WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

Form #1

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OFFICE OF WEST VIRGINIA SECRETARY OF STATE

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: West Virginia Board of Education TITLE NUMBER: 126

RULE TYPE: Legislative ; CITE AUTHORITY W.Va. Const., Article XII, §2, W.Va. Code §18-2-5

AMENDMENT TO AN EXISTING RULE: YES X NO ___

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 44

TITLE OF RULE BEING AMENDED: Instructional Goals and Objectives for West Virginia Schools (2520)

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

TITLE OF RULE BEING PROPOSED: ___

DATE OF PUBLIC HEARING: November 12, 1996 TIME: 7:00 p.m.

LOCATION OF PUBLIC HEARING: Independence Jr. High School, Beckley (Sophia); Cabell Midland High School, Huntington; Museum of Culture and History Theater, Charleston; Eastern Greenbrier Jr. High School, Lewisburg; Parkersburg South High School, Parkersburg; Wheeling Park High School, Wheeling; East Fairmont High School, Fairmont; and James Rumsey Technical Institute, Martinsburg

COMMENTS LIMITED TO: ORAL ___, WRITTEN ___, BOTH XX

COMMENTS MAY ALSO BE MAILED TO THE FOLLOWING ADDRESS:

Carolyn Meadows, Director
Office of Instructional Services
WV Department of Education
Building 6, Room 330
1900 Kanawha Blvd., East
Charleston, WV 25305-0330

The Department requests that persons wishing to ~~make~~ comments at the hearing make an effort to submit written comments in order to facilitate the review of these comments.

The issues to be heard shall be limited to the proposed rule.

ATTACH A **BRIEF** SUMMARY OF YOUR PROPOSAL

Cynthia E. Evans

Cynthia E. Evans
Director, Legal Services

31.80

West Virginia Board of Education
Notification of Public Hearings

Policies: 1100 (Guide to Implementation of S.B. 300)
2510 (Assuring the Quality of Education: Regulations for Education Programs)
2520 (Instructional Goals and Objectives for West Virginia Schools)
2340 (Statewide Assessment Program)
2470 (Use of Technology by Educators and Students)
2320 (Performance-Based Accreditation System)

Public Comment Period Ends: November 15, 1996

Eight public hearings regarding these policies will be held at 7:00 p.m. on November 12, 1996 at the following locations:

Beckley (Sophia): Independence Junior High School

Huntington: Cabell Midland High School

Charleston: Museum of Culture and History Theater

Lewisburg: Eastern Greenbrier Junior High School

Parkersburg: Parkersburg South High School

Wheeling: Wheeling Park High School

Fairmont: East Fairmont High School

Martinsburg: James Rumsey Technical Institute

Additional Information About the Hearings:

- Persons desiring to speak **must sign in** at a hearing location between 6:15 and 6:45 p.m. the night of the hearing. Speakers will not be registered by telephone.
- Speakers will receive **a maximum of five (5) minutes** for their remarks
- Speakers must provide a **written copy** of their remarks to the hearing moderator
- Smoking is not permitted at any of the hearing locations

1119dav/11a

WEST VIRGINIA DEPARTMENT OF EDUCATION

Dr. Henry R. Marockie, State Superintendent of Schools
Building 6/1900 Kanawha Blvd. E./Charleston, West Virginia 25305-0330

Phone: 304-558-2681
Fax: 304-558-0048

West Virginia Board of Education

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Michael D. Greer
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September 1996

Dear Colleagues:

S.B. 300 provides a unique opportunity to improve student achievement and prepare students for post-secondary education and their eventual entrance into the workplace. To implement the provisions of S.B. 300, a number of educators, parents and interested citizens from around the state have joined with Department of Education staff to revise and update policies. Enclosed for your information and review are copies of those policies. They have been placed on public comment until November 15, 1996 by the West Virginia Board of Education.

On the reverse side of this memorandum is a notice of public hearings on the policies. The hearings will be held in each region of the state on November 12, 1996.

The policies enclosed are:

Policy 1100..... Guide to Implementation of S.B. 300. We suggest you review this policy first as it will direct you to the various changes that are being made to implement S.B. 300

Policy 2510..... Education Programs. This is the basic policy that defines education in public schools in West Virginia.

Policy 2520..... Instructional Goals and Objectives. This policy incorporates by reference the newly-revised instructional goals and objectives for the four core areas of English language arts, mathematics, science and social studies.

Policy 2340..... Statewide Assessment Program. This policy details the new statewide assessment program.

Policy 2470..... Use of Technology by Educators and Students. This policy provides general rules for the use of technology for instruction and incorporates by reference the statewide technology plan.

Policy 2320..... Performance Based Accreditation System. Many of the performance measures and high quality standards have been revised and are incorporated in this policy.

We encourage you to review the policies and submit any comments you may have. Each policy has attached to it a comment form that contains the name and address of the Department staff professional to whom the comments should be sent. We also invite you to attend the public hearing on November 12 closest to you.

Thanks for taking the time to look through the policies. We appreciate the work you do for the children of West Virginia.

Henry Marockie
State Superintendent of Schools

HM:dav
1118dav/11a

EXECUTIVE SUMMARY
WEST VIRGINIA BOARD OF EDUCATION

POLICY NUMBER AND TITLE: Policy 2520
Instructional Goals and Objectives

PUBLIC COMMENT PERIOD ENDS: November 15, 1996 **ADOPTED:** _____

BACKGROUND:

West Virginia Board of Education Policy 2510 provides a definition of, a delivery system for, and an assessment and accountability system for, a thorough and efficient education for West Virginia public school students. This policy defines the instructional goals and objectives for the programs of study required by Policy 2510 and establishes a standardized format for them.

PURPOSE:

The purpose of this policy is to set forth a focused and well-defined curriculum K-12 that incorporates what students should know and be able to do. These proposed instructional goals and objectives shall become the vehicle for teachers to focus and target their instruction toward critical skills.

The revised instructional goals and objectives for English language arts, mathematics, social studies and science are aligned with the objectives assessed on the statewide standardized test, include process workplace skills, incorporate computer/technology objectives in each core curriculum area at each grade level, and define a challenging and rigorous curriculum for all students. A partnership of teachers, principals, county administrators, college and university faculty, Department of Education representatives, business and community members collaborated in the production of the instructional goals and objectives.

IMPACT:

The use of the revised instructional goals and objectives will help schools establish well-defined curriculum that focuses instruction on mastery of critical skills with opportunities for immediate reteaching when necessary that should result in more consistent and higher achievement for all students.

FISCAL IMPACT:

No cost to local schools or county boards of education will result from this policy.

Instructional Goals and Objectives
Policy (2520)

The State Board of Education believes that the guiding principles of excellence and equity of educational opportunity provide the foundation upon which a learner-based system of educational program development and delivery is built. Further, the board recognizes that the primary goal of such a system is to establish high quality standards concerning performance expectations for all students attending West Virginia public schools.

Therefore, the board affirms its commitment to a state level learner-based system of educational program development and delivery that ensures that each learner has the opportunity to master the knowledge, skills, attitudes, and behaviors related to state approved programs of study through delivery of approved instructional goals and objectives. These programs of study and instructional goals and objectives are periodically reviewed to ensure needs of students and represent what students should know and be able to do.

TITLE 126
LEGISLATIVE RULE
BOARD OF EDUCATION

SERIES 44
INSTRUCTIONAL GOALS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS (2520)

§126-44-1. General.

1.1. Scope. -- West Virginia Board of Education Policy 2510 provides a definition of, a delivery system for, and an assessment and accountability system for, a thorough and efficient education for West Virginia public school students. This policy defines the instructional goals and objectives for the programs of study required by Policy 2510 and establishes a standardized format for them.

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

1.3. Filing Date. --

1.4. Effective Date. --

1.5. Repeal of former rule. -- This legislative rule repeals and replaces WV 126CSR44 (Policy 2520) and repeals WV 126CSR44C (Policy 2520.02), WV 126CSR44G (Policy 2520.04), WV 126CSR44E (Policy 2520.08) and WV 126CSR44I (Policy 2520.09).

§126-44-2. Purpose and Format.

2.1. This policy defines the instructional goals and objectives for the programs of study required by Policy 2510 in English language arts, mathematics, science and social studies. The instructional goals and objectives for all other programs of study required by Policy 2510 are being rewritten and will be available as quickly as possible.

2.2. The instructional goals and objectives for all programs of study required by Policy 2510 shall be developed, approved, and published in the format used for the current revision of the instructional goals and objectives for English language arts, mathematics, science and social studies. All of the new instructional goals and objectives will be compiled together into one document.

§126-44-3. Incorporation by Reference.

3.1. A copy of 126CSR44, Instructional Goals and Objectives for West Virginia Schools (Policy 2520), is attached. Copies may be obtained in the Office of the Secretary of State and in the West Virginia Department of Education, Office of Instructional Services.

§126-44-4. Summary of the Instructional Goals and Objectives.

4.1. Summary of the Instructional Goals and Objectives: The West Virginia Board of Education has the responsibility for establishing high quality educational standards pertaining to all education programs (W.Va. Code §18-9A-22). The instructional goals and objectives provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace or in further education. The document includes: instructional goals for English language arts, mathematics, social studies, science, process/workplace skills; program charts for K-2, 3-4, 5-8, and 9-12; instructional practices for K-12; a document guide; instructional objectives that reflect a rigorous and challenging curriculum, the objectives assessed on the state standardized test, process/workplace objectives and computer/technology objectives for each grade level in each program of study.

Instructional Goals and Objectives

for West Virginia Schools

Henry R. Marockie
State Superintendent of Schools
September 1996

WEST VIRGINIA BOARD OF EDUCATION
1996-97

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Discrimination Prohibited: The West Virginia Department of Education does not discriminate on the basis of sex, race, color, religion, disability, age and national origin in employment and in the administration of any of its education programs and activities. Inquiries may be directed to the Elimination of Sex Discrimination Program Coordinator, 558-7864; to the Section 504 Coordinator, 558-2696, WV Department of Education, 1900 Kanawha Blvd. E., Charleston, West Virginia, 25305-0330; or to the U.S. Department of Education's Director of the Office for Civil Rights, 215-596-6795.

Instructional Goals and Objectives

for West Virginia Schools

Henry R. Marockie
State Superintendent of Schools
September 1996

Foreword

The West Virginia Board of Education is pleased to present the Criteria of Excellence: Instructional Goals and Objectives for use in promoting student success throughout the state. Senate Bill 300 challenges all state educators to develop a school system that fosters higher student achievement by combining a rigorous academic program with a realistic understanding of work place expectations. To meet the mandate of this legislation, a partnership of teachers, principals, county administrators, college and university faculty, State Department of Education representatives, and business and community members collaborated in the production of this document.

English language arts, mathematics, science and social studies are the four basic cornerstone subjects from which the total learning system of a school, county or state evolves. Mastery of grade level objectives in these core areas is essential for students' future success.

The process of developing a strong learning system begins with the clearly stated instructional goals and objectives contained in this document. These instructional goals and objectives are challenging and rigorous with content based on sound educational research. Educators on the county and school levels will use the goals and objectives contained in the Criteria of Excellence: Instructional Goals and Objectives to design innovative academic programs, select high quality instructional materials and provide targeted staff development.

Working together, educators, students, parents and business leaders can secure a future full of promise and productivity for all children in West Virginia.

Henry Marockie
State Superintendent of Schools

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English Language Arts Instructional Goals

The English language arts curriculum promotes student proficiency in understanding and expressing meaning. Today's global economy and technology-driven society demand people who can communicate, express, and exchange ideas in a variety of forms for different audiences and medias. All careers require people to use language to work individually and cooperatively to analyze and interpret information; to solve problems; and to make decisions.

Students will study a wide range of classic and contemporary works to build an understanding of the culture and history of a democratic society. They will approach writing tasks systematically and use the writing process appropriately. When they create text, they will apply knowledge of structure, study skills, editing, usage, spelling, and punctuation. Students must recognize connections among the English language arts. Growth in one of the English language arts areas will promote growth in the other areas.

Language

All students should make progress toward mastery of grammar, mechanics, and usage of standard English in their writing and speaking. They will master parts of speech, determine relationships between and among those parts, and correctly apply these rules for speaking and writing. Students will work individually and/or cooperatively to evaluate and edit material.

Listening/Speaking

Students will listen and speak effectively to exchange ideas and opinions for a variety of purposes, audiences, and medias. Strong listening and speaking skills ultimately enhance their personal, academic, and occupational lives. Many reading comprehension and literary appreciation skills are first learned through listening and speaking.

Spelling

Students will acquire vocabulary through spelling instruction. Students will spell and pronounce words correctly and apply strategies to spell unknown words across the curriculum.

Reading

Initial reading instruction should emphasize learning to read by establishing the concept, sound, and structure of print. A transition will then begin toward reading to learn. Students will use reading strategies that will assist them in achieving personal goals to succeed in society. Comprehension and critical reading skills are essential and will be developed through all grades by reading selections from various genres.

Study Skills

Students will work individually or as members of a team to acquire, integrate, store, and retrieve information from different sources Research skills should be constantly taught and reinforced at all grade levels. Instruction should lead the student to complete oral and written presentations that exhibit interaction and consensus within a group. All study skills should provide the necessary competency to become lifelong learners.

Writing

All students will work toward error-free compositions with increasing command of the conventions of composition. These compositions will include narrative, informative, and persuasive writing. Students will use an appropriate writing process (pre-writing, drafting, revising, editing, and publishing) to express and communicate ideas. They will demonstrate continuous progress toward keyboarding, word processing, and writing legibly in penmanship.

Mathematics Instructional Goals

The mathematics curriculum at all levels is currently undergoing significant change. Many of these changes have arisen as a response to the need to better prepare students for college, other post-secondary education, and gainful employment. Today's global and computer-driven society demands workers with thinking skills who can master new technologies, solve problems by employing a variety of strategies, and explain concepts and procedures based on mathematical reasoning. All students are to value mathematics, become confident in their ability to do mathematics, become mathematical problem solvers, communicate mathematically, and learn to reason mathematically.

Mathematical Problem Solving

Students in grades K-12 will become competent problem solvers. The incorporation of the problem solving process is a focus of all instruction in mathematics. Learners will work individually or cooperatively to investigate mathematical content, formulate problems, and solve problems using real-life data. Problem solving strategies include: modeling, making a list, estimating; guessing and checking; patterning; working backwards; using formulas; making and/or using tables, charts, and diagrams; brainstorming, and solving simpler problems.

Mathematical Communication

Students in grades K-12 will have multiple opportunities to develop communication skills in mathematics. Students will regularly reflect upon their learning, formulate conclusions, and express mathematical ideas. The students' understanding of mathematics will be clarified through reading, writing, speaking, and listening. Students will use the language of mathematics, including specialized vocabulary and symbols, to represent and describe mathematical ideas, generalizations, and relationships.

Mathematical Reasoning

The development of critical thinking skills is essential for a genuine understanding of mathematics. Students will regularly be asked to extend ideas, make conjectures, generalize, clarify by example, identify alternate problem solving strategies, and justify solutions. Students will apply deductive and inductive reasoning in a variety of problem solving situations. The student will recognize reasoning as a process that can grow out of every mathematical activity.

Mathematical Connections

Students will recognize connections among concepts and procedures within the various branches of mathematics and with other disciplines. Recognizing these connections reinforces the importance of the mathematical content.

Algebraic and Geometric Concepts

Algebraic and geometric concepts will be taught in all grade levels so that all students are well prepared for the requirement of Algebra and Geometry at the high school level.

Social Studies Instructional Goals

Social studies at all levels integrate the social sciences and humanities to promote civic competence and participation. The curriculum should be dynamic in order to prepare students for a society where change is rapid and constant. The realities of a globally interdependent world require students to understand their historical roots and draw upon historical knowledge. Students must learn to solve problems facing their own communities as well as emerging global issues. The curriculum must provide opportunities for students to develop skills in making not only personal choices but also economic choices based on limited resources. Students need preparation to face persistent dilemmas in our democracy. All students need to be confident in their ability to be lifelong learners, to enter and adapt to a changing world of work and further the goals of democracy.

Civics and Government

Students in K-12 will develop competencies essential for informed, responsible, civic behavior. Instruction should allow students to understand the need for authority and government and the exercise of rights and responsibilities. Students must learn and practice intellectual and participation skills essential for an involved citizenry. This will involve articulating ideas, taking and defending positions, building coalitions, negotiating, compromising, seeking consensus, making decisions, and resolving problems. In order to develop these skills the curriculum must extend beyond the school to include experiences in the workplace and service in the community.

Economics

Students will learn to make informed economic choices in a growing global economy through mastery of the economics objectives. Learners will investigate economic principles and their application to historical situations. Then learners will work cooperatively and individually to analyze how basic economic principles affect their daily lives by examining real problems and situations. The economic principles should include an understanding of scarcity and choice, productivity, markets and prices, supply and demand, competition, role of government, international trade factors, and consumer decisions.

Geography

Students will learn that geography is the science of space and place on Earth's surface through mastery of the geography objectives. Its subject matter is the physical and human phenomena that make up the world's environments and places. The students will be able to describe the changing patterns of places in words, maps, and geographics, explain how these patterns come to be, and analyze their meaning. The students continuing quest is to understand the physical and cultural features of places and their natural settings on the surface of Earth.

History

Students in K-12 study history to gain a sense of order and time. Through understanding the results and consequences of human decisions and actions, students will develop historical concepts, examine the past and its relationship to the present. Students will analyze how individuals, groups, and nations have shaped cultural heritages. Through the study of history, students will learn about states, nations, locations, settlements, formations, governments, economic developments, and cultural heritage. In order to develop a historical perspective, students must be challenged to see causal relationships, evaluate problem solving techniques and to recognize the value of history in preparing for the future.

Science Instructional Goals

Scientific literacy for all students is the fundamental goal of the science curriculum. All West Virginia children must be prepared to live and work productively in a highly scientific, technological world. Economic competitiveness is dependant on an educated, trained workforce that understands why and how things work. Students must learn to make evidence-based decisions in their personal lives and on societal issues. Drawing upon the National Science Education Standards, the goals of Project 2061, and the tenets of the Scope, Sequence, and Coordination Project, the science curriculum delineates what students must know, understand, and be able to do. Inquiry-based science instruction is emphasized throughout the K-12 curriculum.

Nature of Science

Students will develop an understanding of the nature of science which encompasses the understanding and the practice of scientific inquiry; the acquisition and the nature of scientific knowledge; and the comprehension of scientific endeavors.

Scientific Attitudes/Habits of Mind

Through cultivation of scientific attitudes (i.e., demand for verification, test for validation, display of curiosity), students will develop an understanding of the limits of science and to evaluate scientific advances and technological applications as they impact society. Through the participation in the scientific enterprise, students will construct their knowledge about the natural and designed world.

Scientific Processes/Thinking Skills

Students will develop and demonstrate the scientific processes for investigating the world. They will utilize critical thinking skills to make decisions based on evidence and employ appropriate strategies to solve problems. The processes of science used to construct knowledge not only help students find meaning in science, but also assist students in the development of important life management and work skills. Ample opportunities are needed for students to develop the scientific skills such as formulating questions; making predictions; designing experiments; making observations; classifying, organizing, and analyzing data; drawing conclusions; and evaluating results.

Laboratory Investigations/Hands-On Learning

Scientific inquiry is as a pathway to knowledge. Students acquire skills for learning and gain knowledge of the natural world from direct observation, interaction, and concrete manipulation of the tools and the materials of science. Students will engage in active inquiries, investigations, and hands-on activities a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills.

Science Themes and Subject Matter

Through the integration of the fields of science and the development of unifying themes, students will be able to see that interrelationships among biology, chemistry, physics, and the earth sciences. Scientifically literate students will make connections in the formal education setting and will apply their knowledge and skills to daily life experiences. Science themes - systems, changes, and models - provide students with unifying conceptual schemes that increase their understanding of the natural world.

Science History

Science is a human endeavor. Studying historical and current discoveries of scientists and scientific milestones provide students with information about how discoveries have influenced current scientific thought and advances. Scientifically literate students will realize the contributions of diverse cultures, past and present scientists and society in general.

Science, Technology, and Society

Science, Technology, and Society

Understanding science and technology in the context of personal and social perspectives are critical issues in preparing students to take an active and responsible role in society. To live and work in the highly scientific and technological world of the twenty-first century, students must be able to identify problems and design, implement, and evaluate solutions. Students must comprehend the inherent link between science and technology and their impact on society.

Process/Workplace Goals

In addition to the core academic areas of English language arts, mathematics, science and social studies, six key areas of process skills have been identified. These are essential skills students need for successful entry into work or post-secondary education. The ability to solve problems, communicate successfully, work with others, apply sound judgement, establish clear objectives for advancing career interest and utilize technology to assist with specific tasks. Throughout the 7 - 12 curricula the ◊ mark those academic learning objectives particularly that lend themselves to the development of process skills. The instructional practices section of this document also incorporates practices that support the development of these skills. The six goals are as follows:

Process/Workplace Problem Solving
These process skills reflect one's ability to organize, plan, reason, and use information to solve problems. Time management; the ability to prioritize; understanding cause and effect relationships; and evaluating, summarizing, and communicating information are skills embedded throughout the core subjects K-12.

Process/Workplace Communication
Effective communication is fundamental to achieving a desired result whether in the workplace or advancing one's education. The goal is to communicate effectively both orally and in writing. Correct grammar, punctuation, spelling and an extensive vocabulary equip students to deal effectively with various audiences, publics and individuals. Listening is also a significant skill in the area of communication.

Process/Workplace Working With Others
The development of these skills gives the individual the ability to: function in both leadership and non-leadership roles, to deal with conflict effectively, to motivate individuals or teams of people, to understand the concept of "customer service", to participate in work-related decisions and acknowledge the contributions of others.

Process/Workplace Technology
The ability to understand and utilize technology to solve problems is a mandate in today's world. Students will learn to: set-up and operate computer equipment and assorted peripherals, use on-line sources to obtain or exchange information; select and use multiple software packages; and demonstrate skills in the use of word processing, databases, spread sheets, graphics and telecommunications.

Process/Workplace Self Management
Students will aquire the attributes of motivation, promptness, perseverance, honesty and reliability in word and action. Well developed self management skills also reflect pride in work effort, attention to detail and accuracy and a focus on personal wellness and grooming.

Process/Workplace Career Development
This area establishes a process to assist students in planning and preparing for a career. The formal initiation begins at the end of eighth grade when the student, the parents, and counselor begin assessing and discussing the students career interest and choose some corresponding career clusters to be explored in grades nine and ten. Upon completion of the tenth grade, students, parents and the counselor select a career major. Flexibility for changing clusters and majors remains throughout. Another objective is to assist students in developing and reviewing career goals and plans, to evaluate personal interest and aptitudes, to master skills needed to prepare job applications, resumes, cover and follow-up letters and to speak with confidence and composure about one's own skills and qualifications in an interview setting. A culminating step in the area of career development is the workplace experience that all students will have during their eleventh and twelfth grade.

Process/Workplace Objectives

Although these objectives are reflected throughout the core subjects K-12 and identified with a ◇ in grades 7-12, a listing of highly focused process skill objectives provides additional guidance for teachers in developing experiences and opportunities for students. These objectives may also be used by the school and employer to determine if the workplace experience merits awarding unit(s) of credit.

Problem Solving

PW.1 generate a concept to improve working conditions, production, personnel, or public relations then plan, organize, and implement the concept

PW.2 given a set of rules, directions, or instructions, apply them to solve a problem or accomplish a task

PW.3 given multiple tasks, prioritize them according to importance and prepare a time frame and schedule to accomplish the tasks

PW.4 identify and analyze a problem by stating causes and effects

PW.5 given an event or activity, identify the resources needed and develop a plan of action

PW.6 provided several sources of information relative to the workplace assignment, evaluate the information for reliability, completeness and applicability

PW.7 establish a procedure and method for maintaining and retaining information relative to the workplace assignment

PW.8 demonstrates an understanding of oral, visual, and written communication by orally summarizing the communication

Communication

PW.9 use correct grammar when speaking and writing

PW.10 use correct punctuation, spelling, vocabulary and grammar in all written work

PW.11 given a situation or circumstance, take a position and communicate ideas to justify the position

PW.12 compose correspondence for a variety of audiences that is grammatically correct, easily understood, and reflects all necessary information

PW.13 using multi-media, prepare an oral presentation that has a specific message, that is effective and then alter the presentation for a different audience

PW.14 perform a task after listening to oral information

Working With Others

PW.15 given an assignment with two or more individuals, use encouragement, persuasion, and motivation to complete the assignment

PW.16 perform effectively in both leadership and non-leadership roles

PW.17 placed in situations of conflict, demonstrate ability to mediate and resolve the conflict

PW.18 analyze verbal and non-verbal feedback from supervisors, fellow employees, and/or customers, then reflect what if any action should be taken

PW.19 identify the appropriateness and effectiveness of using verbal and non-verbal feedback

PW.20 given a customer complaint, understand the businesses' policy for dealing with customer dissatisfaction and effectively resolve the situation

PW.21 provided an organizational chart reflecting work responsibilities of various employees, clearly identify the role assumed by each and the relationship each role has relative to the total organization

PW.22 given the opportunity to participate in work-related decisions, demonstrate the ability to abide by those decisions.

PW.23 given a circumstance where there is a difference of opinion, demonstrate the ability to recognize those differences and work toward a compromise

PW.24 gives credit to all individuals contributing to an accomplishment

Technology

PW.25 demonstrate the ability to set up computer equipment

PW.26 demonstrate the ability to operate computer equipment

PW.27 demonstrate the ability to obtain and exchange information by using on-line sources

PW.28 demonstrate the ability to select and use multiple software packages for specific purposes

PW.29 demonstrate the ability to use word processing

PW.30 demonstrate the ability to create and use databases, spreadsheets, and graphics

PW.31 demonstrate the ability to use telecommunications

PW.32 given a problem, assignment, or task, select and use the appropriate technology and procedures for a resolution or solution

Self Management

PW.33 arrive on time

PW.34 stay with an assignment or task to completion

PW.35 demonstrate self-motivation

PW.36 work independently without direct supervision

PW.37 take steps appropriate to developing or implementing new ideas or concepts to improve the workplace, product, or services

PW.38 choose ethical courses of action and exhibit honesty and reliability in words and action

PW.39 given a real or imagined salary, create a personal budget and demonstrate the ability to balance a checkbook

PW.40 dress appropriately for various settings (e.g., work, school, community functions)

PW.41 demonstrate sound safety practices and respond appropriately to emergencies

PW.42 reflects attention to detail accuracy, and quality in work through exhibits and products

Career Development

PW.43 establish career clusters and majors with the guidance of parents and counselors at the end of eighth and tenth grades taking into consideration self assessment and career assessment data (e.g., ACT Explore)

PW.44 identify multiple career options and establishes goals toward the pursuit of the selected career path

PW.45 prepare a job or college application, résumé, and write appropriate cover and follow-up letters

PW.46 practice interview strategies concentrating on speaking clearly and correctly, speaking with confidence about one's own skills and qualifications as they relate to the specific situation

PW.47 provide community service and assesses entrepreneurial opportunities that exist within the community, the region, the state or the nation.

PW.48 discuss with the workplace supervisor the legal and labor issues associated with the job assignment (e.g., eleventh and twelfth grade students)

Early Childhood K-2

These core programs of study shall be taught daily with a reteach component ensuring mastery of the instructional objectives. Reteaching is to occur daily for those students needing more help.

English Language Arts
Mathematics

These required programs of study may be taught as separate or integrated programs but need not be taught daily. Teachers may not be able to schedule students on some days for instruction in the following programs of study if they require reteaching or extended instructional time in English language arts or mathematics.

Science
Social Studies
Art
Music
Physical Education
Health

Compenents of career awareness and the application of technology shall be included during instruction in all subjects.

Students demonstrating mastery of instructional grade level objectives in the core programs of study are to be provided the opportunity to advance to the next grade level objectives.

Early Childhood 3-4

These core programs of study shall be taught daily with a reteach component ensuring mastery of the instructional objectives. Reteaching is to occur daily for those students needing more help.

English Language Arts
Mathematics
Social Studies
Science

These required programs of study may be taught as separate or integrated programs but need not be taught daily. Teachers may not be able to schedule students on some days for instruction in the following programs of study if they require reteaching or extended instructional time in English language arts or mathematics.

Art
Music
Physical Education
Health

Components of career awareness and the application of technology shall be included during instruction in all subjects.

Students demonstrating mastery of instructional grade level objectives in the core programs of study are to be provided the opportunity to advance to the next grade level objectives.

Middle Childhood 5-8

These core programs of study shall be taught daily with a reteach component assuring mastery of the instructional objectives.

English Language Arts
Mathematics
Social Studies
Science

These required programs of study shall be taught at each grade level each year as separate subjects.

Art
Music*
Physical Education
Health

These required programs of study shall be taught annually.

Career Exploration**
Developmental Guidance***
Foreign Language****

Career awareness and the application of technology shall be taught in all core programs of study. Students demonstrating mastery of instructional grade level objectives in the core subjects are to be provided the opportunity to advance to the next grade level objectives.

* Choral and instrumental music must be offered no later than grade six.

** This course must be taken during grade seven or eight.

*** This may be an integrated or separated course.

**** Beginning the fall term of 1998, all counties are encouraged to offer two years of foreign language for students in grades seven and eight. Beginning the fall of 2002, all counties will be required to offer two years of foreign language for students in grades seven and eight.

Adolescent 9 - 12

Requirements for Graduation

English Language Arts
4 courses
English 9, 10, 11, 12

Mathematics
3 courses
Two of the three credits will be Algebra I and above, and one course from the approved elective list*

Science
3 courses
Coordinated and Thematic Science 9, Coordinated and Thematic Science 10, and one course from the approved elective list

Social Studies
3 courses
United States to 1900, World Studies to 1900, and Twentieth Century

Physical Education/Wellness
1 course

Health
1 course

The Arts
1 course

Foreign Languages**
2 courses

Career Majors***
4 courses

Work-based Experience****

Electives (chosen from the school's offerings of electives)
4 - 8 courses

Credits for these courses are to be awarded based upon demonstrated mastery of the instructional objectives.

Students demonstrating mastery of instructional grade level objectives in the core subjects are to be provided the opportunity to advance to the next grade level objectives.

*Successful completion of the objectives for applied math I and II is equivalent to an algebra I credit. Applied geometry may be substituted for a formal course of geometry.

**Two credits in one foreign language shall be required of all college bound students and students in designated majors beginning with ninth grade students entering in the fall of 1997.

***Prior to students selecting career majors opportunities for career decision making orientation must be provided.

****Work-based Experiences will be determined at the local level. The decision regarding credit for the experiences at grades 11 - 12 will also be made at the local level.

Core Electives
Adolescent 9-12

ENGLISH LANGUAGE ARTS, MATHEMATICS, SCIENCE AND SOCIAL STUDIES

English Language Arts

Drama
Theater
Journalism
Mass Media
Television
Film
Speech
Creative Writing
Technical Writing
Desk Top Publishing
AP English
English College Courses

Mathematics

Applied Mathematics I*
Applied Mathematics II*
Geometry/Applied Geometry*
Algebra II*
Trigonometry*
Probability and Statistics*
Pre-Calculus*
Discrete Mathematics
Algebra/Geometry Preparation*
Algebra Support*
AP Mathematics
Mathematics College Courses

Science

Biology Eleven/Twelve*
Chemistry Eleven/Twelve*
Chemistry - Conceptual/Technical
Environmental Earth Science*
Eleven/Twelve
Human Anatomy & Physiology
Physics Eleven/Twelve*
Physics - Conceptual/Technical
AP Science
Science College Courses

Social Studies

Economics*
Civics/Government*
AP Social Studies
Social Studies College Courses

Credit for AP classes will be awarded only if the student takes the AP exam.
*Required to be offered.

*Non-Core Electives 9-12

The Arts**

Dance
Instrumental Music (Band)
Instrumental Music (Strings)
Choral Music
Music Appreciation (Music History or Humanities)
Music Theory
AP Music Theory
Theatre
General Art I, II, III, IV
Studio Art
AP Studio Art
Art Appreciation (Art History, Aesthetics, Art Criticism, or Humanities)
AP Art History

Foreign Language***

Health

Career Majors

Physical Education

* The non-core instructional objectives for electives will be submitted to the State Board for approval within the next six months.

** One course from theatre, instumental music, choral music, and art is required to be offered.

*** Two levels of one foreign language are required to be offered. Languages to be offered will be determined by local boards of education.

Note: Electives for health, career majors and physical education will be listed when the goals and objectives are submitted. Electives to be offered in these areas will be determined by local boards of education.

Kindergarten - Twelve Instructional Practices

IP.1 continually monitor students' daily work, provide feedback to students on progress and reteach skills before introducing new ones

IP.2 provide opportunities for students demonstrating grade level mastery of skills to advance to the next grade level of skills

IP.3 include in the structure of the lesson preteaching, reviewing of prerequisite learning, sharing the objectives, presenting new material in small steps with practice after each step and checking for understanding, then after initial instruction provide guided practice under direct teacher supervision, assign homework to reinforce classroom learning, and conduct periodic reviews

IP.4 increase time for teaching and learning by establishing rules, procedures and consequences and communicating them to students; enforcing behavioral expectations consistently and uniformly; planning lessons well in advance; reducing transition time between lessons and activities; setting an appropriate pace in teaching the lesson; giving students alternate or ongoing assignments; using "self- instructional" activities; giving additional work that builds desired skills; and making instructions focused and clear

IP.5 match instructional methodologies to learning styles; differences in students' achievement levels; and emotional, social and physical characteristics of students

IP.6 encourage students to think systematically, critically and analytically about issues and events by using effective questioning techniques and other strategies (e.g., the Socratic method, "what if" questions, graphic organizers, creating a time capsule, human timeline or opinion continuum)

IP.7 make teaching student-centered, utilizing a variety of participatory strategies and materials. (e.g., cooperative learning, role playing, small group exploration, manipulatives, calculators)

IP.8 provide feedback to students on homework assignments through grades, comments and/or discussion

IP.9 establish a grading procedure that reflects assessment of the required instructional objectives; passing status is not to be awarded through extra credit: a variety of assessments may be used in determining grades (e.g., teacher-made test, research projects, performance assessments, presentations)

IP.10 use a variety of print sources in teaching, practicing and extending concepts (e.g., primary historical documents, literature, current periodicals, technical manuals, Internet, reference materials)

IP.11 incorporate writing into all curricular areas with essays, diaries, journals, logs, research papers, position papers, poetry, fiction, newspaper articles, letters

IP.12 encourage students to engage in presentations to their peers and to adults in such activities as debates, panel discussions, mock legislatures, model United Nations, Social Studies and Science Fairs, press conferences, plays, oral interpretation of prose or poetry and student produced videos. Give students practice in communicating their knowledge and in expressing and accepting feedback both positive and negative

IP.13 show students linkages among all the subject areas by organizing theme-oriented projects, by co-teaching with a colleague and/or by integrating skills from other content areas (e.g., data collection and graphing in a social studies assignment, journal writing as part of a chemistry experiment)

IP.14 provide constant opportunities for students to use classroom knowledge and skills in addressing local, national and international issues; and give students the opportunity to correspond and interact with adults from the community, national and international pen

pals, and citizens from other countries

IP.15 teach students how to work effectively on a team by assuming both leadership and non-leadership roles, by understanding differences of opinion, by dealing appropriately with conflict, and by motivating and acknowledging others' contributions

IP.16 help students understand their individual roles in larger organizations (e.g., team, class, school) as active participants in decision making, accepting supervision and cooperating with authority. Provide practice in effective work habits as part of instruction and assist students in realizing that it is their job to learn, so that students become "workers" in their own education

IP.17 use classroom management techniques (e.g., in the formulation of rules and procedures) to foster cooperation, self-control, independence, perseverance, honesty and reliability in word and action in students. Recognize the potential of each individual learner and his/her worth as a human being; model for students what you expect from them

IP.18 build skills and encourage attitudes in students which will lead to life-long learning by setting goals, reading independently, researching, assessing one's own progress and developing pride in a high quality of work

IP.19 teach the state indentified instructional objectives using appropriate correlated material

IP.20 alternate instructional strategies within each lesson and use computers ond other technologies to provide creative instructional opportunities in all subjects for students individually and in groups

IP.21 integrate and interrelate academic and technical content when appropriate

IP.22 work and plan with other teachers and use professional judgements in delivery class-room instruction

Document Guide

- Boldface font indicates the objectives that will be assessed on the state standardized test.
- Subscripted numerical notations ($6.28_{7,8}$) indicate the objective will be assessed at additional grade level(s).
- ◊ notation indicates the objective is a workplace readiness skill.

Kindergarten
English Language Arts

The kindergarten student will be immersed in a language rich environment to develop oral language skills and appreciation for the English language arts. Kindergarten teachers will engage students by providing them opportunities to participate in meaningful activities and roles throughout the entire curriculum where the English language arts are the foundation for all learning. The English language arts will challenge students to extend and elaborate upon what others have said, developing higher-order thinking skills.

Listening/Speaking

K.1 listen to a variety of literary forms, including stories and poems

K.2 participate in choral speaking, reciting poems, rhymes, songs, and stories with repeated patterns and creative dramatics

K.3 use words to describe/name people, places, things, and number words

K.4 use words to describe actions

K.5 restate and follow one-step and two-step directions

K.6 follow implicit rules for conversation (e.g., taking turns, staying on topic, utilizing communication technologies)

K.7 use appropriate voice level, phrasing, sentence structure, and intonation in speaking

K.8 participate in discussions about learning

K.9 differentiate between a word and a sentence

K.10 substitute words in a rhyming pattern

K.11 identify high, low, near, far, soft, and loud sounds

K.12 hear, say, and manipulate phonemes of spoken language (e.g., divide words into phonemes and blend phonemes into words)

K.13 demonstrate appropriate listening behaviors (e.g., resist distractions, stay alert, hands/feet quiet, eyes on speaker, take responsibility for success of communication)

Reading Comprehension

K.14 read literary work by national and international authors to include, but not to be limited to: fairy tales, science fiction, tall tales, and poetry

K.15 use one-to-one correspondence

K.16 use eye/hand coordination

K.17 use left to right progression

K.18 recognize likenesses and differences in objects, pictures, and designs

K.19 match similar objects

K.20 classify objects and pictures

K.21 recognize upper and lower case letters of the alphabet and their sounds

K.22 reproduce, from auditory clues and memory, lower and upper case letter symbols

K.23 **recognize and match pictures with the same consonants/sounds in initial word positions**

K.24 **recognize sound-letter correspondence including beginning consonants, two-letter consonant blends, and two-letter consonant digraphs-all in the initial word positions**

K.25 **recognize and match two-letter consonant blends in initial word positions**

K.26 **recognize and match two-letter consonant digraphs in initial word position**

K.27 recognize and reproduce own name

K.28 recognize colors and color names

K.29 **comprehend concept of positional words (e.g., above, behind, between)**

K.30 understand the concept of a story (e.g., beginning, middle, end)

K.31 recognize real and unreal
K.32 recognize and use rhyming words
K.33$_{1,2,3,4,5,8,9}$ **determine sequence of events**
K.34 **complete sentences by choosing correct picture for meaning with beginning letters supplied**
K.35 **understand concepts of past, present, and future**
K.36$_{2,3,4,5,6,9,11}$ **predict situations that might occur based upon text of a story**
K.37$_{2,3,4,5,6,7,8,9,11}$ **understand and relate to feelings of characters in a story**
K.38$_{1,2,3,4,5,6,7,8,9}$ **understand and identify the main idea in a story**
K.39$_{1,2}$ **use illustrations and oral text to comprehend both literally and interpretively**

Reading Vocabulary

K.40 participate in discussions about learning to include appropriate voice level, phrasing, sentence structure, and intonation
K.41 recognize colors and color names, positional words, and rhyming words

Writing

K.42 use directionality (e.g, left/right, top/bottom, up/down)
K.43 use dominant hand with correct paper position
K.44 hold pencil correctly
K.45 assume and maintain appropriate posture
K.46 use appropriate stroke formation
K.47 print upper/lower case letters correctly
K.48 align writing (e.g., keeps on baseline)
K.49 uses uniform spacing between letters and words
K.50 demonstrates uniformity when writing letters
K.51 write numerals 0-10 correctly
K.52 evaluate handwriting
K.53 use the five steps for process writing (e.g., prewrite, draft, revise, edit, and publish) to begin forming words, phrases, and/or sentences
K.54 use electronic editing tools and traditional editing strategies for words not detected by electronic tools in computer generated work (e.g., proper nouns, in and inn [homophone])

Spelling

K.55 recognize and differentiate among initial and final sounds
K.56 reproduce designs, shapes, numerals, letters, etc. accurately in a predetermined sequence
K.57 produce the graphic symbols for consonant sound spellings

Language

K.58$_{1,2,3,4,5,6,7,8,9,10,11}$ capitalize months of the year, days of the week, names of people, first word in a sentence, and the pronoun "I"
K.59$_{1,2,3,4}$ comprehend and identify correct uses of punctuation: period, question mark, and exclamation point

Study Skills

K.60 acquire organizational skills to manage school materials and personal time management
K.61$_{3,4,6,7,9,11}$ become familiar with reference sources (e.g., dictionary/glossary, encyclopedia, newspapers)
K.62 interpret information from graphic sources (e.g., charts, graphs)
K.63 become familiar with test-taking strategies (e.g., listen closely, make careful choices, do your best)

Computer/Technology

K.64 use appropriate software to practice and master Kindergarten English language arts instructional objectives
K.65 on a keyboard, use the letters of his/her name and/or numbers to "Log On"
K.66 on a keyboard, use special function keys such as "Return/Enter, space bar, and Esc"

K.67 select a program from a menu
K.68 use a mouse to "point and click"
K.69 identify the uses of technology at work and play
K.70 identify various components of a computer (e.g., monitor, keyboard, CPU, disk drive, printer, etc)

Kindergarten Mathematics

The Kindergarten objectives emphasize the use of manipulatives, concrete materials, and appropriate technology so that students explore and develop ideas that are fundamental to the study of mathematics: number, counting, ordering, comparing, classifying, patterning, shape, size, position, numeration, measuring, and problem solving. The emphasis is on experience and growth in mathematics.

Number Theory and Number Sense

K.1 count forward to 100 and backward from 10 with and without objects
K.2 **given a set containing ten or fewer concrete items: tell how many are in the set; select the corresponding numeral from a given set; trace over the numeral using tactile materials; identify and describe one set as having more or fewer or the same number of members as the other set, using the concept of one-to-one correspondence; identify one more and one less than a given number; identify missing numbers in a sequence**
K.3 recognize patterns of counting by fives and tens, using concrete objects and/or a calculator
K.4 given an ordered set of three objects, indicate the ordered position of each item, from left to right, right to left, top to bottom, and bottom to top
K.5 determine the value of a collection of pennies whose total value is less than twenty cents
K.6 estimate the number of objects in a group of twenty or less and count to determine the reasonableness of the estimate
$K.7_{1,2}$ **identify ordinal positions first through tenth**

Fractions and Decimals

K.8 participate in experiences that demonstrate a need for using fractions (e.g., sharing a graham cracker)
K.9 identify and name halves and wholes using concrete models

Whole Number Operations and Computations

$K.10_{1}$ **model addition and subtraction of whole numbers with a total of twelve or less using objects, using a number line, by counting-on, or writing the corresponding number sentence**
$K.11_{1}$ **use addition and subtraction of whole numbers in one and two step problems**

Patterns and Relationships

K.12 sort and classify objects according to similar attributes (e.g., number, size, shape, thickness, and color)
$K.13_{1,2}$ **identify, describe, and extend a pattern found in common objects, sounds, and movements**
K.14 develop and justify own rules for classifying a group of objects

Geometry and Spatial Sense

K.15 use physical materials to construct, identify, and classify basic geometric shapes: circle, triangle, square, and rectangle

K.16 identify basic geometric shapes in the environment

K.17$_{1,2,3,4}$ identify representations of plane geometric figures (circle, triangle, square, rectangle) regardless of their position and orientation in space

K.18 describe spatial relationships: inside/outside, top/bottom, before/after, over/under, and left/right

K.19 **estimate the number of objects needed to fill an empty space**

K.20 **identify the separate parts used in making a whole object**

Measurement

K.21$_{1,2}$ estimate the size of an object and compare objects with respect to a given attribute (e.g., length and weight)

K.22$_{1,2,3,4,5,6,7,8}$ **use standard and non-standard units of measure to find the length of an object**

K.23 order sets of objects by length

K.24$_{1,2,3,4}$ **compare two objects or events, using direct comparison and nonstandard units of measure according to one or more of the following attributes: length, height, weight, temperature and volume. (Examples of non-standard units include: foot length, hand span, pencil, paper clips, blocks, etc)**

K.25 name the days of the week and the seasons of the year

K.26 read time to the nearest hour using both an analog and digital clock

K.27 identify penny, nickel, dime, quarter, and dollar

Probability and Statistics

K.28 collect and organize data as a group project

K.29$_{1,2,3,4}$ construct graphs using objects and pictures

Computer and Technology

K.30 use appropriate software to practice and master Kindergarten instructional objectives in mathematics

K.31 on a keyboard, use the letters of his/her name and or numbers to "Log On"

K.32 on a keyboard, use special function keys such as "return/enter, space bar, and esc"

K.33 select a program from a menu

K.34 use a mouse to "point and click"

K.35 identify the uses of technology at work and play

K.36 use a calculator to count by fives and tens

K.37 identify various components of a computer (e.g., monitor, keyboard, CPU, disk drive, printer, etc)

Kindergarten Social Studies

The kindergarten objectives include an introduction to the lives of interesting people in history. Basic concepts involving historical time sequence, geographic direction, and economic choices are integrated in the program of study. The social studies program begins the formal introduction of what constitutes the good citizen of the United States. Citizenship education will include the importance of following rules and respecting the rights of people. The program includes the concepts of self-control, honesty, courage, justice, and leadership.

Civics

K.1 demonstrate an understanding that being a good citizen involves taking turns and sharing, taking responsibility for doing daily chores, taking care of personal things (pencils, clothing, books), and showing respect for what belongs to others

K.2 identify examples of honesty, courage, and patriotism

K.3$_{3,4}$ identify traditional patriotic

symbols such as state and national flags and be given the opportunity to participate in patriotic activities such as reciting the Pledge of Allegiance and standing for the National Anthem

K.4 identify the need for rules, authority figures, and the consequences for breaking rules; practice conflict resolution

K.5 explain the importance of safety precautions in everyday life

K.6 explain why citizens voluntarily contribute their time and talents to the community

K.7 identify situations in which rules and leadership are needed

K.8 demonstrate appropriate behaviors and expectations in school-related experiences

K.9 evaluate likely consequences of school-related behaviors and expectations to determine if actions are responsible or irresponsible

Economics

K.10 identify occupations within the local community

K.11 identify economic concepts, including the difference between basic needs (food, shelter, and clothing) and wants (luxuries), the exchanging of money for goods and services, and examples of saving money for the future

Geography

K.12 given locations on the United States map, demonstrate knowledge of left/right and up/down by placing colored stars appropriately in response to teacher instructions

K.13 given a United States map, identify land masses versus bodies of water

K.14 compare and contrast characteristics of life in the city and country

K.15 identify community symbols (e.g., traffic signs, traffic lights, street and highway markers) and map symbols (e.g., legend references to land, water, roads and cities)

K.16 name the days of the week

K.17 name the four seasons and describe the characteristics of each season

History

K.18 explore the past through stories of people, pictures, songs, holidays, customs, traditions, and legends

K.19 sequence time, space, people, and events as they relate to the student's own life

K.20 begin to identify sources of information to answer questions

K.21 build a sense of empathy toward other times and cultures

Study Skills

K.22 collect, organize, and present data in physical form (e.g., symbols, pictures, graphs, charts, tables)

Computer/Technology

K.23 use appropriate software to practice and master kindergarten instructional objectives in social studies

K.24 on a keyboard, use the letters of his/her name and/or numbers to "Log On"

K.25 on a keyboard, use special function keys such as "Return/Enter, space bar, and Esc"

K.26 select a program from a menu

K.27 use a mouse to "point and click"

K.28 identify the uses of technology at home and play

K.29 identify various components of a computer (e.g., monitor, keyboard, CPU, disk drive, mouse, printer)

Kindergarten Science

The Coordinated and Thematic Science (CATS) Kindergarten objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. CATS Kindergarten enhances the child's natural curiosity about the environment and augments the awe and wonder of inquiries and discoveries using the senses and by hands on manipulation of objects to build a strong foundation of concepts blended with safety principles.

Nature of Science

K.1 perceive science as the human's search for an understanding of the world by asking questions about themselves and their world (e.g., make qualitative observations about one's own physical characteristics, recognize arms, legs, head, eyes, ears, etc., make observations about things found in nature, clouds, animals, plants, etc., compare size, shape, and structure of living things)

K.2 define science as a search for answers about themselves and their world (e.g., recognize the roles of people involved in science careers)

K.3 explore objects and events (e.g., make qualitative observations using the five senses, identify changes in nature)

K.4 probe deeply into natural phenomena by asking and answering questions about the environment (e.g., animals, plants, stars, weather)

K.5 use a variety of communication techniques (e.g., pictures, models, graphs)

K.6 realize that science is never finished by observing changes in the environment (e.g., weather cycles, plant and animal cycles)

K.7 recognize that a solution to one scientific problem often creates new problems (e.g., recycling)

Scientific Attitudes/Habits of Mind

K.8 ask and answer questions to further an appreciation and joy of discovery of the natural world

K.9 demonstrate innate curiosity, initiative, and creativity by asking questions about the environment (e.g., day/night, weather conditions, living things)

K.10 be in awe and wonder of the patterns, variations, and interactions of natural objects in the environment (e.g., tree, leaves, animal structures, sun and shadow)

K.11 trust observations and accept results of personal discoveries (e.g., use five senses)

K.12 listen to and be tolerant of different viewpoints (e.g., working in groups, communicate what is perceived)

K.13 continue probing phenomena until questions are resolved (e.g., properties of living and non-living things, effects of weather)

K.14 regard science as an integrated whole and a part of daily life

K.15 recognize that scientists work alone and in groups (e.g., visit scientists at work, work in groups to make simple models)

Scientific Processes/Thinking Skills

K.16 develop observational skills (e.g., use of senses)

K.17 collect and record information in a variety of ways (e.g., drawings, weather calendar, graphs)

K.18 use a variety of classification systems (e.g., sorting by color, shape, size, texture)

K.19 make predictions based on personal observations (e.g., clouds-rain, cold weather-snow, bud-flowers, metamorphosis of butterflies)

K.20 use mathematical skills in investigations (e.g., ordering, sequencing, counting, measuring)

K.21 participate in drawing conclusions and making decisions

K.22 use decision making skills in daily life (e.g., selecting clothes for weather conditions)

Laboratory Investigations/Hands-On Learning

K.23 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

K.24 use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, metric ruler, balance, thermometer, magnets, computers)

K.25 use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, treat living organisms humanely)

Science Themes and Subject Matter

K.26 develop an understanding of the scientific themes of systems, changes, and models (e.g., systems are made of parts which interact with one another; change occurs gradually, repetitively, or randomly; models are representations of real things)

K.27 understand that the study of living and non-living things in the natural world integrates living organisms, earth materials, and physical properties of matter

K.28 establish connections across the curriculum (e.g., integrate science with mathematics, social studies, language arts, arts, and/or physical education)

K.29$_{3,4,5}$ compare, sort, and group objects according to size, shape, color, weight, texture and buoyancy- *systems*

K.30$_{3,4,5,6}$ using the five senses, identify living and non-living things- *systems*

K.31$_{3,4,5,7,9}$ observe water can be a liquid or a solid (e.g., rain, snow)- *changes*

K.32 observe the properties of plants and animals (e.g., movement, growth)- *systems*

K.33$_{3,4,5,6,7}$ observe changes in plants and animals (e.g., animal baby to adult, seed to plant)- *changes*

K.34$_{3,5,7,9}$ observe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, field)- *models*

K.35 understand the terms hot and cold, warm and cool- *systems*

K.36$_{5}$ demonstrate that heat can be created by rubbing hands together- *systems*

K.37$_{3,5,6,8,10}$ discover magnetic properties of objects- *systems*

K.38 recognize the effects of energy on the environment (e.g, light, heat)- *systems*

K.39 observe the effects of gravity (e.g., objects)- *changes*

K.40$_{3,5,6,8,10,11}$ observe various particle sizes (e.g., crushing a sugar cube)- *changes*

K.41 explore changes in energy (e.g., hot/cold, light/dark, loud/soft)- *changes*

K.42 show that objects can be moved in different ways (e.g., straight, circular, fast, and slow)- *models*

K.43 observe, record, and compare the length of time it takes to travel from one place to another (e.g., faster/slower)- *changes*

K.44 using a color chart, identify the

colors- *models*

K.45 observe clouds and know that there are different kinds- *systems*

K.46$_{3}$ observe the effects of wind- *systems*

K.47$_{3}$ name and describe hte four seasons- *systems*

K.48$_{3,5,8}$ observe the weather and describe it in general terms- *systems*

K.49$_{3}$ observe air temperature changes during the day- *changes*

K.50$_{3}$ observe and graph daily changes in weather- *changes*

K.51$_{3}$ recognize that there are more stars than you can see or count- *changes*

K.52$_{3}$ recognize that the stars, sun, and moon appear to move- *changes*

K.53 observe and compare the properties of rock, sand, and soil- *changes*

K.54 observe the effects of weather on humans, animals, and plants- *changes*

K.55$_{3}$ explore the reason for day and night- *changes*

K.56$_{4,5,7,9}$ observe and describe the effect of evaporation on salt water and tap water in various environments- *changes*

K.57 make a model of the earth to illustrate that the earth has more water than land- *models*

K.58$_{3}$ use materials to make imprints (e.g., wet sand, clay)- *models*

K.59$_{3}$ draw and describe models of the sun, moon, and earth- *models*

K.60$_{3,4}$ use a chart to identify the types of weather daily (e.g., sunny, cloudy)- *models*

Science History

K.61 listen to the lives and discoveries of scientists (e.g., from short stories and news items, films and videos, and visit with men and women scientists)

K.62 recognize that science changes over time (e.g., dinosaurs no longer live, rocks break off from mountains)

K..63 realize that scientists will continue to discover new things (e.g., listen to reports from daily papers and news magazines and visit with scientists)

Science, Technology, and Society

K.64 recognize that there are many science-related careers through the use of speakers, field trips, audio-visual, and/or printed material (e.g., veterinarian, forest ranger)

K.65 recognize that science skills are used in careers not usually related to science (e.g., farmer, construction worker)

K.66 observe how technology has positively or negatively affected the quality of life in West Virginia and the world (e.g., toys, laser price scanner, litter)

K.67 observe that common daily events involve science (e.g., use of car, use of microwave, ice melting)

K.68 develop respect and responsibility for the environment by recognizing the interrelationship of living and non-living things and engaging in conservation practices

Computer/Technology

K.69 use appropriate software to practice and master Kindergarten instructional objectives in science

K.70 on a keyboard, use the letters of his/her name and/or numbers to "Log On"

K.71 on a keyboard, use special function keys such as "Return/Enter, space bar, and Esc"

K.72 select a program from a menu

K.73 use a mouse to "point and click"

K.74 identify the uses of technology at home and play

K.75 identify various components of a computer (e.g., monitor, keyboard, CPU, disk drive, mouse, printer)

Grade One
English Language Arts

The first grade student will be immersed in a literature-rich environment to develop an awareness of print materials as sources of information and enjoyment. The children will grow in language development through reading, writing, speaking, and listening that will become lifelong skills. First grade students will learn from reading authentic literature such as fiction, non-fiction, and poetry that reflect cultures, experiences, and ideas. The English language arts curriculum will encourage active children to actively participate as members of the community of readers and writers.

Listening/Speaking

1.1 listen to a variety of literary forms, including stories and poems

1.2 clarify and explain words and ideas

1.3 **follow and state simple two-step directions**

1.4 use singular and plural nouns and compound words in oral communication

$1.5_{3,4,5,6,7,8}$ **given descriptive words and other specific vocabulary, identify synonyms, antonyms, and homonyms**

1.6 express ideas orally in complete sentences (e.g., utilizing communication technologies as a tool)

$1.7_{2,3,4}$ **make inferences based upon story characters and actions**

1.8_{2} **use story content and personal background to make predictions**

1.9 given a narrative, orally summarize story content

1.10 use graphic organizers and visualization to determine meaning

$1.11_{2,3}$ **identify beginning, middle, and end of a narrative selection**

$1.12_{2,3,4}$ **given a narrative, repeat the correct sequence of events**

$1.13_{2,3,4,5,6,7,8}$ **remember specific details, interpret and extend meaning, and evaluate material**

1.14_{2} **hearing a narrative, utilize pictures as well as print options to enhance comprehension (e.g., illustrate part of a story and label with a sentence)**

1.15 demonstrate appropriate listening behaviors (e.g., resist distractions, stay alert, and use appropriate listening posture-hands/feet quiet, eyes on the speaker)

1.16_{2} given an oral selection, respond to, explore, and imagine beyond story

1.17 given a word, create rhyming word families

1.18 identify and manipulate phonemes in syllables and multi-syllable words

1.19 given words with one to three syllables, hear, say, and manipulate phonemes of spoken language (e.g., divide words into phonemes and blend phonemes into words)

1.20 use descriptive words to name objects, places, and things

Reading Comprehension

$1.21_{2,3,4,5,6,7,8,9,10,11}$ **read literary works by national and international authors to include but not to be limited to: fairy tales, science fiction, tall tales, and poetry**

1.22_{2} **determine relationships between phonemes and graphemes**

$1.23_{K,2}$ **identify single consonants/sounds in initial, medial, and final word positions**

1.24_{2} **identify short and long vowels and their sounds**

$1.25_{K,2}$ identify consonant blends in initial positions (e.g., bl, fl, pl, sl, br)

1.26$_{K,2}$ **identify consonant digraphs in initial and final word positions (e.g., ch, sh, th, wh)**
1.27$_{2}$ **identify "other" vowel sounds (e.g., oy, oo, ea, ou, ur)**
1.28$_{2}$ **identify "r-controlled" vowel sounds (e.g., ur, ar, ir)**
1.29 create and use rhyming words
1.30 read sight words fluently from an appropriate word list
1.31$_{2}$ **identify and use compound words**
1.32$_{2}$ **identify and use contractions and be able to match them to the two words being replaced (e.g., I'm for I am)**
1.33 divide words with affixes, double consonants, and compound words into syllables
1.34$_{2}$ **identify words with inflectional endings (e.g., s, es, ed, ing, er, est)**
1.35 identify and use prefixes (e.g., reread, untie)
1.36 use context clues to determine word meaning
1.37 understand and comprehend multiple meaning words
1.38$_{3,6,7,9}$ **determine the object that corresponds to two sentence riddles**
1.39$_{K,2}$ **use picture clues to complete a passage by choosing one of three words to complete a sentence describing a picture**
1.40$_{2,5,6,7,8,9}$ **read for meaning in sentences using both illustration and text**
1.41$_{2,4,5,6,8,9,11}$ **respond to both literal and interpretive comprehension questions after reading a short story selection**
1.42$_{2,4,5,6,8,9,10}$ **interpret recreational (narrative), textual (expository), and functional reading material**
1.43$_{2,3,4,5,6,7,8,9,10}$ **differentiate between fiction and nonfiction**
1.44$_{K,2,3,4,5,8,9,10,11}$ **follow written directions sequentially to achieve a desired result**
1.45 dramatize, illustrate, and retell stories that have been read
1.46 retell major events of a story in sequence
1.47 identify and understand cause and effect in a familiar story
1.48 compare and contrast in text and descriptive language
1.49 recall main ideas and details from a familiar story
1.50 identify story elements (e.g., plot, character, setting)
1.51 use the text and illustrations to predict and confirm
1.52 select and read books for independent, recreational reading
1.53 explain likes and dislikes of a reading selection

Reading Vocabulary

1.54$_{2,3,4,5,6,7,8,9,10,11}$ recognize and use synonyms, antonyms, homonyms, and homophones
1.55$_{2,3,4,5,6,7,,8,910,11}$ use context clues to gain meaning of unfamiliar words
1.56$_{k,2,3,4,5,6,7,8,9,10,11}$ identify and use multiple meaning words

Writing

1.57 use directionality (e.g, left/right, top/bottom, up/down)
1.58 use dominant hand with correct paper position
1.59 hold pencil correctly
1.60 assume and maintain appropriate position
1.61 use appropriate stroke formation
1.62 write upper/lower case letters correctly
1.63 use lined paper correctly with headline, midline, baseline
1.64 demonstrate uniformity when writing letters
1.65 use uniform spacing between letters, words, and sentences
1.66 write numerals 0-9 correctly
1.67 write comma, question mark, exclamation mark correctly
1.68 self-evaluate handwriting
1.69 begin to use the five steps for process writing (e.g., prewrite, draft, revise, edit, and publish)
1.70 write original and complete sentences and paragraphs that describe and explain
1.71 complete riddles and rhymes
1.72 write summaries of stories read or dictated
1.73 write original compositions

1.74 use electronic and traditional editing strategies to spell words correctly (e.g., proper nouns, in and inn [homophone])

Spelling

1.75 recognize and differentiate among initial, medial, and final sounds

1.76 reproduce designs, shapes, numerals, letters, etc. accurately in a predetermined sequence

1.77 produce the graphic symbols for phonemes (e.g., vowel sound spellings and consonant sound spellings)

1.78 spell phonetically regular words

1.79 spell phonetically irregular words (e.g., could, they, one)

1.80 spell contractions

1.81 spell compound words

1.82 spell words with silent consonants (e.g., kn, wr, mb)

1.83 spell irregular verbs (e.g., knew, known)

1.84 spell irregular plural nouns (e.g., teeth, mice, wives, wolves)

1.85 use spelling patterns (e.g. consonant vowel-consonant)

1.86 spell multi-syllable words

1.87 make structural changes as needed in root words by adding inflectional endings (e.g., d, s, es, ing) and dropping final silent "e" before adding "ing"

1.88 make structural changes as needed by changing terminal letters before endings: 1) doubling a final consonant letter 2) changing "y" to "I" before adding endings (e.g., ed, er, est), 3) adding suffixes to change a part of speech

1.89 make structural changes as needed to correctly spell words with prefixes

1.90 listen to a word and a sentence containing that word to identify and select the correct spelling of that word: basic sight words, frequently used nouns and verbs, single and double consonants in initial, medial, and final positions (e.g., consonant blends and consonant digraphs, long and short vowels, vowel digraphs, and vowel dipthongs)

Language

1.91 differentiate between common and proper nouns

1.92$_{2,3,4,5,6,7,8,9,10,11}$ **capitalize first word in a sentence, the pronoun "I", months of the year, and proper nouns (e.g., months of the year, days of the week, names of people)**

1.93$_{2,3,4}$ **identify and use correct punctuation: period, question mark, and exclamation point**

1.94$_{2,3,4,5,6,7,8,9,10,11}$ **use correct subject-verb agreement with corresponding proper verb formation**

1.95 **edit for understanding and meaning**

1.96$_{2,3,4,5,6,7,8,9,10,11}$ **understand and correctly use present and past tense**

1.97$_{2,3,4,7}$ **identify and correct errors in sentence construction and language expression**

1.98$_{2,3,4,5,6,7,8,9}$ **identify sentence fragments**

1.99$_{4,10,11}$ **compose narrative text using correct sentence structure, adding to key ideas and supplying details**

1.100$_{2,3,4,5,6,7,8,9,10,11}$ **identify an author's purpose for writing a selection**

1.101$_{2,3,5,6,7,8,9,10,11}$ **identify supporting sentences that would or would not support key ideas in a text**

1.102$_{8,10,11}$ **communicate ideas in well-organized and clearly written text**

1.103$_{2}$ **identify words in alphabetical order beginning with different letters and beginning with the same letter**

1.104 identify and use nouns, verbs, pronouns, and adjectives

1.105 use contractions and irregular verbs correctly

Study Skills

1.106 acquire organizational skills to manage school materials and time on task

1.107$_{3,4,5,7,9,11}$ locate and become familiar with reference sources (e.g., dictionary, glossary, encyclopedia, card catalog)

1.108 interpret information on graphic sources (e.g., charts/tables, graphs, lists, schedules, diagrams, scale drawings, maps/atlases, statistical illustrations, timelines)

1.109$_{3,4,5,6,7,9,10,11}$ **determine if a word is on a dictionary page when guide words are supplied**

1.110$_{5,6,7,8,9,10}$ given a book, identify the author, illustrator, and title and be able to use the table of contents, glossary, and index

1.111 practice and use test-taking strategies (e.g., listen closely, make careful choices, do your best)

Computer/Technology

1.112 use appropriate software to practice and master first grade English language arts instructional objectives

1.113 turn on/off a student workstation

1.114 on a keyboard, use letters, numbers, and other special function keys (e.g., shift, delete/backspace, and arrow keys) to input information

1.115 save and/or retrieve a file

1.116 print a document

1.117 identify the uses of technology at home and school

1.118 demonstrate respect for the (computer) work of others

1.119 identify fundamental computer terms (e.g., disk, software, hardware, boot/start, cursor, etc)

1.120 select and use appropriate software and/or other technologies to locate and use reference sources (1.07)

1.121 use graphic software to read and interpret information from charts and bar garphs (1.08)

Grade One Mathematics

The first grade objectives continue the emphasis on the use of manipulatives, concrete materials, and appropriate technologies to give students the foundation needed to explore new mathematical concepts. Development of mathematical language allows students to explain such concepts as: addition and subtraction of whole numbers; knowing the value of coins; knowing addition and subtraction facts; identifying two and three dimensional figures; and gathering, organizing, and explaining data.

Number Theory and Number Sense

1.1$_2$ count forward to 999 and backward from 20 with and without objects; name numbers to 999

1.2 given a set containing 100 or fewer concrete items, count and write the corresponding numeral

1.3$_2$ compare and order numbers through 100 using words "greater than", "less than", and "equal to"; identify the set with the least number or the most number of elements

1.4$_2$ identify and construct place value models for written numbers through 200 using concrete materials; find the place value of a digit in the one's and ten's place without models

1.5$_2$ model and count by twos, fives, and tens to 100

1.6$_2$ identify the ordinal positions first through twelfth

1.7 identify a number through 100: before or after a given number, ten more or ten less than a given number

1.8$_2$ group and count concrete items by tens and ones and write the number in standard

and expanded form

1.9$_{2,3,4}$ **count and trade a collection of pennies, nickels and dimes, whose total value is one hundred cents or less**

Fractions and Decimals

1.10$_{2}$ **identify and model halves, thirds, fourths, and whole using appropriate materials or a drawing; identify models divided into different parts**

1.11 fold and cut paper circles, squares, and triangles into halves and fourths labeling the parts; identify models divided into equal parts

1.12$_{2,3,4,5,6}$ **identify a fraction model that is part of a group**

Whole Number Operations and Computations

1.13$_{2,3,4,5,6}$ **model addition and subtraction of whole numbers with a sum of twenty or less using objects and a number line. Identify the identity element (0), missing elements, and identify the number sentence that represents the commutative property of addition (1+3=3+1), and write the corresponding number sentence. Identify a number sentence that represents the inverse operation of a given number sentence (6-1=5 and 6=1+5 - fact families)**

1.14$_{2}$ **recall basic addition facts with sums to ten and the corresponding subtraction facts**

1.15$_{2}$ **model and solve two and three digit addition and subtraction without regrouping and write the corresponding number sentence**

1.16$_{2}$ **add three numbers with a sum of eighteen or less**

1.17$_{2}$ **solve one digit addition and subtraction problems written horizontally and vertically with sums to 18**

1.18$_{2,3,4}$ **solve story and picture problems involving one-step solutions, using basic addition and/or subtraction facts, and non-routine strategies (logical reasoning)**

Patterns and Relationships

1.19 sort and classify concrete objects according to more than one attribute including size, color, shape, and thickness

1.20$_{K,2,3,4,5,6,7,8}$ **analyze, extend, and describe a wide variety of repeating patterns (e.g., using numbers, rhythm, shapes, and calculators)**

1.21 identify patterns in our world

Probability and Statistics

1.22$_{2,3,4}$ **record data from simple experiments using spinners and color tiles/cubes, and use data to predict which of the two events is more likely or less likely to occur if the experiment is repeated**

1.23 **create, read, and interpret a pictograph with each picture representing a single unit**

1.24 investigate, identify and describe various forms of data collection (e.g., recording daily temperature, lunch count, attendance, or favorite food)

1.25 interpret information displayed on graphs using the vocabulary: less, more, fewer, greater than, and less than

1.26$_{2,3,4}$ **tally by ones, organize the data in a chart/table, and construct a bar graph; read and interpret tally charts and tables**

Geometry and Spatial Sense

1.27$_{2,3,4}$ **draw and describe triangles, squares, circles, and rectangles according to number of sides and vertices (corners)**

1.28 use physical materials to construct, identify, describe, and classify three-dimensional figures: cube, cone, sphere,

cylinder, and rectangular solid

1.29 identify three-dimensional figures in the environment

1.30 identify and construct open and closed figures

1.31$_{2,3,4}$ **determine and draw lines of symmetry**

1.32$_{2,3,4}$ **identify and construct plane figures that are congruent (same shape and size) and similar (same shape, different size)**

Measurement

1.33$_{2}$ compare the volumes of two given containers using concrete materials (e.g., sand, jelly beans, rice)

1.34$_{2}$ compare the weight of two objects using a balance

1.35$_{k,2,3,4,5,6,7}$ **use customary, metric, and non-standard units to measure length to the nearest whole unit (e.g., inch, cm, paper clips)**

1.36 explain time concepts in context of personal experiences (e.g., We will go outside in one hour.)

1.37$_{2}$ **name the months of the year and find a date on a monthly calendar(e.g., the fourth Wednesday in March)**

1.38 **read time to the nearest hour and half hour using an analog and digital clock**

1.39 **identify 1 cent, 5 cents, 10 cents, and 25 cents coins**

1.40 **role play making change up to a dime (e.g., using pennies, and/or nickels)**

1.41 **identify the number of pennies equivalent to a nickel, dime, quarter, and dollar**

1.42$_{2,3,4,5,6}$ **select appropriate units to determine length, weight, or volume using standard measurement (e.g., would you use inches, pounds, or cups?)**

1.43$_{k,2,3}$ **compare two objects or events, using direct comparison according to one or more of the following attributes: length, height, weight, temperature, and volume**

Computer and Technology

1.44 use appropriate software to practice and master first grade instructional objectives in mathematics

1.45 turn on/off a student workstation.

1.46 on a keyboard, use letters, numbers, and other special function keys (e.g., shift, delete/backspace, and arrow keys) to input information

1.47 save and/or retrieve a file

1.48 print a document

1.49 identify the uses of technology at home and school

1.50 demonstrate respect for the computer work of others

1.51 identify fundamental computer terms (e.g., Disk, software, hardware, boot/start, cursor, etc.)

1.52 use a calculator to produce repeating number patterns

1.53 use graphing software to create a table and/or bar graph

Grade One Social Studies

The grade one social studies program of study continues the introduction of what constitutes a good citizen by focusing on self and family. Student rights and responsibilities as citizens will be practiced. Rules will be developed and enforced using conflict resolution strategies. The course introduces patriotic traditions and develops an understanding of the connection between past and present. A variety of graphic skills will be incorporated throughout the course including graphs, charts, timelines, and other data collection activities.

Activities will contribute to an understanding of the relationship between people and their environment. Consumer roles in communities and the ways that money relates to those roles will be explored. Good safety practices in communities will be taught. Common geographic features and map symbols will be introduced through simple map construction.

Civics

1.1$_{3,4,5,6,7,8,9,10,11}$ name the country/President, state/Governor, city/Mayor

1.2$_{3}$ participate in making classroom rules through experiencing consequences- both positive and negative- and participating in the process of resolving conflicts

1.3$_{3}$ experience various role responsibilities within the classroom and in cooperative learning groups (e.g., group leader, recorder, reporter, collector)

1.4$_{3,4}$ be given the opportunity to recite the Pledge of Allegiance, participate in patriotic singing, and celebrate national holidays

1.5 explain and experience the benefits of volunteerism in the community and at school

1.6$_{3}$ practice safety precautions in role playing situations

1.7 express opinions and accept opinions of others in solving problems and/or resolving conflicts

Economics

1.8$_{3,4}$ identify the name and value of the following coins: penny, nickel, dime, and quarter, and role-play their exchange for goods/services

1.9$_{4}$ compare and contrast occupations in the community

1.10$_{3}$ identify the need to conserve resources through recycling and litter reduction

1.11 make choices from among needs and wants and predict the consequences of the choices

1.12 recognize that although customs and habits differ from one group to another, all people have the same basic needs

Geography

1.13 construct a simple map of a familiar area incorporating cardinal directions and map symbols

1.14$_{3}$ locate on a world map, the United States, the two Americas, the Atlantic and Pacific Oceans, and West Virginia

1.15$_{3}$ describe how climate/weather affects the way people live (e.g., food, clothing, shelter, and recreation)

1.16 sequence the days of the week and months of the year

1.17$_{3}$ given a United States map, recognize the major rivers, lakes, mountains, and oceans

1.18 recognize common traffic, safety, and information signs

History

1.19 identify different types of families (e.g., single parent, extended, multigenerational) and homes (e.g., apartments, mobile homes, houseboats)

1.20$_{3,4,5}$ investigate family history through two generations (parents, grandparents) and make comparisons to present-day living, using such sources as timelines, interviews, surveys, and graphs

1.21$_{3,4}$ list the major holidays and explain their significance

1.22 explore the values and contributions of heroic men and women past and present

1.23 compare the past to the present by investigating stories of people (e.g., folk tales, pictures, poems, songs, legends, holidays, and customs)

Study Skills

1.24 participate in data collection activities (e.g., polls, surveys) and the graphing of results

1.25 construct and interpret simple maps of the community using cardinal directions, location, a scale, and symbols in a legend

1.26 construct and interpret tables, charts, and graphs

Computer/Technology

1.27 use graphics software to create tables and graphs

1.28 use appropriate software to practice and master first grade

instructional objectives in social studies

1.29 turn on/off a student workstation

1.30 on a keyboard, use letters, numbers, and other special function keys (e.g., shift, delete/backspace, and arrow keys) to input information

1.31 save and/or retrieve a file

1.32 print a document

1.33 identify the uses of technology at school and work

1.34 demonstrate respect for the (computer) work of others

1.35 identify fundamental computer terms (e.g., disk, software, hardware, boot/start, cursor)

Grade One Science

The Coordinated and Thematic Science (CATS) One objectives builds on the process skills and adds data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS One continues the excitement of learning about the natural world and allows the beginning of experimentation and data collection to emphasize the tools of science and the properties of matter.

Nature of Science

1.1 identify science as a search for answers about themselves and their world (e.g., understand that living things share characteristics, make observations about differences among objects found in nature, distinguish among living and non-living)

1.2 recognize the roles of people involved in science careers

1.3 explore objects and events using the five senses

1.4 describe changes in nature

1.5 probe deeply into natural phenomena by asking and answering questions about the environment (e.g., animals, plants, mountains, rivers)

1.6 use a variety of communication techniques (e.g., sketches, pictographs, models)

1.7 realize that science is never finished by observing changes in the environment (e.g., weather cycles, plant and animal cycles, energy cycles)

1.8 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution)

Scientific Attitudes/Habits of Mind

1.9 ask and answer questions to further an appreciation and joy of discovery of the natural world

1.10 demonstrate innate curiosity, initiative, and creativity by questioning observations of changes in their environment (e.g., life cycles, motion of celestial objects, sun and shadow)

1.11 be in awe and wonder of the patterns, variations, and interactions of natural objects in the environment (e.g., trees, rivers, rock formations, weather)

1.12 trust observations of changes in the environment (e.g., use of senses)

1.13 listen to and be tolerant of different viewpoints by engaging

in collaborative activities

1.14 continue probing phenomena until questions are resolved (e.g., properties of living and non-living, motions of sun and moon)

1.15 recognize that developing solutions to problems takes time and patience

1.16 recognize that science includes both individual and cooperative ventures (e.g., making models, visit scientists at work, read about lives of scientists)

Scientific Processes/Thinking Skills

1.17 develop observation skills (e.g., use of senses)

1.18 collect, record, and compare information (e.g., pictograph, bar graph of heights, months of birthdays)

1.19 use a variety of classification systems (e.g., sorting, sequencing) and associate objects and characteristics (e.g., spirals in shells, growth rings of trees, movement of living things)

1.20 measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, counting bears)

1.21 use mathematical skills in scientific investigations (e.g., ordering, sequencing, measuring, graphing)

1.22 describe trends of data and make predictions based on that data (e.g., metamorphosis of frogs, seasonal changes and plants, temperature and weather)

1.23 participate in decision making

Laboratory Investigations/Hands-On Learning

1.24 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

1.25 use scientific equipment and everyday materials to investigate the world (e.g., hand lens, balance, thermometer, seeds, rocks, magnets, calculators, computers)

1.26 use safe and proper techniques for handling, manipulating, and caring for science materials

Science Themes and Subject Matter

1.27 develop an understanding of the scientific themes of systems, changes, and models (e.g., systems is a collection of parts and processes that interact with each other; change occurs gradually, repetitively, or randomly; a model is a picture, description, or a representation of the real thing)

1.28 understand that the study of living and non-living in the natural world integrates living organisms, earth materials, and physical properties of matter

1.29 establish connections across the curriculum (e.g., integrate science with mathematics, social studies, language arts, arts, and/or physical education)

$1.30_{3,4,5}$ compare, sort, and group objects according to size, shape, color, texture, weight, buoyancy, and magnetic properties- *systems*

$1.31_{4,5,6}$ classify objects as living or non-living- *systems*

$1.32_{4,5,6,7,8,9,10,11}$ recognize that water can be a solid (ice), a liquid (rain), and can change from one form to another- *changes*

$1.33_{3,5,6,7,8,9,10}$ identify needs of living things (e.g., food, water, light)- *systems*

$1.34_{3,4,5,6,7}$ recognize, compare, and/or sequence changes in living things (e.g., seed to plant, tadpole to frog, caterpillar to butterfly) - *changes*

$1.35_{3,5,7,9}$ construct and/or manipulate models that depict movement of living and non-living things in air, water, space, and on land (e.g., birds and airplanes flying, fish

and boats moving through water, animals and vehicles moving on land)- *models*

1.36$_{3,5,6,7}$ recognize that heat can be produced in many ways (e.g., burning, rubbing)- *systems*

1.37$_{3,6,7}$ understand energy types and sources (e.g., sunlight, electricity) and their relationship to heat and temperature- *systems*

1.38 compare the effects of force on an object (e.g., changing direction, stopping, slowing down, speeding up)- *systems*

1.39 notice that objects can change direction when striking a surface (e.g., balls off a wall, light off a mirror)- *changes*

1.40 observe the changes in the object's motion while moving over a surface (e.g., slowing, speeding up, curving)- *changes*

1.41 recognize that sound may change in volume as it travels through different substances (e.g., air, water, wood)- *changes*

1.42$_{3,5,6,8,10}$ examine objects with magnetic properties and observe the changes in fields (e.g., magnet and iron filings between transparencies)- *changes*

1.43 draw pictures of objects that produce heat (e.g., sun, stove, toaster)- *models*

1.44 record/draw a person's shadow at different times of the day- *models*

1.45 construct a model of a simple machine to show how to make work easier (e.g., lever, wedge)- *models*

1.46 construct a musical instrument to demonstrate that sounds are produced by vibrations (e.g., rubber band guitar)- *models*

1.47$_{3}$ compare the day sky with the night sky- *systems*

1.48$_{3}$ identify stars as very distant objects that give off light- *systems*

1.49 explain that the moon reflects light from the sun- *systems*

1.50 identify reasons why the sun is important- *systems*

1.51 identify bodies of water and landforms on Earth- *systems*

1.52$_{3}$ identify important uses of air- *systems*

1.53$_{3}$ identify various weather changes (daily and by seasons) and their effect on living organisms- *changes*

1.54$_{3,4}$ observe and record changes in weather- *changes*

1.55 record temperature at different times of the day (e.g., cool morning, warm at noon)- *changes*

1.56$_{3}$ understand that the sun, moon, and stars appear to move- *changes*

1.57$_{3}$ infer that heat is energy and some materials transfer heat better than others- *changes*

1.58 identify the globe as a model of the Earth- *models*

1.59$_{3}$ compare imprints (e.g., animal tracks, leaf prints, shell prints)- *models*

1.60 construct a wind machine to show wind direction (e.g., wind sock)- *models*

1.61$_{3,4,5,7,9}$ recognize that earth materials consist of solids (e.g., rocks, soils), liquids (e.g., water), and gases (e.g, air) in the atmosphere- *models*

1.62$_{3,9}$ observe and explain the water cycle (e.g., Ziploc bag with water taped to windows)- *models*

Science History

1.63 study the lives and discoveries of scientists (e.g., use short stories, films, and videos) about men and women of science and visit their places of work)

1.64 recognize that science changes over time (e.g., stars appear and disappear, new animals replace dinosaurs)

1.65 realize that scientists will continue to discover new things (e.g., listen to reports and news articles about new stars, plants, and animals and visit with scientists about their work in laboratories)

Science, Technology, and Society

1.66 recognize that there are many science-related careers through

the use of speakers, field trips, audio-visual, and/or printed material (e.g., astronomer, geologist)

1.67 recognize that science skills are used in careers not usually related to science (e.g., carpenter, bee keeper)

1.68 develop an awareness of how technology has positively or negatively affected the quality of life in West Virginia and the world (e.g., electromagnets, power lines)

1.69 recognize that common daily events involve science (e.g., CD players, velcro, weather)

1.70 develop respect and responsibility for the environment by recognizing the interrelationship of living and non-living things and engaging in conservation practices

Computer/Technology

1.71 use appropriate software to practice and master first grade instructional objectives in science

1.72 turn on/off a student workstation

1.73 on a keyboard, use letters, numbers, and other special function keys (e.g., shift, delete/backspace, and arrow keys) to input information

1.74 save and/or retrieve a file

1.75 print a document

1.76 identify the uses of technology at school and work

1.77 demonstrate respect for the computer work of others

1.78 identify fundamental computer terms (e.g., disk, software, hardware, boot/start, cursor)

1.79 using the graphing application of appropriate software, create tables and/or bar graphs

1.80 use a calculator to perform mathematical functions in data analysis

Grade Two
English Language Arts

In grade two, students will continue to be immersed in a literature-rich environment to encourage exploration of various literary forms. Experiencing a total English language arts program, enriched by technology, second graders will apply skills mastered through reading, speaking, listening, and writing activities across the curriculum. Using a combination of writing strategies, students will be able to read with comprehension, speak and listen effectively, and develop both literal and critical thinking skills. Second graders will develop from dependent to independent readers/learners, and begin to make their own choices for recreational and informative reading.

Listening/Speaking

$2.1_{1,3,4,5,6,7,8}$ given descriptive words and other specific vocabulary, identify synonyms, antonyms, homophones, and homonyms

$2.2_{1,3,5,6,7,8}$ use story content and personal background to make predictions

$2.3_{1,3,4}$ given a narrative, make inferences based upon story characters and actions

$2.4_{3,4}$ given a narrative, differentiate between factual information and information based on opinion

$2.5_{1,5,6,7,8}$ listen to a story, remember information to interpret or extend meaning, evaluate material, or perform a task

$2.6_{1,3,4}$ listen to a story, place events in correct sequence

$2.7_{1,3}$ identify the beginning, middle, and end of a narrative

2.8_{1} hearing a narrative, utilize pictures as well as print options to enhance comprehension (e.g., illustrate part of a story and label with a sentence)

$2.9_{3,4}$ given a narrative, identify the main idea and supporting details to determine the purpose of a passage

$2.10_{1,5,6,7,8}$ listen to a variety of literary forms, respond to, explore, and imagine beyond story

2.11 participate in class discussions, following rules for conversation (e.g., utilizing communication technologies)

2.12 create and share stories orally with an audience

2.13 ask for clarification and/or explanation of words and ideas

2.14 state and follow directions with three or four steps

2.15 orally identify and manipulate phonemes in syllables and words

2.16 discriminate long and short vowel sounds

2.17 given a word, create rhyming word families

2.18 demonstrate appropriate listening and speaking behaviors after differentiating between active listening and hearing

Reading Comprehension

$2.19_{1,3,4,5,,6,7,8,9,10,11}$ read literary works by national and international authors to include, but not limited to: humor, irony, make-believe, fiction, nonfiction, fairy tales, tall tales, and poetry

$2.20_{1,3,4,5,,6,7,8,9}$ interpret recreational, textual, and functional material

$2.21_{K,1,3,4,5,6,7,,8,9,10,11}$ use informational text (trade books, textbooks, magazines, and reference sources)

$2.22_{K,1,3,4,5,6,7,8,9,10,11}$ determine differences between fiction and nonfiction selections

$2.23_{5,6,7,8,9,11}$ analyze the organizational structure, author's style, and text characteristics to determine genre

$2.24_{K,1}$ identify single consonants/sounds in initial, medial, and final word

positions

2.25 **identify short and long vowels and their sounds**

$2.26_{K,1}$ **identify two and three letter consonant blends and digraphs in initial, medial, and final word positions**

2.27_{1} **identify "other vowel" sounds (e.g., diphthongs, digraphs, r-controlled vowels, vowel variants, and schwa sound [away])**

2.28 identify consonant and vowel patterns

2.29 differentiate between rhyming and non-rhyming words and word families

2.30_{1} **recognize word parts to decode and assign meaning to words**

2.31 identify base/root words in an extended word

2.32 identify words with suffixes (e.g., -ful, -less) and prefixes (e.g., un-, re-)

2.33_{1} **identify words with inflectional endings (e.g., -ed. -ing, -s, -es, -er, -est)**

2.34_{1} **identify contractions by matching them with the two words being replaced**

2.35 identify nouns showing possession

2.36_{1} **identify compound words**

2.37 use long word decoding strategies to identify words and count syllables

2.38 use a pronunciation key

$2.39_{K,1,5,9}$ **use illustrations and text to read for meaning in sentences and paragraphs**

$2.40_{3,4,5,6,7,9,10,11}$ **use context clues to determine a reasonable meaning of an unknown word**

$2.41_{K,1,3,4,5,6,7,8,9,10,11}$ **determine sequence of events from stories and written text**

$2.42_{K,1,3,11}$ **comprehend and follow steps in a process and determine reasons and/or cause-effect relationships related to these steps**

$2.43_{5,6,9,10,11}$ **read to perform a task**

$2.44_{3,4,5,6}$ **locate sources of additional information on a specific topic**

2.45 **recall details of a passage and identify the main idea of a selected reading**

2.46 read sight words fluently from an appropriate grade level word list

2.47 **understand first-person narrative**

2.48 use figurative language (e.g., similes, metaphors)

2.49 determine relationships of events, characters, and objects in a story with regard to position, function, time, and quantity

$2.50_{5,8,10}$ **use graphic organizers such as story maps and Venn diagrams to compare, contrast, and construct meaning**

$2.51_{1,3,4,5,6,7,8,9,10,11}$ **respond to both literal and interpretive comprehension questions after reading a short story selection**

$2.52_{K,3,4,5,6,9,11}$ **predict outcomes based upon an understanding of the events and/or characters as described in a story**

$2.53_{3,4}$ **incorporate all key concepts or the larger meaning of the text to select the best title for a selection**

$2.54_{3,4,5,6,7,8,911}$ **empathize, relate to, and determine the motivations of characters within a story**

2.55 **use understanding and prior knowledge to apply rules to a specific situation**

$2.56_{3,5,8,10,11}$ **identify author's purpose for writing and the organization used to accomplish that purpose**

$2.57_{K,1,3}$ **use visualization techniques to determine and compare similar characteristics of objects described in a passage**

2.58 explain personal reaction to a selection

2.59 discriminate between reality and fantasy and between fact and opinion

2.60 recognize descriptive language in literary works, including but not limited to, poetry

2.61 infer unstated information in a selection by asking "why" questions

2.62 given a selection, draw

conclusions and generate a brief summary

2.63 given a selection, identify characters, plot, and setting

2.64 select and read books for independent, recreational reading

Reading Vocabulary

2.65$_{2,3,4,5,6,7,8,9,10,11}$ **recognize synonyms, antonyms, homonyms, and homophones for identified vocabulary words**

2.66$_{3,4,5,6,7,8,9,10,11}$ **recognize the correct meaning of a multiple-meaning word when presented in text**

2.67$_{3,4,5,6,7,8,9,10,11}$ **apply context clues to determine the meaning of an unknown word**

2.68 given a variety of reading material, increase the number of recognized words in presented text

Writing

2.69 maintain appropriate handwriting posture

2.70 maintain appropriate position of hand/pencil and paper/desk

2.71 write legible manuscript letters and numerals (0-9) using appropriate strokes

2.72 evaluate manuscript writing in terms of letter formation, alignment, proportion, spacing, and line quality

2.73 write legible cursive letters using appropriate strokes and joinings

2.74 self-evaluate cursive writing in terms of letter formation, alignment, proportion, spacing, and line quality

2.75 use the five-step writing process (e.g., prewrite, draft, revise, edit, publish) across the curriculum

2.76 compose a simple sentence using a subject and predicate differentiating between types of sentences (e.g., declarative, interrogative, exclamatory, and imperative)

2.77 compose a short paragraph with a clearly identified beginning, middle, and end containing a main idea and supporting details

2.78 develop various types of writing including, but not limited to: personal narratives, stories, descriptions, friendly letters, book reports, poetry, and journal entries

2.79 use electronic and traditional editing strategies to spell words correctly (e.g., proper nouns, in and inn [homophones])

Spelling

2.80 correctly spell basic sight words

2.81 correctly spell consonant sounds in initial, medial, and final positions including blends and digraphs

2.82 correctly spell vowel sounds including long and short vowels, vowel digraphs(e.g., ea as in bread, oa as in boat), and vowel dipthongs (e.g., oi, oy, oo, ou, aw, ow, ew)

2.83 correctly spell nouns, verbs, and root words with inflectional endings (e.g., -d, -ed, -s, -es, -ing, -er, -est)

2.84 make structural changes as needed when adding -ing, -ed, -er, or -est to base/root words ending in silent e

2.85 double a final consonant letter when necessary before adding an ending

2.86 change final "y" to "I" when necessary before adding an ending

2.87 correctly spell phonetically irregular words (e.g., could, they, one)

2.88 correctly spell irregular verbs and irregular plural nouns (e.g., knew, known, teeth, mice, wives, wolves)

2.89 correctly spell contractions

2.90 correctly spell compound words

2.91 correctly spell words with silent consonants (e.g., kn-, wr-, -mb)

2.92 use spelling patterns (e.g., taught- caught; light- right)

Language

2.93$_{1}$ **alphabetize words beginning with different letters and**

beginning with the same letter

2.94 differentiate between common and proper nouns

2.95$_{1,3,4,5,6,7,8,9,10,11}$ **capitalize first word in a sentence, pronoun "I", titles and initials, titles of written works, greeting and closing of a letter, and proper nouns (e.g., family names, months of the year, days of the week)**

2.96$_{1,3,4,5,6,7,8,9,10,11}$ **identify and use correct punctuation: period (e.g., end of sentence, abbreviations, initials); question mark; exclamation point; comma (e.g., in dates, after greeting and closing of letter, to separate city and state or country, with items in a series); quotation marks; and apostrophe (e.g., contractions, possessives)**

2.97$_{1,3,4,5,6,7,8,9,10,11}$ **use correct subject-verb agreement with proper regular and irregular verb formations**

2.98$_{1,3,4,5,6,7,8,9,10,11}$ **use past and present tense correctly**

2.99$_{1,3,4,5,6,7,8,9,10,11}$ **recognize and write correctly formed sentences (e.g., telling, asking, exclamation, command)**

2.100$_{1,3,4,5,6,7,8,9}$ **recognize and correct sentence fragments**

2.101$_{1,3,4,5,6,7,8,9,10,11}$ identify and correct errors in language expression and sentence construction

2.102$_{1,3,4,5,6,7,8,9,10,11}$ **identify sentences that would or would not support ideas in a text**

2.103 write a paragraph using correct form containing a main idea and supporting details

2.104 recognize and appropriately use parts of speech in their own writing (e.g., nouns, pronouns, verbs, adjectives, and adverbs)

2.105$_{1,3,4,5,6,7,8,9,10,11}$ **determine the purpose, audience, and intent of written composition**

2.106$_{6,7,8,9,10,11}$ **organize information and make decisions about what information is necessary and important to include**

2.107 express experiences adequately to relate ideas

Study Skills

2.108$_{3,4,5,6,7,9,10,11}$ **determine if a given word is on a dictionary page when guide words are supplied**

2.109 use the dictionary for pronunciation, spelling, and meaning

2.110 acquire organizational skills to manage school materials, personal time management, and information to be studied (e.g., sequence, timeline, mapping)

2.111$_{5,6,7,8,910}$ given a book, identify the author, illustrator, and title and be able to use the table of contents, glossary, and index

2.112 follow written directions with multiple steps

2.113 use a study plan to spell new words (e.g., look-say-spell-write-check)

2.114 choose/narrow a topic for story paragraph writing

2.115 adjust reading rate to purpose

2.116 interpret graphic sources (e.g., charts, tables, graphs, lists, schedules, diagrams, maps, and timelines)

2.117 practice and use test-taking strategies (e.g., read directions carefully, read for key words, budget time, read all choices)

Computer/Technology

2.118 use appropriate software to practice and master second grade English language arts instructional objectives

2.119 demonstrate correct keyboarding posture and finger placement for the home row keys

2.120 on a keyboard, locate and use symbol keys (e.g., period, question mark, Caps Lock, arror keys, shift, and ESC)

2.121 using a word processing program, input information such as spelling words, vocabulary words and definitions, journal writing, etc

2.122 use a mouse to "click and drag"

2.123 execute a program from disk and/or CD-ROM
2.124 identify the uses of technology in the community
2.125 describe the right of an individual to ownership of his/her (computer) work
2.126 identify the function of the various components of a computer system (e.g., monitor, keyboard, CPU, disk drive, CD-ROM, printer, etc)
2.127 use graphic software to read and interpret information from charts and bar graphs (2.116)

Grade Two Mathematics

The second grade objectives help a student to become a more independent problem solver through concrete and technology related experiences which explore: new problem solving strategies, everyday use of mathematical language, and reasonableness and interrelationships of mathematics. Additional concepts include: place value through hundreds, addition and subtraction of three digit numbers, multiplication facts through the fives and related division facts, estimation, introduction of properties of mathematics, and measurement which includes spatial perception.

Number Theory and Number Sense

2.1 **count forward and name numbers to 1000**
2.2_3 **compare and order numbers through 1000; identify the set with the fewest or most elements**
2.3 identify and construct models for numbers through 1000 using concrete materials
2.4 **model and count by twos and fives to 100 and by threes and fours to 96 using mental math, paper/pencil, hundred chart, calculators, and concrete objects**
2.5 **identify the ordinal positions first through twentieth using ordered sets of objects**
2.6 identify the number before or after any number through 1000
2.7 **group and count concrete items by ones, tens, and hundreds and identify the place value; find the place value of a digit in the tens place**
2.8 **read and write three digit numbers, utilizing standard and expanded form**
$2.9_{3,4}$ **model and identify odd and even numbers with and without objects**
2.10 **identify and model 100 more than and 100 less than a given number**
$2.11_{3,4}$ estimate, by front-end digit and rounding, numbers to the nearest hundred

Fractions and Decimals

$2.121_{,3,4,5}$ **identify fraction models that are part of the whole and/or group**

Whole Number Operations and Computations

2.13_1 **recall basic addition facts with sums to eighteen and the corresponding subtraction facts**
$2.14_{1,6}$ **identify the identity element (0) for addition**
2.15_1 **identify a number sentence that represents the commutative property of addition**
2.16_3 **model and solve without modeling two digit addition and subtraction with regrouping and write the corresponding number sentence**
$2.17_{3,4}$ **given two whole numbers whose sum is 99 or less; estimate the sum, and find the sum using various methods of**

calculation (mental computation, concrete materials, and paper/pencil)

2.18$_{3,4}$ **given two whole numbers whose sum is 99 or less, estimate the difference, and find the difference using various methods of calculation (mental computation, concrete materials, and paper/pencil**

2.19$_{3,4}$ **model and solve without modeling three digit addition and subtraction with and without regrouping**

2.20 **solve addition and subtraction problems using data from simple charts, picture graphs, tables, patterns, and word problems. Problems will require a two step solution**

2.21$_{3,4}$ **given a simple addition or subtraction fact, recognize and describe the inverse relationship between addition and subtraction (e.g., 3+_=7, 7-3=_ and 7-_=3)**

2.22$_{3}$ **model multiplication facts and the corresponding division facts using objects, a number line, and repeated addition; then write the corresponding number sentence**

Patterns and Relationships

2.23$_{k,1,3,4,5,6,7,8}$ **analyze, extend, describe, and create a wide variety of growing patterns (e.g., using numbers, rhythm, shape, and calculators)**

Probability and Statistics

2.24$_{1,3,4}$ **record data from simple experiments using spinners and colored tiles/cubes, and use the data to predict which of the two events is more likely and less likely to occur if the experiment is repeated**

2.25 **create, read, and interpret a pictograph with each picture representing greater than a single unit**

2.26$_{1,3,4}$ read and interpret tables and tally charts

2.27$_{3,4,5,6,7}$ locate ordered pairs on a grid

Geometry and Spatial Sense

2.28 identify and describe a cube, rectangular solid, cylinder, cone, and pyramid according to the number of faces, edges, bases, and vertices

2.29 compare and contrast plane and solid geometric shapes (circle/sphere, square/cube, triangle/pyramid, and rectangle/rectangular solid)

2.30$_{3,4}$ **given a design with a line of symmetry, construct the mirror image**

2.31 describe the shape created by combining two or more two-dimensional shapes

2.32 identify and construct lines, line segments, and rays and angles using a straight edge

2.33$_{3,4,5,6,7,8,9,10,11}$ **identify rotations and reflections**

2.34$_{3,4}$ **identify plane figures**

2.35$_{3,4}$ **identify congruent figures**

2.36$_{1,3,4}$ **identify geometric figures by the number of sides and vertices (corners)**

Measurement

2.37$_{3,4}$ **estimate and then use a ruler to determine linear measurement to the nearest centimeter and inch; then compare lengths and determine perimeter (the distance around a polygon)**

2.38$_{3,4}$ given grid paper, estimate and count the number of square units needed to cover a given area

2.39 estimate and count the number of cubes in a rectangular box (determine volume)

2.40 estimate and determine weight/mass of familiar objects in pounds and kilograms

2.41 use standard measuring tools for measuring capacity in metric and customary units

2.42$_{3,4}$ read Celsius and Fahrenheit thermometers

2.43 order events in relation to time

2.44 **given a calendar, determine past and future days of the week and identify specific dates**

2.45$_{3,4,5,6,7,8}$ **read time to the nearest quarter hour using an analog and a digital clock and calculate the elapsed time**

2.46 **identify and order all coins (penny, nickel, dime, quarter, half-dollar)**

2.47$_{3,4}$ **role play making change to a dollar using adding/counting on**

2.48$_{1,3,4,5,6}$ **select appropriate units to determine length, weight, or volume using metric measurement (e.g., would you use centimeters, grams, or liters)**

Computer and Technology

2.49 use appropriate software to practice and master second grade instructional objectives in mathematics

2.50 practice correct keyboarding posture and finger placement for the home row keys

2.51 on a keyboard, use symbol keys (e.g., Plus, minus, equal, and dollar sign)

2.52 use a mouse to "click and drag"

2.53 execute a program from disk and/or CD-ROM

2.54 identify the uses of technology in the community

2.55 use a calculator to count by twos and fives to 100, and by threes and fours to 96

2.56 use a calculator to find the sum/difference of two whole numbers whose sum/difference is less than 99

2.57 use a calculator to produce a wide variety of growing number patterns

2.58 describe the right of an individual to ownership of his/her (computer) work

2.59 identify the function of the various components of a computer system (e.g., monitor, keyboard, CPU, disk drive, CD-ROM, printer, etc)

Grade Two Social Studies

The second grade social studies program emphasizes the broader roles of citizenship. Distinguishing basic governmental functions, patriotic symbols and traditions, as well as reporting and discussing current events will build understanding of the child as a citizen in a democratic nation. Volunteerism and service projects in the school and community will be encouraged. Basic economic concepts such as needs versus wants and scarcity will be taught at this level. Classroom strategies will include activities in resource conservation and environmental preservation. The creation and interpretation of a variety of graphic tools, including charts, graphs, timelines, maps, and globes will be integrated. Conflict resolution skills will be taught and implemented.

Civics

2.1$_{3,4,5,6,7,8,9,10,11}$ identify functions of the following governmental bodies: Congress, state legislature, and city council

2.2$_{3}$ explain the difference between laws and rules and participate in the writing of "mock" rules for the school

2.3$_{3,4}$ be given the opportunity to recite the Pledge of Allegiance, sing the National Anthem, participate in national celebrations, and identify famous Americans

2.4 choose and participate in a project of volunteer service to the school

2.5 identify and practice components

of conflict mediation within the school community

2.6$_3$ identify appropriate safety responses to a variety of dangerous situations (e.g., fire, traffic, strangers, drugs)

2.7 recognize the need for responsible authority figures and identify the characteristics of good leaders in various situations

2.8 demonstrate increasing self-control (e.g., respecting the rights, space, and property of others in classroom and school activities)

2.9 identify people who make a difference in our lives, (e.g., ancestors, neighbors, community members, and people from books and other media sources)

Economics

2.10$_{3,4,6}$ demonstrate knowledge of needs and wants in relation to making appropriate personal choices

2.11$_{3,4,5,9}$ explain the role of banks in securing goods/services

2.12 practice bartering as an alternative method of securing goods/services and needs/wants

2.13$_4$ explore career options

2.14$_3$ participate in resource conservation and environmental preservation through recycling and litter reduction awareness activities

Geography

2.15 given a map, demonstrate knowledge of cardinal directions and a compass rose by identifying locations in relation to a base marker

2.16$_{3,4,5,6,7,8,9,10,11}$ demonstrate knowledge of map legends by interpreting legend symbols

2.17$_{3,4,5,6,7,8,9,10,11}$ given a world map and globe, locate the seven continents and the four oceans

2.18 name the months of the year and the four seasons

2.19$_{3,4,5,6,7,8,9,10,11}$ identify on a map rivers, lakes, oceans, islands, continents, and mountains

History

2.20$_{3,4,5}$ investigate change over time that has occurred in the community

2.21$_{4,9}$ investigate current events through various media (e.g., student newspaper, T.V., news broadcasts)

2.22$_{3,4,7}$ investigate the role of Native Americans in the history of the United States

2.23$_{3,6}$ celebrate historic movements, (e.g., women's history, African American history)

2.24 explore American heritage through children's literature

2.25 investigate the history of the community by identifying locally significant sites and people

2.26 understand that a particular gender or race does not give one rights over others

Study Skills

2.27$_{3,5,6}$ use a map scale to construct class and school maps

2.28$_{3,4,5,6,7,8,9,10,11}$ construct, read, and interpret graphs, charts, tables, and maps of familiar areas

2.29$_{3,4,5,6,7,8,9,10,11}$ utilize and draw conclusions from various data collection methods (e.g., graphs, charts, and timelines)

Computer/Technology

2.30 use graphics software to create graphs and charts

2.31 use appropriate software to practice and master second grade instructional objectives in social studies

2.32 practice correct keyboarding posture and finger placement for the home row keys

2.33 use a mouse to "click and drag"

2.34 execute a program from disk and/or CD-ROM

2.35 identify the ways technology changes the lives of people in the community

2.36 describe the right of an individual to ownership of his/her (computer) work

2.37 identify the function of the various components of a computer

system (e.g., monitor, keyboard, mouse, disk drive, CD-ROM, printer)

Grade Two Science

The Coordinated and Thematic Science (CATS) Two objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Two will provide opportunities for developmental and academic growth. The activities will introduce the concepts that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding.

Nature of Science

2.1 determine that science is a search for answers and an understanding of the world (e.g., classify plants and animals based on observations, compare likenesses and differences among plants and animals, observe changes in the environment caused by humans and/or nature)

2.2 identify the role of community people in science careers

2.3 compare and contrast objects and events using the five senses

2.4 identify examples of changes in nature

2.5 probe deeply into natural phenomena by asking and answering questions about the environment (e.g., animals, plants, mountains, rivers, deserts, grasslands, weather)

2.6 use a variety of communication techniques (e.g., pictographs, models, simple bar graphs, logs)

2.7 realize that science is never finished by observing changes in the environment (e.g., weather cycles, energy cycles, life cycles)

2.8 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation)

Scientific Attitudes/Habits of Mind

2.9 ask and answer questions while participating in investigations that lead to an appreciation and joy of discovery of the natural world

2.10 demonstrate innate curiosity, initiative, and creativity by observing, classifying, and comparing (e.g., states of matter, structure and function of living and non-living things)

2.11 be in awe and wonder of the patterns, variations, and interactions of natural objects in the environment (e.g., sun, earth and moon, plant and animal structures)

2.12 trust observations of living and non-living things in the environment (e.g., wild and domesticated animals, weather phenomena)

2.13 listen to and be tolerant of different viewpoints by engaging in collaborative activities and coming to a group decision

2.14 continue probing phenomena until questions are resolved (e.g., properties of living and non-living things, interaction of objects)

2.15 engage in problem-solving activities that have multiple solutions or explanations

2.16 recognize that science includes both individual and cooperative ventures (e.g., group solutions to problems, individual collections of living and non-living things)

Scientific Processes/Thinking Skills

2.17 observe, collect and record information (e.g., graphing, ordering, sequencing, measuring)

2.18 use a variety of classification systems (e.g., properties of living and non-living things)

2.19 use mathematical skills in SI (metric) units in investigations (e.g.,addition and subtraction, measurement of length, weight, and temperature)

2.20 use data to make predictions and construct reasonable explanations (e.g., sink and float, magnetic and non-magnetic objects, growth rate of plants)

2.21 plan and conduct simple investigations

Laboratory Investigations/Hands-On Learning

2.22 engage in active inquiries, investigations and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

2.23 manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, bulbs and batteries, weather instruments, calculators, computers)

2.24 use safe and proper techniques for handling, manipulating, and caring for science materials.

Science Themes and Subject Matter

2.25 develop an understanding of the scientific themes of systems, changes, and models (e.g., a system consists of many parts that which interact with each other and give rise to new properties; change occurs gradually, repetitively, or randomly; a model is a picture, description, or representation of the real thing)

2.26 understand that the study of living and non-living objects in the natural world integrates living organisms, earth materials, and physical properties of matter

2.27 establish connections across the curriculum (e.g., integrate science with mathematics, social studies, language arts, arts, and/or physical education)

$2.28_{3,4,5,6,8,10}$ compare, sort, and group objects according to size, shape, color, weight, texture, buoyancy, magnetic properties and states of matter -*systems*

$2.29_{3,4,5,6,7,8}$ identify the structures of living things and explain their functions (e.g., wings for flying, fins for swimming, flowers for attracting insects, physical characteristics inherited from parents) - *systems*

$2.30_{3,5,6,7,8,9,10}$ observe, classify, compare, investigate, record and discuss needs of living things in different environments - *systems*

$2.31_{3,4,5,6,7}$ observe, record, predict and discuss changes in living things (e.g., adaptations, growth and development) - *changes*

$2.32_{3,4,5,6,7,8}$ construct and/or manipulate models that depict movement, structures, and functions of living things (e.g., animal movements, plant parts) models

$2.33_{3,4,5,6,7,8}$ identify substances, mixtures and simple solutions -*models*

$2.34_{3,5,6,8,10}$ demonstrate that a magnet can attract or repel objects - *systems*

2.35 illustrate ways to produce sound (e.g., striking and plucking strings) - *systems*

$2.36_{4,5,6,7,8,9,10,11}$ explain energy types, sources and their relationship to

heat and temperatures - *systems*

2.37 recognize that sound can change in pitch and volume - *changes*

2.38 investigate how matter changes from one state to another (e.g., melting, freezing, boiling) - *changes*

2.39 draw a picture of an electric circuit illustrating that electricity travels -*models*

2.40 recognize that some materials conduct heat better that others (e.g., metals) - *models*

2.41 conclude that solids, liquids, and gases take up space - *models*

2.42 recognize that a shadow is cast when an object blocks light - *systems*

2.43_{3} explain how the Earth rotating on its axis causes day/night - *systems*

2.44 identify structural adaptations that benefit living organisms - *systems*

2.45 describe the water cycle and identify various sources of water - *systems*

$2.46_{5,6,9,11}$ distinguish changes in the atmosphere (e.g., wind movement) - *changes*

2.47 collect and observe the amount of rain in one week - *changes*

2.48 examine changes in non-living things (e.g., events that shape the Earth) - *changes*

2.49_{3} understand that the moon has phases - *changes*

2.50_{3} describe how fossils are formed - *changes*

2.51_{3} construct a collage of resources used for heating homes and buildings - *models*

2.52_{3} construct and explain models (e.g., sun, moon, earth and landforms) - *models*

$2.53_{3,4}$ construct a chart showing weather conditions over a period of time -*models*

2.54_{3} sequence pictures of events to illustrate the passage of time - *models*

2.55 use a map key to identify features (e.g., mountains, rivers, lakes) - *models*

2.56_{3} match a fossil or a picture of a fossil, with a picture of its original organism (e.g., dinosaur shell, fern) - *models*

Science History

2.57 study the lives and discoveries of scientists of different cultures and backgrounds (e.g., read stories about Thomas Edison, Jacques Cousteau, Alexander Graham Bell, and Rachel Carsen and visit scientists in their laboratory

2.58 recognize that science changes over time (e.g., earth features change shape, variations of birds appeared, plants of long ago became coal)

2.59 realize that scientists will always have new things to discover (e.g., galaxies, diseases, plants, and animals)

Science, Technology and Society

2.60 understand that there are many science-related careers through the use of speakers, field trips, audio-visual, and/or printed material (e.g., inventor, meteorologist)

2.61 understand that science skills are used in careers not usually related to science (e.g., piano tuner, photographer)

2.62 understand how technology has positively or negatively affected the quality of life in West Virginia and the world (e.g., solar energy use, sound "pollution")

2.63 understand that common daily events involve science (e.g., food, electricity, toys, transportation)

2.64 develop respect and responsibility for the environment by recognizing the interrelationship of living and non-living things and engaging in conservation practices

Computer/Technology

2.65 use appropriate software to practice and master second grade instructional objectives in science

2.66 practice correct keyboarding posture and finger placement for the home row keys
2.67 use a mouse to "click and drag"
2.68 execute a science program from disk and/or CD-ROM
2.69 using the graphing application of appropriate software, create tables and/or bar graphs
2.70 use appropriate software to practice reading and interpreting graphs and charts
2.71 identify the ways technology changes the lives of people in the community
2.72 describe the right of an individual to ownership of his/her (computer) work
2.73 identify the function of the various components of a computer system (e.g., monitor, keyboard, mouse, disk drive, CD-ROM, printer)
2.74 use a calculator to perform mathematical functions in data analysis

Grade Three
English Language Arts

The third grade student will learn, practice, and apply strategies associated with a total English language arts program focused on preparing literate, independent, self-motivated, critical thinkers who take responsibility for their own learning. Students will be engaged in reading and responding to a variety of literature using both literal and critical comprehension skills. Students will communicate orally in large and small group settings. The student will interact with and respond to text and technology in purposeful, situations across the curriculum. Proficiency in reading, writing, listening, speaking, and research skills will foster an appreciation for literature and will allow students to make connections between their experiences and the academic disciplines.

Listening/Speaking

3.1$_{1,2,4,5,6,7,8}$ **given descriptive words and other specific vocabulary, identify synonyms, antonyms, homonyms, and word meaning**

3.2$_{1,2,4}$ **listen to a story, draw conclusions regarding the source of information, characters, events, setting, and purpose**

3.3$_{1,2}$ **use story content and prior knowledge to make predictions**

3.4$_{4}$ **determine titles for narratives, paragraphs, stories, and student writing**

3.5$_{1,2,4}$ **given a dictated paragraph or set of directions, identify stated details**

3.6$_{1,2,4}$ **given a dictated paragraph, determine the main idea**

3.7 **given a dictated story, paraphrase, summarize, ask questions, make inferences, and identify author's opinion**

3.8$_{1,2,4}$ **recognize the sequence of events in a story or a set of directions**

3.9 use graphic organizers and visualization techniques to determine meaning

3.10 listen to a variety of literary forms

3.11 after differentiating between active listening and hearing, demonstrate appropriate listening and speaking behaviors (e.g., utilizing communication technologies)

3.12 given a speaking assignment, determine audience and purpose of presentation (e.g., persuade, entertain, inform)

3.13 given a topic, present information orally using specific vocabulary

3.14 make an oral presentation using appropriate volume, pitch, and rate of speech

Reading Comprehension

3.15$_{1,2,4,5,6,7,8,9,10,11}$ **read literary works by national and international authors to include, but not limited to: legends, folktales, and non-fiction**

3.16$_{K,1,2,4,5,6,7,8,9,10,11}$ **identify explicitly stated information including, but not limited to: story elements (e.g., setting, characters, plot), a set of directions, and functional reading (e.g., invitations, bulletins)**

3.17$_{K,1,2,4,9,10,11}$ **determine sequence (e.g., events in a story, set of directions, and/or a missing item)**

3.18$_{2,4,5,7,8,9,10,11}$ **use context clues to determine word meaning**

3.19$_{K,1,2,4,5,6,7,8,9,10,11}$ **recognize characteristics of a fictional and non-fictional story**

3.20$_{K,2,4,5,6,7,8,9,11}$ **draw conclusions regarding character (e.g., feelings, moods, traits, motives, point of view)**

3.21$_{K,1,2,4,5,6,7,8,9,10,11}$ **draw conclusions about a sequence of activities in an announcement or advertisement**

3.22$_{2,11}$ draw conclusions regarding the identity of certain objects when specific details are given

3.23$_{6,7,8,9,10,11}$ compare and contrast in order to draw conclusions regarding a story

3.24$_{K,2,4,9}$ make predictions based on prior knowledge and story information

3.25$_{2,4}$ determine an appropriate title for a reading selection or a story

3.26$_{2,4,5,8,9,10}$ identify theme, main idea, and author's purpose in a selection when it is not explicitly stated

3.27 paraphrase, summarize, compose questions, and make inferences about material read

3.28$_{2,5,6,9}$ recognize other resources where additional information on a specific topic can be located (e.g., dictionary, encyclopedia)

3.29$_{2,5,6,9}$ identify possible sources of functional information (e.g., where would such information probably appear)

3.30 identify cause and effect related to a given event (e.g., what happened and why)

3.31 make generalizations regarding story elements

3.32 recognize figurative language (e.g., similes, metaphors, and idioms)

3.33 chooses and responds to a variety of reading material for pleasure and information

3.34 experience content through imagery (visualizing)

Reading Vocabulary

3.35$_{2,4,5,6,7,8,9,10,11}$ recognize synonyms, antonyms, homonyms, and homophones for identified vocabulary words presented in isolation or within a group of words

3.36$_{2,5,6,7,8,9,10,11}$ recognize the correct meaning of a word with multiple meanings when presented in text

3.37$_{K,2,4,5,6,7,8,9,10,11}$ apply structural analysis and context clues to decode and encode words

3.38 identify and use content area vocabulary

3.39 given a variety of reading material, increase the number of recognized words presented in text

Writing

3.40 demonstrate proper manuscript and cursive writing techniques (e.g., posture, paper placement, pencil grip, letter formation, slant, letter size, spacing, rhythm, and alignment)

3.41 use the writing process (e.g, prewriting, drafting, revising, editing, publishing) across the curriculum

3.42 develop various types of writing including but not limited to narrative, informative, and persuasive (e.g., paragraphs, short stories, reports, and letters)

3.43 produce original writing samples related to creative arts including but not limited to poetry and journal entries

3.44$_{7,10}$ using complete sentences, write a composition with a clearly identified beginning, middle, and end

3.45$_{7,10}$ using complete sentences, write a composition with a main idea and specific relevant details

3.46 use electronic and traditional editing strategies to spell words correctly (e.g., proper nouns, in and inn [homophones])

Spelling

3.47 correctly spell basic sight words and/or frequently used words

3.48 correctly spell words with consonant sounds including, but not limited to: consonant digraphs (e.g., ph, sh, ch, wh), consonant blends (e.g., cr, cl, bl, gr, st), silent consonants (e.g., kn, ght, mb, wr, gn), and double consonants (e.g., tt, ll, dd)

3.49 **correctly spell vowel sounds including but not limited to vowel digraphs (e.g., ee, ea, ai, oa, ie), vowel dipthongs (e.g., oi, oy, oo, ou, aw), variants, and short/long vowels**

3.50 **apply spelling rules to spell words with prefixes and suffixes**

3.51 **correctly spell irregular verbs and irregular plural nouns (e.g., knew, known, teeth, mice, wives, wolves)**

3.52 correctly spell compound words

3.53 given a contraction, correctly identify the two words that form that contraction; given two words, combine them into a correctly spelled contraction

3.54 correctly spell abbreviations

3.55 **make structural changes to spell words correctly (e.g., add inflectional endings, drop silent e, double final consonants, change y to I before adding -ing)**

3.56 identify and correctly spell homophones

Language

$3.57_{1,2,4,5,6,7,8,9,10,11}$ **correctly use capitalization skills (e.g., beginning of sentence, titles, proper nouns, salutations of letters, pronoun "I")**

$3.58_{1,2,4,5,6,7,8,9,10,11}$ **correctly use punctuation skills (e.g., end of a sentence, abbreviations, salutation of a letter, quotations, contractions, possessives, commas in a series)**

$3.59_{4,5,6,7,8,9,10,11}$ **correctly use various forms of common and proper nouns and pronouns (e.g., subjective, objective, possessive, number, gender)**

$3.60_{1,2,4,5,6,7,8,9,10,11}$ **use proper forms of regular and irregular verbs (e.g., tense, helping verbs, forms of be)**

$3.61_{1,2,4,5,6,7,8,9,10,11}$ **use correct subject-verb agreement**

$3.62_{4,5,6,7,8}$ **recognize and correctly use adjectives (including articles) and adverbs**

$3.63_{1,2,4,5,6,7,8,9}$ **distinguish between correct and incorrect usage (e.g., that there)**

$3.64_{1,2,4,5,6,7,8,9,10,11}$ **identify and use correct sentence structure (e.g., refrain from use of fragments, awkward, and run-on sentences)**

3.65 identify types of sentences (e.g., statement, question, command, exclamation)

3.66 identify the subject and predicate in a sentence

$3.67_{4,5,6,7,9,10,11}$ **identify and use correct paragraph structure (e.g., indent, topic sentence, supporting sentences, recognize sentences that do not belong)**

$3.68_{4,5,6,9}$ **recognize and use the correct combining of sentences**

$3.69_{1,2,4,5,6,7,8,9,10,11}$ **recognize the intended audience and purpose of a brief reading selection/paragraph**

3.70 **identify and use appropriate dictionary skills (e.g., word meaning, guide words, syllabication, pronunciation guide)**

3.71 **identify appropriate reference sources for specific information (e.g., dictionary, encyclopedia, atlas)**

3.72 **identify a heading for a category of words**

$3.73_{1,2,4,5,6}$ **correctly write and punctuate a friendly letter**

Study Skills

$3.74_{4,5,6,7}$ **identify and use sources for different types of information (e.g., dictionary, encyclopedia, newspapers, card catalog)**

$3.75_{4,5,6,7,8,9,10,11}$ **recognize and use dictionary skills (e.g., word meaning, guide words, the pronunciation guide, syllabication, alphabetical order)**

3.76_{8} **organize and classify information (e.g., headings, categories, sorting)**

3.77 use graphic sources to interpret

and organize information (e.g., tables, graphs, diagrams, maps, timelines)

3.78 acquire organizational skills to manage school materials, time on task, and information to be studied

3.79 follow written directions with multiple steps

3.80 practice and use test-taking strategies (e.g., read directions carefully, read for key words, budget your time, read all choices)

3.81 identify and use parts of a book (e.g., glossary, index, title page, table of contents)

3.82 use a library and its reference sources (e.g., card catalog, computer listing, electronic retrieval systems)

Computer/Technology

3.83 use appropriate software to practice and master third grade English language arts instructional objectives

3.84 demonstrate proper finger placement for all letters on the keyboard

3.85 using a word processor, input information such as stories, reports, and narratives

3.86 use a mouse to draw simple graphics

3.87 identify the ways technology changes the lives of people in the community

3.88 demonstrate the understanding of the concept that copyright law protects a person's (or company's) work

3.89 relate the input, output, and processing devices of a computer to their functions

3.90 select and use appropriate software and/or other technologies to locate and use reference sources (3.28, 3.29, 3.74 and 3.82)

3.91 use the spellcheck function in a word processor (3.46)

3.92 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts (3.77)

Grade Three Mathematics

The third grade objectives extend the students' mathematical skills and concepts through concrete experiences and appropriate technology. These concepts and operations include: whole number operations; comparing and ordering numbers to a hundred and a thousand; fractions and decimals; multiplication facts through the nines; and exploring concepts of perimeter, area, and volume. Additional concepts include: gathering and organizing data, estimating and performing measurements.

Number Theory and Number Sense

3.1$_4$ **compare and order numbers through 100,000**

3.2 group and count concrete items by ones, tens, hundreds, and thousands

3.3$_{4,5}$ **Read and write six digit numbers and identify place value for each digit utilizing standard and expanded form**

3.4$_{2,4}$ **identify a number as odd or even**

3.5$_5$ identify and model 100 more and 100 less than a given number.

3.6 give examples of multiple uses of numbers in the real world

3.7$_4$ **estimate to the nearest 1000 using front-end digit, rounding, compatible numbers, and logical reasoning**

Fractions and Decimals

3.8$_{1,2,4,5}$ **identify fraction models that are part of a whole and/or part of a group**

3.9$_{4,5}$ **compare and order fractions with like and unlike**

denominators

3.10 add and subtract like fractions using concrete materials.

3.11$_{4,5}$ **read, write, compare, and order decimals expressed to hundredths**

3.12 identify and represent equivalent fractions, and relate fractions to decimals as tenths and hundredths using concrete materials

3.13$_{4,5}$ **add and subtract decimals to tenths and hundredths.**

3.14 recognize and model mixed numbers using concrete materials

3.15$_{2,4}$ **add and subtract two and three digit whole numbers and money with and without regrouping**

Whole Number Operations and Computations

3.16$_{4,5}$ **recall basic multiplication facts 0-9 and the corresponding division facts that make up families of facts**

3.17$_{4,5,6,7}$ **identify the commutative property and identity element for multiplication and recognize multiplication as repeated addition**

3.18$_{4}$ model three digit subtraction with regrouping across zeros

3.19$_{2,4}$ **solve problems using various computational methods, including calculator, paper/pencil, mental computation, and estimation**

3.20 use a calculator in situations involving four digit or higher numbers with two or more addends

3.21$_{4}$ **in computation and problem solving situations: identify missing information, verify solutions, and determine the reasonableness of results**

3.22$_{4}$ **multiply two and three digit by one digit numbers with and without regrouping**

3.23$_{4}$ **divide two and three digit by one digit numbers with and without regrouping**

Patterns and Relationships

3.24$_{1,2,4,5,6,7,8}$ **identify patterns within the number system, including numerical operations using the calculator (e.g., odd+odd=even, even+odd=odd)**

3.25$_{k,1,2,4}$ **analyze a given pattern using concrete objects and pictures, and then create a pattern with the same attribute; complete geometric patterns**

Probability and Statistics

3.26$_{1,2,4}$ **experiment and describe the concepts of probability and chance, and list possible outcomes from a sampling**

3.27 using a calculator, determine the mean from collected data

3.28 as part of a problem solving situation, conduct a survey, organize the data, and display the findings on a bar and line graph

3.29$_{4}$ **given grid paper, collect data on a given topic and read, interpret, construct, and label a bar graph showing the results**

3.30 use a time line to display a sequence of events

3.31$_{1,2,4}$ **read and interpret tables and tally charts**

Geometry and Spatial Sense

3.32$_{4,5}$ **locate and graph/plot ordered pairs on a grid in the first quadrant**

3.33$_{2,4,5,6,7,8,9,10,11}$ **given a model, draw an example of a flip, slide, and turn**

3.34$_{1,2,4}$ **identify basic polygons including (pentagon, hexagon, and octagon) and components (sides and vertices)**

3.35$_{4,5}$ identify and construct right, obtuse, and acute angles

3.36$_{4,5,6}$ **compare areas of figures**

3.37$_{1,2,4}$ **identify lines of symmetry**

3.38$_{1,2,4}$ **identify congruent figures**

Measurement

3.39$_{2,4}$ **estimate and compare linear measurements (e.g., length and height) using inch,**

(precise to the nearest half inch) foot, yard, centimeter, and meter; then measure

3.40 estimate and measure results of mass/weight in ounces, pounds, grams, and kilograms

3.41 estimate capacity and measure with appropriate units (teaspoons, tablespoons, cups, pints, quarts, gallons, milliliters, and liters)

3.42$_{1,2,4,6}$ **select and use appropriate units of measurement according to type and size of unit. (read scales of length, temperature, weight, or capacity)**

3.43 indicate the approximate size of units without using a ruler (e.g., width of little finger as centimeter, first joint of thumb as inch)

3.44 **estimate, read, and recognize common temperatures in Fahrenheit and Celsius (e.g., body temperature, hot and cold day, freezing and boiling points)**

3.45$_{2,4,5,6,7,8}$ **read time to the five minute interval and to the nearest minute using an analog and digital clock and calculate elapsed time**

3.46 identify equivalent periods of time, including relationships between days, weeks, months, years, as well as seconds, minutes, and hours

3.47 read and write amounts of money up to $100.00

3.48$_{4}$ **role-play making change up to $10.00**

Computer and Technology

3.49 use appropriate software to practice and master third grade instructional objectives in mathematics

3.50 practice proper finger placement for all letters on the keyboard.

3.51 use a mouse to draw simple graphics

3.52 identify the ways technology changes the lives of people in the community

3.53 use a calculator to solve whole number operations

3.54 use a calculator to solve problems with multiple four-digit (or greater) addends

3.55 use a calculator to produce patterns within the number system, including numerical operations

3.56 from a collected data, use a calculator to find the mean.

3.57 demonstrate the understanding of the concept that copyright law protects a person's (or company's) work

3.58 relate the input, output, and processing devices of a computer to their functions

3.59 use graphing software to construct bar and line graphs

Grade Three Social Studies

The objectives for third grade encourage an understanding of community. The study of history will show community change over time due to technology, movement of people, and human interaction with the environment. The geographic factors that influence people's lives will be identified. The creation, exchange, and consumption of goods and services in the context of the community and within a child's experience will build economic understanding. Citizenship will be practiced in problem solving and decision making to understand participatory democracy. In all areas, collection, interpretation, and construction of data will be emphasized through the use of graphics (e.g., maps, globes, charts, tables and graphs).

Civics

3.1$_{4,5,6,7,8,9,10,11}$ **compare and contrast the lawmaking function of government to the legislative branch at local, state , and national levels**

for all letters on the keyboard

3.54 use a mouse to draw simple graphics

3.55 read and interpret graphs and charts

3.56 identify the uses of technology in the community

3.57 demonstrate the understanding of the concept that copyright law protects a person's (or company's) work

3.58 relate the input, output, and processing devices of a computer to their functions

Grade Three Science

The Coordinated and Thematic Science (CATS) Three objectives build upon problem-solving and experimentation and move into a more in-depth study of science. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Three highlights careers, the beginning of the study of geology and astronomy. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigate abilities that lead to logical conclusions.

Nature of Science

3.1 discuss the ways science is a search for answers and an understanding of the world (e.g., ask questions about your role in your world with litter and pollution)

$3.2_{4,5,6,7}$ **given the science-related careers of a nurse, doctor, dentist, x-ray technician, etc., state the roles each plays in a community**

$3.3_{4,\ 5,\ 6,\ 7,\ 8,\ 9,\ 10,\ 11}$ **explore objects and events by attributes (e.g., shape, color, texture)**

3.4 differentiate natural changes from man-made changes

3.5 probe deeply into natural phenomena by asking and answering questions about the environment (e.g., oceans, landforms, volcanoes, weather)

3.6 use a variety of communication techniques (e.g., charts, bar graphs, pie graphs, models, written descriptions)

3.7 realize that science is never finished by observing changes in the environment (e.g., weather cycles, energy cycles, life cycles, rock cycles)

3.8 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal)

Scientific Attitudes/Habits of Mind

3.9 ask and answer questions while recognizing interactions that further an appreciation and joy of discovery of the natural world

3.10 demonstrate innate curiosity, initiative, and creativity by constructing models to investigate their environment

$3.11_{4,\ 5,\ 6,\ 7,\ 8,\ 9,\ 10,\ 11}$ **be in awe and wonder of the patterns, variations, and interactions of natural objects in the environment (e.g., food chain, rocks and minerals)**

3.12 trust observations as a basis for taking risks involved in new tasks and skills

3.13 listen to and be tolerant of

different viewpoints by engaging in collaborative activities and be willing to modify ideas when new and valid information is presented

3.14 continue probing phenomena until questions are resolved (e.g., properties of matter, motions of sun and moon and planets, adaptations of plants and animals)

3.15 recognize that developing solutions to problems takes time, patience, and persistence

3.16 recognize that science includes both individual and cooperative ventures (e.g., read about scientific discoveries, on-going group investigations)

Scientific Processes/Thinking Skills

$3.17_{3,4,5,6,7,8,9,10}$ **sort, classify, and compare materials based on useful properties (e.g., magnetism, density, solubility, and conductivity)**

$3.18_{3,4,5,6,7,8,9,10,11}$ **given a set of objects, group or order the objects according to an established scheme (e.g., celestial objects, patterns of motion, constellations)**

$3.19_{6,8,11}$ **given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity**

$3.20_{4,5}$ **apply mathematical skills and use metric units (e.g., graphing, addition, subtraction, multiplication, division, and measurement of length and volume of liquid samples)**

$3.21_{3,4,5,6,7,8,9,10,11}$ **establish a data table, graph, map, or diagram and use it to answer questions (e.g., volume, temperature, and rates of melting)**

3.22 support statements with facts (e.g., found in nature books, magazines, and the Internet)

$3.23_{3,4,5,6,7,8,9,10,11}$ **construct predictions and make inferences based on patterns of evidence**

$3.24_{4,5,6,8,9,10,11}$ **when collecting and observing things around you, look for changes and question what may cause the change (e.g., the effect of push or pull on a moving object, motion related to points of reference, falling bodies, fossils, and weather maps)**

3.25_{7} **relate an organism's pattern of behavior to the nature of its environment (e.g., the kinds and numbers of other organisms present, the availability of food, and the physical characteristics of the environment)**

$3.26_{4,7,10}$ **test variables (e.g., those that effect plant growth, speed, action of water on soil, and shadow formation)**

Laboratory Investigations/Hands-On Learning

3.27 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

$3.28_{4,5,6,7,8,10,11}$ use scientific instruments and everyday materials to investigate the natural world (e.g., graduated cylinder, hand lens, thermometer, bulbs and batteries, tuning fork, and calculators)

3.29 use safe and proper techniques for handling, manipulating, and caring for science materials

Science Themes and Subject Matter

3.30 develop an understanding of the scientific themes of systems, changes, and models (e.g., systems consists of many parts that interact with one another and give rise to new properties or functions; change occurs gradually, repetitively, or randomly; a model is a picture, description, or simulation of the real thing)

3.2$_{4,5,8,9,10}$ **compare and contrast leaders and their length of terms and qualifications in the executive branch of government at local, state, and national levels**

3.3 **research and identify laws passed for public safety (e.g., bicycle helmets, speed limits, handicapped access, fire regulations)**

3.4 **resolve classroom dilemmas by using the democratic process of majority rule**

3.5$_{4}$ **explain the significance of patriotic symbols, holidays, celebrations, and famous people (e.g., American flag, national anthem, Pledge of Allegiance, and Capitol)**

3.6 identify people in the community who volunteer for public service

3.7$_{4,9}$ **explain how the government prints and coins currency**

3.8 give examples of rules and laws that protect our health, our safety, our property, and make life more pleasant

3.9 develop rules for cooperative group work and attainment of group goals

3.10 set criteria for "fair" rules and identify characteristics of unfair rules

3.11 cite examples to show how groups and individuals can make a difference in the community

3.12$_{5,6,7,8,9,10,11}$ **identify functions of government and which officials are charged with various responsibilities**

3.13 **know what majority rule means and give examples of that concept in democracy**

3.14 **explain the concept of owning property and the rights and responsibilities of property ownership**

3.15 **explain the primary functions of county commission, city council, school board, branches of state legislature, and branches of Congress**

3.16$_{10}$ **list the qualifications at the federal level for being a member of the House of Representatives, the Senate, president, and the lengths of their terms in office**

3.17$_{5,6,8}$ **identify and explain the similarities and differences of various public officials (e.g., president of United States, mayor, governor)**

Economics

3.18$_{4,5,7,9}$ **explain the purpose of property, personal, and income taxes, who pays taxes, and the consequences for not paying taxes**

3.19$_{7}$ explain the relationship between government taxation and the provision of public services

3.20 **explain the concept of scarcity by citing examples of limited supplies and scarce resources**

3.21$_{4,5,6,7,8,9,10,11}$ **explain supply and demand with appropriate examples**

3.22$_{4,5,6,7,8,9,10,11}$ **illustrate the concepts of goods and services by categorizing community workers who provide each; explain goods and services purchased through personal cost and those provided by government (tax) money**

3.23$_{4,6,7}$ **describe how competition for products increases with advertising and availability of communication and transportation (e.g., printing press)**

3.24 **explain the concept of monopolies and how the government controls monopolies**

3.25$_{4}$ **trace the path of a product from the raw material to the consumer**

3.26$_{4}$ **explain why budgeting is a critical skill necessary for good management (e.g., personal, business, government)**

3.27 **analyze the purpose of various forms of transportation (e.g., tram, car, bicycle, truck, boat, plane, rocket) and identify how each of these impact our**

economy

3.28 identify activities that individuals can do to keep the environment clean

Geography

3.29$_{4,5,6,7,8,9,10,11}$ given an appropriate map, utilize map skills to locate places using cardinal directions, symbols, grids/coordinates, and a scale

3.30$_{4,6,9,10}$ compare and contrast climate, weather, and location to people's clothing, food, shelter, and jobs

3.31$_{4,6,9,10}$ identify change over time using maps of the community and region

3.32$_{4}$ identify major geographic features in North America (e.g., bodies of water, mountains, gulfs, straits, bays)

3.33 determine direction using a compass, the sun, and the stars

3.34$_{6,8,9,11}$ identify geographic features (e.g., peninsulas, islands, continents, straits, mountains, rivers, deserts, oceans, seas, harbors, gulfs, forests, and oasis)

3.35 locate all states and capitals on a blank United States map

3.36$_{4,5,6,11}$ given a map, identify north, south, east, west, borders, lines of longitude and latitude, equator, north and south poles, and time zones

History

3.37 make historical inferences by analyzing artifacts and pictures

3.38$_{4,8,11}$ research and report on major inventions (e.g., printing press, steam engine, cotton gin, reaper) and indicate their impact upon society

3.39$_{4,5}$ explain the historical significance of major events, people, and their contributions as it relates to specific events

3.40$_{6,7,9}$ investigate ways the present culture is similar to and different from the culture of Native Americans and people of other historical time periods (e.g., source of food, clothing, shelter, products used)

3.41$_{4}$ using appropriate news sources, draw conclusions and inferences about current events

3.42 explain how diversity in the heritage, culture, ideas, and opinions of others is important

3.43 explain the impact that railroads and other forms of transportation had on western expansion

3.44$_{6}$ recognize portions of famous speeches and writings (e.g., John F. Kennedy- inaugural address, Martin Luther King- "I Have a Dream,")

Study Skills

3.45$_{4,7,10}$ create and use graphs, charts, maps and other data sources to illustrate the use of resources, the demand for products, the supply of goods and services

3.46$_{4,5,6,7,8,9,10,11}$ read and interpret data from various types of maps, globes, charts, graphs, and timelines (e.g., population, products, climate)

3.47$_{4,5,6,7,8,9,10,11}$ analyze and construct timelines, charts, and graphs to interpret historical data

3.48$_{4,8}$ sequence a series of pictures that reflect historic change (e.g., transportation, technology, agriculture)

3.49 organize information from various reference sources to prepare short reports

3.50$_{6,11}$ use and organize information on time lines to sequence events in history

Computer/Technology

3.51 use graphics software to create graphs and charts

3.52 use appropriate software to practice and master third grade instructional objectives in social studies

3.53 practice proper finger placement

3.31 understand that the study of living and non-living objects in the natural world integrates living organisms, earth materials, and physical properties of matter

3.32 establish connections across the curriculum (e.g., integrate science with mathematics, social studies, language arts, arts, and/or physical education)

3.33$_{3,4,5,6,8,10,11}$ **compare, sort, and group objects according to buoyancy, magnetic properties, states of matter, density, solubility and conductivity - *systems***

3.34$_{4,5,6,7,8,9,10,11}$ **compare and contrast chemical and physical changes - *systems***

3.35$_{3,4,5,6,7,8}$ **identify the structures of living things, including their systems, and explain their functions (e.g., roots absorb water, circulatory system to move materials) - *systems***

3.36$_{5,7,9}$ **relate the structures and behaviors of living organisms to the environment in which they live (e.g., beaks and feet in birds, seed dispersal, camouflage, different types of flowers -*systems***

3.37$_{5,6,7,8,9,10}$ **describe the relationships among the plants and animals in a closed system of interdependent organisms (e.g., aquariums, terrariums) - *systems***

3.38$_{5,6,7,8,9,10}$ **identify relationships among organisms in an ecosystem (e.g., sequencing food chains, behavior, adaptations, factors that effect populations, predator-prey relationships -*systems***

3.39$_{4,5,6,7}$ **observe, measure, and record changes in living things (e.g., growth and development, variations within species) - *changes***

3.40$_{3,4,5,6,7,8}$ **manipulate, measure, diagram, construct, arrange, observe and discuss models of plant and animal structures and systems - *models***

3.41$_{3,5,6,8,10,11}$ **observe chemical reactions (e.g., Alka Seltzer and water, vinegar and baking soda) - *systems***

3.42$_{5,6,8,11}$ **recognize that moving objects must have a force exerted upon them (e.g., gravity, push or pull, unbalanced force) - *systems***

3.43 **identify objects that appear to move or not move based upon the motion of other objects - *systems***

3.44 find out how the number of turns in an electromagnet affects the strength - *systems*

3.45$_{4,5,7,9}$ **show that matter can change phases (e.g., condensation, melting, evaporation) - *changes***

3.46$_{4,5,7,9}$ **relate changes in states of matter to temperature (e.g., water) - *changes***

3.47$_{5,6,8,10}$ **recognize energy transformations (e.g., mechanical to heat, electrical to heat) - *changes***

3.48 recognize that it takes work to move objects over a distance - *models*

3.49 recognize that speed depends on distance and time - *models*

3.50$_{4,5,7,9}$ **construct models related to the structure of solids, liquids - *models***

3.51$_{4,6,9,10,11}$ identify properties of minerals - *systems*

3.52 explain how igneous, sedimentary and metamorphic rocks are formed - *systems*

3.53 describe three layers of the Earth - *systems*

3.54$_{4}$ identify and describe the various features of the Earth's crust (e.g., plateaus, plain, and valleys) - *systems*

3.55$_{4,6,7,8,9}$ **explain how the rotations of the Earth causes day and night - *systems***

3.56$_{4,6}$ **explain how the revolution of Earth and the tilt of Earth's axis causes the seasons - *systems***

3.57 plan and carry out investigations to show how shadows are formed - *systems*

3.58 **describe the similarities and differences among the planets - *systems***

3.59$_{5,6,7,8,9,10,11}$ **describe the size and surface of the Sun, Moon and Earth - *systems***

3.60$_{4}$ **relate changes in the environment to the water cycle -*changes***

3.61$_{10}$ **associate fossils as a record of time (e.g., what organisms once lived on Earth, where they lived) - *changes***

3.62$_{10}$ **move through a simple time line illustrating changes on the Earth over the past 50 million years -*changes***

3.63$_{5,8}$ **describe weather changes by seasons - *changes***

3.64$_{4,5,7,10}$ using water and wind explore the eroding of different materials (e.g., sand, mud pile and rocks) - *changes*

3.65 describe how volcanoes and earthquakes change the Earth - *changes*

3.66$_{4,6}$ **recognize the movement of the Sun and Moon in relationship to the Earth's position - *changes***

3.67$_{4}$ recognize the existence of constellations and their changes through the seasons -*changes*

3.68$_{10}$ **make a model of a fossil and review fossil formation - *models***

3.69$_{6,7}$ **design a collage that represents how Earth's resources are used in every day life (e.g., water, wind, rock, soil, and minerals) - *models***

3.70$_{7,8,10,11}$ **identify land features using a topographical model or map (e.g., mountains, rivers, valleys, lakes, glaciers, and volcanoes) - *models***

3.71$_{7,8,9}$ **explain using models the phases of the Moon and eclipses - *models***

3.72$_{3,5,6,9,11}$ **build a weather station and use to collect and record measurable data (e.g., temperature, wind, direction, wind speed, and precipitation) - *models***

3.73$_{4,6,7,8,9,10,11}$ **read a weather chart or map - *models***

Science History

3.74 study the lives and discoveries of scientists of different cultures and backgrounds (e.g., find articles, videos, and books about specific scientists, their discoveries, and their equipment: George Washington Carver, Luther Burbank, John Audubon, Isaac Newton, and Madame Curie and take field trips to places where scientists work)

3.75 recognize that science changes over time (e.g., weathering, new plants and animals appear)

3.76 realize that scientists will always have questions about the world (e.g., how big is the world, when did it start, how old is it)

Science, Technology and Society

3.77 examine that there are many science-related careers through the use of speakers, field trips, audio-visual, and/or printed material (e.g.,allergist, environmentalist)

3.78 examine that science skills are used in careers not usually related to science (e.g.,animator, transportation engineers)

3.79 research how technology has positively or negatively affected the quality of life in West Virginia and the world (e.g., Biosphere II, "skyglow" light pollution)

3.80 examine how common daily events involve science (e.g., mail delivery, television)

3.81 develop respect and responsibility for the environment by recognizing the interrelationship of living and non-living things and engaging in conservation practices

Computer/Technology

3.82 use appropriate software to practice and master third grade instructional objectives in science

3.83 practice proper finger placement for all letters on the keyboard

3.84 use a mouse to draw simple graphics

3.85 use appropriate software to practice reading, interpreting, and analyzing the data on a chart, graph, and table

3.86 use appropriate software to practice drawing conclusions, making predictions, and making inferences based on data from a chart, graph, and table

3.87 use appropriate software to practice determining the length of an object

3.88 identify the uses of technology in the community (e.g. health care, communications, agriculture)

3.89 demonstrate understanding of the concept that copyright law protects a person's (or company's) work

3.90 relate the input, output, and processing devices of a computer to their functions

3.91 using the graphing application of appropriate software, create tables and/or bar graphs

3.92 use a calculator to perform mathematical functions in data analysis

3.93 use a variety of instruments (e.g., probes, thermometers, measuring devices) to perform measurements and record data

Grade Four
English Language Arts

The goal of the fourth grade English language arts curriculum is to develop readers and writers who are independent, self-motivated, critical thinkers who take responsibility for their own learning. Students will learn to critically evaluate what they read, express themselves clearly in speaking and in writing, gather and use information, and utilize strategies to be applied in all content areas. At this level, children are provided with a variety of opportunities to interact with a wide range of literary forms, setting the foundation for lifelong reading.

The curriculum has been developed in such a way as to encourage integrated English language arts instruction across the curriculum, thus enabling students to make connections to all subject areas. A wide variety of instructional activities are to be provided that address individual student needs and learning styles.

Listening/Speaking

- 4.1$_{1,2,3,5,6,7,8}$ **demonstrate skill in using conventions of English (e.g., synonyms, antonyms, homonyms, word meanings, subject/verb agreement, adjectives, adverbs, and pronouns)**
- 4.2$_{1,2,3}$ **given a dictated paragraph, recognize intended audience**
- 4.3$_{1,2,3}$ **given a dictated narrative, draw conclusions/infer details related to setting, characters, problem, plot, theme, point of view, and author's purpose**
- 4.4$_{3}$ **given a dictated paragraph, determine meaningful titles**
- 4.5$_{2,3,5,6,7,8}$ **given a narrative, distinguish between factual information and information based on opinion**
- 4.6$_{2,3,5,6,7,8}$ **given a dictated paragraph, identify the stated or implied main idea**
- 4.7$_{1,2,3,5,6,7,8}$ **given a narrative or set of directions, identify stated details**
- 4.8$_{3}$ **given a narrative, paraphrase, summarize, and ask appropriate questions regarding content**
- 4.9$_{1,2,3,5,6,7,8}$ **recognize the sequence of events in a story or set of directions**
- 4.10 **given a set of directions, draw conclusions/infer specific information**
- 4.11 **listen to a variety of literary forms**
- 4.12 given oral text, listen to, record, and state factual information
- 4.13 contribute to group discussions
- 4.14 seek ideas and opinions of others
- 4.15 using oral communication, form and support opinions
- 4.16 given a topic, organize and use subject-related information and vocabulary in an oral presentation
- 4.17 make an oral presentation using appropriate volume, pitch, and rate of speech
- 4.18 after differentiating between active listening and just hearing, demonstrate appropriate listening/speaking behaviors (e.g., using communication technologies)

Reading Comprehension

- 4.19$_{K,1,2,3,5,6,7,8,9,10,11}$ **read literary works by national and international authors to include, but not limited to: legends, folktales, biographies, historical fiction, and WV authors**
- 4.20$_{2,3,5,6,7,8,9,10,11}$ **identify explicitly stated information/details including, but not limited to: story elements (e.g., setting, character, plot), a set of directions, functional reading (e.g., invitations, bulletins), and expository text**
- 4.21$_{K,1,3,9,10}$ **locate and order events in a**

story (e.g., first, second, third) or identify missing items in a sequence of events

4.22$_{K,1,2,3,5,6,7,8,9,10,11}$ recognize characteristics of a fictional and nonfictional story (e.g., fairy tales, mysteries, vs. true stories)

4.23$_{3,11}$ scan a short passage for key words to answer a question

4.24$_{3,11}$ skim a short passage for an overview of the material

4.25$_{K,2,5,6,8,9,10}$ identify theme and main idea of a story

4.26$_{K,2,3,4,5,6,7,8,11}$ draw conclusions and make inferences regarding information related to story elements, functional selections, informational selections, or expository text

4.27$_{2,3,5,9,10,11}$ identify and/or draw conclusions regarding details and the purpose of a set of directions

4.28$_{2,3}$ determine an appropriate title for a reading selection (e.g., expository text, story, biography)

4.29$_{K,2,3,5,6,9,10,11}$ make predictions based on information provided

4.30$_{6,7,8,10}$ identify characteristics of fact versus opinion

4.31$_{9,10}$ read and make use of information in a functional selection or expository text

4.32$_{K,1,2,3,5,6,7,8,9,10,11}$ use context clues to determine word meaning

4.33 use prior knowledge to recognize the topic of a story

4.34 recognize different organizations of paragraphs (e.g., main ideas with details, how things are alike or different, how something has changed)

4.35 identify cause and effect related to a given event

4.36 compare/contrast likenesses and differences of words, objects, and ideas

4.37 develop generalizations regarding story elements and relate facts to content

4.38 experience content through imagery (visualizing)

4.39 recognize non-literal meanings (e.g., similes, metaphors, analogies, idioms, puns)

4.40 paraphrase, summarize,, compose questions, and make inferences about material read

4.41 identify nonverbal symbols (e.g., #, &, etc.)

4.42 choose and respond to a variety of reading material for pleasure and information

Reading Vocabulary

4.43$_{2,3,5,6,7,8,9,10,11}$ recognize synonyms, antonyms, homonyms, and homophones for identified vocabulary words that are either presented alone or within a group of words

4.44$_{2,3,5,6,7,8,9,10,11}$ recognize the correct meaning of a word with multiple meanings when presented in text

4.45$_{K,2,3,5,6,7,8,9,10,11}$ apply structural analysis and context clues to decode and encode words

4.46 identify and use content area vocabulary given a variety of reading material

4.47 increase the number of recognized words presented in text

Writing

4.48 demonstrate proper manuscript and cursive techniques (e.g., posture, paper placement, pencil grip, letter formation, slant, letter size, spacing, rhythm, and alignment)

4.49 use the writing process (e.g., prewriting, drafting, revising, editing, and publishing) across the curriculum

4.50 develop various types of writing including, but not limited to, narrative, informative, and persuasive (e.g., paragraphs, stories, letters, and newspaper articles)

4.51 produce original writing samples related to creative arts including but not limited to poetry, journal entries, and plays

4.52$_{7,10}$ using complete sentences, write a composition with a clearly identified beginning, middle, and end

4,53$_{7,10}$ **produce a composition with a main idea and specific, relevant details**

4.54$_{7,10}$ **using complete sentences, write a composition that is focused, coherent, and has a logical progression of ideas**

4.55 use electronic and traditional editing strategies to spell words correctly (e.g., proper nouns, in and inn [homophones])

Spelling

4.56 correctly spell basic sight words and frequently used words

4.57 **identify and correctly spell homophones**

4.58 **use syllabication rules to spell words correctly**

4.59 **correctly spell words with consonant sounds including silent consonants, consonant digraphs and doubling the final consonant to add -ing**

4.60 **correctly spell words using various vowel patterns (e.g., silent vowels, vowel dipthongs, silent e when -y or -ing are added, and vowel digraphs)**

4.61 **make structural changes as needed in root (base) words (e.g., -y to -I before adding -ed)**

4.62 **apply spelling rules to the addition of prefixes and suffixes**

4.63 correctly spell irregular verbs and irregular plural nouns (e.g., knew, known, teeth, wolves)

4.64 correctly spell compound words

4.65 given a contraction, correctly identify the two words that form that contraction; given two words, combine them into a correctly spelled contraction

4.66 correctly spell abbreviations

4.67 given a word, determine the origin of its meaning to correctly spell it

4.68 correctly spell multi-syllabic words

Language

4.69$_{1,2,3,5,6,7,8,9,10,11}$ **use capitalization skills correctly (e.g., titles, closing of a letter, greeting of a letter, first word in a quotation, first word of sentence, proper nouns, pronoun "I")**

4.70$_{1,2,3,5,6,7,8,9,10,11}$ **use punctuation skills correctly (e.g., quotation marks, end marks, commas in a series, apostrophes, correspondences, contractions, abbreviations, separation of clauses, underlining) in narratives and friendly business letters**

4.71$_{1,2,3,5,6,7,8,9,10,11}$ **use various forms of common and proper nouns and pronouns correctly (e.g., subjective, objective, number, gender)**

4.72$_{1,2,3,5,6,7,8,9,10,11}$ **use various forms of verbs correctly (e.g., verb tense, subject/verb agreement, helping verbs, forms of be, linking verbs)**

4.73$_{3,5,6,7,8}$ **distinguish between and correctly use adjectives and adverbs (e.g., making comparisons)**

4.74 distinguish between proper and improper usage (e.g., that there)

4.75$_{1,2,3,5,6,7,8,9,10,11}$ identify and use correct sentence structure (e.g., refrain from use of sentence fragments, awkward and run-on sentences)

4.76 identify and use simple and compound subjects and predicates

4.77$_{3,5,6,9}$ combine sentences into a logical, clear sentence using such words as "and" and "however"

4.78$_{3,6,7,9,10,11}$ identify and use correct paragraph structure (e.g., indent, topic sentence, closing sentence, supporting sentences, recognizing sentences that do not belong)

4.79$_{1,2,3,5,6,7,8,10,11}$ **identify purpose of various types of paragraphs (e.g., narrative, informative, persuasive)**

4.80 identify and use appropriate dictionary skills (e.g., word

meaning, guide words, syllabication, pronunciation guide)

4.81 identify appropriate reference sources for specific information (e.g., dictionary, encyclopedia, atlas)

4.82 identify and use various sentence types (e.g., declarative, interrogative, exclamatory, imperative)

Study Skills

4.83$_{5,6,7}$ **identify and use sources of different types of information (e.g., dictionary, encyclopedia, newspapers, card catalog)**

4.84$_{3,5,6,7,8,9,10,11}$ **recognize and use dictionary skills (e.g., use of guide words, word meaning, pronunciation guide, syllabication, alphabetical order)**

4.85$_{3,8}$ **use graphic sources to interpret and organize information (e.g., tables, graphs, maps, diagrams, timelines, web)**

4.86$_{5,6,7}$ **acquire organizational skills to manage school materials, personal time management, and information to be studied**

4.87 follow written directions with multiple steps

4.88 practice and use test-taking strategies (e.g., read all directions, read for key words, budget your time, read all possible choices)

4.89$_{5,6,7,8,9,10}$ **identify parts of a book and the information therein (e.g., glossary, index)**

4.90$_{8,9,10}$ **know the purpose of and use a book's table of contents (e.g., locate specific chapters, determine the general idea of the book, locate specific information, infer the content of a chapter)**

4.91$_{3,8}$ **organize items that belong under one heading**

4.92 **use a library and its reference sources (e.g., card catalog, computer listing, electronic retrieval systems)**

Computer/Technology

4.93 use appropriate software to practice and master fourth grade English language arts instructional objectives

4.94 demonstrate proper finger placement for all keys on a keyboard

4.95 using a word processor, create a one (or more) paragraph document

4.96 identify ways technology is used to access information

4.97 demonstrate the understanding that the violation of copyright law is a crime

4.98 select and use appropriate software and/or other technologies to locate and use reference sources (4.82)

4.99 use the spellcheck function in a word processor (4.56)

4.100 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts (4.86)

4.101 using a word processor, input types of writing such as paragraphs, stories, letters, and newspaper articles (4.51 and 4.52)

Grade Four Mathematics

The fourth grade objectives emphasize critical thinking skills to create independent problem solvers who possess a personalized set of skills and strategies to solve problems in everyday life. Concepts which are stressed include: multiplication and division of two and three digit numbers, construction and description of objects from different perspectives, estimation, reading temperatures, description of possible outcomes in a given situation, use of calculators and computers, and describing mathematical relationships and patterns in other content areas and the real world. Additional concepts include adding and subtracting like fractions, multiplication of fractions, and adding and subtracting decimals.

Number Theory and Number Sense

- 4.1$_5$ **compare and order two or more whole numbers through 1,000,000**
- 4.2$_{5,6}$ **read, name, and write nine digit numbers and identify place value for each digit utilizing standard and expanded form**
- 4.3$_6$ identify 1,000 more and 1,000 less than a given number
- 4.4$_{3,5,6,7,8}$ **estimate to the nearest 1000 using front-end digit and rounding, compatible numbers, and reasonableness**
- 4.5$_{2,3}$ **identify odd and even numbers**

Fractions and Decimals

- 4.6$_{1,2,3,5}$ **identify fraction models that are part of a whole or part of a group**
- 4.7$_{3,5}$ **compare and order fractions with like and unlike denominators**
- 4.8$_5$ add and subtract like and unlike fractions using concrete materials and paper and pencil
- 4.9$_5$ add and subtract fractions and reduce to lowest terms
- 4.10$_5$ **given a fraction model: read and write the fraction or mixed number, change an improper fraction to a mixed number, and change a mixed number to an improper fraction**
- 4.11$_5$ **read, write, compare, order, and identify place value and pictorial representations of decimals expressed as thousandths**
- 4.12 identify and represent equivalent fractions and relate fractions to decimals using concrete objects
- 4.13 change a fraction into a decimal using a calculator
- 4.14 **add and subtract decimals to tenths, hundredths, and thousandths**
- 4.15 round decimals to the nearest whole, tenth, and hundredth
- 4.16 solve problems using fractions and decimals

Whole Number Operations and Computations

- 4.17$_{5,6,7,8}$ **add and subtract two, three, and four digit whole numbers and money with and without regrouping**
- 4.18$_{2,3}$ **choose the appropriate method to solve a problem: paper/pencil, mental math, estimation, and calculators**
- 4.19$_{3,5}$ **use concrete materials to demonstrate and identify the associative property of addition and multiplication, the identity element and commutative property of multiplication (fact families)**
- 4.20$_6$ **multiply two and three digit numbers by two and three digit numbers with and without regrouping**
- 4.21$_6$ **divide two and three digit numbers by one and two digit numbers with and without regrouping**
- 4.22 **introduce and use the order of operations (e.g., parenthesis, multiplication/division, and addition/subtraction**
- 4.23 **round to the nearest dollar, hundreds, and thousands**

Patterns and Relationships

4.24$_{k,1,2,3,5,6,7,8}$ **solve problems involving pattern identification and completion of patterns**

4.25 describe and represent relationships with tables, graphs, and rules

Probability and Statistics

4.26 understand and reason about the use and misuse of statistics in our society. Given certain situations and reported results, identify faulty arguments or misleading representations of data

4.27 as a part of a problem solving situation, conduct a survey, organize data, and display the findings on a bar, line, and circle graph

4.28$_{3,5}$ **collect, organize, display, read, and interpret data from a problem solving situation in line graphs, bar graphs, tally charts, and tables with scale increments of one or greater than one**

4.29$_{5}$ **list all possible outcomes for an experiment using a tree diagram (e.g., tournaments and roll the dice)**

4.30$_{5,6,7}$ determine mean, median, mode, and range from collected data

4.31$_{3,5,6,7}$ **identify coordinate locations**

4.32$_{1,2,3}$ **identify plane figures and their components (sides and vertices)**

Geometry and Spatial Sense

4.33$_{5}$ **construct, label, compare, and classify acute, right, and obtuse angles**

4.34 **compare and contrast quadrilaterals (rectangle, square, parallelogram, trapezoid, and rhombus)**

4.35 identify and construct lines which intersect, are parallel, and are perpendicular

4.36$_{6,7}$ using a compass, construct a circle, and draw and label the parts of a circle (center, radius, chord, and diameter)

4.37 describe three dimensional objects from different perspectives (e.g., view of face, view of vertex)

4.38 model and use a protractor for measuring angles

4.39$_{2,3,4,5,6,7,8,9,10,11}$ **identify rotations and reflections**

4.40$_{1,2,3}$ **identify symmetry**

Measurement

4.41$_{2,3,4,5,6,7}$ **compare, estimate, and measure length using customary and metric units**

4.42$_{5}$ solve problems involving perimeter, area, volume, and surface area

4.43$_{3,5,6}$ **compare areas of figures**

4.44 compare inches and centimeters, quart and liter, yard and meter, pound and kilogram

4.45 identify the major United States time zones, and their relationships to each other

4.46$_{2,3,5,6,7,8}$ **calculate elapsed time**

4.47 **create and solve problems involving addition, subtraction, multiplication, and division of money amounts using various computational methods such as calculations, paper/pencil, mental computation and estimation**

4.48$_{3}$ **count coins and bills and identify correct change**

4.49$_{1,2,3,5,6}$ **read scales of length, temperature, weight, or capacity and select appropriate units**

Computer and Technology

4.50 use appropriate software to practice and master fourth grade instructional objectives in mathematics

4.51 practice proper finger placement for all keys on a keyboard

4.52 identify ways technology is used to access information

4.53 use a calculator to change a fraction into a decimal

4.54 use a calculator to solve operations with money

4.55 demonstrate the understanding that the violation of copyright law

is a crime

4.56 use graphing software to construct tables, bar, line, and circle graphs

4.57 use a calculator to find the mean, mode, and range of collected data

Grade Four Social Studies

The program at the fourth grade level will focus upon the growth of America through its colonization, assimilation of immigrant groups, development of improved technology, and major historical figures. Course content will include the influence of geographic factors upon the diverse cultures that settled in America through time. The democratic process will be incorporated into classroom activities. The study of economics will emphasize the relationship among geographic factors, natural resources, transportation, advertising, and the work force. In all areas, collection, interpretation and construction of data through the use of graphics such as maps, globes, charts, tables and graphs will be emphasized.

Civics

4.1$_{3,5,6,7,8,9,10,11}$ identify the functions of the three branches of national government and compare to local and state levels.

4.2$_{5,7,8,9}$ explain the role of voting in the democratic process and practice the voting process by participating in a class or school election, identifying the rights and responsibilities of citizens, and knowing the legal voting age

4.3$_{6,7,11}$ explain the rights of minorities in the democratic process and the right to dissent responsibly

4.4$_{3}$ research public documents to determine the significance of patriotic symbols, holidays, celebrations, and famous people

4.5$_{3,8}$ identify public agencies in the community that provide services and investigate opportunities for volunteerism

4.6 identify historical conflicts concerning individual rights and how those conflicts were resolved

4.7$_{7,11}$ explain the make-up of United States Congress and the relationship between the Senate and House of Representatives

4.8 **compare and contrast the differences between city, county, state, and national governments**

4.9$_{3}$ list the primary responsibilities of public officials (e.g., FBI, sheriff, school superintendent, mayor)

4.10 **compare and contrast the similarities of various branches of government on local, state, and national levels**

4.11$_{3,5,8}$ contrast examples of elected and appointed officials (e.g., president is elected, school principal is appointed)

4.12 **understand the difference between public sector and private sector employment (e.g., postman-public, teacher-public, deputy sheriff-public, artist-private, welder-private, store owner-private)**

Economics

4.13 **compare and contrast the relationship among geographic factors, available resources, and transportation in determining how people make a living**

4.14$_{3,5,6,7,8,9,10,11}$ give examples of people as consumers and producers of goods and services in the public and private sectors

4.15$_{3,6,7}$ using print and media sources, analyze advertisements and

their impact upon consumer choices

4.16 explain the concept of "trade-off" (e.g., developing hypothetical budgets in simulated situations)

$4.17_{3,5,7,9}$ investigate the various kinds of taxes and their relationship to services

$4.18_{5,6,7,10}$ predict how competition in the market place affects prices

$4.19_{5,7,9}$ explain the concept of taxation (e.g., tax assessment, services provided)

$4.20_{3,10}$ research the origin of American currency and how it is regulated

4.21 analyze product labels (e.g., ingredients, quality, and information omitted) and compare prices

4.22 explain how each new form of transportation affected society and the economy

4.23 interpret how the availability of transportation on roads and waterways impact the production and marketing of certain products

Geography

4.24 compare and contrast geographic factors to development of transportation routes and settlement patterns in the Americas

4.25 identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachian and Rocky Mountains, Isthmus of Panama)

$4.26_{6,9,10}$ analyze and compare the effects of geographic factors upon people's jobs, food, clothing, shelter, services, and interaction with the outside world

$4.27_{5,8}$ contrast the physical, economic, and political changes caused by geographic conditions and human intervention

4.28 describe geographic terms in relation to America's physical features (e.g., mountains, rivers, grassland, oasis)

4.29 identify and locate North, South, and Central American countries and bodies of water on a blank map

4.30 identify geographic factors which affect population density

History

$4.31_{3,6,7}$ describe the cultures of the colonists and Native Americans and list the changes that occured when they came into contact with one another

$4.32_{5,6,7,8,9,11}$ create a timeline showing the arrival of major immigration groups and describe the influence of each culture upon American society

$4.33_{8,10,11}$ explain how major inventions eliminated some jobs (e.g., Pony Express/invention of the telegraph) and created the need for other jobs (e.g., telegraph operators)

$4.34_{6,10}$ research events that led to the colonists' break with England and the fight for an independent nation (e.g., Sugar Act, Stamp Act, Boston Tea Party)

4.35_{5} identify major leaders and events from America's colonization to the Civil War

$4.36_{8,10,11}$ depict territorial expansion and population distribution in the United States through maps, charts, pictures, and research projects

4.37_{8} identify the Presidents of the United States and their involvement with major historical events

4.38 list and identify the sequence of major United States conflicts

4.39 explain why maintaining historical records and landmarks are important to civilization

4.40 identify major United States historical figures, their contributions, and their involvement related to specific

events

4.41 **explain how African Americans came to America and list their accomplishments**

Study Skills

4.42$_{4,7,10}$ **analyze a product chart for price comparison**

4.43$_{3,5,6,7,8,9,10,11}$ **utilize map skills to locate places and to construct maps (e.g., symbols in a legend/key; lines of demarcation [Equator, Prime Meridian, latitude and longitude, time zones, borders, coast lines] scales; directions [cardinal and intermediate]; and geographic barriers)**

4.44$_{3,5,6,7,8,9,10,11}$ **read, interpret, and construct special purpose American and other maps/globes, graphs, charts, and timelines**

4.45 construct and use charts, graphs, tables, and grids to display data

4.46$_{3,5,6,8,10,11}$ **analyze and interpret information from pictures and news sources related to America's historical events and people**

4.47 suggest appropriate reference sources to answer specific questions, collect information, and prepare short reports

4.48 **sequence major historical events in United States history on a timeline (e.g., discovery of America, Revolutionary War, Civil War, Boston Tea Party)**

4.50$_{3,5,6,7,8,9,10,11}$ **read and interpret graphs, charts, and timelines**

Computer/Technology

4.51 use graphics software to create graphs and charts

4.52 use appropriate software to practice and master fourth grade instructional objectives in social studies

4.53 practice proper finger placement for all keys on a keyboard

4.54 identify ways technology is used to access information

4.55 demonstrate why violation of copyright law is a crime

Elementary West Virginia Studies

The objectives for West Virginia Studies explore historic, geographic, economic, and civic concepts. These objectives may be taught as a separate fourth grade class and/or integrated throughout the K-4 curriculum. The relationship among geographic factors, settlement patterns, and economic development of West Virginia will be explored in this course. The cultural heritage of the various groups who settled West Virginia will be researched through classroom activities. The course content will reflect West Virginia's unique characteristics as well as its relationship to the nation.

Civics

WV.1 identify student's state, town, and address

WV.2 identify state symbols, the state capital, the Governor, celebrations and holidays, and famous West Virginians

WV.3 recite the State Motto and State Song

WV.4 identify the roles and functions of the government (e.g., legislative, executive, and judicial branches) at the local, county, and state levels

WV.5 explain why voting as a West Virginia citizen is a right, a privilege, and a responsibility

WV.6 given a local problem, propose solutions and investigate opportunities for public volunteerism

Economics

WV.7 identify the major occupations of people in the private and public sectors of our state

WV.8 identify the effect of natural resources and geographic

features upon the economic development of counties and the state

Geography

WV.9 locate West Virginia on a United States map and identify bordering states

WV.10 locate student's county and county seat on a West Virginia map

WV.11 locate and describe the four geographic regions of West Virginia

WV.12 describe West Virginia's climate and weather

WV.13 analyze the impact of West Virginia's geography on transportation, settlement, jobs, clothing, food, shelter, services, and interaction with the outside world

WV.14 explain the effect of geography on the expansion and development of West Virginia

History

WV.15 explain and trace the economic, social, and political history of West Virginia

WV.16 describe the cultural life of West Virginia as reflected in folklore and heritage

WV.17 compare and contrast lifestyles of West Virginians of yesterday and today

Study Skills

WV.18 use maps to explore West Virginia's population, products, resources, transportation, state parks, forests, and scenic/recreational resources

WV.19 find an absolute West Virginia location (e.g., using a grid system) and a relative location (e.g., direction and reference to neighboring states, rivers, and mountain ranges)

WV.20 use reference sources to answer specific questions, collect information, and prepare short reports about West Virginia

Grade Four Science

The Coordinated and Thematic Science (CATS) Four objectives builds on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Four promotes cooperative learning, group decisions, cultural diversity, careers, and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented.

Nature of Science

4.1 explain that science is a search for truth and an understanding of the world

4.2 $_{3, 5, 6, 7}$ **explore the role of science and science-related careers**

4.3 $_{3, 5, 6, 7, 8, 9, 10, 11}$ **design a model given a set of attributes (e.g., design a fish)**

4.4 explain the changes in nature given a series of pictures illustrating changes

4.5 probe deeply into natural phenomena by asking and answering questions about the environment (e.g., biomes, weather patterns)

4.6 use a variety of communication

techniques (e.g., charts, bar graphs, pie graphs, models, reports)

4.7 realize that science is never finished by observing changes in the environment (e.g., seasons, energy cycles, life cycles, rock cycles, weathering, erosion)

4.8 recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, need for technology)

Scientific Attitudes/Habits of Mind

4.9 **experience the joy of discovery of the natural world by developing questions and an understanding of the natural world which lead to investigations**

4.10 demonstrate innate curiosity, initiative, and creativity by designing simple experiments (e.g., electrical circuits, evaporation and condensation)

4.11 be in awe and wonder of the patterns, variations, and interactions of objects in the universe (e.g., constellations, rock cycle, weather patterns)

4.12 trust observations of discoveries when trying new tasks and skills

4.13 listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented

4.14 continue probing phenomena until questions are resolved (e.g., motion of celestial objects, relationship of living things and habitat, transfer of energy)

4.15 recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected

4.16 recognize that science includes both individual and cooperative ventures (e.g., interview scientists and meteorologists, group investigation, and model building)

Scientific Processes/Thinking Skills

4.17$_{5,6,7,8,9,10,11}$ **sort, classify, and compare objects, and events based on properties (e.g., mass, volume, density, conductivity)**

4.18$_{3,5,6,7,8}$ **given a set of objects, group or order the objects according to an established scheme**

4.19$_{5,6,8,10,11}$ **apply mathematical skills and use metric units (e.g., graphing, multiplication, division, and measurement of length and volume)**

4.20$_{5,6,8,9}$ **establish the variables and controls in an experiment**

4.21$_{3,5,6,7,8,9,10,11}$ **construct a hypothesis when provided a problem (e.g., cause and effects of an event, changing length of shadows)**

4.22$_{3,5,6,7,8,9,10,11}$ **construct predictions and inferences based on patterns of evidence**

4.23$_{3,5,6,7,8,9,10,11}$ **test variables (e.g., that effect plant growth, action of water in shaping the earth, and causes and effects of events)**

4.24$_{3,5,6,7,8,9,10,11}$ **interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions**

4.25$_{5,6,7,8,9,10,11}$ **draw and support a conclusion based on patterns of evidence (e.g., weather maps, change of speed in a given amount of time, change in wave motions with changes in energy, and variation of plants)**

4.26 support statements with facts (e.g., found in books, multimedia, Internet)

Laboratory Investigations/Hands-On Learning

4.27 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

4.28 use scientific instruments and

everyday materials to investigate the natural world (e.g., observe the natural world using instruments such as a hand lens, microscope, telescope, thermometer, magnets, bulbs and batteries, graduated cylinders, calculators, computers)

4.29 demonstrate safe and proper techniques for handling, manipulating, and caring for science materials

Science Themes and Subject Matter

4.30 develop an understanding of the scientific themes of systems, changes, and models (e.g., systems consists of many parts that interact with one another and give rise to new properties or functions; change occurs gradually, repetitively, or randomly; a model is a picture, description, simulation, or equation which represents the real thing)

4.31 understand that the study of living and non-living objects in the natural world integrates living organisms, earth materials, and physical properties of matter

4.32 establish connections across the curriculum (e.g., integrate science with mathematics, social studies, language arts, arts, and/or physical education)

4.33$_{3,4,5,6,7,8,9,10,11}$ **compare, sort, and group objects according to buoyancy, magnetic properties, states of matter, density, solubility, conductivity and ability to react - *systems***

4.34$_{3,5,6,7,8}$ **identify the structures of living things including their systems, and explain their function (e.g., skeletons, teeth structures, plant needles and leaves) - *systems***

4.35$_{3,5,7,9}$ **describe the different characteristics of plants and animals which help them to survive in different niches and environments - *systems***

4.36$_{3,5,6,7,8,9,10}$ **describe the environments and conditions which are needed for the survival of living things (e.g., water, sunlight, soil, food, climate, correct habitat, environmental barriers) - *systems***

4.37$_{3,5,6,7}$ **classify living things according to their structures and functions (e.g., taxonomy) - *systems***

4.38$_{3,5,6,7,8,9,10}$ **review relationships among organisms in an ecosystem (e.g., fresh water, salt water, and terrestrial organisms and habitats, climate as related to biomes, food webs) - *systems***

4.39$_{3,5,6}$ **identify human uses of plants and animals (e.g., food sources, medicines) - *systems***

4.40 associate the behaviors of living things to external and internal influences (e.g., hunger, climate, seasons) - *systems*

4.41 identify cells in plants and animals (e.g., use hand lenses or microscopes to examine plant and animal cells) - *systems*

4.42 **identify variations in structures and function within and among species of living things (e.g., different seeds, leaves, skeletons, different forms of reproduction, animal and plant structures) - *changes***

4.43$_{3,5,6,7}$ **recognize, compare, and/or sequence changes in living things (e.g., plant and animal life cycles) - *changes***

4.44 describe environmental barriers to the migration of animals - *changes*

4.45 construct and explain models of habitats, food chains, and food webs - *models*

4.46$_{5,6,7,8,9,10,11}$ **observe and investigate how properties can be used to identify substances (e.g., acids and bases, solubility, conductivity, magnetism) - *systems***

4.47$_{3,5,6,7,8,9,10,11}$ **examine simple chemical changes (e.g., tarnish, rust, burning) - *changes***

4.48_{10} **construct Bohr models of atoms - *models***

4.49 identify different forms of energy and describe energy transformation (e.g., electrical to heat, light to mechanical) - *systems*

4.50 examine properties of waves (e.g., transverse, longitudinal, frequency, wavelengths) - *systems*

4.51 relate motion to its properties (e.g., frame of reference, position) - *systems*

$4.52_{3,5,7,9}$ **relate changes in states of matter to energy transformation (e.g., adding heat) - *systems***

$4.53_{5,6,11}$ **predict and investigate the changes in motion produced when applied force is changed (e.g., increase/decrease in applied force, length of vibrating strings, length of time force is applied) - *changes***

$4.54_{3,5,7,9}$ **identify various changes in states (e.g., solids to liquids, liquids to solids, solids to gas) - *changes***

$4.55_{5,6,10,11}$ **use models to demonstrate heat, light, and sound (how produced., how changed, applications to every day living, how moved through system) - *models***

$4.56_{5,10}$ **construct simple electrical circuits (e.g., conductors, non-conductors, complete/incomplete) - *models***

$4.57_{6,9,10,11}$ **explain the relationship between the rate of cooling and crystal size of igneous rocks - *systems***

4.58 describe the Earth's atmosphere - system

4.59_{6} **state that air has mass, takes up space, and is made of molecules - *systems***

$4.60_{5,6}$ **identify the sun as a star - *systems***

4.61 explain the reason why other planets are not always seen in the same position

$4.62_{4,5}$ **research evidence to discover the age of the earth - *systems***

4.63_{10} **associate fossils with the periods in which they were formed - *systems***

$4.64_{3,5,6,7,8,9,10}$ **locate and identify patterns of stars and their seasonal changes - *changes***

4.65_{4} **describe the orbits of the sun and moon -*changes***

4.66_{5} **compare and explain the relative time differences to erode materials (e.g., a sand pile, mud pile, rock pile) - *changes***

4.67_{4} **investigate the cause and effects of volcanoes, earthquakes, and landslides - *changes***

$4.68_{6,7,8,9,10,11}$ **enter weather data on weather charts and use the data to hypothesize how air temperature and humidity affect air pressure - *models***

Science History

4.69 study the lives and discoveries of men and women scientists of different cultures and backgrounds (e.g., Albert Einstein, Earl Core, Wright Brothers, Gerty Cori, Gertrude Elion, Albert Achweitzer, Lewis and Clark, John Muir)

4.70 recognize that science changes over time (e.g., discoveries of new ideas creates a need for new equipment, new equipment makes it possible to discover new ideas, new ideas may have positive or negative consequences)

4.71 realize that scientists will continue to have questions about the world (e.g., what is the smallest particle, what causes diseases, can humans live in space for a long time)

Science, Technology, and Society

4.72 explain that there are many science-related careers through the use of speakers, field trips, audio-visual, and/or printed material (e.g.,computer

technician, food chemist)

4.73 explain that science skills are used in careers not usually associated with science (e.g., jewelry maker, pilot)

4.74 explain how technology has positively or negatively affected the quality of life in West Virginia and the world (e.g., rechargeable batteries, Great Lakes Zebra Mussels, oil spills and clean up)

4.75 research how common daily events involve science (e.g., flashlights, laser scanners, printed materials)

4.76 develop respect and responsibility for the environment by recognizing the interrelationship of living and non-living things and engaging in conservation practices

Computer/Technology

4.77 use appropriate software to practice and master fourth grade instructional objectives in science

4.78 practice proper finger placement for all keys on a keyboard

4.79 use appropriate software to practice reading, interpreting, and analyzing the data on a map, chart, graph, table, and diagram

4.80 use appropriate software to practice drawing conclusions, making predictions, and making hypotheses based on data from a map, diagram, chart, graph, and table

4.81 identify and demonstrate ways technology is used to access information

4.82 demonstrate understanding that the violation of copyright law is a crime

4.83 using the graphing application of appropriate software, create tables, charts, and/or graphs

4.84 use a calculator to perform mathematical functions in data analysis

4.85 use a variety of instruments (e.g., probes, thermometers, measuring devices) to perform measurements and record data

Grade Five
English Language Arts

English Language Arts at the fifth grade level is designed to expand and strengthen knowledge and abilities learned in the fourth grade and to prepare students for the sixth grade. Listening and speaking instruction prepares students for interaction and expression at school, at home, and , later, in the work place. Reading comprehension and vocabulary skills enable students to read on literal, interpretive, and critical levels for functional and recreational purposes. Writing, spelling, and language objectives provide instruction and opportunity to develop proficient written expression. Study skills help students interact with the world of information that will be much more complex when they become adults.

Listening/Speaking

5.1 distinguish difference between listening and hearing

5.2 recognize and exhibit oral communication skills (e.g., pitch, tone, rate)

5.3 identify and correct usage errors in oral communication (e.g., word choice, grammar)

5.4 exhibit appropriate speaking etiquette (e.g., speaking in turn, proper use of communication technologies)

5.5 use public speaking strategies to prepare formal and informal speaking presentations across the curriculum (e.g., oral report, recitation, dramatization)

5.6 exhibit appropriate audience etiquette in a variety of listening experiences

5.7 listen to a story and retell events in sequence

5.8 $_{1,2,3,6,7,8}$ **listen to multi-step oral instructions and successfully complete a task(s)**

5.9 supply missing step(s) in a set of oral directions

5.10$_{6,7,8}$ **listen to sentences to identify the meaning of a synonym, antonym, homonym, etc., by using context clues**

5.11$_{1,2,6,7,8}$ **listen to oral communications and critique, evaluate, question, imagine and summarize about a selection**

5.12$_{2,3,4,,7,8}$ **use critical thinking to distinguish fact from opinion, purpose, predict, draw conclusions, and compare or contrast information**

5.13$_{2,3,4,6,7,8}$ **listen to specific information and interpret it to construct meaning in and beyond text**

5.14 $_{6,7,8}$ **relate personal experience to construct new meaning from information heard**

Reading Comprehension

5.15$_{1,2,3,4,6,7,8,9,10,11,12}$ **read literary works by national and international authors to include but not limited to: article autobiography, biography, fable, fairy tale, folk tale, legend, mystery, myth, novel, play, poetry, tall tale, historical fiction, science fiction, realistic fiction, humorous fiction, and fantasy**

5.16$_{6,7,8,9}$ **locate factual information (e.g., details, events, sequences)**

5.17$_{k,2,4,6,8,9,10}$ **determine the main idea in text to establish meaning and determine main idea inferred in text to establish meaning**

5.18$_{3,4,6,7,8,9,10,11}$ **determine time/sequence using order words**

5.19$_{3,7,8,9,10,11}$ **determine plot, style, mood, characterization to construct initial meaning**

5.20$_{k,1,2,3,4,8,9,10}$ **analyze text to identify a sequence of events**

5.21$_{3,4,7,9,11}$ determine a character's feelings, motives, and traits based on text

5.22$_{3,4,7,9,11}$ interpret text to infer information about an event

5.23$_{8,9,10,11}$ interpret text to draw conclusions about a person or event

5.24$_{k,2,3,4,6,7,8,9,10,11}$ predict what will happen next in a story

5.25$_{2,3,8,9,10,11}$ determine author's purpose by using tone, style, and technique

5.26$_{2,3,4,7,8,9,10,11}$ determine the appropriate reading strategy (e.g., rereading) to acquire specific information

5.27$_{3,6,9,10}$ identify how and where to locate additional information on a text topic (e.g., map, resource person, book, cartoon, drawing)

5.28 determine the meaning of a word using context clues

5.29$_{10}$ interpret the use of a rhetorical question in text

5.30$_{10,11}$ interpret figurative language in text

5.31$_{k,3,6,7,8,9,10,11}$ make hypothesis based on text

5.32$_{1,2,3,9,10}$ read and apply directions for a specific task

5.33$_{8,9,10}$ draw graphic organizers to reflect main ideas and supporting details

5.34 utilize paraphrasing and summarization to establish understanding of text

5.35 create an alternative ending to a story

Reading Vocabulary

5.36$_{2,3,4,6}$ use context clues to determine meaning of an unknown word

5.37$_{7,8,9,10,11}$ define synonyms

5.38 use context clues to find a synonym for an unknown word

5.39$_{2,3,4,6,7,8,9,10,11}$ identify synonyms to improve quality of text

5.40 define antonyms

5.41 use context clues to find an antonym for an unknown word

5.42$_{2,3,4,6,7,8,9,10,11}$ use context clues to determine meaning of a multiple-meaning word

5.43 choose the correct definition of a multiple-meaning word

5.44 recognize homophones (e.g., dear-deer, knight-night), and choose correct homophone for the context

5.45 recognize homographs (e.g., lead (to guide)-lead (a metal) and chose correct homographs for the context

5.46 sort words into categories or classes

5.47 analyze and complete analogies (e.g., synonyms, antonyms, part/whole, object/group)

5.48 use prefixes as structure clues for word recognition and meaning

5.49 use root words as structure clues for word recognition and meaning

5.50 use suffixes as structure clues for word recognition and meaning

5.51 evaluate a list of synonyms and sort according to their connotations

Writing

5.52$_{4,7,10}$ write complete sentences

5.53$_{4,7,10}$ use a variety of sentence types (e.g., simple, compound, complete, declarative, and interrogative)

5.54 develop a paragraph with a main idea/topic sentence supported by details

5.55 use prewriting and drafting strategies to generate topics and plan approaches to writing tasks

5.56 use strategies to write for a specific purpose (e.g., narrative, informative, and persuasive)

5.57$_{4,7,10}$ use editing strategies to correct errors in organization, content, usage, capitalization, punctuation and spelling

5.58$_{4,7,10}$ compose narrative text that contains a beginning, middle and end

5.59$_{4,7,10}$ use a writing prompt to develop a composition with a smooth transition

5.60 develop a composition that is focused, coherent, and has a clear and logical progression of ideas

5.61$_{4.7.10}$ develop a composition that contains specific, relevant details

5.62 use writing strategies to address specific types of writing (e.g., journal, friendly letters, and business letters)

5.63 demonstrate progress toward mastery of penmanship and keyboarding

5.64 use electronic and traditional editing strategies (e.g., symbols, dictionaries) to correct spelling errors (e.g., proper names, homographs, [in, inn].)

Spelling

5.65 **identify and spell common homophones/homonyms (words that have different meanings and spellings but are pronounced the same (e.g., here - hear, sun - son)**

5.66 spell words correctly containing "long a" and its variants (e.g., ai, ay, a_e, eigh)

5.67 **spell words correctly containing "long e" and its variants (e.g., ea, e_e, _e, ee)**

5.68 spell words correctly containing "long I", and its variants (e.g., i_e, ie, igh, _y, _ye)

5.69 spell words correctly containing "long o" and its variants (e.g., oa, oe, ow, ough, o_e, _o)

5.70 spell words correctly containing "long u" and its variants (e.g., u_e, ue, oo, ew)

5.71 **spell words correctly containing the "r" controlled vowels (e.g., ir, ur, er, ar, or)**

5.72 spell words correctly containing the letter "g" pronounced "j" (e.g., gi, ge, dge)

5.73 **spell words correctly containing the letter "c" pronounced "s" (e.g., ci, ce, cy)**

5.74 spell words correctly containing the phonetic elements "ch" and "sh" (e.g., churn, shirt)

5.75 **spell correctly words ending in "s", "ss", "x", "ch", "sh", with an "s" added (e.g., gases, boxes, churches, pushes)**

5.76 spell correctly words beginning with the "n" sound, but have silent consonants (e.g., gnat, knot)

5.77 spell correctly words having "f" sound spelled with diphthong ph (e.g., phone)

5.78 **spell correctly words ending in a vowel with an inflectional ending or suffix added (e.g., mating, messiness)**

5.79 **spell correctly words ending in a consonant with an inflectional ending or suffix added (e.g., hopping, hoping)**

5.80 spell correctly words with the prefix "mis" (e.g., misspell)

5.81 spell correctly words with the suffix "ion", "sion", "tion"

5.82 demonstrate accurate spelling across the curriculum

5.83 develop spelling competency by recognizing one's own spelling weakness

5.84 differentiate words that are commonly misspelled (e.g., except, accept)

5.85 distinguish between spelling of contractions and similar possessives (e.g., its, it's)

5.86 use correct and exaggerated pronunciation as a spelling strategy (e.g., identify I-den-ti-fy)

5.87 use syllabication as a spelling strategy

5.88 use memorization and /or mnemonic devices as a spelling strategy

5.89 use meaning as a spelling strategy (e.g., "bi" means "two", "tri" means "three", "sub" means "under", "super" means "over")

5.90 use visualization as a spelling strategy (e.g., word configuration)

5.91 use visual and auditory cues as a spelling strategy (e.g., dessert, desert)

5.92 use visual and auditory cues as a spelling strategy (e.g., -ise, -ice, -ize)

5.93 use visual and auditory cues as a spelling strategy (e.g., compound words)

5.94 use electronic as well as traditional editing resources to correct spelling errors (e.g., electronic spell checker,

dictionary, thesaurus)

Language

5.95 capitalize first word in sentence
5.96 capitalize pronoun "I"
5.97$_{1,2,4,7,8,9,10,11}$ **capitalize proper nouns, abbreviations, and proper adjectives**
5.98 **capitalize titles of persons and initials**
5.99 capitalize titles of written works
5.100$_{2,3,4,6}$ **capitalize parts of a letter**
5.101$_{3,4,6,9,10,11}$ **capitalize first word of direct quotation**
5.102 capitalize parts of an outline
5.103 use period at end of declarative and imperative sentence, after abbreviation, and in outline form
5.104 use question mark at end of interrogative sentence
5.105 use exclamation mark at end of exclamatory sentence and after interjections
5.106$_{2,3,4,6}$ **use commas between city and state**
5.107 use comma to separate day of week from day of month from year
5.108$_{2,3,4,6}$ **use comma after greeting and after closing in a friendly letter**
5.109$_{3,4,6,9}$ **use comma to separate items in a series**
5.110$_{3,4,6,7,8,9,10,11}$ **use comma in a compound sentence (e.g., ..., and ; ...., but....)**
5.111$_{7,8,10,11}$ **use comma to separate a noun from its appositive**
5.112 use commas after introductory words phrases and clauses
5.113 underline titles of books
5.114$_{2,3,4,6,9}$ **use apostrophe with contractions**
5.115$_{4,6,7,8,9,10,11}$ **use apostrophe with possessive nouns**
5.116$_{3,4,6,9,10,11}$ **use quotation marks in direct quotations**
5.117$_{4,6}$ **use quotation marks in titles of written work or work of art**
5.118$_{6,8,10,11}$ **use colon to indicate a list follows**
5.119 use a hyphen to divide words between syllables at the end of a writing line
5.120 use a hyphen in appropriate compound words
5.121$_{4,6,8,9,10,11}$ **evaluate and correct the use of apostrophes, colons, quotation marks, and commas when editing a writing sample**
5.122$_{1,2,4,7,9,10,11}$ **identify proper and common nouns**
5.123 use correct forms for regular and irregular plurals of nouns
5.124 use correct possessive forms of nouns
5.125 identify concrete nouns (e.g., people, places)
5.126 identify abstract nouns (e.g., feelings)
5.127 identify verbs
5.128$_{1,2,3,4,6,7,8,9,10,11}$ **use correct verb tense in oral and written work**
5.129 recognize action, helping, and linking verbs
5.130$_{1,2,3,4,6,7,8,9,10,11}$ **use subject-verb agreement in oral and written work**
5.131 use correct forms of irregular verbs
5.132 identify adjectives
5.133$_{3,4,6,7}$ **use "-er" at end of comparative adjectives**
5.134$_{3,4,6,7}$ **use "-est" at end of superlative adjectives**
5.135 identify adverbs
5.136 use "-er" at end of comparative adverbs
5.137 use "-est" at end of superlative adverbs
5.138 identify adjectives that use "more" and "most" instead of "-er" and "est" for comparative and superlative forms
5.139 identify adverbs that use "more" and "most" instead of "-er" and "-est" for comparative and superlative forms
5.140$_{1,2,3,4,6,7,8,9,10,11}$ **identify and correct double negatives in oral and written work**
5.141$_{4,6,7,8,9,10,11}$ **use the correct pronoun case (e.g., nominative, objective, possessive)**
5.142 use pronoun/antecedent agreement
5.143 use correct demonstrative pronoun (e.g., this, that, these, those)

5.144 use correct compound personal pronouns (himself instead of hisself, themselves instead of theirself)
5.145 identify subject of a sentence
5.146 identify predicate of a sentence
$5.147_{3,4,6,8}$ combine two sentences by combining subjects, predicates, modifiers, phrases, and/or clauses
$5.148_{1,2,3,4,6,7,8,9,10,1}$ identify and correct run-on sentences
$5.149_{1,2,3,4,6,7,8,9,10,11}$ identify and correct sentence fragments
$5.150_{1,2,3,4,6,7,8,9,10,11}$ identify and correct redundant words/sentences
$5.151_{6,7,8,9,10,11}$ recognize an appropriate ending to a story (e.g., purpose, content, organization, and tone)
$5.152_{3,4,6,7,9,10,11}$ recognize a topic sentence in a paragraph
$5.153_{2,3,6}$ recognize a summary or supporting sentence in a paragraph
$5.154_{2,3,4,6,7,8,9,10,11}$ identify audience for which a selection was written
$5.155_{6,7,8,9,10,11}$ edit to produce concise, effective writing (e.g., exact/precise words, vivid words, trite/overused words, cliches)
$5.156_{1,2,4,6,7,8,10,11}$ edit to remove unnecessary sentences

Study Skills

$5.157_{8,9,10}$ identify and evaluate the general usefulness of a book's content after reading the table of contents, title page, copyright page, and index
$5.158_{8,9}$ know the purpose of the table of contents of a book
$5.159_{8,9,10}$ locate information in identified chapters using the table of contents
$5.160_{8,9,10}$ locate specific information using the table of contents and index
5.61 **infer the content of a chapter after reading the table of contents**
$5.162_{6,7}$ identify sources for certain types of information (e.g., newspaper, dictionary, encyclopedia
$5.163_{6,7,8,9,10}$ identify parts of a text and the information contained therein (e.g., glossary, telephone, directory, and index
$5.164_{3,4,6,7,9,11}$ demonstrate the appropriate use of the general reference sources of a dictionary, thesaurus, atlas, almanac, and encyclopedia
$5.165_{6,7}$ identify a word that will come first in alphabetical order according to its second and, then, third letter
$5..166_{3,6,7,9,10,11}$ use guide words from a dictionary page to select the word that would be on the page
$5.167_{3,6,7,8,9,10,11}$ read the various meanings of a dictionary entry to determine the meaning of a word in a sentence
$5.168_{3,6,7,8}$ use the dictionary pronunciation guide to determine sounds, syllables, and accent(s) of a word
$5.169_{6,7,8,9,10,11}$ determine which number in a dictionary definition best fits the meaning of a word in a sentence
5.170 know the purpose of the card catalog, both electronic and traditional
$5.171_{5,6,7,8}$ locate a call number from electronic or traditional catalog
5.172 use active reading skills to gain information (e.g., survey, note-taking, adjust reading rate, underlining, outlining or webbing, and summarizing)
$5.173_{9,10,11}$ organize title, topics, and details into a semantic web
$5.174_{6,7,8}$ recognize topic, main headings, and sub-headings in a graphic organizer
$5.175_{5,6,7,8}$ know author's sources of information are in a bibliography or reference section
5.176 identify and interpret graphic aids (e.g., maps, charts, graphs, tables, and timelines)
5.177 identify and use note-taking and test-taking skills
5.178 adjust reading rate according to

purpose and nature of material

Computer/Technology

5.179 use appropriate software to practice and master fifth grade English language arts instructional objectives

5.180 using a word processor, demonstrate correct keying, editing, and formatting techniques

5.181 use a word processing program to copy and move text (5.57)

5.182 use a word processing program to produce a report that contains centering, tabs, and more than one paragraph (5.57)

5.183 use the editing functions of a word processor (spell check, grammar checker, thesaurus, outliner) (5.57, 5.64 and 5.94)

5.184 identify examples of written, spoken, and viewed work that is protected by copyright laws

5.185 describe the influence of technology on communication (reading, writing, spelling, handwriting/keyboarding, speaking, listening, and viewing)

5.186 select and use appropriate software and/or other technologies to locate and use reference sources (5.27 and 5.162)

5.187 develop keyboarding skills: proper posture, finger placement, keying letters, numbers, symbols, and special keys (5.63)

5.188 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts (5.176)

Grade Five Mathematics

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

Number Theory and Number Sense

$5.1_{4,6,7,8}$ **read, write, and identify place value of whole numbers and decimals from millions through thousandths using standard and expanded form**

$5.2_{4,6}$ **compare and order the value of whole numbers and decimals from millions through thousandths using symbols <,>, or =**

$5.3_{6,7,8}$ **identify alternative representations (pictures, models, number lines, etc.) of fractions, mixed numbers, and decimals**

$5.4_{6,7,8}$ **compare and order fractions, including lowest term fractions, improper fractions, and mixed numbers with like and unlike denominators**

$5.5_{6,7,8}$ **write or model equivalences of fractions, decimals, percent, and ratios**

5.6_{6} **find the Greatest Common Factors of two numbers by listing factors**

5.7_{6} **find the Least Common Multiple of two numbers by listing multiples**

5.8_{6} represent or model decimals on a grid or use concrete materials

5.9 **identify a number that is one**

hundred more or one hundred less than a given number

Computation and Estimation

5.10$_{3,4,6,7,8}$ **use estimation to solve problems with whole numbers and decimals including money (compatible numbers, rounding, and front-end estimation); use to determine reasonableness**

5.11$_{6,7,8}$ **solve problems in context involving addition and subtraction of whole numbers through six digits; multiplication of whole numbers through four digits by three digits; division of whole numbers with dividends of up to five digits and divisors of up to two digits using estimations, mental math, calculators, and paper and pencil**

5.12$_{6,7,8}$ **solve problems in context involving addition, subtraction, and multiplication of decimals through the thousandths and division of decimal dividends through the thousandths by a single digit whole number divisor using estimation, mental math, calculators, and paper and pencil**

5.13$_{6,7,8}$ **solve problems in context involving addition and subtraction of fractions and mixed numbers with like and unlike denominators involving regrouping, expressing answers in simplest form**

5.14 use computation, estimation, calculators, and computers to solve application problems

5.15$_{6,7,8}$ **round to the nearest dollar, hour, and to the million and millionth places**

5.16$_{6,7,8}$ **solve problems with multiple operations in context and with operations involving basic percents in context**

Patterns, Functions, and Algebra

5.17$_{k,1,2,3,4,6}$ **explore a variety of patterns with missing elements, including numeric and geometric patterns, such as triangular numbers, perfect squares, patterns formed by powers of ten, and arithmetic sequences using paper and pencil, concrete materials, calculators, and/or computers**

5.18$_{6,7,8}$ **use input/output models for functions (number machines)**

5.19 **write a number sentence using a variable to solve problems**

5.20 solve problems by using a choice of strategies including guess and check, make a table, make a model, make a list, draw a picture, find a pattern, work backwards, use a formula, and/or make a diagram

5.21$_{3,4,6,7}$ **rewrite addition and multiplication number sentences and expressions using the operations of addition and multiplication and their inverse and commutative properties [e.g., 4×3=□→ □÷3=4 (fact families) and 5×8×3=3×8×5]**

5.22 introduce the order of operations: parenthesis, multiplication and division, then addition and subtraction

Probability and Statistics

5.23$_{6,7,8}$ **collect, organize, display, read, and interpret numerical data in a variety of forms: tables, tally charts, bar graphs, line graphs, circle graphs, and stem-and-leaf plots**

5.24$_{6,7}$ **find the mean, median, range, and mode of a given set of data**

5.25$_{4,6,7,8}$ **identify probabilities and solve problems involving the probability of an event by using tree diagrams or by construction of a sample space representing all possible results**

5.26 construct, read, or interpret tables, charts, and graphs to draw reasonable inferences or verify predictions using available technology

5.27 model situations by carrying out experiments to determine probability

5.28$_{6,7,8}$ **determine combinations and permutations (tree diagrams and probability experiments with and without replacements)**

Geometry

5.29$_{4,6,7}$ **compare, classify, measure, and draw right, acute, and obtuse angles and triangles using a straightedge and protractor**

5.30 recognize and construct isosceles, right, and equilateral triangles

5.31 **classify and compare the following polygons: square, rectangle, parallelogram, pentagon, hexagon, and octagon**

5.32$_{3,4,6,7}$ **identify the ordered pair for a point and locate the point in the first quadrant of a coordinate plane**

5.33 **identify figures as similar and/or congruent, including scale drawings**

5.34 **recognize lines of symmetry in the environment**

5.35 **recognize the images of figures after flips, slides, and turns (reflections, translations, and rotations)**

Measurement

5.36$_{6,7,8}$ **estimate and/or measure the length of real objects in parts of an inch up to 1/8 inch, whole inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers**

5.37 estimate and/or measure the weight/mass of real objects in ounces, pounds, tons, grams, and kilograms

5.38 estimate and/or measure liquid volume in cups, pints, quarts, gallons, milliliters, and liters

5.39 estimate and measure temperature in Celsius and Fahrenheit units of the boiling point of water, freezing point of water, room temperature, and body temperature

5.40$_{4,6,7,8}$ **describe, determine, and compare the perimeters of polygons and the area in square units of squares, rectangles, and triangles, given the appropriate measures**

5.41 apply the concepts of perimeter, area, volume, weight/mass, time, and temperature in practical problem-solving situations

5.42$_{2,3,4,6,7,8}$ **determine an amount of elapsed time in hours and minutes within a twenty-four hour period**

5.43 apply the concepts of perimeter, area, volume, weight/mass, time, and temperature in practical problem-solving situations

5.44$_{6,7,8}$ **compute and convert customary and metric units of measure within the same system in problem-solving situations**

5.45$_{6}$ **select appropriate customary and metric units and tools for measuring to desired degree of precision**

5.46$_{6,7,8}$ **determine actual measurements from scale drawings**

Computer and Technology

5.47 use appropriate software to practice and master fifth grade instructional objectives in mathematics

5.48 use a calculator to solve problems with large whole numbers and small decimal numbers

5.49 use a calculator to solve problems with large whole numbers and small decimal numbers

5.50 use a calculator to solve application problems.

5.51 use a calculator to produce a variety of number patterns

5.52 use a calculator to find mean, median, range, and mode of a given set of data

5.53 use a calculator to convert

customary and metric units of measure in problem-solving situations

5.54 use graphing software to organize and display data by creating tables, charts, bar, line, and circle graphs

5.55 practice inputting data using correct keying, editing, and formatting techniques

5.56 identify examples of mathematical work that is protected by copyright laws

5.57 describe the influence of technology on mathematics

Grade Five: United States History

The fifth grade program of study consists of a basic overview of the history of the United States from the age of exploration to the present.

Civics

5.1 **explain how the implementation of the Articles of Confederation led to the development of the United States Constitution**

5.2_{11} **identify and analyze the reasons for compromises used in the development of the Constitution.**

5.3 identify the three parts of the Constitution and explain the importance of each section

$5.4_{3,5,6,7,8,9,10,11}$ **list and explain the functions of the executive, legislative, and judicial branches of government**

5.5 **define the national census and explain the effects that it has on the legislative branch**

5.6 explain the reasons for the adoption of the Bill of Rights to the Constitution and the rights that it protects

$5.7_{6,7,8,9}$ **identify differences between individual rights and responsibilities of American citizenship**

5.8_{3} **using a mock legislature, demonstrate the roles of elected representatives**

$5.9_{3,6,8,9,10}$ **construct a chart which lists the roles of government at the local, state, and national levels**

5.10 **compare similar responsibilities in public and private sector jobs**

5.11_{7} participate in role playing exercises which demonstrates knowledge of "trial by jury"

Economics

$5.12_{4,6,8}$ **list geographic factors that can enhance or limit economic activities in various United States regions**

$5.13_{4,6,7,10}$ **utilizing economic vocabulary, apply the concept of supply and demand to a specific United States situation**

5.14 explain the economic impact of slavery upon the development of the United States

5.15_{6} **examine graphs, charts, and timelines to draw conclusions about agricultural development**

5.16_{10} **explain the economic importance of the New Deal in relation to the Great Depression**

$5.17_{6,8}$ **describe the characteristics of an industrial center and its impact on the United States economy**

$5.18_{3,4,7,9}$ **construct a chart showing the distribution of tax dollars in the United States economy**

$5.19_{7,9,10}$ **identify the roles of consumers in the United States economy**

$5.20_{4,6}$ **apply the concepts of sales,**

expenses, and profits to a real life event (e.g., school-related situation such as sports events, concession stand, snack machines)

Geography

5.21 use maps and globes to trace the location and movements of various cultures drawn to the New World

5.22$_{4,6,11}$ **measure distances using a scale and apply the concept of cardinal and intermediate directions to maps**

5.23$_{6,11}$ **use a map to indicate the location of a country by hemisphere and its proximity to the equator**

5.24$_{7,8}$ **explain the geographic perceptions explorers had of the New World with regard to landforms, wealth, and people**

5.25$_{7}$ trace the development of America's urban areas

5.26$_{6}$ **use geography to describe historical events (e.g., the emergence of different Native American groups, the rise of slavery in the South, the need for Asian labor in the West, exploration)**

5.27$_{9}$ **explain the relationship of United State's cultures to its environments**

5.28 **identify and locate each of the fifty United States within their regions**

5.29 locate, identify, and contrast the major rivers, mountain ranges, climate regions, major soil regions, and deserts of the United States, landforms, natural resources, and climate in the eastern and western United States

5.30 **relate America's westward expansion to natural resources and physical geography**

5.31 describe how people have changed the United States environment

5.32$_{3,4,6,7,8,9,10,11}$ **read, interpret, and drawconclusions from United States maps (e.g., special purpose maps, graphs, charts, tables, and timelines)**

History

5.33 compare and contrast Native American cultures and the cultures of European settlers

5.34$_{6,7,8,9,11}$ **explain problems faced by immigrants relocating to the New World**

5.35$_{9}$ **identify areas and patterns of early American settlement**

5.36 examine the lifestyles and customs of the colonial settlers

5.37$_{6,10}$ **analyze the causes and effects of the American Revolutionary War, and identify leaders in the movement**

5.38$_{3,6}$ **interpret quotes of famous Americans from various periods of history**

5.39$_{6,10}$ **identify and classify the issues contained in the Declaration of Independence**

5.40$_{8}$ describe problems faced by Washington when he became the first United States President

5.41 **list and explain the causes and effects of the Louisiana Purchase**

5.42$_{6,8,10,11}$ **compare and contrast reasons for exploration and land acquisition by the French, Spanish, and English in America and the effect it had on Native Americans**

5.43$_{7,8,9}$ **analyze how immigration policy changes have affected United States immigration patterns**

5.44$_{4,6,8}$ **identify causes, major events, and important people of the Civil War**

5.45$_{6,8}$ **analyze the impact of slavery and the Abolitionist Movement upon the development of the United States**

5.46$_{6,8}$ **explain how expansion affected the inhabitants of the American West (e.g., Native Americans, settlers) ,and explain the roles of Homesteaders**

5.47$_{6,9}$ **explain the importance of**

various historical documents in the development of the United States

5.48 identify and explain social and technological changes that took place during the Industrial Revolution in the United States

5.49 trace the development of transportation in the United States and describe its impact on settlement, industry, and residential patterns

5.50 identify events which led to the United States becoming a world power

5.51 identify the two opposing sides in World War I, and explain why the United States entered the war

5.52 describe the effects of the Great Depression on the people of the United States

5.53 identify the causes and effects of World War I and World War II

5.54 identify contributors to the Civil Rights Movement (e.g., John Fitzgerald Kennedy, Martin Luther King Jr., Rosa Parks, Lyndon Johnson)

5.55 identify United States conflicts resulting from police action as opposed to a declaration of war (e.g., World War I, World War II, Korea, Vietnam)

5.56 identify contributing factors leading to United States peace keeping missions initiated by the United Nations

Computer/Technology

5.57 use appropriate software to practice and master fifth grade social studies instructional objectives

5.58 use a variety of audio-visual and multi-media materials to practice and master fifth grade social studies instructional objectives

5.59 practice inputting data using correct keying, editing, and formatting techniques

5.60 using graphics software, select the appropriate type of graph to display a set of data

5.61 use graphics software to create charts, graphs, and tables

5.62 identify database management terms (e.g., database, file, record, field/category, sort/arrange, select/search, report)

5.63 use a database template to enter and edit data

5.64 identify intellectual property protected by technological copyright

5.65 describe the influence of technology on life in the United States

Grade Five Science

The Coordinated and Thematic Science (CATS) Five objectives identify, compare, classify and explain our living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth/space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. CATS Five reviews earth and the sky, life cycles and habitats of organisms, properties, positions, and motions of objects, and energy. New major concepts introduced at the fifth grade level include changes in properties of matter, structures, functions and adaptations of organisms, and the structure of the earth's system.

Nature of Science

5.1 develop a conceptual framework of scientific principles

5.2 recognize the interdependency of science themes and scientific concepts

5.3 evaluate the interrelationships of scientific concepts to everyday life by making informed decisions and choices using scientific reasoning and knowledge ◊

$5.4_{6,7}$ **investigate career choices in science and technology** ◊

$5.5_{6,7,8}$ **apply skepticism, careful methods, logical reasoning, and/or creativity in investigating the observable universe (e.g., changing of mechanical energy to electrical energy, electrical energy to mechanical energy, electrical energy to light)**

5.6 recognize and appreciate that scientific knowledge is subject to modification as new information challenges current theories

5.7 acquire a holistic view of scientific knowledge by integrating reading, writing, mathematics and other disciplines with the science curriculum

5.8 use a variety of activities and investigations to produce a sense of wonder about the natural world and the joy of discovery

5.9 recognize that the exploration of science is challenging and fulfilling and establishes patterns of lifelong curiosity and learning

Scientific Attitudes/Habits of Mind

5.10 cooperate and collaborate to ask questions, find answers, solve problems and conduct investigations to further an appreciation and joy of scientific discovery ◊

5.11 process and integrate experiences with prior knowledge to formulate new ideas

5.12 understand that the study of science is a dynamic process and the results are not always definite or complete

$5.13_{6,7,8,9,10,11}$ **formulate conclusions through close observations, logic, objectivity, perseverance and integrity in data collection (e.g., adaptations in structures, photosynthesis, respiration)** ◊

Scientific Processes/Thinking Skills

5.14 recognize and apply facts, concepts, laws, and theories to explain phenomena

$5.15_{3,4,6,7,8,9,10}$ **compare and contrast objects, actions or phenomena according to similarities and differences in order to classify them (e.g., atoms and molecules, AC and DC currents, earthquakes and volcanoes)**

$5.16_{3,4,6,7,8,9,10,11}$ **construct and use charts, graphs, and tables to organize, display, interpret, analyze, and explain data (e.g., extrapolation, interpolation)** ◊

$5.17_{3,4,6,7,8,9,10}$ **use inferential reasoning to make logical conclusions from collected data (e.g., causes and effects)** ◊

$5.18_{3,4,6,7,8,9,10,11}$ **utilize experimentation to demonstrate scientific processes (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables)**

$5.19_{3,4,6,7,8,9,10,11}$ **develop rational thinking processes that underlie scientific approaches to problem solving by employing critical-thinking skills in applying scientific knowledge, using imagination and creativity while working individually or cooperatively (e.g., patterns of motion, cycles of matter and energy)** ◊

$5.20_{3,4,6,7,8,9,10,11}$ **develop skills in the use of laboratory materials and equipment; and proper communication of scientific**

data collected (e.g., meter sticks, balances, thermometers, scales, graduated cylinders) ◊

Laboratory Investigations/Hands-On Learning

5.21 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

5.22 use a variety of materials and scientific instruments to conduct explorations and investigations of the natural world to explain science concepts (e.g., measure environmental conditions using appropriate instruments) ◊

5.23 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment and living organisms ◊

Science Themes and Subject Matter

5.24 develop through the study of interdependent themes including systems, changes, and models an understanding of biological, earth/space, and physical science concepts

5.25 associate hands-on activities to daily life experiences

5.26 express ideas that illustrate the relevance of science, technology, and societal issues

$5.27_{3,4,6,8,9,10,11}$ **classify living and non-living things according to properties (e.g., structures and functions, mass, volume, density, solubility, conductivity, magnetism, weight, shape, color, freezing point, boiling point, evaporation, rocks and minerals) - *systems***

5.28 identify and explain common energy transformations and cycles of matter (e.g., photosynthesis, water, carbon dioxide, nitrogen, energy conversions including fuels) - *systems*

5.29 demonstrate the processes involved in the changes of physical states of matter (e.g., solid to liquid to gas to liquid to solid) - *systems*

$5.30_{3,4,6,7,8,9,10,11}$ **recognize and explore methods for investigating physical changes (e.g., evaporating, condensing, boiling, freezing, melting, salinity, density, shape and size) - *changes***

5.31_{6} **explain the affects of force on motion (e.g., wind currents, hot air on balloons) - *changes***

$5.32_{5,3,2,4,7,8,9,10}$ **explain how the different characteristics of plants and animals help them to survive in different niches and environments (e.g., adaptations, natural selection, extinction) - *systems***

$5.33_{4,7,8}$ **identify the structures of living things and explain their functions (e.g., cells, tissues, organs, organ systems, whole organisms, communities, ecosystems) - *systems***

$5.34_{4,6,8,10}$ **compare variations of plant growth and reproduction (e.g., seed dispersal, asexual and sexual reproduction, needs of growing plants) - *systems***

5.35 describe methods that various cells use to obtain and process food - *changes*

$5.36_{3,4,6,7,8,9,10}$ **trace the pathways of the sun's energy through producers, consumers, and decomposers (e.g., food webs, pyramids) - *models***

5.37 **explain that the mass of a material is conserved whether it is together, in parts, or in a different state - *systems***

5.38 recognize that elements are composed of atoms of the same type - *models*

5.39 using the periodic table, identify common elements according to their symbols - *models*

5.40 describe variables affecting the motion of objects (e.g., gravity, friction, density of medium, amount of energy) - *systems*

5.41 **use SI (metric) units of measurement as they apply to electricity (e.g., amps, volts, watts) - *systems***

$5.42_{6,7,8,9,10}$ **construct and interpret graphs depicting motion (e.g., speed vs time) - *models***

$5.43_{4,10}$ **analyze diagrams of circuits (e.g., complete and incomplete circuits, parts and functions) - *models***

5.44_{8} **demonstrate magnetic forces using magnets (e.g., law of magnets, lines of force) - *models***

5.45 **describe sound as a wave (e.g., compressional wave) - *models***

5.46 **review fundamental earth science concepts including, relative age of the earth, movement of celestial objects, air has mass and exerts pressure - *systems***

$5.47_{4,6}$ **understand there are stars in the universe just like our sun as well as many that are bigger or smaller - *systems***

5.48_{10} explore how fossils can be used to determine the age of rock layers - *systems*

5.49_{6} interpret the influence of land forms on weather and climate - *systems*

5.50 **identify and describe natural land forms, changes in these land forms and recognize that they may be used as a record of time - *changes***

5.51 **compare and explain the different rates of weathering in certain materials (e.g., sand pile, mud pile, rock pile) - *changes***

$5.52_{3,8}$ **explain how the earth's tilt and revolution determine the seasons - *changes***

5.53 **compare how seasonal weather patterns are affected by the sun (e.g., amount of sunlight, tilt of the earth, revolution) - *changes***

$5.54_{3,6,9}$ **collect and display weather data to describe weather patterns (e.g., temperatures, wind direction, wind speed, precipitation) - *models***

$5.55_{3,4,6,7,8,9,10,11}$ **fabricate and illustrate models (e.g., solar system, structure of earth, erosion and weathering, forces which drive the rock cycle) - *models***

Science History

$5.56_{6,7}$ **articulate the historical significance of scientific discoveries (e.g., as influenced by technological demands, competition, controversy, world events, personalities, societal issues)**

$5.57_{6,7}$ **compare the evolution of science concepts and theories (e.g., cells, plate tectonics, atoms, genetics)**

$5.58_{6,7}$ **examine the contributions of men and women of diverse cultures to the development of science**

Science, Technology, and Society

$5.59_{6,7,8,10,11}$ **give examples of how science and technology are used in daily living** ◊

$5.60_{6,7,8,10,11}$ **use the knowledge of science and technology to make personal decisions at local and global levels** ◊

5.61 evaluate and critically analyze mass media reports of scientific developments and events ◊

$5.62_{6,7,8,10,11}$ **critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality)**

$5.63_{6,7,8,10}$ **explore the connections between science, technology, society, and career opportunities**

$5.64_{6,7,8,10,11}$ **analyze the positive and negative effects of technology on society and the influence of societal pressures on the**

direction of technological advances

Computer/Technology

5.65 use appropriate software and a variety of audio-visual and/or multimedia materials to practice and master fifth grade instructional objectives in science

5.66 input data using correct keying, editing, and formatting techniques

5.67 using the graphing application of appropriate software, select the suitable graph, chart, or table to display a set of data

5.68 using the graphing application of appropriate software, create tables, charts, and/or graphs

5.69 use a calculator to perform mathematical functions in data analysis

5.70 use a variety of instruments (i.e. probes, thermometers, measuring devices) to perform measurements and record data

5.71 identify database management terms (e.g., database, file, record, field, record, field/category, sort/arrange, select/search, report)

5.72 use a database template to enter and edit data

5.73 use appropriate software to practice reading, interpreting, analyzing, and evaluating the data on a map, chart, graph, table, and diagram

5.74 use appropriate software to practice drawing conclusions from maps, diagrams, charts, graphs, and tables

5.75 use appropriate software to practice making predictions, inferences, and hypothesis from maps, diagrams, charts, graphs, and tables

5.76 associate computer/technology activities with related careers

5.77 identify work created by using technology as intellectual property and thus protected by copyright

5.78 describe the influence of technology on life in your community

5.79 retrieve current data from a variety of electronic sources which might include the Internet, and/or software reference programs

Grade Six
English Language Arts

English Language Arts at the sixth grade level promotes continued proficiency in communication skills of students. At this level, listening and speaking strategies require students to gather and process oral information and to effectively express themselves orally in a variety of situations. Reading objectives strive to promote the development of various vocabulary and comprehension skills that advance the acquisition of literal and inferential knowledge of students and foster recreational reading from a variety of genres, authors, media and resources. Emphasis is given to develop effective writing skills, including prewriting, drafting, revising, editing, and publishing compositions that are error-free and demonstrate proficiency in mechanics and usage to communicate ideas through conventional and electronic methods. This includes applying strategies to spell correctly across the curriculum. Objectives for study skills help students collect and organize information to make it useful in all situations.

Listening/Speaking

6.1 identify and correct usage in oral communications

6.2 exhibit appropriate speaking etiquette (e.g., speaking in turn, using proper communication technologies, demonstrating interpersonal communication)

6.3 use public speaking strategies to prepare formal and informal speaking presentations across the curriculum using appropriate pitch, tone, and rate

6.4 listen to oral communications using proper etiquette

6.5 listen to oral communications and retell in either oral or written form

6.6$_{2,3,5,7,8}$ **listen to oral directions and successfully complete the task**

6.7 listen to oral communications and critique, evaluate, and summarize their contents across the curriculum

6.8$_{2,4,5,7,8}$ **listen to specific oral information and interpret it to construct meaning in and beyond the text**

6.9$_{5,7,8}$ listen to oral communications and identify the synonym of an unknown word from context

6.10 listen to oral communication to determine the main idea

6.11 listen to oral communication to list details

6.12 $_{2,3,4,5,7,8}$ **listen to oral communication and distinguish between fact and opinion**

6.13 listen to oral communication to predict outcomes

6.14 $_{1,2,5,7,8}$ **think critically about oral selection to foster exploration, questioning and imagining**

6.15 $_{5,7,8}$ relate personal experiences to the information heard to construct new meaning

Reading Comprehension

6.16$_{1,2,3,4,5,6,7,8,9,10,11}$ **read literary works by national and international authors to include but not to be limited to: short stories, biographies, contemporary fiction, nonfiction (science and social sciences), narratives, novels, folk-lore, poetry, and drama**

6.17$_{1,2,3,4,5,6,7,8,9,10,11}$ **analyze the organization, author's style, and text components to determine genre**

6.18 determine and use the appropriate reading style for a particular reading situation (e.g., skim, scan, reading for information, recreational reading)

6.19 read directions to perform a task and apply the directions to a specific situation

6.20$_{7,8,9}$ **locate key words and other explicit information to construct initial meaning of a**

text

6.21$_{k,2,4,8,9,10,11}$ **extend the meaning from a passage to determine the main idea (e.g., theme)**

6.22$_{3,4,5,7,8,9,10,11}$ **locate specific details in a textbook passage to promote understanding (e.g., cause-effect, classifying, compare and contrast, sequence, etc.)**

6.23$_{k,3,4,5,7,8,9,10,11}$ **locate specific details in functional materials (e.g., advertisements) and recreational materials to promote initial understanding**

6.24$_{4,7,8,10}$ **determine factual information from opinion or fiction**

6.25 determine the meaning of a word by using context clues

6.26$_{k,3,4,7,8,9,11}$ **draw conclusions to describe character traits, thoughts, feelings, and motives**

6.27$_{k,3,4,5,7,8,9,10,11}$ **draw conclusions to make generalizations, judgements, inferences, and to summarize and analyze information based on reading selection**

6.28$_{k,3,4,5,7,8,9,10,11}$ **draw conclusions from functional material (e.g., advertisements) to make analysis of information**

6.29$_{8,9,10,11}$ **justify conclusions based on textbook information**

6.30$_{k,2,3,4,5,6,7,9,10,11}$ **make logical predictions based on events in a passage**

6.31$_{9,10}$ **use setting, plot, characterization, author's style, and theme to determine understanding and extend the story**

6.32$_{5,9,10,11}$ **use figurative language (e.g., simile, metaphor, hyperbole, pun, idioms alliteration, personification, and onomatopoeia,) and jargon to determine meaning of information in functional text (e.g., advertisement)**

6.33$_{3,5,10}$ **identify other sources of information for a textbook topic (e.g., encyclopedia, dictionary, thesaurus, and library resources)**

6.34$_{k,5,10}$ **identify and apply appropriate strategies to aid in comprehension (e.g., graphic organizers, outlining, etc.)**

Reading Vocabulary

6.35 recognize and use key words introduced in the text

6.36 recognize and supply rhyming words

6.37 identify and generate compound words

6.38 recognize and select synonym for a word

6.39$_{2,3,4,5,7,8,9,10,11}$ **determine the synonym for words in text to clarify meaning**

6.40 recognize and select antonyms

6.41 recognize words as homophones and be able to chose appropriate homophone according to the usage

6.42 recognize words as homographs and correctly pronounce according to its usage

6.43$_{2,3,4,5,7,8,9,10,11}$ **determine the meaning of multiple meaning words according to context**

6.44$_{k,2,3,4,5,7,8,9,10,11}$ **determine the meaning of words from their use in context**

6.45 use prefixes as structural clues for word recognition and meaning

6.46 use base words as structural clues for word recognition and meaning

6.47 use suffixes as structural clues for word recognition and meaning

6.48 recognize and use Greek or Latin roots as structural clues for help in determining word meanings

6.49 recognize and understand clipped or shortened words (e.g., exam-examination)

6.50 recognize and select appropriate word to complete analogies

6.51 use connotation/denotation to understand meaning

Writing

6.52 write sentences that are complete, varied, and economical

6.53 use prewriting and drafting

strategies (e.g., drawing, clustering, brainstorming, discussion, etc.) to generate topics and plan approaches to writing tasks

6.54 use writing strategies to address specific writing purposes, such as research, creative, journalistic, essay, narrative, informative and persuasive

$6.55_{4.7,10}$ use a writing prompt to develop a composition that has smooth transition

$6.56_{4.7,10}$ use a writing prompt to develop a composition that addresses the assigned topic

$6.57_{4.7,10}$ use a writing prompt to develop a composition containing specific, relevant details

$6.58_{4.7,10}$ write sentences where diction is expressed in complete, varied, and economical ways

6.59 use revision strategies (e.g., adding dialogue, varying sentence length and structure, adding details, etc.)

6.60 edit own writing as well as the writing of others (e.g., peer editing) to delete or correct errors in organization, content, usage, mechanics, and spelling

$6.61_{4.7,10}$ write with ever increasing command of the conventions of composition

$6.62_{4.7,10}$ use a writing prompt to develop a composition that has a beginning, middle, and end

$6.63_{4.7,10}$ use a writing prompt to develop a composition that is focused, coherent, and has a clear and logical progression of ideas

6.64 use writing strategies to write for audiences, including peers, teachers, and employers

6.65 demonstrate continuous progress toward mastery of penmanship and keyboarding in the writing process

6.66 use electronic and traditional editing strategies to correct spelling errors (e.g., symbols, dictionaries) (e.g., proper names, homophones, [in, inn].)

Spelling

6.67 demonstrate accurate spelling and pronunciation in their written and oral communication across the curriculum

6.68 develop spelling competency by recognizing one's own spelling weakness

6.69 focus on problem parts of words that are commonly misspelled (e.g., busy, minute, etc)

6.70 use memorization or mnemonic devices as a strategy for spelling words (e.g., colonel)

6.71 spell correctly words containing short vowel sounds (e.g., snack, spend)

6.72 **spell correctly words containing long vowel sounds (e.g., "a" cane, paint, pay)**

6.73 **spell correctly words containing the schwa sound (e.g., elephant, telephone)**

6.74 **spell correctly words containing a vowel variant (e.g., ou, ie, ey)**

6.75 **spell correctly words with multi-spellings for the same sound (e.g., "c" sounded as "k", "c" sounded as "s")**

6.76 **form and spell correctly the plurals of words ending in "o" and "y" (e.g., domino, potato, baby)**

6.77 spell correctly words that form plurals requiring the addition of "s" and "es" (e.g., girls - dresses)

6.78 spell correctly words containing "y" sounded as "I" (e.g., my, fly)

6.79 spell correctly words containing silent letters or have doubling of final consonant (e.g., doll, class, comb, gnaw, etc)

6.80 spell correctly words containing "oi" and "oy" and "ei" and "ie" (e.g., boil, toy, receive, believe)

6.81 identify, use, and spell common homophones/homonyms (words that have different meanings and spellings but are pronounced the same (e.g., hear - here, sun - son)

6.82 identify and form words with inflectional endings including when the word ending changes to

add "ed" or "ing"

6.83 identify and form comparative and superlative adjectives (e.g., hard, harder, hardest)

6.84 **identify and form words with prefixes (e.g., in, im, pre, tri, re, un, dis, etc)**

6.85 **identify and form words with the common suffix, "tion", "ly", "ious", "ture", "ible", and "able" (e.g., subtraction, lovely, mixture, precious, enjoyable, and flexible)**

6.86 acquire a spelling vocabulary from a wide variety of instructional sources

6.87 use electronic editing as well as traditional editing resources to correct spelling errors (e.g., electronic spell checker, dictionary, thesaurus)

Language

6.88 use capital letters at beginning of sentences

6.89 capitalize the pronoun "I"

6.90$_{1,2,3,4,5,7,8,9,10,11}$ **use capital letters for proper nouns (e.g., names, family relationships, days of the week, cities, states, countries, holidays, months, geographic features, nationalities, languages, and historic events)**

6.91$_{k,1,2,3,4,5}$ **use capital letters for titles of works (e.g., books, stories, T.V. shows, and works of art)**

6.92$_{1,2,3,4,5,7,8,9,10,11}$ **use capital letters for titles of people (e.g., President Lincoln)**

6.93$_{2,3,4,5}$ **capitalize appropriate part of a letter (e.g., heading, greeting, closing, etc)**

6.94 use capital letters when writing initials and abbreviated titles

6.95$_{3,4,5,10,11}$ **use a capital letter for the first word of a direct quotation**

6.96 use capital letters for parts of an outline

6.97$_{7,8,10,11}$ **use a capital letter for proper adjectives**

6.98 use periods at the end of a declarative or imperative sentence, after abbreviations, and in outlines

6.99 use a question mark at the end of an interrogative sentence

6.100 use an exclamation mark at the end of an exclamatory sentence and following an interjection

6.101$_{3,4,5,7,8,9,10,11}$ **supply commas for words in a series, and for compound sentences**

6.102 supply commas between cities and states, in dates, addresses, letter parts, direct quotations, direct addresses, appositives, adjective, adverbial clauses, and to introduce phrases and clauses

6.103$_{2,3,4,5,7,8,9,10,11}$ **supply apostrophes for contractions and possessive nouns**

6.104$_{3,4,5,9,10,11}$ **supply quotation marks for direct quotations, dialogue, and titles of written works (e.g., stories, poems, etc)**

6.105$_{5,8,10,11}$ use colon with a list

6.106 use hyphen to divide syllables at end of writing line and in certain compound words (e.g., sister-in-law)

6.107 recognize and compose declarative, interrogative, exclamatory, and imperative sentences

6.108 identify and compose simple, compound, and complex sentences

6.109$_{1,2,3,4,5,7,8,9,10,11}$ **recognize and correct sentence fragments and run-on sentences**

6.110$_{1,2,3,4,5,7,8,9,10,11}$ **identify and correct awkward sentence structure (e.g., misplaced modifiers)**

6.111 identify and compose complete, simple, and compounds subjects and predicates

6.112$_{4,5,8}$ **organize information by combining sentences**

6.113 recognize direct objects, indirect objects, predicate nominatives, and predicate adjectives

6.114 recognize singular, plural, and possessive nouns

6.115$_{1,2,4,5,7,9,10,11}$ **recognize proper and common nouns**

6.116$_{4,5,7,8,9}$ **recognize and use the cases (e.g., nommative, objective, possessive) of pronouns(personal, compound**

personal, demonstrative, interogative, relative, and indefinite) correctly by labeling the pronoun and its anticedent

6.117 recognize and understand antecedent of a pronoun

6.118 recognize and supply action, linking, and helping verbs

6.119$_{1,2,3,4,5,7,8,9,10,11}$ **write and edit text using past, present, and future tense correctly**

6.120$_{1,2,3,5,7,8,9,10,11}$ **write and edit text using correct subject-verb agreement**

6.121 recognize and use adjectives and adverbs

6.122$_{8}$ **differentiate the use of adjectives and adverbs (e.g., real and really)**

6.123 recognize and use comparative and superlative adjectives correctly

6.124 identify prepositions and their prepositional phrases

6.125 identify and use coordinating and correlative conjunctions

6.126$_{1,2,3,4,5,7,8,9,10,11}$ **identify the purpose and audience in written expression**

6.127$_{4,5,7,9,10,11}$ **identify topic sentences in written expression**

6.128$_{1,2,3,7,8,10,11}$ **identify supporting sentences in written expression**

6.129$_{1,2,4,5,7,8}$ **make decisions about relevant and appropriate content to eliminate extraneous sentences in writing**

6.130$_{5,7,8,9,10,11}$ **identify and correct redundancy**

6.131$_{1,2,3,4,5,7,8,9,10,11}$ **recognize and use editing skills in writing compositions**

Study Skills

6.132$_{5,7,8,9,10}$ **identify and use the parts of a book including title page, copyright page, table of contents, glossary, index**

6.133$_{8,9,10}$ **use the table of contents to determine the purpose of a book, the main idea of a book, locate general and specific information in a book, and determine the intent of a chapter**

6.134 identify the index of a book and parts of an index entry (e.g., topic, subtopics, and cross-references)

6.135$_{5,7,8,9,10}$ **use an index to locate specific information**

6.136$_{3,4,5,7,9,11}$ **demonstrate the appropriate use of the general reference sources of a dictionary, thesaurus, atlas, almanac, and encyclopedia**

6.137$_{5,7}$ **identify a word that will come first in alphabetical order according to the second, third, fourth, and fifth letter**

6.138$_{3,5,7,9,10,11}$ **use a set of guide words from a dictionary page to select a word to be found on that page**

6.139$_{3,5,7,8}$ **use the dictionary pronunciation guide to determine how a word is divided into syllables, determine the sounds of dictionary entry words, and sounds of letters as they appear in words**

6.140$_{3,5,7,8,9,19,11}$ **read the various meanings of a dictionary entry to determine the meaning of a word in a sentence**

6.141 develop an awareness of word origin as contained in a dictionary

6.142 identify and use a thesaurus as a source for locating synonyms and antonyms

6.143$_{5,7}$ **identify and use sources for specific types of information (e.g., encyclopedia, atlas/maps, almanac, periodicals/magazines, newspapers, Readers Guide to Periodical Literature, and computer on-line services)**

6.144 recognize and use the library as a source of reference

6.145 identify and use various resources in the library including fiction and non-fiction categories of books

6.146$_{5,7,8}$ **access and identify title, author, subject, call number, publisher, and copyright of**

resources using the card catalog system or electronic systems

6.147$_{9,10,11}$ **know the purpose and use of graphic organizers (e.g., diagrams, webbing, T-chart, and flow chart)**

6.148 know the purpose and interpret graphic aids (e.g., graphs, tables, charts, diagrams, maps, and illustrations)

6.149$_{3,8}$ **organize information into an outline by being able to categorize information into topics, subtopics, and details**

6.150 identify and use the correct procedure for note taking, test taking, completing functional forms

6.151 access and use information from various audiovisuals resources (e.g., compact disks, tape, and films)

6.152 adjust reading rate according to purpose and nature of material

Computer/Technology

6.153 use appropriate software to practice and master sixth grade English language arts instructional objectives

6.154 use the editing functions of a word processor (spell check, grammar checker, thesaurus, outliner) (6.60, 6.66, 6.87 and 6.131)

6.155 using a word processor, demonstrate correct keying, editing, and formatting techniques (6.65)

6.156 use a word processing program to copy and move text

6.157 use a word processing program to produce a report that contains centering, tabs, and more than one paragraph (6.60)

6.158 identify examples of copyright law violations and possible penalties

6.159 identify the role of technology in various communication careers

6.160 select and use appropriate software and/or other technologies to locate and use reference sources (6.33 and 6.151)

6.161 develop keyboarding skills: proper posture, finger placement, keying letters, numbers, symbols, and special keys (6.65)

6.162 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts (6.148)

Grade Six Mathematics

The sixth grade objectives place continued emphasis on the study of whole numbers, decimals, and fractions. However, students need opportunities to apply their computation skills to real life applications. Calculators and computers may be used to solve problems. Decreased attention should be given to tedious paper and pencil computations. Sixth graders will continue to use manipulatives whenever new material is introduced or whenever it is needed to review previously taught material. The areas of probability, statistics, geometry, and pre-algebra will be stressed. Students will use ratios to compare data sets, make geometric constructions of three-dimensional figures, explore thoroughly the algebra strand, and solve problems involving circles, volume, and surface area.

Number Theory and Number Sense

6.1$_{7,8}$ **read, write, and identify the place value from billions through millionths using standard and expanded form**

6.2$_{7,8}$ **compare and order the value of whole numbers, fractions, and decimals from billions through ten-thousandths and write and model equivalences**

6.3$_{7}$ **identify prime and composite numbers up to 100 using hundred chart, manipulatives, and calculators**

6.4 identify and represent integers on a number line

6.5 identify and use the divisibility rules of 2,3,5, and 10

6.6$_{7,8}$ **identify pictorial representations of fractions and decimals**

6.7$_{5}$ **identify least common multiple or greatest common factor of two numbers**

Computation and Estimation

6.8$_{3,4,5,7,8}$ **use estimation to solve problems with whole numbers (rounding, compatible numbers, clustering, front-end estimation with adjustment) and decimals, including money**

6.9$_{5,7,8}$ **continue to reinforce whole number computation skills, applying them to problem-solving situations using estimation, mental math, calculators, and paper and pencil**

6.10$_{5,7,8}$ **solve problems in context that involve addition, subtraction, multiplication, and division of fractions and mixed numbers with and without regrouping, including like and unlike denominators, expressing answers in simplest form using estimation, mental math, calculators, and paper and pencil**

6.11$_{5,7,8}$ **solve problems in context that involve addition, subtraction, and multiplication of decimals through the ten-thousandths and division of decimals by decimal divisors using estimation, mental math, calculators, and paper and pencil**

6.12$_{7,8}$ **use concrete materials, estimation, mental math, calculators, and paper and pencil to find the percent of a number**

6.13 use order of operations to solve multi-step problems

6.14 **identify a number that is 1,000 more or 1,000 less than a given number**

Patterns, Functions, and Algebra

6.15 **identify missing elements in numeric and geometric patterns and explore a variety of patterns, including perfect squares, square roots, exponents, and scientific notation**

6.16$_{5,7,8}$ **use input/output models for functions (number machines).**

6.17 **solve equations using the identity property of addition (8+n=8) and the identity property of multiplication (8*n=8)**

6.18 write the cross product of a proportion and solve the resulting equation.

6.19 represent and solve real world-problems by choosing the appropriate strategy, such as guess and check, make a table, write a proportion, find a pattern, work backwards, use a formula, write an equation, or make a scale drawing

6.20 **write algebraic expressions for word expressions and evaluate them by replacing the variable with a given value**

6.21$_{5,7}$ **solve equations with addition, subtraction, multiplication, and division of whole numbers, fractions, decimals, and integers using inverse operations, guess and check, and/or physical models**

6.22 solve inequalities by using a number line

6.23 graph one-step linear equations in one variable in the first quadrant

Probability and Statistics

6.24$_{5,7,8}$ **collect, organize, display, and interpret data using line graphs, circle graphs, bar graphs, histograms, stem-and-leaf plots, tables, and charts**

6.25$_{5,7,8}$ **create and solve problems involving the mean, median, mode, and range of a set of data**

6.26 model practical problem-solving situations by constructing a sample space to determine probability

6.27 **determine the probability of a given event and express that probability as a ratio, decimal, or percent**

6.28 test the expected probability of an event against the actual outcome by carrying out an experiment using technology whenever appropriate

$6.29_{5,7,8}$ **determine combinations and permutations (tree diagrams, probability experiments with and without replacement)**

Geometry

$6.30_{7,8}$ classify lines as parallel, intersecting, perpendicular, or skew

6.31 draw, compare, and contrast the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid along with the following polygons: pentagon, hexagon, octagon, decagon, and dodecagon

$6.32_{4,5,7}$ **classify and compare line segments, angles, and polygons**

6.33 describe, identify, and build models of three dimensional figures, including prisms, pyramids, cylinders, and cones; locate, count, and record the faces, edges, and vertices of the prisms and pyramids

6.34 bisect a line segment and construct congruent angles using a compass and straightedge

$6.35_{7,8}$ **identify the ordered pair for a point and locate the point in all four quadrants of the coordinate plane**

6.36 **recognize line symmetry and rotational symmetry**

6.37 **demonstrate flips, slides, and turns using congruent geometric figures**

$6.38_{7,8}$ **identify the radius and diameter of a circle**

Measurement

6.39 use concrete materials to derive approximation for pi from actual measurements of circumference and diameter of a circle

6.40_{7} create and solve problems by finding the circumference and area of a circle when given the radius or diameter

$6.41_{7,8}$ **measure real objects in order to develop the formulas for perimeter and area; determine the perimeter and area of a triangle, square, rectangle, parallelogram, and irregular figures given the appropriate measures**

6.42 investigate and solve problems involving the volume and surface area of rectangular prisms using real objects and practical situations

$6.43_{7,8}$ **use prior knowledge of customary and metric measures of length, mass/weight, and capacity/volume to solve problems**

$6.44_{2,3,4,5,7,8}$ **solve application problems using measurement including elapsed time**

$6.45_{5,7,8}$ **convert between units within the same system**

$6.46_{2,3,4,5}$ **select appropriate units to determine length, weight, temperature, or volume using customary and metric units**

$6.47_{7,8}$ **determine measurements indirectly from scale drawings**

Computer and Technology

6.48 use appropriate software to practice and master sixth grade instructional objectives in mathematics

6.49 use a calculator to do computations in problem-solving situations

6.50 use a calculator to solve problems with fractions and mixed numbers

6.51 use a calculator to add, subtract, and multiply problems with decimal through ten-thousandths

and division of decimals by decimals

6.52 use a calculator to find the percent of a number

6.53 use a calculator to solve multi-step problems involving order of operations

6.54 use a calculator to find mean, median, mode, and range from a set of data

6.55 use graphing software to create line, circle, and bar graphs, histograms, tables and charts

6.56 identify spreadsheet terms (e.g., column, row, cell, formula, etc)

6.57 compare the difference between a paper spreadsheet and a computer spreadsheet (e.g., grade book, budget, sports statistics)

6.58 use a spreadsheet software template to enter and edit data.

6.59 practice inputting data using correct keying, editing, and formatting techniques

6.60 identify examples of copyright law violations and possible penalties.

6.61 identify the role of technology in various mathematical careers

Grade Six Social Studies: Selected Regions of the World

The sixth grade program of study will provide an interdisciplinary examination of selected regions of the world: North America, South America, Western Europe, and the Middle East's (e.g., North Africa, Southwest Asia). The study of early civilizations and their impact on modern cultures will emphasize how cultures have adapted to environmental, changes, and emerged into a global society.

Civics

6.1 identify and give examples of different forms of government

6.2 **identify the aspects of strong leadership as they impact world events (e.g., Abe Lincoln)**

$6.3_{9,11}$ **explain the purpose of political parties in governments and identify how special interest groups attempt to influence political parties and the political process**

$6.4_{4,8,9,10}$ **explain the concept of separation of powers among executive, legislative, and judicial branches of democracies**

$6.5_{3,8,9,10}$ **explain the functions of community support systems and their roles in local government (e.g., police, fire departments, city/town councils)**

6.6 **differentiate between the rights and privileges of citizens of different countries**

6.7 **explain how individuals, companies, and countries may enter into a legally binding contract or treaty**

6.8_{10} **identify the major court cases and civil rights acts that ended segregation in the United States**

6.9_{8} **explain how a nation's constitution protects the rights of individuals, states, or political sub-divisions**

$6.10_{5,9}$ **identify and analyze the effect of written documents which contributed to the formation of the American system**

Economics

$6.11_{4,7,9,10}$ **explain how the law of supply and demand affects different countries and be able to interpret a supply and demand graph**

6.12$_{3,10}$ **draw conclusions about the economic contributions of early settlers to the Americas by examining their principal occupations and places of origin**

6.13$_{8,11}$ **assess the impact of technology on settlement, homes, industry, and agriculture**

6.14 **outline the steps in producing and marketing goods**

6.15 **identify strategies used by individuals, companies, and corporations to obtain profits**

6.16$_{4,5,7,9}$ **identify where responsibility rests for upkeep of private property as opposed to public property**

6.17 explain how trade cartels affect the world economy (e.g., Organization of Petroleum Exporting Countries) ◊

6.18 trace the development of treaties and organizations related to trade

6.19$_{9,10}$ **compare the basic characteristics of communism, socialism, and capitalism**

6.20 **compare production and consumption of goods and services in different countries**

Geography

6.21$_{3,8}$ **locate and identify the continents, major climates, major water bodies, and natural resources (e.g., a knowledge of landforms such as peninsulas, mountain ranges, plateaus, river valleys, and lakes) and compare the relationship of people and the environment**

6.22$_{3}$ **locate the major lakes of North America, South America, and Western Europe; and explain their impact on exploration, settlement, and trade**

6.23$_{4}$ **given a world time zone map, determine the time at one location when informed of the time at another location**

6.24$_{3,4}$ **compare and contrast general characteristics of the population of selected regions with regard to religion, language, and movement**

6.25$_{3,4}$ **interpret information from a population growth graph and a population pyramid (e.g., discuss the age of the population, growth potential, and life expectancy)**

6.26$_{3,5,8,11}$ **solve problems dealing with map locations (e.g., use legends, keys, and scales) and interpret map information (e.g., climate, landforms, and resources)**

6.27$_{4,9}$ **using maps, draw conclusions about the effects of geography on transportation, culture, economic activities, and population density and distribution** ◊

6.28 explain the changing nature of earth's structure (e.g., earthquakes, volcanoes)

6.29 identify changes in population due to shifts from agricultural to industrial/urban development

6.30$_{9}$ trace changes in the commercial form and function (e.g., agriculture center to trade center to industrial center) of urban areas in different regions of the world

History

6.31$_{3,7,9}$ **explain the role of climate and vegetation in determining how people feed, cloth, and shelter themselves (e.g., Woodland Indians, Plains Indians, Irish Farmers, Arab Nomads, Native Americans and others)**

6.32 **identify how Europeans benefited by expansion in the New World**

6.33$_{9,11}$ **outline or build a timeline showing the influx of ethnic groups into North America**

6.34$_{4,10}$ **explain the causes of the American Revolutionary War**

6.35 **explain the competition of the English and French on the**

American frontier

6.36_{10} **explain how the Industrial Revolution affected the lives of people in Western Europe and the Americas**

$6.37_{8,11}$ **develop a timeline of the major events of western migration in the United States and identify key land acquisitions on a map ◇**

$6.38_{5,8,9}$ **outline events in the Abolitionist movement and its outside influences from the beginning to the conclusion (e.g.,the Emancipation Proclamation, Amendments 13, 14, 15)**

$6.39_{4,7,11}$ **identify key figures, philosophies, and events in the Minority Rights movements (e.g., Women's Rights, Civil Rights)**

6.40 **identify the major historical events in the development of transportation systems (aviation, rail, motor vehicles, and water transportation)**

6.41 identify and evaluate the contributions of the classical civilizations and cite the reasons for their rise and fall

6.42_{10} explain the basic tenets of major monotheistic religions (Judaism, Christianity, Islam) and their impact on western civilizations

6.43 identify the contributions and characteristics of Arab/Islamic society

6.44 identify the contributions and characteristics of the Christian society (e.g., cultural, political, economic)

6.45 compare and contrast the worth of the individual in different societies

6.46 identify the causes and consequences of the Reformation

6.47 describe how the slave trade impacted political, economic, and social systems in North America, Latin America, Iberia, and Africa

6.48 identify examples of agricultural products exchanged between the New and Old World during the Age of Exploration.

6.49 contrast the slavery system's development in the United States with West Africa, North Africa, the Middle East, and Iberia

6.50 analyze the growth of democracy during the nineteenth century in western nations

6.51 explain the causes of World War I and the factors which led to United States' involvement

6.52 explain the causes and effects of the economic depression of the 1930's

6.53 explain the political responses to the Depression (e.g., election of Mussolini, election of Hitler, rise of militarism in Japan, and the New Deal in the United States)

6.54 identify the global tensions which contributed to the outbreak of World War II

6.55 explain the impact of the use of atomic weapons

6.56 analyze the threat to world security posed by terrorists and their impact on world peace

6.57 identify concerns for future generations (e.g., diminishing resources, medical issues, environmental issues, technological change, population, aging, space, destructive capability of man, crime, redistribution of people, changing nature of jobs, adaptability of the United States Constitution, intolerance, and changing roles of men and women)

$6.58_{3,4,5,7,8,9,10,11}$ **draw historical conclusions from informational maps, globes, charts, graphs, and timelines**

Computer/Technology

6.59 use appropriate software to practice and master sixth grade social studies instructional objectives

6.60 use a variety of audio-visual and multi-media materials to practice and master sixth grade social studies instructional objectives

6.61 use graphics software to select the appropriate type of graph to display a set of data
6.62 use graphics software to create charts, graphs, and tables
6.63 practice inputting data using correct keying, editing, and formatting techniques
6.64 use a database to enter and edit data
6.65 use a database to sort and search data for two criteria
6.66 identify examples of copyright law violations and possible penalties
6.67 identify ethical and unethical uses of technology
6.68 project concerns for the future relating to technological changes
6.69 identify the role of technology in various careers

Grade Six Science

The Coordinated and Thematic Science (CATS) Six objectives demonstrate, differentiate, and apply concepts of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth/space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of major science themes of systems, changes and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction integrated in all activities. CATS Six reviews changes in the properties of matter, structures, functions, and adaptations of organisms, and the structure of the earth's systems. New major concepts introduced a the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather.

Nature of Science

6.1 develop a conceptual framework of scientific principles
6.2 recognize the interdependency of science themes and scientific concepts
6.3 evaluate the interrelationships of scientific concepts to everyday life by making informed decisions and choices using scientific reasoning and knowledge ◊
$6.4_{5,7}$ **investigate career choices in science and technology ◊**
$6.5_{5,7,8}$ **apply skepticism, careful methods, logical reasoning, and/or creativity in investigating the observable universe (e.g., sun, earth, and moon relationships, changes in ecosystems, weather forecasting)**
6.6 recognize and appreciate that scientific knowledge is subject to modification as new information challenges current theories
6.7 acquire a holistic view of scientific knowledge by integrating reading, writing, mathematics and other disciplines with the science curriculum
6.8 use a variety of activities and investigations to produce a sense of wonder about the natural world and the joy of discovery
6.9 recognize that the exploration of science is challenging and fulfilling and establishes patterns of lifelong curiosity and learning

Scientific Attitudes/Habits of Mind

6.10 cooperate and collaborate to ask questions, find answers, solve problems and conduct investigations to further an appreciation and joy of scientific discovery ◊
6.11 process and integrate experiences with prior knowledge to formulate new ideas

6.12 understand that the study of science is a dynamic process and the results are not always definite or complete

6.13$_{4,5,7,8,9,10,11}$ **formulate conclusions through close observations, logic, objectivity, perseverance and integrity in data collection (e.g., water quality, forces and motion, populations and ecosystems)** ◊

Scientific Processes/Thinking Skills

6.14 recognize and apply facts, concepts, laws, and theories to explain phenomena

6.15$_{3,4,5,7,8,9,10}$ **compare and contrast objects, actions or phenomena according to similarities and differences in order to classify them (e.g., systems in living organisms, changes in rock record, elements)**

6.16$_{3,4,5,7,8,9,10,11}$ **construct and use charts, graphs, and tables to organize, display, interpret, analyze and explain data (e.g., extrapolation, interpolation)** ◊

6.17$_{3,4,5,7,8,9,10}$ **use inferential reasoning to make logical conclusions from collected data (e.g., causes and effects)** ◊

6.18$_{3,4,5,7,8,9,10,11}$ **utilize experimentation to demonstrate scientific processes (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables)**

6.19$_{3,4,5,7,8,9,10,11}$ **develop rational thinking processes that underlie scientific approaches to problem solving by employing critical-thinking skills in applying scientific knowledge, using imagination and creativity while working individually or cooperatively (e.g., how systems work together, factors which impact the environment, ecological consequences of human interactions)** ◊

6.20$_{3,4,5,7,8,9,10,11}$ **develop skills in the use of laboratory materials and equipment; and proper communication of scientific data collected (e.g., meter sticks, balances, thermometers, scales, graduated cylinders)** ◊

Laboratory Investigations/Hands-On Learning

6.21 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

6.22 use a variety of materials and scientific instruments to conduct explorations and investigations of the natural world to explain science concepts (e.g., measure environmental conditions using appropriate instruments) ◊

6.23 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment and living organisms ◊

Science Themes and Subject Matter

6.24 develop through the study of interdependent themes including systems, changes, and models an understanding of biological, earth/space, and physical science concepts

6.25 associate hands-on activities to daily life experiences

6.26 express ideas that illustrate the relevance of science, technology, and societal issues within the lessons

6.27$_{4,8,9,10,11}$ **describe the interactions of various cycles that provide energy and/or materials for growth, repair and shelter (e.g., carbon cycle, water cycle, nitrogen cycle, decomposition photosynthesis, respiration, transpiration)**

6.28$_{4,5,7,8}$ **identify the structures of living**

things and explain their functions (e.g., similarities and differences in organisms, complexity in organisms, similarities and differences among closely related groups) - *systems*

6.29$_{4,5,6,7}$ **classify living things according to their structures and functions (e.g., dichotomous keys, field guides) -*systems***

6.30$_{4,5,7,8,9,10}$ **explain changes in common patterns of interdependence among organisms (e.g., biotic and abiotic factors) - *changes***

6.31 demonstrate changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, habitat) - *changes*

6.32$_{4,5}$ **analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources) - *models***

6.33$_{5,6,8,10}$ **interpret growth patterns in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, herbaceous plants) - *models***

6.34$_{3,4,5,7}$ **demonstrate how the various systems provide for the needs of a living organism (e.g., plants, animals, fungi) - *models***

6.35 construct models of plant and animal cells which show the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, chloroplasts) - *models*

6.36$_{3,4,5,7,8,9,10,11}$ **classify materials according to physical and chemical properties - *systems***

6.37$_{3,4,5,7,8,9,10,11}$ **identify processes as physical or chemical changes - *systems***

6.38$_{4,8}$ **identify food as sources of energy in animals - *systems***

6.39$_{11}$ research historical reasons for classifying elements and compounds (e.g., Greek philosophers, European alchemists) - *systems*

6.40$_{8,10,11}$ apply knowledge of physical and chemical properties to examine samples of water - *systems*

6.41$_{10}$ identify the atom as the smallest particle of an element - *systems*

6.42$_{3,4,5,7,8,9,10,11}$ **investigate the formation of simple mixtures - *changes***

6.43$_{9}$ investigate methods for separating mixtures (e.g., evaporation, filtration, chromatography, screening) - *changes*

6.44$_{3,8,10,11}$ **using indicators, identify substances as acidic, basic, or neutral - *changes***

6.45$_{11}$ identify the symbols of elements -*models*

6.46$_{11}$ using the periodic table, identify elements as metals or non-metals - *models*

6.47$_{10}$ draw Bohr's models to indicate the placement of protons and neutrons in the nucleus and electrons outside the nucleus - *models*

6.48$_{5,7,8,9,10,11}$ **describe properties of matter (e.g., inertia, gravitational interaction, specific heat, malleability, melting point, density) - *systems***

6.49 differentiate concepts related to the electromagnetic spectrum (e.g., wavelengths, frequencies, visible light) - *systems*

6.50$_{8,11}$ **interpret the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational pull, the closer the objects the stronger the pull) - *systems***

6.51$_{4,5,8,11}$ **examine simple machines and the forces involved (e.g., levers, pulleys) - *systems***

6.52$_{11}$ **describe the flow of heat between objects (e.g., hot air rises, absorption and release of heat by metals) - *systems***

6.53$_{7}$ **identify factors affecting reflection and refraction (e.g., nature of surfaces, color, density of medium) - *systems***

6.54$_{5,11}$ **apply the effects of balanced and unbalanced forces on motion of objects (e.g., inertia,**

addition and subtraction of forces in a straight line) - *changes*

6.55 describe the relationship between different frequencies and receivers (e.g., eyes, ears, radios) -*changes*

6.56_{4} explain absorption and reflection of light by different objects of various colors and textures (e.g., transparent, translucent, opaque, different colors) -*changes*

$6.57_{3,4,11}$ **explain motion in terms of frames of reference (e.g., motions on earth, ball thrown in or from moving vehicle) - *changes***

6.58_{4} **relate the length of a shadow to the position or source of illumination (e.g., sundials) - *changes***

6.59 utilize a model to represent direction and amount of force (e.g., arrow point to show direction) - *models*

6.60 diagram simple parallel and series circuits (e.g., bulbs, battery, wires, switch) - *models*

$6.61_{5,7,8,9,10}$ **analyze graphs depicting motion, predict future motion (e.g., graphs, tables, charts) - *models***

6.62 relate wave lengths and/or frequency to position on electromagnetic spectrum (e.g., colors, x-ray) - *models*

6.63 **review fundamental earth science concepts including celestial relationships, air has mass and exerts pressure - *systems***

$6.64_{4,5}$ **recognize that stars are different temperatures and ages - *systems***

$6.65_{3,5,7,8,10,11}$ **identify and investigate Earth's resources (e.g., use and abuse, energy sources, how man's utilization affects the environment) - *changes***

$6.66_{9,10,11}$ **probe atmospheric conditions (e.g., composition, interactions)- *changes***

6.67 summarize the forces and results of plate tectonics - *changes*

6.68 describe the factors involved in causing catastrophic meteorological and geological events - *changes*

6.69 develop an understanding in the change's of the rock record - *changes*

$6.70_{3,4,5,8,10,11}$ **identify and measure changes in weather (e.g., air temperature, speed and direction of wind, humidity, precipitation) -*changes***

$6.71_{4,7,8,9,10,11}$ **investigate weather (e.g., forecasting, data, methods, making and using maps, thunderstorms, tornadoes, hurricanes, acid rain) - *models***

$6.72_{4,9,10,11}$ **construct and explain various models (e.g., solar eclipses, lunar eclipses, rock formation including sedimentary, igneous and metamorphic) -*models***

Science History

$6.73_{5,7}$ **articulate the historical significance of scientific discoveries (e.g., as influenced by technological demands, competition, controversy, world events, personalities, societal issues)**

$6.74_{5,7}$ **compare the evolution of science concepts and theories (e.g., cells, plate tectonics, atoms, genetics)**

$6.75_{5,7}$ **examine the contributions of men and women of diverse cultures to the development of science**

Science, Technology, and Society

$6.76_{5,7,8,10}$ **give examples of how science and technology are used in daily living** ◊

$6.77_{5,7,8,10}$ **use the knowledge of science and technology to make personal decisions at the local and global levels** ◊

6.78 evaluate and critically analyze mass media reports of scientific developments and events ◊

$6.79_{5,7,8,10}$ **critically analyze the effects and impacts of science and**

technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality)

$6.80_{5,7,8,10}$ **explore the connections between science, technology, society, and career opportunities**

$6.81_{5,7,8,10}$ **analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances**

Computer/Technology

6.82 use appropriate software, audio-visual and/or multimedia materials to practice and master sixth grade instructional objectives in science

6.83 using the graphing application of appropriate software, select the suitable chart, table, or graph to display a set of data

6.84 using the graphing application of appropriate software, create tables, charts, and/or graphs

6.85 use a calculator to perform mathematical functions in data analysis

6.86 use a variety of instruments (i.e. probes, thermometers, measuring devices) to perform measurements and record data

6.87 use appropriate software to practice reading, interpreting, analyzing, and evaluating the data on a map, chart, graph, table, and diagram

6.88 use appropriate software, practice extrapolating and interpolating information from a graph

6.89 use appropriate software to practice drawing conclusions from maps, diagrams, charts, graphs, and tables

6.90 use appropriate software to practice making predictions, inferences, and hypothesis from maps, diagrams, charts, graphs, and tables

6.91 use appropriate software to practice reading an instrument

6.92 input data using correct keying, editing, and formatting techniques

6.93 use a database to sort and search data given one and/or two criteria

6.94 identify examples of copyright law violations and possible penalties

6.95 identify ethical and unethical uses of technology

6.96 recognize concerns for the future as they relate to technological changes

6.97 identify the role of technology in various careers

6.98 retrieve current data from a variety of electronic sources which might include the Internet, and/or software reference programs

Grade Seven
English Language Arts

English language arts in the seventh grade continues to build, expand, and refine prior learning. Listening and speaking instruction rigor is regarded as a skill that will help prepare students to interact and express themselves among peers, at home, and in the community. Reading comprehension and vocabulary will be developed through the use of a wide variety of literary genre. Strategies that are essential to each genre will be targeted. Writing utilizes prewriting, composing, revising, and editing skills to produce error-free, and content-rich written communication. Correct spelling will be emphasized in all writing across the curriculum. Strategies that enable students to develop spelling skill and awareness of their individual weaknesses will be utilized. Language instruction is addressed through mechanics and expression. Ability to gather, organize, interpret, and report on information gained through reading or research will be fulfilled through study skill development.

Listening/Speaking

7.1 identify and correct usage errors in oral communication ◊

7.2 exhibit appropriate speaking etiquette (e.g., speaking in turn, using proper communication in technology, demonstrating interpersonal communication)◊

7.3 $_{1,2,3,5,6,8}$ **understand multi-step oral directions to perform a task** ◊

7.4 order events chronologically in a given passage ◊

7.5 use public speaking strategies to prepare formal and informal speaking presentations ◊

7.6 identify and correct grammar errors in oral communication ◊

7.7 listen to oral communication using proper etiquette (e.g., proper theater behavior) ◊

7.8 listen to oral communication to retell information ◊

7.9 $_{2,4,5,6,8}$ **listen to specific information and construct meaning beyond the text (e.g., character's feeling)** ◊

7.10$_{5,6,8}$ **listen to oral communications and identify a synonym for a dictated word** ◊

7.11 $_{2,3,4,5,6,8}$ **listen to oral communications and distinguish between fact and opinion** ◊

7.12 listen to oral communications to determine author's purpose ◊

7.13 listen to oral communications to compare and contrast information ◊

7.14 listen to oral communications to predict outcomes ◊

7.15 draw conclusions and infer information from listening to oral communication ◊

7.16$_{1,2,5,6,8}$ **think critically about the selection to foster exploration, questioning, and imagining** ◊

7.17$_{1,2,5,6,8}$ **listen to oral communications and critique, evaluate, and summarize content from different perspectives** ◊

7.18 $_{5,6,8}$ relate personal experiences to information heard to construct new meaning ◊

Reading Comprehension

7.19$_{1,2,3,4,5,6,8,9,10,11}$ **read literary works by national and international authors to include but not be limited to biographies, short stories, science fiction, tall tales, legends, folktales, contemporary fiction, poetry, plays, and essays** ◊

7.20 respond to a wide variety of literary genre ◊

7.21$_{1,2,3,4,5,6,8,9,10,11}$ **use setting, plot, characterization, and style to determine a text's genre (e.g., science fiction, folktales)**

7.22 **locate details in a passage to promote initial understanding of text**

7.23$_{k,2,4,8,9,10,11}$ determine main idea of a passage ◊

7.24$_{k,2,3,4,5,6,9,10,11}$ **make a logical prediction based on events in a passage** ◊

7.25$_{k,2,3,4,5,6,8,9,10,11}$ **draw a conclusion to describe a character based on character's thoughts and actions**

7.26$_{k,3,4,5,6,9,11}$ interpret a character's feeling based on content of a story

7.27$_{8,10,11}$ determine the meaning of persuasive language and propaganda to determine meaning of information in functional text (e.g., advertisements) ◊

7.28$_{6,8,9,10,11}$ make inferences from functional text to make analysis of information (e.g., advertisements) ◊

7.29$_{8,9,10,11}$ justify conclusions reached from textbook information ◊

7.30 identify other sources of information to support conclusion made from textbook information ◊

7.31$_{6,9,11}$ identify and apply appropriate strategies to aid comprehension ◊

7.32$_{5,9,10,11}$ use figurative language and jargon to determine meaning of information in functional text

7.33$_{3,5,10}$ identify other sources of information for a textbook topic ◊

7.34$_{5,8,9,10}$ use graphic organizers to construct meaning of textbook passage showing important ideas and relationships among those ideas ◊

7.35$_{9,10}$ use setting, plot, characterization and author's style to determine an appropriate extension to the story

7.36$_{4,6,8,9,10}$ distinguish between information based on fact and information based on opinion ◊

7.37$_{2,3,4,5,6,8,9,10,11}$ infer meaning of a word used in context ◊

Reading Vocabulary

7.38$_{k,2,3,4,5,8,9,10,11}$ use context clues to determine the precise word to complete a given statement ◊

7.39 supply a synonym or anonym for a given word ◊

7.40$_{2,3,4,5,6,8,9,10,11}$ **determine the synonym for words in text to improve quality** ◊

7.41 determine whether the word has a literal or figurative meaning

7.42 choose from multiple word meanings to complete a statement ◊

7.43$_{2,3,4,5,6,8,9,10,11}$ **determine the definition of multiple meanings words used in context** ◊

7.44 using given words, find the meaning and word origin

7.45 identify positional words and time words in a given passage ◊

7.46 determine root/base word from a list of affixed words

7.47 use a dictionary to locate meaning of words used in a statement ◊

7.48 generate new words given a list of prefixes and suffixes

7.49 determine meaning of word based on its affix

7.50 supply appropriate word to complete a given analogy ◊

Writing

7.51$_{4,10}$ **use prewriting and drafting strategies to address specific writing purposes** ◊

7.52$_{4,10}$ **compose a composition that is focused, coherent, and has a clear and logical progression of ideas** ◊

7.53$_{4,10}$ **compose a composition that shows a smooth transition to produce a cohesive piece of writing** ◊

7.54$_{4,10}$ **use a writing prompt to develop a composition on a given topic** ◊

7.55$_{4,10}$ **use writing strategies to write for different audiences** ◊

7.56$_{4,10}$ **compose a composition with a beginning, middle, and end** ◊

7.57$_{4.10}$ compose the piece of writing that includes specific, relevant details ◊

7.58$_{4.10}$ compose sentences that are complete, varied, and economical ◊

7.59$_{4.10}$ use writing strategies to compose various types of paragraphs (e.g., informative, narrative, expository, persuasive, chronogically ordered, explanatory, compare/contrast, and cause/effect) ◊

7.60$_{4.10}$ use writing strategies to address specific types of writing (e.g., newspaper article, essay, journal, friendly letter, business letter, research, and poetry)

7.61$_{4.10}$ use revision strategies as necessary (e.g., varying sentence length, changing order, making words more exact, and edit for organizational errors) ◊

7.62$_{4.10}$ use editing strategies to correct usage, punctuation, and spelling errors ◊

7.63$_{4.10}$ demonstrate continuous progress toward mastery of penmanship

7.64$_{4.10}$ demonstrate continuous progress toward control of keyboarding in the writing process ◊

7.65 use electronic and traditional editing strategies (e.g., symbols, dictionaries) to correct spelling errors in computer generated work (e.g., proper names, homophones, [in, inn].) ◊

Spelling

7.66 acquire a written vocabulary from a wide variety of instructional sources and activities that demonstrate accurate spelling and pronunciation in their written communication across the curriculum ◊

7.67 develop spelling competency by recognizing one's own spelling weakness

7.68 use metacognition as a strategy for self-assessment ◊

7.69 use the spelling strategy of focusing on problem parts of words that are commonly misspelled (e.g., all right [alright], does [dose]) ◊

7.70 **use meaning as a strategy for spelling words correctly (e.g., bi means two, tri means three, sub means under)**

7.71 use visual and pronunciation cues as strategies for spelling (e.g., dessert, desert) ◊

7.72 use memorization as a strategy for spelling (e.g., colonel) ◊

7.73 create mnemonic devices to assist in spelling problem parts of words (e.g., mosquito --A mosquito is hard to avoid. You'd like for the mosquito to "quit" biting you) ◊

7.74 use visual and auditory cues as a strategy to spell (e.g., ise, ice, ize sh, ti, ci) ◊

7.75 use correct and exaggerated pronunciation as a strategy to spell words (e.g., identity-iden- ti-ty) ◊

7.76 identify a mismatch between homophones or homophone confusion (e.g., dear-deer, hear-here) ◊

7.77 distinguish between misuse and proper spelling of a contraction and possessive ◊

7.78 identify and spell common homophones/homonyms and homographs ◊

7.79 **spell words containing the vowel variant (ou, ie, ey) ◊**

7.80 **use generalization to spell words containing "c" sounded as "k" (e.g., candle) ◊**

7.81 **spell words with the common suffix "tion" and "ly" (e.g., subtraction, lovely) ◊**

7.82 **spell words containing "oi" and "oy" (e.g., boil, toy) ◊**

7.83 **spell words with "our" sounded as "or" (e.g., pour,**

four) ◊

7.84 **form inflectional endings when spelling words ending in "e" (e.g., stately)** ◊

7.85 **form comparative forms of words ending in "y" (e.g., easy, easier, easiest)**◊

7.86 **form past tense of words ending in "y" (e.g., played)** ◊

7.87 use electronic as well as traditional editing resources to correct spelling errors (e.g., electronic spell checker, dictionary, thesaurus) ◊

Language

$7.88_{1,2,3,4,5,6,8,9,10,11}$ **capitalize every important word in the names of particular people, places, or things (e.g., Melvin J. Harris, District of Columbia, Lincoln Memorial, Bill of Rights)** ◊

$7.89_{1,2,3,4,5,6,8,9,10,11}$ **capitalize title or their abbreviations when used with a person's name (e.g., Governor John Dodridge, Senator Stone, Dr. John, President Washington)** ◊

$7.90_{6,8,10,11}$ **capitalize proper adjectives (e.g., We ate at a German restaurant.)** ◊

7.91 capitalize the names of organizations, businesses, institutions, and agencies (e.g., National Football Association, The Status Company) ◊

7.92 capitalize the first and last words and all important words in the titles of books, newspapers, magazines, stories, songs, poems, reports, and outlines (e.g., articles, short conjunctions, and short prepositions are not capitalized unless they are the first and last word) ◊

7.93 capitalize the first word of each main topic and subtopic in an outline ◊

7.94 capitalize nationalities, languages, religions, and religious terms ◊

7.95 capitalize words showing family relationships only when they are used before a name, or when they take the place of a name (e.g., My mom is nice. When I came home from school Mom wasn't home.)

$7.96_{8,9,10,11}$ **capitalize regions of the United States (e.g., the Southwest)** ◊

7.97 capitalize names of documents (e.g., Declaration of Independence) ◊

$7.98_{8,9}$ **use comma with an introductory phrase** ◊

$7.99_{4,6,8,9,10,11}$ **use commas with conjunction between clauses (e.g., We had lunch in the park, and arrived at the parade in time for the bands.)** ◊

$7.100_{5,8,9,10,11}$ **use commas to set off an appositive from the rest of the sentence when the appositive is not necessary to the meaning of the sentence (e.g., West Virginia, the Mountain State, is very scenic.)** ◊

7.101 use a comma following an introductory prepositional phrase (e.g., Inside the right-hand dresser drawer, you will find the scarf.) ◊

$7.102_{8,9,10,11}$ **use semicolon between independent clauses** ◊

$7.103_{4,5,6,9,10,11}$ **form the possessive of a singular noun by adding an apostrophe and s (e.g., baby's rattle)** ◊

$7.104_{4,5,6,9,10,11}$ **form the plural possessive of a noun that ends in s by adding apostrophe only (e.g., teachers' lounge)** ◊

$7.105_{4,5,6,9,10,11}$ **form the possessive of a plural noun that does not end in s by adding an apostrophe and s (e.g., women's)** ◊

7.106 use a hyphen to join the parts of compound numbers, to join two or more words that work together as one adjective before a noun, or to divide a word at the end of a line (e.g., fifty-five, well-developed paragraph) ◊

7.107 use dashes to show a break of

thought in a sentence (e.g., The posters -- curiously enough -- are done in watercolor.) ◊

7.108 use parentheses to enclose an explanation that is not of major importance to a sentence (e.g., Read chapter 10 (page 26) to find the answer.) ◊

7.109$_{1,2,4,5,6,9,10,11}$ **recognize proper and common nouns** ◊

7.110 **use correct subject-verb agreement with an intervening phrase** ◊

7.111$_{8}$ use the correct subject-verb agreement with a compound subject ◊

7.112 use a compound subject with "or" or "nor" with a verb that agrees with the nearer subject (e.g., He or his brothers are ready to work.) ◊

7.113$_{8,9,10,11}$ **use a pronoun that agrees with the noun to which it refers** ◊

7.114$_{5,6,8,9,10,11}$ **use correct pronoun case (e.g., nominative, objective, possessive)** ◊

7.115 use the different types of pronouns correctly in written expression (e.g., personal, compound personal, demonstrative, indefinite, interrogative, and relative) ◊

7.116 use in a sentence and identify a personal pronoun whose antecedent is an indefinite pronoun ◊

7.117$_{3,4,6,10,11}$ **identify and use adjectives correctly** ◊

7.118 differentiate the use of adjectives and adverbs ◊

7.119 **identify and correct sentence fragments** ◊

7.120$_{1,2,3,4,5,6,8,9,10,11}$ **identify and correct awkward sentence construction (e.g., The bird flew near the girl with red feathers.)** ◊

7.121$_{1,2,3,6,8,10,11}$ **identify and correct run-on sentences** ◊

7.122$_{1,2,3,6,8,10,11}$ **identify supporting sentences in written expression** ◊

7.123$_{3,4,5,6,9,10,11}$ **identify topic sentence in written expression** ◊

7.124$_{8,10,11}$ **identify and correct redundancy** ◊

7.125$_{1,2,4,5,6,8,9,10,11}$ **make decisions about relevant and appropriate content to eliminate extraneous sentences in writing** ◊

7.126$_{8,10,11}$ **identify and use appropriate transitions in writings (e.g., however, thus, and therefore)** ◊

7.127$_{8,10,11}$ **identify and correct faulty subordination (e.g., I like baseball since I want a car.)** ◊

7.128$_{8,10,11}$ **identify appropriate use of descriptive language in written expression** ◊

7.129 **use indefinite articles correctly in writing and editing (e.g., "a" and "an")** ◊

7.130$_{3,4,6,8,10,11}$ **write and edit text using correct past perfect tense** ◊

7.131 **use "have" and "of" correctly when editing text** ◊

7.132$_{1,2,3,4,6,8,10,11}$ **identify purpose and audience in written expression** ◊

Study Skills

7.133$_{4,9}$ **demonstrate appropriate use of parts of a book such as title page, introduction, table of contents, appendix, and references**

7.134$_{4,9,10}$ **use title page, copyright page, table of contents, appendix, bibliography, glossary, and index to locate specified information**

7.135 **predict the name of an informational book given chapter names**

7.136$_{4,9,10}$ **demonstrate appropriate use of the table of contents to locate where chapter specific information can be found**

7.137$_{3,4,5,6,9,11}$ **demonstrate appropriate use of the general reference sources (e.g., dictionary,**

thesaurus, atlas, almanac, and encyclopedia, Reader's Guide, Books in Print) ◊

7.138$_{5,6}$ **identify a word that will come first in alphabetical order according to its third, fourth, and fifth letter**

7.139 identify parts of a dictionary entry

7.140$_{3,5,6,9,10,11}$ **use a set of guide words from a dictionary page to select the word that would be found on that page, preceding page, and subsequent page**

7.141$_{3,5,8,9,10,11}$ **use the various meanings of a dictionary entry to determine the meaning of a word in a sentence** ◊

7.142$_{5,6,9,10,11}$ **use dictionary entries to select the best meaning for a multi-meaning word when used in context** ◊

7.143$_{5,6,8,9,10,11}$ **determine which entry in a dictionary definition best fits meaning of a word in a sentence** ◊

7.144$_{3,4,5,6}$ **use pronunciation guide to determine sounds of letters as they appear in individual words**

7.145$_{3,4,5,6}$ **use pronunciation guide to determine number of syllables in a word**

7.146 know how to access reading material and resources in traditional or electronic catalog systems ◊

7.147$_{9,10,11}$ **use the card catalog and electronic catalog systems to determine a book's call number, title, subject, copyright, publisher, and illustrator** ◊

7.148 adjust reading rate according to purpose, prior knowledge, and nature of material

7.149 use skimming to obtain an overview or general idea of a selection ◊

7.150 use scanning to locate specific information ◊

7.151 differentiate when to use skimming and when to use scanning to obtain information

7.152 write a paragraph using prepared notes ◊

7.153 write a paragraph using an outline ◊

7.154 develop an outline that includes topics, subtopics, and details ◊

7.155$_{3,4}$ **identify a main heading from a list of topics in order to organize a report** ◊

7.156 know the purpose and use of graphic organizers (e.g., web, Venn diagram, semantic feature, analysis, T-chart)

7.157$_{4,7,11}$ **construct and read a graphic organizer for a written report for a content area**

7.158 know the purpose and be able to interpret graphic aids (e.g., graphs, charts, tables, diagrams, maps, illustrations, schedules, and timelines)

7.159 become familiar with words used on standardized tests (e.g., paraphrase, enumerate, categorize, analyze, rank)

7.160 become familiar with modifiers used in testing material (e.g., all, none, invariably, and seldom)

7.161 become familiar with various test formats (e.g., objective, essay, quantitative, and standardized)

7.162 use appropriate test taking strategies based on format

Computer/Technology

7.163 use appropriate software to practice and master seventh grade English language arts instructional objectives

7.164 use a word processor to edit a document (adjust margins, select justifcation, change fonts, and paginate) (7.60)

7.165 using a word processor, demonstrate correct keying, editing, and formatting techniques (7.60)

7.166 identify work produced by using technology as intellectual property and thus protected copyright laws

7.167 discriminate between ethical and unethical access to information

7.168 identify technological skills

required for various careers

7.169 select and use appropriate software and/or other technologies to locate and use reference sources (7.137)

7.170 develop keyboarding skills: proper posture, finger placement, keying letters, numbers, symbols, and special keys (7.64)

7.171 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts

7.172 use a word processing program to copy and move text (7.61)

7.173 use the editing functions of a word processor (spell check, grammar checker, thesaurus, outliner) (7.62, 7.65 and 7.87)

Grade Seven Mathematics

Pre-Algebra with Geometry

Replaces 7th Grade General Mathematics

The seventh grade year is an introduction to high school subjects such as algebra, geometry, probability, and statistics. Instruction focuses on preparing the student for Algebra I in the 8th grade . With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology.

Number Theory and Number Sense

$7.1_{6,8}$ compare and order integers,decimals and fractions using symbols (<,>,=) manipulatives, or graphing on a number line

7.2_{8} find powers, squares, and square roots using manipulatives, models, calculators, tables, and mental math

7.3 determine the effect of absolute value on a number or expression

7.4_{8} convert between fractions, mixed numbers, decimals, whole numbers, and percents mentally, on paper, and with a calculator

7.5 recognize and write rational numbers in the form a/b

$7.6_{6,8}$ identify pictorial representations of fractions and decimals

$7.7_{5,6,8}$ identify the place value of a digit in a decimal

7.8_{8} distinguish between prime and composite numbers

Computation and Estimation

7.9 add, subtract, multiply, and divide integers using mental math, paper/pencil, and calculators

7.10 apply the commutative property of addition and multiplication, associative property of addition and multiplication, distributive property, identity property of addition and multiplication, inverse property of addition, and multiplicative property of zero to perform mental math operations with integers and whole numbers and to simplify expressions

7.11_{8} select and use an appropriate process for estimating and computing fractions, decimals, percents, and whole numbers using mental math, paper/pencil, calculator and computer methods in traditional, non-routine

application problems

7.12$_{5,6,8}$ **use appropriate estimation strategies (overestimation, underestimation, front-end estimation, range of estimates) in problem situations including evaluating the reasonableness of a solution and missing information**

Patterns, Functions, and Algebra

7.13$_{5,6,8}$ **find missing elements in a variety of number patterns including sequences and series; apply a rule to generate a number pattern; use input/output models for functions (number machines)**

7.14$_{5,6,8}$ **simplify numerical expressions including whole numbers, integers, absolute value, and exponents using the order of operations**

7.15$_{8,9,10,11}$ **evaluate algebraic expressions containing variables with whole numbers, integers, absolute value, and exponents using the order of operations and exponent rules**

7.16 add, subtract, multiply, and divide monomials, and put it in simplest form

7.17 find and use the Greatest Common Factor and Least Common Multiple of a set of monomials or algebraic fractions using prime factorization and exponent rules

7.18$_{8,9,10,11}$ **create algebraic expressions and equations from written statements**

7.19$_{8,9,10,11}$ **use ratios and proportions to represent and solve a variety of problems, such as rates**

7.20$_{8}$ use and apply formulas in problem solving situations such as perimeter, circumference, area, volume, surface area, distance, and Celsius/Fahrenheit.

7.21 use patterns to develop the concept of negative exponents

7.22$_{8}$ **use and apply scientific notation containing positive and negative exponents in problem solving situations**

7.23 **solve linear equations containing whole numbers and integers using substitution or inverse operations for addition, subtraction, multiplication, and division**

7.24 graph inequalities (e.g., x>7) on a number line and explain the solution sets

7.25$_{3,4,5,6,8,9,10,11}$ **locate and plot points and lines with the Cartesian Coordinate Plane using ordered pairs and a table of values**

7.26$_{9,10,11}$ recognize the slope of a line through inspection and modeling and relate slope to real world situations

Probability and Statistics

7.27$_{8}$ **read and interpret multiple line graphs**

7.28$_{8,9,10,11}$ **express probability as a ratio, decimal, or percent and predict outcomes from the data obtained through student experimentation or written information**

7.29$_{9,10,11}$ construct sample spaces by listing, tree diagrams, and frequency distribution tables, and calculate combinations and permutations

7.30$_{8,9,10,11}$ **extrapolate information from multiple-line graphs, circle graphs, bar graphs, histograms, tables, and frequency distributions (tally charts)**

7.31$_{9,10,11}$ collect, organize, graphically represent, and interpret data using frequency distributions, line-plots, stem-and-leaf plots, box-and-whisker plots, and scatter plots

7.32$_{8,9,10,11}$ **determine measures of central tendency (mean, median, mode, range) and dispersion from data, graphs, tables, and experiments**

7.33$_{5,6,8}$ **determine combinations and permutations**

Geometry with Measurement

7.34$_{8}$ **identify, describe, and classify plane and space geometric figures including triangles, quadrilaterals, pentagons, hexagons, octagons, decagons, dodecagons, prisms, pyramids, cones, and spheres**

7.35 construct congruent segments and angles, perpendicular bisectors of segments, and angle bisectors using straightedge/compass, computer, and paper folding

7.36$_{2,3,4,5,6,8,9,10,11}$ **apply transformations (rotations, reflections, translations) to plane figures using physical models and graph paper**

7.37$_{2,3,4,5,6,8,9,10,11}$ discover lines of symmetry in any plane geometric figure; apply and demonstrate by paper folding, mirrors, and drawings

7.38$_{6,8,9,10,11}$ **define similar and congruent plane geometric figures and apply in problem solving situations involving proportions and scale drawings**

7.39$_{8,9,10,11}$ **find perimeter, area, circumference, and volume of plane and solid geometric figures using measurement, diagrams, or calculations**

7.40$_{9,10,11}$ use the Pythagorean Theorem to find the length of any side of a right triangle

7.41 find length, mass, and capacity in both metric and standard units using indirect and direct methods

7.42$_{5,6,8}$ **solve application problems using measurement including elapsed time and conversion of units within the same system**

7.43$_{6,8}$ **identify radius and diameter**

7.44$_{8}$ **identify parallel and perpendicular lines**

7.45$_{5,6}$ **classify angles**

Computer and Technology

7.46 use appropriate software to practice and master seventh grade instructional objectives in mathematics

7.47 use a calculator to find squares, square roots, and exponential numbers (7.2)

7.48 use a calculator to convert between fractions, mixed numbers, decimals, whole numbers, and percents (7.4)

7.49 use a calculator to solve problems with integers (7.6)

7.50 use a calculator to find combinations and permutations (7.26)

7.51 use a calculator to determine measures of central tendency and dispersion from data, graphs, tables, and experiments (7.29)

7.52 use a calculator to find perimeter, area, circumference, and volume of plane and solid figures (7.35)

7.53 use a graphing calculator to locate and plot points and lines on a Cartesian Coordinate Plane using ordered pairs and/or a table of values (7.22)

7.54 use graphing software to create graphs frequency distributions, line-plots, and scatter plots (7.28)

7.55 use a spreadsheet software to enter and edit data

7.56 practice inputting data using correct keying, editing, and formatting techniques

7.57 identify work produced by using technology as intellectual property and thus protected copyright laws

7.58 discriminate between ethical and unethical access to information

7.59 identify technological skills required for variouscareers

Grade Seven Social Studies: World Geography

The seventh grade program of study includes the five themes of geography (e.g., location, place, movement, human/environment interaction, and regions). The purpose of this program is to present a picture of a crowded world, a physical world more threatened, and global regions more competitive and interconnected. This will be accomplished through the analysis of the physical and human characteristics of world regions.

Civics

7.1 **identify the different forms of government in various world regions** ◊

$7.2_{5,8,9,11}$ **compare and contrast individual rights of citizens in a variety of world regions** ◊

7.3 **explain the impact of the United States Constitution's Preamble and Amendments on the formation of various world governments** ◊

7.4_{9} **compare and contrast the lawmaking processes of world governments** ◊

7.5 **participate in role playing exercises which demonstrates knowledge of "trial by jury"**

7.6_{11} outline the purposes and functions of major international governmental and non-governmental organizations

7.7 **compare and contrast the functions and structure of U.S. government to governments of other countries**

Economics

$7.8_{4,10,11}$ **describe the impact of technology on agriculture and industry throughout the world** ◊

7.9 **identify and compare different types of economic systems** ◊

7.10 analyze how geography influences the economy of a region

7.11_{9} **identify the impact and global effects of a "strike" on an industry** ◊

$7.12_{3,4,5,6,9}$ **describe the relationship between supply, demand, and the price of a product** ◊

7.13_{10} **define economic terms (e.g., balanced budget, budget deficit, infrastructure, primary sector, industrial sector)** ◊

7.14 explain how countries are economically interdependent ◊

7.15 identify and classify the different types of world trade organizations

7.16_{10} **analyze the operation and the importance of stock markets in the global economy (e.g., New York, London, and Tokyo stock exchanges)** ◊

7.17 analyze the technological improvements in transportation and communication that have helped create a global society ◊

$7.18_{4,56,9}$ **compare and contrast social services provided by world governments**

$7.19_{3,4,5,6,8,9,10,11}$ **draw conclusions from economic maps, charts, graphs, and timelines** ◊

Geography

7.20 compare and contrast geographic regions (e.g., physical, cultural, perceptual, economic)

7.21 compare the physical, political, cultural, and economic environments on the size and importance of regions

7.22 use correct geographic terminology

7.23 **identify and explain the advantages and disadvantages of different map projections and their uses (e.g., aerial photos, globes, charts and graphs, and polar projection)** ◊

7.24 identify how mental maps (perceptions) affect our judgments about people and places

7.25_{11} draw conclusions about information presented on special purpose maps and be able to differentiate among map types ◊

7.26 experiment with the use of directions (e.g., cardinal directions, subordinate directions, latitude, and longitude)

7.27_{9} **identify the seven continents of the world and their associated oceans, seas, rivers, and landforms**

7.28 identify countries, cities and transportation networks on maps ◊

7.29 **define the term "culture" and use the term in a geographic context (e.g., isolation, core area, movement)**

7.30 identify geographic factors and cultural factors that block the movement of ideas and innovations ◊

7.31_{9} **identify the world's climatic regions and the ways in which they influence lifestyle**

7.32 **identify how human processes impact on the world's climates by predicting the effects of extreme weather phenomena on the physical environment (e.g., pollution, clear-cutting, strip mining)**

7.33 describe the physical and human characteristics in major world regions

7.34 analyze interconnections between regions (e.g., goods and services, music, language, and religion) ◊

7.35 analyze renewable and nonrenewable resources (e.g., fossil fuels and hydroelectric power) and explain how technology affects the ways in which culture groups perceive and use their resources ◊

$7.36_{4,9,10}$ **identify emerging agricultural methods used in different regions and compare to methods used in various early civilizations**

7.37 compare and contrast the characteristics of demographic structure of population in a population pyramid (e.g., total size, birth rates, age, distribution, and doubling time) ◊

7.38 **identify and describe the patterns of immigration and effects on the distribution of cultural patterns in a region (e.g., disease, language, religion, customs, diversity)**

7.39 explain cooperation and conflict over control of the world's resources ◊

7.40 investigate and describe new geographic frontiers such as the oceans, Antarctica, and air space

7.41 analyze the growth of tourism and its impact on regional environments and culture ◊

7.42 **explain the geographic factors in the past and present growth of the world's urban centers** ◊

7.43 locate major meridians of longitude and parallels of latitude

7.44 locate and identify major world rivers, climate areas, and rain forests

History

7.45 **identify social conditions that have influenced or altered the movement of people throughout the world (e.g., slavery)** ◊

$7.46_{3,6,9}$ **draw conclusions about the effect of the environment and location on native cultures (e.g., Native Americans, Australian Aborigines, African Berbers)**

7.47 **identify religious and secular celebrations observed around the world**

$7.48_{5,8,9,11}$ **analyze changes which immigration has made on the world's physical, political, and cultural environment**

7.49_{9} **compare and contrast the**

beliefs, religion, and mythology of native cultures throughout the world

7.50$_{4,6,11}$ **identify the role of racial and ethnic minorities and women in the advancement of civil rights and key figures** ◇

7.51$_{10}$ **trace the development of early civilizations (e.g., Mesopotamia, Egypt, Greece, China, India, Sparta, Sumeria)**

7.52 **explain what occurs when people from different regions interact** ◇

7.53$_{9,11}$ **describe the role geo-politics played in historic events of the twentieth century (e.g., Cold War, Vietnam, Persian Gulf War)**

7.54$_{3,4,5,6,8,9,10,11}$ **draw world geography/history conclusions from maps, globes, charts, posters, graphs, and timelines** ◇

Review for Assessment:

7.55 **know the rule of trial by jury; and identify the purpose of the parole system in the United States**

7.56$_{4,5,6,9}$ **using basic economic vocabulary, apply the concept of supply and demand to a specific United States situation** ◇

7.57$_{4}$ **identify physical barriers to transportation in the Americas and how people adapted to the barriers (e.g., Appalachia and Rocky Mountains, Isthmus of Panama)**

7.58$_{3}$ **explain the relationship between government taxation and the provision of public services**

Computer/Technology

7.59 use appropriate software to practice and master seventh grade social studies instructional objectives ◇

7.60 use a variety of audio-visual and multi-media materials to practice and master seventh grade social studies instructional objectives ◇

7.61 practice inputting data using correct keying, editing, and formatting techniques ◇

7.62 use graphics software to create graphs, histograms, tables, and charts ◇

7.63 use graphics software to select the appropriate type of graph to display a set of data ◇

7.64 use a database to sort and search data to solve a specific problem ◇

7.65 explain how technology affects the ways in which people use their resources ◇

7.66 discriminate between ethical and unethical access to information ◇

7.67 identify technological skills required for various careers ◇

7.68 use on-line sources to obtain or exchange information ◇

Grade Seven Science

The Coordinated and Thematic Science (CATS) Seven objectives evaluate, interpret, and predict conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth/space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Seven reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources, and weather. Major concepts introduced at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy, and earth's history.

Nature of Science

7.1 develop a conceptual framework of scientific principles

7.2 recognize the interdependency of science themes and scientific concepts

7.3 evaluate the interrelationships of scientific concepts to everyday life by making informed decisions and choices using scientific reasoning and knowledge ◊

7.4$_{5,6}$ **investigate career choices in science and technology** ◊

7.5$_{5,6,,8}$ **apply skepticism, careful methods, logical reasoning, and/or creativity in investigating the observable universe (e.g., uses of natural resources, chemical and physical changes of matter; factors affecting living conditions in space vehicles)**

7.6 recognize and appreciate that scientific knowledge is subject to modification as new information challenges current theories

7.7 acquire a holistic view of scientific knowledge by integrating reading, writing, mathematics and other disciplines with the science curriculum

7.8 use a variety of activities and investigations to produce a sense of wonder about the natural world and the joy of discovery

7.9 recognize that the exploration of science is challenging and fulfilling and establishes patterns of lifelong curiosity and learning

Scientific Attitudes/Habits of Mind

7.10 cooperate and collaborate to ask questions, find answers, solve problems and conduct investigations to further an appreciation and joy of scientific discovery ◊

7.11 process and integrate experiences with prior knowledge to formulate new ideas

7.12 understand that the study of science is a dynamic process and the results are not always definite or complete

7.13$_{4,5,6,8,9,10,11}$ **formulate conclusions through close observations, logic, objectivity, perseverance and integrity in data collection (e.g., impact of natural phenomena on the environment, conservation of energy, concepts of chemical composition of living things)** ◊

Scientific Processes/Thinking Skills

7.14 recognize and apply facts, concepts, laws, and theories to explain phenomena

7.15$_{3,4,5,6,8,9,10}$ **compare and contrast objects, actions or phenomena according to similarities and**

differences in order to classify them (e.g., variations in systems and organisms, characteristics of geological time, models of earth structures)

7.16$_{3,4,5,6,8,9,10,11}$ construct and use charts, graphs, and tables to organize, display, interpret, analyze, and explain data (e.g., extrapolation, interpolation) ◊

7.17$_{3,4,5,6,8,9,10,11}$ use inferential reasoning to make logical conclusions from collected data (e.g., causes and effects) ◊

7.18$_{3,4,5,6,8,9,10,11}$ utilize experimentation to demonstrate scientific processes (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables)

7.19$_{3,4,5,6,8,9,10,11}$ develop rational thinking processes that underlie scientific approaches to problem solving by employing critical-thinking skills in applying scientific knowledge, using imagination and creativity while working individually or cooperatively (e.g., sequencing of components and processes according to order of occurrence, cause and effect of interruptions in a sequence of a system, representations involving sequencing of processes and components of a system) ◊

7.20$_{3,4,5,6,8,9,10,11}$ develop skills in the use of laboratory materials and equipment; and proper communication of scientific data collected (e.g., meter sticks, balances, thermometers, scales, graduated cylinders) ◊

Laboratory Investigations/Hands-On Learning

7.21 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

7.22 use a variety of materials and scientific instruments to conduct explorations and investigations of the natural world to explain science concepts (e.g., measure environmental conditions using appropriate instruments) ◊

7.23 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment and living organisms ◊

Science Themes and Subject Matter

7.24 develop through the study of interdependent themes including systems, changes, and models an understanding of biological, earth/space, and physical science concepts

7.25 associate hands-on activities to daily life experiences

7.26 express ideas that illustrate the relevance of science, technology, and societal issues

7.27$_{7,9,11}$ identify and describe disease causing organisms and the diseases they cause (e.g., bacteria, viruses, protozoa, fungi) - *systems*

7.28$_{3,4,5,6,8}$ evaluate how the different adaptations and life cycles of plants and animals help them to survive in different niches and environments (e.g., inherited and acquired adaptations) - *systems*

7.29$_{8,9,10,11}$ explain how human body systems work together (e.g., skeletal, muscular, and integumentary systems) - *systems*

7.30$_{3,4,5,6,8,9,10}$ predict the trends of interdependent populations if one of the limiting factors is changed - *changes*

7.31$_{5,8}$ analyze how changes in the environment have lead to variations in reproductive

adaptations (e.g., seed dispersal, egg laying, live birth) - *changes*

7.32$_{6,8,9}$ **evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, mutations) - *changes***

7.33$_{6,8}$ **analyze the differences in the growth, development and reproduction of plants (e.g., flowering and non-flowering plants) - *changes***

7.34 compare the variations in cells, tissues, and organs of the skeletal, muscular, and integumentary systems of different organisms - *changes*

7.35$_{3,4,5,6}$ **construct simple keys to differentiate among living things of similar characteristics - *models***

7.36 construct and manipulate models which show variations in living things (e.g.,skeletal, muscular, integrementary systems) - *models*

7.37$_{5,6}$ construct models of biologically important substances (e.g., organic and inorganic molecules) - *models*

7.38 differentiate among elements, compounds and mixtures - *systems*

7.39$_{3,4,6,8,10}$ differentiate mixtures as solutions, colloids or suspensions - *systems*

7.40$_{3,5,6,8,10,11}$ **evaluate types of solutions by solutes and solvents, relative concentrations, conductivity, pH, and nine types of solutions (e.g., liquid in gas, solid in solid, gas in gas) - *systems***

7.41$_{9,11}$ **studying chemical reactions involving acids and bases, follow the neutralization process using color indicators and identify the salt formed in the reaction - *changes***

7.42$_{6,8,9,10,11}$ **describe the behavior of individual particles and verify the conservation of matter while exploring the melting and freezing of pure substances - *changes***

7.43$_{6,8,9,10,11}$ **trace the energy flow into and out of materials and verify that melting and freezing occurs at the same temperature - *changes***

7.44 using pictures showing cyclical processes in nature, trace the water cycle, the nitrogen cycle, and the carbon dioxide cycle - *models*

7.45$_{6,9,11}$ **write word equations to describe chemical reactions - *models***

7.46$_{3,6,9}$ **relate characteristics of light and sound to waves (e.g., amplitude, pitch, wavelength, reflection, absorption rate, color) - *systems***

7.47 interpret characteristics of AC and DC circuits (e.g., batteries, transformers) - *systems*

7.48 experiment with simple machines to demonstrate the relationship between forces and distance - *systems*

7.49 explain the effect of gravity on falling objects (e.g., g= 9.8m/s^2, object dropped on earth and on moon) - *systems*

7.50$_{4,5,6,8,9,10,11}$ **relate physical changes to the Kinetic-Molecular Theory (e.g., molecular energy, molecular movement) - *changes***

7.51 explain qualitatively conservation of matter (e.g., water cycle, food chain, chemical reactions) - *changes*

7.52$_{8,9}$ **explain qualitatively conservation of energy (e.g., potential energy to kinetic energy) -*changes***

7.53$_{8,9}$ **recognize that energy can be changed from one form to another (e.g., electrical to heat, electrical to mechanical, heat to mechanical) - *changes***

7.54 **use vectors to represent direction of motion - *models***

7.55$_{5,6,8,9,10}$ **analyze motion graphically - *models***

7.56 **investigate application of lenses to science (e.g.,**

microscopes, telescopes, magnifying glass, periscopes) - *models*

7.57 **review fundamental earth science concepts including, motions of sun and moon, weather and topographic maps - *systems***

7.58 recognize that stars not only are different in age and size, but also in color, temperature and brightness - *systems*

7.59 **describe and compare the physical characteristics of celestial objects - *systems***

7.60_{10} **depict and relate causes of tides, surfs and currents - *systems***

7.61 examine the relationships among air masses, oceans, weather, convection currents and the sun's energy -*systems*

7.62 demonstrate how natural phenomena and societal behaviors impact the environment - *systems*

7.63 identify and summarize origin of the universe theories - *systems*

7.64 understand man's responsibility to recognize and solve problems involving the environment including solid waste management - *systems*

7.65 identify factors affecting living conditions in space - *changes*

7.66 compare and contrast geologic time - *changes*

$7.67_{4,10}$ **construct and explain various models (e.g., motions of earth, sun and moon, ocean floor structures, coastal landforms and soil erosion) - *models***

$7.68_{3,8,10,11}$ **given a topographical model or map, identify land features (e.g., mountains, rivers, valleys, lakes, glaciers, volcanoes) - *models***

Science History

$7.69_{5,6}$ **articulate the historical significance of scientific discoveries (e.g., as influenced by technological demands, competition, controversy, world events, personalities, societal issues)**

$7.70_{5,6}$ **compare the evolution of science concepts and theories (e.g., cells, plate tectonics, atoms, genetics)**

$7.71_{5,6}$ **examine the contributions of men and women of diverse cultures to the development of science**

Science, Technology, and Society

$7.72_{5,6,8,10,11}$ give examples of how science and technology are used in daily living ◊

$7.73_{5,6,8,10,11}$ use the knowledge of science and technology to make personal decisions at the local and global levels ◊

7.74 evaluate and critically analyze mass media reports of scientific developments and events ◊

$7.75_{5,6,8,10,11}$ **critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality)**

$7.76_{5,6,10}$ **explore the connections between science, technology, society, and career opportunities**

$7.77_{5,6,8,10,11}$ **analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances**

Computer/Technology

7.78 use appropriate software, audio-visual, and/or multimedia materials to practice and master seventh grade instructional objectives in science

7.79 using the graphing application of appropriate software, select the suitable chart, table, or graph to display data

7.80 using the graphing application of appropriate software, create tables, charts, and/or graphs

7.81 use a calculator to perform mathematical functions in data

analysis

7.82 use a variety of instruments (i.e. probes, thermometers, measuring devices) to perform measurements and record data

7.83 use appropriate software to practice reading, interpreting, analyzing, and evaluating the data on a map, chart, graph, table, and diagram

7.84 use appropriate software, practice extrapolating and interpolating information from a graph

7.85 use appropriate software to practice drawing conclusions from maps, diagrams, charts, graphs, and tables

7.86 use appropriate software to practice making predictions, inferences, and hypothesis from maps, diagrams, charts, graphs, and tables

7.87 input data using correct keying, editing, and formatting techniques

7.88 use a database to sort and search data to solve a specific problem

7.89 demonstrate a knowledge of how technology affects the ways in which people use resources

7.90 discriminate between ethical and unethical access to information

7.91 associate computer/technology activities with related careers

7.92 retrieve current data from a variety of electronic sources which might include the Internet, and/or software reference programs

Grade Eight
English Language Arts

English Language arts at the eight grade level is designed to encourage students to develop strategies that deal with language in real life situations. Writing focuses on prewriting, composing, and editing with emphasis on audience and use of technology. Reading comprehension and vocabulary stresses development of reading and thinking skills that enable students to comprehend and react critically to various genre of national, international, and West Virginia works. Language objectives stress mechanics language expression and organization of ideas. Study skills emphasize collection and organization to analyze information. The English Language arts curriculum is designed to prepare students for the workplace.

Listening/Speaking

8.1 identify and correct usage errors in oral communications ◊

8.2 exhibit proper speaking and listening etiquette (e.g., focusing on speaker, speaking in turn, using various communication technologies, demonstrating interpersonal communications) ◊

8.3 use public speaking strategies to prepare formal and informal speaking presentations (e.g., informational demonstrations, persuasive speeches, job interviews) ◊

$8.4_{5,6,7}$ listen to oral communication and retell in oral form relating personal experiences and constructing new meaning ◊

$8.5_{1,2,3,5,6,7}$ understand multi-step oral instructions and complete task ◊

$8.6_{2,4,5,6,7}$ listen to specific information and construct meaning beyond the text (e.g., character's feeling) ◊

$8.7_{2,4,5,6,7}$ listen to specific information and sequence in proper order ◊

$8.8_{2,4,5,6,7}$ listen to specific information to make predictions ◊

$8.9_{2,4,5,6,7}$ listen to specific information to locate main idea ◊

$8.10_{2,4,5,6,7}$ listen to specific information; identify word meaning from context ◊

$8.11_{2,4,5,6,7}$ listen to information to identify purpose of writing ◊

$8.12_{2,3,4,5,6,7}$ use critical thinking to distinguish fact from opinion; form personal opinions; make predictions and analyze outcomes ◊

$8.13_{5,6,7}$ identify synonym of unknown words by using context clues in sentences read aloud ◊

$8.14_{1,2,5,6,7}$ think critically about a selection to lead to exploration, questioning, and imagining about a selection read orally ◊

Reading Comprehension

$8.15_{1,2,3,4,5,6,7,9,10,11}$ read literary works by national and international authors to include but not limited to: short stories, science fiction, contemporary fiction, historical fiction, biographies, narratives, poetry, and West Virginia authors ◊

$8.16_{k,2,4,5,6,9,10,11}$ determine the main idea of a passage ◊

$8.17_{2,3,5,9,10,11}$ determine author's purpose by analyzing information on style of writing ◊

$8.18_{3,4,5,6,7,9,10,11}$ locate specific details in a textbook passage to promote initial understanding ◊

$8.19_{5,9,10}$ use graphic organizers to construct meaning of a textbook passage showing

important ideas and the relationship among those ideas ◊

8.20$_{k,3,4,5,6,7,9,11}$ draw a conclusion to describe characters based on their thoughts and actions ◊

8.21$_{6,9,10,11}$ justify conclusions or opinions reached from textbook information ◊

8.22$_{6,9,11}$ identify and apply comprehension strategies through the critical thinking of summarizing interpreting , evaluating, critiquing, and analyzing what is read ◊

8.23$_{10,11}$ infer meaning of a phrase used in context ◊

8.24$_{2,3,4,9,10}$ determine the sequence of events in a text to determine initial understanding ◊

8.25$_{1,2,3,4,5,6,7,9,10}$ use setting, plot, characterization and style to determine a text's genre (e.g., science fiction, folktale)

8.26$_{5,6,9,10,11}$ locate information in recreational reading to promote initial understanding

8.27$_{4,6,7,10}$ distinguish factual from opinion statements ◊

8.28$_{7,9,10,11}$ determine the meaning of persuasive language and propaganda to determine meaning of information in functional text (e.g., advertisement) ◊

8.29$_{3,4,6,7,9,10,11}$ make inferences from functional text to make analysis of information (e.g., advertisements) ◊

8.30$_{6,7,9,10,11}$ draw conclusions from functional materials to make analysis of information (e.g., advertisements) ◊

8.31$_{3,5,6,7,9,10,11}$ locate specific details in ads and other functional material to verify initial understanding

8.32$_{6,7,9,10,11}$ predict the action of a reader of persuasive writing

8.33 determine types of conflict in a short story (e.g., man vs. man, man vs. society, man vs. nature, man vs. self) ◊

8.34 identify literary techniques used in literature (e.g., irony, understatement, exaggeration, foreshadowing, etc.)

8.35 identify the elements of plot in a short story (exposition setting, complications, suspense, climax, and resolution

8.36 identify types of poetry found in literature (e.g., narrative poem, ballad, lyric poem)

8.37 identify figures of speech used by author's in selected pieces of literature (e.g., simile, metaphor, allusion, and personification)

Reading Vocabulary

8.38$_{k,2,3,4,5,6,7,9,10,1}$ determine the meaning of words from their use in context ◊

8.39$_{2,3,4,5,7,9,10,11}$ determine the definition of multiple meaning words used in context ◊

8.40$_{2,3,4,5,6,7,9,10,11}$ determine the synonym for words in text to improve quality (e.g., precise verbs, descriptive modifiers) ◊

8.41 make use of classifications to determine possible use of words

8.42 use analogy to determine relationship of new and familiar words ◊

8.43 examine connotation of words as used in selection and other possible uses ◊

8.44 identify root words and add prefixes and suffixes to change meaning ◊

8.45 identify synonyms and antonyms of selected words ◊

8.46 identify idioms and their use in passages ◊

8.47 identify homophones and homographs and determine their meaning in a selection ◊

Writing

8.48 use prewriting and drafting strategies to generate topics and plan approaches to writing tasks

8.49 use writing strategies to address specific writing purposes, (e.g., narrative, descriptive, informative,

and persuasive) in paragraphs or compositions ◊

8.50 use writing strategies to write for audiences, including peers, teachers, and employers ◊

8.51 use revision and editing strategies to delete or correct errors in organization, and content◊

$8.52_{4,7,10}$ use a writing prompt to develop a composition that contains a beginning, middle and end

$8.53_{4,7,10}$ develop a composition that is focused, coherent, and has a clear and logical progression of ideas

$8.54_{4,7,10}$ develop a composition that contains smooth transition

$8.55_{4,7,10}$ use a writing prompt to develop a composition that addresses the assigned topic

$8.56_{4,7,10}$ use a writing prompt to develop a composition that is complete, varied, and economical

$8.57_{4,7,10}$ use a writing prompt to develop a composition whose word choice is vivid, precise, and economical

$8.58_{4,7,10}$ use editing strategies to correct errors in usage, capitalization, punctuation, and spelling

8.59 demonstrate mastery of penmanship and keyboard in the writing process ◊

8.60 incorporate examples of specific parts of speech, phrases, and clauses in the writing process ◊

8.61 use and identify different types of sentences, paragraphs, and essays ◊

8.62 demonstrate the use of personal writing for pleasure and enjoyment (e.g., journals, friendly letters) ◊

8.63 make use of functional types of writing (e.g., book reports, friendly letters, essay questions, and outlining) ◊

8.64 use electronic and traditional editing strategies (e.g., symbols, dictionaries) to correct spelling errors in computer generated work (e.g., proper names, homophone, [in, inn].) ◊

Spelling

8.65 identify and spell common homophones/homonyms (words that have different spellings an meaning but one pronounced the same (e.g., stake and steak) ◊

8.66 **use generalization to spell words containing "c" sounded as "k" (e.g., candle)** ◊

8.67 **spell words containing "oi" and "oy" (e.g., soil, boy)** ◊

8.68 **use visual cues as a strategy to spell words containing the sound "sh" (e.g., partial, special, dish)** ◊

8.69 form plurals of words ending with "sh" (e.g., wish, wishes) ◊

8.70 **spell words containing "y" sounded as "i" (e.g., my) and comparative forms ending in "y" (e.g., busy, busier, busiest)** ◊

8.71 **use meaning as a strategy for spelling prefixes "bi", "re", and "mis" (e.g., bilateral, reread, misunderstand)** ◊

8.72 **spell words with suffix "tive" (e.g., protective)** ◊

8.73 form inflectional endings on words ending in "e" (e.g., participate, participation) ◊

8.74 **form correct spelling of word when adding common endings (e.g., s, es)** ◊

8.75 **develop spelling competency by recognizing one's own spelling weakness** ◊

8.76 use syllabication as a strategy for spelling words ◊

8.77 use visual and pronunciation cues as strategies for spelling (e.g., dessert, desert) ◊

8.78 distinguish between misuse and proper spelling of a contraction and possessive ◊

8.79 focus on problem words that are commonly misspelled ◊

8.80 use memorization and/or mnemonic strategies to help spell problem parts of words (e.g., Tell these mosquitoes to quit biting

me) ◇

8.81 acquire a written vocabulary from a wide variety of instructional sources and activities in written communication across the curriculum ◇

8.82 use electronic editing tools as well as traditional editing resources to correct spelling errors (e.g., electronic spell checker, dictionary, thesaurus) ◇

Language

8.83$_{1,2,3,4,5,6,7,9,10,11}$ **capitalize titles of people (e.g., President Jefferson)** ◇

8.84$_{6,7,9,10,11}$ **capitalize geographic names and directions that are used to name a region (e.g., The West has many very large states.)** ◇

8.85$_{6,7,10,11}$ **capitalize proper adjectives (e.g., German steel)** ◇

8.86 **capitalize brand names, organizations, business firms, institutions, and government bodies** ◇

8.87 capitalize historical events and periods, special events, and calendar events ◇

8.88 capitalize nationalities, races, religions, academic courses, and languages ◇

8.89 capitalize particular places, things, events, and awards ◇

8.90$_{7,9,10,11}$ **use a comma with an introductory phrase** ◇

8.91$_{4,6,7}$ **use commas with a conjunction between independent clauses (e.g., We had lunch on the bus, and it was fun.)** ◇

8.92$_{5,7,9,10,11}$ **use commas with appositives** ◇

8.93$_{4,9}$ **use commas with conjunctions in compound sentences** ◇

8.94 **use commas to separate items in a series** ◇

8.95 **use comma to separate two or more adjectives preceding a noun** ◇

8.96 use comma to set off nonessential clauses and nonessential participial phrases ◇

8.97 use commas to set off sentence interrupters (e.g., appositives, nonessential phrases and clauses) ◇

8.98 use commas in certain situations (e.g., dates and addresses, parts of letters, abbreviations after names) ◇

8.99$_{7,9,10,11}$ **use a semicolon between independent clauses** ◇

8.100 use a semicolon between items in a series if the items contain commas ◇

8.101$_{5,6,10,11}$ **use a colon to introduce a list of items** ◇

8.102 use a colon after the salutation of a business letter ◇

8.103 use a colon between numerals that represent hours and minutes and between chapter and verse in a biblical reference ◇

8.104 use correctly hyphens, dashes, and parentheses in written expression ◇

8.105 use quotation mark correctly when punctuating titles and dialogue ◇

8.106 identify parts of a sentence (e.g., subject, verb, and complement) ◇

8.107$_{7,9,10,11}$ **use correct pronoun antecedent in sentences** ◇

8.108 use correct pronoun case in written expression (e.g., nominative, objective, possessive) ◇

8.109 use the different types of pronouns correctly in written expression (e.g., personal, demonstrative, interrogative, compound personal, indefinite, and relative) ◇

8.110$_{7,9}$ **use the correct subject verb agreement with a compound subject** ◇

8.111$_{6}$ **differentiate the use of adjectives and adverbs** ◇

8.112$_{6}$ **use adverbs correctly in written expression** ◇

8.113$_{1,2,4,6,10,11}$ **write and edit text using**

correct present tense ◊

8.114 **write and edit text using correct past tense** ◊

8.115 write and edit text using correct future tense ◊

8.116$_{7,9,10,11}$ **identify appropriate use of descriptive language in written expression** ◊

8.117$_{7,10,11}$ **identify and correct misplaced modifiers** ◊

8.118$_{1,2,3,4,5,6,7,9,10,11}$ **identify and correct awkward sentence construction** ◊

8.119$_{3,4,5,7,9,10,11}$ **identify and correct run-on sentences** ◊

8.120$_{5,6,7,9,10,11}$ **identify and correct redundancy** ◊

8.121$_{5,10,11}$ **identify and correct faulty parallel sentence structure** ◊

8.122$_{6,7,9}$ **identify and correct faulty subordination (e.g., I like hamburgers since I want candy.)** ◊

8.123 identify and punctuate complex sentences ◊

8.124$_{7,9,10,11}$ **identify and use appropriate transitions in writings** ◊

8.25$_{1,2,4,5,6,7,9,10,11}$ **make decisions about relevant and appropriate content to eliminate extraneous sentences in writing** ◊

8.126$_{3,4,6}$ **organize information by combining sentences** ◊

8.127$_{1,2,3,4,5,6,7,9,10,11}$ **identify the purpose and audience in written expression** ◊

8.128 identify thesis statements in written expression ◊

8.129$_{1,2,3,5,6,7,10,11}$ **identify supporting sentences in written expression** ◊

Study Skills

8.130$_{4,9}$ **demonstrate appropriate use of parts of a book such as title page, introduction, table of contents, appendix and references**

8.131$_{9,10,11}$ **use the card catalog or on-line catalog systems to determine a book's call number, author, publisher, publisher and artist, (an artist is an illustrator)** ◊

8.132$_{3,4,5,6,7}$ **use a pronunciation guide to determine numbers of syllables in a word, and sounds of letters as they appear in individual words**

8.133$_{5,6,7,9,10,11}$ **use dictionary entries to select the best meaning for a multi-meaning word when used in context**

8.134$_{4,9,10}$ **demonstrate appropriate use of a contents page to locate which chapter specific information can be found** ◊

8.135$_{4,9,10}$ **use table of contents and index to locate information** ◊

8.136 **given chapter names in an informational book, predict the type of book**

8.137$_{4,10,11}$ **construct and read a graphic organizer for a written report for a content area**

8.138$_{3,4}$ **identify a main heading from a list of topics in order to organize a report (e.g., food, needs, clothing, and shelter)** ◊

8.13 use study skills of scanning, skimming, and reading for mastery to prepare for a test

8.140 develop strategies for effective reading prior to a test (e.g., scanning, skimming, finding main idea, and paraphrasing)

8.141 organize information to classify, compare and contrast, and make analogies to answer questions on a test

8.142 evaluate resources by gathering and evaluating evidence to make appropriate conclusions about information

8.143 develop skills in outlining main points, summarizing, and noting important examples to evaluate information ◊

8.144 use available technologies to gather information (e.g., thesaurus, and other software programs ◊

Computer/Technology

8.145 use appropriate software to practice and master eighth grade English language arts instructional objectives
8.146 convert a word processing document into a simple desktop publishing document
8.147 using a word processor, demonstrate correct keying, editing, and formatting techniques (8.51)
8.148 distinguish between private and public data/information
8.149 identify technological skills required for various communication careers
8.150 use a word processing program to copy and move text (8.51)
8.151 use the editing functions of a word processor (spell check, grammar checker, thesaurus, outliner) (8.58, 8.64 and 8.82)
8.152 use a word processing program to produce a report that contains centering, tabs, and more than one paragraph (8.51)
8.153 develop keyboarding skills: posture, finger placement, keying letters, numbers, symbols, and special keys (8.59)
8.154 use graphic software to create, read, interpret and organize information in the form of tables, graphs, diagrams and charts
8.155 select and use appropriate software and/or other technologies to locate and use reference sources (8.144)

Grade Eight Mathematics

Pre-Geometry with Algebra

Replaces 8th Grade General Mathematics

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

Number Theory and Number Sense

8.1$_{9,10,11}$ compare and order rational and irrational numbers using Venn Diagrams, number lines, symbols (<,>,=), manipulatives, calculators, computer, and definitions
8.2 describe the properties of terminating, repeating, and non-repeating decimals and convert between fractions, mixed numbers, and decimals mentally, with paper/pencil, or a calculator
8.3 extend scientific notation to numbers with a wide range of values using a calculator when appropriate
8.4$_{7}$ find powers, squares, and square roots
8.5$_{7}$ distinguish between prime and composite numbers
8.6$_{6,7}$ identify pictorial representations of decimals
8.7$_{5,6,7}$ identify the place value of a digit in a decimal

Computation and Estimation

8.8 solve consumer application problems including tips, discounts, sales tax, and simple interest using mental

math, paper/pencil, or calculator

8.9$_{6,7,9,10,11}$ **solve ratio and proportion problems including rates, scale drawings, similar polygons, and estimating populations**

8.10$_{5,6,7}$ **use estimation techniques (front-end, rounding, clustering, and compatible numbers) with whole numbers, decimals, money, percent, fractions, and mixed numbers to solve or to verify solutions in application problems**

8.11$_{5,6,7}$ **add, subtract, multiply, or divide fractions, mixed numbers, and integers resulting from problem situations using mental math, paper/pencil, and calculators**

8.12 develop computational strategies based on the commutative, associative, and identity properties with emphasis on the inverse and distributive properties

8.13$_{9,10,11}$ **solve traditional and non-routine problems, which may include missing information, using appropriate tools**

Patterns, Functions, and Algebra

8.14$_{9,10,11}$ **use order of operations and exponent rules to evaluate and simplify numerical and algebraic expressions containing whole numbers, integers, absolute value, fractions, or exponents**

8.15$_{9,10,11}$ **solve one and two step linear equations and inequalities with integer, fraction and decimal solutions, graphing solutions when appropriate**

8.16$_{9,10,11}$ analyze problems by identifying relationships, discriminating relevant from irrelevant information, sequencing, observing patterns, prioritizing, and questioning

8.17$_{9,10,11}$ **identify algebraic equations and expressions equivalent to a problem expressed in words**

8.18$_{9,10,11}$ solve problems using appropriate methods such as equations, formulas, expressions, charts or drawings

8.19$_{9,10,11}$ **apply inductive reasoning to write a rule from data in a function table**

8.20 disprove mathematical conjectures by using counter-examples

8.21$_{9,10,11}$ **plot lines within the Cartesian Coordinate Plane using ordered pairs and table of values**

8.22$_{5,6,7}$ **use input/output models for functions (number machines)**

8.23$_{k,1,2,3,4,5,6,7}$ **find missing elements in numeric patterns**

Probability and Statistics

8.24$_{5,6,7,9,10,11}$ **use combinations and permutations in application problems**

8.25 investigate and describe the difference between the probability of an event found through simulation or experiment versus the theoretical probability of the same event

8.26$_{9,10,11}$ **extrapolate information from multiple-bar graphs, stem-and-leaf plots, histograms, scattergrams, tables, and frequency distributions (tally charts)**

8.27$_{1,2,3,4,5,6,7}$ **analyze problem situations, such as games of chance or consumer applications, and use a statistical sampling to make predictions**

8.28$_{5,6,7,9,10,11}$ **determine measures of central tendency (mean, median, mode, range), and dispersion from data, graphs, tables, and experiments**

8.29 investigate and recognize misuses of statistical or numeric information

8.30$_{9,10,11}$ draw inferences and construct convincing arguments

based on data analysis

Geometry with Measurement

8.31 **calculate area and circumference of circles using radius and diameter**

$8.32_{7,9,10,11}$ **use the concept of volume for prisms/cylinders as the product of the area of the base and the height**

8.33 use the concept of volume for cone/pyramids as one-third the product of the base and the height

$8.34_{9,10,11}$ **find angle measures; estimate and solve application problems involving perimeter, area, surface area, and volume of plane and solid geometric figures**

$8.35_{9,10,11}$ **solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models, or definitions**

$8.36_{9,10,11}$ solve right triangle problems using the Pythagorean Theorem, indirect measurement, and definitions

8.37 discover and verify the value of pi using measurement of physical models

8.38 **create geometric patterns including tiling, art design, tessellations or scaling using transformations (rotations, reflections, and translations)**

8.39 construct segments, angles, perpendicular bisectors, and angle bisectors

8.40 draw two and three-dimensional figures as a means to solve problems

8.41 **graph similar figures, reflections, translations, linear equations, and linear equalities on a coordinate plane**

8.42_{7} **identify parallel and perpendicular lines**

$8.43_{9,10,11}$ investigate the relationship between angles when parallel lines are cut by a transversal using models, pencil/paper, or graphing calculator

$8.44_{5,6,7,9,10,11}$ **measure in both the customary and metric systems; convert units within the same system**

8.45 **classify polyhedrons by components (faces and edges)**

Computer and Technology

8.46 use appropriate software to practice and master eighth grade instructional objectives in mathematics

8.47 use a calculator to compare rational and irrational numbers (8.1)

8.48 use a calculator to convert between fractions, mixed numbers, and decimals (8.2)

8.49 use a calculator to solve consumer application problems (8.4)

8.50 use a calculator to solve problems with fractions, mixed numbers, and integers resulting from problem situations (8.7)

8.51 use a calculator to determine measures of central tendency, range, and dispersion from data, graphs, tables, and experiments. (8.22)

8.52 use a calculator to find area and circumference of a circle. (8.25)

8.53 use a scientific calculator to extend scientific notation to numbers with a wide range of values (8.3)

8.54 use a graphing calculator to solve one and two step linear equations and inequalities with integers, fractions and decimals (8.11)

8.55 use a graphing calculator to plot lines within the Cartesian Coordinate Plane using ordered pairs or tables of values (8.17)

8.56 use a graphing calculator to investigate the relationships between angles formed when parallel lines are cut by a transversal (8.36)

8.57 use a spreadsheet and/or database to sort and search data, set up formulas, create graphs and charts, and analyze data

8.58 practice inputting data using correct keying, editing, and formatting techniques

8.59 distinguish between private and public data/information

8.60 identify technological skills required for various mathematical careers

Grade Eight Social Studies: West Virginia Studies

The eighth grade program of study consists of a comprehensive course on West Virginia, from the Pre-Columbian period to present day. Special emphasis is placed on the interdependence of geographic, cultural, political, environmental, and economic factors involved in the history of the state.

Civics

8.1_9 identify major responsibilities and powers of the United States, West Virginia, and local governments as specified by the United States and West Virginia Constitutions

$8.2_{3,4,5,6,7,9,10,11}$ analyze the shared powers and responsibilities of the executive, legislative and judicial branches of United States and West Virginia state government and how the system of checks and balances limits those powers ◊

$8.3_{3,5,6}$ identify the duties and requirements for office of elected officials and representatives at the national, state and local levels (e.g., President, Governors, Senators, Representatives/Delegates, Members of Board of Public Works, County Commission)

$8.4_{6,9,10}$ identify fundamental American principles by using primary source documents and significant political speeches and writings

8.5 identify major sources and uses of revenue for state and local governments (e.g., property tax, income tax, fees and licenses, excise tax, levies) ◊

8.6 identify the major purposes and provisions of the West Virginia Constitution and the processes by which it can be changed ◊

8.7 describe the components of the lawmaking process

$8.8_{3,5,10}$ identify types of laws which are made at the national, state, and/or local levels

8.9 analyze the functions and jurisdictions of the federal, state, local, and juvenile courts (e.g., United States Supreme Court, State Supreme Court, Circuit Courts, Magistrate Courts, specialized courts)

8.10_6 identify individual rights protected by the United States and West Virginia Constitutions and laws ◊

8.11 identify various types of elections in West Virginia (e.g., primary/general, state/local, partisan/non-partisans)

8.12 trace the evolution of suffrage from colonial America to the present and relate to West Virginia

8.13 describe how citizens can participate in government at the local, state, and national levels (e.g., voting, community service, letter writing), and benefit the individual and community ◊

8.14 research and describe how special interest groups influence government and the law-making process in West Virginia ◊

8.15 evaluate information from various sources (e.g., newspapers,

advertisements, cartoons, editorials) and make choices on public issues and candidates for political office in West Virginia ◊

Economics

8.16 determine the factors that caused West Virginia to become a leader in the production of salt, coal, and electricity

8.17 identify industries and products (e.g., tourism, coal, glass, recreation, agriculture) that are important to the economy of the four regions of West Virginia ◊

8.18 **describe how West Virginia's economic condition affects social conditions (e.g., employment, in/out migration)** ◊

8.19 analyze the changes in West Virginia's economy and people due to industrial development ◊

8.20 define and explain the importance of West Virginia's renewable and non-renewable resources and how absentee ownership of these impacts the state's economy ◊

8.21 identify the labor/management strategies that have affected West Virginia's economy (e.g., strikes, boycotts, yellow-dog contracts) ◊

8.22_{10} **analyze the effects of national and state governmental actions on West Virginia's economy** ◊

$8.23_{3,10}$ **use a graph to draw conclusions about how national spending affects West Virginia** ◊

8.24 **analyze the importance of banking in West Virginia's economy (e.g., savings, interest, loans)** ◊

8.25 **explain the benefits of trade to West Virginia's economy** ◊

$8.26_{6,11}$ **examine the effect of technological changes on West Virginia's economy (e.g., in employment, agriculture, tourism, education, industry)** ◊

8.27 **examine economic reasons for the deterioration of some "downtown" areas in twentieth century West Virginia and the renaissance of others** ◊

Geography

$8.28_{4,5,6}$ **describe West Virginia's location in relationship to the Prime Meridian, Equator, Tropic of Cancer, Tropic of Capricorn, Arctic and Antarctic Circles**

8.29 identify West Virginia's location by longitude and latitude including degrees, minutes, and seconds

8.30 identify West Virginia's man-made and natural borders

8.31 identify the location of West Virginia in relationship to neighboring states and the eastern United States

8.32 use a map to identify the four major geographic regions, major rivers, landforms, and points of interest in West Virginia ◊

$8.33_{3,4,5,9}$ **draw conclusions about climate, landforms, and resources in West Virginia's four geographic regions using special purpose maps** ◊

8.34 **identify West Virginia's geographic regions through reading descriptive literature** ◊

8.35 use a map to identify the counties and major cities in West Virginia

8.36_{5} **describe West Virginia's climate and its effect on people's lives**

8.37_{11} **use a map to explain the settlement, exploration, and population patterns of West Virginia in relation to geographic features** ◊

8.38 cite reasons for the development of the West Virginia transportation system ◊

$8.39_{4,5,8,9,10,11}$ **identify the geographic**

factors which lead to development of agriculture, coal, glass, chemical, metallurgical and tourism industries in West Virginia ◊

8.40$_{4,5,9,10,11}$ **explain how the cultural and economic isolation of different areas of the United States and West Virginia has been changed through technological advances (e.g., TV, radio, telephone, computers, highways)** ◊

History

8.41 identify characteristics of various Native American cultures in West Virginia from the pre-Columbian period to the arrival of Europeans

8.42 list reasons for exploration , major explorers, their routes, and discoveries in the western Virginia frontier

8.43 **compare and contrast French and English explorers, settlers, and settlements on the western Virginia frontier**

8.44$_{5,6}$ sequence the events and incentives for Virginia's expansion west to the Ohio River

8.45 describe the European-Native American cultural conflict as it relates to West Virginia

8.46 explain reasons for and resulting consequences of conflicts and wars as they pertain to the development of West Virginia (e.g., French and Indian War, American Revolution, Civil War) ◊

8.47$_{7,9}$ **explain the effect of immigration on West Virginia's and America's culture from European settlement through the early twentieth century**

8.48 explain the conflicts between eastern and western Virginia and sequence the events that led to the formation of the state of West Virginia

8.49$_{5,6}$ **identify men and women in West Virginia who have made significant contributions to our history in the public and/or private sectors (statehood movement, Abolition movement, education, industry, literature)** ◊

8.50$_{4,6,10}$ **match representative quotes about historical events in West Virginia and United States to the person who most likely held that view**

8.51$_{3}$ **identify the types of transportation which facilitated the growth of West Virginia and western expansion** ◊

8.52 **trace the evolution of the labor movement in West Virginia and the United States** ◊

8.53 identify the role of ethnic and racial minorities and women in West Virginia's history through contemporary society

8.54$_{4,11}$ **sequence and analyze the impact of contemporary social, economic, and technological developments on West Virginia's and the United States' people and culture** ◊

8.55$_{11}$ **draw conclusions about West Virginia and other areas from various types of charts, graphs, maps, pictures, models, and timelines** ◊

Review for Assessment:

8.56 **describe problems faced by Washington upon becoming the first United States President**

8.57$_{3,4,5,6,7,9,10,11}$ **explain the law of supply and demand** ◊

8.58 **describe the unique contributions and characteristics of Arab/Islamic society throughout history**

Computer/Technology

8.59 use appropriate software to practice and master eighth grade social studies instructional objectives ◊

8.60 use a variety of audio-visual and multi-media materials to practice and master eighth grade social

studies instructional objectives ◊

8.61 practice inputting data using correct keying, editing, and formatting techniques ◊

8.62 use graphics software to create graphs, histograms, tables, and charts ◊

8.63 read, interpret, and draw conclusions from graphs, charts, and tables ◊

8.64 use a database to sort and search data to solve a specific problem ◊

8.65 distinguish between private and public data/information ◊

8.66 identify various careers in the field of technology ◊

8.67 discriminate between legal and illegal use of electronic information (including material that is protected by copyright) ◊

8.68 examine the effect of technological changes on West Virginia's economy (employment, agriculture, tourism, education, industry, etc.) ◊

8.69 examine the effect of technological changes on West Virginia's culture (e.g., television, radio, telephone, computers, the Internet) ◊

8.70 use on-line sources to obtain or exchange information ◊

8.71 sequence technological developments (e.g., printing press, television, radio, and computer)

Grade Eight Science

The Coordinated and Thematic Science (CATS) Eight objectives analyze, quantify, and explain conditions and phenomena of the living and designed worlds. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics, and earth/space sciences. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes and models. Students will engage in active inquires, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities. CATS Eight reviews elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy, and earth's history. Major concepts introduced at the eighth grade level include reproduction, genetics, behavior, chemical reactions, and environmental concerns.

Nature of Science

8.1 develop a conceptual framework of scientific principles

8.2 recognize the interdependency of science themes and scientific concepts

8.3 evaluate the interrelationships of scientific concepts to everyday life by making informed decisions and choices using scientific reasoning and knowledge ◊

$8.4_{5,6,7}$ **investigate career choices in science and technology ◊**

$8.5_{5,6,7}$ **apply skepticism, careful methods, logical reasoning, and/or creativity in investigating the observable universe (e.g., effect of human existence on the biosphere, fundamentals of genetics, sampling techniques involved in data collection)**

8.6 recognize and appreciate that scientific knowledge is subject to modification as new information challenges current theories

8.7 acquire a holistic view of scientific knowledge by integrating reading, writing, mathematics and other disciplines with the science curriculum

8.8 use a variety of activities and investigations to produce a sense of wonder about the natural world

and the joy of discovery

8.9 recognize that the exploration of science is challenging and fulfilling and establishes patterns of lifelong curiosity and learning

Scientific Attitudes/Habits of Mind

8.10 cooperate and collaborate to ask questions, find answers, solve problems and conduct investigations to further an appreciation and joy of scientific discovery ◊

8.11 process and integrate experiences with prior knowledge to formulate new ideas

8.12 understand the study of science is a dynamic process and the results are not always definite or complete

$8.13_{4,5,6,7,9,10,11}$ **formulate conclusions through close observations, logic, objectivity, perseverance and integrity in data collection (e.g., Newton's Laws of Motion, forces causing the construction and destruction of topographical features, how to illustrate the path of waves traveling through different media)** ◊

Scientific Processes/Thinking Skills

8.14 recognize and apply facts, concepts, laws, and theories to explain phenomena

$8.15_{3,4,5,6,7,9,10}$ **compare and contrast objects, actions or phenomena according to similarities and differences in order to classify them (e.g., refraction and reflection of light, how waves travel through different materials, how to represent forces as vectors)**

$8.16_{3,4,5,6,7,9,10,11}$ **construct and use charts, graphs, and tables to organize, display, interpret, analyze, and explain data (e.g., extrapolation, interpolation)** ◊

$8.17_{3,4,5,6,7,9,10,11}$ **use inferential reasoning to make logical conclusions from collected data (e.g., causes and effects)** ◊

$8.18_{3,4,5,6,7,9,10,11}$ **utilize experimentation to demonstrate scientific processes (e.g., formulating questions, predicting, forming hypotheses, quantifying, identifying dependent and independent variables)**

$8.19_{3,4,5,6,7,9,10,11}$ **develop rational thinking processes that underlie scientific approaches to problem solving by employing critical-thinking skills in applying scientific knowledge, using imagination and creativity while working individually or cooperatively (e.g., properties of substances and environmental impact, adaptations of organisms to their habitat, methods of classifying common organisms by observable characteristics)** ◊

$8.20_{3,4,5,6,7,9,10,11}$ **develop skills in the use of laboratory materials and equipment; and proper communication of scientific data collected (e.g., meter sticks, balances, thermometers, scales, graduated cylinders)** ◊

Laboratory Investigations/Hands-On Learning

8.21 engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and laboratory skills

8.22 use a variety of materials and scientific instruments to conduct explorations and investigations of the natural world to explain science concepts (e.g., measure environmental conditions using appropriate instruments) ◊

8.23 demonstrate safe techniques for handling, manipulating and caring for science materials, equipment and living organisms ◊

Science Themes and Subject Matter

8.24 develop through the study of interdependent themes including systems, changes, and models an understanding of biological, earth/space, and physical science concepts

8.25 associate hands-on activities to daily life experiences

8.26 express ideas that illustrate the relevance of science, technology, and societal issues

8.27 summarize problems related to water on earth as a life sustaining substance (e.g., quality and quantity of surface and ground water)

8.28$_{10}$ **identify and explain the structures and functions of cell organelles (e.g., mitochondria, cell membrane, nucleus) - *systems***

8.29$_{10}$ **discuss the interdependencies within and among organelles, cells, tissues, organs, and systems - *systems***

8.30$_{7,9,10,11}$ **explain how human body systems work together (e.g., circulatory, respiratory, reproductive systems) - *systems***

8.31$_{3,4,5,6,7,9,10}$ **analyze how structures, functions and behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, seed dispersal) - *systems***

8.32$_{3,4,5,6}$ **group unknown organisms into correct taxonomy based on observable characteristics (e.g., use dichotomous keys) - *systems***

8.33$_{7,9,10,11}$ **compare the variations in cells, tissues, and organs of the circulatory, respiratory, and reproductive systems of different organisms - *changes***

8.34$_{4,5,6,9,10,11}$ **design an environment in which the chemical and energy needs for the growth, reproduction and development of plants are met (e.g., food pyramids, decomposition) - *models***

8.35$_{4,6,8,10,11}$ **demonstrate how living cells obtain the essentials of life (e.g., transpiration, respiration, photosynthesis) - *models***

8.36$_{9,11}$ demonstrate the basic principles of genetics (e.g., Mendel's laws, DNA, monohybrid crosses, production of sperm and egg, production of body cells, genes, chromosomes, inherited traits) - *models*

8.37 construct and manipulate models which show variations in living things (e.g., circulatory, respiratory, reproductive systems) -*models*

8.38$_{9,10,11}$ **classify chemical reactions as endothermic and exothermic - *systems***

8.39$_{11}$ identify elements as metallic, non-metallic or metalloid and locate them on the periodic table - *systems*

8.40$_{11}$ assign each element to its chemical family on the periodic table and note similarities in outer energy, level electrons within each family - *systems*

8.41$_{3,6,10,11}$ **utilize properties of acidity, conductivity, and solubility to classify substances - *systems***

8.42$_{6,9,11}$ classify chemical reactions as synthesis, decomposition, single replacement or double replacement and identify the oxidation reactions (e.g., elements or compounds combing with oxygen) - *systems*

8.43$_{9,10,11}$ **identify acid-base reactions and verify that matter is conserved in chemical reactions - *systems***

8.44$_{6,7,9,10,11,12}$ **identify chemical reaction factors that might affect the reaction rates including catalysts, temperature changes, light energies, and particle size - *changes***

8.45$_{10}$ evaluate gaseous systems noting the variation in diffusion rates - *changes*

8.46$_{6,7,9,10,11}$ **examine the expansion of gases at elevated temperatures**

- ***changes***

8.47$_{10}$ draw Bohr's Model for each element identifying protons, neutrons, and electrons for each element - *models*

8.48$_{11}$ **write word equations for chemical reaction - *models***

8.49$_{4,5,6,7,10,11}$ **relate physical properties of matter to everyday life (e.g., reflection/refraction, magnetism/compasses, density of regular/irregular objects, temperature/molecular movement, pendular motions and other vibrating objects) - *systems***

8.50 identify sources of energy (e.g., petroleum refinement, windmills, geothermal) - *systems*

8.51 describe Newton's Laws of Motion and identify examples (e.g., sailboat, bouncing balls, firing a rifle) - *systems*

8.52 interpret and illustrate changes in waves as they pass through various mediums (e.g., sound through water and metal, light through thicknesses of glass) - *changes*

8.53$_{7,9,10,11}$ **describe how sound is perceived by the ear (e.g., range of hearing, frequency, amplitude) - *changes***

8.54$_{7,9}$ **apply the conservation of energy theory to energy transformations (e.g., electrical/heat, heat/mechanical) - *changes***

8.55 quantitatively represent work, power, pressure (e.g., W=f x d, P=W/t, pressure =force/area) - *models*

8.56$_{5,6,7,9,10}$ **draw vector quantities (e.g., displacement, velocity, force) - *models***

8.57$_{5,6,7,9,10}$ **graph and interpret the relationships (e.g., distance versus time, speed versus time, acceleration versus time) - *models***

8.58$_{9,10}$ **illustrate qualitatively and quantitatively Newton's Laws of Motion (e.g., F=m x a, D=v x t, p= m x v, simple machines, W= f x d) - *models***

8.59 illustrate quantitatively mechanical advantage of simple machines - *models*

8.60 **review fundamental earth science concepts including the characteristics of stars, topographic maps and weather maps - *systems***

8.61 **compare and contrast the orbits of planets and comets - *systems***

8.62 **relate rock formation to the types of fossil fuels - *systems***

8.63 identify resources as being renewable or non-renewable - *systems*

8.64 summarize and explain the principle of plate tectonics - *systems*

8.65 explore the societal effects of meteorological phenomena - *systems*

8.66 describe the factors involved in mining resources - *systems*

8.67 compare and contrast the different types of galaxies (e.g., shape, size, components) - *systems*

8.68 recognize societal concerns with exploration and colonization of space - *systems*

8.69$_{3,5}$ **relate climatic patterns and change to Earth's revolution and tilt of the axis - *changes***

8.70 examine energy transfer in Earth science (e.g., forces in construction of topographical features, causes of geological phenomena, interaction of atmosphere and oceans) - *changes*

8.71$_{3,4,5,6,7,9,10,11}$ **diagram the motions of the Sun, Moon, and Earth and explain the astronomical phenomena associated with these motions with an emphasis on gravitational variances - *models***

8.72$_{5,6}$ **use a variety of instruments to gather data (e.g., mass, temperature, electrical current, air pressure, wind direction, wind speed, and humidity) - *models***

8.73 construct and interpret rock layer

models through stratigraphic interpretation (e.g., age, environment when deposited) - *models*

8.74$_5$ **determine the relationship between the Earth's magnetism and directions on the Earth's surface through the construction and use of a compass - *models***

Science History

8.75$_{5,6,7}$ **articulate the historical significance of scientific discoveries (e.g., as influenced by technological demands, competition, controversy, world events, personalities, societal issues)**

8.76$_{5,6,7}$ **compare the evolution of science concepts and theories (e.g., cells, plate tectonics, atoms, genetics)**

8.77$_{5,6,7}$ **examine the contributions of men and women of diverse cultures to the development of science**

Science, Technology, and Society

8.78$_{5,6,8,10,11}$ give examples of how science and technology are used in daily living ◊

8.79$_{5,6,7,10,11}$ **use the knowledge of science and technology to make personal decisions at the local and global levels** ◊

8.80 evaluate and critically analyze mass media reports of scientific developments and events ◊

8.81$_{5,6,8,10,11}$ **critically analyze the effects and impacts of science and technology on global and local problems (e.g., mining, manufacturing, recycling, farming, water quality)**

8.82$_{5,6,10}$ **explore the connections between science, technology, society, and career opportunities**

8.83$_{5,6,8,10,11}$ **analyze the positive and negative effects of technology on society and the influence of societal pressures on the direction of technological advances**

Computer/Technology

8.84 use appropriate software, audio-visual and/or multimedia materials to practice and master eighth grade instructional objectives in science

8.85 input data using correct keying, editing, and formatting techniques

8.86 using the graphing application of appropriate software, select the suitable chart, table or graph to display data

8.87 using the graphing application of appropriate software, create tables, charts, and/or graphs

8.88 use a calculator to perform mathematical functions in data analysis

8.89 use a variety of instruments (i.e. probes, thermometers, measuring devices) to perform measurements and record data

8.90 use appropriate software to practice reading, interpreting, analyzing, and evaluating the data on a map, chart, graph, table, and diagram

8.91 use appropriate software, practice extrapolating and interpolating information from a table, chart, and graph

8.92 use appropriate software to practice drawing conclusions from maps, diagrams, charts, graphs, and tables

8.93 use appropriate software to practice making predictions, inferences, and hypothesis from maps, diagrams, charts, graphs, and tables

8.94 use appropriate software to practice reading an instrument or gauge

8.95 use a database to sort and search data to solve a specific problem

8.96 identify various careers in the field of technology

8.97 discriminate between legal and illegal use of electronic information (including material that is protected by copyright)

8.98 retrieve current data from a variety of electronic sources which might include the Internet, and/or software reference programs

Adolescent English Language Arts Education

The adolescent education program of study maintains an integrated approach to the English language arts. Through literature study, the refinement of research skills, and an emphasis on mastering the conventions of standard English, the learner grows in English language arts competency. To promote life-long learning, the student gains refined media/technology skills, work-related literacy skills, and clearer understanding of the interrelationships of these areas to the English language arts. All students must be provided the opportunity to select honors and/or advanced placement courses to fulfill the four units of English language arts credits currently required for graduation. In addition to the required yearly courses offered throughout this programmatic level, elective course development is encouraged. These elective courses must expand and enhance the English language arts in the areas of reading, writing, speaking, listening, and viewing. Examples of electives include, but are not limited to, courses in:

Drama
Theater
Journalism
Mass Media
Television
Film
Speech
Creative Writing
Technical Writing
Desk Top Publishing
AP English
College Courses

English language arts electives with the exception of AP and college courses cannot be used as a substitute course for the required four units of English language arts. Course descriptions for these electives must include the appropriate West Virginia Goals and Objectives for English Language Arts (9-12) that are applicable to the elective course. All English language arts electives must be approved by the local county board of education.

Grade Nine
English Language Arts

The ninth grade year will focus on the effective use of written language in educational, occupational, and personal endeavors. Instructional delivery will be enhanced by computer technology. Frequent interaction with a broad array of quality literature will encourace an appreciation for the power of the spoken and written word. Testing data will provide direction and focus for prioritizing the instructional objectives that will be needed to ensure student mastery.

Listening and Speaking

9.1$_{K,1,2,3,4,5,6,7,8}$ review appropriate classroom speaking and listening skills (e.g., asking and answering questions, following directions) ◊

9.2 review the listening behaviors prior to a school-wide audience activity (e.g., stay alert, resist distractions, identify and adapt to the speaker's purpose) ◊

9.3$_{1,2,3,4,5,6,7,8}$ identify and record main idea, linking details, and summary (e.g., dictated material, media)

9.4$_{2,3,4,5,6,7,8,9}$ identify the purpose, make predictions, distinguish fact from opinions and construct meaning in and beyond the text (e.g., lecture, speech, media) ◊

9.5 recognize and correct standard usage errors in dictated sentences and paragraphs ◊

9.6 recognize situations where the use of colloquial, dialectical, and slang are appropriate (e.g., peer conversation versus formal presentations) ◊

9.7 match the level of language formality to the situation/audience (e.g., peer conversation versus adult interaction) ◊

9.8$_{1,2,3,5,8}$ write a set of complex directions and successfully communicate the directions ◊

9.9$_{2,3,4,5,6,7,8}$ make predictions, distinguish fact from opinion, and construct meaning in and beyond the text (e.g., lecture, speech, media) ◊

9.10 ask questions in the proper form and tone at the appropriate time (e.g., classroom lecture, conversation, panel discussion) ◊

9.11$_{5,6,7,8}$ understand the importance of listening for the purpose of asking questions to foster comprehension (e.g., lecture, discussion, conversation) ◊

Reading Comprehension

9.12$_{1,2,3,4,5,6,7,8,10,11}$ **read literary works by national and international authors to include but not limited to: novels, drama, short story, poetry and nonfiction for cultural literacy, appreciation and application**

9.13$_{1,2,3,4,5,6,7,8,10,11}$ identify the elements and structures of the various genres as separate entities with distinctive structures and styles (e.g., use of graphic organizer or venn diagram)

9.14 identify the influences of historical, cultural and authorial factors in shaping styles and voice of literary works, by genre, (e.g., group research via Internet, CD-ROM, and guest speaker(s) such as authors and historians) ◊

9.15$_{10,11}$ identify common careers found in short stories and evaluate their desirability ◊

9.16$_{10,11}$ determine and contrast the quantity and quality of short stories appearing on the Internet and catalog them

9.17$_{10,11}$ assess the quality of solicited unpublished short story manuscripts from the local

community

9.18 understand the different reading approaches, (e.g., literary experience, information, and task performance) that texts with various purposes require from one approach to another (e.g., rewrite a factual newspaper article into a poem) ◊

9.19$_{2,3,5,10}$ **read directions necessary to perform a task, then perform the task , (e.g., critique directions of a household task, perform the task and report what happened)** ◊

9.20$_{K,9}$ **interpret, discuss an illustration's purpose relative to the specific text, (e.g., critique illustrations contained in a textbook to determine their relevance to the context of the text)** ◊

9.21$_{K,2,3,5,6,10,11}$ **read and state the theme of a text (e.g., in short stories, novels, drama and poetry)** ◊

9.22$_{2,3,4,5,6,7,8,11}$ **identify central characters of a text by (e.g., graphic organizers, outlines)** ◊

9.23$_{3,7,8,10,11}$ **make reasonable logical predictions based upon events in a story or text (e.g., predicting the ending of a story based on the introduction or predicting the outcome of a historical event or person beyond the information in the text)** ◊

9.24$_{2,3,5,10}$ **read directions necessary to perform a task, then perform the task** ◊

9.25$_{3,4,5,6,8,10,11}$ **locate specific information in reading text (e.g., main idea, specific fact/statistic, definition, character)** ◊

9.26$_{K,5,8,10}$ **recognize and explain the function of an illustration within a specific text (e.g., graphic organizers such as maps, charts, lists, graphs)** ◊

9.27$_{K,9}$ **create an illustration that supports a specific text (e.g., graphic organizer such as map, chart, list, graph)** ◊

9.28$_{2,3,4,5,6,7,8,10,11}$ **use context clues to establish word meaning** ◊

9.29$_{3,7,8,10,11}$ **recognize the function of a text (e.g., technical manual, almanac, advertisement, short story)** ◊

9.30$_{3,7,8,10,11}$ **recognize differences in structure, content, and tone of various texts (e.g., exposition versus persuasion as in technical manual, almanac, advertisement, and literary genres, including audio/film version versus written texts)** ◊

9.31$_{3,4,5,6,8,9,10,11}$ develop different strategies of reading (e.g., skimming, scanning, analytical note taking) ◊

9.32$_{5,6,10,11}$ recognize literary devices (e.g., symbolism, imagery, metaphor, simile, humor, rhythm, rhyme, meter, alliteration, assonance)

9.33$_{2,3,5,8,10,11}$ recognize literary style (e.g., genre, point of view, theme, author's voice including humor) ◊

Reading Vocabulary

9.34$_{2,3,4,5,6,7,8,9,10,11}$ select vocabulary that is vivid, precise, and economical for oral and written communication including real life situations, using a variety of resources (e.g., thesaurus, dictionary, computer) ◊

9.35$_{9,10,11}$ expand specialized vocabulary commonly used in content areas through reading and writing ◊

9.36$_{9,10,11}$ show how words can function in different uses in oral and written communication including real life situations (e.g., Jim (noun/subject) is my friend, my friend is Jim (predicate nominative) ◊

9.37$_{2,3,4,5,6,7,8,9,10,11}$ recognize the multiple meanings of words in the context

of oral and written communication including real life situations (e.g., short story, speech, conversation) ◊

9.38$_{2,3,4,5,6,7,8,9,10,11}$ recognize and understand the function of antonyms, synonyms, homonyms, homophones, and homographs in oral and written communication and real life situations ◊

Writing Skills

9.39 use writing strategies to address specific writing purposes, (e.g., narrative, informative and persuasive, in paragraphs or compositions ◊

9.40 use writing strategies to write for audiences including peers, teachers, and employers (e.g., formal versus informal/informational versus conversational) ◊

9.41 use prewriting strategies to generate topics and plan approaches to writing tasks (e.g., brainstorming, mapping, outlining) ◊

9.42 adapt drafting strategies for specific writing tasks (e.g., rough draft all paragraphs, essays, book reports) ◊

9.43$_{4,7,10}$ use a writing prompt to develop a composition that contains a beginning, middle, and end ◊

9.44$_{4,7,10}$ develop a composition that addresses the assigned topic with a clearly worded thesis statement supported by relevant details ◊

9.45$_{4,7,10}$ develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay/chronological order in a process essay) ◊

9.46$_{4,7,10}$ use and identify different transitional devices (e.g., introductory and internal transitional phrases/conjunctions) ◊

9.47$_{4,7,10}$ develop a composition that demonstrates variation in sentence structure ◊

9.48$_{4,7,10}$ develop a composition where word choice is vivid, precise, and economical ◊

9.49$_{4,7,10}$ develop a composition in which errors in standard written English usage and mechanics (punctuation, spelling, capitalization) do not occur ◊

9.50 use revision and editing strategies to correct errors in organization, content, usage, mechanics, and spelling (e.g., write-re-write) ◊

9.51 demonstrate competence in pennmanship and keyboarding/word processing in the writing process to produce a clear, legible product ◊

9.52 use electronic editing and traditional editing strategies (e.g., symbols, dictionaries) to spell words correctly in computer generated work (e.g., proper names, in, inn, [homographs]) ◊

Spelling

9.53 recognize and understand the social, cultural, technical/media influences on the evolution of word origins (e.g., Xerox, fax, mouse, mythology, foreign language) ◊

9.54 **apply rules to the spelling and pronunciation of affixes (prefixes and suffixes) in communications, both academic and real life (e.g., numeric (mono, bi, tri); negation (non, un); degrees of comparison (er, est, less); directional (trans, inter, intra)** ◊

9.55 **expand pronunciation and spelling skills to include specialized vocabulary commonly used in content areas (e.g., algae)** ◊

9.56 **apply rules to the pronunciation and spelling of homophonic consonant and vowel sounds in communications, both**

academic and real life (e.g., context clues; editing process; phonetic principles "ph" for "f"; "ee" for "ea") ◊

9.57 **apply rules to the pronunciation and spelling of inflectional endings in communications, (e.g., tion, ly, ing)** ◊

9.58 students will use a variety of resources and strategies to ensure choices of pronunciation and spelling (e.g., spell check, thesaurus) ◊

Language

$9.59_{1,2,3,4,5,6,7,8,10,11}$ use editing strategies to recognize and correct errors in capitalization of titles of people, proper and common nouns (e.g., use of graphic organizer to categorize errors and show corrections) ◊

$9.60_{1,2,3,4,5,6,7,8,10,11}$ use editing strategies to recognize and correct errors in subject and verb agreement (e.g., peer record of errors in listening to oral presentation)◊

$9.61_{7,8,10,11}$ use editing strategies to recognize and correct errors in pronoun and antecedent relationships (e.g., collect and correct errors found in newspapers, magazine articles)◊

$9.62_{1,2,3,4,5,6,7,8}$ use editing strategies to recognize and correct run-on sentences and fragments (e.g., students edit a peer's mistakes in exchanging written drafts or word processor screens)◊

$9.63_{3,4,5,6,7,8,10,11}$ apply rules in compositions and editing relevant to commas, semicolons, quotation marks, and apostrophes to ensure accuracy of expression in student writing ◊

$9.64_{5,6,7,8,10,11}$ apply editing strategies to correct errors in redundancy and faulty subordination (e.g., student writing, advertisements, magazine articles) ◊

$9.65_{2,3,4,5,6,7,8,10,11}$ determine audience for whom a specific piece of writing will be generated to ensure appropriately content and style (e.g., letter of complaint, composition for peers versus teacher)◊

$9.66_{3,4,5,6,7,10,11}$ use prewriting/drafting strategies to generate topic sentences and thesis statements (e.g., brainstorming, mapping outlining, personal journal entries)◊

$9.67_{7,8,10,11}$ use writing strategies to identify and use transitional conjunctions, phrases, clauses, and sentences ◊

$9.68_{2,8,10,11}$ use graphic organizers and other writing strategies to provide logical sequencing of ideas (e.g., diagram of a space, listing of process steps, charts of similarities/differences, inverted pyramid for general to specific domino arrangement for cause and effect)◊

Study Skills

$9.69_{1,2,3,4,5,6,7,10,11}$ use guide words to locate words in a dictionary ◊

$9.70_{2,3,4,5,6,7,8,10,11}$ determine which number in a dictionary definition best fits the meaning of a word in context ◊

9.71 expand word choices through the use of a thesaurus (e.g., composition revision) ◊

$9.72_{10,11}$ use Bartlett's Familiar Quotations and other resources to select quotations and anecdotes on a variety of topics (e.g., use Bartlett's to select a quote for use in the beginning paragraph of an essay ◊

9.73 consult Reader's Guide to select a variety of periodical resources relevant to a given topic (e.g., small groups work as teams to seek resources on assigned

topics) ◊

9.74$_{8,10,11}$ **use the card catalog or an on-line catalog to retrieve information (e.g., reports, speeches, projects)** ◊

9.75 retrieve information from electronic media (e.g., access the Internet, CD ROM and other technologies as they become available for research purposes) ◊

9.76 use word processing skills to produce a multi-page document (e.g., copy and move text, adjust margins, select justifications, use tools, change fonts, and paginate) ◊

9.77$_{4,8,10}$ **use parts of books (e.g., table of contents or index) to locate information** ◊

9.78$_{10,11}$ **use book's glossary to find the definition of an unfamiliar word** ◊

9.79$_{10}$ **know the parts of a newspaper and locate information in a newspaper** ◊

9.80$_{10}$ **know the parts of a telephone directory and use them to locate information** ◊

9.81$_{10,11}$ **use outlining to organize text and composition information by selecting main points and supporting details (e.g., take notes from a text and organize them in outline form; prewrite an essay in outline form)** ◊

9.82 practice correct use of bibliographic format in research documentation (e.g., compile an annotated bibliography in standard MLA format) ◊

9.83 practice notetaking skills to process and organize information (e.g., listening and recording from teacher or text; interviewing) ◊

9.84 know and respond appropriately to directives in essay prompts (e.g., "compare"/"contrast"; "discuss";" interpret"; "evaluate") ◊

9.85 select appropriate study/review techniques for particular materials (e.g., read headings and transofrm them into questions) ◊

9.86 apply research skills to daily situations (e.g., use technology to make informed career decisions) ◊

9.87 explain the concept of intellectual property (e.g., media copyright laws) ◊

9.88 use memoriation techniques to facilitate retention (e.g., mnemonics, acronyms)

9.89 set goals for learning in school and beyond, and review progress in meeting goals ◊

Computer/Technology

9.86 use appropriate software to practice and master ninth grade English language arts instructional objectives

9.87 use a variety of audiovisual and multimedia materials to practice and master ninth grade English language arts instructional objectives

9.88 using a word processor, demonstrate correct keying, editing, and formatting techniques

9.89 use appropriate software to practice and master the five step writing process including prewriting, drafting, editing, revising, and publishing

9.90 use appropriate software to practice and master desktop publishing incorporating text, graphics, and various fonts in a variety of formats

9.91 select and use appropriate technologies to locate and use reference sources

9.92 use graphic software to organize, analyze and present information

9.93 select and use appropriate technologies to create and deliver presentations

9.94 use simulation software for investigating open-ended problems, formatting questions, and extending problem solving situations

9.95 use simulation software to

practice critical thinking and decision making

Grade Ten
English Language Arts

During the tenth grade, emphasis will be on the use of written language for educational, occupational, and personal endeavors. Preparation will include critiquing oral presentations, and using speaking and listening while reading and writing.
Instructional delivery will be enhanced by computer technology. Frequent interaction with a broadened array of literature will encourage an increased appreciation for the power of the spoken and written word. Testing data will provide direction and focus for prioritizing the instructional objectives that will ensure student mastery.

Listening and Speaking

10.1 review appropriate classroom speaking and listening skills (e.g., asking questions, answering questions and following directions) ◊

10.2 review the listening behaviors prior to a school-wide audience activity (e.g., stay alert, resist distractions, identify the speaker's purpose and adaptation) ◊

$10.3_{1,2,5,6,7,8}$ identify a character's feelings, thoughts, actions and relationships to other characters in the work (e.g., imagining and role playing)

$10.4_{5,6,7,8}$ use interviewing skills of questioning, note taking, exploring, summarizing and roles to explored extend meaning beyond the text ◊

10.5 listen to text containing common errors in standard English usage (e.g., subject verb agreement, double subjects, double negatives, misuse of pronouns, verbs and/or verb tenses) and to identify and correct those errors ◊

10.6 recognize and record common usage errors from daily experiences and analyze the errors for type, extent and audience ◊

$10.7_{5,6,7,8}$ listen to and use context clues to identify meaning of words and/or structures (e.g., malapropisms, oxymorons)

$10.8_{5,6,7,8}$ relate personal experience to information heard to construct new meaning (e.g., watch a television show and compare/contrast the new knowledge with personal experience

$10.9_{5,6,7,8}$ listen to speech (e.g., the funeral orations from Shakespere's Julius Caesar) to identify specific examples of central idea, fact versus opinion and persuasive devices (e.g., human interest, emotional appeal, repetition)

10.10 revise a text from a written to an oral one to show adaptations a writer makes from writing to speaking (e.g., how to paper) ◊

$10.11_{1,2,3,5,6,7,8}$ listen to speech such as the "how to" and analyze adaptations of text from written to oral to include audience, sequence, and style

Reading Comprehension

$10.12_{1,2,3,4,5,6,7,8,9,11}$ **read literary works by national and international authors to include but not limited to novels, drama, short story and poetry for cultural**

literacy, appreciation and application ◊

10.13 identify the influences of historical, cultural and biographical (author) factors in shaping styles and voice of literary works by genre, (e.g., group research via Internet or CD-ROM, guest speakers) ◊

10.14$_{2,3,5,8,9,11}$ **given a variety of selections from the various genres, compare/contrast characteristics of author's style, purpose and tone (e.g., class discussion, panel presentation, newspaper/scrapbook)** ◊

10.15$_{9,11}$ identify common careers found in fiction (novels) and evaluate their desirability ◊

10.16$_{9,11}$ determine and contrast the quantity and quality of fiction (novels) appearing on the Internet and catalog them

10.17$_{9,11}$ assess the quality of solicited unpublished fiction (novels) from the local community

10.18 understand the different reading approaches (e.g., literary, experience, information and task performance that texts with various purposes require from one approach to another, (e.g., rewrite a short story into a dramatic dialogue) ◊

10.19$_{5,8,9}$ **use graphic organizers such as webbing/charting to show important ideas and relationships of ideas (e.g., read three poems by an author to identify commonalities)** ◊

10.20$_{4,6,7,8,9}$ **differentiate between fact and opinion in text (e.g., review of a cultural event)** ◊

10.21$_{9,11}$ **classify information in text as necessary or unnecessary to understanding the selection (e.g., review a brochure to determine necessary information)** ◊

10.22$_{11}$ **determine point of view in expository text (e.g., compare/contrast the distances between author and subject in two or more newspaper editorials)** ◊

10.23$_{5,8,9,11}$ **make generalizations from implicit ideas (e.g., trace the implicit ideas that lead to a surprise ending in a short story such as those of O'Henry or Saki)** ◊

10.24$_{2,3,5,9}$ **read directions necessary to perform a task, then perform the task** ◊

10.25$_{9,11}$ **after locating specific information in a text, classify the information as necessary or unnecessary to understanding the text (e.g., essential facts versus supplementary description, value of a figure of speech, author's biographical background/experience)** ◊

10.26$_{K,5,8,9}$ **create an illustration/graphic organizer to demonstrate the importance of and relationship between ideas** ◊

10.27$_{2,3,4,5,6,7,8,9,11}$ **continue to use context clues to establish word meaning** ◊

10.28$_{3,7,8,9,11}$ **by analyzing content and structure, identify the source of a piece of text by analyzing content and structure (e.g., exposition versus persuasive essay, author/genre advertisement, biographical dictionary)** ◊

10.29$_{3,7,8,9,11}$ compare/contrast types of texts, according to content, structure, and tone (e.g., exposition versus persuasion as in technical manual, almanac, advertisement, and literary genre) ◊

10.30$_{4,6,7,8,9}$ **differentiate between fact and opinion in text** ◊

10.31$_{3,6,8,9,11}$ **make decisions by comparing facts** ◊

10.32$_{11}$ **determine point of view in expository text (e.g., first person, second person, third person, omniscient versus episodic/sequential)** ◊

$10.33_{7,8,9,11}$ recognize persuasive language and techniques (e.g., in particular propaganda in advertising) ◊

Reading Vocabulary

$10.34_{2,3,4,5,6,7,8,9,10,11}$ select vocabulary that is vivid, precise, and economical for oral and written communication including real life situations, using a variety of resources (e.g., thesaurus, dictionary, computer) ◊

$10.35_{9,10,11}$ expand specialized vocabulary commonly used in content areas through reading and writing ◊

$10.36_{9,10,11}$ show how words can function in different uses in oral and written communication including real life situations (e.g., Jim (noun/subject) is my friend, my friend is Jim (predicate nominative) ◊

$10.37_{2,3,4,5,6,7,8,9,10,11}$ recognize the multiple meanings of words in the context of oral and written communication including real life situations (e.g., short story, speech, conversation) ◊

$10.38_{2,3,4,5,6,7,8,9,10,11}$ recognize and understand the function of antonyms, synonyms, homonyms, homophones, and homographs in oral and written communication and real life situations ◊

Writing Skills

10.39 use writing strategies to address specific writing purposes (e.g., narrative, descriptive, informative and persuasive) in paragraphs or compositions ◊

10.40 use writing strategies to write for audiences including peers, teachers, and employers (e.g., formal versus informal/informational versus conversational) ◊

10.41 use prewriting strategies to generate topics and plan approaches to writing tasks (e.g., brainstorming, mapping, outlining) ◊

10.42 adapt drafting strategies to execute specific writing tasks (e.g., rough draft all paragraphs, essays, book reports) ◊

$10.43_{4,7}$ use a writing prompt to develop a composition that contains a beginning, middle, and end ◊

$10.44_{4,7}$ develop a composition that addresses the assigned topic with a clearly worded thesis statement which is supported by relevant details ◊

$10.45_{4,7}$ develop a composition that is focused and coherent and has a clear, logical progression of ideas (e.g., spatial order in a descriptive essay/chronological order in a process essay) ◊

$10.46_{4,7}$ use and identify different transitional devices (e.g., introductory and internal transitional phrases/conjunctions) ◊

$10.47_{4,7}$ develop a composition that demonstrates variation in sentence structure ◊

$10.48_{4,7}$ develop a composition where word choice is vivid, precise, and economical ◊

$10.49_{4,7}$ develop a composition in which errors in standard written English usage and mechanics (e.g., punctuation, spelling, capitalization) do not occur ◊

10.50 use revision and editing strategies to delete or correct errors in organization, content, usage, mechanics, and spelling (e.g., write-re-write) ◊

10.51 demonstrate competence in penmanship and keyboarding/word processing in the writing process to produce a clear, legible product ◊

10.52 use electronic editing tools and traditional editing strategies (e.g., symbols, dictionaries) for words

not detected by electronic tools in computer generated work (e.g., proper names [in, inn] [homographs]) ◊

Spelling

10.53 **recognize and understand the social, cultural, technical/media influences on the evolution of word origins (e.g., Xerox, fax, mouse, mythology, foreign language) ◊**

10.54 **apply rules to the spelling and pronunciation of affixes (prefixes and suffixes) in communications, both academic and real life (e.g., numeric (mono, bi, tri); negation (non, un); degrees of comparison (er, est, less); directional (trans, inter, intra) ◊**

10.55 **expand pronunciation and spelling skills to include specialized vocabulary commonly used in content areas (e.g., algae) ◊**

10.56 **apply rules to the pronunciation and spelling of homophonic consonant and vowel sounds in communications both academic and real life (e.g., context clues; editing process; phonetic principles "ph" for "f"; "ee" for "ea") ◊**

10.57 **apply rules to the pronunciation and spelling of inflectional endings in communications both academic and real life (e.g., tion, ly, ing) ◊**

10.58 **students will use a variety of resources and strategies to ensure choices of pronunciation and spelling (e.g., spell check, thesaurus) ◊**

Language

$10.59_{1,2,3,5,6,7,8,11}$ **use content and organizational strategies to identify supporting sentences and paragraphs (e.g., example/illustration, personal anecdote, extended definition, analogy)◊**

$10.60_{7,8,9,11}$ **use content and organizational strategies to identify transitional devices (e.g., repetition of key words and sentences/sentence links, in particular contrast, cause-effect, addition, time, and person/place/thing relationships)◊**

$10.61_{3,4,5,6,7,9,11}$ **use content and organizational strategies to identify and use topic sentences and thesis statements (e.g., placement, figurative or literal, singular or multiple focus, implied versus stated)◊**

$10.62_{7,8,11}$ **recognize descriptive language (e.g., connotation, repetition, language that appeals to the senses [imagery], figurative language [personification, metaphor, apostrophe], symbolism, musical effect)◊**

$10.63_{1,2,3,4,5,6,7,8,9}$ **use capitalization rules to generate sentences containing correct capitalizations of proper/common nouns, proper adjectives, direction as a region, and titles of people (e.g., students generate incorrect sentences to be corrected by peers)◊**

$10.64_{3,4,5,6,7,8,9}$ **use punctuation rules to recognize and correct sentences with errors in use of commas as interrupters; apostrophes with possessives; quotation marks with dialogue; colons with lists; semicolons between independent clauses; and commas with appositives (e.g., in a student-generated composition that includes usage of all these skill areas, peers identify and edit errors)◊**

$10.65_{1,2,3,4,5,7,8,9}$ **use correct verb tense by recognizing appropriate**

situations for tense shifts (e.g., rewrite a paragraph in a different tense; write a paragraph/composition to illustrate correct tense shift)◇

10.66$_{7,8}$ **recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns** ◇

10.67$_{8,9}$ **correct errors in parallel structure in paragraphs and compositions (e.g., student work, newspaper articles, editorials)**◇

10.68$_{5,6,7,8,9}$ **correct errors in redundancy in paragraphs and compositions (e.g., student work)**◇

10.69$_{7,8,9}$ **correct errors of misplaced modifiers in sentences and paragraphs, (e.g., advertisements, student essays, articles)** ◇

10.70$_{2,3,4,5,6,7,8,9}$ **recognize the specific audience for whom a piece of writing has been generated (e.g., letter of job application/scholarship application, essay, personal letter)**◇

Study Skills

10.70$_{1,2,3,4,5,6,7,9,11}$ **use guide words to locate words in a dictionary** ◇

10.71 **determine which word choice in a dictionary entry that best fits the shades of meaning implied in the context of a given sentence** ◇

10.72 expand word choices through the use of a thesaurus (e.g., revise compositions with more vivid word choices) ◇

10.73$_{9,11}$ **use Bartlett's Familiar Quotations and other resources to select quotations and/or anecdotes on a variety of topics (e.g., reference a quotation to introduce a speech or composition)** ◇

10.74 consult the Reader's Guide to select a variety of periodical resources relevant to a given topic (e.g., small groups work as teams to seek resources on assigned topics) ◇

10.75$_{8,9,11}$ use the card catalog or an on-line catalog system to retrieve information (e.g., reports, projects, speeches) ◇

10.76 retrieve information from electronic media for research purposes (e.g., access Internet, CD ROM and other technologies as available) ◇

10.77 apply word processing skills to produce a multi-page document (e.g., copy and move text, adjust margins, select justifications, use tools, change fonts, and paginate) ◇

10.78$_{4,8,9}$ **use parts of books to locate information (e.g., table of contents, index)** ◇

10.79$_{9,11}$ **use the glossary of a book to find the definition of an unfamiliar word (e.g., allusions, technical terms)** ◇

10.80$_{9}$ know the parts of a newspaper and locate information in a newspaper ◇

10.81$_{9}$ know the parts of a telephone directory and use them to locate information (e.g., use directories to facilitate job application process) ◇

10.82$_{9}$ **use outlining to organize text and information by selecting main points and supporting details (e.g., take notes from a text and organize them in outline form; prewrite an essay)** ◇

10.83 practice correct use of bibliographic format in research documentation (e.g., compile an annotated bibliography in standard MLA format) ◇

10.84 practice note taking skills to process and organize information (e.g., listening and recording from teacher or text; interviewing) ◇

10.85 know the respond appropriately to directives in essay prompts (e.g., "analyze", "interpret",

"synthesize") ◊

10.86 use appropriate study/review techniques for given materials (e.g., paraphrase, paragraphs, mneumonics) ◊

10.87 apply research skills to daily situations (e.g., use technology to make informed career decisions) ◊

10.88 explain the concept of intellectual property in all media, as it is protected by copyright laws (e.g., integrity of the research process; video copyright restrictions) ◊

10.89 set goals for learning in school and beyond, and review progress in meeting goals ◊

Computer/Technology

10.81 use appropriate software to practice and master tenth grade English language arts instructional objectives

10.82 use a variety of audiovisual and multimedia materials to practice and master tenth grade English language arts instructional objectives

10.83 using a word processor, demonstrate correct keying, editing, and formatting techniques

10.84 use appropriate software to practice and master the five step writing process including prewriting, drafting, editing, revising, and publishing

10.85 use appropriate software to practice and master desktop publishing incorporating text, graphics, and various fonts in a variety of formats

10.86 select and use appropriate technologies to locate and use reference sources

10.87 use graphic software to organize, analyze and present information

10.88 select and use appropriate technologies to create and deliver presentations

10.89 use simulation software for investigating open-ended problems, formatting questions, and extending problem solving situations

10.90 use simulation software to practice critical thinking and decision making

Grade Eleven
English Language Arts

In the eleventh grade, fundamental literary and communication skills are refined and enhanced. Indeed, the eleventh grade represents another leap in academic rigor and depth. In addition, career formalization, including college entrance exam preparation and workplace readiness skills, become a primary focus. Student proficiency should be diagnosed to determine instructional priorities. As the need for challenging research skills becomes more vital, the incorporation of technology should be emphasized.

Listening and Speaking

$11.1_{1,2,3,4,5,6,7,8,9,10}$ review appropriate classroom speaking and listening skills (e.g., asking questions, answering questions, following directions) ◊

$11.2_{1,2,3,4,5,6,7,8,9,10}$ prior to a school-wide audience activity, review listening behaviors (e.g., stay alert, resist distractions, identify speaker's purpose and adapt to it) to become a responsible audience member ◊

11.3 identify barriers to listening and generate methods to overcome them ◊

$11.4_{5,6,7,8}$ compare and contrast shared personal cultural experiences

with information gathered from resources in the media center ◊

11.5 listen and respond to the sensory appeal of poetry with any medium of personal expression (e.g., art/illustration, music, response journal)

11.6_{10} practice efficient notetaking skills with careful attention to identifying purpose, main ideas/key facts, overall themes in order to synthesize information into a well-developed essay ◊

11.7 determine purpose, appropriate usage and audience by listening to a variety of formal, informal and colloquial discourse ◊

$11.8_{2,3,4,5,6,7,8,10}$ identify various speaking techniques used to influence an audience through emotional appeal (propaganda, bias, distortion) by listening to vehicles from the media (e.g., news broadcasts, commercials, public addresses) ◊

11.9 demonstrate questioning and critical thinking skills in a structured class discussion of literary topics and/or cultural connections ◊

11.10 analyze, interpret and evaluate a literary selection via some group activity (e.g., panel group discussion)

11.11 utilize effective argumentation techniques in a formally prepared and rehearsed speech delivered to the class ◊

11.12 interview primary sources as part of the research process ◊

11.13 project shifts in cultural trends from the present to the future (21st Century) and demonstrate through oral presentation (e.g., discussion, panel presentation, role play) ◊

11.14 recognize speaking styles appropriate to the given audience and deliver oral presentation accordingly ◊

Reading Comprehension

$11.15_{1,2,3,4,5,6,7,8,9,10,11}$ read literary works by national and international authors to include, but not be limited to novels, drama, short story, poetry, and nonfiction for cultural literacy, appreciation and application ◊

11.3 identify barriers to listening and generate methods to overcome them ◊

11.16 research, analyze and evaluate the influences of historical, cultural and biographical (author) factors in shaping styles and voice of literary works (e.g., independent analysis of historical documents, periodicals and appropriate resources) ◊

11.17 analyze and evaluate characteristics of author's style and purpose given a variety of selections from the various genres (e.g., written character analysis or critique) ◊

11.18 examine the effects of technical and stylistic components in an author's work(s) in determining literary merit (e.g., write a feature article or critical review) ◊

11.19 read examples of various genres written by a single author and compare/contrast style and literary merit (e.g., read a passage from Twain's Huckleberry Finn, Twain's epigrams, and his "The Celebrated Jumping Frog of Calaveras County")

11.20 read a piece written in one format and, retaining theme and author's intent, rewrite it in

a different genre (e.g., reproduce "The Pit and the "Pendulum" as a poem or "Stopping by the Woods on a Snowy Evening" as a descriptive essay) ◊

11.21 compare/contrast the style, content, merit and impact of a literary piece produced in various forms of media (e.g., evaluate The Great Gatsby as a novel and as a film; conduct a debate with the "author" versus the "director")

11.22$_{9,10,11}$ identify common careers found in nonfiction and fictional works and evaluate their desirability ◊

11.23$_{9,10,11}$ locate and identify literary criticism applicable to the genre being studied by using electronic retrieval systems (e.g., Internet/CD ROM)

11.24$_{9,10,11}$ evaluate, whenever applicable to the genre being studied, writing samples from the local community (e.g., brochures, editorials, poetry, community history)

11.25 understand the different reading approaches (e.g., information, and task performance) that texts with various purposes require (e.g., transform an historical poem to school textbook style) ◊

11.26$_{3,4,5,6,7,8,9,10}$ draw conclusions substantiated by text, (e.g., read an educational catalog and determine the desirability of attending that school) ◊

11.27$_{6,8,9,10}$ infer implicit ideas and draw conclusions during the act of reading (e.g., using historical journal articles, speeches or statistical data) ◊

11.28$_{K,3,5,6,7,8,9}$ interpret character traits based on the context of the entire story (e.g., the roles of Willie Lowman, Hester Prynne, Richard Cory)

11.29$_{K,8,9,10}$ make generalizations from implicit ideas (e.g., first paragraph of The Declaration of Independence) ◊

11.30$_{9,10}$ identify consequences for not properly following a specific set of instructions (e.g., applying for a job, college, or financial aid or following directions on a test) ◊

11.31$_{9,10}$ locate specific information in a text, classifying the information as necessary or unnecessary to understanding the text (e.g., essential facts versus supplementary description, value of an author's imagery, author's biographical background/experience) ◊

11.32$_{K,5,8,9,10}$ continue to create graphic organizers that complement a text ◊

11.33$_{2,3,4,5,6,7,8,9,10}$ continue to use context clues to establish word meaning ◊

11.34$_{3,7,8,9,10}$ identify the type or genre of a text by analyzing content, language, and style (e.g., expository versus persuasive essay, author/genre, advertisement, biographical dictionary) ◊

11.35$_{9,10}$ recognize the organizational pattern of expository text (e.g., process, comparison/contrast, classification, cause-effect, narrative) ◊

11.36$_{3,7,8,9,10}$ continue to compare/contrast types of texts, according to content, structure, and tone (e.g., Puritan poetry versus free verse poetry, author/genre, expository versus persuasive) ◊

11.37$_{5,8,10}$ identify a particular author's work and recognize the use of tone (e.g., Mark Twain's use of humor, Jonathan Edwards' religious

fervor, Frederick Douglass's advocacy)

11.38$_{3,8,9,10}$ continue to differentiate between fact and opinion in order to make decisions by comparing facts (e.g., consumer magazines, travel brochures, letters to the Editor) ◇

11.39$_{2,3,9,10}$ differentiate between human interest elements and hard fact/opinion in a text (e.g., subjective versus objective news reporting as in human interest versus straight news story) ◇

11.40$_{10}$ continue to determine point of view in expository text (e.g., objective versus subjective, first/second/third person, omniscient versus episodic) ◇

11.41$_{7,8,9,10}$ recognize persuasive language and techniques (e.g., authority of speaker, special interest bias, propaganda in advertising)

11.42$_{5,6,8,9,10}$ interpret various literary devices and techniques, in particular, figurative language (e.g., personification, archetypes, allegorical patterns) ◇

11.43$_{3,4,5,6,,8,9}$ continue to practice different reading strategies, in particular skimming for overall understanding and scanning for keywords and ideas (e.g., Reader's Guide listings, chronology of events, captioned illustrations) ◇

Reading Vocabulary

11.44$_{2,3,4,5,6,7,8,9,10}$ select vocabulary that is vivid, precise, and economical for oral and written communication including daily situations, using a variety of resources (e.g., thesaurus, dictionary, computer) ◇

11.45$_{9,10,11}$ expand specialized vocabulary commonly used in content areas through reading and writing◇

11.46$_{9,10,11}$ show how words can function as different uses in oral and written communication including daily situations (e.g., Jim (noun/subject) is my friend, my friend is Jim (predicate nominative) ◇

11.47$_{2,3,4,5,6,7,8,9,10,11}$ recognize the multiple meanings of words in the context of oral and written communication including daily situations (e.g., short story, speech, conversation)

11.48$_{2,3,4,5,6,7,8,9,10,11}$ recognize and understand the function of antonyms, synonyms, homonyms, homophones, and homographs

Writing

11.49 use writing strategies to develop text to address specific writing purposes, to include, but not be limited to, narrative, informative, persuasive and poetical ◇

11.50 adapt a short piece of text to multiple audiences (e.g., peers, teachers, general public) ◇

11.51 use a writing prompt to experiment with point of view (e.g., distance between the writer and his/her subject) ◇

11.52 identify and use rhetorical devices (e.g., parallel structure, antithesis, an appeal to emotion) ◇

11.53 identify and correct types of fallacious reasoning (e.g., red herring, circular reasoning, either/or reasoning) ◇

11.54 develop a personal style and voice in student's writing (e.g., gender, humor, sentence patterns) ◇

11.55 identify and use more subtle forms of transition in a composition (e.g., sentence links, repetition of key words or

sentences) ◇

11.56 select a quotation and use it correctly in some aspect of a piece of writing (e.g., introduction, body conclusion) ◇

11.57 write an analysis of a poem, short story, novel, or play using terminology and characteristics of the genre ◇

11.58 write and send a letter of application and a resume ◇

11.59 produce an informative or persuasive research paper following a style sheet (MLA, APA, or teacher generated) ◇

11.60 demonstrate competence in word processing and, when possible, desktop publishing in the publication of written text ◇

$11.61_{4,7,10}$ produce written text in which errors in standard written English usage and mechanics (punctuation, spelling, capitalization) do not occur ◇

11.62 use traditional editing strategies (e.g., symbols, dictionaries) for words not detected by electronic editing devices in computer generated work (e.g., proper names, in inn [homohyms]) ◇

Spelling

11.63 **recognize and understand the social, cultural, technical/media influences on the evolution of word origins (e.g., Xerox, fax, mouse, mythology, foreign language)** ◇

11.64 **apply rules to the spelling and pronunciation of (prefixes and suffixes in communications (e.g., numeric [mono-, bi-, tri-] ; negation [non, un]; degrees of comparison [er, est-, less]; directional [trans-, inter-, intra]** ◇

11.65 **expand pronunciation and spelling skills to include specialized vocabulary commonly used in content areas (e.g., algae)** ◇

11.66 **apply rules to the pronunciation and spelling of homophonic consonant and vowel sounds in communications (e.g., context clues; editing process; phonetic principles "ph" for "f"; "ee" for "ea")** ◇

11.67 **apply rules to the pronunciation and spelling of inflectional endings in communications both academic and real life (e.g.,-tion, -ly, -ing)** ◇

11.68 use a variety of resources and strategies to ensure choices of pronunciation and spelling (e.g., spell check, thesaurus) ◇

Language

$11.69_{1,2,3,4,5,6,7,8,9,10}$ **use capitalization rules to generate sentences containing correct capitalizations of proper/common nouns, proper adjectives, direction as region, and titles of people (e.g., students generate incorrect sentences to be corrected by peers)** ◇

$11.70_{4,5,6,7,8,9,10}$ **use punctuation rules to recognize and correct sentences with errors in use of commas as interrupters; apostrophes with possessives; quotation marks with dialogue; colons with lists; semicolons between independent clauses, and commas with appositives (e.g., in a student-generated composition which includes usage of all these skill areas, peers identify and edit errors, where necessary)** ◇

$11.71_{1,2,3,4,5,7,8,9,10}$ **use correct verb tense by recognizing appropriate situations for tense shifts (e.g., rewrite a paragraph/composition to**

illustrate correct tense shift) ◊

11.72$_{7,8,10}$ **recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns (e.g., within a composition, substitute indefinite pronouns for various nouns functioning as subjects and change verbs, appropriately) ◊**

11.73$_{8,9}$ **correct errors in parallel structure in paragraphs and compositions (e.g., student work, newspaper articles, editorials) ◊**

11.74$_{5,6,7,8,9,10}$ **correct errors in redundancy in paragraphs and compositions (e.g., student work, newspaper article editorials) ◊**

11.75$_{7,8,9}$ **correct errors of misplaced modifiers in sentences, paragraphs, and essays (e.g., advertisements, student essays, articles) ◊**

11.76$_{2,3,4,5,6,7,8,9,10}$ **recognize the specific audience for whom a piece of writing has been generated (e.g., letter of job application/scholarship application, essay, personal letter) ◊**

11.77$_{1,2,3,5,6,7,8,10}$ **use content and organizational strategies to identify supporting sentences and paragraphs (e.g., example/illustration, personal anecdote, extended definition, analogy) ◊**

11.78$_{7,8,9,10}$ **use content and organizational strategies to identify transitional devices (e.g., repetition of keywords and sentences; sentence links; particular relationships in contrast, cause-effect, time, and person/place/thing relationships) ◊**

11.79$_{3,4,5,6,7,9}$ **use content and organizational strategies to identify and use topic sentences and thesis statements (e.g., placement, figurative or literal, singular or multiple focus, implied versus stated) ◊**

11.80$_{7,8,10}$ **recognize descriptive language (e.g., connotation, repetition, sensory language [imagery], figurative language [personification, metaphor, apostrophe], symbolism, musical effect) ◊**

Study Skills

11.81 develop a sound notetaking skill that can be applied to classroom, library, interview and other life circumstances ◊

11.82$_{8,9,10,11}$ **identify the role and function of the library/media center including all electronic retrieval systems (e.g., CD ROM Reader's Guide and card catalog, encyclopedia, Internet) (uses cross referencing while gathering information for a research topic) ◊**

11.83 identify copyright and plagiarism laws in the editing process ◊

11.84$_{9,10}$ **judge the reliability of sources for bias and authority ◊**

11.85$_{9,10}$ **demonstrate the ability to use the dictionary by using guide words to locate a dictionary entry and identify the best definition for the word's context ◊**

11.86$_{9,10}$ **demonstrate the ability to use a variety of reference sources (e.g., thesaurus, Bartlett's Familiar Quotations, atlas, almanac, specialized dictionaries, and the glossaries) ◊**

11.87 follow a style sheet (e.g., MLA, APA, teacher-generated) ◊

11.88$_{10}$ **collect and organize information through systematic note taking and**

outlining ◊

11.89 use available primary sources when gathering information, taking into consideration the motives and perspective of those sources ◊

11.90 consult various career sources (e.g., Occupational Outlooks Handbook, community resources, college/training center catalogs) ◊

11.91 set goals for learning in school and beyond, and review progress in meeting goals ◊

Computer/Technology

11.92 use appropriate software to practice and master eleventh grade English language arts instructional objectives

11.93 use a variety of audiovisual and multimedia materials to practice and master eleventh grade English language arts instructional objectives

11.94 using a word processor, demonstrate correct keying, editing, and formatting techniques

11.95 use appropriate software to practice and master the five step writing process including prewriting, drafting, editing, revising, and publishing

11.96 use appropriate software to practice and master desktop publishing incorporating text, graphics, and various fonts in a variety of formats

11.97 select and use appropriate technologies to locate and use reference sources

11.98 use graphic software to organize, analyze and present information

11.99 select and use appropriate technologies to create and deliver presentations

11.100 use simulation software for investigating open-ended problems, formatting questions, and extending problem solving situations

11.101 use simulation software to practice critical thinking and decision making

Grade Twelve
English Language Arts

The senior year is a year of focus and polish in personal goals and academic proficiency. Experiences such as a senior project or a sophisticated persuasive research paper should culminate the twelve-year career. Readiness for the work place or post secondary education is the final reality check. The expansion and appreciation of language and literature is the focus of the senior year. Shakespeare can speak to students, but the anxiety of an uncertain future haunts them.

Listening and Speaking

12.1 review appropriate classroom speaking and listening skills (e.g., asking questions, answering questions, following directions) ◊

12.2 prior to a school-wide audience activity, review the listening behaviors (e.g., stay alert, resist distractions, identify the speaker's purpose, and adapt to it) to become a responsible audience member ◊

$12.3_{5,6,7,8}$ continue to develop skills in recognizing and overcoming barriers to listening in a variety of large and small group, formal and informal settings (e.g., absence of modulation in voice,

the speaker's pace, poor enunciation, physical behaviors or obstacles) ◊

12.4$_{1,2,3,4,5,6,7,8}$ continue to adapt/apply listening skills in order to interpret a variety of situations (e.g., note taking, interview, broadcast media including television, radio, CD ROM, Internet, and live oral performance) ◊

12.5$_{2,3,4,5,6,7,8}$ continue to identify organizational patterns and interpret messages in narrative, informational, and persuasive contexts (e.g., fact vs. opinion, propaganda, bias, and emotional appeal) ◊

12.6$_{1,2,3,4,5,6,7,8}$ continue to adapt/apply speaking skills in order to participate in a variety of situations (e.g., panel/group discussion, telephone/teleconference, interview, oral report) ◊

12.7$_{1,2,3,4,5,6,7}$ continue to broaden speaking skills by editing and correcting usage according to conventional Standard English, distinguishing dialectal, colloquial, and slang variations (e.g., comparing a local news anchor person's pronunciation to a national news anchor's standard delivery, "shuck" versus "husk" corn, accepted use of slang expressions) ◊

Reading Comprehension

12.8$_{1,2,3,4,5,6,7,8,9,10,11}$ **read literary works by national and international authors to include, but not be limited to, novels, drama, short story, poetry and nonfiction for cultural literacy, appreciation and application** ◊

12.9$_{11}$ research, analyze, and evaluate the influences of historical, cultural and biographical (author) factors in shaping styles and voice of literary works (e.g., independent analysis of historical documents, periodicals, and appropriate resources) ◊

12.10$_{11}$ analyze and evaluate characteristics of author's style and purpose given a variety of selections from the various genres (e.g., written character analysis or critique) ◊

12.11$_{11}$ examine the effects of technical and stylistic components in an author's work(s) in determining literary merit (e.g., write a feature article or critical review) ◊

12.12$_{11}$ read examples of various genres written by a single author and compare/contrast style and literary merit (e.g., read the play Murder in the Cathedral and "The Love Song of Alfred Prufrock" by T.S. Elliot)

12.13$_{11}$ read a piece written in one format and, retaining theme and author's intent, rewrite it in a different genre (e.g., reproduce Hamlet as an epic poem; rewrite Yeat's "The Lake Isle of Innisfree" as a descriptive essay) ◊

12.14$_{11}$ compare/contrast the style, content, merit and impact of a literary piece produced in various forms of media (e.g., evaluate Wuthering Heights as a novel and as a film; conduct a debate with the "author" versus the "director") ◊

12.15$_{9,10,11}$ identify common careers found in nonfiction and fictional works ◊

12.16$_{9,10,11}$ locate and identify literary criticism applicable to the genre being studied by using electronic retrieval system (e.g., Internet/CD ROM) ◊

12.17$_{9,10,11}$ evaluage, whenever applicable to the genre being studied, writing samples from the local community (e.g., brochures, editorials, poetry, community history) ◊

12.18 understand the different reading approaches (e.g., pleasure, information and task

performance) that texts with various purposes require (e.g., transform Robert Frost's "Mending Wall" to the process of wall repair ◊

12.19$_{3,4,5,6,7,8,9,10,11}$ **draw conclusions substantiated by text (e.g., read two educational catalogs to determine which offers the best program of study for a particular career choice** ◊

12.20$_{6,8,9,10,11}$ **recognize implicit ideas and draw, conclusions during the act of reading (e.g., using historical journal articles, speeches or statistical data)** ◊

12.21$_{K,3,5,6,7,8,9,11}$ **interpret character traits based on the context of the entire story (e.g., the roles of Lady Mabeth, Heathcliff, Beowulf)**

12.22$_{K,8,9,10,11}$ **make generalizations from implicit ideas (e.g., Francis Beacon's "Of Studies" and its relevance to study skills today)** ◊

12.23$_{9,10,11}$ **recognize consequences for not following a specific set of instructions (e.g., scholarship, financial aid applications, selective service and voter registration)** ◊

12.24$_{9,10,11}$ **locate specific information in a text ,classifying the information as necessary or unnecessary to understanding the text (e.g., essential facts versus supplementary description, value of an author's imagery author's biographical background/experience** ◊

12.25$_{K,5,8,9,10}$ continue to create graphic organizers that complement a text ◊

12.26$_{2,3,4,5,6,7,8,9,10,11}$ **continue to use context clues to establish word meaning** ◊

12.27$_{3,7,8,9,10,11}$ identify the type or genre of a text, by analyzing content, language, and style (e.g., expository versus persuasive essay, author/genre, advertisement biographical dictionary) ◊

12.28$_{9,10,11}$ **analyze the organizational pattern of expository text (e.g., process, comparison/contrast, classification, cause effect narrative** ◊

12.29$_{3,7,8,9,10,11}$ continue to compare/contrast types of texts, according to content, structure, and tone (e.g., blank verse, free verse, authorization, expository versus persuasive) ◊

12.30$_{5,8,10,11}$ **analyze a particular author's, use of tone (e.g., A. E. Housman's use of humor, O'Henry's use of irony, Jonathan Swift's use of satire)**

12.31$_{3,8,9,10,11}$ **continue to differentiate between fact and opinion in order to make decisions by comparing facts (e.g., college pamphlets, military recruitment brochures, junk mail advertising)** ◊

12.32$_{2,3,9,10,11}$ **differentiate between human interest elements and hard fact/opinion in a text (e.g., subjective versus objective news reporting as in human interest versus straight news story)** ◊

12.33$_{10,11}$ **continue to determine point of view in expository text (e.g., objective versus subjective, first/second/third person, omniscient versus episodic)** ◊

12.34$_{8,8,9,10,11}$ **interpret persuasive language and techniques (e.g., authority of speaker, special interest bias, propaganda in advertising)** ◊

12.35$_{5,6,8,9,10,11}$ **interpret various literary devices and techniques, in particular, figurative language (e.g., personification, archetypes, allegorical patterns)** ◊

12.36$_{3,4,5,6,8,9,11}$ **continue to practice different reading strategies, in**

(e.g., repetition of keywords and sentences; sentence links, in particular relationships in contrast, cause-effect, time, and person/place/thing relationships) ◊

12.72$_{3,4,5,6,7,9,11}$ **use content and organizational strategies to identify and use topic sentences and thesis statements (e.g., placement, figurative or literal, singular or multiple focus, implied versus stated)** ◊

12.73$_{7,8,10,11}$ **recognize descriptive language (e.g., connotation, repetition, sensory language [imagery], figurative language [personification, metaphor, apostrophe], symbolism, musical effect)** ◊

Study Skills

12.74 develop a sound notetaking skill that can be applied to classroom, library, interview, and other life circumstances ◊

12.75$_{8,9,10,11}$ **know and understand the role and function of the library/media center including ll electronic retrieval systems (e.g., CD Rom)**

12.76 know and understand the use of the Reader's Guide and card catalog, encyclopedia, Internet ◊

12.77 know and understand the use of cross referencing while gathering information for a research topic ◊

12.78 apply copyright and plagiarism laws in the editing process ◊

12.79 **judge the reliability of sources for bias and authority** ◊

12.80$_{9,10,11}$ **use guide words to locate a dictionary entry and by identify the best definition for the word's context** ◊

12.81$_{9,10,11}$ **demonstrate the ability to use a variety of reference sources (e.g., thesaurus, Bartlett's Familiar Quotations, atlas, almanac, specialized dictionaries, and the glossaries** ◊

12.82 understand and follow a style sheet (e.g., MLA, APA, teacher-generated) ◊

12.83$_{9,10,11}$ **collect and organize information through systematic note taking and outlining** ◊

12.84 use available primary sources when gathering information, taking into consideration the motives and perspective of those sources ◊

12.85 consult various career information sources (e.g., Occupational Outlooks Handbook, community resources, college/training center catalogs) ◊

12.86 applies the necessary research skills in the production of a senior project or a persuasive research paper ◊

12.87 set goals for learning beyond high school ◊

Computer/Technology

12.88 use appropriate software to practice and master twelfth grade English language arts instructional objectives

12.89 use a variety of audiovisual and multimedia materials to practice and master twelfth grade English language arts instructional objectives

12.90 using a word processor, demonstrate correct keying, editing, and formatting techniques

12.91 use appropriate software to practice and master the five step writing process including prewriting, drafting, editing, revising, and publishing

12.92 use appropriate software to practice and master desktop publishing incorporating text, graphics, and various fonts in a

variety of formats

12.93 select and use appropriate technologies to locate and use reference sources

12.94 use graphic software to organize, analyze and present information

12.95 select and use appropriate technologies to create and deliver presentations

12.96 use simulation software for investigating open-ended problems, formatting questions, and extending problem solving situations

12.97 use simulation software to practice critical thinking and decision making

particular, skimming for overall understanding and scanning for keywords and ideas (e.g., yellow pages, classified job ads, headline of a newspaper) ◇

Reading Vocabulary

12.37$_{2,3,4,5,6,7,8,9,10,11}$ **select vocabulary that is vivid, precise, and economical for oral and written communication including real life situations, using a variety of resources (e.g., thesaurus, dictionary, computer)** ◇

12.38$_{9,10,11}$ **expand specialized vocabulary commonly used in content areas through reading and writing** ◇

12.39$_{9\text{-}12}$ **use words to function as different parts of speech in oral and written communication including daily situations (e.g., my wants exceed my reach [noun]; I can reach [verb] any goal)** ◇

12.40$_{2,3,4,5,6,7,8,9,10,11}$ **recognize the multiple meanings of words in the context of oral and written communication including daily situations (e.g., short story, speech, conversation)** ◇

12.41$_{2,3,4,5,6,7,8,9,10,11}$ **recognize and understand the function of antonyms, synonyms, homonyms, homophones, and homographs** ◇

Writing

12.42 use writing strategies to develop text to address specific writing purposes to include, but not be limited to, narrative, informative, persuasive and poetical ◇

12.43 adapt a short piece of text to multiple audiences (e.g., peers, teachers, general public) ◇

12.44 use a writing prompt to experiment with point of view (e.g., distance between the writer and his/her subject) ◇

12.45 identify and use rhetorical devices (e.g., parallel structure, antithesis, an appeal to emotion) ◇

12.46 identify and correct types of fallacious reasoning (e.g., red herring, circular reasoning, either/or reasoning) ◇

12.47 develop a personal style and voice in student's writing (e.g., gender, humor, sentence patterns) ◇

12.48 identify and use more subtle forms of transition in a composition (e.g., sentence links, repetition of key words or sentences) ◇

12.49 select a quotation and use it correctly in some aspect of a piece of writing (e.g., introduction, body conclusion) ◇

12.50 write an analysis of a poem, short story, novel, or drama using terminology and characteristics of the genre ◇

12.51 write and send a letter of application and a resume ◇

12.52 produce a persuasive research paper following a style sheet (MLA, APA, or teacher generated) or a senior project ◇

12.53 demonstrate competence in word processing and desktop publishing in the publication of written text

12.54$_{4,7,10}$ produce written text in which errors in standard written English usage and mechanics (punctuation, spelling, capitalization) do not occur

12.55 use elctronic editing and traditional editing strategies (e.g., symbols, dictionaries) to correct spelling errors (e.g., proper names, in/inn [homohyms])

Spelling

12.56 **recognize and understand the social, cultural, technical/media influences on the evolution of word origins (e.g., Xerox, fax, mouse, mythology, foreign language)** ◇

12.57 **apply rules to the spelling and pronunciation of affixes (prefixes and suffixes in communications, both academic and real life (e.g., numeric [mono-, bi-, tri-]; negation [non-, un-]; degrees of comparison [-er, -est, -less]; directional [trans-, inter-, intra-]) ◊**

12.58 **expand pronunciation and spelling skills to include specialized vocabulary commonly used in content areas (e.g., algae) ◊**

12.59 **apply rules to the pronunciation and spelling of homophonic consonant and vowel sounds in communications both academic and real life (e.g., context clues; editing process; phonetic principles "ph" for "f"; "ee" for "ea") ◊**

12.60 **apply rules to the pronunciation and spelling of inflectional endings in communications both academic and dally (e.g.,-tion,-ly,-ing) ◊**

12.61 will use a variety of resources and strategies to ensure choices of pronunciation and spelling (e.g., spell check, thesaurus) ◊

Language

$12.62_{1,2,3,4,5,6,7,8,9,10,11}$ **use capitalization rules to generate sentences containing correct capitalization of proper/common nouns, proper adjectives, direction as region, and titles of people (e.g., students generate incorrect sentences to be corrected by peers) ◊**

$12.63_{3,4,5,6,7,8,9,10,11}$ **use punctuation rules to recognize and correct sentences with errors in use of commas as interrupters, apostrophes with possessives; quotation marks with dialogue; colons with lists; semicolons between independent clauses, and commas with appositives (e.g., in a student generated composition which includes usage of all these skill areas, peers identify and edit errors, where necessary) ◊**

$12.64_{1,2,3,4,5,7,8,9,10,11}$ **verb tense by recognizing appropriate situations for tense shifts (e.g., rewrite a paragraph/composition to illustrate correct tense shift) ◊**

$12.65_{7,8,10,11}$ **recognize and correct errors in subject/verb agreement with emphasis on indefinite pronouns (e.g., take a composition, substitute a variety of indefinite pronouns for a variety of nouns functioning as subjects and change verbs, where appropriate, to agree) ◊**

$12.66_{8,9}$ **correct errors in parallel structure in paragraphs and compositions (e.g., student work, newspaper articles, editorials) ◊**

$12.67_{5,6,7,8,9}$ **correct errors in redundancy in paragraphs and compositions (e.g., student work, newspaper articles, editorials) ◊**

$12.68_{7,8,9}$ **correct errors of misplaced modifiers in sentences, paragraphs, and essaysparagraphs (e..g., advertisements, student essays, articles) ◊**

$12.69_{2,3,4,5,6,7,8,9}$ **recognize the specific audience for whom a piece of writing has been generated (e.g., letter of job application/scholarship application, essay, personal letter) ◊**

$12.70_{1,2,3,5,6,7,8,11}$ **use content and organizational strategies to identify supporting sentences and paragraphs (e.g., example/illustration, personal anecdote, extended definition, analogy) ◊**

$12.71_{7,8,9,10,11}$ **use content and organizational strategies to identify transitional devices**

Adolescent Mathematics Education

The mathematics program represents a core curriculum from which students will select at least three, and preferably four, courses for mathematics credit toward high school graduation. County school systems or individual high schools may opt to offer additional mathematics courses; however, students will have the opportunity to choose from the following:

Applied Mathematics I*
Applied Mathematics II*
Algebra I*
Geometry and Applied Geometry*
Algebra II*
Trigonometry*
Probability and Statistics*
Pre-Calculus*
Discrete Mathematics
Algebra/Geometry Preparation*
Algebra Support*
AP Courses
College Courses

Credit for Algebra I may be granted through two paths: successful completion of Algebra I or successful completion of Applied Mathematics I and Applied Mathematics II. The Algebra/Geometry Preparation course is designed to allow a ninth grade student the opportunity to acquire the mathematical maturity necessary to proceed to Algebra I or Applied Mathematics I. Students not demonstrating mastery of the Algebra I instructional objectives must be scheduled into the Algebra Support Class. The Algebra Support class may be taken concurrently with Geometry and Applied Geometry. Elective credit will be given for the Algebra Support class and the Algebra/Geometry Preparation class. These two courses may not be used to fulfill the three mathematics credits required for graduation.

An integrated mathematics program is an alternative method of delivery if the integrity of the course objectives as defined in this document is maintained. The objectives specified in this document offer a challenging and rewarding curriculum for all students.

* minimum courses required to be taught at all high schools.

Applied Mathematics I

Applied Mathematics I is the first year of a two year course. An Applied Mathematics credit will be given for this course. Upon successful completion of both courses and the demonstration of competency, Algebra I credit will be given. Applied Mathematics I is a lab based course taught with teacher-led, concrete activities. This course is designed to develop algebraic concepts applicable in the work place as well as in traditional areas.

AM1.1 use a scientific calculator to perform the basic operations of whole numbers, fractions, and decimals ◊

AM1.2 estimate using both a rough estimate and truncating before solving a problem involving computation ◊

AM1.3 write numbers in scientific notation and combine numbers written in scientific notation to solve problems

AM1.4 distinguish between counting and measuring using precision tools to make measurements

AM1.5 solve problems and interpret results using signed numbers and vectors

AM1.6$_{9,10,11}$ **simplify numerical expressions and evaluate algebraic expressions using grouping symbols and order of operations**

AM1.7$_{9,10,11}$ **translate word phrases into algebraic expressions or word sentences into equations and inequalities**

AM1.8 justify steps in the simplification of expressions and the solving of equations based on the properties of real numbers

AM1.9$_{9,10,11}$ **solve literal equations (i.e. formulas) for a given variable and apply the skills toward solving practical problems**

AM1.10$_{9,10,11}$ **represent problems and solve linear algebraic equations and inequalities using a four step problem solving approach**

AM1.11$_{9,10,11}$ **collect, organize, and interpret data using graphs, charts, and tables** ◊

AM1.12 solve absolute value equations in one variable and interpret the results on the number line

AM1.13 use the laws of exponents to perform operations on expressions with integral exponents

AM1.14$_{9,10,11}$ **estimate and simplify square roots**

Computer and Technology

AM1.15 use appropriate software to practice and master Applied Mathematics I instructional objectives

AM1.16 use a scientific calculator to preform basic operations with whole numbers, fractions, and decimals (AM1.1)

AM1.17 use graphic software to create graphs, charts, and tables from given data. (AM1.11)

AM1.17 use a spreadsheet to solve linear equations

AM1.18 use an integrated software package to develop a formula table, a measurement table, and an equality table

Applied Mathematics II

Applied Mathematics II is the second year of a two year course. Upon successful completion of both courses and the demonstration of competency, Algebra I credit it will be given. Algebraic concepts will be taught using laboratory activities based on several strategies that include the use of the graphing calculator. Working in groups will be used to develop problem solving skills and social skills needed in the work place as well as in traditional areas.

AM2.1$_{9,10,11}$ **factor polynomials by applying various methods**

AM2.2 add, subtract, multiply, and divide polynomials

AM2.3$_{9,10,11}$ **determine the slope of a line given an equation of the line, the graph of the line, two points on the line, or information that allows two points to be identified. Applications, such as graph interpretation, will be utilized**

AM2.4 graph linear equations by identifing and applying an appropriate technique-methods include slope intercept, point-slope, and x and y intercept

AM2.5$_{9,10,11}$ **write an equation of a line using sufficient given information such as the graph of a line, two points on the line, the slope and a point, or the slope and y intercept**

AM2.6$_{9,10,11}$ **analyze a given set of data for the existence of a pattern, represent the pattern algebraically and graphically, determine the domain and range, and determine if the relation is a function**◇

AM2.7$_{9,10,11}$ **solve quadratic equations by graphing, by factoring, and by the quadratic formula** ◇

AM2.8 solve systems of linear equations graphically and by multiple algebraic methods, such as elimination and substitution with application

AM2.9 add, subtract, multiply, and divide rational expressions

AM2.10$_{9,10,11}$ **collect, organize, interpret data, and predict outcomes using the mean, mode, median, range, and standard deviation**

AM2.11$_{9,10,11}$ **predict the outcomes of simple events using the rules of probability**

AM2.12 load and use single spreadsheet template to solve practical problems ◇

AM2.13$_{9,10,11}$ **use process charts and histograms, run charts, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control** ◇

Computer and Technology

AM2.14 use appropriate software to practice and master Applied Mathematics II instructional objectives

AM2.15 use a graphing calculator to determine the slope of a line, the graph of a line, two points on the line, or identification of those two points (AM2.3 and AM2.4)

AM2.16 use a graphing calculator to graph linear equations given slope-intercept, point-slope, and x and y intercept (AM2.4)

AM2.17 use a graphing calculator to solve quadratic equations (AM2.7)

AM2.18 use graphing software to create graphs, charts, histograms, and tables of given data; to find frequency distribution and standard deviation (AM2.10)

AM2.19 use graphing software to create process charts and histograms, run charts, scatter diagrams, and distribution curves (AM2.13)

AM2.20 use spreadsheet software to solve given problems. (AM2.12)

Algebra I

Algebra I is a one-year course that provides the gateway to all other mathematics courses. This course uses a conceptual approach to mathematics and does not focus on algorithmic methods. Algebraic representations will be used to generalize, and the algebraic method will be viewed as a problem solving tool. In planning for instruction, consideration should be given to the student's readiness for abstract concepts. Manipulatives, such as algebra tiles, should be used to bridge the gap from the concrete to the abstract. Available technology such as calculators, computers, and graphing utilities are to be used as tools to enhance learning.

At the completion of Algebra I, the students are to be tested on the instructional objectives. If mastery is not achieved, the student will be expected to take the Algebra Support class.

AI.$1_{9,10,11}$ **simplify numerical expressions and evaluate algebraic expressions using grouping symbols and order of operations**

AI.$2_{9,10,11}$ **translate word phrases into algebraic expressions and word sentences into equations or inequalities** ◊

AI.3 justify steps in the simplification of expressions and in the solving of equations based on the properties of real numbers ◊

AI.$4_{9,10,11}$ **solve multi-step linear equations and inequalities in one variable and apply the skills toward solving practical problems** ◊

AI.$5_{9,10,11}$ **solve literal equations (i.e. formulas) for a given variable and apply the skills toward solving practical problems and better equip students for calculator usage** ◊

AI.$6_{9,10,11}$ **analyze a given set of data for the existence of a pattern, represent the pattern algebraically and graphically, determine the domain and range, and determine if the relation is a function** ◊

AI.7 solve absolute value equations in one variable and interpret the results on a number line.

AI.8 use the laws of exponents to perform operations on expressions with integral exponents

AI.$9_{9,10,11}$ **determine the slope of a line given an equation of the line, the graph of the line, or the information that allows two points to be identified. Appropriate applications, such as graph interpretation, will be utilized**◊

AI.10 graph linear equations by identifying and applying an appropriate technique--methods include slope intercept, point slope, and x and y intercept

AI.$11_{9,10,11}$ **write an equation of a line using sufficient given information such as the graph of a line, two points on the line, the slope and a point, or the slope and the y intercept**

AI.12 solve systems of linear equations graphically and by multiple algebraic methods, such as elimination and substitution

AI.13 add, subtract, multiply, and divide polynomials

AI.14 factor polynomials by applying various methods

AI.15 solve quadratic equations by graphing, factoring, and by the quadratic formula

AI.16 add, subtract, multiply, and divide rational expressions

AI.$17_{9,10,11}$ **identify the effects of parameter changes on a function** ◊

AI.$18_{9,10,11}$ **solve equations containing radicals**

AI.15 solve quadratic equations by graphing, factoring, and by the quadratic formula

AI.16 add, subtract, multiply, and divide rational expressions

AI.17$_{9,10,11}$ **identify the effects of parameter changes on a function** ◊

AI.18$_{9,10,11}$ **solve equations containing radicals**

AI.19$_{9,10,11}$ **solve inequalities**

Computer and Technology

AI.20 use appropriate software to practice and master Algebra I instructional objectives

AI1.21 use a graphing calculator to solve linear equations and to graph linear equations (AI1.5 and AI1.10)

AI1.22 use a graphing calculator to determine the slope of a line. (AI1.9)

AI1.23 use a graphing calculator to solve quadratic equations. (AI1.15)

Geometry and Applied Geometry

Geometry is a one year course designed for students who have successfully completed the objectives for Algebra I. The study of geometry should include experiences and activities that foster in students a feeling for the value of geometry in their lives. Students should be encouraged to develop conjectures by inductive processes using manipulatives and computer software such as Geometer's Sketchpad. Cooperative learning groups are particularly effective in allowing students to become proficient in analyzing conjectures and in formulating proofs. Emphasis should be placed on applications to the work place and everyday life and on connections to other branches of mathematics and other disciplines.

Applied Geometry is a one year course for students who have successfully completed the objectives of Algebra I. Upon completion of this course a geometry credit will be given. Applied Geometry will use manipulatives to enhance the understanding of geometric concepts and terminology. Working in groups will allow students to analyze applications of geometry in their lives and in the work place. Concepts will be taught using laboratory activities including the use of tools such as the graphing calculator and the Geometer's Sketchpad. The objectives for Applied Geometry will be the same as those for Geometry.

G.1 represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and angles

G.2 differentiate between inductive and deductive reasoning ◊

G.3 use the basic concepts of symbolic logic including identifying the converse, inverse, and contrapositive of a conditional statement and testing the validity of conclusions with Venn diagrams ◊

G.4 construct logical arguments using various formats with emphasis on paragraph form, flow proofs, and indirect approaches ◊

G.5 apply definitions, theorems, and postulates related to such topics as complementary, supplementary, and vertical angles perpendicular and parallel line in geometric proofs, in algebraic problems, and in practical applications

G.6$_{10,11}$ **explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel,**

and use the results to develop methods to show parallelism

G.7 investigate and verify congruence relationships in triangles

G.$8_{9,10,11}$ **explore and identify properties of quadrilaterals and verify properties for parallelogram, rectangle, rhombus, square, and trapezoid**

G.9 investigate measures of angles and lengths of segments to determine the existence of triangles (triangle inequality) and the order of sides and angles

G.$10_{9,10,11}$ **apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios**

G.$11_{9,10,11}$ **using trigonometric ratios, determine lengths of sides and measures of angles in right triangles**

G.$12_{10,11}$ **apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships**

G.13 investigate measures of angles and the relationship to the arcs of a circle

G.$14_{9,10,11}$ **discover the measures of angles of a polygon and connect the results to tessellating pattern ◊**

G.$15_{9,10,11}$ **discover the lengths of sides of polygons from given data ◊**

G.16_{9} **develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems ◊**

G.$17_{9,10,11}$ **develop and apply basic concepts of analytical geometry such as formulas for distance, slope, and midpoint ◊**

G.18 construct by Euclidean methods a triangle's medians, altitudes, angle bisectors, and perpendicular bisectors and make conjectures about their relationships

G.$19_{9,10,11}$ **recognize terminology associated with transformational geometry. Given a figure, create a reflection, translation, rotation, glide reflection or dilation of that figure**

G.20 compare and contrast other geometries to Euclidean geometry

G.$21_{9,10,11}$ **find the area of a closed figure inscribed within another closed figure**

G.$22_{9,10,11}$ **using the Cartesian Coordinate system, find the dimensions of a polygon, given the coordinates of the polygon**

Computer and Technology

G.23 use appropriate software to practice and master Geometry and Applied Geometry instructional objectives

G.24 use a calculator to perform operations on whole numbers, fractions, and decimals

Algebra II

Listed below are the objectives for a one-year course in Algebra II. It is an underlying assumption that a mastery of Algebra I has been achieved since Algebra II continues the study of concepts introduced in Algebra I. Graphing calculators are an integral part of instruction in the Algebra II objectives. Students will have the opportunity to make conjectures and test them by using any graphing utility. Manipulatives and other available technology should be used as appropriate.

A2.1 continue to identify and formalize the justification of the use of the field properties, axioms of equality and inequality, and properties of order that are valid for the set of real numbers, complex numbers, and matrices

A2.2$_{9,10,11}$ **continue to review the concept of slope of a line, write equations of lines given various information, and graph linear equations. Graphing calculators will be used as a teaching aid** ◊

A2.3$_{9,10,11}$ **continue to factor polynomials by applying various methods of factoring including the sum and difference of two cubes**

A2.4$_{9,10,11}$ **solve and graph the solution of a linear inequality and systems of linear inequalities in two variables. Graphing calculators will be used to enhance the solving and confirming of solutions**

A2.5 perform operations with complex numbers and give answers in simplest form

A2.6$_{9,10,11}$ **simplify radicals and expressions involving fractional exponents and convert between the two forms**

A2.7 use the complex number system to define i and a+bi, and simplify powers and products of i

A2.8 solve a quadratic equation over the set of complex numbers by selecting and applying factoring, graphing, the quadratic formula or completing the square. Use the discriminate to determine the nature of the roots. Graphing calculators will be used for solving and/or confirming solutions

A2.9 perform basic matrix operations and solve a system of linear equations using the inverse matrix method. Graphing calculators will be used to perform the calculations

A2.10$_{9,10,11}$ **solve equations containing radicals and exponents**

A2.11$_{9,10,11}$ **recognize linear, quadratic, absolute value, step, and exponential functions. Convert between a graph, table and an equation**

A2.12$_{9,10,11}$ **find the domain, range, zeros, and inverse of a function, the value of a function for a given element in its domain, and the composition of multiple functions**

A2.13$_{9,10,11}$ **graph quadratic functions, solve problems using quadratic equations, and solve quadratic inequalities**

A2.14$_{9,10,11}$ **find the maximum and minimum values of a function over a region using linear programming techniques** ◊

A2.15 solve problems involving direct, inverse, and joint variation. Applications to practical problems will be investigated

A2.16 recognize, identify, and sketch the graphs of a parabola, circle, ellipse, and hyperbola. Graphing calculators will be used as a teaching aid ◊

A2.17 solve absolute value equations and inequalities graphically and algebraically. Graphing calculators will be used as a primary method of solution and to verify algebraic solutions ◊

A2.18 define a logarithmic function, transform equations from exponential form into logarithmic form, and apply the basic properties of logarithms to simplify or expand an expression

A2.19$_{9,10,11}$ **solve problems using non-routine strategies**◊

Computer and Technology

A2.20 use appropriate software to practice and master Algebra II instructional objectives

A2.21 use graphing software to explore, analyze, and display algebraic relationships

A2.22 use a graphing calculator to

graph linear equations (A2.2 and A2.9)

A2.23 use a graphing calculator to graph linear inequalities and systems of inequalities with two variables (A2.4)

A2.24 use a graphing calculator to graph quadratic functions, and to solve quadratic equations and inequalities (A2.8 and A2.13)

A2.25 use a graphing calculator to investigate functions (A2.12)

A2.26 use a graphing calculator to find the maximum and minimum values of a function over a region (A2.14)

A2.27 use a graphing calculator to graph a parabola, circle, ellipse, and hyperbola (A2.16)

A2.28 use a graphing calculator to solve absolute value equations and inequalities (A2.17)

Trigonometry

Trigonometry is a one semester course designed for students who have successfully completed Algebra II. Connections between right triangle trigonometry and circular functions should be emphasized. Graphing utilities such as calculators and computers will be used to enhance student learning and to aid in finding the values of trigonometric functions and their inverses.

T.1 define the six trigonometric functions in terms of a right triangle and find the values of the functions of an angle in standard position, given a point on the terminal side of the angle. Circular function definitions will be connected with trigonometric function definitions

T.2 find the values of the other trigonometric functions, given the value of one trigonometric function

T.3 develop recall of the values of the six trigonometric functions of special angles as related to the unit circle

T.4 use a calculator to find the values of the trigonometric functions for any angle and to find the measure of an angle given the value of one of its trigonometric functions

T.5 convert angle measures from radians to degrees and vice versa

T.6 verify trigonometric identities by making substitutions and recalling basic identities ◊

T.7 solve trigonometric equations that include both infinite solutions and solutions with a restricted domain

T.8 find the value of inverse trigonometric functions

T.9 find the area of a triangle given the measures of two sides and the included angle or the measures of three sides (Heron's formula)

T.10 express complex numbers in polar form and perform operations. This will include adding, subtracting, multiplying, and dividing complex numbers in polar form, evaluating powers of complex numbers using De Moivre's Theorem, and finding the roots of a complex number

$T.11_{9,10,11}$ **solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines**

T.12 recognize the graph of the six trigonometric functions. Given an equation in the form y=ASin(Bx+C)+D, the student will identify the domain and range, determine the period, phase shift, amplitude and vertical shift, and sketch at least one period of the

graph. The graphing calculator will be used to investigate how A, B, C, and D affect the graph of the function ◊

T.13 recognize and graph the inverse of trigonometric functions. Restrictions on the domain will be included

T.14 develop and use formulas such as sum or difference of two angles, double-angle, and half-angle

Computer and Technology

T.15 use appropriate software to practice and master trigonometric instructional objectives

T.16 use a scientific calculator to find the values of the trigonometric functions for an angle, and the measure of an angle given its trigonometric functions (T.4)

T.17 use a scientific calculator to convert angle measures from radius to degrees and vice versa (T.5)

T.18 use a scientific calculator to find the value of inverse trigonometric functions (T.8)

T.19 use a scientific calculator to solve practical problems involving triangles (T.9)

T.20 given an equation in the form $y=ASin(Bx+C)+D$, use a graphing calculator to investigate how *A, B, C,* and *D* effect the graph of a function (T.12)

T.21 use a graphing calculator to graph the inverse of a trigonometric function (T.13)

Probability and Statistics

Probability and Statistics, a one-semester course, is one of the most important branches of the mathematical sciences. Knowledge of these topics is critical to decision making and to the analysis of data. Using concepts of probability and statistics, individuals are able to predict the likelihood of an event occurring, organize and evaluate data, and identify the significance of statements. Connections between content and applications to the students' world will be emphasized. Prerequisites for this course are successful completion of Algebra II and Geometry.

PS.1 distinguish between experimental and theoretical probability

PS.$2_{9,10,11}$ **create and interpret data using various methods of displaying numerical data, including frequency distributions, circle graphs, histograms, and frequency curves, and make predictions about outliers** ◊

PS.3 determine possible outcomes using tree diagrams and the counting principles of permutations and combinations

PS.$4_{9,10,11}$ **express the chances of events occurring either in terms of a probability or odds**

PS.$5_{9,10,11}$ **use the normal distribution and the binomial distribution including Pascal's triangle, to determine probability of events**

PS.$6_{9,10,11}$ **interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation** ◊

PS.$7_{9,10,11}$ **interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation** ◊

PS.8 describe individual performances in terms of percentiles, z-scores, and t-scores

PS.9 describe the role of sampling,

randomness, bias, and sample size in data collection and interpretation

PS.10 explain and illustrate the use and misuse of statistics ◊

PS.11 test the validity of a hypothesis using appropriate statistical concepts ◊

PS.12$_{9,10,11}$ **determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable** ◊

PS.13 calculate the Chi-Square values for a given population

PS.14 perform a t-test for a designated set of data, and use the results to test the validity of a hypothesis

PS.15$_{10,11}$ **perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the equation for the line of regression for a scattergram**

PS.16 perform an analysis of variance (ANOVA) and interpret the results

PS.17$_{9,10,11}$ **make a prediction based upon a statistical sample**◊

PS.18$_{9,10,11}$ **make a statistical conclusion based on information in a chart or table** ◊

Computer and Technology

PS.19 use appropriate software to practice and master Probability and Statistics instructional objectives

PS.20 use graphing software to create frequency distribution charts, graphs, histograms, and frequency curves (PS.2)

PS.21 use spreadsheets to calculate central tendency, frequency distribution and standard deviation from given data (PS.6)

PS.22 use a calculator to find measures of dispersions (PS.7)

PS.23 use a calculator to find the Chi-Square values for a given population (PS.13)

PS.24 use a calculator to perform the t-test on a given set of data (PS.14)

PS.25 use a calculator to perform a regression analysis on a set of data (PS.15)

PS.26 use a calculator to perform an analysis of variance (ANOVA) (PS.16)

Pre-Calculus

Pre-Calculus is a one year course intended for students who have mastered the concepts of Algebra II. It will extend students' knowledge of functions as well as provide appropriate preparation for a calculus course. Available technology will be used by students and teachers to enhance learning. Graphing utilities are powerful tools for solving and verifying equations and inequalities. They also aid in investigating functions and their inverses.

PC.1 investigate and identify the characteristics of polynomials and rational functions and use these to sketch the graphs of the functions. These characteristics include zeros, upper and lower bounds, y-intercepts, symmetry, asymptotes, and maximum and minimum points. Graphing calculators will be used to verify these characteristics ◊

PC.2 solve higher order polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, and Rational Root Theorem

PC.3 perform mathematical operations on complex numbers and graph

complex numbers

PC.4 expand binomials with positive integral exponents by the use of Pascal's triangle and the Binomial Theorem

PC.5 establish the relationship between exponential and logarithmic functions and graph the functions. Graphing calculators will be used to investigate the characteristics ◊

PC.6 perform calculations involving exponential and logarithmic expressions to solve equations and practical problems. This will include natural and common logarithms, laws of exponents and logarithms, and the solution of logarithmic and exponential equations

PC.7 recognize and use properties of matrices to solve practical problems

PC.$8_{9,10,11}$ **solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included**

PC.9 find the limit of a function, a sequence, or a series by intuitive reasoning, algebraic methods, and numerical substitution

PC.10 use properties of parallel and perpendicular lines to analyze systems of equations ◊

PC.11 perform mathematical operations with vectors and use vectors to solve practical problems. This will include addition, subtraction, scalar multiplication, inner (dot) product, norm (magnitude) of a vector, unit vector, graphing, perpendicular components, and cross products

PC.12 apply the method of mathematical induction to prove formulas and statements ◊

PC.13 use graphs to investigate and describe the continuity of functions. The functions will include rational, piece-wise defined, and step functions. Graphing calculators will be used to investigate and verify the graphs ◊

PC.14 graph functions and conic sections using translation and rotation of axes. Graphing calculators will be used to investigate and verify the graphs ◊

PC.$15_{9,10,11}$ **estimate the area under a curve**

Computer and Technology

PC.16 use appropriate software to practice and master Pre-Calculus instructional objectives

PC.17 use a graphing calculator to graph the functions of polynomials and rational functions (PC.1)

PC.18 use a graphing calculator to graph complex numbers (PC.3)

PC.19 use a graphing calculator to graph exponential and logarithmic functions (PC.5)

PC.20 use a calculator to solve equations with exponential and logarithmic expressions (PC.6)

PC.21 use a graphing calculator to perform operations with vectors and use vectors to solve problems (PC.11)

PC.22 use a graphing calculator to investigate the continuity of functions (PC.13)

PC.23 use a graphing calculator to graph functions of conic sections (PC.14)

Discrete Mathematics

Discrete mathematics is an advanced course which may be an alternative to pre-calculus, trigonometry, or calculus. The emphasis will be placed on learning and creating algorithms to perform certain computations or to process information within a discrete (finite) set. Counting, optimization, recursively defined functions, modeling situations with graphs, arranging objects, sequences, and series are a few of the topics that will be explored. As the use of computers (a discrete machine) continues to increase, so will the expansion and importance of discrete mathematics.

DM.1 analyze and evaluate graphs made of vertices and edges that model real world problems ◊

DM.2 define, use, and differentiate such concepts as Eulerian path, Eulerian circuit, Hamiltonian path, Hamiltonian circuit, and isomorphism

DM.3 define and use algorithms, such as breadth-first, depth-first, minimum spanning tree algorithm, the shortest path, and the four color conjecture to solve problems ◊

DM.4 understand and apply graph coloring to real situations, such as scheduling ◊

DM.$5_{9,10,11}$ **find the number of possible ways independent objects from a given set may be selected or find the number of ways events may occur**

DM.6 analyze and evaluate situations where elements are ordered or repeated

DM.7 differentiate between random and ordered selections and apply these concepts in a variety of settings

DM.$8_{9,10,11}$ **calculate the probability of a given event occurring**

DM.9 solve problems by applying the exclusion-inclusion principle, pigeonhole, and catalan numbers

DM.10 recognize types of codes, including error-correcting codes, and apply decoding techniques

DM.11 define and identify various number and geometric patterns (including tessellations), symmetries, and apply to real world settings

DM.12 create and use matrices. Explain the connection between graphs and matrices

DM.13 perform basic operations on matrices and apply to real world applications

DM.14 distinguish between convergent and divergent sequences and series

DM.$15_{9,10,11}$ **use recurrence relations to solve problems**

DM.16 construct fractals using a recursive process (use calculator or computer)

DM.17 identify and explain the characteristics of self-similarity (symmetry of scale)

DM.18 explain the characteristics of a fractal

Computer and Technology

DM.19 use appropriate software to practice and master Discrete Mathematics instructional objectives

DM.20 use software for analyzing and evaluating graphs made of vertices and edges that model real world problems (DM.1)

DM.21 using spreadsheets, create, analyze, and use matrices

DM.22 use graphing software, apply graph coloring to real world situations (DM.4)

DM.23 perform basic operations on matrices and apply to real world use (DM.13)

DM.24 use fractal construction software, create fractals using a recursive process (DM.17)

DM.25 using fractal created, identify and explain characteristics of

symmetry of scale. (DM.18)

Algebra/Geometry Preparation

Algebra/Geometry preparation is an elective course, not for mathematics credit, designed to be a bridge between the concrete elementary curriculum and the more formal mathematics curriculum ahead. In this course students will explore algebraic concepts in an informal way to build a foundation for subsequent formal study of algebra. Such informal explorations should emphasize physical models, data, graphs, and other mathematical representations rather than facility with formal algebraic manipulations. The study of geometry is to assist students to represent and make sense of the world. Geometric models will provide a perspective from which students are to analyze and solve problems, and geometric interpretations are to help make abstract representations more easily understood. The study of geometry at this level should simply provide increased opportunities for students to engage in more systematic explorations.

AGP.1 identify and use properties of numbers (commutative,associative, distributive,etc)

AGP.2 add, subtract, multiply, and divide decimals, integers, fractions and mixed numbers

AGP.3 use order relations to compare, order, or locate whole numbers, integers, fractions, and decimals on a number line

AGP.4$_{9,10,11}$ **read, interpret, and construct graphs to solve problems.**

AGP.5$_{9,10,11}$ **use data to determine mean, median, mode, and range**

AGP.6$_{9,10,11}$ **find the probability of complementary events and exclusive events**

AGP.7 estimate, measure, and perform operations involving length, mass, and capacity using customary and metric units

AGP.8 use a protractor to measure and draw angles

AGP.9 use a compass to construct congruent angles, bisect angles, and bisect line segments

AGP.10$_{9,10,11}$ **estimate and find circumference and area of a circle**

AGP.11$_{9,10,11}$ **estimate and find the area and perimeter of polygons**

AGP.12$_{9,10,11}$ **estimate and find the surface area and the volume of three dimensional figures**

AGP.13 identify angle relationships: complementary, supplementary, vertical, and adjacent

AGP.14$_{9,10,11}$ **identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles)**

AGP.15$_{9,10,11}$ **investigate similar triangles and apply proportions in problem solving situations**

AGP.16$_{9,10,11}$ develop and explore circle relationships, emphasizing the vocabulary of circles

AG1.17$_{9,10,11}$ **substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems**

AGP1.18$_{9,10,11}$ **solve equations with at least two operations**

Computer and Technology

AGP.19 use appropriate software to practice and master Algebra/Geometry Preparation instructional objectives.

AGP.20 use a spreadsheet to determine mean, median, mode, and range of a selected group of data (AGP.5)

AGP.21 use a calculator to find the probability of complementary and

exclusive events (AGP.6)

AGP.22 use a calculator to find the circumference of a circle (AGP.10)

AGP.23 use a calculator to find the area and perimeter of a polygon (AGP.11)

AGP.24 use a calculator to find the volume of a three dimensional figure (AGP.12)

AGP.25 use a calculator to find the value of an expression (AGP.17)

AGP.26 use a calculator to solve an equation with at least two operations (AGP.18)

Advanced Placement (AP) Calculus

Calculus AB is an Advanced Placement curriculum for a one-year course in elementary functions and calculus for students who have successfully completed Pre-Calculus. The major topics include differential and integral calculus. Calculus BC is an intensive one-year course in the calculus of functions for a single variable. In addition to the topics covered in Calculus AB, the BC course also includes infinite series and differential equations. Calculus AB and Calculus BC represent college-level mathematics for which most colleges grant Advanced Placement credit. The instructional objectives for these courses are outlined in the College Board Publications. It is strongly recommended that students in Advanced Placement Calculus take the AP exam.

Advanced Placement (AP) Statistics

The AP Statistics course is a one year course designed for students who have successfully completed an Algebra II course. Its purpose is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Four broad conceptual themes are emphasized: (1) exploring data: observing patterns and departures from patterns; (2) planning a study: deciding what and how to measure; (3) anticipating patterns in advance: producing models using probability and statistics; and (4) statistical inference: confirming models.

Algebra Support

Algebra support is a one semester elective course,not for mathematics credit, designed for students who have successfully completed Algebra I or Applied Mathematics I and II, but have not demonstrated mastery on the Algebra I end-of-course exam. This class should be small enough to allow for individualized instruction thus strengthening each student's weaknesses. Manipulatives and technology should be used where appropriate. A student may progress to geometry while taking this course.

Review for Assessment Grades 9,10,11

The following instructional objectives require review prior to the administration of spring standardized tests in grades 9, 10, and 11.

Applied Mathematics I

AM1.$6_{9,10,11}$ **simplify numerical expressions and evaluate algebraic expressions using grouping symbols and order of operations**

AM1.$7_{9,10,11}$ **translate word phrases into algebraic expressions or word sentences into equations and inequalities**

AM1.$9_{9,10,11}$ **solve literal equations (i.e. formulas) for a given variable and apply the skills toward solving practical problems**

AM1.$10_{9,10,11}$ **represent problems and solve linear algebraic equations and inequalities using a four step problem solving approach**

AM1.$11_{9,10,11}$ **collect, organize, and interpret data using graphs, charts, and tables ◊**

AM1.$14_{9,10,11}$ **estimate and simplify square roots**

Applied Mathematics II

AM2.$1_{9,10,11}$ **factor polynomials by applying various methods**

AM2.$3_{9,10,11}$ **determine the slope of a line given an equation of the line, the graph of the line, two points on the line, or information that allows two points to be identified. Applications, such as graph interpretation, will be utilized**

AM2.$5_{9,10,11}$ **write an equation of a line using sufficient given information such as the graph of a line, two points on the line, the slope and a point, or the slope and y intercept**

AM2.$6_{9,10,11}$ **analyze a given set of data for the existence of a pattern, represent the pattern algebraically and graphically, determine the domain and range, and determine if the relation is a function◊**

AM2.$7_{9,10,11}$ **solve quadratic equations by graphing, by factoring, and by the quadratic formula ◊**

AM2.$10_{9,10,11}$ **collect, organize, interpret data, and predict outcomes using the mean, mode, median, range, and standard deviation**

AM2.$11_{9,10,11}$ **predict the outcomes of simple events using the rules of probability**

AM2.$13_{9,10,11}$ **use process charts and histograms, run charts, scatter diagrams, and normal distribution curves in order to perform statistical process (quality) control ◊**

Algebra I

AI.$1_{9,10,11}$ **simplify numerical expressions and evaluate algebraic expressions using grouping symbols and order of operations**

AI.$2_{9,10,11}$ **translate word phrases into algebraic expressions and word sentences into equations or inequalities ◊**

AI.$4_{9,10,11}$ **solve multi-step linear equations and inequalities in one variable and apply the skills toward solving practical problems ◊**

AI.$5_{9,10,11}$ **solve literal equations (i.e. formulas) for a given variable and apply the skills toward solving practical problems and better equip students for**

calculator usage ◊

AI.$6_{9,10,11}$ analyze a given set of data for the existence of a pattern, represent the pattern algebraically and graphically, determine the domain and range, and determine if the relation is a function ◊

AI.$9_{9,10,11}$ determine the slope of a line given an equation of the line, the graph of the line, or the information that allows two points to be identified. Appropriate applications, such as graph interpretation, will be utilized◊

AI.$11_{9,10,11}$ write an equation of a line using sufficient given information such as the graph of a line, two points on the line, the slope and a point, or the slope and the y intercept

AI.$17_{9,10,11}$ identify the effects of parameter changes on a function ◊

AI.$18_{9,10,11}$ solve equations containing radicals

AI.$19_{9,10,11}$ solve inequalities

Geometry and Applied Geometry

G.$6_{10,11}$ explore the relationship between angles formed by two lines cut by a transversal when lines are and are not parallel, and use the results to develop methods to show parallelism

G.$8_{9,10,11}$ explore and identify properties of quadrilaterals and verify properties for parallelogram, rectangle, rhombus, square, and trapezoid

G.$10_{9,10,11}$ apply properties of similar triangles to determine inaccessible heights and distances, construct scaled drawings, and derive the basis for the trigonometric ratios

G.$11_{9,10,11}$ using trigonometric ratios, determine lengths of sides and measures of angles in right triangles

G.$12_{10,11}$ apply the Pythagorean Theorem and its converse in solving practical problems and in deriving the special right triangle relationships

G.$14_{9,10,11}$ discover the measures of angles of a polygon and connect the results to tessellating pattern ◊

G.$15_{9,10,11}$ discover the lengths of sides of polygons from given data ◊

G.16_{9} develop and apply formulas for area, perimeter, surface area, and volume and apply them in the modeling of practical problems ◊

G.$17_{9,10,11}$ develop and apply basic concepts of analytical geometry such as formulas for distance, slope, and midpoint ◊

G.$19_{9,10,11}$ recognize terminology associated with transformational geometry. Given a figure, create a reflection, translation, rotation, glide reflection or dilation of that figure

G.$21_{9,10,11}$ find the area of a closed figure inscribed within another closed figure

G.$22_{9,10,11}$using the Cartesian Coordinate system, find the dimensions of a polygon, given the coordinates of the polygon

Algebra II

A2.$2_{9,10,11}$ continue to review the concept of slope of a line, write equations of lines given various information, and graph linear equations. Graphing calculators will be used as a teaching aid ◊

A2.$3_{9,10,11}$ continue to factor polynomials by applying various methods of factoring including the sum and difference of two cubes

A2.$4_{9,10,11}$ solve and graph the solution of a linear inequality and systems of linear inequalities in two variables.

Graphing calculators will be used to enhance the solving and confirming of solutions

A2.6$_{9,10,11}$ simplify radicals and expressions involving fractional exponents and convert between the two forms

A2.10$_{9,10,11}$ solve equations containing radicals and exponents

A2.11$_{9,10,11}$ recognize linear, quadratic, absolute value, step, and exponential functions. Convert between a graph, table and an equation

A2.12$_{9,10,11}$ find the domain, range, zeros, and inverse of a function, the value of a function for a given element in its domain, and the composition of multiple functions

A2.13$_{9,10,11}$ graph quadratic functions, solve problems using quadratic equations, and solve quadratic inequalities

A2.14$_{9,10,11}$ find the maximum and minimum values of a function over a region using linear programming techniques ◊

A2.19$_{9,10,11}$ solve problems using non-routine strategies◊

Trigonometry

T.11$_{9,10,11}$ solve practical problems involving triangles using the trigonometric functions, the Pythagorean Theorem, the Law of Sines, and the Law of Cosines

Probability and Statistics

PS.2$_{9,10,11}$ create and interpret data using various methods of displaying numerical data, including frequency distributions, circle graphs, histograms, and frequency curves, and make predictions about outliers ◊

PS.4$_{9,10,11}$ express the chances of events occurring either in terms of a probability or odds

PS.5$_{9,10,11}$ use the normal distribution and the binomial distribution including Pascal's triangle, to determine probability of events

PS.6$_{9,10,11}$ interpret and calculate measures of central tendency (mean, median, and mode) from data presented in a variety of forms such as charts, tables, and graphs or from data created through experimentation ◊

PS.7$_{9,10,11}$ interpret and calculate measures of dispersions (range and standard deviation) from data presented in a variety of forms such as charts, tables and graphs or from data created through experimentation ◊

PS.12$_{9,10,11}$ determine the correlation values for given data or for data generated by students and use the results to describe the association of the variables within the given data. Identify whether this association is systematic or predictable ◊

PS.15$_{10,11}$ perform a regression analysis on a set of data, either given or created through experimentation, and use the results to predict specific values of a variable. Identify the equation for the line of regression for a scattergram

PS.17$_{9,10,11}$ make a prediction based upon a statistical sample◊

PS.18$_{9,10,11}$ make a statistical conclusion based on information in a chart or table ◊

Pre-Calculus

PC.8$_{9,10,11}$ solve problems involving the sum of finite and infinite sequences and series. Sigma (summation) notation will be included

PC.15$_{9,10,11}$ estimate the area under a curve

Discrete Mathematics

DM.$5_{9,10,11}$ **find the number of possible ways independent objects from a given set may be selected or find the number of ways events may occur**

DM.$8_{9,10,11}$ **calculate the probability of a given event occurring**

DM.$15_{9,10,11}$ **use recurrence relations to solve problems**

Algebra Geometry Preparation

AGP.$4_{9,10,11}$ **read, interpret, and construct graphs to solve problems.**

AGP.$5_{9,10,11}$ **use data to determine mean, median, mode, and range**

AGP.$6_{9,10,11}$ **find the probability of complementary events and exclusive events**

AGP.$10_{9,10,11}$ **estimate and find circumference and area of a circle**

AGP.$11_{9,10,11}$ **estimate and find the area and perimeter of polygons**

AGP.$12_{9,10,11}$ **estimate and find the surface area and the volume of three dimensional figures**

AGP.$14_{9,10,11}$ **identify angle relationships; involving parallel lines and apply in solving problems (corresponding angles, alternate interior angles, and alternate exterior angles)**

AGP.$15_{9,10,11}$ **investigate similar triangles and apply proportions in problem solving situations**

AG1.$17_{9,10,11}$ **substitute values, evaluate expressions involving variables, and calculate formulas to solve application problems**

AGP1.$18_{9,10,11}$ **solve equations with at least two operations**

Adolescent Social Studies Education

The adolescent social studies program represents a core curriculum from which students will select at least three courses for social studies credit toward high school graduation. County school systems or individual high schools may opt to offer additional social studies courses; however, the following courses are required of all students.

The social studies curriculum prepares students for gainful employment, post secondary education, and/or college. Each course will provide experiences and emphasize skills which enable students to make the transition from the classroom to the workplace and to a culturally diverse society.

Required Courses

United States Studies to 1900
World Studies to 1900
Twentieth Century Studies

Elective Courses

Economics*
Civics/Government*
AP Courses
College Courses

Alternative: Courses developed by a county system which are approved with a waiver from the West Virginia Board of Education may also be offered.

* Required to be offered.

Grade Nine: United States Studies to 1900

This program of study follows the evolution of the Constitution as a living document and the role of participatory democracy in the development of a rapidly changing technological society. This study of the United States is an examination of the formative years from the Pre-Columbian civilizations to its transformation to a dominant political and economic influence in the world. Special emphasis is placed on how the challenges of settling expansive and widely differing environments were met by a diverse population.

Civics

9.1$_{10}$ **analyze the content of the Declaration of Independence and the factors that led to its creation** ◇

9.2$_{5,6}$ **summarize the impact of documents and philosophies that were the basis for the United States governmental system** ◇

9.3$_{10}$ **explain the major challenges faced by the members of the Constitutional Convention and how the design of the Constitution affects national, state, and local powers** ◇

9.4 analyze the United States Constitution as a response to the political, economic, and social conditions that existed after the American Revolution (e.g., federation and confederation, power of taxation, interstate commerce, adaptability of the United States Constitution, Bill of Rights) ◇

9.5$_{3,4,5,6,7,8,10,11}$ **explain the Constitutional basis for resolving disputes between branches of government** ◇

9.6$_{10}$ **explain the steps required to amend the Constitution** ◇

9.7$_{11}$ **describe the presidential election process (e.g., reasons for the creation and continued use of the Electoral College, the duties of the president, and the order of the presidential succession process)** ◇

9.8$_{3,4,5,6,7,8,10,11}$ **given a specific legal problem, describe how the legislative process works to resolve it** ◇

9.9 compare and contrast various American people's responses to controversial government actions ◇

9.10$_{3,8,10}$ **describe the different types of local government, and compare their functions and powers**

9.11$_{6,8}$ discuss the complexity and variety of issues facing local governments (e.g., zoning laws) ◇

9.12$_{10}$ **explain the evolution of representative democracy in the United States**

9.13$_{3,4,5,6,7,8,11}$ **explain the purpose, organization, and function of the legislative, executive, and judicial branches**

9.14$_{7,8}$ **summarize the Articles of and Amendments to the Constitution**

9.15 demonstrate the ability to work cooperatively and resolve conflict peacefully ◇

Economics

9.16$_{3,4,5,6,7,8,10,11}$ **draw conclusions, make inferences, and suggest generalizations about United States economic issues using**

various types of graphs, charts, and tables ◊

9.17 describe how the United States economic system changed from mercantilism to free enterprise capitalism ◊

9.18 **examine the role of the United States government in the banking, finance, and monetary systems** ◊

9.19 using charts and graphs, analyze the effects of foreign trade and tariff policies on the United States ◊

9.20 differentiate among various types of taxes and relate them to taxation controversies in the United States during their era ◊

9.21_{11} **describe the cause and effect relationship between the labor movement and industrialization in the United States** ◊

9.22 **identify and analyze the role of market factors in the settlement of the United States and the development of the free enterprise system** ◊

Review for Assessment

$9.23_{6,10}$ **compare the basic characteristics of communism, socialism, and capitalism** ◊

$9.24_{3,4,5,6,7,8,10,11}$ **understand how the laws of supply and demand affected the production and consumption of goods and services** ◊

$9.25_{3,4,5,7}$ **understand the concept of taxation (e.g., income, property, sales, and estate)** ◊

Geography

9.26 **explain settlement, population patterns, and the growth of service centers from reading and interpretting maps, graphs and charts** ◊

9.27 **identify and describe major landforms, cities, and climate areas of the United States** ◊

9.28 **show how the climates, landforms and rivers of the United States relate to in a world context**

$9.29_{3,6,7}$ **analyze the relationship of Native American cultures to their physical environment**

9.30 **describe geographic differences which contributed to economic development and regionalism prior to the Civil War**

9.31 **locate and place on a blank map, states and capitals, landforms, and the major events in United States history**

9.32_{11} **analyze the effect of geography on immigration and settlement patterns** ◊

Review for Assessment

9.33_{7} **locate major meridians of longitude and parallels of latitude**

9.34_{7} **locate and identify major world rivers, climate areas, and rain forests**

9.35 **explain the impact of health and cultural considerations on life expectancy over different historical time periods**

History

9.36 chart the contacts that occurred between Native Americans and European settlers

9.37 analyze the effect of United States policy on Native Americans

9.38_{5} **analyze the factors that led to settlement and expansion across the United States continent** ◊

$9.39_{7,11}$ **explain major United States conflicts in terms of causes and consequences** ◊

9.40 analyze the effect of European empire building and

how it led to the American Revolution ◊

9.41 **analyze how nationalism affected the constitutional, political, economic and foreign policy issues faced by the U. S. in its formative years** ◊

9.42 **compare the political, economic, and social conditions in the United States before and after the Civil War** ◊

9.43 **evaluate the effects of technological change on the United States** ◊

9.44 analyze the goals and actions of reformers and reform movements during this era ◊

9.45 **describe the influence and impact of diverse cultures on United States society and their assimilation into American life**

$9.46_{3,4,5,6,7,8,10,11}$ **draw conclusions of America from maps, graphs, charts, cartoons and timelines** ◊

Review for Assessment

$9.47_{4,7}$ **describe the effect of farming on culture**

9.48 **trace the development of religion in early civilizations**

9.49 **analyze the contributions of Russian rulers to the development of that country**

$9.50_{7,11}$ **analyze twentieth century foreign policy and wars**

Computer/Technology

9.51 use appropriate software to practice and master grade nine social studies instructional objectives ◊

9.52 use a variety of audio-visual and multi-media materials to practice and master ninth grade social studies instructional objectives ◊

9.53 practice inputting data using correct keying, editing, and formatting techniques

9.54 use graphics software to create graphs, histograms, tables and charts ◊

9.55 use graphics software to select the appropriate type of graph to display a set of data ◊

9.56 design and use a database to analyze, compare, and interpret the relationship between United States historical and geographical events ◊

9.57 use simulation software for investigating open-ended problems, formulating questions and extending problem-solving situations as they relate to United States history ◊

Grade Ten: World Studies to 1900

This study of the world emphasizes the historic, economic, geographic, political, and social structure of various cultural regions of the world from the dawn of civilization to the interdependent world of the twentieth century. Special attention is given to the formation and evolution of societies into complex political and economic systems. Geography /map skills and critical thinking skills are emphasized.

Civics

10.1 identify and evaluate the contributions of the classical civilizations to the development of the United States Constitution.

10.2 **discuss world historical events**

which affected the evolution of democracy in various countries as well as the United States

10.3 analyze the nature of civic responsibility in a diverse society

10.4 analyze the causes and resolution of conflict ◊

Review for Assessment

$10.5_{3,4,5,6,7,8,9,11}$ identify the powers given by the United States Constitution to local, state and national governments and qualifications of state leaders

10.6_{9} explain the section of the United States Constitution that describes the election, duties and replacement of the president and Vice President

10.7_{9} explain the process used to amend the United States Constitution ◊

10.8_{9} analyze the Declaration of Independence

$10.9_{6,11}$ explain the significance of the Supreme Court decision Brown vs. Board of Education to public education

10.10 define the powers of the federal government

10.11_{9} explain the major challenges of the Constitutional Convention

10.12 relate cause and effect of the War Powers Act of 1973

Economics

10.13 describe the main imports and exports of regions of the world ◊

10.14 analyze and describe how various societies developed economic systems (e.g., goods and services produced and how they were distributed) ◊

10.15 analyze the role of exchange/trade systems as economic systems developed ◊

10.16 analyze and compare monetary and fiscal policies of several world societies

10.17 identify a cause and effect relationship of economic change ◊

$10.18_{3,4,5,6,7,8,9,11}$ read and interpret relevant charts, graphs, and tables ◊

10.19 compare the advantages and disadvantages of developing economic systems

Review for Assessment

10.20_{7} identify the role of stock ownership

10.21 describe the sharecropper system of the Reconstruction Period

$10.22_{3,4,5,6,7,8,9,11}$ differentiate between services supplied by public and private sectors

10.23 describe economic development and changes in the United States before and after 1900 (e.g., federal deficit and the origins of the national debt) ◊

Geography

$10.24_{3,4,5,6,7,8,9,11}$ read and interpret information using maps, graphs and charts ◊

10.25 identify and label geographic features of the world, (e.g., continents, mountain ranges, and bodies of water)

10.26 identify and label geographic features of the continents,(e.g., plateaus, highpoints, low points and major river valleys)

10.27 identify world language patterns

10.28 identify world resources and explain how the location of resources influenced economic development and the global economy

10.29 identify and explain geographic reasons for the

development of major world cities and the recent trends in urban population growth ◊

10.30 explain the development of major political boundaries of the world, and relate these to the theme of geo-politics ◊

10.31 describe the evolution of significant world trade routes ◊

10.32 describe and analyze the migration of people during this era

10.33 analyze the physical and cultural patterns of settlement

Review for Assessment

10.34 **identify the effect of geographic features upon the environment**

History

10.35 identify and evaluate the interaction of early humans with their environment ◊

10.36 **analyze the causes for the rise and decline of civilizations (e.g., the river civilizations, Greek and Roman Empires)**

10.37 **identify, compare, and evaluate the political, economic and cultural contributions of significant world societies**

10.38 analyze the cyclical nature of dynasties

10.39 **explain the basic tenets of major world religions and philosophies**

10.40 compare feudalism around the world

10.41 identify and evaluate the political and economic role and the cultural contributions, of the Christian church in medieval society

10.42 describe the role and impact of the Crusades

10.43 relate the worth of the individual in society to the growth of the concept of the "Renaissance Man"

10.44 describe the location, unique contribution, and characteristics of Arab/Islamic society

10.45 identify the causes and consequences of the Reformation ◊

10.46 describe how European needs/wants for foreign products contributed to the Age of Exploration ◊

10.47 **identify the impact of British colonization**

10.48 **identify and assess the impact of the Industrial Revolution**

10.49 **describe how late 19th century social reformers improved the conditions for working class people through social changes** ◊

10.50 **identify and explain the development of various forms of government in Latin America** ◊

10.51 analyze and assess the impact of revolutions ◊

10.52 analyze and assess the concept of nation building ◊

10.53 **examine key people, places, events and ideas of the period** ◊

$10.54_{3,4,5,6,7,8,9,11}$ **read and interpret historical charts, tables, graphs, narratives, primary source documents, political cartoons, and timelines** ◊

Review for Assessment

10.55_{5} **identify the major goals for the New Deal**

10.56 **analyze and sequence important events of the Civil War**

10.57 **explain the meaning of the United States "Open Door" policy**

10.58 **explain taxation issues between America and the English Parliament**

10.59 **explain the development of the English Navy**

$10.60_{6,9}$ **analyze the commonalities of Fascism, Nazism, and Communism**

Computer/Technology

10.61 use appropriate software to practice and master grade ten

social studies instructional objectives ◊

10.62 use a variety of audio-visual and multi-media materials to practice and master tenth grade social studies instructional objectives ◊

10.63 practice inputting data using correct keying, editing, and formatting techniques ◊

10.64 use graphics software to create graphs, histograms, tables, and charts ◊

10.65 use graphics software to select the appropriate type of graph to display a set of data ◊

10.66 design and use a database of countries of the world to analyze, compare, and interpret the relationship between historical and geographical events ◊

10.67 use simulation software for investigating open-ended problems, formulating questions and extending problem-solving situations as they relate to World Studies ◊

Grade Eleven: Twentieth Century Studies

The focus of the course is an identification and study of the interaction of geographic, political, economic, and historical factors. Such factors provide students a framework to examine and appreciate the changing nature of societies and the increasing interdependency of the United States and the world. Students will contrast and evaluate past and present world concerns and hypothesize about problems and solutions for the future. Students will realize the importance of well-informed citizens in a diverse society and their place in the democratic process.

Civics

11.1 analyze the changing nature of federalism and the growth of national government in the 20th century

11.2 **examine 20th century Supreme Court cases and explain their Constitutional basis** ◊

11.3 explain the role of the president in the formation of national and foreign policy ◊

11.4 $_{3,4,5,6,7,8,9,10}$ **identify the responsibilities and interaction of the executive, legislative, and judicial branches in an increasingly complex society**

11.5 **identify the reasons for amendments ratified in the 20th century and analyze the effects**

11.6$_{6,9}$ **analyze the election process and the functions of political parties**

11.7 **evaluate the formation, role, and impact of third parties in the United States political process** ◊

11.8$_{4,6,7}$ **analyze and compare the goals and actions of reformers with regard to the extension of civil rights** ◊

11.9 examine historical and current political conflicts and compare resolutions within the framework of constitutional and totalitarian states ◊

11.10$_{10}$ analyze the changing nature of civic responsibility in a diverse society

11.11 **develop generalizations and make inferences from primary and secondary sources in the twentieth century** ◊

11.12 compare and contrast totalitarian and democratic governments and list representative examples ◊

11.13 **outline the purposes and functions of major international governmental and**

non-governmental organizations

11.14 cite examples of working cooperatively and resolving conflict peacefully ◊

11.15 analyze and evaluate the influence of citizen action on public policy and law making ◊

11.16 formulate positions and/or courses of action on the problems of today and possible challenges of the future ◊

Review for Assessment

11.17_5 **identify compromises in the formation of the United States Constitution**

11.18 **describe the impact of important African-American leaders**

Economics

$11.19_{3,4,5,6,7,8,9,10}$ **identify the basic economic systems and explain how each attempts to allocate scarce resources to provide a mix of private and public goods and services** ◊

11.20 analyze national and international economic interdependency ◊

11.21 **apply the law of supply and demand in the production of services in developed and developing nations** ◊

11.22 explain the business cycle and how different political systems formulate policy ◊

11.23 explain monetary policy and its effect on society ◊

11.24 analyze the causes and consequences of the U.S. national debt and its effect on the world economic system ◊

11.25 **explain the impact of technology and industrialization on the development of mass production and mass consumption** ◊

11.26 **analyze the economies of developing nations** ◊

11.27 **explain how Gross Domestic Product and per capita income are calculated and used to compare the economies of different nations** ◊

11.28 **explain how industrialization/technology changes life styles**

11.29 compare and evaluate basic economic systems according to how the system deals with demand, supply, labor unions, savings, investment, and capital ◊

Review for Assessment

11.30 **review ideas of noted economists on economic systems**

Geography

11.31 **identify U.S. settlement patterns throughout the 20th century, and draw conclusions about causes and effect (e.g., discuss the problems resulting from the migration to and from the Great Plains)**

11.32 **relate and interpret the importance of geographic resources to international conflicts and cooperation in the 20th century. (e.g., discuss how U.S. dependence on Middle Eastern oil resulted in geo-political consequences)** ◊

11.33 **relate and interpret the importance of geographic factors to social, political, economic and technological change. (e.g., discuss the supposed increased "cost of doing business" since the establishment of the Environmental Protection Agency, or the lack of water west of the Mississippi)** ◊

$11.34_{3,4,5,6,7,8,9,10}$ **read and interpret maps, graphs, charts, cartoons, and timelines** ◊

11.35 transform primary data into maps, graphs, and charts ◊

11.36 identify on a blank map the places significant to each period

of study

11.37 analyze the impact of human decision making and technology on the environment. (e.g., discuss the geographic discrimination suffered by minority neighborhoods) ◊

11.38_{10} apply geographic factors/features in relationship to development of civilizations ◊

Review for Assessment

11.39 **draw conclusions about the advantages and disadvantages of annual flooding in the world**

11.40 **analyze and describe the effect of the Gulf Stream**

11.41 **define the term transcontinental**

History

11.42 assess the impact of United States foreign policy on different world regions ◊

$11.43_{7,9}$ **identify and analyze the causes and consequences of world conflicts (e.g., World War I, World War II, Korea, Vietnam, and Gulf War)** ◊

11.44 identify and analyze the causes and consequences of regional conflicts (e.g., Middle East, Latin America, Africa, and Europe) ◊

11.45 **critique United States immigration policies**

11.46_{9} **describe the development and impact of the United States labor movement**

11.47 describe the growth and development of social, economic, and political reforms ◊

11.48 **explain the rise and fall of Communism in the former Soviet Union**

11.49 **analyze the advent and implications of the Nuclear Age**

11.50_{7} **analyze the origins and implications of the Cold War**

11.51 **trace and analyze the development of civil and human rights in the U.S. and in the world** ◊

11.52 analyze the challenges to national and world security by extremists and terrorists ◊

11.53 **identify major historical events in chronological order**

11.54 **trace and analyze the global concern for human rights (e.g., Holocaust, ethnic cleansing)**

Review for Assessment

11.55 **identify legal systems which had an impact on western civilization**

11.56_{10} **identify the major causes for the fall of the Roman Empire**

11.57 **know the Supreme Court decision which institutionalized slavery**

Computer/Technology

11.58 use appropriate software to practice and master grade eleven social studies instructional objectives ◊

11.59 use a variety of audio-visual and multi-media materials to practice and master eleventh grade social studies instructional objectives ◊

11.60 practice inputting data using correct keying, editing, and formatting techniques ◊

11.61 use graphics software to create graphs, histograms, tables and charts ◊

11.62 use graphics software to select the appropriate type of graph to display a set of data ◊

11.63 design and use a database to analyze, compare, and interpret the relationship between historical and geographical events of the twentieth and early twenty-first century ◊

11.64 use simulation software for investigating open-ended problems, formulating questions and extending problem-solving situations as they relate to the twentieth and early twenty-first centuries ◊

11.65 critically evaluate information obtained from telecommunications and other technology sources ◊

Economics

Economic understanding is essential so students will know that most decisions have economic consequences. As more resources become scarce, as the economic environment changes, and as the economic impact of decisions becomes more immediate, students must know how to use economic analysis to solve the complex problems they face now and in the future. This course will emphasize the need to make sense of the array of economic facts, events, observations and issues in everyday life and in being able to make effective decisions about economic issues.

E.1 give examples showing how scarcity of goods and services forces people to make choices about needs and wants ◊

E.2 analyze how the scarcity of natural, technological, capital, and human resources requires economic systems to make choices about the distribution goods and services ◊

E.3 explain the role supply and demand, prices, incentives, and profits play in determining what is produced and distributed in a free enterprise system ◊

E.4 compare and contrast examples of private and public goods and services ◊

E.5 evaluate the costs and benefits of allocating goods and services through public and private means ◊

E.6 describe and compare relationships among economic institutions (e.g., households, businesses, banks, government agencies, and labor unions) ◊

E.7 explain how specialization and division of labor in economic systems increase productivity ◊

E.8 describe the role of money and other forms of exchange in the economic process ◊

E.9 compare and analyze how values and beliefs influence economic decisions in different economic systems ◊

E.10 evaluate economic systems according to how laws, rules, and procedures deal with demand, supply, and prices ◊

E.11 evaluate historical and current social developments and issues from an economic perspective ◊

E.12 explain historical and current developments and issues in local, national, and global contexts from an economic perspective ◊

E.13 define inflation and explain its effects on economic systems ◊

E.14 define and analyze the use of fiscal and monetary policy in the national economic system ◊

E.15 explain the process of international trade from an economic perspective ◊

E.16 analyze and evaluate growth and stability in different economic systems ◊

E.17 analyze a public issue from an economic perspective and propose a socially desirable solution ◊

Civics/Government

Civic education is essential for active participation by informed citizens. This course will emphasize a study of governement and individual rights and responsibility. Examination of rules and laws and the need for authority is crucial to maintaining a society safe for diverse individuals and groups. Civic understanding increases as students develop the skills to make informed decisions, resolve conflicts peacefully, articulate and defend positions, and engage in the civic and political life of their communities.

C.1 use documents such as the Declaration of Independence and the Constitution to explain the primary purposes of government ◊

C.2 describe the characteristics of government and civil society that relate to civic participation ◊

C.3 explain the significance of the consent of the governed in the formation of a democratic society ◊

C.4 explain the rule of law and why accepted rules must be followed by the government and those governed ◊

C.5 compare and contrast the tension between individual liberty and society's need for order ◊

C.6 identify examples of how individual rights are protected and how the government promotes the common good ◊

C.7 explain the rights of people to express their views and positions on proposed governmental actions ◊

C.8 compare and contrast direct and representative democracy ◊

C.9 explain why the founding fathers chose a republic as a form of government ◊

C.10 explain the roles of elected officials and their relationship tof citizens ◊

C.11 explain how power is separated and shared in the United States at all levels of government ◊

C.12 define federalism and differentiate between states and federal governments ◊

C.13 explain the system of checks and balances provided by the Constitution ◊

C.14 explain how the rights of those accused of crime are protected in the 5th, 6th, and 14th amendments ◊

C.15 explain the values and interests protected by the right to counsel and due process ◊

C.16 identify and describe United States foreign policy, national security, and objectives ◊

C.17 describe the importance of foreign policy to individual citizens ◊

C.18 explain the process of becoming a citizen ◊

C.19 explain how United States citizenship differs from authoritarian and totalitarian regimes ◊

C.20 evaluate and defend postitions facing on issues contemporary American society ◊

C.21 describe and evaluate the ways in which technology might affect civic life in the future ◊

Adolescent Science Education

The goal of adolescent science education prescribes that all students be scientifically literate. To accomplish scientific literacy, a curriculuIm based on an integration of science, mathematics, and technology with an emphasis on development of themes and concepts shall be utilized. The science program represents a core curriculum from which all students will successfully complete three science courses (Coordinated and Thematic Science Nine, Coordinated and Thematic Science Ten, and one approved science elective) for science credit toward high school graduation.

The CATS Nine and CATS Ten courses continue the development of biology, chemistry, physics, and earth/space science concepts from the middle school curriculum. CATS Nine and CATS Ten are laboratory-based courses. Completion of CATS Nine and CATS Ten assures that students possess the foundational knowledge and preparation needed for advanced, in-depth study in all fields of science - biological sciences, chemistry, physics, and the environmental earth sciences.

Students must select at least one science approved elective. Approved electives must address all seven overarching goals of the science curriculum. They are in-depth studies in laboratory-based natural sciences and science applications.

Required Courses

Coordinated and Thematic Science Nine
Coordinated and Thematic Science Ten

Approved Elective Courses

*Biology Eleven/Twelve
*Chemistry Eleven/Twelve
Chemistry - Technical/Conceptual
*Environmental Earth Science Eleven/Twelve
Human Anatomy and Physiology
*Physics - Eleven/Twelve
Physics - Technical/Conceptual
AP Courses
College Courses

County school systems or individual high schools may opt to offer additional approved science electives such as Astronomy, Biochemistry, Botany/Zoology, Coordinated and Thematic Science Eleven/Twelve, Ecology, Microbiology, Organic Chemistry, Physical Geology.

* minimum elective courses required to be taught at all high schools

Grade Nine Science

The Coordinated and Thematic Science (CATS) Nine objectives continue the development of foundational knowledge in biology, chemistry, physics, and the earth sciences. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills aquired in CATS Eight, students in CATS Nine will expand and deepen their understanding of major concepts such as energy interactions, genetic probabilities, chemical changes and mineral composition of local rock layers.

Nature of Science

9.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

9.2 recognize general limitations of science

9.3_{11} explain that science is composed of observations set in a testable framework of ideas

9.4 conclude that science is a blend of creativity, logic and mathematics

Scientific Attitudes/Habits of Mind

$9.5_{4,5,6,7,8,10,11}$ **model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◊

9.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review)◊

9.7_{11} apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges) ◊

Scientific Processes/Thinking Skills

$9.8_{3,4,5,6,7,8,10,11}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring and applying)** ◊

$9.9_{3,4,5,6,7,8,10,11}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◊

$9.10_{3,4,5,6,7,8,10,11}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and effect graphical analysis including interpretation and extrapolation)** ◊

9.11 use SI (metric) measurements

9.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

9.13 use the tools of science safely, accurately and appropriately ◊

$9.14_{4,5,6,8}$ **identify independent and dependent variables in experimental investigations**

9.15 **manipulate variables to extend experimental activities**

9.16_{11} **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to improve investigations and communications, formulate and**

revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientific inquiry) ◊

Laboratory Investigations/Hands-on Learning

9.17 engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

9.18 properly and safely manipulate equipment, materials, chemicals, organisms and models ◊

9.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

9.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Content and Themes

9.21 articulate connections among the major disciplines of science

9.22 utilize the thematic approach incorporating the following themes: systems, changes, and models

9.23_{11} **analyze and explain the principles of genetics (e.g., monohybrid and dihybrid crosses, mutations, genotypes, phenotypes, X and Y chromosomes, DNA, probability, diversity) - *models***

$9.24_{7,8,10,11}$ **identify and explain the structures and functions of tissues (e.g., striated, cardiac, smooth muscle) - *systems***

$9.25_{7,8,10,11}$ **explain how human body systems work together (e.g., excretory, digestive systems) - *systems***

$9.26_{7,11}$ **identify and describe microscopic organisms and foreign substances in the environment and their harmful effects (e.g., microorganisms, mutagens, carcinogens) - *systems***

9.27 **mathematically illustrate changes in populations of organisms - *changes***

9.28 **identify the organisms and the chemical processes involved in the decay of materials - *changes***

$9.29_{4,6,8,10,11}$ trace the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration, and fermentation - *changes*

$9.30_{7,8,10,11}$ **compare the variations in cells, tissues, and organs of the excretory and digestive systems of different organisms - *changes***

$9.31_{3,4,5,7,8,10,11}$ **design an environment which demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors) - *models***

9.32 **illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg, and body cells - *models***

9.33 construct and manipulate models which show variations in living things (e.g., excretory, digestive systems) - *systems, models*

9.34 list the characteristics of radioactivity including alpha and beta particles and gamma rays - *systems*

9.35 associate proton number with type of element, electron distribution with reactivity, and number of neutrons with nuclear stability - *systems*

9.36_{11} review the relationship between elements and their location in the periodic table including families, metals, nonmetals and metalloids - *systems*

9.37_{11} determine the number of neutrons, protons and electrons given atomic number and average atomic mass number and relate to the periodic table position - *systems*

9.38_{11} identify and distinguish kinds of chemical bonds including ionic, nonpolar covalent and polar covalent - *systems*

9.39_{11} recognize that water has unusual properties due to its molecular shape, polarity, and hydrogen bonding - *systems*

9.40$_{6,7,8,10,11}$ **recognize that all chemical reactions involve energy changes (e.g. endothermic and exothermic reactions) - *systems***

9.41$_{11}$ experimentally determine the products of chemical reactions then write and balance chemical equations - *changes, models*

9.42$_{6,7,11}$ **conduct, write equations and classify five types of chemical reactions including synthesis, decomposition, single displacement, double displacement and combustion - *changes, models***

9.43$_{6,7,8,10,11}$ **investigate the relationships among temperature, pressure and volume in gases with respect to Charles (V-T), Boyles (V-P) and Gay-Lussac's Laws (P-T) - *changes***

9.44$_{10,11}$ diagram the relationship between energy and phase changes (e.g. freezing, boiling, sublimation) - *models*

9.45$_{10}$ trace the development of the model of the atom (e.g. Crookes, Thompson, Becquerel, Rutherford and Bohr) - *models*

9.46 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions - *models*

9.47 draw structures of simple organic compounds (e.g. alkanes, alcohols) - *models*

9.48$_{11}$ **demonstrate water characteristics including capillary action, surface tension, adhesion and cohesion via a variety of methods (e.g. chromatography, meniscus readings) - *models***

9.49$_{8,10}$ **experiment with a pendulum to determine which variables (amplitude, mass, length) will affect the motion of the pendulum - *systems***

9.50 **relate the force between charged objects to the charge on the objects and the distance between them - *systems***

9.51 **examine the differences and similarities between transverse and longitudinal waves - *systems***

9.52 **relate absorption and dissipation of heat to the composition of a material - *systems***

9.53 **describe the behavior of atoms and molecules in terms of the Kinetic Molecular Theory (e.g., gases, solids, liquids) - *systems***

9.54 **relate wavelength to color and frequency - *systems***

9.55 **review of foundational concepts including refraction, speed, distance, time, Newton's Laws, simple machines, tables and graphs, heat absorption, energy transformations, and air pressure - *systems***

9.56$_{7,8}$ **differentiate energy transformations (e.g., heat, light, sound, mechanical, chemical, nuclear) - *changes***

9.57 define a chain reaction and show an example using a radioactive isotope (e.g., U-235) - *changes*

9.58 differentiate between fission and fusion - *changes*

9.59$_{6,7,8,10,11}$ **identify and describe various forms of energy (e.g., electromagnetic, electrical, chemical, mechanical, nuclear form) - *changes***

9.60$_{5,6,7,8,10,11}$ **solve for variables using the density equation, D = m/V and experimentally determine the density of an object making measurements of mass and volume - *models***

9.61 define and solve problems involving potential difference - *models*

9.62 **define types of waves and their properties (e.g., interference, diffraction, resonance) - *models***

9.63 use the wave equation to determine the relationships among speed, wavelength, and frequency - *models*

9.64 solve electrical problems (e.g., Ohm's Law $I = V/R$, Power $P = I^2R$) - *models*

9.65 **hypothesize and experiment when different components are substituted in an electrical circuit. Test the hypothesis - *models***

9.66 demonstrate and diagram a magnetic field using a bar magnet and iron filings - *models*

9.67 **list the characteristics of electromagnetic waves and identify uses - *models***

9.68 **define and describe half life of a**

radioactive isotope - *models*

9.69 **demonstrate light as a wave motion (e.g., ripple tank) - *models***

9.70 **review characteristics of light (e.g., reflect, refract, diffract) - *change***

9.71 **review fundamental earth science concepts including air has mass and exerts pressure, physical states of matter -*systems***

9.72 research uses and values of natural resources -*systems*

9.73 research space technology in everyday life -*systems*

9.74 **examine how scientists use seismographic evidence in determining structure and composition of the Earth's interior -*systems***

9.75 **explain and compare motions of the sun and moon -*systems***

9.76 **relate temperature, pressure, wind speed, wind direction, and humidity as elements of weather - *systems***

9.77 interpret why warm air can hold more water vapor than cold air -*systems*

9.78 **estimate the age of materials using existing radioactive data -*systems***

9.79 research current environmental issues (e.g., effects of pollution, solid waste management, local, national, and global issues) -*systems*

9.80 relate the structure of the ocean floor to the kind of organisms present - *systems*

9.81 explore the properties and motions of oceans -*systems*

9.82 **interpret how sound travels through different materials (e.g., transmitted, reflected, or absorbed) -*changes***

$9.83_{3,6}$ **examine and describe interactive cycles (e.g., water cycle, nitrogen cycle, and carbon cycle) -*changes***

9.84_{10} distinguish the movements of subsurface water -*changes*

9.85_{10} examine geologic time emphasizing isotopic ages and biostratigraphy - *changes*

9.86 investigate formation and destruction of mountains (e.g., weathering, earthquakes, volcanoes, plate tectonics) -*changes*

$9.87_{4,6,7,8,10,11}$ **construct and use weather maps and charts (e.g., temperature, pressure, wind speed, wind direction, humidity) -*models***

$9.88_{4,6,10,11}$ **analyze and describe a common rock sample (e.g., color, grain, and composition) -*models***

$9.89_{4,6,10,11}$ **employ tests to identify rocks and minerals (e.g., streak, color, hardness, cleavage) -*models***

$9.90_{8,10}$ **estimate linear distance on a map scale (e.g., topographic maps) - *models***

9.91 construct and explain models (e.g., solar systems, galaxies, constellations, stellar types, and stellar evolution) -*models*

9.92 **use a model to describe the functions of the water cycle (e.g., water entering and leaving the atmosphere, flow of water and precipitation) -*models***

Science History

9.93 identify contributors to the scientific body of knowledge including their diverse cultures

9.94 trace the historical development of key historical concepts and principles describing their impact on modern thought and life

9.95 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology, and Society

9.96 apply scientific skills and technological tools to address personal and societal needs ◊

9.97 engage in decision making activities and actions to resolve science-technology-society issues ◊

9.98 investigate and analyze the interdependence of science and technology ◊

9.99 describe the scientific concepts underlying technological innovations ◊

9.100 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer/Technology

9.101 access, gather, store, retrieve, and organize data using hardware and

software designed for these purposes ◊

9.102 collect, analyze, and display data using computers and other electronic technology ◊

9.103 access internet resources for a variety of purposes (e.g., research, exchange data, e-mail, real-time investigations) ◊

9.104 demonstrate skills in the use of word processing, data bases, spreadsheets, graphics and telecommunication ◊

9.105 identify and solve problems with the appropriate technology ◊

9.106 incorporate correct grammar, spelling, vocabulary, and graphical representation for both written and oral multimedia presentations ◊

Grade Ten Science

The Coordinated and Thematic Science (CATS) Ten objectives conclude the development of foundational knowledge of biology, chemistry, physics, and the earth sciences. Through the spiraling, inquiry-based program of study, all students will demonstrate scientific literacy across these major fields of science. The subject matter is delivered through a coordinated, integrated approach with an emphasis on the development of the major science themes of systems, changes, and models. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated in all activities. Building on the knowledge and skills acquired in CATS Nine, students in CATS Ten will expand their depth of understanding of major concepts such as energy transformation qualifications, molecular genetics, embryology, physical, chemical and nuclear changes, mineral extraction techniques, and environmental concerns.

Nature of Science

10.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

10.2 recognize general limitations of science knowledge

10.3_{11} explain that science is composed of observations set in a testable framework of ideas

10.4 conclude that science is a blend of creativity, logic and mathematics

Scientific Attitudes/Habits of Mind

$10.5_{4,5,6,7,8,9,11}$ **model and exhibit the skills, attitudes and values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)**

10.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review)◊

10.7_{11} apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges) ◊

Scientific Processes/Thinking Skills

$10.8_{3,4,5,6,7,8,9,11}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring and applying) ◊**

$10.9_{3,4,5,6,7,8,9,11}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis◊**

$10.10_{3,4,5,6,7,8,9,11}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect graphical analysis including interpretation and**

extrapolation) ◊

10.11 use SI (metric) measurements

10.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

10.13 use the tools of science safely, accurately and appropriately ◊

10.14$_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

10.15 manipulate variables to extend experimental activities

10.16$_{11}$ design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to improve investigations and communications, formulate and revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientific inquiry) ◊

Laboratory Investigations/Hands-on Learning

10.17 engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time ◊

10.18 properly and safely manipulate equipment, materials, chemicals, organisms and models ◊

10.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

10.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Content

10.21 articulate connections among major disciplines of science

10.22 utilize the thematic approach incorporating the following themes: systems, change, and models

10.23$_{4,5,6,8,11}$ **review the needs of growing plants and the environments supplying those needs - *systems***

10.24$_{8}$ **identify and explain the structures and functions of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplast, ribosomes, lysosomes, vacuoles) - *systems***

10.25$_{7,8,9,11}$ **explain how human body systems work together (e.g., nervous, endocrine, immune)- *systems***

10.26$_{3,4,5,6,7,8,9}$ **review factors that affect succession and populations and communities (e.g., use maps, graphs, charts, and tables) - *systems***

10.27 **identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis) - *systems***

10.28$_{11}$ **explain the role of DNA in controlling cellular functions (e.g., protein synthesis, heredity, cell division) - *systems***

10.29$_{3,4,5,6,7,8,9,11}$ **construct concept maps showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles) - *changes***

10.30$_{8}$ trace matter and energy flow through the respiration processes of glycolysis, the Krebs cycle, and electron transport system (e.g., ATP, carbon, oxygen, water) - *changes*

10.31$_{7,8,9,11}$ **compare the variations in cells, tissues, and organs of the nervous, endocrine and immune systems of different organisms - *changes***

10.32 **compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy) - *changes***

10.33$_{3,4,5,6,7,8,9}$ **relate the role of natural selection to the development and/or extinction of a species - *changes***

10.34$_{7,8,9,11}$ illustrate the interdependence of cells, tissues, organs, and systems to the life functions of the whole organism - *models*

10.35 construct and manipulate models which show variations in living things (e.g., nervous, endocrine, immune systems) - *models*

10.36$_{3,5,6,8,11}$ investigate the properties of solutions including density, conductivity, solubility, concentration, pH, and colligative properties - *systems*

10.37$_{11}$ use polarity, molecular shape, and bonding to explain why water is considered the "universal solvent" - *systems*

10.38$_{6,7,8,9,11}$ interpret graphs showing the relationships among temperature, pressure, and volume in gases with respect to Charles (V-T), Boyles (V-P), and Gay-Lussac's Law (P-T) - *systems*

10.39$_{4,5,6,7,8,9,11}$ differentiate between physical, chemical, and nuclear changes - *changes*

10.40 measure the change in heat gained or lost during chemical reactions using the specific heat of water (e.g, heat released during burning of food materials, acid-base neutralization) - *changes*

10.41$_{11}$ investigate the relationship between energy and phase change in order to demonstrate heat of fusion and/or heat of vaporization - *changes*

10.42 recognize that the equation $E=mc^2$ can be used to illustrate the conversion of mass to energy during nuclear reactions - *changes*

10.43$_{11}$ validate the law of conservation of matter in chemical reactions - *changes*

10.44$_{6,7,9,11}$ use chemical equations to represent chemical and biochemical reactions (e.g., photosynthesis) - *models*

10.45$_{9}$ predict the isotope or radiation particle emitted during nuclear reactions given either isotope or radiation particles - *models*

10.46 complete simple nuclear equations given all but one of the materials involved in the reaction - *models*

10.47 illustrate how scientists used the electromagnetic spectrum to show the energy levels of electrons within atoms -*models*

10.48 relate characteristics and behavior of waves with earth and life processes (e.g., erosion, vision) -*systems*

10.49 calculate the relationship among rate, force, momentum and time - *systems*

10.50 summarize the relationship between frequency and speed (e.g., Doppler effect) - *systems*

10.51$_{8,9}$ determine the effect of different forces on vibrating systems (e.g., pendulums, springs) - *systems*

10.52$_{9}$ qualitatively explain the relationship between electricity and magnetism (e.g., the electromagnetic field) - *systems*

10.53$_{4,5}$ describe how components of an electric circuit function individually and as a component in an electric circuit - *systems*

10.54 review of fundamental concepts including air pressure, speed (distance and time), pendulums, vibrating objects - *systems*

10.55$_{3,9,11}$ demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels) - *systems*

10.56$_{3,4,5,6,7,8,9,11}$ qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical) - *changes*

10.57$_{5,6,7,8,9,11}$ relate the physical change in substances to changes in temperature (e.g., thermal expansion/contraction, increases/decreases in density) - *changes*

10.58 explain the relationship between wind and waves - *models*

10.59 differentiate between the movement of water particles in a wave and the movement of wave energy - *models*

10.60 explain the cause of tides - *models*

10.61$_{9}$ compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum - *models*

10.62$_{9}$ calculate the frequency of a

particular wavelength - *models*

10.63$_9$ **measure the rate of absorption of infrared radiation in containers of various colors - *models***

10.64 **apply Newton's Laws of Motion to living systems (e.g., walking) - *models***

10.65 extrapolate and interpolate graphs of distance and time (e.g., migration) - *models*

10.66$_{8,9}$ describe and quantify how machines can provide mechanical advantages - *models*

10.67$_{5,6,7,8,11}$ identify and describe the effects of specific heat on heating and cooling objects - *models*

10.68 **review fundamental earth science concepts including tests to identify rocks and minerals, topographic maps - *systems***

10.69$_3$ **investigate fossils (e.g., origins, use in establishing geological time, types of plants and animals included in fossil-fuel formation, compare fossils to present today organisms - *systems***

10.70$_{11}$ **examine the effects of natural phenomena on the environment (e.g., oceanographic, meteorologic) - *systems***

10.71$_3$ **probe characteristics of the atmosphere (e.g., relationship of air pressure to temperature and humidity, demonstrate that air has mass and exerts pressure - *systems***

10.72$_7$ **compare and contrast the characteristics of Earth to the other planets - *systems***

10.73$_{8,9}$ **illustrate methods to recover subsurface water for human use - *systems***

10.74$_9$ **relate electromagnetic fields to the earth's magnetosphere - *systems***

10.75$_7$ **describe factors determining the height and frequency of tides - *systems***

10.76 **identify and describe the effects of ocean currents on climate - *change***

10.77$_{9,11}$ **interpret apparent motion of constellations and their relationship to the rotation of the earth - *change***

10.78$_4$ **explore and explain the energy relationships in earth science (e.g., weather, plate tectonics, height and frequency of waves) - *change***

10.79 summarize technological advances in astronomy and meteorology - *change*

10.80 research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rain forest pollution) - *change*

10.81$_8$ **review physical changes in earth materials due to temperature variations and relate those changes to earth's natural processes - *change***

10.82$_{4,7}$ **utilize a stream table to observe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity) - *change***

10.83$_{11}$ **construct and interpret maps (e.g., use maps of geographic features to predict flora and fauna, weather maps and charts to observe and predict weather, topographical maps to illustrate surface features) - *models***

Science History

10.84 identify contributors to the scientific body of knowledge including their diverse cultures

10.85 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

10.86 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology and Society

10.87 apply scientific skills and technological tools to address personal and societal needs ◊

10.88 engage in decision making activities and actions to resolve science-technology-society issues ◊

10.89 investigate and analyze the interdependence of science and technology ◊

10.90 describe the scientific concepts underlying technological innovations ◊

10.91 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

10.92 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

10.93 collect, analyze and display data using computers and other electronic technology ◊

10.94 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◊

10.95 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

10.96 identify and solve problems with the appropriate technology ◊

10.97 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Biology Eleven/Twelve

This is an advanced level course designed for students who have completed Coordinated and Thematic Science (CATS) 10 and desire a broader, in-depth study of the content found in many biological fields of endeavor. This course is designed to build upon and extend the Biology concepts, skills, and knowledge from the CATS 7-10 program. Students interested in health and scientific related careers will build and expand their laboratory skills and experiences. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills.

Nature of Science

B.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

B.2 recognize general limitations of science

B.3 **explain that science is composed of observations set in a testable framework of ideas**

B.4 conclude that science is a blend of creativity, logic, and mathematics

Scientific Attitiudes/Habits of Mind

$B.5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes and values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity** ◊

B.6 demonstrate ethical practices for science (e.g., established research protocol, accurate recond keeping, replication of results and peer review) ◊

B.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges)** ◊

Scientific Processes/Thinking Skills

$B.8_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, catagorizing, classifying, relating, hypothesizing, predicting, inferring, and applying)** ◊

$B.9_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis** ◊

$B.10_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and effect graphical analysis including interpretation and extrapolation)** ◊

B.11 use SI measurement (metric)

B.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination, and creativity while working individually and/or cooperatively ◊

B.13 use the tools of science safely, accurately, and appropriately ◊

B.14$_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

B.15$_{9}$ manipulate variables to extend experimental activities

B.16$_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to imporve investigations and communications, formulate and revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientifc inquiry)** ◊

Laboratory Investigations/Hand-On Learning

B.17 engage in active inquiries, investigations, and hands-on activities for a minimun of 50 percent of instructional time ◊

B.18 properly and safely manipulate equipment, materials, chemicals, organisms, and models ◊

B.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations) ◊

B.20 use computers and other electronic techonolgies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze, and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

B.21$_{9,10}$ **apply molecular genetic principles to explain energy patterns (e.g., DNA, RNA, recombinant DNA, role of enzymes, mutations, population dynamics)**

B.22$_{7,9}$ **illustrate the stages in the life cycle of pathogens and trace the causes of diseases**

B.23$_{7,8,9,10}$ **investigate the interrelationships between anatomy and physiology of organisms**

B.24$_{7,8}$ **discuss external and internal factors that could damage cells, tissues, organs, or systems (e.g., carcinogens, fractures, noise, temperature)**

B.25$_{6,8,10}$ **trace matter and energy transfer that occurs during cellular respiration and photosynthesis**

B.26 construct models of all cell types showing structure, function, and biochemical processes

B.27 classify organisms into proper taxonomic groups by embryology, morphology, biochemistry, and karyotyping

B.28 compare the diversity of living organisms by grouping organisms according to similar characteristics (e.g., Monerans, protists, fungi, plants, simple and complex animals)

B.29 trace the embryological development of organisms

B.30 investigate and analyze responses of the ecosystem to events that cause changes

B.31$_{8,9,10}$ **design and map a biome or ecosystem showing geographical features, climate, and organisms that will adapt to life conditions there**

B.32 construct maps of the relationships between past and present life forms

B.33 explore and identify the different areas of biology (e.g., entomology, ichthyology, ornithology, phycology, zoology)

Science History

B.34 identify contributors to the scientific body of knowledge including their diverse cultures

B.35 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

B.36 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology and Society

B.37$_{9}$ apply scientific skills and

technological tools to address personal and societal needs ◇

B.38 engage in decision making activities and actions to resolve science-technology-society issues ◇

B.39 investigate and analyze the interdependence of science and technology ◇

B.40 describe the scientific concepts underlying technological innovations ◇

B.41 explore occupational opportunities in science and technology including the academic preparation necessary ◇

Computer and Technology

B.42 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◇

B.43 collect, analyze and display data using computers and other electronic technology ◇

B.44 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◇

B.45 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◇

B.46 identify and solve problems with the appropriate technology ◇

B.47 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◇

Chemistry Eleven/Twelve

Chemistry Eleven/Twelve is the advanced study of matter, its composition, and its changes. Chemistry Eleven/Twelve builds on the foundation of chemical concepts developed in CATS Seven through CATS Ten. This course is designed to prepare a student for college chemistry, requiring a strong mathematical base. The relationship between chemistry concepts and mathematics will be emphasized. Students will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

C.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◇

C.2 recognize general limitations of science

C.3 **explain that science is composed of observations set in a testable framework of ideas**

C.4 conclude that science is a blend of creativity, logic, and mathematics

Scientific Attitudes/Habits of Mind

C.$5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes, and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◇

C.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results, and peer review)◇

C.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges)** ◇

Scientific Processes/Thinking Skills

C.$8_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing,**

measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, and applying) ◊

C.9$_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◊

C.10$_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect, graphical analysis including interpretation and extrapolation)** ◊

C.11 use SI (metric) measurements

C.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

C.13 use the tools of science safely, accurately, and appropriately ◊

C.14$_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

C.15$_{9}$ manipulate variables to extend experimental activities

C.16$_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations; design and conduct scientific investigations; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument; understand scientific inquiry)** ◊

Laboratory Investigations/Hands-on Learning

C.17 engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

C.18 properly and safely manipulate equipment, materials, chemicals, organisms, and models ◊

C.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

C.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

C.21$_{3,4,5,6,7,8,9,10}$ **review of foundational chemical concepts including chemical symbols representing elements, ions, and formulas; balanced-equations; atomic structure including subatomic particles and atomic models; use of periodic table to locate and classify elements; states of matter; colligative properties; kinetic molecular theory; chemical and physical properties; and chemical and physical changes**

C.22 write electron configurations and complete diagrams for electron position

C.23 relate the position and velocity of an electron to the Heisenberg Uncertainty Principle

C.24 identify four types of electron clouds (s, p, d, f)

C.25 evaluate the contributions of Planck, Einstein, and deBroglie to the wave-particle duality of light

C.26 research the contributions of Schrodinger's work to the development of a mathematical basis for the wave-mechanical view of hydrogen atom

C.27 describe the quantum number (n, l, m, s) for electrons

C.28 write electron dot structures for representative elements

C.29 associate electrons configuration of elements with element location on periodic table

C.30 **analyze the periodic table to predict trends in atomic size, ionic size, electronegativity,**

ionization energy, and electron affinity

C.31$_9$ **using the periodic table, predict the type of bonding that occurs between atoms and differentiate among properties of ionic, covalent, and metallic bonds**

C.32$_{10}$ **construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals**

C.33 use hybridization theory to explain bond angles in compounds

C.34 define and describe the types of van der Waals forces and list the three factors contributing to them

C.35 describe the formation of sigma and pi bonds

C.36$_{7,8,9,10}$ **predict the products and write balanced equations for the general types of chemical reactions**

C.37 use the Avogadro constant to define the mole and to calculate molecular and molar mass as well as a molar volume

C.38 use molar mass to calculate the molarity of solutions, percentage composition, and empirical formulas

C.39 experimentally determine the formulas of hydrates

C.40 do stoichiometric calculations including mass-mass, mass-volume, volume-volume to determine percent yield and heat of reaction

C.41 use the ideal gas equation to calculate the molar mass of a gas

C.42 identify the limiting reactant and predict the theoretical yield

C.43 distinguish between the thermodynamic and kinetic stability

C.44 experimentally determine the factors that influence the rate of reaction

C.45 calculate equilibrium constants and concentration of products and reactants

C.46 apply LeChatelier's principle to explain the effect of changes in concentration, pressure, volume, and temperature on an equilibrium system

C.47 draw and label an energy-time diagram for both an endothermic and an exothermic reaction

C.48 name and define acids and bases using Arrhenius, Bronsted-Lowery and Lewis definitions

C.49 predict the products upon adding water to both acidic and basic anhydrides

C.50 write and balance net ionic equations and calculate ionization constants for neutralization reactions

C.51 solve problems using the solubility product constants

C.52 calculate the pH and/or pOH for various solutions and relate to the pH scale

C.53 conduct titrations and perform calculations for both acid-base and oxidation-reduction reactions

C.54 define oxidation and reduction in terms of electron transfer within reactions

C.55 construct electrolytic and voltaic cells, write and balance the half-cell reactions and calculate the cell voltage

C.56 calculate the enthalpy change in reactions using the heat of formation

C.57 evaluate the factors driving chemical reactions including enthalpy and entropy and their interrelationship

C.58 calculate Gibb's Free Energy using enthalpy and entropy values

C.59 calculate the rate of radioactive decay and apply to radiometric dating

C.60 predict nuclear stability using proton-neutron diagrams

C.61 distinguish between the hazards of ionizing and penetrating radiation

C.62 research the application of nuclear technology (e.g., power plants, medicine, weaponry)

C.63 compare and contrast fusion and fission reactions

C.64 recognize simple organic functional groups and name simple organic compounds

Science History

C.65 identify contributors to the

scientific body of knowledge including their diverse cultures

C.66 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

C.67 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology, and Society

C.68_9 apply scientific skills and technological tools to address personal and societal needs ◊

C.69 engage in decision making activities and actions to resolve science-technology-society issues ◊

C.70 investigate and analyze the interdependence of science and technology ◊

C.71 describe the scientific concepts underlying technological innovations ◊

C.72 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

C.73 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

C.74 collect, analyze and display data using computers and other electronic technology ◊

C.75 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, on-line chat and real-time, investigations) ◊

C.76 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

C.77 identify and solve problems with the appropriate technology ◊

C.78 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Chemistry-Technical/Conceptual

Chemistry -Technical/Conceptual is the study of matter, its compostion, and its changes. This course is an alternative to a traditional college preparatory course. It emphasizes real life applications of chemical principles. Mathematical based problem solving is de-emphasized. Emphasis is placed on the important role chemistry plays in a student's personal life, career opportunities, environment, and society. Students will engage in active inquiries, investigations, and hand-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

CTC.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

CTC.2 recognize general limitations of science

CTC.3 **explain that science is composed of observations set in a testable framework of ideas**

CTC.4 conclude that science is a blend of creativity, logic and mathematics

Scientific Attitudes/Habits of Mind

CTC.$5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◊

CTC.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer

review)◊

CTC.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges)** ◊

Scientific Processes/Thinking Skills

CTC.8$_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring and applying)** ◊

CTC.9$_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◊

CTC.10$_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect graphical analysis including interpretation and extrapolation)** ◊

CTC.11 use SI (metric) measurements

CTC.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

CTC.13 use the tools of science safely, accurately and appropriately ◊

CTC.14$_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

CTC.15$_{9}$ manipulate variables to extend experimental activities

CTC.16$_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to improve investigations and communications, formulate and revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientific inquiry)** ◊

Laboratory Investigations/Hands-on Learning

CTC.17 engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

CTC.18 properly and safely manipulate equipment, materials, chemicals, organisms and models ◊

CTC.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

CTC.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

CTC.21$_{3,4,5,6,7,8,9,10}$ **review fundamental chemistry concepts including, parts of the atom, chemical and physical properties, chemical and physical changes, chemical formula, balancing equations, conservation of matter and energy, transfer or sharing of electors during chemical reactions, periodic table, metallic and nonmetallic properties, ionic and covalent bonds, solubility, concentration, colloids, suspensions, acids, bases, neutralization reactions, pH, colligative properties, temperature, pressure, and volume relationships, nuclear fission, nuclear fusion**

CTC.22$_{3,5,6,8}$ **discuss the impact of water's unusual physical properties**

CTC.23 illustrate the concept of limiting reagent

CTC.24$_{6,7,8,9,10}$ **identify the parts of the kinetic molecular theory and explain states of matter**

CTC.25 define the term mole, and calculate the molar mass of a compound when provided with its formula and the atomic masses of its elements

CTC.26 calculate the percent by mass of a specific element in a given compound

CTC.27 investigate the formation of elements from compounds using electrolysis to demonstrate an oxidation-reduction process as an example of metal purification from ores

CTC.28 predict reactivity of metals using the activity series of metals

CTC.29 describe the use of half-reactions to describe electrochemical cells

CTC.30 show how to apply resource conservation techniques to a limited nonrenewable resouce (e.g., reduce, reuse, and recycle)

CTC.31 investigate the relationship of boiling point, density and viscosity to the number of carbon atoms and side chains in organic compounds

CTC.32 draw and build structural models of the first ten alkanes

CTC.33 collect data and calculate the heat of combustion for organic compounds (e.g., candle, food product)

CTC.34 identify the functional groups for common alcohols, ethers, carboxylic acids, and esters

CTC.35 model polymerization including addition and condensation reactions 9e.g., plastics, esters, polysaccharides, proteins, fats)

CTC.36 explain the benefits and consequences of energy conservation with respect to petroleum's ability to be use as a building material and/or fuel

CTC.37 examine examples of nuclear technology that affect daily life

CTC.38 balance nuclear equations and use them to describe natural radioactive decay

CTC.39 compare penetrating power of alpha, beta, and gamma radiation and discuss safety factors

CTC.40 **simulate and explain half-life decay**

CTC.41 **graph radiation vs. Time illustrating half-life of radioisotopes**

Science History

CTC.42 identify contributors to the scientific body of knowledge including their diverse cultures

CTC.43 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

CTC.44 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology and Society

CTC.45$_9$ apply scientific skills and technological tools to address personal and societal needs ◊

CTC.46 engage in decision making activities and actions to resolve science-technology-society issues ◊

CTC.47 investigate and analyze the interdependence of science and technology ◊

CTC.48 describe the scientific concepts underlying technological innovations ◊

CTC.49 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

CTC.50 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

CTC.51 collect, analyze and display data using computers and other electronic technology ◊

CTC.52 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, on-line

chat and real-time, investigations) ◊

CTC.53 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

CTC.54 identify and solve problems with the appropriate technology ◊

CTC.55 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Environmental Earth Science Eleven/Twelve

As responsible citizens on this planet, students must be able to recognize their role as caretakers of the earth in order to protect its fragile environment. This is possible only if students have a deep understanding of the earth and its processes. Environmental Earth Science Eleven/Twelve builds on the fundamentals of geology, oceanography, meteorology and astronomy developed in CATS 7-10 in a rigorous and integrated manner with the traditional disciplines of biology, chemistry and physics where appropriate. As stewards of the earth, an emphasis on environment should be included within the traditional earth science disciplines. Ecology, economics, politics and social considerations all combine to help students develop an understanding of how humans effect and are effected by their environment. Students will engage in active inquiries, investigations, and hands-on activities fora minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

ES.1 recognize the open-ended structure of science

ES.2 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

ES.3 recognize the limits of science

ES.4 recognize science as composed of observations set in a testable framework of ideas

ES.5 conclude that science is a blend of logic, mathematics, and imagination

Scientific Attitudes/Habits of Mind

ES.$6_{4,5,6,7,8,9,10}$ **model and exhibit the skills attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◊

ES.7 demonstrate ethical practices in science (e.g., established research protocol, accurate record keeping, replication of results, peer review)

ES.8 realize that science and technology affect the environment

ES.9 apply scientific information to personal and societal decision making

ES.10 **apply scientific approaches to seek solutions for everyday problems (e.g., personal community health, population growth, natural resources, environmental quality, natural and human induced hazards, and scientific and technological challenges)**◊

Scientific Processes/Thinking Skills

ES.$11_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, relating, inferring, and applying)**◊

ES.$12_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis** ◊

ES.$13_{3,4,5,6,7,8,9,10}$ **identify analyze and infer using patterns and relationships in data (e.g., cause and effect, graphical analysis including interpretation, interpolation and**

extrapolation) ◊

ES.14 use SI (metric) measurements

ES.15 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

ES.16 use the tools of science safely, accurately, and appropriately ◊

ES.17$_{4,5,6,8,9}$ **identify independent and dependent variables in experimental investigations**

ES.18$_{9}$ manipulate variables to extend experimental activities

ES.19$_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to improve investigations and communications, formulate and revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientific inquiry)**

Laboratory/Investigations/Hands-on Learning

ES.20 engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

ES.21 conduct explorations in a variety of traditional and nontraditional educational environments (e.g., laboratories, museums, libraries, parks and other outdoor locations) ◊

ES.22 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research ◊

ES.23 properly and safely manipulate equipment, materials, chemicals, organisms and models) ◊

Science Themes and Subject Matter

ES.24 **review the following foundational earth science concepts including rocks and minerals, properties of waves, constructing and interpreting weather maps, surface features found on maps, climatic relationships to biomes, use of data gathering instruments, temperature-phase change relationships**

ES.25 research theories concerning origins of the universe

ES.26 **investigate the solar system including origin theories, comparing and contrasting the planets, planetary motions, and other celestial bodies**

ES.27 explore the Earth-Sun-Moon relationships (e.g., moon phases, eclipses, relationship between tilt of the earth and seasonal changes as well as tides

ES.28 probe and explain stellar evolution, stellar types and distances

ES.29 compare and contrast the different kinds of galaxies

ES.30 develop a timeline outlining space exploration

ES.31 investigate celestial bodies (e.g., composition, motions, origins of celestial objects such as quasars, pulsars, and black holes

ES.32 explain the relationships between location, navigation and time

ES.33 summarize various methods used to study astronomy

ES.34 identify components of the solid earth (e.g., shape, dimensions, and structure)

ES.35 **identify the lithosphere, the hydrosphere, the atmosphere, and the biosphere**

ES.36 describe earth's origin as it relates to the lithosphere, hydrosphere, and atmosphere

ES.37 identify and describe the natural processes relating to the development of the solid earth from atomic structure through the rock cycle

ES.38 identify and describe agents and processes of degradation (e.g., weathering by gravity, wind, water, and ice)

ES.39 identify and describe tectonic forces

ES.40 **understand the cause and effect relationships of degradational and tectonic forces with respect to the dynamic earth and its surface**
ES.41 **construct and/or interpret information on topographic maps**
ES.42 list, identify, and sequence eras, epochs, and periods in relation to earth history and geologic development
ES.43 **identify, describe, and understand properties of our oceans (e.g., water composition, physical features of the ocean floor, and life within the oceans)**
ES.44 compare and contrast ocean movements
ES.45 identify and describe the structure of the atmosphere
ES.46 **investigate and explain heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, and precipitation)**
ES.47 **compare and contrast meteorological processes related to air masses, weather systems, and forecasting**
ES.48 examine global change over time (e.g., climatic trends, fossil fuel depletion, global warming, ozone depletion)
ES.49 describe the relationship between earth processes and natural disasters and draw conclusions concerning their human impact
ES.50 explore the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste
ES.51 investigate and describe in detail the physical and chemical properties of water
ES.52 **explain common problems related to the conservation, use, supply and the quality of water**
ES.53 explore the relationships between the extraction and use of natural resources and the impact on the environment
ES.54 research alternative energy sources and possible impact
ES.55 understand the fragile nature of the earth's major spheres (e.g., lithosphere, hydrosphere, atmosphere, and biosphere)
ES.56 research and explain how the political system influences environmental decisions
ES.57 investigate which federal and state agencies have responsibility for environmental monitoring and actions
ES.58 develop decision-making skills with respect to addressing environmental problems

Science History

ES.59 identify contributors to the scientific body of knowledge including scientists both past and present as well as contributions from diverse cultures
ES.60 recognize the historical development of significant scientific events and their impact on modern thought and life
ES.61 be aware of the evolving nature of scientific thought and models by tracing the evolutionary development of several key scientific concepts and principles
ES.62 understand and appreciate the evolving nature of scientific thought and knowledge and the patterns by which major scientific ideas change

Science, Technology, and Society

ES.63 apply science and use technology to solve problems ◊
ES.64 describe the costs and benefits of scientific skills and new technologies needed to address personal and societal needs
ES.65 engage in decision making activities and actions to resolve science-technology- society issues ◊
ES.66 recognize the scientific principles in technological applications (the why as well as the how)
ES.67 explore the connections among science, technology, and career opportunities

Computer and Technology

ES.68 access, gather, store, retrieve, and organize data using hardware and

software designed for these purposes ◊

ES.69 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◊

ES.70 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

ES.71 identify and solve problems with the appropriate technology ◊

ES.72 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral communication ◊

Human Anatomy and Physiology

This course is designed for those students wanting a depth of understanding in the structure and function of the human body. Focus will be at both micro and macro levels reviewing cellular functions biochemical processes, tissue interactions, organ systems, and the interaction of those system as it relates to the human organism. This course will be appropriate for college bound students as well as those choosing a health services career cluster. Students will engage in active inquiries, investigations, and hands-on activities fora minimum of 50% of the instructonal time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

HAP.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

HAP.2 recognize general limitations of science

HAP.3_{11} **explain that science is composed of observations set in a testable framework of ideas**

HAP.4 conclude that science is a blend of creativity, logic and mathematics

Scientific Attitudes/Habits of Mind

HAP.$5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◊

HAP.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review)◊

HAP.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards and scientific and technological challenges)** ◊

Scientific Processes/Thinking Skills

HAP.$8_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring and applying)** ◊

HAP.$9_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◊

HAP.$10_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect graphical analysis including interpretation and extrapolation)** ◊

HAP.11 use SI (metric) measurements

HAP.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination and creativity while working individually and/or cooperatively ◊

HAP.13 use the tools of science safely,

accurately and appropriately ◊

HAP.14$_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

HAP.15$_{9}$ manipulate variables to extend experimental activities

HAP.16$_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations, design and conduct scientific investigations, use technology and mathematics to improve investigations and communications, formulate and revise scientific explanations and models using logic and evidence, recognize alternative explanations, communicate and defend a scientific argument, understand about scientific inquiry)** ◊

Laboratory Investigations/Hands-on Learning

HAP.17 engage in active inquiries, investigations and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

HAP.18 properly and safely manipulate equipment, materials, chemicals, organisms and models ◊

HAP.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

HAP.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laserdiscs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

HAP.21$_{7,8,9,10}$ describe the organizational levels, interdependency and the interaction of cells, tissues, organs, organ systems

HAP.22 **apply the importance of ionic and covalent bonding to the chemical processes in the human body**

HAP.23 summarize the structure and function of organelles within a typical human body cell

HAP.24 categorize, by structure and function, the various types of human tissue (e.g., cardiac, epithelial, connective, etc.)

HAP.25 relate how bone tissue is important to the development of the human skeleton

HAP.26 relate the various joints to their muscle movement

HAP.27$_{7,8,9,10}$ recognize the structure and relationship among skeletal, neural, and muscular systems

HAP.28 classify and describe the structure and function of various types of neurons

HAP.29 examine how the autonomic nervous system controls other organs and systems

HAP.30 examine how food provides nutrition to tissues through its breakdown by the digestive system, into carbohydrates, fats, proteins, vitamins, and minerals

HAP.31 discuss the specific role of enzymes and hormones to bodily functions

HAP.32$_{7,8,9,10}$ explain how the respiratory system is significant to communication, gas exchange, and cellular respiration

HAP.33 identify the cellular processes and the energy and nutritional requirements needed to maintain human metabolism

HAP.34 recognize the relationship of the excretory system to other organs and systems to rid the human body of its wastes

HAP.35$_{7,8,9,10}$ explain the structure and function of the male and female reproductive systems and how they relate to human growth and development

HAP.36 trace the transfer of matter and energy in chemical molecular processes in the human body

HAP.37$_{8,9,10}$ compare and contrast the purposes, processes and outcomes of cellular meiosis and mitosis

HAP.38$_{7,9}$ describe potential system failures

in the human body due to genetic, nutritional, operational, disease, or environmental influences

HAP.$39_{7,8,9,10}$ relate the structure of the integumentary system to its function as a sensory organ, environmental barrier, and temperature regulator

HAP.40_{10} **analyze the change in DNA activity and how it affects the control of protein synthesis and human inheritance**

HAP.41 demonstrate the directional terminology used to locate structures in the human body (e.g., dorsal, bilateral, sagittal, etc.)

HAP.42_{10} illustrate how transport mechanisms in cells, tissues, and/or organs depend on osmosis and mixture gradients

HAP.43 show the mechanism of muscle contraction on a micro and macro level

HAP.44 apply the knowledge of the structure of the ear and eye to their function/disfunction of environmental perception

HAP.$45_{7,8,9,10}$ illustrate the structure of the circulatory and lymph systems and the function of blood to the role of transportation, cellular support and defense

Science History

HAP.46 identify contributors to the scientific body of knowledge including their diverse cultures

HAP.47 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

HAP.48 describe the impact of cultural, technological and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology and Society

HAP.49_9 apply scientific skills and technological tools to address personal and societal needs ◊

HAP.50 engage in decision making activities and actions to resolve science-technology-society issues ◊

HAP.51 investigate and analyze the interdependence of science and technology ◊

HAP.52 describe the scientific concepts underlying technological innovations ◊

HAP.53 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

HAP.54 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

HAP.55 collect, analyze and display data using computers and other electronic technology ◊

HAP.56 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◊

HAP.57 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

HAP.58 identify and solve problems with the appropriate technology ◊

HAP.59 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Physics Eleven/Twelve

A college preparatory course, Physics Eleven/Twelve is a laboratory driven, advanced study of nature's universal laws with emphasis on process skills. Physics Eleven/Twelve builds on the foundation of physics concepts developed in CATS Seven through CATS Ten. The course is organized around the content areas of kinematics, dynamics, thermodynamics, light and optics, electricity and magnetism, and modern physics. SI (metric) units of measurement will be used. Students will engage in active inquiries, investigations, and hands-on activities fora minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

P.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◇

P.2 recognize general limitations of science

P.3 **explain that science is composed of observations set in a testable framework of ideas**

P.4 conclude that science is a blend of creativity, logic, and mathematics

Scientific Attitudes/Habits of Mind

$P.5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes, and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◇

P.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results, and peer review)◇

P.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards, and scientific and technological challenges)** ◇

Scientific Processes/Thinking Skills

$P.8_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, and applying)** ◇

$P.9_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◇

$P.10_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect, graphical analysis including interpretation and extrapolation)** ◇

P.11 use SI (metric) measurements

P.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination, and creativity while working individually and/or cooperatively ◇

P.13 use the tools of science safely, accurately, and appropriately ◇

$P.14_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

$P.15_{9}$ manipulate variables to extend experimental activities

$P.16_{9}$ **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations; design and conduct scientific investigations; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and**

defend a scientific argument; understand scientific inquiry) ◊

LaboratoryInvestigations/Hands-on Learning

P.17 engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

P.18 properly and safely manipulate equipment, materials, chemicals, organisms, and models ◊

P.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

P.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

P.21 **investigate, analyze, synthesize, and evaluate the concepts of kinematics (e.g., distance, time, velocity, acceleration)**

P.22 **investigate, analyze, synthesize, and evaluate the concepts of dynamics (e.g., force, impulse, gravitation, conservation of energy, conservation of momentum, Newton's Laws)**

P.23 **investigate, analyze, synthesize and evaluate the concepts of thermodynamics (e.g., kinetic molecular theory, heat exchange, work)**

P.24 **investigate, analyze, synthesize, and evaluate the concepts of light and optics (e.g., waves, behavior of light, ray diagrams)**

P.25 **investigate, analyze, synthesize and evaluate the concepts of electricity and magnetism (e.g., electrostatics, circuits, magnetic effects, electronic devices)**

P.26 **investigate, analyze, synthesize, and evaluate the concepts of modern physics (e.g., atomic structure, nuclear changes, high energy physics)**

Science History

P.27 identify contributors to the scientific body of knowledge including their diverse cultures

P.28 trace the historical development of key scientific concepts and principles describing their impact on modern thought and life

P.29 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology, and Society

P.30_9 apply scientific skills and technological tools to address personal and societal needs ◊

P.31 engage in decision making activities and actions to resolve science-technology-society issues ◊

P.32 investigate and analyze the interdependence of science and technology ◊

P.33 describe the scientific concepts underlying technological innovations ◊

P.34 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

P.35 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

P.36 collect, analyze and display data using computers and other electronic technology ◊

P.37 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◊

P.38 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

P.39 identify and solve problems with the appropriate technology ◊

P.40 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Physics-Technical/Conceptual

Physics- Technical is a course designed to prepare students for technical careers. Basic physics principles are dealt with in a thematic approach. Principles are applied to four energy systems: mechanical, fluid, thermal, and electrical that make up both simple and complex technological devices and equipment. The course also emphasizes the analogies in mechanical, fluid, thermal, and electrical systems. Incorporated in the instruction is the mathematics needed to understand and apply the principles. Refer to objectives PT.21 - PT.24.

Physics- Conceptual is an alternative to the traditional mathematical approach to physics. Emphasis will be on the concepts which underlie the natural laws of the universe. Mathematics will be de-emphasized. Laboratory work will require traditional physics measurements to be made. SI (metric) units of measurement will be used. Refer to objectives PC.25 - PC.30.

Students in Physics-Technical or Physics- Conceptual will engage in active inquiries, investigations, and hands-on activities for a minimum of 50% of the instructional time to develop conceptual understanding and research/laboratory skills. Safety instruction is integrated into all activities.

Nature of Science

PTC.1 participate in activities that consider alternate, changing points of view to stimulate the development of a sense of inquiry ◊

PTC.2 recognize general limitations of science

PTC.3 **explain that science is composed of observations set in a testable framework of ideas**

PTC.4 conclude that science is a blend of creativity, logic, and mathematics

Scientific Attitudes/Habits of Mind

PTC.$5_{4,5,6,7,8,9,10}$ **model and exhibit the skills, attitudes, and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, fairness, creativity)** ◊

PTC.6 demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results, and peer review)◊

PTC.7 **apply scientific approaches to seek solutions for everyday problems (e.g., personal, community health, population growth, natural resources, environmental quality, natural and human induced hazards, and scientific and technological challenges)** ◊

Scientific Processes/Thinking Skills

PTC.$8_{3,4,5,6,7,8,9,10}$ **demonstrate science processes within a problem solving setting (e.g., observing, measuring, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, and applying)** ◊

PTC.$9_{3,4,5,6,7,8,9,10}$ **organize qualitative and quantitative data into tables, diagrams, and/or graphs for analysis**◊

PTC.$10_{3,4,5,6,7,8,9,10}$ **identify, analyze, and infer using patterns and relationships in data (e.g., cause and affect, graphical analysis including interpretation and**

extrapolation) ◊

PTC.11 use SI (metric) measurements

PTC.12 apply rational thinking processes that underlie scientific approaches to problem solving by employing critical thinking skills, imagination, and creativity while working individually and/or cooperatively ◊

PTC.13 use the tools of science safely, accurately and appropriately ◊

PTC.$14_{4,5,6,8,9}$ identify independent and dependent variables in experimental investigations

PTC.15_{9} manipulate variables to extend experimental activities

PTC.16_{9} **design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide scientific investigations; design and conduct scientific investigations; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument; understand scientific inquiry)** ◊

Laboratory/Investigations/Hands-on Learning

PTC.17 engage in active inquiries, investigations, and hands-on activities for a minimum of 50 percent of the instructional time to develop conceptual understanding and laboratory skills ◊

PTC.18 properly and safely manipulate equipment, materials, chemicals, organisms, and models ◊

PTC.19 conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations)◊

PTC.20 use computers and other electronic technologies (e.g., computer, CBL, probe interfaces, laser discs) to collect, analyze and/or report data, interact with simulations, and research ◊

Science Themes and Subject Matter

PT.21 **qualitative and quantitative analysis of mechanical systems (e.g., force, work, rate, resistance, energy, power, force transformations)**

PT.22 **qualitative and quantitative analysis of fluid systems (e.g., pressure, work, rate, resistance, energy, power, force transformations)**

PT.23 **qualitative and quantitative analysis of electrical systems (e.g., voltage, work, rate, resistance, energy, power, force transformations)**

PT.24 **qualitative and quantitative analysis of thermal systems (e.g., temperature, rate, resistance, energy)**

PC.25 **investigate and analyze the concepts of kinematics (e.g., distance, time, velocity, acceleration)**

PC.26 **investigate and analyze the concepts of dynamics (e.g., force, impulse, gravitation, conservation of energy, conservation of momentum, Newton's Laws)**

PC.27 **investigate and analyze the concepts of thermodynamics (e.g., kinetic molecular theory, heat exchange, work)**

PC.28 **investigate and analyze concepts of light and optics (e.g., waves, behavior of light, ray diagrams)**

PC.29 **investigate and analyze concepts of electricity and magnetism (e.g., electrostatics, circuits, magnetic effects, electronic devices)**

PC.30 **investigate and analyze concepts of modern physics (e.g., atomic structure, nuclear changes, high energy physics)**

Science History

PTC.31 identify contributors to the scientific body of knowledge including their diverse cultures

PTC.32 trace the historical development of key scientific concepts and principles describing their impact

on modern thought and life

PTC.33 describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge ◊

Science, Technology, and Society

PTC.34_9 apply scientific skills and technological tools to address personal and societal needs ◊

PTC.35 engage in decision making activities and actions to resolve science-technology-society issues ◊

PTC.36 investigate and analyze the interdependence of science and technology ◊

PTC.37 describe the scientific concepts underlying technological innovations ◊

PTC.38 explore occupational opportunities in science and technology including the academic preparation necessary ◊

Computer and Technology

PTC.39 access, gather, store, retrieve, and organize data using hardware and software designed for these purposes ◊

PTC.40 collect, analyze and display data using computers and other electronic technology ◊

PTC.41 access Internet resources for a variety of purposes (e.g., research, exchange data, E-mail, and real-time investigations) ◊

PTC.42 demonstrate skills in use of word processing, data bases, spreadsheets, graphics and telecommunications ◊

PTC.43 identify and solve problems with the appropriate technology ◊

PTC.44 incorporate correct grammar, spelling, vocabulary and graphical representation for both written and oral multimedia presentations ◊

Henry Marockie
State Superintendent of Schools

RESPONSE

Policy 2520: Instructional Goals and Objectives for West Virginia Schools

Directions: Please use this form to comment on Policy 2520: Instructional Goals and Objectives for West Virginia Schools.

Individual/Organization: _____

Address: _____

_____

Phone: _____

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§126-44-1. General.

_____

_____

§126-44-2. Purpose and Format.

_____

_____

§126-44.3. Incorporation by Reference.

INSTRUCTIONAL GOALS:

English Language Arts _____

_____

_____

_____

Mathematics _____

_____

_____

_____

Social Studies _____

_____

_____

_____

Science

Process/Workplace Goals

PROGRAM CHARTS:

Early Childhood K-2

Early Childhood 3-4

Middle Childhood 5-8

Adolescent 9-12

Core Electives 9-12

Non-Core Electives 9-12

INSTRUCTIONAL PRACTICES:

DOCUMENT GUIDE:

INSTRUCTIONAL OBJECTIVES GRADES K-8:

Kindergarten:

English Language Arts

Mathematics

Social Studies

Science

First Grade:

English Language Arts

Mathematics

Social Studies

Science

Second Grade:

English Language Arts

Mathematics

Social Studies

Science

Third Grade:

English Language Arts

Mathematics

Social Studies

Science

Fourth Grade:

English Language Arts

Mathematics

Social Studies

Science

Fifth Grade:

English Language Arts

Mathematics

Social Studies

Science

Sixth Grade:

English Language Arts

Mathematics

Social Studies

Science

Seventh Grade:

English Language Arts

Mathematics

Social Studies

Science

Eighth Grade:

English Language Arts

Mathematics

Social Studies

Science

INSTRUCTIONAL OBJECTIVES GRADES 9-12:

English Language Arts Grade Nine

English Language Arts Grade Ten

English Language Arts Grade Eleven

English Language Arts Grade Twelve

Applied Math I

Applied Math II

Algebra I

Geometry/Applied Geometry

Algebra II

Trigonometry

Probability and Statistics

Pre-Calculus

Discrete Mathematics

Algebra/Geometry Preparation

AP Courses

Algebra Support

Review for Assessment (9-11)

U. S. Studies to 1900

World Studies to 1900

Twentieth Century Studies

Economics

Civics/Government

Science Grade Nine

Science Grade Ten

Biology Eleven/Twelve

Chemistry Eleven/Twelve

Chemistry - Conceptual/Technical

Environmental Earth Science Eleven/Twelve

Human Anatomy and Physiology

Physics - Eleven/Twelve

Physics - Conceptual/Technical

§126-44-4. Summary of the Instructional Goals and Objectives.

RETURN BY NOVEMBER 15, 1996 TO:

Carolyn Meadows, Director
Office of Instructional Services
West Virginia Department of Education
1900 Kanawha Boulevard, East
Building 6, Room 330
Charleston, WV 25305-0330

HD 201
)

FISCAL NOTE WORKSHEET
(Submit 4 Copies)

) _____ DRAFT NO _____ BILL NO _____ RESOLUTION NO _____

ECT Policy 2520: Instructional Goals and Objectives FUND _____

CE OF REVENUE: ☐ GENERAL FUND ☐ SPECIAL ☐ OTHER (SPECIFY) _____

OF ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

IE ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

SHOW OVER-ALL EFFECT IN ITEMS 1 AND 2 & GIVE EXPLANATION OF BREAKDOWN BY FISCAL YEAR INCLUDING LONG-RANGE EFFECT

FECT OF PROPOSAL	ANNUAL		FISCAL YEAR		
	INCREASE	DECREASE	CURRENT	NEXT	THEREAFTER
STIMATED TOTAL OST	$	$	$	$	$
ERSONAL SERVICES URRENT EXPENSES EPAIRS/ALTERATIONS QUIPMENT THER	$	$	$	$	$
TIMATED TOTAL EVENUES	$	$	$	$	$

XPLANATION OF ABOVE ESTIMATES (INCLUDING LONG-RANGE EFFECT):

ere will be no increase in costs due to this policy.

1/3/96

AGENCY

AUTHORIZED REPRESENTATIVE

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