FILED IN THE OFFICE OF
THE SECRETARY OF STATE
THIS DATE 11-15-06 3:31pm
ADMINISTRATIVE LAW DIVISION SH

WEST VIRGINIA BOARD OF EDUCATION
Capitol Building 6, Room 351
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330

Telephone: 304-558-3660
Fax: 304-558-0198

November 15, 2006

The Honorable Betty Ireland
Secretary of State
State of West Virginia
Capitol Building 1, Suite 157-K
1900 Kanawha Boulevard, East
Charleston, West Virginia 25305

Dear Secretary Ireland:

I request that the following rules, filed with your office on ~~December~~ November 13, 2006, be withdrawn.

126CSR44A, Policy 2520.1, 21st Century Reading and English Language Arts Content Standards and Objectives for West Virginia Schools

126CSR44B, Policy 2520.2, 21st Century Mathematics Content Standards and Objectives for West Virginia Schools

126CSR44C, Policy 2520.3, 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

126CSR44D, Policy 2520.4, 21st Century Social Studies Content Standards and Objectives for West Virginia Schools

126CSR44N, Policy 2520.14, 21st Century Learning Skills and Technology Tools Content Standards and Objectives for West Virginia Schools

Thank you for your attention to this matter.

Sincerely,

Steven L. Paine
State Superintendent of Schools

WEST VIRGINIA
SECRETARY OF STATE
BETTY IRELAND
ADMINISTRATIVE LAW DIVISION

Form #5

Do Not Mark In This Box

FILED IN THE OFFICE OF
THE SECRETARY OF STATE
THIS DATE 11-15-06 3:45pm SH
ADMINISTRATIVE LAW DIVISION

NOTICE OF AGENCY ADOPTION OF A PROCEDURAL OR INTERPRETIVE RULE OR A LEGISLATIVE RULE EXEMPT FROM LEGISLATIVE REVIEW

AGENCY: West Virginia Board of Education TITLE NUMBER: 126

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

RULE TYPE: PROCEDURAL _____ INTERPRETIVE _____

EXEMPT LEGISLATIVE RULE X
CITE STATUTE(s) GRANTING EXEMPTION FROM LEGISLATIVE REVIEW
W.Va. Code §§29A-3B-1, et seq.; *W.Va. Board of Education v. Hechler*, 180 W.Va. 451; 376 S.E.2d 839 (1988).

AMENDMENT TO AN EXISTING RULE: YES X NO ___

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

TITLE OF RULE BEING AMENDED: 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools (2520.3)

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

TITLE OF RULE BEING PROPOSED: _____

THE ABOVE RULE IS HEREBY ADOPTED AND FILED WITH THE SECRETARY OF STATE. THE EFFECTIVE DATE OF THIS RULE IS July 1, 2008.

Jack McClanahan
Deputy State Superintendent of Schools

TITLE 126
LEGISLATIVE RULE
BOARD OF EDUCATION

SERIES 44C
21st CENTURY SCIENCE K-8 CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS (2520.3)

§126-44C-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. Policy 2520.3 defines the content standards (or instructional goals) and objectives for the science as required by W.Va. 126CSR42 (Policy 2510).

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

1.3. Filing Date. -- November 15, 2006.

1.4. Effective Date. -- July 1, 2008.

1.5 Repeal of former rule.-- This legislative rule repeals and replaces W. Va. 126CSR44C "Science Content Standards and Objectives for West Virginia Schools (2520.3)" filed February 25, 2003 and effective July 1, 2003.

§126-44C-2. Purpose.

2.1. This policy defines the content standards (or instructional goals) and objectives for the program of study required by Policy 2510 in science.

§126-44C-3. Incorporation by Reference.

3.1. A copy of 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools is attached and incorporated by reference into this policy. Copies may be obtained in the Office of the Secretary of State and in the West Virginia Department of Education, Office of Instructional Services.

§126-44C-4. Summary of the Content Standards and Objectives.

4.1. The West Virginia Board of Education has the responsibility for establishing high quality standards pertaining to all educational standards (W.Va. Code §18-9A-22). The content standards and objectives provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace and further education. The document includes content standards for science, an explanation of terms, objectives that reflect a rigorous and challenging curriculum, and performance descriptors.

WEST VIRGINIA
SECRETARY OF STATE

BETTY IRELAND

ADMINISTRATIVE LAW DIVISION

Form #5

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FILED IN THE OFFICE OF
THE SECRETARY OF STATE
THIS DATE 11/13/06 2:46pm
ADMINISTRATIVE LAW DIVISION

NOTICE OF AGENCY ADOPTION OF A PROCEDURAL OR INTERPRETIVE RULE OR A LEGISLATIVE RULE EXEMPT FROM LEGISLATIVE REVIEW

AGENCY: West Virginia Board of Education TITLE NUMBER: 126

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

RULE TYPE: PROCEDURAL _____ INTERPRETIVE _____

EXEMPT LEGISLATIVE RULE X
CITE STATUTE(s) GRANTING EXEMPTION FROM LEGISLATIVE REVIEW
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AMENDMENT TO AN EXISTING RULE: YES X NO ___

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

TITLE OF RULE BEING AMENDED: 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools (2520.3)

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

TITLE OF RULE BEING PROPOSED: _____

THE ABOVE RULE IS HEREBY ADOPTED AND FILED WITH THE SECRETARY OF STATE. THE EFFECTIVE DATE OF THIS RULE IS December 14, 2006.

Jack McClanahan
Deputy State Superintendent of Schools

TITLE 126
LEGISLATIVE RULE
BOARD OF EDUCATION

SERIES 44C
21st CENTURY SCIENCE K-8 CONTENT STANDARDS AND OBJECTIVES FOR WEST VIRGINIA SCHOOLS (2520.3)

§126-44C-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. Policy 2520.3 defines the content standards (or instructional goals) and objectives for the science as required by W.Va. 126CSR42 (Policy 2510).

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

1.3. Filing Date. -- November 13, 2006.

1.4. Effective Date. -- ~~November~~ Dec 14 14, 2006.

1.5. Repeal of former rule.-- This legislative rule repeals and replaces W. Va. 126CSR44C "Science K-8 Content Standards and Objectives for West Virginia Schools (2520.3)" filed February 25, 2003 and effective July 1, 2003.

§126-44C-2. Purpose.

2.1. This policy defines the content standards (or instructional goals) and objectives for the program of study required by Policy 2510 in science.

§126-44C-3. Incorporation by Reference.

3.1. A copy of 21st Century Science Content Standards and Objectives for West Virginia Schools is attached and incorporated by reference into this policy. Copies may be obtained in the Office of the Secretary of State and in the West Virginia Department of Education, Office of Instructional Services.

§126-44C-4. Summary of the Content Standards and Objectives.

4.1. The West Virginia Board of Education has the responsibility for establishing high quality standards pertaining to all educational standards (W.Va. Code §18-9A-22). The content standards and objectives provide a focus for teachers to teach and students to learn those skills and competencies essential for future success in the workplace and further education. The document includes content standards for science, an explanation of terms, objectives that reflect a rigorous and challenging curriculum, and performance descriptors.

West Virginia Department of Education

West Virginia Board of Education Policy 2520.3
21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

Steven L. Paine
State Superintendent

Foreword

A 21st century science curriculum is an increasingly important component in the development learners prepared for success in the 21st century. Thus, the West Virginia Board of Education and the West Virginia Department of Education are pleased to present Policy 2520.3, 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools. The West Virginia Science Standards for 21st Century Learning includes 21st century *content* standards and objectives as well as 21st century standards and objectives for *learning skills* and *technology tools*. This broadened scope of science curriculum is built on the firm belief that quality engaging instruction must be built on a curriculum that triangulates rigorous 21st century content, 21st century learning skills and the use of 21st century technology tools.

Committees of educators from across the state convened to revise the content standards and objectives. The overarching goal was to build a rigorous, relevant and challenging science curriculum that would prepare students for the 21st century. West Virginia educators, including regular classroom teachers, special education teachers, and teachers representing higher education institutions played a key role in shaping the content standards to align with national standards, rigorous national assessments, and research and best practice in the field of science education. The contribution of these professionals was critical in creating a policy that is meaningful to classroom teachers and appears in a format that can easily be used and understood.

Policy 2520.3 is organized around the three major components of a standards-based curriculum: learning standards, instructional objectives and performance descriptors. The learning standards are the *broad descriptions* of what *all* students must know and be able to do at the conclusion of the instructional sequence. The accompanying grade-level objectives are specific descriptors of knowledge, skills and attitudes that when mastered will enable the student to attain the standard. The instructional objectives guide instructional *planning* and provide a basis for determining appropriate *assessments, instructional strategies and resources*. The performance descriptors provide the basis for *assessing* overall student competence of grade level standards. The performance descriptors define the five student performance levels ranging from novice to distinguished. With the ultimate goal of "learning for all," these descriptors allow the teacher, students and parents to judge the *level* of student proficiency in each 21st century learning standard.

In combination, the use of learning standards, instructional objectives and performance descriptors become a comprehensive guide for delivering a rigorous and relevant science curriculum to all West Virginia students. These elements, when used to guide the instructional process and when delivered with the creativity and instructional expertise of West Virginia teachers, will become a powerful resource for preparing students to meet the challenges of the 21st century.

Steven L. Paine
State Superintendent of Schools

Explanation of Terms

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

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

Performance Descriptors describe in narrative format how students demonstrate achievement of the content standards. West Virginia has designed five performance levels: distinguished, above mastery, mastery, partial mastery and novice. Performance Descriptors serve two functions. Instructionally, they give teachers more information about the level of knowledge and skills students need to acquire. Performance levels and descriptors are also used to categorize and explain student performance on statewide assessment instruments.

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

- the content area code is SC for Science,
- the letter S, for Standard,
- the grade level and
- the standard number.

Illustration: SC.S.4.1 refers to fourth grade science content standard #1.

Numbering of Objectives
The number of each objective is composed of five parts, each part separated by a period:

- the content area code (SC for Science),
- the letter O is for Objective,
- the grade level,
- the number of the content standard addressed, and
- the objective number.

Illustration: SC.O.6.2.3 refers to a science sixth grade objective that addresses standard #2 in science, and that is the third objective listed under that standard.

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

- the content area (SC for Science),
- the letters PD are for Performance Descriptors,
- the grade level, and
- the standard number.

Illustration: SC.PD.6.2 refers to science performance descriptors for sixth grade, content standard 2.

Unique Electronic Numbers (UENs)
Unique Electronic Numbers (or UENs) are numbers that help to electronically identify, categorize and link specific bits of information. Once Policy 2520.3 is available on the Web, each standard, each objective, and each group of five performance descriptors will have a Unique Electronic Number (UEN) that will always remain the same.

The codes printed in Policy 2520.3 form the basis of the UENs. The only additional set of numbers that will be added to each code to formulate its UEN will be a prefix that indicates the year and month that a particular version of Policy 2520.3 is approved by the State Board of Education.

The prefix for the UENs for each content area in Policy 2520.3 is noted at the top of each page containing standards, objectives and performance descriptors. As sections of 2520.3 are revised, UENs will be changed to reflect the new approval date.

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

Illustration: The UEN for ninth grade science standard #2 will be "200602.SC.S.9.2".

Abbreviations

Content Areas

SC	Science

Other Abbreviations

PD	Performance Descriptors
O	Objective
S	Standard (Content Standard)

SCIENCE – POLICY 2520.3

The K-8 science content standards identify what students should know, understand and be able to do in the natural sciences throughout the eighth grade. Because each content standard utilizes the knowledge and skills of other standards, they are designed to be used as an integrated whole. Although material can be added to the content standards, using only a subset of the standards will leave gaps in the students' scientific literacy.

A multitude of of references was considered to support the development of the Science curriculum including NAEP. ACT, SAT, 21st Century Learning, National Science Education Standards, Project 2061, National Science Teachers Standards, and nationally recognized research. Each reference was reviewed and its relevance was determined in order to produce a more challenging curriculum for West Virginia students.

A three-dimensional instructional strategy model must be utilized to address the science curriculum and assure students' depth of understanding and breadth of knowledge. That model uses the nature, content and application of science concepts to develop scientific inquiry and reasoning skills in students.

Standard 1: Nature of Science
The study of science as a human endeavor provides for the acquisition of ideas leading toward the current knowledge base that represents science content. The nature of science encompasses the basic values and beliefs that make up the scientific world view, how scientists go about their work and the general culture of scientific enterprise. Studying historical and current discoveries of scientists and scientific milestones provides students with information about how discoveries have influenced current scientific thought and advancements. Students should understand that the continuous development of scientific knowledge shapes history. The study of the history and nature of science clarifies scientific inquiry and the role of science in the development of world cultures. Students will engage in active inquiry through investigations and hands-on activities a minimum of 50% of the instructional time. Developing scientific literacy requires a learning environment in which students actively participate in meaningful hands-on activities while developing current technology skills. These investigations explore the natural world, require critical thinking and develop process skills. Learning activities are sequenced to shape, modify and develop students' knowledge in order for them to become independent inquirers.

Standard 2: Content of Science
Science subject matter focuses on the scientific facts, concepts, principles, theories and models that are important for all students to know, understand and apply. Through the integration of the fields of science and the development of unifying themes, students will understand the 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. The objectives describe the specific subject matter/concepts that students are to master at each grade level.

Standard 3: Application of Science
Broad unifying themes complement the perspectives presented in the other content standards. These themes are fundamental to understanding and unifying the various science disciplines. Major unifying themes are systems, models and changes. Scientific design and application permits the extension of senses, the enhancement of the knowledge base, transportation of materials and information, synthesizing of new products and

the modification of the world. Students must learn to use technology to analyze situations, gather relevant information, generate and evaluate creative ideas, pose tangible solutions and communicate their analyses, results and suggestions concisely. The need to adapt to the rapid changes that are likely to occur in the future makes it imperative that students develop a broad spectrum of technology-related skills and an openness to change. Applying science and technological innovations to personal and social issues such as health, populations, resources and environment helps students to develop decision-making skills. As students expand their conceptual horizons, they should recognize that collective individual actions manifest as societal issues. Students must recognize that society cannot afford to deal only with symptoms; personal and societal actions must be focused on elimination of the causes of problems. Students should recognize that unless imposed by legislation social change involves negotiation among different interest groups. Students must be allowed to encounter and examine social change in a variety of current and historical contexts.

The Role of Technology

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

Organization of the Science Program of Study

The West Virginia Science Program of Study is drawn from the National Science Education Standards and the Project 2061 Benchmarks to promote a rigorous and challenging science curriculum. Through experiencing a spiraling, inquiry-based program of study, students in grades K-10 will develop foundational knowledge and skills in the physical sciences, the life sciences, and the earth and space sciences. To assure scientific literacy for all students, a coordinated, integrated approach is utilized in grades K-8. Students in the 9^{th}, 10^{th}, 11^{th} and 12^{th} grades participate in advanced in-depth laboratory-based courses designed to expand their conceptual understanding and enhance their research and laboratory skills.

Kindergarten Science Content Standards and Objectives

The Kindergarten Science objectives emphasize the process skills. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy and the use of 21st century skills in the physical sciences, the life sciences and the earth and 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. Kindergarten Science 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. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

<table>
<tr><td>Kindergarten</td><td colspan="5">Science</td></tr>
<tr><td>Standard 1:</td><td colspan="5">Nature of Science</td></tr>
<tr><td>SC.S.K.1</td><td colspan="5">Students will
demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers.
demonstrate the abilities and understanding necessary to do scientific inquiry.
demonstrate the ability to think and act as scientists by engaging in active inquiries and investigations, while incorporating hands-on activities.</td></tr>
<tr><td colspan="6">Performance Descriptors SC.PD.K.1</td></tr>
<tr><td>Distinguished</td><td>Above Mastery</td><td>Mastery</td><td>Partial Mastery</td><td>Novice</td></tr>
<tr><td>Kindergarten students at the distinguished level ask questions about themselves and their world and search for answers; use safety techniques; identify and describe unknown objects or events using their senses or scientific instruments.</td><td>Kindergarten students at the above mastery level ask questions about themselves and others; use safety techniques; compare and contrast objects or events using their senses or scientific instruments.</td><td>Kindergarten students at the mastery level ask questions about themselves and their world; use safety techniques; explore and describe objects and events using their senses and scientific instruments.</td><td>Kindergarten students at the partial mastery level ask questions about themselves and their world; describe objects or events by using their senses or scientific instruments safely.</td><td>Kindergarten students at the novice level ask questions about themselves; identify objects or events using their senses or scientific instruments safely.</td></tr>
<tr><td>Objectives</td><td colspan="5">Students will</td></tr>
<tr><td>SC.O.K.1.01</td><td colspan="5">ask questions about themselves and their world.</td></tr>
<tr><td>SC.O.K.1.02</td><td colspan="5">listen to and discuss stories about the lives and discoveries of scientists.</td></tr>
<tr><td>SC.O.K.1.03</td><td colspan="5">demonstrate curiosity, initiative and creativity by asking questions about the environment noting patterns and variations of natural</td></tr>
</table>

	objects (e.g., trees, leaves, or animal structures).
SC.O.K.1.04	explore and describe objects and events using the five senses to develop observational skills and make predictions based on personal observation.
SC.O.K.1.05	use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, or magnets).
SC.O.K.1.06	use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, or treat living organisms humanely).
SC.O.K.1.07	collect and record information in a variety of ways (e.g., drawings, weather calendar, or graphs).

Kindergarten	**Kindergarten Science**			
Standard 2:	Content of Science			
SC.S.K.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.			
Performance Descriptors SC.K.PD.2				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level compare and contrast living and nonliving things; describe life cycles of living organisms and their rate of growth; develop a classification system to sort objects; recognize that water can change states; demonstrate properties of magnetism; compare force and motion of objects; record weather changes and the effect on living things; investigate properties of soil.	Kindergarten students at the above mastery level distinguish between living and nonliving things; compare life cycles of organisms; classify objects; describe solids, liquids and gases; classify objects as magnetic or nonmagnetic; describe changes in an object's motion and energy; compare weather over time; compare land and water features.	Kindergarten students at the mastery level identify living and nonliving things; describe changes in plants and animals and their environment; sort and group objects; identify solids and liquids; explore magnetic properties, motion and changes in energy; identify celestial objects and changes in weather; compare differences in earth materials.	Kindergarten students at the partial mastery level identify living and nonliving things; list changes in plants and animals; sort objects according to a scheme; name a solid and a liquid; recognize that some objects are magnetic; identify changes in motion and energy; observe daily changes in weather; identify earth materials.	Kindergarten students at the novice level name a living and nonliving thing; observe plants and animals in the environment; identify colors; name a solid or liquid; examine a magnet; differentiate between fast and slow; identify the sun and moon; observe earth materials.
Objectives	Students will			
SC.O.K.2.01	using the five senses, identify living and non-living things.			

SC.O.K.2.02	observe and describe the movement, growth and changes in plants and animals.
SC.O.K.2.03	observe and describe models of plants and animals in different environments (e.g., terrariums, aquariums, animals and plants in a forest, pond, or field).
SC.O.K.2.04	describe, compare, sort and group objects in terms of what they are made of (e.g., clay, cloth, paper, or metal) and their physical properties of size, shape, color, weight or texture.
SC.O.K.2.05	identify liquids and solids.
SC.O.K.2.06	identify colors.
SC.O.K.2.07	explore and describe changes in energy (e.g., hot/cold or light/dark).
SC.O.K.2.08	explore and discuss magnetic properties of objects.
SC.O.K.2.09	explore and state different ways objects can be moved (e.g., straight, circular, fast, or slow).
SC.O.K.2.10	observe and record daily changes in weather (e.g., clouds or air temperature).
SC.O.K.2.11	identify objects in the day and night sky (e.g., moon, stars, or sun).
SC.O.K.2.12	observe and compare differences in earth materials.

Kindergarten	**Kindergarten Science**			
Standard 3:	Application of Science			
SC.S.K.3	Students will • recognize models as representations of real things. • observe that changes occur gradually, repetitively, or randomly within the environment. • listen and be tolerant of different viewpoints while working in collaborative groups. • observe and identify the use of tools and appliances in everyday life.			
Performance Descriptors SC.PD.K.3				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Kindergarten students at the distinguished level when given a sample, construct a model; describe changes that occur within the environment; be tolerant of different viewpoints while working in a group; choose an appropriate tool or appliance to accomplish a specified task.	Kindergarten students at the above mastery level recognize and use models as representations of real things; describe changes that occur within the environment; be tolerant of different viewpoints while working in a group; describe the use of a tool or appliance in everyday life.	Kindergarten students at the mastery level recognize models as representations of real things; observe and identify changes that occur within the environment; be tolerant of different viewpoints while working in a group; observe and identify the use of tools and appliances in everyday life.	Kindergarten students at the partial mastery level recognize models as representations of real things; name a change that occurs within the environment; be tolerant of different viewpoints while working in a group; identify tools or appliances in everyday life.	Kindergarten students at the novice level recognize models of real things; talk about changes that occur in the environment; be tolerant of different viewpoints while working in a group; name a tool or appliance.
Objectives	Students will			
SC.O.K.3.01	recognize that models are representations of real things.			

SC.O.K.3.02	observe and point out that change occurs gradually, repetitively, or randomly within the environment.
SC.O.K.3.03	observe and identify the uses of tools and appliances at home and at play.
SC.O.K.3.04	work in groups, listen to and be tolerant of different viewpoints.

First Grade Science Content Standards and Objectives

The First Grade Science objectives build on the process skills and add data gathering and reporting. Through a spiraling, inquiry-based program of study, all students will demonstrate scientific literacy and the use of 21st century skills in the fields of biology, chemistry, physics, and earth and 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. First Grade Science 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. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

<table>
<tr><td>Grade 1</td><td colspan="5">Science</td></tr>
<tr><td>Standard 1:</td><td colspan="5">Nature of Science</td></tr>
<tr><td>SC.S.1.1</td><td colspan="5">Students will
demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers.
demonstrate the abilities and understanding necessary to do scientific inquiry.
demonstrate the ability to think and act as scientists by engaging in active inquiries and investigations, while incorporating hands-on activities.</td></tr>
<tr><td colspan="6">Performance Descriptors SC.PD.1.1</td></tr>
<tr><td>Distinguished</td><td>Above Mastery</td><td>Mastery</td><td>Partial Mastery</td><td>Novice</td></tr>
<tr><td>First grade students at the distinguished level relate science discoveries to their world; use science content to explain environmental changes; use a variety of communication techniques to explain the reason for classifying.</td><td>First grade students at the above mastery level relate scientist's discoveries to their own lives; develop a hypothesis to explain environmental changes; use a variety of communication techniques to explain the reason for classifying; use oral communication to explain classification systems.</td><td>First grade students at the mastery level discuss scientists' lives and discoveries; question environmental changes; compare information by using a classification system; use a variety of communication techniques to safely collect and record information.</td><td>First grade students at the partial mastery level discuss scientists' lives; identify environmental changes; safely collect and record information.</td><td>First grade students at the novice level listen to a story about a scientist; observe environmental changes; sort objects.</td></tr>
<tr><td>Objectives</td><td colspan="5">Students will</td></tr>
</table>

SC.O.1.1.01	ask questions about themselves and their world.
SC.O.1.1.02	discuss the lives and discoveries of scientists after listening to stories about their lives and discoveries.
SC.O.1.1.03	demonstrate curiosity, initiative and creativity by questioning observations of changes in the environment (e.g., life cycles, motion of celestial objects, or sun and shadow).
SC.O.1.1.04	use scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, magnets, thermometer, seeds, or rocks).
SC.O.1.1.05	use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, or treat living organisms humanely).
SC.O.1.1.06	collect, record and compare information using a variety of classification systems (e.g., ordering, sorting, or sequencing) and using a variety of communication techniques (e.g., sketches, pictographs, or models).

Grade 1	**Science**
Standard 2:	Content of Science
SC.S.1.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.1.2

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
First grade students at the distinguished level categorize living and nonliving objects; construct diagrams to represent life cycles of various plants and animals; investigate properties of magnetism; explain how water changes state; compare and contrast the buoyancy of materials; plan a recycling project; discuss factors that affect change in an objects motion; explore pitch and volume of sound; predict	First grade students at the above mastery compare and contrast living and nonliving objects; sequence life cycles of living organisms; demonstrate properties of magnetism; predict the buoyancy of objects in water; identify materials that can be recycled; compare the force and motion of objects; compare and contrast sounds; compare changes in the weather to its effect on living things; identify and	First grade students at the mastery level classify objects as living and non-living; describe needs, growth changes and life cycles in living organisms; classify objects as magnetic or nonmagnetic; recognize that water can change states and investigate buoyancy of objects in water; recognize that materials can be recycled; describe changes in an object's motion; demonstrate that sounds	First grade students at the partial mastery level identify living and nonliving objects; list changes in life cycles; explore and discuss magnetic properties of matter; name water in its three states; identify changes in an object's motion; identify that sound is produced by vibrations; identify changes in weather; identify the movement of the sun and moon; identify land and water features; name parts in soil; list uses of air.	First grade students at the novice level list living and nonliving objects; name basic needs of living things; recognize that some objects are magnetic; identify liquids and solids; name an object that vibrates; observe changes in weather; identify the sun, moon and stars; identify land and water features; observe soil; name an important use of air.

weather changes and its effect on living things; compare and contrast changes in the earth and sky; draw a diagram representing land and water features; describe possible outcomes due to polluted air.	explain the changes in earth and sky; identify land and water features on a diagram; list air pollutants.	are produced by vibrations; record changes in weather and its effect on living things; discuss the importance of celestial objects and their movement; using models, compare land and water features; investigate properties of soil; and discuss the important uses of air.		

Objectives	Students will
SC.O.1.2.01	classify objects as living or non-living.
SC.O.1.2.02	identify that most living things need water, food, light and air.
SC.O.1.2.03	describe changes in life cycle of living organisms.
SC.O.1.2.04	identify the parts of growing plants as they develop.
SC.O.1.2.05	depict movement of living things in air, water and on land. (e.g., birds flying, fish swimming, or worms burrowing in soil).
SC.O.1.2.06	recognize that materials are composed of smaller parts that may be seen with a magnifier.
SC.O.1.2.07	recognize that materials can be recycled and used again, sometimes in different forms.
SC.O.1.2.08	recognize that water can change from one form to another and give examples of changes.
SC.O.1.2.09	predict and investigate the buoyancy of objects in water.
SC.O.1.2.10	classify objects as magnetic or non-magnetic.
SC.O.1.2.11	observe and record shadows at different times of the day.
SC.O.1.2.12	describe the changes in the motion of objects (e.g., slowing down, speeding up, or curving).
SC.O.1.2.13	demonstrate that sounds are produced by vibrations.
SC.O.1.2.14	observe, identify and record changes in weather and effects on living organisms.
SC.O.1.2.15	recognize that the sun, moon, and stars appear to move.
SC.O.1.2.16	observe and discuss the importance of objects in the day and night sky.
SC.O.1.2.17	use a model to compare land and water features on the Earth.
SC.O.1.2.18	identify important uses of air.
SC.O.1.2.19	investigate and compare the properties of soil (e.g., sand, clay, or humus).

Grade 1	**Science**
Standard 3:	Application of Science
S.C.S.1.3	Students will • identify how the parts of a system interact,

	• recognize and use models as representations of real things, • demonstrate the ability to distinguish between natural and man-made objects, • Listen and be tolerant of different viewpoints while working in collaborative groups, and • demonstrate the ability to evaluate the impact of different points of view on health, population, resources and environment practices.

Performance Descriptors SC.PD.1.3				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
First grade students at the distinguished level describe and identify how parts of a system interact; construct and describe a model; compare and contrast natural and man-made objects; demonstrate tolerance of different points of view; engage and involve the community in conservation practices.	First grade students at the above mastery describe and identify how parts of a system interact; construct a model as representations of real things; classify man-made and natural items; demonstrate tolerance of different points of view; engage in conservation practices.	First grade students at the mastery level identify how parts of a system interact; recognize and use models as representations of real things; distinguish between natural and man-made objects; demonstrate tolerance of different points of view; engage in conservation practices.	First grade students at the partial mastery level list parts of a system; recognize and use models; name a natural and a man-made object; work in collaborative groups; list conservation practices.	First grade students at the novice level name a system; recognize models; name a natural or man-made object; name a conservation practice.

Objectives	Students will
SC.O.1.3.01	identify that systems are made of parts that interact with one another.
SC.O.1.3.02	use models as representations of real things.
SC.O.1.3.03	distinguish between natural and man-made objects.
SC.O.1.3.04	listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.O.1.3.05	develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, or trash clean-up).

Second Grade Science Content Standards and Objectives

The Second Grade Science objectives build upon the early stages of experimentation and maintenance of natural curiosity. Through a spiraling, inquiry-based program of study and the use of 21st century skills, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and 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. Second Grade Science will provide opportunities for developmental and academic growth. The activities will introduce the concept that science and technology are interrelated. The curricular thrust will be to develop early problem-solving skills through observation, experimenting and concluding. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

<table>
<tr><td>Grade 2</td><td colspan="5">Science</td></tr>
<tr><td>Standard 1:</td><td colspan="5">Nature of Science</td></tr>
<tr><td>SC.S.2.1</td><td colspan="5">Students will
demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers.
demonstrate the abilities and understanding necessary to do scientific inquiry.
demonstrate the ability to think and act as scientists by engaging in active inquiries and investigations, while incorporating hands-on activities.</td></tr>
<tr><td colspan="6">Performance Descriptors SC.PD.2.1</td></tr>
<tr><td>Distinguished</td><td>Above Mastery</td><td>Mastery</td><td>Partial Mastery</td><td>Novice</td></tr>
<tr><td>Second grade students at the distinguished level interview people in scientific careers; design and conduct investigations using safe techniques, draw conclusions and present their findings.</td><td>Second grade students at the above mastery level relate science careers to their role in the community; design and conduct simple investigations using safe techniques and draw conclusions from collected data.</td><td>Second grade students at the mastery level identify and discuss science careers in their community; design and conduct simple investigations using safe techniques; describe trends of data and make predictions; use scientific tools.</td><td>Second grade students at the partial mastery level discuss science careers; carry out a directed investigation using safe techniques; collect and record data; classify tools.</td><td>Second grade students at the novice level list careers in science; observe simple investigations and view data collected; identify scientific tools.</td></tr>
<tr><td>Objectives</td><td colspan="5">Students will</td></tr>
<tr><td>SC.O.2.1.01</td><td colspan="5">interpret science as the human's search for an understanding of the world by asking questions about themselves and their world.</td></tr>
</table>

SC.O.2.1.02	compare the lives and discoveries of scientists of different cultures and backgrounds.
SC.O.2.1.03	identify and discuss science careers in the community.
SC.O.2.1.04	demonstrate curiosity, initiative and creativity by observing, classifying, comparing and analyzing natural objects in the environment.
SC.O.2.1.05	manipulate scientific instruments and everyday materials to investigate the natural world (e.g., hand lens, balance, thermometer, metric ruler, magnets, weather instruments, or calculators).
SC.O.2.1.06	measure the length and width of various objects using standard and non-standard units (e.g., metric ruler, paper clips, or counting bears).
SC.O.2.1.07	use safe and proper techniques for handling, manipulating, and caring for science materials (e.g., follow safety rules, maintain a clean work area, or treat living organisms humanely).
SC.O.2.1.08	design and conduct simple investigations; observe, collect and record information using a variety of classification systems; describe trends of data; and make predictions based on that data (e.g., seasonal changes and plants or temperature and weather).

Grade 2	**Second Grade Science**			
Standard 2:	Content of Science			
SC.S.2.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.			
Performance Descriptors SC.PD.2.2				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level relate various structures and functions of different plants and animals; compare and contrast various life cycles of plant and animals; explain the differences in organisms that live in various habitats; compare and contrast the changes in states of matter; predict the properties of light, heat, and magnetism; predict motion when force is	Second grade students at the above mastery level compare and contrast structures of plant and animals; construct diagrams to represent life cycles of various plants and animals; predict the organisms that would live in a habitat; explain the changes in each state of matter; investigate properties of light, heat, and magnetism; explain the effects of force verses motion and the changes in	Second grade students at the mastery level identify and explain various structures and functions in plants and animals; sequence illustrations of plant and animal life cycles and relate them to the human life cycle; compare and contrast habitats; identify physical properties and changes of matter; identify and demonstrate properties of light, heat, and magnetism; explore sound	Second grade students at the partial mastery level identify various structures of plant and animals; describe life cycles of plants and animals and different habitats; identify physical properties of matter; identify the properties of light, heat, and magnetism; explore the motion of objects; identify the changes in the earth and sky; explain how fossils form.	Second grade students at the novice level name structures of plants and animals; identify plant and animal life cycles; list habitats; name a physical property of matter; recognize properties of light, heat, and magnetism; describe an object's motion; describe daily weather changes; identify a fossil.

applied; design an experiment to show variable pitch; predict changes in the earth and sky; examine and classify fossils.	pitch and volume; compare and contrast the changes on earth and in the sky; describe and correlate fossils to original organisms.	and compare the force and motion of objects; observe, identify and explain the changes in earth and the sky; describe and correlate fossils to original organisms.		

Objectives	Students will
SC.O.2.2.01	identify that plants and animals have different structures.
SC.O.2.2.02	identify the structures of living things including their systems, and explain their functions (e.g., wings for flying, fins for swimming, or roots for support and obtaining water).
SC.O.2.2.03	sequence pictures of events to illustrate the changes in the life cycle of plants and animals.
SC.O.2.2.04	relate observations of the butterfly's life cycle to student's own growth and change.
SC.O.2.2.05	compare and contrast simple models of different kinds of habitats, including a forest and a stream.
SC.O.2.2.06	identify materials as a solid, a liquid or a gas and recognize that matter takes up space, and can change from one state to another.
SC.O.2.2.07	demonstrate that a magnet can attract or repel objects.
SC.O.2.2.08	identify which materials and colors conduct heat better than others.
SC.O.2.2.09	demonstrate that a shadow is cast when an object blocks light.
SC.O.2.2.10	compare the effects of force on the motion of an object.
SC.O.2.2.11	explore how sound can change in pitch and volume.
SC.O.2.2.12	identify and examine changes in the earth's surface (e.g., weathering, or erosion).
SC.O.2.2.13	identify the effects of wind movement.
SC.O.2.2.14	observe and describe different types of precipitation.
SC.O.2.2.15	describe daily and seasonal weather changes.
SC.O.2.2.16	explain how the rotation of the Earth on its axis causes day and night.
SC.O.2.2.17	understand that the moon has phases.
SC.O.2.2.18	describe how fossils are formed, and match a fossil, or a picture of a fossil, to its original organism.

Grade 2	**Second Grade Science**
Standard 3:	Application of Science
SC.S.2.3	Students will • identify how the parts of a system interact. • recognize and use models as representations of real things. • observe that changes occur gradually, repetitively, or randomly within the environment. • recognize that common objects and events incorporate science to solve human problems and enhance the quality of life. • demonstrate the ability to listen to, be tolerant of, and evaluate the impact of different points of view on health, population, resources and environmental practices while working in collaborative groups.

Performance Descriptors SC.PD.2.3				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level describe and identify how parts of a system interact; construct and describe a model; observe and identify patterns of change, consistency or regularity within the environment; use technology to gather and communicate data; demonstrate tolerance of different points of view; engage and involve the community in conservation practices.	Second grade students at the above mastery level describe and identify how parts of a system interact; construct a model as representations of real things; observe and identify patterns of change, consistency or regularity within the environment; use technology to gather data; demonstrate tolerance of different points of view; engage in conservation practices.	Second grade students at the mastery level identify how parts of a system interact; recognize and use models as representations of real things; observe and identify patterns of change, consistency or regularity within the environment; recognize that science is incorporated into solving problems and enhancing daily life; demonstrate tolerance of different points of view; engage in conservation practices.	Second grade students at the partial mastery level list parts of a system; recognize and use models; name patterns of change within the environment; give examples of science and technology in daily events work in collaborative groups; list conservation practices.	Second grade students at the novice level name a system; recognize models; list an environmental change; name an example of technology in daily events; name a conservation practice.

Objectives	Students will
SC.O.2.3.01	identify parts of systems and identify how they interact with one another.
SC.O.2.3.02	use models as representations of real things.
SC.O.2.3.03	observe that changes occur gradually, repetitively, or randomly within the environment.
SC.O.2.3.04	recognize that common objects and events incorporate science (e.g., CD players, Velcro, or weather) to solve human problems and enhance the quality of life.
SC.O.2.3.05	listen to and be tolerant of different viewpoints while working in collaborative groups.
SC.O.2.3.06	develop respect and responsibility for the environment by engaging in conservation practices (e.g., recycling, trash clean-up, or power consumption reduction).

Third Grade Science Content Standards and Objectives

The Third Grade Science 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 and 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. Third Grade Science highlights science-related careers. The study of geology and astronomy expands in Third Grade Science. Collecting materials, testing the materials, recording data and developing concepts related to physics and chemistry are introduced to expand investigative abilities that lead to logical conclusions. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Grade 3	**Science**			
Standard 1:	Nature of Science			
SC.S.3.1	Students will • demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers. • demonstrate the abilities and understanding necessary to do scientific inquiry. • demonstrate the ability to think and act as scientists by engaging in active inquiries and investigations, while incorporating hands-on activities.			
Performance Descriptors SC.PD.3.1				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Second grade students at the distinguished level research scientists from different cultures and backgrounds and present their findings using technology; design and conduct an investigation using safe techniques; interpret, predict, and present data, control variables and conduct	Third grade students at the above mastery level compare and contrast the lives and discoveries of scientists from different cultures and backgrounds and identify their discoveries; plan and conduct investigations using safe techniques; interpret and present data and control variables.	Second grade students at the mastery level study scientists from different cultures and backgrounds and identify their discoveries; recognize that scientific explanations lead to new discoveries; plan and conduct simple investigations using safe techniques; interpret and present data; control	Second grade students at the partial mastery level name scientists from different cultures and backgrounds and recall their discoveries; conduct investigations using safe techniques; identify variables, and record data.	Second grade students at the novice level name a scientist from a different culture and background; and observe and participate in investigations using safe techniques.

multiple trials.		variables, and explore science careers in the community.		

Objectives	Students will
SC.O.3.1.01	recognize that scientific explanations may lead to new discoveries (e.g., new knowledge leads to new questions).
SC.O.3.1.02	study the lives and discoveries of scientists of different cultures and backgrounds.
SC.O.3.1.03	explore science careers in the community.
SC.O.3.1.04	demonstrate curiosity, initiative and creativity by planning and conducting simple investigations.
SC.O.3.1.05	recognize that developing solutions to problems takes time, patience and persistence through individual and cooperative ventures.
SC.O.3.1.06	support statements with facts found through research from various sources, including technology.
SC.O.3.1.07	use scientific instruments, technology, and everyday materials to investigate the natural world.
SC.O.3.1.08	use safe and proper techniques for handling, manipulating and caring for science materials (e.g., follow safety rules, maintain a clean work area, or treat living organisms humanely).
SC.O.3.1.09	apply mathematical skills and use metric units in measurements.
SC.O.3.1.10	interpret data presented in a table, graph, map or diagram and use it to answer questions and make predictions and inferences based on patterns of evidence.
SC.O.3.1.11	Identify and control variables.

Grade 3	**Science**
Standard 2:	Content of Science
SC.S.3.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.3.2

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Third grade students at the distinguished level construct and use classification systems based on the structure and physical characteristics of living things and propose how adverse factors affect the interrelationships of	Third grade students at the above mastery level classify a variety of organisms according to specific physical characteristics and explain the importance of plants and animals adapting to their environment; describe physical and	Third grade students at the mastery level compare the physical characteristics, structures, and behaviors of living things and explain how they function, change and adapt to their environment; identify physical and chemical	Third grade students at the partial mastery level list ways living things function, change, and interact with each other and their environment; identify physical properties of matter; relate the color of an object to reflection;	Third grade students at the novice level list the physical characteristics of living things; name the three states of matter; recognize that light can be reflected; give an example of energy of motion; list erosion, earthquakes, and volcanoes

organisms; investigate and describe various properties of matter including states of matter, physical and chemical properties/ changes; design an experiment to test the reflection, refraction, and absorption of light by objects; measure and record changes in the direction of an object when forces have been applied; demonstrate the relationships between speed, distance, and time; evaluate the consequences of earthquakes and volcanic eruptions and explore how technologies are used to help predict the impact of future occurrences; explain the effects of the alignment of earth, moon, and sun on the earth; compare and contrast rocks and minerals and factors that affect their formation; infer how natural processes and human behavior affect geographical features.	chemical properties of matter and recognize change in temperature to state of matter; demonstrate that light can be reflected and refracted; explain the relationship between speed, distance, and time when forces have been applied; compare changes in the Earth's surface that are due to erosion, volcanic eruptions, and earthquakes; explain how fossils provide evidence about prehistoric life; compare and contrast the planets and their movement; differentiate between types of rocks and their formation; construct and interpret models that illustrate the geographical features and layers of the earth.	properties of matter including density and changes in states of matter; investigate the properties of light energy; recognize the principles of force and motion and identify examples of potential and kinetic energy; examine the relationship between speed, distance and time; explore and describe how erosion, volcanoes, and earthquakes change Earth's surface; identify fossils as a record of time; describe the relative movement of the earth and moon in relation to the sun; describe the planets; identify the composition of rocks and explain how they are formed; compare and contrast layers of the Earth; identify geographical features using a model or map.	demonstrate the principles of force and motion; describe how erosion, volcanoes, and earthquakes change Earth's surface; describe how fossils are formed; name the planets; describe the motion of Earth and moon in relation to the sun; name the three types of rocks; describe geographical features and identify layers of the Earth.	as changes that affect Earth's surface; match a fossil to its original organism; draw a model of the earth and moon in relation to the sun; list physical characteristics of rocks, name geographical features of the Earth.

Objectives	Students will
SC.O.3.2.01	identify the structures of living things, including their systems and explain their functions.
SC.O.3.2.02	observe, measure and record changes in living things (e.g., growth and development, or variations within species).
SC.O.3.2.03	compare physical characteristics and behaviors of living organisms and explain how they are adapted to a specific environment (e.g., beaks and feet in birds, seed dispersal, camouflage, or different types of flowers).
SC.O.3.2.04	observe and describe relationships among organisms and predict the effect of adverse factors.

SC.O.3.2.05	relate the buoyancy of an object to its density.
SC.O.3.2.06	identify physical and chemical properties.
SC.O.3.2.07	relate changes in states of matter to changes in temperature.
SC.O.3.2.08	investigate the dissolving of solids in liquids.
SC.O.3.2.09	investigate the reflection and refraction of light by objects.
SC.O.3.2.10	relate how the color of an object is based upon the reflection of light.
SC.O.3.2.11	recognize that it takes work to move objects over a distance.
SC.O.3.2.12	examine the relationships between speed, distance, and time.
SC.O.3.2.13	recognize that the greater a force is exerted on an object, the greater the change of its motion.
SC.O.3.2.14	identify examples of potential and kinetic energy.
SC.O.3.2.15	identify fossils as a record of time.
SC.O.3.2.16	explore erosion of different materials by water and wind (e.g., sand, soil, or rocks).
SC.O.3.2.17	describe how volcanoes and earthquakes affect the Earth.
SC.O.3.2.18	recognize the relative movement of the Earth and moon in relation to the sun.
SC.O.3.2.19	describe the similarities and differences among the planets.
SC.O.3.2.20	identify properties of minerals and recognize that rocks are composed of different minerals.
SC.O.3.2.21	explain how igneous, sedimentary and metamorphic rocks are formed.
SC.O.3.2.22	identify geographical features using a model or map.
SC.O.3.2.23	compare and contrast the layers of the Earth and their various features.

Grade 3	**Science**			
Standard 3:	Application of Science			
SC.S.3.3	• Students will • identify how the parts of a system interact. • recognize and use models as representations of real things. • observe and identify patterns of change, consistency or regularity within the environment. • demonstrate the ability to utilize technology to gather and organize data to communicate designs, results and conclusions. • identify that a solution to a problem often creates new problems. • demonstrate the ability to listen to, be tolerant of, and evaluate the impact of different points of view on health, population, resources and environmental practices while working in collaborative groups.			
Performance Descriptors SC.PD.3.3				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Third grade students at the distinguished level explain how parts of a system	Third grade students at the above mastery level describe and identify how	Third grade students at the mastery level identify how parts of a system interact;	Third grade students at the partial mastery level list parts of a system; recognize	Third grade students at the novice level name a system; recognize models; name an

interact; construct and explain a model that represents an abstract idea; predict patterns of change within the environment; apply technology to solve problems, gather and communicate data; demonstrate tolerance of different points of view and the willingness to modify ideas when new and valid information is presented.	parts of a system interact; construct a model; observe and identify patterns of change, consistency or regularity within the environment; use technology to gather and communicate data; demonstrate tolerance of different points of view.	recognize and use models as representations of real things; observe and identify patterns of change, consistency or regularity within the environment; cite examples of science and technology in daily events;demonstrate tolerance of different points of view.	and use models; name patterns of change within the environment; cite examples of science and technology in daily events; work in collaborative groups.	environmental change, cite examples of science and technology in daily events.

Objectives	Students will
SC.O.3.3.01	identify that systems are made of parts that interact with one another.
SC.O.3.3.02	use models as representations of real things.
SC.O.3.3.03	observe that changes occur gradually, repetitively, or randomly within the environment and question causes of changes.
SC.O.3.3.04	given a set of objects, group or order the objects according to an established scheme.
SC.O.3.3.05	given a set of events, objects, shapes, designs, or numbers, formulate patterns of constancy or regularity.
SC.O.3.3.06	cite examples of the uses of science and technology in common daily events and in the community.
SC.O.3.3.07	explain a simple problem and identify a specific solution describing the use of tools and/or materials to solve the problem or to complete the task.
SC.O.3.3.08	recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, or waste disposal).
SC.O.3.3.09	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.
SC.O.3.3.10	develop respect and responsibility for the environment by engaging in conservation practices.
SC.O.3.3.11	describe how modern tools and appliances have positively and/or negatively impacted their daily lives.

Fourth Grade Science Content Standards and Objectives

The Fourth Grade Science objectives build on the study of geology, astronomy, chemistry and physics. Through a spiraling, inquiry-based program of study and the use of 21st century skills, all students will demonstrate scientific literacy in the fields of biology, chemistry, physics and earth and 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 into all activities. Fourth Grade Science promotes cooperative learning, group decisions, cultural diversity, and careers and expands the development of hands-on exploration. Basic science concepts are developed and problem-solving abilities are augmented. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Grade 4	**Grade Science**			
Standard 1:	Nature of Science			
SC.S.4.1	Students will • demonstrate an understanding of the history and nature of science as a human endeavor encompassing the contributions of diverse cultures, scientists, and careers. • demonstrate the abilities and understanding necessary to do scientific inquiry. • demonstrate the ability to think and act as scientists by engaging in active inquiries and investigations, while incorporating hands-on activities.			
Performance Descriptors SC.PD.4.1				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Fourth grade students at the distinguished level analyze and evaluate new discoveries and examine how they impact society; design and conduct an investigation based on previous investigations using safe techniques and critiquing the results of both, using technology to present and defend their	Fourth grade students at the above mastery level explain how new discoveries lead to new careers; analyze and evaluate data and design a plan to further the investigation through research and technology.	Fourth grade students at the mastery level recognize that new discoveries lead to changes in scientific knowledge; interpret data and draw and support conclusions; make predictions and inferences based on patterns of evidence; design simple experiments using safe techniques, and support	Fourth grade students at the partial mastery level recognize that scientific knowledge changes over time; collect and interpret data using safe techniques.	Fourth grade students at the novice level identify scientific discoveries; and participate in investigations using safe techniques and collect data using safe techniques.

conclusions.		conclusions with evidence found through research.		

Objectives	Students will
SC.O.4.1.01	explain how new discoveries lead to changes in scientific knowledge.
SC.O.4.1.02	study the lives and discoveries of scientists of different cultures and backgrounds.
SC.O.4.1.03	explore science careers in West Virginia.
SC.O.4.1.04	demonstrate curiosity, initiative and creativity by developing questions that lead to investigations; designing simple experiments; and trusting observations of discoveries when trying new tasks and skills.
SC.O.4.1.05	recognize that developing solutions to problems requires persistence, flexibility, open-mindedness, and alertness for the unexpected.
SC.O.4.1.06	support statements with facts found through research from various sources, including technology.
SC.O.4.1.07	use scientific instruments, technology and everyday materials to investigate the natural world.
SC.O.4.1.08	demonstrate safe and proper techniques for handling, manipulating and caring for science materials.
SC.O.4.1.09	construct a hypothesis when provided a problem.
SC.O.4.1.10	establish variables and controls in an experiment; test variables through experimentation.
SC.O.4.1.11	interpret data presented in a table, graph, or diagram and use it to answer questions and make decisions.
SC.O.4.1.12	draw and support conclusions, make predictions and inferences based on patterns of evidence (e.g., weather maps, variation of plants, or frequency and pitch of sound).
SC.O.4.1.13	apply mathematical skills and use metric units in measurements and calculations.

Grade 4	**Science**
Standard: 2	
SC.S.4.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories, and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.0.4.2				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Fourth grade students at the distinguished level when given an environment, predict organisms, their characteristics, variations, life cycles, and interactions; predict how environmental changes will affect a food	Fourth grade students at the above mastery level compare and contrast the characteristics, variations, and life cycles of organisms within different environments; construct and explain models of habitats,	Fourth grade students at the mastery level observe and distinguish characteristics, variation, and life cycles of organisms and how they interact within the environment; construct and explain models of habitats,	Fourth grade students at the partial mastery level describe life cycles of organisms and the environment in which they live; identify habitats, food chains and food webs; list states of matter and	Fourth grade students at the novice level Identify the life cycle of an organism; name organisms in a food chain; list states of matter; identify a conductor and nonconductor; identify motion and force; recognize

web; design an investigation involving physical and chemical properties of matter; develop an energy transformation web; diagram and construct an electrical circuit; draw conclusions based on motion and applied force investigations; compare and contrast factors that affect the rate of change of earth's composition; describe how the different types of rocks are formed; research estuaries; make valid predictions on location and movement of objects within the universe.	food chains, and food webs; investigate and analyze changes in states of matter; describe energy transformations; diagram an electrical circuit; draw conclusions based on motion and applied force investigations; compare factors that affect the rate of change of earth's composition; differentiate between types of rocks; explain the differences between ocean and fresh water; compare and contrast the movement of objects within the universe.	food chains, and food webs; investigate and describe various properties of matter including states of matter, physical and chemical properties/changes; describe energy transformations, investigate conductors / nonconductors and electrical circuits, predict and investigate motion/force, and frequency/pitch; describe earth's geological composition and how it changes; differentiate between types of rocks; compare ocean/fresh water; identify and describe objects within the universe and their movement.	physical properties; identify different forms of energy; investigate conductors and nonconductors; demonstrate motion and force; identify changes caused by volcanoes, earthquakes, and landslides; list three types of rocks in the rock cycle; name examples of oceans and fresh water; identify objects within the universe.	that volcanoes, earthquakes, and landslides change the earth; name one type of rock; name an example of an ocean or fresh water; list objects within the solar system.

Objectives	Students will
SC.0.4.2.01	describe the different characteristics of plants and animals, which help them to survive in different niches and environments.
SC.0.4.2.02	associate the behaviors of living organisms to external and internal influences (e.g., hunger, climate, or seasons).
SC.0.4.2.03	identify and classify variations in structures of living things including their systems and explain their functions (e.g., skeletons, teeth, plant needles, or leaves).
SC.0.4.2.04	compare and sequence changes in cycles in relation to plant and animal life.
SC.0.4.2.05	give examples how plants and animals closely resemble their parents and that some characteristics are inherited from the parents and others result from interaction with the environment.
SC.0.4.2.06	identify human uses of plants and animals (e.g., food sources, or medicines).
SC.0.4.2.07	describe the effects of altering environmental barriers on the migration of animals.
SC.0.4.2.08	construct and explain models of habitats, food chains, and food webs.
SC.0.4.2.09	investigate how properties can be used to identify substances.
SC.0.4.2.10	design an experiment to investigate the dissolving of solids and analyze the results.
SC.0.4.2.11	examine simple chemical changes (e.g., tarnishing, rusting, or burning).
SC.0.4.2.12	explain that materials including air take up space and are made of parts that are too small to be seen without magnification.

SC.0.4.2.13	differentiate changes in states of matter due to heat loss or gain.
SC.0.4.2.14	investigate variables that affect the rate of evaporation of a liquid.
SC.0.4.2.15	compare and classify liquids based on density.
SC.0.4.2.16	identify different forms of energy and describe energy transformations that occur between them (e.g., electrical to heat, or radiant to chemical).
SC.0.4.2.17	examine types and properties of waves (e.g., transverse, longitudinal, frequency, or wavelengths).
SC.0.4.2.18	investigate static electricity and conductors/nonconductors of electricity.
SC.0.4.2.19	construct simple electrical circuits.
SC.0.4.2.20	describe and explain the relationship between a compass and a magnetic field.
SC.0.4.2.21	relate motion of an object to its frame of reference.
SC.0.4.2.22	predict and investigate the motion of an object if the applied force is changed.
SC.0.4.2.23	explore that sounds are produced by vibrating objects and columns of air and form conclusions about the relationship between frequency and pitch of sound.
SC.0.4.2.24	investigate the change in the length, tension, or thickness of the vibrating object on the frequency of vibration (e.g., string, wire, or rubber band).
SC.0.4.2.25	examine the geologic time scale.
SC.0.4.2.26	locate and identify patterns of stars and their change in location throughout the year.
SC.0.4.2.27	compare and explain the relative time differences to erode materials.
SC.0.4.2.28	investigate the cause and effects of volcanoes, earthquakes and landslides.
SC.0.4.2.29	interpret a weather chart or map and predict outcomes.
SC.0.4.2.30	identify the sun as a star.
SC.0.4.2.31	explain the effects of alignment of earth, moon and sun on the earth.
SC.0.4.2.32	describe and explain the planets orbital paths.
SC.0.4.2.33	differentiate between types of rock and describe the rock cycle.
SC.0.4.2.34	compare ocean water and fresh water.
SC.0.4.2.35	investigate soil types and soil composition.

Grade 4	**Science**
Standard 3:	Application of Science
SC.S.4.3	Students will • identify how the parts of a system interact. • recognize and use models as representations of real things. • observe and identify patterns of change, consistency or regularity within the environment. • demonstrate the ability to utilize technology to gather and organize data to communicate designs, results and conclusions. • identify that a solution to a problem often creates new problems. Demonstrate the ability to listen to, be tolerant of, and evaluate the impact of different points of view on health, population,

	resources and environmental practices while working in collaborative groups.

Performance Descriptors SC.PD.4.3				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Fourth grade students at the distinguished level explain how parts of a system interact; construct and explain a model that represents an abstract idea; predict patterns of change within the environment; apply technology to solve problems, gather and communicate data; demonstrate tolerance of different points of view, and the willingness to modify ideas when new and valid information is presented.	Fourth grade students at the above mastery level describe and identify how parts of a system interact; construct a model; observe and identify patterns of change, consistency or regularity within the environment; apply technology to solve problems, gather and communicate data; demonstrate tolerance of different points of view.	Fourth grade students at the mastery level identify how parts of a system interact; recognize and create models as representations of real things; observe and identify patterns of change, consistency or regularity within the environment; apply technology to solve problems, gather and communicate data; demonstrate tolerance of different points of view.	Fourth grade students at the partial mastery level identify parts of a system; recognize and use models; list patterns of change within the environment; gather and communicate data using technology; work in collaborative groups.	Fourth grade students at the novice level identify a system; recognize models; list changes within the environment; gather and communicate data using technology.

Objectives	Students will
SC.0.4.3.01	identify that systems are made of parts that interact with one another.
SC.0.4.3.02	create models as representations of real things.
SC.0.4.3.03	observe that changes occur gradually, repetitively, or randomly within the environment and question causes of change.
SC.0.4.3.04	given a set of objects, group or order the objects according to an established scheme.
SC.0.4.3.05	given a set of events, objects, shapes, designs, or numbers, find patterns of constancy or regularity.
SC.0.4.3.06	identify and explain a simple problem or task to be completed; identify a specific solution; and list task requirements.
SC.0.4.3.07	use an appropriate engineering design to solve a problem or complete a task.
SC.0.4.3.08	recognize that a solution to one scientific problem often creates new problems (e.g., recycling, pollution, conservation, waste disposal, or need for technology).
SC.0.4.3.09	listen to and be tolerant of different viewpoints by engaging in collaborative activities and modifying ideas when new and valid information is presented from a variety of resources.
SC.0.4.3.10	describe the positive and negative consequences of the application of technology on personal health and the environment.
SC.0.4.3.11	develop respect and responsibility for the environment by engaging in conservation practices.

Fifth Grade Science Content Standards and Objectives

The Fifth Grade Science 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 and the use of 21st century skills in the fields of biology, chemistry, physics, and earth and 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. Fifth Grade Science 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. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

<table>
<tr><td>Grade 5</td><td colspan="5">Science</td></tr>
<tr><td>Standard 1:</td><td colspan="5">Nature of Science</td></tr>
<tr><td>SC.S.5.1</td><td colspan="5">Students will
• demonstrate an understanding of the history of science and the evolvement of scientific knowledge.
• demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists.
• demonstrate an understanding of the characteristics of a scientist.
• demonstrate skills of scientific inquiry.</td></tr>
<tr><td colspan="6">Performance Descriptors SC.PD.5.1</td></tr>
<tr><td>Distinguished</td><td>Above Mastery</td><td>Mastery</td><td>Partial Mastery</td><td>Novice</td></tr>
<tr><td>Fifth grade students at the distinguished level describe the importance of the research of historical and diverse scientists in society and culture; skepticism, use careful methodology and creativity to conduct investigations; predict, hypothesize, identify variables, organize and interpret experimental data</td><td>Fifth grade students at the above mastery level describe the research of historical and diverse scientists in society and culture; use careful methodology and creativity to conduct an investigation; demonstrate safe investigative techniques; make predictions and organize data; suggest</td><td>Fifth grade students at the mastery level recognize the research of historical and diverse scientists in society and culture; use careful methodology to observe, measure and record data as part of an investigation; demonstrate safe investigative techniques.</td><td>Fifth grade students at the partial mastery level recognize the findings of historical or diverse scientists in society and culture; use a methodology to observe, measure and record data; demonstrate safe investigative techniques; recognize factors that change in an experiment.</td><td>Fifth grade students at the novice level recognize the findings of a scientist; observe, measure and record data; demonstrate safe investigative techniques.</td></tr>
</table>

using safe investigative techniques.	experimental variables for investigations.			

Objectives	Students will
SC.O.5.1.01	realize that scientists formulate and test their explanations of nature using observation and experiments.
SC.O.5.1.02	recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.
SC.O.5.1.03	examine the careers and contributions of men and women of diverse cultures to the development of science.
SC.O.5.1.04	compare and contrast the historical significance of scientific discoveries.
SC.O.5.1.05	cooperate and collaborate to ask questions, design and conduct investigations to find answers and solve problems.
SC.O.5.1.06	formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.
SC.O.5.1.07	apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.
SC.O.5.1.08	use a variety of technologies and scientific instruments to conduct explorations, investigations and experiments of the natural world.
SC.O.5.1.09	demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.
SC.O.5.1.10	utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, or identifying dependent and independent variables).
SC.O.5.1.11	construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.
SC.O.5.1.12	use inferential reasoning to make logical conclusions from collected data.

Grade 5	**Science**
Standard 2:	Content of Science
SC.S.5.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.5.2

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Fifth grade students at the distinguished level examine the structure to the function of living organisms and cells; analyze differences in niches, life cycles and energy/matter conversions of organisms in an ecosystem that contribute to	Fifth grade students at the above mastery level relate the structure to the function of living organisms and cells; explore differences in niches, life cycles and energy/matter conversions of organisms in an ecosystem that contribute to	Fifth grade students at the mastery level identify and explain the function of living organisms, cells, and common energy conversions in cycles of matter; explore differences in niches and life cycles of organisms in an ecosystem	Fifth grade students at the partial mastery level identify the function of living organisms, cells, and common energy conversions in cycles of matter; explain differences in niches and life cycles of organisms in an ecosystem	Fifth grade students at the novice level identify structures of living organisms; identify niches in ecosystems; recognize that mass is conserved in physical changes; identify variables that affect the motion of objects; identify

survival; identify substances by their density experimentally; recognize that mass is conserved in physical changes; experimentally determine how the motion of objects are affected by variables; compare and contrast the characteristics of the earth's layers and characterize changes that occur in the lithosphere and atmosphere; interpret the earth's history using plate tectonics and relative dating; select the appropriate materials to design and quantitatively test electromagnets to evaluate differences in design.	survival; identify substances by their density experimentally; recognize that mass is conserved in physical changes; experimentally determine how the motion of objects are affected by variables; contrast the characteristics of the earth's layers and characterize the lithosphere and atmosphere; interpret the earth's history using plate tectonics and relative dating; select the appropriate materials to design, test and diagram the circuit of an electromagnet.	that contribute to survival; find density experimentally; recognize that mass is conserved in physical changes; describe how the motion of objects are affected by variables; describe the structure of the earth and characterize the lithosphere and atmosphere; explore the earth's history using plate tectonics and relative dating; select the appropriate materials to design and test an electromagnet.	that contribute to survival; calculate density; recognize that mass is conserved in physical changes; identify variables that affect the motion of objects; identify the structure of the earth and characterize the lithosphere and atmosphere; recognize the earth's crust is divided into plates and that earth's layers can be dated; build and test an electromagnet.	the structure of the earth; recognize the earth's crust is divided into plates; test an electromagnet.

Objectives	Students will
SC.O.5.2.01	demonstrate an understanding of the interconnections of biological, earth and space, and physical science concepts.
SC.O.5.2.02	identify and explain common energy conversions in cycles of matter including photosynthesis and the carbon dioxide cycle.
SC.O.5.2.03	identify the structures of living organisms and explain their function.
SC.O.5.2.04	observe and identify cells of organisms using a microscope.
SC.O.5.2.05	compare variations of plant growth and reproduction.
SC.O.5.2.06	contrast how the different characteristics of plants and animals help them to survive in different niches and environments including adaptations, natural selection, and extinction.
SC.O.5.2.07	through the use of research and technology, explore the extinction of a species due to environmental conditions.
SC.O.5.2.08	trace and describe the pathways of the sun's energy through producers, consumers and decomposers using food webs and pyramids.
SC.O.5.2.09	explain that the mass of a material is conserved whether it is together, in parts, or in a different state.
SC.O.5.2.10	recognize that elements are composed of only one type of matter.
SC.O.5.2.11	using the periodic table, identify common elements according to their symbols.

SC.O.5.2.12	through experimentation, identify substances by their relative densities (mass/volume=density).
SC.O.5.2.13	analyze diagrams of electrical circuits.
SC.O.5.2.14	measure electricity using voltage and wattage.
SC.O.5.2.15	investigate the properties of an electromagnet by selecting appropriate materials, designing and testing an electromagnet, and evaluating differences in design.
SC.O.5.2.16	describe how the variables of gravity and friction affect the motion of objects.
SC.O.5.2.17	compare and contrast the change in length, tension, or thickness of a vibrating object on the frequency of vibration.
SC.O.5.2.18	describe the layers of the earth and their various features.
SC.O.5.2.19	identify and describe natural landforms and explain how they change and impact weather and climate.
SC.O.5.2.20	use a variety of instruments and sources to collect and display weather data to describe weather patterns.
SC.O.5.2.21	compare and explain the different rates of weathering, erosion and deposition on various materials.
SC.O.5.2.22	analyze a topographical map to make inferences related to elevation and land features.
SC.O.5.2.23	identify resources as being renewable or non-renewable.
SC.O.5.2.24	explore and explain how fossils and geologic features can be used to determine the relative age of rocks and rock layers.
SC.O.5.2.25	recognize that the Earth is made of plates (plate tectonics).

Grade 5	**Science**
Standard 3:	Application of Science
SC.S.5.3	Students will • explore the relationship between the parts and the whole system; construct a variety of useful models; examine changes that occur in an object or system. • demonstrate an understanding of the interdependence between science and technology. • demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions. • demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices.

Performance Descriptors SC.PD.5.3

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Fifth grade students at the distinguished level evaluate the role of parts that contribute to the functioning of a model; identify an innovation with the science that makes it possible; select and use the appropriate technology to	Fifth grade students at the above mastery level analyze parts as they contribute to the functioning of a model; match an innovation with the science that makes it possible; identify and use the appropriate technology to	Fifth grade students at the mastery level compare the functioning of parts to the functioning of a model; report on a technological innovation; use the appropriate technology to collect scientific data; use two media sources to	Fifth grade students at the partial mastery level explain the function of parts of a model; identify a technological innovation; use technology to collect scientific data; identify the point of view of a media source regarding health,	Fifth grade students at the novice level identify the parts of a model; identify a technological innovation; use a technology to collect data; recognize that media sources have a point of view regarding health, population, resources or

collect scientific data; use multiple media sources to evaluate different points of view regarding health, population, resources and environmental practices.	collect scientific data; compare media sources to evaluate two different points of view regarding health, population, resources and environmental practices.	evaluate points of view regarding health, population, resources or environmental practices.	population, resources or environmental practices.	environmental practices.

Objectives	Students will
SC.O.5.3.01	explore the relationship between the parts of a system to the whole system.
SC.O.5.3.02	construct a variety of useful models of an object, event, or process.
SC.O.5.3.03	compare and contrast changes that occur in an object or a system to its original state.
SC.O.5.3.04	compare and contrast the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, or flight characteristics of different-sized model airplanes).
SC.O.5.3.05	research everyday applications and interactions of science and technology.
SC.O.5.3.06	evaluate and critically analyze mass media reports of scientific developments and events.
SC.O.5.3.07	explore the connections between science, technology, society and career opportunities.

Sixth Grade Science Content Standards and Objectives

The Sixth Grade Science 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 and space sciences, using 21st century skills. 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 is integrated in all activities. Sixth Grade Science 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 at the sixth grade level include motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Grade 6	**Science**			
Standard 1:	Nature of Science			
SC.S.6.1	Students will • demonstrate an understanding of the history of science and the evolvement of scientific knowledge. • demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists. • demonstrate an understanding of the characteristics of a scientist. • demonstrate skills of scientific inquiry.			
Performance Descriptors SC.PD.6.1				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Sixth grade students at the distinguished level explain the importance of the research of historical and diverse scientists in society and culture; display skepticism, careful methodology, logical reasoning and creativity to conduct scientific investigations; predict,	Sixth grade students at the above mastery level describe the importance of the research of historical and diverse scientists in society and culture; use skepticism, careful methodology, logical reasoning and creativity to conduct investigations; predict, hypothesize, and	Sixth grade students at the mastery level describe the research of historical and diverse scientists in society and culture; use careful methodology, logical reasoning and creativity to conduct an investigation; and identify variables, organize and interpret experimental data using	Sixth grade students at the partial mastery level state the research of an historical or diverse scientist; use a methodology or creativity to conduct an investigation; demonstrate safe investigation techniques; make predictions, identify variables and record data.	Sixth grade students at the novice level recognize the findings of an historical or diverse scientist; observe measure and record data in conducting an investigation; demonstrate safe investigation techniques; make predictions and record data.

hypothesize, classify independent and dependent variables, organize and interpret experimental data using safe techniques.	classify variables, organize and interpret experimental data using safe techniques.	safe techniques.		

Objectives	Students will
SC.O.6.1.01	realize that scientists formulate and test their explanations of nature using observation and experiments.
SC.O.6.1.02	recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.
SC.O.6.1.03	examine the careers and contributions of men and women of diverse cultures to the development of science.
SC.O.6.1.04	compare and contrast the historical significance of scientific discoveries.
SC.O.6.1.05	cooperate and collaborate to ask questions, design and conduct investigations to find answers and solve problems.
SC.O.6.1.06	formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.
SC.O.6.1.07	apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.
SC.O.6.1.08	use a variety of technologies and scientific instruments to conduct explorations, investigations and experiments of the natural world.
SC.O.6.1.09	demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.
SC.O.6.1.10	utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, or identifying dependent and independent variables).
SC.O.6.1.11	construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.
SC.O.6.1.12	use inferential reasoning to make logical conclusions from collected data.

Grade 6	**Science**
Standard 2:	Content of Science
SC.S.6.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.6.2

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Sixth grade students at the distinguished level analyze changes in chemical and living cycles of ecosystems; compare different classification systems	Sixth grade students at the above mastery level analyze cycles of ecosystems; compare traits of different classifications of organisms; compare	Sixth grade students at the mastery level illustrate cycles of ecosystems; classify organisms using traits; compare plant and animal cell models; classify	Sixth grade students at the partial mastery level illustrate a cycle in an ecosystem; classify an organism; model plant and animal cells; define	Sixth grade students at the novice level Illustrate a cycle in nature; put an organism into a group; use models of plant and animal cells; list properties of

based on different internal and external traits; use models to compare and contrast features of plant and animal cells; evaluate properties of known substances and mixtures and apply properties to identify unknown substances; compare and contrast electromagnetic and sound wave properties; evaluate movement of heat; design simple electric circuits; predict effects of changing positions of the earth, moon, and sun; associate life forms with geologic periods; select technology to predict weather; research current evidence in plate tectonics theory.	components of plant and animal cell models; compare and contrast properties of substances and mixtures; compare electromagnetic and sound wave properties; predict direction of heat flow; compare simple electric circuits; explain events associated with changing positions of the earth, moon, and sun; characterize life forms with geologic eras; predict weather using technology; explain advances in plate tectonics theory.	properties of substances and mixtures; characterize electromagnetic and sound waves; describe the flow of heat between objects; diagram simple electric circuits; relate gravity and mass; examine how forces effect motion; examine simple machines; describe events associated with positions of the earth, moon, and sun; associate life forms with geologic eras; use technology to investigate weather; trace the history of plate tectonics theory.	properties of substances and mixtures; define light and sound waves; describe the flow of heat between objects; define parts of an electric circuit; define mass and weight; give examples of force and motion; identify simple machines; recognize events occur with changing positions of the earth, moon, and sun; recognize that life forms change with geologic eras; investigate weather; describe plate tectonics theory.	substances and mixtures; list light and sound waves terms; recognize that heat flows; list parts of an electric circuit; define weight; define force and motion; draw simple machines; recognize changing positions of the earth, moon, and sun; recognize that life forms change over time; record weather data; label plates.

Objectives	Students will
SC.O.6.2.01	demonstrate the interrelationships among physics, chemistry, biology, earth and environmental science, and astronomy.
SC.O.6.2.02	use pictures to show cyclical processes in nature (e.g., nitrogen cycle, carbon cycle, or water cycle).
SC.O.6.2.03	classify living organisms according to their structure and functions.
SC.O.6.2.04	compare the similarities of internal features of organisms, which can be used to infer relatedness.
SC.O.6.2.05	examine how abiotic and biotic factors affect the interdependence among organisms.
SC.O.6.2.06	construct models of plant and animal cells and compare the basic parts (e.g., cytoplasm, cell wall, cell membrane, nucleus, or chloroplasts).
SC.O.6.2.07	compare growth cycles in different plants (e.g., mosses, ferns, perennials, biennials, woody plants, or herbaceous plants).
SC.O.6.2.08	predict changes in populations of organisms due to limiting environmental factors (e.g., food supply, predators, disease, or habitat).
SC.O.6.2.09	analyze the ecological consequences of human interactions with the environment (e.g., renewable and non-renewable resources).
SC.O.6.2.10	classify and investigate properties and processes (changes) as either physical or chemical.
SC.O.6.2.11	investigate the formation and separation of simple mixtures of matter concluding that matter is composed of tiny particles and that the

	particles are the same for the same type of matter.
SC.O.6.2.12	use indicators to classify substances as acidic, basic or neutral.
SC.O.6.2.13	using the periodic table, identify the symbols of elements as solids, liquids, and gases; metals or nonmetals.
SC.O.6.2.14	describe the composition and properties of matter (e.g., particles, malleability, melting point, density, inertia, or specific heat).
SC.O.6.2.15	investigate the properties of the electromagnetic spectrum (e.g., wavelengths, frequencies, visible light); relate wavelengths and/or frequencies to position on the electromagnetic spectrum (e.g., colors, x-ray).
SC.O.6.2.16	recognize that an object's color is based upon the absorption and reflection of light waves.
SC.O.6.2.17	describe light and sound in terms of longitudinal or transverse waves.
SC.O.6.2.18	describe the flow of heat between objects (e.g., hot air rises, or absorption and release of heat by metals).
SC.O.6.2.19	diagram simple parallel and series circuits (e.g., bulbs, battery, wires, or switch).
SC.O.6.2.20	correlate the relationship of mass to gravitational force (e.g., larger the mass the larger the gravitational force, or the closer the objects the stronger the force).
SC.O.6.2.21	examine simple machines and the forces involved.
SC.O.6.2.22	apply the effects of balanced and unbalanced forces on motion of objects.
SC.O.6.2.23	explain motion in terms of frames of reference and analyze graphs depicting motion and predicted future motion.
SC.O.6.2.24	monitor major atmospheric events using a variety of resources including technology.
SC.O.6.2.25	compare and contrast continental drift hypothesis to the plate tectonic theory.
SC.O.6.2.26	associate plant and animal life forms with specific geologic time periods.
SC.O.6.2.27	recognize the phases of the moon.
SC.O.6.2.28	investigate models of earth-moon-sun relationships (e.g., gravity, time, or tides).
SC.O.6.2.29	compare the earth's tilt and revolution to the seasonal changes.

Grade 6	**Science**
Standard 3:	Application of Science
SC.S.6.3	Students will • explore the relationship between the parts and the whole system; construct a variety of useful models; examine changes that occur in an object or system. • demonstrate an understanding of the interdependence between science and technology. • demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions. • demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices.

Performance Descriptors SC.PD.6.3

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Sixth grade students at the distinguished level evaluate the role of parts that	Sixth grade students at the above mastery level analyze parts as they	Sixth grade students at the mastery level compare the functioning of parts to the	Sixth grade students at the partial mastery level explain the function of parts of a	Sixth grade students at the novice level identify the parts of a system or model;

contribute to the functioning of the system and/or model; identify innovations with the science that makes them possible; select and use the appropriate technology to collect scientific data; use multiple media sources to evaluate different points of view regarding health, population, resources and environmental practices.	contribute to the functioning of the system or model; match innovations with the science that makes them possible; identify and use the appropriate technology to collect scientific data; use multiple media sources to evaluate different points of view regarding health, population, resources and environmental practices.	functioning of the system or model; match innovations with the science that makes them possible; use the appropriate technology to collect scientific data; use media sources to evaluate different points of view regarding health, population, resources or environmental practices.	system or model; match an innovation with the science that makes it possible; use the appropriate technology to collect scientific data; determine the point of view of a media source regarding health, population, resources or environmental practices.	identify a technological innovation; use technology to collect data; recognize that media sources have a point of view regarding health, population, resources or environmental practices.

Objectives	Students will
SC.O.6.3.01	explore the relationship between the parts of a system to the whole system.
SC.O.6.3.02	construct a variety of useful models of an object, event, or process.
SC.O.6.3.03	compare and contrast changes that occur in an object or a system to its original state.
SC.O.6.3.04	compare and contrast the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, or flight characteristics of different-sized model airplanes).
SC.O.6.3.05	research everyday applications and interactions of science and technology.
SC.O.6.3.06	evaluate and critically analyze mass media reports of scientific developments and events.

Seventh Grade Science Content Standards and Objectives

The Seventh Grade Science 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 and use of 21st century skills in the fields of biology, chemistry, physics and earth/environmental science and astronomy. 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 into all activities. Seventh Grade Science reviews motions and forces, ecosystems, diversity of life, energy transformations, plate tectonics, earth's resources and weather. Major concepts expanded at the seventh grade level include elements, mixtures, and compounds, populations/ecosystems, conservation of matter and energy and earth's history. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Grade 7	**Science**			
Standard:1	Nature of Science			
SC.S.7.1	Students will • demonstrate an understanding of the history of science and the evolvement of scientific knowledge. • demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists. • demonstrate an understanding of the characteristics of a scientist. • demonstrate skills of scientific inquiry.			
Performance Descriptors SC.PD.7.1				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Seventh grade students at distinguished level assess the importance of the research of historical and diverse scientists in society and culture; model skepticism, careful methodology, logical reasoning and creativity to conduct scientific investigations; predict,	Seventh grade students at the above mastery level explain the importance of the research of historical and diverse scientists in society and culture; display skepticism, careful methodology, logical reasoning and creativity to conduct scientific investigations; predict,	Seventh grade students at the mastery level identify the importance of the research of historical and diverse scientists in society and culture; use skepticism, careful methodology, logical reasoning and creativity to conduct investigations; predict, hypothesize, identify variables, organize	Seventh grade students at the partial mastery level recognize the research of historical and diverse scientists in society and culture; use skepticism, careful methodology, logical reasoning or creativity to conduct an investigation; demonstrate safe investigation techniques;	Seventh grade students at novice level state the research of an historical or diverse scientist; use a methodology to conduct an investigation; demonstrate safe investigation techniques; make predictions and record data.

hypothesize, quantify independent and dependent variables, organize, interpret experimental data and state a conclusion demonstrating safe techniques.	hypothesize, identify independent and dependent variables, organize and interpret experimental data demonstrating safe techniques.	and interpret experimental data using safe techniques.	make predictions and organize data.	

Objectives	Students will
SC.O.7.1.01	realize that scientists formulate and test their explanations of nature using observation and experiments.
SC.O.7.1.02	recognize scientific knowledge is subject to modification as new scientific information challenges current explanations.
SC.O.7.1.03	examine the careers and contributions of men and women of diverse cultures to the development of science.
SC.O.7.1.04	compare and contrast the historical significance of scientific discoveries.
SC.O.7.1.05	cooperate and collaborate to ask questions, design and conduct investigations to find answers and solve problems.
SC.O.7.1.06	formulate conclusions through close observations, logical reasoning, objectivity, perseverance and integrity in data collection.
SC.O.7.1.07	apply skepticism, careful methods, logical reasoning and creativity in investigating the observable universe.
SC.O.7.1.08	use a variety of technologies and scientific instruments to conduct explorations, investigations and experiments of the natural world.
SC.O.7.1.09	demonstrate safe techniques for handling, manipulating and caring for science materials, equipment, natural specimens and living organisms.
SC.O.7.1.10	utilize experimentation to demonstrate scientific processes and thinking skills (e.g., formulating questions, predicting, forming hypotheses, quantifying, or identifying dependent and independent variables).
SC.O.7.1.11	construct and use charts, graphs and tables to organize, display, interpret, analyze and explain data.
SC.O.7.1.12	use inferential reasoning to make logical conclusions from collected data.

Grade 7	**Science**
Standard: 2	Content of Science
SC.S.7.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy. • apply knowledge, understanding and skills of the science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.7.2				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Seventh grade students at distinguished level analyze the effects of diseases on	Seventh grade students at the above mastery level analyze the structure,	Seventh grade students at the mastery level describe the function of human	Seventh grade students at the partial mastery level describe the effects	Seventh grade students at the novice level Identify diseases effecting humans;

human systems, organs and cells; create dichotomous keys to group similar but distinct organisms based on traits; mathematically model the effects of changing cycles in ecosystems; compare and contrast life cycles of plants and their genetic adaptations; interpret a phase change diagram; classify substances as acids, bases, and salts to predict the products of neutralization reactions; predict the behavior of light waves through media change; compare alternating and direct current; evaluate the mechanical advantage of simple machines; propose changes in the force of gravity on other planets; predict weather and patterns of ocean circulation; relate rock classification and formation to topography; predict the life cycle of a star; predict climate based on latitude.	function of human systems, organs and cells; create dichotomous keys to group organisms; analyze the effects of changing cycles in ecosystems; compare life cycles of plants and their adaptations; draw a phase change diagram to show particle movement; classify substances as acids, bases, and salts to write neutralization word reactions; explain the behavior of light waves; explain lens technology; compare alternating and direct current; compare and contrast mechanical advantage of simple machines; research changes in the force of gravity on other planets; interpret weather and patterns of ocean circulation; relate rock formation to topography and classify rocks; investigate life cycles of a star; contrast climates at various latitudes.	systems, organs and cells; create simple keys to group organisms; analyze chemical and living cycles in ecosystems; illustrate life cycles of plants; describe particle movement and energy during phase changes; identify elements and compounds and place them in word equations; examine the behavior of light waves; interpret effect of medium on waves; characterize alternating and direct current; investigate energy transformation; explain mechanical advantage of simple machines; characterize gravity as a force; explain weather and patterns of ocean circulation; interpret and model topography; describe rock formation and classify rocks; explain life cycles of a star; relate latitude to climate.	diseases have on human systems, organs and cells; compare groups of organisms with a key; identify the role of cycles in ecosystems; illustrate life cycles of plants; illustrate phases of matter during phase changes; write word equations; examine the behavior of waves; recognize that waves are affected by a medium; define alternating and direct current; recognize that simple machines change force; identify gravity as a force; diagram weather and patterns of ocean circulation; group rocks with similar characteristics; model and identify topographic features; sketch the life cycle of a star; associate climates with latitudes.	compare groups of organisms; identify cycles in ecosystems; draw a plant life cycle; illustrate phases of matter; identify elements and compounds; recognize light and sound as waves; observe the interaction of waves and a medium; define current; list types of simple machines; define a force; observe weather and patterns of ocean circulation; describe types of rocks; model topography; recognize that stars have a life cycle; recognize latitude affects climate.

Objectives	Students will
SC.O.7.2.01	demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy.
SC.O.7.2.02	identify and describe disease causing organisms (such as bacteria, viruses, protozoa, fungi) and the diseases they cause.
SC.O.7.2.03	explain how skeletal, muscular, and integumentary systems work together in the human body.

SC.O.7.2.04	compare the level of organization of cells, tissues and organs in living things.
SC.O.7.2.05	construct simple keys to differentiate among living things with similar characteristics.
SC.O.7.2.06	use pictures to show cyclical processes in nature (e.g., water cycle, nitrogen cycle, or carbon cycle).
SC.O.7.2.07	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).
SC.O.7.2.08	analyze how changes in the environment have led to reproductive adaptations through natural selection.
SC.O.7.2.09	explain how an organism's behavior response is a combination of heredity and the environment.
SC.O.7.2.10	analyze the differences in the growth, development and reproduction in flowering and non-flowering plants.
SC.O.7.2.11	predict the trends of interdependent populations if one of the limiting factors is changed.
SC.O.7.2.12	evaluate the consequences of the introduction of chemicals into the ecosystem (e.g., environmental consequences, human health risks, or mutations).
SC.O.7.2.13	compare differences among elements, compounds, homogeneous and heterogeneous mixtures.
SC.O.7.2.14	examine the differences in types of solutions (e.g., solutes and solvents, relative concentrations, conductivity, pH).
SC.O.7.2.15	examine chemical reactions involving acids and bases by monitoring color changes of indicator(s) and identifying the salt formed in the neutralization reaction.
SC.O.7.2.16	write word equations to describe chemical reactions.
SC.O.7.2.17	describe the movement of individual particles and verify the conservation of matter during the phase changes (e.g., melting, boiling, or freezing).
SC.O.7.2.18	identify the characteristics of sound waves and describe how sound is perceived by the ear.
SC.O.7.2.19	define the absorption and reflection of light as translucent, opaque and transparent.
SC.O.7.2.20	interpret and illustrate changes in waves as they encounter various mediums (e.g., mirrors, or lenses).
SC.O.7.2.21	Investigate absorption and reflection of light by an object.
SC.O.7.2.22	characterize series and parallel circuits; AC and DC currents.
SC.O.7.2.23	explain conservation of matter and energy and investigate the different forms of energy (e.g., mechanical, potential, kinetic, or gravitational).
SC.O.7.2.24	perform experiments with simple machines to demonstrate the relationship between forces and distance; use vectors to represent motion.
SC.O.7.2.25	explain the effect of gravity on falling objects (e.g., $g=9.8m/s^2$, object dropped on earth and on moon).
SC.O.7.2.26	describe and compare the causes of tides, surfs and currents.
SC.O.7.2.27	examine the effects of the sun's energy on oceans and weather (e.g., air masses, or convection currents).
SC.O.7.2.28	interpret GIS maps and create and interpret topographical maps.
SC.O.7.2.29	describe rock formations (e.g., rock cycle).
SC.O.7.2.30	classify rocks (e.g., crystal/particle size, or mineral composition and uses).
SC.O.7.2.31	determine the relevant age of rock layers using index fossils and the law of superposition.
SC.O.7.2.32	explain how changing latitude affects climate.
SC.O.7.2.33	trace the life cycle of a star.

Grade 7	**Science**
Standard:3	Application of Science
SC.S.7.3	Students will • explore the relationship between the parts and the whole system; construct a variety of useful models; examine changes that occur in an object or system. • demonstrate an understanding of the interdependence between science and technology. • demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions. • demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices.

Performance Descriptors SC.PD.7.3

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Seventh grade students at the distinguished level predict the change in a system and/or model as a result of changing a part; identify an innovation and the science that makes it possible; evaluate the appropriateness of selected technology to collect scientific data; evaluate the persuasiveness of points of view regarding health, population, resources and environmental practices presented by various media sources.	Seventh grade students at the above mastery level evaluate the role of parts that contribute to the functioning of the system; analyze changes in systems and models; identify innovations with the science that makes them possible; select and use the appropriate technology to collect scientific data; use multiple media sources to evaluate different points of view regarding health, population, resources and environmental practices.	Seventh grade students at the mastery level analyze parts as they contribute to the functioning of the system; analyze changes in systems and models; match an innovation with the science that makes it possible; identify and use the appropriate technology to collect scientific data; use multiple media sources to evaluate different points of view regarding health, population, resources and environmental practices.	Seventh grade students at the partial mastery level compare the functioning of parts to the functioning of the system; match an innovation with the science that makes it possible; use the appropriate technology to collect scientific data; use media sources to evaluate different points of view regarding health, population, resources or environmental practices.	Seventh grade students at novice level identify parts of a system; identify a scientific/ technological innovation; use technology to collect scientific data; use media sources to identify a point of view regarding health, population, resources or environmental practices.

Objectives	Students will
SC.O.7.3.01	explore the relationship between the parts of a system to the whole system.
SC.O.7.3.02	construct a variety of useful models of an object, event, or process.
SC.O.7.3.03	compare and contrast changes that occur in an object or a system to its original state.
SC.O.7.3.04	compare and contrast the influence that a variation in scale will have on the way an object or system works. (e.g., cooling rates of different-sized containers of water, strength of different-sized constructions from the same material, or flight characteristics of different-sized model airplanes).

SC.O.7.3.05	research everyday applications and interactions of science and technology.
SC.O.7.3.06	evaluate and critically analyze mass media reports of scientific developments and events.
SC.O.7.3.07	explore the connections between science, technology, society and career opportunities.

Eighth Grade Science Content Standards and Objectives

The Eighth Grade Science 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 and use of 21st century skills in the fields of biology, chemistry, physics and earth/environmental science and astronomy. 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 into all activities. Eighth Grade Science 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. The West Virginia Standards for 21st Century Learning include the following components: 21st Century Content Standards and Objectives and 21st Century Learning Skills and Technology Tools. All West Virginia teachers are responsible for classroom instruction that integrates learning skills, technology tools and content standards and objectives.

Grade 8	**Science**			
Standard:1	Nature of Science			
SC.S.8.1	Students will • demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists. • demonstrate the ability to use the inquiry process to solve problems.			
Performance Descriptors SC.PD.8.1				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Eighth grade students at the distinguished level assess the importance of scientific innovation and recognize the role of these innovations in advancing societal, cultural and economic issues; use scientific methodology to conduct, communicate and revise experiments utilizing safe procedures and appropriate technology; repeat experiments to verify	Eighth grade students at the above mastery level understand the importance of scientific innovation and recognize the role of these innovations in advancing societal, cultural and economic issues; use scientific methodology to conduct and communicate experiments utilizing safe procedures and appropriate technology; repeat experiments to verify	Eighth grade students at the mastery level recognize the importance of scientific innovation and report the role of these innovations in advancing societal, cultural and economic issues; use scientific methodology to conduct and communicate experiments utilizing safe procedures and appropriate technology; repeat experiments to verify results; draw conclusions	Eighth grade students at the partial mastery level describe the importance of scientific innovation and report the role of these innovations in advancing societal, cultural or economic issues; use a methodology to conduct and communicate experiments utilizing safe procedures and appropriate technology; match an appropriate conclusion with	Eighth grade students at the novice level recognize the importance of a scientific innovation and report the role of this innovation in advancing societal, cultural or economic issues; conduct experiments utilizing safe procedures and appropriate technology; restate observations as the conclusion.

results; draw conclusions from data sources and models.	results; draw conclusions from data sources and models.	from a data source or model.	experimental data.	

Objectives	Students will
SC.O.8.1.01	formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.
SC.O.8.1.02	demonstrate how a testable methodology is employed to seek solutions for personal and societal issues. (e.g., "scientific method").
SC.O.8.1.03	relate societal, cultural and economic issues to key scientific innovations.
SC.O.8.1.04	conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).
SC.O.8.1.05	implement safe procedures and practices when manipulating equipment, materials, organisms, and models.
SC.O.8.1.06	use appropriate technology solutions within a problem solving setting to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.
SC.O.8.1.07	design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).
SC.O.8.1.08	draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Grade 8	**Science**
Standard:2	Content of Science
SC.S.8.2	Students will • demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives. • demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy. • apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.

Performance Descriptors SC.PD.8.2				
Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Eighth grade students at the distinguished level evaluate the structure of cells of varying functions for each	Eighth grade students at the above mastery level analyze the types of cells in organ systems; design an	Eighth grade students at the mastery level describe the importance of cell type in human systems; analyze	Eighth grade students at the partial mastery level identify cell types in human systems; recognize	Eighth grade students at the novice level recognize different cell types exist in human systems; recognize

human organ system; given an environment predict characteristics of organisms; defend placement of organisms in dichotomous keys; analyze the effect of removing producers, consumers or decomposers from an ecosystem; given the number of valence electrons, locate elements on periodic table to draw the Bohr model; predict product formation for chemical reactions by writing word equations; predict and graph diffusion rate and temperature change; compare and contrast sources of energy; interpret wave, motion, work, power, and pressure calculations; classify types of energy transformation; predict Doppler effect of a moving object; apply Newton's Laws of Motion; predict geologic events at plate boundaries; predict the effects of forces on existing geologic structures; compare and contrast the origin of a solar system object to its motion; predict climatic change caused by changing ocean conditions.	organism suited to an environment; construct dichotomous keys to discriminate among similar organisms; recognize the role of producers, consumers and decomposers; predict and construct atomic models based on the element's placement on the periodic table; identify reaction types and predict products for word equations; measure variations in diffusion rate; compare two sources of energy; calculate and graph properties of waves, motion, work, power, and pressure; explain how energy is conserved in transformations; relate Doppler shift to sound; provide examples of Newton's Laws of Motion; explain the presence of geologic events at plate boundaries; identify forces affecting geologic structures; relate the origin of a solar system object to its motion; provide examples of climates affected by oceans.	how genetics, behavior and environment interact; construct simple dichotomous keys; trace the flow of energy in food webs; relate atomic structure and properties to location on the periodic table; write word equations and classify type; evaluate variations in diffusion rates and examine the effect of changing temperature; examine sources of energy; calculate and/or graph properties of waves, motion, work, power, and pressure; relate conservation of energy to transformations; recognize Doppler shift to sound; explain Newton's Laws of Motion; relate plate tectonics to geologic events; describe forces which shape the Earth's surface; describe motion and the origin of solar system objects; explain the relationships among weather, climate and oceans.	genetics, behavior and environment interact; use dichotomous keys; locate energy changes in a food web; construct Bohr models; classify types of chemical reactions; recognize gases diffuse at different rates and are effected by temperature changes; relate conservation of energy to either matter or energy transformations; list Newton's Laws of Motion; locate geologic events at plate boundaries; list forces that shape the Earth's surface; describe motion of solar system objects; relate climates to proximity to oceans.	that genetics and behavior interact; group organisms using similar traits; locate an energy change in a food web; define subatomic particles; list five types of chemical reactions; recognize gases diffuse; recognize energy transformations; list two of Newton's Laws of Motion; recognize that geologic events occur at plate boundaries; list some forces that shape the Earth's surface; describe solar system objects; relate weather conditions to proximity to oceans.

Objectives	Students will
SC.O.8.2.01	demonstrate an understanding of the interrelationships among physics, chemistry, biology, earth/environmental science, and astronomy.
SC.O.8.2.02	examine and describe the structures and functions of cell organelles.
SC.O.8.2.03	explain how the circulatory, respiratory and reproductive systems work together in the human body.
SC.O.8.2.04	compare the variations in cells, tissues and organs of the circulatory, respiratory and reproductive systems of different organisms.
SC.O.8.2.05	discuss how living cells obtain the essentials of life through chemical reactions of fermentation, respiration and photosynthesis.
SC.O.8.2.06	analyze how behaviors of organisms lead to species continuity (e.g., reproductive/mating behaviors, or seed dispersal).
SC.O.8.2.07	demonstrate the basic principles of genetics; introduce Mendel's law, monohybrid crosses, production of body and sex cells (mitosis/meiosis), genes, chromosomes, and inherited traits.
SC.O.8.2.08	compare patterns of human development to other vertebrates.
SC.O.8.2.09	organize groups of unknown organisms based on observable characteristics (e.g., create dichotomous keys).
SC.O.8.2.10	trace matter and energy flow in a food web as it flows from sunlight to producers and consumers, 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).
SC.O.8.2.11	use the periodic table to locate and classify elements as metallic, non-metallic or metalloid.
SC.O.8.2.12	reconstruct development models of the atom (e.g., Crookes, Thompson, Becquerel, Rutherford, or Bohr).
SC.O.8.2.13	calculate the number of protons, neutrons, and electrons and use the information to construct a Bohr model of the atom.
SC.O.8.2.14	classify elements into their families based upon their valence electrons.
SC.O.8.2.15	evaluate the variations in diffusion rates and examine the effect of changing temperatures.
SC.O.8.2.16	conduct and classify chemical reactions by reaction type (e.g., synthesis, decomposition, single replacement or double replacement); energy type (e.g., endothermic and exothermic); and write word equations for the chemical reactions.
SC.O.8.2.17	identify and describe factors that affect chemical reaction rates, including catalysts, temperature changes, light energies and particle size.
SC.O.8.2.18	examine the various sources of energy (e.g., fossil fuels, wind, solar, geothermal, nuclear, biomass).
SC.O.8.2.19	explain the Doppler effect (e.g., sound).
SC.O.8.2.20	quantitatively represent wavelength, frequency and velocity (e.g., $v=\lambda f$).
SC.O.8.2.21	relate the conservation of energy theory to energy transformations (e.g., electrical/heat, or mechanical/heat).
SC.O.8.2.22	quantitatively represent work, power, pressure (e.g., Work=Force x distance, Power=Work/time, or pressure=force/area) from collected data.
SC.O.8.2.23	graph and interpret the relationships of distance versus time, speed versus time, and acceleration versus time.
SC.O.8.2.24	describe Newton's Laws of Motion; identify examples, illustrate qualitatively and quantitatively drawing vector examples.
SC.O.8.2.25	illustrate and calculate the mechanical advantage of simple machines.
SC.O.8.2.26	research and draw conclusions related to the quality and quantity of surface and ground water.
SC.O.8.2.27	identify and explain the principle forces of plate tectonics and related geological events (e.g., earthquakes, volcanoes, or landforms).
SC.O.8.2.28	determine the impact of oceans on weather and climate; relate global patterns of atmospheric movement on local weather.
SC.O.8.2.29	analyze the forces of tectonics, weathering and erosion that have shaped the earth's surface.

SC.O.8.2.30	model processes of soil formation and suggest methods of soil preservation and conservation.
SC.O.8.2.31	research and recognize the societal concerns of exploration and colonization of space.
SC.O.8.2.32	explain phenomena associated with motions in sun-earth-moon system (e.g., eclipses, tides, or seasons).
SC.O.8.2.33	describe the origin and orbits of comets, asteroids, and meteoroids.

Grade 8	**Science**
Standard:3	Application of Science
SC.S.8.3	Students will • demonstrate the ability to use inquiry process to explore systems, models, and changes. • demonstrate an understanding of the interdependence between science and technology. • demonstrate an understanding of the utilization of technology to gather data and communicate designs, results and conclusions. • demonstrate an understanding of personal and societal benefits of science, and an understanding of public policy decisions as related to health, population, resource and environmental issues.

Performance Descriptors SC.PD.8.3

Distinguished	Above Mastery	Mastery	Partial Mastery	Novice
Eighth grade students at the distinguished level construct, test and analyze data to explore systems, models, and changes across science disciplines; analyze technological innovations and the science that makes them possible; evaluate the personal and societal benefits of a scientific discovery; assess the impacts of a public policy decision regarding health, population resources or environmental issues.	Eighth grade students at the above mastery level test, record and analyze data to explore systems, models, and changes; identify technological innovations and the science that makes them possible; explain positive outcomes and unintended consequences of a scientific discovery; explain the impact of a public policy decision regarding health, population resources or environmental issues.	Eighth grade students at the mastery level test and record data to explore systems, models, and changes; identify a technological innovation and the science that makes it possible; identify positive outcomes and unintended consequences of a scientific discovery; identify the impact of a public policy decision regarding health, population resources or environmental issues.	Eighth grade students at the partial mastery level observe and record data to explore systems, models, or changes; match a technological innovation with the science that makes it possible; identify a positive outcome and an unintended consequence of a scientific discovery; identify a public policy decision impacting health, population resources or environmental issues.	Eighth grade students at the novice level observe and record data that relates to systems, models, or changes; identify a technological innovation; identify a positive outcome and an unintended consequence of a scientific discovery; read and restate a public policy decision impacting health, population resources or environmental issues.

Objectives	Students will
SC.O.8.3.01	synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).
SC.O.8.3.02	investigate, compare and design scientific and technological solutions to personal and societal problems.

SC.O.8.3.03	communicate experimental designs, results and conclusions using advanced technology tools.
SC.O.8.3.04	collaborate to present research on current environmental and technological issues to predict possible solutions.
SC.O.8.3.05	explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.
SC.O.8.3.06	given a current science-technology-societal issue, construct and defend potential solutions.

FORM HD 201
(10-66)

FISCAL NOTE WORKSHEET
(Submit 4 Copies)

I _____ DRAFT NO _____ BILL NO _____ RESOLUTION NO _____

SUBJECT State Board Policy 2520.3: Science K-8 Content Standards and Objectives for WV Schools FUND _____

SOURCE OF REVENUE: ☐ GENERAL FUND ☐ SPECIAL ☐ OTHER (SPECIFY) _____

COST OF ESTIMATE BASED ON: ☐ AN ORIGINAL ESTIMATE ☐ BUDGET BILL ☐ OTHER (SPECIFY) _____

INCOME 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

EFFECT OF PROPOSAL	ANNUAL		FISCAL YEAR		
	INCREASE	DECREASE	CURRENT	NEXT	THEREAFTER
1. ESTIMATED TOTAL COST	$ 0	$ 0	$ 0	$ 0	$ 0
PERSONAL SERVICES CURRENT EXPENSES REPAIRS/ALTERATIONS EQUIPMENT OTHER	$ 0	$ 0	$ 0	$ 0	$ 0
2. ESTIMATED TOTAL REVENUES	$ 0	$ 0	$ 0	$ 0	$ 0

EXPLANATION OF ABOVE ESTIMATES (INCLUDING LONG-RANGE EFFECT):

DATE 9/26/06

AGENCY West Virginia Department of Education

AUTHORIZED REPRESENTATIVE Steven L. Paine

Policy *2520.3*: *21st Century Science Content Standards and Objectives*
Comment Log
October 5, 2006 & November 3, 2006

Action	Type
N: No Response	- Negative
NA: Not Accepted	+ Positive
A: Accepted	o Neutral

Date	Individual/Organization	Comments	Action/ Type	Rationale
10.9.2006	James Goff/ Kanawha County Schools	Section 126-44C-4 KUDOS! Finally, I see the science curriculum in WV is moving to a higher level of thinking and more responsibility from the student. Technology should be better integrated into the curriculum and more technological equimpent should be provided by the State. Perhaps the state should a state-wide prioritized curriculum similar to what Kanawha County has in place so that students across the state are being moved and paced in a similar fashion. This would help teachers across the state to better meet the goals and objectives.	N/ +	21st Century Learning Tools and Technology Tools are specifically addressed in policy 2520.14. Instructional Guides for each content area are being developed.

10.10.2006	Jill Sergent/ Parent-family	Section 126-44C-4 I have one question: Are 2nd grade teachers not required to teach Science, Social Studies, or Health any longer? My husband attended my daughter's parent teacher conference last night at Winfield Elementary in Putnam County. I am a science teacher at Hurricane High School. I was appalled to hear that she would not be teaching any science, social studies or health. What are the guidelines currently? If these CSO's are not incorporated currently, what exactly are they required to teach? Teaching science is of great importance to me and I am devastated to think that my child will not be learning any thing but reading and math.	N -	According to Policy 2510 on page 8: "All content areas may be integrated into classroom instruction and must be taught in a manner that supports the acquisition of strong reading, language arts and mathematics skills. Specific content area instruction in the given content areas may or may not be offered daily. Sufficient emphasis must be placed on the given content areas to ensure that students master content knowledge and skills as specified in the 21st century content standards and objectives for each subject."

10.11.2006	Mike Del Re/ Weir HS Science Teacher	Section 126-44C-4 After teaching for 13 years in private and public schools... I have taught Chemistry for in excess of 10 years.... CHEMISTRY should be for 11th grade..... and not a requirement for all students.... a chemistry concepts may be applicable to the non college track of students..... but definitely not to everyone and not in the sophomore year.... CATS 9 and CATS 10 need to be replaced.... a general/earth science course in the 9th grade... BIOLOGY in the 10th grade for everyone... CHEMISTRY for 11th graders..... TWO levels of each should be provided..... college prep and not college prep...	N/ +	Changes to the high school science curriculum are found in Policy 2520.35.
10.12.2006	Richard Burdiss/ Teacher	Section 126-44C-4 I think this will be great to get rid of the CATS program. It was just a way to bring the standards down instead of raising the standards. The only thing I would change is to have the students take Biology in the 10th grade instead of the 11th grade.	N/ +	Coordinated and Thematic Science curriculum is still in effect at the K-8 level. Changes to the high school science curriculum are found in Policy 2520.35.

10.14.2006	Michael Lutz/ Parkersburg South High School	Section 126-44C-4 I am glad to see a return to a non-integrated science approach at the 9-12 grade level. The sequence is logical with physical science at grade 9 followed by chemistry at grade 10 and biology at grade 11. It is necessary to have some chemistry to understand parts of a biology course. The fourth science requirement for the professional track is also a good improvement. Many of our students have been doing it anyway. For the science intensive student there is a good selection of electives one the required classes are completed. There may be some personnel issues relating to certification that need to be worked out but it will reduce the number of teachers teaching topics that are outside of their areas of certification.	N/ +	Coordinated and Thematic Science curriculum is still in effect at the K-8 level. Changes to the high school science curriculum are found in Policy 2520.35

10.14.2006	Laura Fullen/ Harrison County Schools	Section 126-44C-4 7.2.22 Should read: series and parallel circuits; AC and DC currents 7.2.28 contains GIS maps; this content is not in textbooks and is hard to find on the Internet. This is not a fair content standard to students who are absent. Many students will be absent on the day that this CSO is taught and/or retaught. 7.3.1 needs examples as it previously had. 7.3.2 needs examples as it previously had. 7.3.3 needs examples at it previously had.	A/ + N/ - N/ + N/ + N/ +	7.2.22 edited to reflect recommended change. GIS information is widely available on the Internet. Examples have been intentionally omitted to permit teacher choice. Examples have been intentionally omitted to permit teacher choice Examples have been intentionally omitted to permit teacher choice
10.15.2006	Stefan Smolski/ Oak Glen High School	Section 126-44C-4 SC.O.8.2.5 lists transpiration, respiration and photosynthesis as chemical prcesses. I suspect that transpiration should be repleced with fermentation which is a chemical process. Overall, these revised content standards, if taught, will adequately prepare all students for entry into high school science.	A/ +	The word transpiration was replaced with the word fermentation.

10.18.2006	Robert L. Harrison, Jr./ West Virginia State University	Section 126-44C-1 Insert the National Science Teachers Standards in the opening narrative to be consistent with Policy 5100-Approval of Professional Preparation Programs. The Language Arts/ Reading and Math do. Policy 5100 requires all teacher preparation programs to align their prpearation programs with the National and West Virginia standards. Having a reference to the National Standards in all WV Public School Standrads helps us to better prepare teachers and meet Policy 5100 requirements.	A/ +	Appropriate language was added to Policy 2520.3.

10.28.06	Bob Seymour/ None listed	Section 126-44C-1 Reasons are laudable statements, CSOs are improved but are still an "inch deep mile wide" program - an ideal example of what national recommendations say to avoid. Section 126-44C-4	N/ +	National Standards are reflected in the revised standards.
		Standard 1 - begins definition with "...acquisition of ideas..." which suggests that the primary focus is on lowere level things rather than higher level "critical thinking skills and problem solving skills" which were the "reason" not an afterthought as written here.	N/ -	National Standards are reflected in the revised standards.
		Organization states grade levels incorrectly	A/ +	Correct terminology was inserted.
		Performance descripters are too inclusive and as written are science teacher derailers filled with minutia and questionable factoids.	N/ -	Performance descriptors are written to assist teachers.
		Objectives for Standard 2 are somewhat condensed and you are to be aplauded for that, but they are still a hodge-podge of factoids which become barriers to developing instruction into higher level thought processes.	N/ 0	National Standards are reflected in the revised standards and objectives.

10.30.2006	Steve Beckelheimer/ Cabell Midland High School	Section 126-44C-4 The UEN should be written to better allow sorting by database software. For example when objective numbers are sorted by a computer SC.O.8.2.10 would show up between SC.O.8.2.1 and SC.O.8.2.2. An easy fix would be to place a zero in front of objective numbers that are single digit so that SC.O.8.2.1 becomes SC.O.8.2.01 and SC.O.8.2.2 becomes SC.O.8.2.02. Objectives SC.O.8.2.10 and above would remain the same.	A/ +	Number changes were made to reflect this recommendation.
10.30.2006	Steve Beckelheimer/ Cabell Midland High School	Section 126-44C-4 The UEN should be written to better allow sorting by database software. For example when objective numbers are sorted by a computer SC.O.8.2.10 would show up between SC.O.8.2.1 and SC.O.8.2.2. An easy fix would be to place a zero in front of objective numbers that are single digit so that SC.O.8.2.1 becomes SC.O.8.2.01 and SC.O.8.2.2 becomes SC.O.8.2.02. Objectives SC.O.8.2.10 and above would remain the same.	A/ +	Duplicate comment.

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Tuesday, October 31, 2006 7:41 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-28 08:50:44)

Follow Up Flag: Follow up
Flag Status: Flagged

Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Saturday, October 28, 2006 8:51 AM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-28 08:50:44)

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Comment Received for Policy 2520.3
##
#
Name: Bob Seymour
Organization:
Email: bobseymour@charter.net
Title: Science Consultant
Address1: 533 20th Street
Address2:
City/State/Zip: Dunbar, WV 25064
Role: Professional Support
Posted: 2006-10-28 08:50:44
Posted from IP: 75.108.243.144

Comments for section 126-44C-1 General

Reasons are laudable statements, CSOs are improved but are still an "inch deep mile wide" program - an ideal example of what national recommendations say to avoid

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and

Objectives

Standard 1 - begins definition with "...acquisition of ideas..." which suggests that the primary focus is on lowere level things rather than higher level "critical thinking skills and problem solving skills" which were the "reason" not an afterthought as written here.

Organization states grade levels incorrectly

Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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Performance descripters are too inclusive and as written are science teacher derailers filled with minutia and questionable factoids.

Objectives for Standard 2 are somewhat condensed and you are to be aplauded for that, but they are still a hodge-podge of factoids which become barriers to developing instruction into higher level thought processes.

Mike Kees

From: cljwilli@access.k12.wv.us
Sent: Monday, October 30, 2006 1:07 PM
To: mkees@access.k12.wv.us
Subject: Fwd: Comment Received for Policy 2520.3 (2006-10-30 10:28:37)

Follow Up Flag: Follow up
Flag Status: Flagged

Forwarded Message:
> To: mkees@access.k12.wv.us
> From: cljwilli@access.k12.wv.us
> Subject: Fwd: Comment Received for Policy 2520.3 (2006-10-30 10:28:37)
> Date: Mon, 30 Oct 2006 17:56:25 EST5EDT
> -----
> Forwarded Message:
> > To: fibanez@wvde.state.wv.us, cljwilli@access.k12.wv.us
> > From: Nobody <nobody@wvde.state.wv.us>
> > Subject: Comment Received for Policy 2520.3 (2006-10-30 10:28:37)
> > Date: Mon, 30 Oct 2006 10:28:37 -0500
> > -----
> > Please save this email in a "Comments Received Online" folder.
> > Your folder will be a backup. All comments are saved in our database.
> > The Complete Comments Report from the database can be found here:
> > http://129.71.2.32/r.html?id=c5d03f85b06bca0ecf0100353c9e6cff
> > This is an encrypted URL. Please Bookmark it.
> >
> > Comment Received for Policy 2520.3
> >
##
> > Name: Steve Beckelhimer
> > Organization: Cabell Midland High School
> > Email: sbeckelh@access.k12.wv.us
> > Title: Science Department Chair
> > Address1: 2300 Rt. 60
> > Address2:
> > City/State/Zip: Ona, WV 25545
> > Role: Teacher
> > Posted: 2006-10-30 10:28:37
> > Posted from IP: 168.216.126.12
> >
> >
> > Comments for section 126-44C-1 General
> > ----------
> > The UEN should be written to better allow sorting by database software.
For
> example when
> objective numbers are sorted by a computer SC.O.8.2.10 would show up
> between
> SC.O.8.2.1
> and SC.O.8.2.2. An easy fix would be to place a zero in front of
> objective numbers that are single digit so that SC.O.8.2.1 becomes
> SC.O.8.2.01 and SC.O.8.2.2
becomes
> SC.O.8.2.02. Objectives SC.O.8.2.10 and above would remain the same.
> >
> >
> >
> > Comments for section 126-44C-2 Purpose
> > ----------
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> >
> > Comments for section 126-44C-3 Incorporation by Reference

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> >
> > Comments for section 126-44C-4 Summary of the Content Standards and
> Objectives
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> > Comments for section 126-44C 21st Century Science K-8 Content
Standards
> and Objectives
> for West Virginia Schools
> > ----------
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> >
> >
>
>

Mike Kees

From: cljwilli@access.k12.wv.us
Sent: Monday, October 30, 2006 12:56 PM
To: mkees@access.k12.wv.us
Cc: cljwilli@access.k12.wv.us
Subject: Fwd: Comment Received for Policy 2520.3 (2006-10-30 10:28:37)

Follow Up Flag: Follow up
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Forwarded Message:
> To: fibanez@wvde.state.wv.us, cljwilli@access.k12.wv.us
> From: Nobody <nobody@wvde.state.wv.us>
> Subject: Comment Received for Policy 2520.3 (2006-10-30 10:28:37)
> Date: Mon, 30 Oct 2006 10:28:37 -0500
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>
> Comment Received for Policy 2520.3
> ##
> #######
> Name: Steve Beckelhimer
> Organization: Cabell Midland High School
> Email: sbeckelh@access.k12.wv.us
> Title: Science Department Chair
> Address1: 2300 Rt. 60
> Address2:
> City/State/Zip: Ona, WV 25545
> Role: Teacher
> Posted: 2006-10-30 10:28:37
> Posted from IP: 168.216.126.12
>
>
> Comments for section 126-44C-1 General
> ----------
> The UEN should be written to better allow sorting by database
> software. For
example when
objective numbers are sorted by a computer SC.O.8.2.10 would show up between
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and SC.O.8.2.2. An easy fix would be to place a zero in front of objective numbers that
are single digit so that SC.O.8.2.1 becomes SC.O.8.2.01 and SC.O.8.2.2 becomes
SC.O.8.2.02. Objectives SC.O.8.2.10 and above would remain the same.
>
>
>
> Comments for section 126-44C-2 Purpose
> ----------
>
>
> Comments for section 126-44C-3 Incorporation by Reference
> ----------
>
>
> Comments for section 126-44C-4 Summary of the Content Standards and
Objectives
> ----------
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>

> Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives
for West Virginia Schools
> ----------
>
>
>
>

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Wednesday, October 18, 2006 6:33 PM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-18 11:13:07)

Follow Up Flag: Follow up
Flag Status: Flagged

Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Wednesday, October 18, 2006 11:13 AM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-18 11:13:07)

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Comment Received for Policy 2520.3
##
#
Name: Robert L. Harrison, Jr.
Organization: West Virginia State University
Email: harrisonr@wvstateu.edu
Title: Ed. Dept Chairperson
Address1: 627 Wallace Hall
Address2: PO Box 1000
City/State/Zip: Institute , WV 25112
Role: Teacher
Posted: 2006-10-18 11:13:07
Posted from IP: 129.71.208.161

Comments for section 126-44C-1 General

Comments for section 126-44C-2 Purpose

Insert the National Science Teachers Standards in the opening narrative to be consistent with Policy 5100-Approval of Professional Preparation Programs. The Language Arts/ Reading and Math do.

Policy 5100 requires all teacher preparation programs to align their prpearation programs with the National and West Virginia standards. Having a reference to the National Standards in all WV Public School Standrads helps us to better prepare teachers and meet Policy 5100 requirements.

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives

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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Monday, October 16, 2006 8:50 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-14 19:53:15)

Follow Up Flag: Follow up
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Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Saturday, October 14, 2006 7:53 PM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-14 19:53:15)

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Comment Received for Policy 2520.3
##
#
Name: Laura Fullen
Organization: Harrison County Schools
Email: lfullen@verizon.net
Title: 7th grade science teacher
Address1: 440 W. Philadelphia Ave.
Address2:
City/State/Zip: Bridgeport, WV 26330
Role: Teacher
Posted: 2006-10-14 19:53:15
Posted from IP: 72.65.90.187

Comments for section 126-44C-1 General

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives

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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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7.2.22 Should read: series and parallel circuits; AC and DC currents
7.2.28 contains GIS maps; this content is not in textbooks and is hard to find on the Internet. This is not a fair content standard to students who are absent. Many students will be absent on the day that this CSO is taught and/or retaught.
7.3.1 needs examples as it previously had.
7.3.2 needs examples as it previously had.
7.3.3 needs examples at it previously had.

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Monday, October 16, 2006 8:50 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-15 11:31:47)

Follow Up Flag: Follow up
Flag Status: Flagged

Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Sunday, October 15, 2006 11:32 AM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-15 11:31:47)

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Comment Received for Policy 2520.3
##
#
Name: Stefan Smolski
Organization: Oak Glen High School
Email: ssmolski@access.k12.wv.us
Title: Science Teacher
Address1: 510 Pittsburgh Ave
Address2:
City/State/Zip: Fairmont, WV 26554
Role: Teacher
Posted: 2006-10-15 11:31:47
Posted from IP: 151.205.44.181

Comments for section 126-44C-1 General

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives

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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

---

SC.O.8.2.5 lists transpiration, respiration and photosynthesis as chemical prcesses. I suspect that transpiration should be repleced with fermentation which is a chemical process.

Overall, these revised content standards, if taught, will adequately prepare all students for entry into high school science.

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Saturday, October 14, 2006 4:11 PM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.1 (2006-10-14 15:50:29)

Follow Up Flag: Follow up
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This was sent in on the English Language Arts response form, but it is science! It is positive so you be sure you place it in your log!

Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Saturday, October 14, 2006 3:50 PM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.1 (2006-10-14 15:50:29)

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Comment Received for Policy 2520.1
##
#
Name: Michael Lutz
Organization: Parkersburg South high School
Email: mrlutz@access.k12.wv.us
Title: Chemistry instructor
Address1: 1511 Blizzard Drive
Address2:
City/State/Zip: Parkersburg, WV 26101
Role: Teacher
Posted: 2006-10-14 15:50:29
Posted from IP: 168.216.77.85

Comments for section 126-44A-1 General

Comments for section 126-44A-2 Purpose

Comments for section 126-44A-3 Incorporation by Reference

Comments for section 126-44A-4 Summary of the Content Standards and

Objectives

I am glad to see a return to a non-integrated science approach at the 9-12 grade level. The sequence is logical with physical science at grade 9 followed by chemistry at grade 10 and biology at grade 11. It is necessary to have some chemistry to understand parts of a biology course. The fourth science requirement for the professional track is also a good improvement. Many of our students have been doing it anyway. For the science intensive student there is a good selection of electives one the required classes are completed. There may be some personnel issues relating to certification that need to be worked out but it will reduce the number of teachers teaching topics that are outside of their areas of certification.

Comments for section 126-44A 21st Century Reading and English Language Arts Content Standards and Objectives for West Virginia Schools

---

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Friday, October 13, 2006 7:09 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-11 20:19:28)

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Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Wednesday, October 11, 2006 8:19 PM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-11 20:19:28)

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This is an encrypted URL. Please Bookmark it.

Comment Received for Policy 2520.3
##
#
Name: Mike Del Re
Organization: WEIR HS Science Teacher
Email: mdelre@access.k12.wv.us
Title: WEIR HS Science Teacher
Address1: 109 Scenery Court
Address2:
City/State/Zip: Weirton, WV 26062
Role: Teacher
Posted: 2006-10-11 20:19:28
Posted from IP: 71.236.67.13

Comments for section 126-44C-1 General

After teaching for 13 years in private and public schools... I have taught Chemistry for in excess of 10 years....

CHEMISTRY should be for 11th grade..... and not a requirement for all students.... a chemistry concepts may be applicable to the non college track of students..... but definitely not to everyone and not in the sophomore year....

CATS 9 and CATS 10 need to be replaced.... a general/earth science course in the 9th grade... BIOLOGY in the 10th grade for everyone... CHEMISTRY for 11th graders..... TWO levels of each should be provided..... college prep and not college prep...

Thanks

Mike Del Re
Science teacher at WEIR HS

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives
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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools
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Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Friday, October 13, 2006 7:09 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-12 15:57:52)

Follow Up Flag: Follow up
Flag Status: Flagged

Carla Williamson

Carla Williamson, Special Assignment
Office of Instruction
West Virginia Department of Education
1900 Kanawha Boulevard East
Charleston, West Virginia 25305-0330
Phone (304) 558-5325
Fax (304 558-3741
Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Thursday, October 12, 2006 3:58 PM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-12 15:57:52)

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Comment Received for Policy 2520.3
##
#
Name: richard burdiss
Organization: parkersburg south H.S.
Email: rcbxenon@1st.net
Title: teacher
Address1: 10101 state route 550
Address2:
City/State/Zip: vincent , oh 45784
Role: Teacher
Posted: 2006-10-12 15:57:52
Posted from IP: 168.216.74.203

Comments for section 126-44C-1 General

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives

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I think this will be great to get rid of the CATS program. It was just a way to bring the standards down instead of raising the standards. The only thing I would change is to have the students take Biology in the 10th grade instead of the 11th grade.

Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Wednesday, October 11, 2006 8:58 AM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-10 23:31:05)

Carla Williamson

Carla Williamson, Special Assignment
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Email cljwilli@access.k12.wv.us

-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Tuesday, October 10, 2006 11:31 PM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-10 23:31:05)

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Comment Received for Policy 2520.3
##
#
Name: Jill Sergent
Organization:
Email: jsergent@access.k12.wv.us
Title:
Address1: 1 Hampton Dr.
Address2:
City/State/Zip: Winfield, WV 25213
Role: Parent-Family
Posted: 2006-10-10 23:31:05
Posted from IP: 151.205.81.37

Comments for section 126-44C-1 General

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives
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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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I have one question: Are 2nd grade teachers not required to teach Science, Social Studies, or Health any longer? My husband attended my daughter's parent teacher conference last night at Winfield Elementary in Putnam County. I am a science teacher at Hurricane High School. I was apalled to hear that she would not be teaching any science, social studies or health.
What are the guidelines currently? If these CSO's are not incorporated currently, what exactly are they required to teach? Teaching science is of great importance to me and I am devastated to think that my child will not be learning any thing but reading and math.

Mike Kees

From: Carla Williamson [cljwilli@access.k12.wv.us]
Sent: Tuesday, October 10, 2006 3:50 PM
To: Mike Kees
Subject: FW: Comment Received for Policy 2520.3 (2006-10-09 11:16:30)

Follow Up Flag: Follow up
Flag Status: Flagged

Carla Williamson

Carla Williamson, Special Assignment
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-----Original Message-----
From: Nobody [mailto:nobody@wvde.state.wv.us]
Sent: Monday, October 09, 2006 11:17 AM
To: fibanez@wvde.state.wv.us; cljwilli@access.k12.wv.us
Subject: Comment Received for Policy 2520.3 (2006-10-09 11:16:30)

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Comment Received for Policy 2520.3
##
#
Name: James Goff
Organization: Kanawha Co. Schools
Email: jgoff@kcs.kana.k12.wv.us
Title: Teacher
Address1: 3000 Kanawha Terrace
Address2:
City/State/Zip: St, Albans, WV 25177
Role: Teacher
Posted: 2006-10-09 11:16:30
Posted from IP: 168.216.59.163

Comments for section 126-44C-1 General

KUDOS! Finally, I see the science curriculum in WV is moving to a higher level of thinking and more responsibility from the student. Technology should be better integrated into the curriculum and more technological equimpent should be provided by the State. Perhaps the state should a state-wide prioritized curriculum similar to what Kanawha County has in place so that students across the state are being moved and paced in a similar fashion. This would help teachers across the state to better meet the goals and objectives.

Comments for section 126-44C-2 Purpose

Comments for section 126-44C-3 Incorporation by Reference

Comments for section 126-44C-4 Summary of the Content Standards and Objectives

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Comments for section 126-44C 21st Century Science K-8 Content Standards and Objectives for West Virginia Schools

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