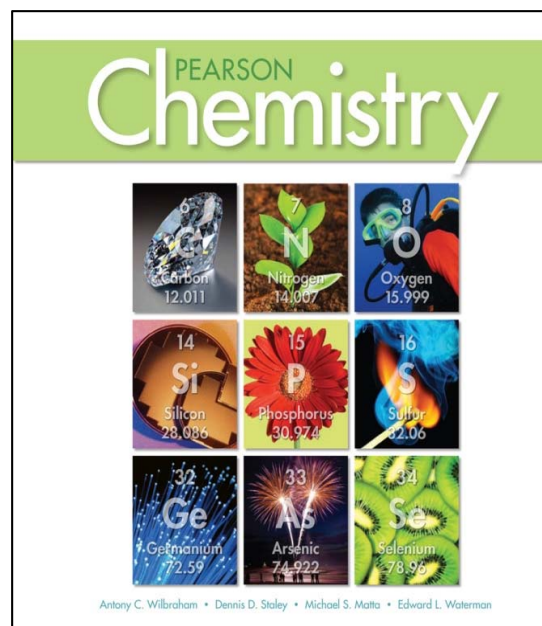


A Correlation of
Pearson Chemistry
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To the
West Virginia 2016-2022
Group IV – Science, Chemistry

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Disclaimer: The Specific Criteria for science is currently out on public comment as part of Policy 2520.3C – The Next Generation Content Standards and Objectives for Science in West Virginia Schools. The Policy is out for comment until February 17, 2015. The State Board of Education will then act on the Policy at the March board meeting. I will notify you as soon as possible if changes are made to the specific criteria due to the current comment period.

PUBLISHER:	Pearson Education, Inc., publishing as Prentice Hall		
SUBJECT:	Science	SPECIFIC GRADE:	11
COURSE:	Chemistry	TITLE	Pearson Chemistry
COPYRIGHT:	2012		
SE ISBN:	9780133172539	TE ISBN:	9780132525824

NON-NEGOTIBLE EVALUATION CRITERIA

2016-2022
Group IV – Science
Chemistry

Equity, Accessibility and Format				
Yes	No	N/A	CRITERIA	NOTES
			1. INTER-ETHNIC The instructional materials meets the requirements of inter-ethnic: concepts, content and illustrations, as set by WV Board of Education Policy (Adopted December 1970).	The photos and features throughout Pearson Chemistry connect with an array of cultures and ethnicities with which a variety of students can identify. The Chemistry & You - History feature outlines the accomplishments and contributions of scientists from around the world. Sample references include: Photos: 17, 21, 52, 60, 200, 230, 247, 254, 263, 404, 439, 450, 467, 533, 557, 569, 574, 613, 620, 663, 716, 796, 817, 823, 825, 836-837, 842, 845 Chemistry & You - History: 133, 368, 736

		<p>2. EQUAL OPPORTUNITY The instructional material meets the requirements of equal opportunity: concepts, content, illustration, heritage, roles contributions, experiences and achievements of males and females in American and other cultures, as set by WV Board of Education Policy (Adopted May 1975).</p>	<p>A variety of races, colors, genders, nationalities, religions, and potential disabilities are highlighted throughout Pearson Chemistry. The Untamed Science video feature follows a diverse group of young scientists around the globe in search of answers to the big questions of science. Sample references include: Photos: 4, 15, 18, 29, 171, 184, 334, 405, 407, 430, 475, 497, 503, 528, 635, 787, 806, 826, 854, 887 Untamed Science: 1, 33, 61, 101, 127, 159, 193, 221, 263, 305, 345, 383, 449, 487, 517, 555, 593, 691, 727, 761, 837, 875</p>
		<p>3. FORMAT This resource is available as an option for adoption in an interactive electronic format.</p>	<p>PearsonChem.com is the next generation of digital instruction, offering complete online Student and Teacher editions, a comprehensive teacher center, customizable lesson plans, editable resources, hundreds of lab worksheets, interactive animations and simulations, tutorials, videos, virtual labs, and assessments in one place. Featuring the latest in digital instructional technology, PearsonChem.com integrates the key concepts in the textbook and brings them alive online. This easy-to-manage site also fits planning, teaching, and assessment needs by offering everything needed to manage a class, track progress, customize teaching style, and reach and teach students in new and exciting ways.</p>
		<p>4. BIAS The instructional material is free of political bias.</p>	<p>Pearson Chemistry offers a variety of unique product options to support a range of teaching and learning styles that is free from political bias. The Pearson Chemistry program combines proven content with cutting-edge digital support and a variety of lab investigations to help ensure student success in chemistry.</p> <ul style="list-style-type: none"> • Personalized learning opportunities support unique learning styles. • Connections to the real world relate abstract concepts and processes to everyday life. • Cutting-edge technology that is integrated throughout the program providing options for interaction with the content in multiple ways. • Rich lab explorations and study support provide numerous opportunities to practice and reinforce essential chemistry skills.

			<p>5. INQUIRY This resource must include rigorous and developmentally appropriate active inquiry, investigations, and hands-on activities.</p>	<p>Pearson Chemistry offers the most opportunities to get students to think like scientists and enables students to enhance their understanding by participating in the discovery. Pearson Chemistry encourages students to develop inquiry skills across the spectrum from teacher-guided to open-ended. Flexible lab options are included in every chapter, structured from directed to open-ended – providing the flexibility to address all types of learners and accommodate class time and equipment requirements. PearsonChem.com offers a wealth of labs that are available in an editable format. The Virtual ChemLab on CD-ROM helps chemistry concepts come to life in a hands-on lab environment simulated on the computer screen, rendering safety and equipment needs obsolete. Sample references include: Quick Lab: 39, 109, 180, 238, 328, 404, 467, 519, 600, 699, 778, 856 Small-Scale Lab: 20, 92, 149, 200, 295, 374, 435, 508, 583, 670, 752, 828, 887 Lab Manual: 33, 52, 85, 120, 139, 166, 203, 274, 305</p>
			<p>6. SAFETY This resource must include explicit guidance for demonstrating the safe and proper techniques for handling, manipulating and caring for developmentally appropriate science materials and treating living organisms humanely.</p>	<p>Pearson Chemistry highlights a variety of safety symbols throughout the text in the Quick Lab and Small-Scale Lab features. These symbols alert students to possible dangers and remind them to work carefully. The safety symbols are explained in depth on page R50. A complete Safety in the Chemistry Lab section is provided on pages R49-R50 and Lab Safety is covered on pages T25-T26. Sample references include: Quick Lab: 17, 142, 207, 279, 404, 467, 519, 600, 699, 856 Small-Scale Lab: 51, 120, 184, 254, 324, 399, 475, 545, 635, 717, 828 Lab Manual: 26-32, 92-96, 102-108, 156-162, 204-210, 300-304</p>

GENERAL EVALUATION CRITERIA

2016-2022 Group IV – Science Chemistry

The general evaluation criteria apply to each grade level and are to be evaluated for each grade level unless otherwise specified. These criteria consist of information critical to the development of all grade levels. In reading the general evaluation criteria and subsequent specific grade level criteria, **e.g. means “examples of” and i.e. means that “each of” those items must be addressed.** Eighty percent of the general and eighty percent of the specific criteria must be met with I (in-depth) or A (adequate) in order to be recommended.

(Vendor/Publisher) SPECIFIC LOCATION OF CONTENT WITHIN PRODUCTS	(IMR Committee) Responses				
	I=In-depth, A=Adequate, M=Minimal, N=Nonexistent	I	A	M	N
	<i>In addition to alignment of Content Standards and Objectives (CSOs), materials must also clearly connect to Learning for the 21st Century which includes opportunities for students to develop:</i>				
Next Generation Skills:					
Thinking and Problem-Solving Skills					
Science Content:					
<p>TE Only: Differentiated Instruction: 106 Focus on ELL: 108 Teacher Demo: 130, 177 Explore: 135, 165, 205, 265 Introducing the Chapter: 159 Connect to Economics: 335 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 79, 109, 167, 291, 305</p>	<p>1. provides opportunities for student collaboration.</p>				

<p>This objective is addressed throughout. See, for example:</p> <p>SE/TE: CHEMystery: 193, 221, 305, 449, 593, 691 Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 279, 437, 571, 750, 818 Chemistry & You: Technology: 12, 239, 407, 784, 892</p> <p>TE Only: 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 33, 52, 85, 120, 139, 166, 203, 274, 305</p>	<p>2. requires students to investigate and discover multiple solutions through inquiry.</p>							
<p>TE Only: Performance Tasks: 636 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 38-44, 80-84, 200-202</p>	<p>3. includes options for using technology tools to gather information, make informed decisions and justify solutions.</p>							

<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: Performance Tasks: 185 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 287, 311</p>	<p>4. engages students in critical thinking and the synthesis of information to analyze real-world problems.</p>						
<p>This objective is addressed throughout. See, for example: SE/TE: Chemistry & You: Technology: 12, 239, 407, 784, 892 CHEMystery: 193, 221, 305, 449, 593, 691 Small-Scale Lab: 254, 435, 475, 635, 752, 849 Quick Lab: 17, 354, 437, 571, 750 Chemistry & You: Everyday Matter: 73, 208, 355, 532, 671, 744, 821</p> <p>Lab Manual: 91, 139, 163, 199, 279, 311</p>	<p>5. offers activities to connect multiple scientific phenomena to real-world events.</p>						

Information and Communication Skills						
<i>For student mastery of content standards and objectives, the instructional materials will include multiple strategies that provide students with opportunities to:</i>						
TE Only: 21st Century Learning: 397, 576, 602, 663, 700, 744, 867	6. interact with secure external multimedia resources for local and global collaboration.					
SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 17, 109, 279, 354, 437, 571, 750, 818 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355 TE Only: Performance Tasks: 185 21st Century Learning: 397, 576, 602, 663, 700, 744, 867 Lab Manual: 52, 72, 146, 202, 250, 310, 312	7. develop conceptual understanding and research skills.					

<p>This objective is addressed throughout. See, for example:</p> <p>SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 207, 279, 354, 437, 467, 571, 750, 818 CHEMystery: 1, 193, 341, 379, 513, 645 Lesson Check: 137, 283, 315, 463, 706 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: 21st Century Learning: 163, 397, 440, 602, 663, 700, 744, 867 Performance Task: 185, 442, 636, 509, 584</p> <p>Lab Manual: 23-24, 119-120, 141-146, 157-163, 249-251</p>	<p>8. articulate thoughts and ideas through oral, written, and multimedia communications.</p>				
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Personal and Workplace Productivity Skills

For students mastery of content standards and objectives, the instructional materials will provide students with opportunities to:

<p>TE Only: Differentiated Instruction: 106 Focus on ELL: 108 Teacher Demo: 130, 177 Explore: 135, 165, 205, 265 Introducing the Chapter: 159 Connect to Economics: 335 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 79, 109, 167-171, 291-298, 305</p>	<p>9. use interpersonal skills to work cooperatively to accomplish a task.</p>						
<p>TE Only: Connect to Economics: 335 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p>	<p>10. develop and initiate a plan of action to complete a task or project.</p>						
<p>TE Only: Connect to Economics: 335 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p>	<p>11. practice time- and project-management skills</p>						
<p>SE/TE: Small-Scale Lab: 201 Sample Problem: 141</p> <p>TE Only: Connect to Economics: 335 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 44, 89, 161, 216</p>	<p>12. reflect upon and evaluate the results of a task or project.</p>						

<p>TE Only: Connect to Economics: 335 21st Century Learning: 397 Differentiated Instruction: 452 Performance Task: 442, 788 Informal Assessment: 207</p>	<p>13. assume various roles and responsibilities when working independently or as a group.</p>				
<p>SE/TE: 284, 455, 620, 663, 774, 853</p>	<p>14. explore science-related careers.</p>				
<p>TE Only: 21st Century Learning: 532</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	<p>15. conduct research, validate sources, and report findings ethically.</p>				
<p>SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818 Lesson Check: 137, 283, 315, 463, 706 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688 Standardized Test Prep: 191, 261, 417, 515, 795</p> <p>Lab Manual: 23-24, 52, 119-120, 141-146, 157-163, 202, 249-251, 310</p>	<p>16. provide learning experiences for students to demonstrate mastery through multiple efforts.</p>				

Developmentally Appropriate Instructional Resources and Strategies

For student mastery of content standards and objectives, the instructional materials:

<p>SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818</p> <p>TE Only: Performance Tasks: 636 Differentiated Instruction: 3, 13, 89, 111, 330, 421, 682 Focus on ELL: 17, 39, 105, 167, 440, 683 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	<p>17. include multiple research-based strategies for differentiation, intervention and enrichment to support all learners.</p>						
<p>SE/TE: Careers: 284, 455, 620, 663, 774, 853 Standardized Test Prep: 191, 261, 417, 515, 795</p>	<p>18. support college and career readiness.</p>						

<p>This objective is addressed throughout. See, for example: SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818</p> <p>TE Only: Use Visuals: 579 Differentiated Instruction: 3, 13, 89, 111, 330, 421, 682 Focus on ELL: 17, 39, 105, 167, 440, 683 Explore: 242 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Task: 185, 255, 636</p> <p>Lab Manual: 49-52, 127-132, 163-166, 183-188, 299-304</p>	<p>19. provide multiple opportunities for incorporating various learning modalities.</p>						
<p>SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818</p> <p>Lab Manual: 49-52, 101-108, 139-146, 173-178, 203-210, 305-310</p>	<p>20. cultivate investigative abilities leading to logical conclusions.</p>						

<p>This objective is addressed throughout. See, for example: SE/TE: Vocabulary: 134, 174, 306, 450, 578, 728</p> <p>TE Only: Building Vocabulary: 307, 457, 469, 595, 665, 775 Foundations for Math: 65, 87, 459, 560, 623 Performance Task: 788</p> <p>Lab Manual: 23-24, 52, 119-120, 141-146, 157-163, 202, 249-251, 310</p>	<p>21. incorporate authentic vocabulary acquisition.</p>						
<p>SE/TE: Small-Scale Lab: 20-21, 435, 583, 635, 670 Quick Lab: 142, 279, 467, 571, 699, 750 Safety in the Chemistry Lab: R49-R50</p> <p>TE Only: Lab Safety: T25-T26 Teacher Demo: 45</p> <p>Lab Manual: 26-32, 92-96, 102-108, 156-162, 204-210, 300-304</p>	<p>22. integrate laboratory safety practices within learning experiences.</p>						

Assessment						
<i>The materials provide:</i>						
<p>This objective is addressed throughout. See, for example: SE/TE: Lesson Check: 253, 283, 315, 367, 568, 620, 693 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Informal Assessment: 5, 19, 91, 137, 454, 501</p>	<p>23. ongoing diagnostic formative and summative assessments.</p>					
<p>This objective is addressed throughout. See, for example: SE/TE: Lesson Check: 253, 283, 315, 367, 568, 620, 693 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Informal Assessment: 5, 19, 91, 137, 454, 501 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p>	<p>24. a variety of assessment formats, including performance tasks as well as multimedia simulations, portfolio evaluations, and data-dependent and open-ended questions.</p>					
<p>TE Only: 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p>	<p>25. rubrics wherein all learners demonstrate progress toward mastery.</p>					

Organization, Presentation and Format

The materials:

<p>This objective is addressed throughout. See, for example: SE/TE: Contents: x-xiv Sample Problems: xxii-xxiii Appendices: xv, R1-R117 Small-Scale Labs: xix Quick Lab: xix Lesson Assessments: Chapters 1-25 Chapter Assessments: Chapters 1-25</p> <p>TE Only: Pacing Guide: T16 Materials List: T19-T24 Planning Guide: Chapters 1-25</p> <p>Lab Manual: Safety: 5-9 Equipment: 10-12 Laboratory Techniques: 13-19 Experiments: 21-318 Reference Tables: 322-325</p>	<p>26. are organized in logical sequence to optimize instructional effectiveness and efficiency.</p>				
<p>SE/TE: Scientific Measurement: 60-99 Water and Aqueous Systems: 486-493 The Chemistry of Life: 836-873 Radiation in Your Life: 894-897</p> <p>TE Only: 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 292-298</p>	<p>27. connect common themes across multiple science disciplines.</p>				

<p>This objective is addressed throughout. See, for example:</p> <p>TE Only: Foundations for Reading: 63 Foundations for Math: 65, 87 Connect to Literature: 11 Connect to Biology: 53 Connect to Math: 63, 87 Connect to Geology: 208 Connect to Economics: 335</p> <p>21st Century Learning: 397, 576, 602, 663, 700, 744, 867 Performance Task: 185, 442, 636, 509, 584</p> <p>Lab Manual: 156-162, 164-172, 288-290, 292-298, 311-314</p>	<p>28. integrate cross-curricular connections.</p>						
<p>This objective is addressed throughout. See, for example:</p> <p>TE Only: Focus on ELL: 17, 71, 105, 124, 167, 420, 787 Foundations for Math: 65, 87, 459, 560, 623 Professional Development Note: 15, 64, 139, 161, 558, 735 Differentiated Instruction: 3, 13, 89, 111, 330, 421, 682</p>	<p>29. provide educators necessary science content knowledge, pedagogy, and management techniques to guide learning experiences.</p>						

Life Skills					
<i>For student mastery of content standards and objectives, the instructional materials will provide students with opportunities to:</i>					
<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 17, 109, 279, 354, 437, 571, 750, 818</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 68-72, 102-108, 148-154, 212-216, 280-286</p>	<p>30. persevere to complete a task.</p>				
<p>SE/TE: Quantum Mechanics: 147 Organizing the Elements: 160-162 Chemistry and You: Technology: 476-477</p> <p>TE Only: A Scientific Controversy: 147 21st Century Learning: 502, 532, 803, 867 Performance Tasks: 718</p> <p>Lab Manual: 304-310</p>	<p>31. be exposed to varying viewpoints.</p>				
<p>TE Only: Teacher Demo: 130 Performance Tasks: 185 Explore: 242 Explain: Use Models: 529 Build Background: 779</p> <p>Lab Manual: 68-72, 140-146, 238-242, 306-310</p>	<p>32. engage in physical activity to promote the understanding of science content.</p>				

<p>This objective is addressed throughout. See, for example: SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818</p> <p>Chemistry & You: Technology: 12, 239, 407, 784, 892 CHEMystery: 193, 221, 305, 449, 593, 691 Small-Scale Lab: 254, 435, 475, 635, 752, 849 Quick Lab: 17, 354, 437, 571, 750 Chemistry & You: Everyday Matter: 73, 208, 355, 532, 671, 744, 821</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867 Explore: 205, 265, 423</p> <p>Lab Manual: 49-52, 101-108, 139-146, 173-178, 203-210, 305-310</p>	<p>33. investigate the natural world and universe.</p>						
<p>TE Only: Performance Task: 185, 442, 636, 509, 584, 718 21st Century Learning: 163, 397, 440, 502, 576, 602, 636, 663, 700, 744, 867 Differentiated Instruction: 106 Focus on ELL: 108 Teacher Demo: 130, 177 Explore: 135, 165, 205, 265 Introduce the Chapter: 159 Connect to Economics: 335</p>	<p>34. practice situational language (e.g., presentations, debates, speeches, collaborative discussions, social media) in real-world activities.</p>						

<p>SE/TE: Green Chemistry: 52, 83, 270, 407, 440, 576, 681, 803</p> <p>TE Only: 21st Century Learning: 440, 502, 576, 602, 744, 784</p> <p>Lab Manual: 279-286, 311-314</p>	<p>35. understand the impact of global issues and events on their lives, communities, and greater society.</p>							
<p>SE/TE: Small-Scale Lab: 20-21, 435, 583, 635, 670 Quick Lab: 142, 279, 467, 571, 699, 750 Safety in the Chemistry Lab: R49-R50</p> <p>TE Only: Lab Safety: T25-T26 Teacher Demo: 45</p> <p>Lab Manual: 26-32, 92-96, 102-108, 156-162, 204-210, 300-304</p>	<p>36. use laboratory equipment properly.</p>							

SPECIFIC EVALUATION CRITERIA

2016-2022 Group IV – Science Chemistry

Chemistry is an advanced elective course designed for students pursuing Science Technology Engineering Mathematics (STEM) education and careers. Students will develop a deeper understanding of the core concepts of: Structure and Properties of Matter and Chemical Reactions as they prepare for college chemistry requiring a strong mathematical foundation. The chemistry course prepares high school students to explain more in-depth phenomena central not only to the physical sciences, but to life and earth and space sciences as well. The chemistry objectives blend the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain ideas across the science disciplines. There is a focus on several scientific practices which include developing and using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking, and constructing explanations. Students will use these practices to demonstrate understanding of the core ideas as well as demonstrate understanding of several engineering practices, including design and evaluation. Students will engage in active inquiries, investigations, and hands-on activities as they develop and demonstrate conceptual understandings and research and laboratory skills described in the objectives. Safety instruction is integrated in all activities, and students will implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

All West Virginia teachers are responsible for classroom instruction that integrates content literacy and *21st Century Learning Skills and Technology Tools*.

General Science Content

The General Science Standard is a content standard that provides an integrated approach to science instruction that is arranged in a coherent manner, follows the logic of learning progressions and spans kindergarten through middle school. The three disciplines of science--Physical Science, Life Science, and Earth and Space Science--are limited to the major topics in the core ideas from each discipline. From the Life Science discipline the core ideas are the following: From Molecules to Organisms: Structures and Processes; Ecosystems: Interactions, Energy, and Dynamics; Heredity: Inheritance and Variation of Traits Across Generations; and Biological Evolution: Unity and Diversity. From the Physical Science discipline, the topics are the following: Matter and Its Interactions; Motion and Stability, Forces and Interactions; Energy; and Waves and Their Applications in Technologies for Information Transfer. Earth's Place in the Universe; Earth's Systems; and Earth and Human Activity are the topics from the Earth and Space Science discipline. Limiting instruction to the main topics of core ideas allows opportunities for deep exploration of important concepts and provides time for students to develop meaningful understandings, engage in science and engineering practices, and reflect on crosscutting concepts and the nature of science. The foundation not only provides an organizational structure for the acquisition of new knowledge, it prepares students to engage in deeper levels of scientific and engineering practices as they continue to high school, college, and beyond.

Earth and Space Science Content

The Earth and Space Standard is a content standard which spans kindergarten through high school and provides opportunities for students to investigate processes that operate on Earth and also address its place in the solar system and the galaxy. The standard encompasses three core ideas: Earth's Place in the Universe; Earth's Systems; and Earth and Human Activity. Beginning in kindergarten, students make observations, ask questions, and make predictions as they describe patterns in their local Weather and Climate. In later grades, the content progresses to include these topics: Space Systems: Patterns and Functions; Earth Systems: Processes that Shape the Earth; Earth's Systems: Space Systems: Stars and the Solar System; History of Earth; and Human Impacts. Elementary students observe and investigate matter and processes in their own yards and neighborhoods with their own eyes; the content continues in the grades that follow to include investigations of invisibly small phenomena to the unimaginably large and distant. As students investigate the atmosphere, hydrosphere, geosphere, and biosphere, they gain understanding of the differing sources of energy, matter cycles, multiple systems' interconnections, and feedbacks which cause Earth to change over time.

Life Science Content

The Life Science Standard is a content standard which spans kindergarten through high school and focuses on patterns, processes, and relationships of living organisms. The standard includes four core ideas: From Molecules to Organisms: Structures and Processes; Ecosystems: Interactions, Energy, and Dynamics; Heredity: Inheritance and Variation of Traits across Generations; and Biological Evolution: Unity and Diversity. These four core ideas, which represent basic life science fields of investigation—structures and processes in organisms, ecology, heredity, and evolution—have a long history and solid foundation based on the research evidence established by many scientists working across multiple fields. Beginning in kindergarten, curious learners explore Animals, Plants, and Their Environment as they learn of the Interdependent Relationships in Ecosystems. In the grades which follow, the inquiry continues as the standards encompass these topics: Structure, Function, and Information Processing; Inheritance and Variation of Traits: Life Cycles and Traits; Matter and Energy in Organisms and Ecosystems; and Growth, Development, and Reproduction of Organisms. Investigations include single molecules, organisms, ecosystems, and the entire biosphere that is all life on Earth. Students examine processes that occur on time scales from the blink of an eye to those that happen over billions of years. As they make observations, construct hypotheses, perform experiments, evaluate evidence, build models, and use technology to explore how life works, they prepare to answer questions about themselves and the world around them.

Physical Science Content

The Physical Science Standard is a content standard which spans kindergarten through high school as two subjects, physics and chemistry, are presented in a coherent approach which addresses four core ideas: Matter and Its Interactions; Motion and Stability, Forces and Interactions; Energy; and Waves and Their Applications in Technologies for Information Transfer. Beginning in kindergarten, students explore pushes and pulls as an introduction to the Forces and Interactions Topic. The inquiry continues through each programmatic level and includes the following topics: Light and Sound, Structure and Properties of Matter, Forces and Interactions, Energy, Waves and Information, Matter and Energy in Organisms and Ecosystems, Waves and Electromagnetic Radiation, and Chemical Reactions. An understanding of these topics allows students to answer two fundamental questions- “What is everything made of?” and “Why do things happen?” Students apply these core ideas to explain and predict a wide variety of phenomena, such as the evaporation of water, the transmission of sound, the digital storage and transmission of information, the tarnishing of metals, and photosynthesis, to name just a few. Because such explanations and predictions rely on a basic understanding of matter and energy, students’ abilities to conceive the interactions of matter and energy are central to their science education.

Chemistry Content

The Chemistry Standard is a content standard which focuses on the core concepts: Structure and Properties of Matter and Chemical Reactions. Opportunities are provided for studying in-depth phenomena central not only to the physical sciences, but to life science and earth and space science, as well. The standard includes the chemistry concepts found in the Physical Science Standard, but *not* those emphasizing Forces & Interactions, Energy, and Waves and Electromagnetic Radiation. Instead the standard goes into greater depth in the study of matter, its composition, and its changes by including concepts such as the periodic table and modern theories of bonding, the effects of temperature, concentration, and vapor pressure on solubility, types of chemical reactions, stoichiometry, molarity, and gas laws. The standard blends the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain ideas across the science disciplines. There is an emphasis on several scientific practices which include developing and using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking and constructing explanations.

Physics Content

The Physics Standard is a content standard which focuses on the core concepts: Forces and Interactions, Energy, and Waves and Electromagnetic Radiation. Opportunities are provided for studying in-depth phenomena central not only to the physical sciences, but to life science and earth and space science, as well. The standard includes the physics concepts found in the Physical Science Standard, but *not* those emphasizing Structure and Properties of Matter and Chemical Reactions. Instead the standard goes into greater depth in the studies of elastic and inelastic collisions, buoyancy and fluid dynamics, projectile motion, vectors, circuits and currents, and optics. The standard blends the core ideas with scientific and engineering practices and crosscutting concepts to support students in developing useable knowledge to explain ideas across the science disciplines. There is an emphasis on several scientific practices which include developing and

using models, planning and conducting investigations, analyzing and interpreting data, using mathematical and computational thinking and constructing explanations.

Environmental Content

The Environmental Standard is a content standard which focuses on chemical, physical, biological, and geological processes and the interdependent relationships in the natural world. Concepts from the major science disciplines—Life Science, Physical Science, and Earth and Space Science—are integrated into six environmental topics which include: Biogeochemical cycles, Energy Conservation, Ecosystems, Oceans and Climate, Water Management, Land Use. There is an emphasis on several scientific practices that include developing and using models; planning and conducting investigations; analyzing and interpreting data; constructing explanations; engaging in arguments from evidence; obtaining, evaluating, and communicating information; and synthesizing concepts across various science disciplines. The standard provides opportunities for students to develop an understanding of systems of a complex world and the interdependence of organisms as well as an appreciation of the ecosystem in which they live. As students develop an awareness of the environment and its associated problems, they acquire knowledge and skills of how to work individually and collectively toward solutions of current problems and the prevention of new ones.

Forensic Science Content

The Forensic Science Standard is a content standard which applies the knowledge and technology of science to criminal and civil law. Concepts from the three major disciplines--Life Science, Physical Science, and Earth and Space Science--are reinforced and made relevant and pertinent to students as they acquire techniques and skills and learn the limitations of the modern crime laboratories. There is an emphasis on several scientific practices which include planning and carrying out investigations; analyzing and interpreting data; obtaining, evaluating and communicating information; and using mathematics and computations. Students must address the attention to detail and protocol that are necessary for providing impartial scientific evidence that may be used in courts of law to support the prosecution or defense in criminal and civil investigations. These skills and attitudes transfer readily to other areas of science.

Human Anatomy and Physiology Content

Human Anatomy and Physiology is a content standard which addresses the structures and functions of the human body. While concepts from the Life Science discipline are the major focus of study, concepts from the Physical Sciences are incorporated to explain processes and mechanisms of the human body. The interdisciplinary nature of the sciences is revealed through the interdependency of body systems. There is an emphasis on several scientific practices which include asking questions, developing and using models, constructing explanations, and obtaining and communicating information. Engineering Design Standards are integrated throughout instruction as students define problems and design solutions related to the course objectives. The standard encompasses gross and microscopic anatomy, basic biochemistry and physiological concepts which are foundational to medical fields of study and useful as students make health related decisions.

Engineering, Technology, and Applications of Science

Engineering, Technology, and Applications of Science Standards (ETS) are included in science instruction, kindergarten through high school, and provide opportunities for students to utilize science and appreciate the distinctions and relationships between engineering, technology, and applications of science. The ETS are in programmatic levels- Kindergarten through Second Grade, Third through Fifth Grade, Middle School, and High School. As Engineering, Technology, and the Application of Science objectives are integrated with content from the three major strands of science- life science, physical science, and earth and space science- students develop understandings of how scientific knowledge is acquired, scientific explanations are developed, and science is applied in the world around us. The interactive cycle of design offers potential in applying science knowledge and engaging in engineering practices. Students gain experiences and understandings about the following: 1.) using technology to modify the natural world to fulfill human needs or desires; 2.) using an engineering approach to design objects, use processes, or construct systems to meet human needs and wants; and 3.) applying scientific knowledge for a specific purpose, whether to do more science, design a product, process, or medical treatment, develop a new technology, or to predict the impacts of human actions.

Literacy

Literacy Standards span middle and high school and address skills which are critical to building knowledge in science. The standards work in tandem with the specific content standard demands outlined in the West Virginia Next Generation Science Standards and Objectives. Reading in science requires an appreciation of the norms and conventions of the sciences which includes a working knowledge of domain-specific words, phrases, and symbols; an understanding of the nature of evidence used to support claims; an attention to precision and detail; and the capacity to make and assess intricate arguments, synthesize complex information often presented qualitatively and quantitatively in tables and graphs, and follow detailed procedures and accounts of events and concepts. Students also need to be able to gain knowledge from elaborate diagrams and data that convey information and illustrate scientific concepts. Likewise, writing and presenting information orally are key means for students to assert and defend claims in science, demonstrate what they know about a concept, and convey what they have experienced, imagined, thought, and learned. The skills and understandings students are expected to demonstrate in both reading and writing have a wide applicability outside the classroom and workplace and serve students as they address public and private responsibilities and interests.

For student mastery of content standards and objectives, the instructional materials will provide students with the opportunity to

		(IMR Committee) Responses				
		I=In-depth, A=Adequate, M=Minimal, N=Nonexistent	I	A	M	N
Chemistry Content						
Structure and Properties of Matter						
SE/TE: Electron Configuration in Groups: 170-173 Sample Problem: 173 Lesson Check: 173 Chapter Assessment: 186-187 Standardized Test Prep: 191	1. use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.					
SE/TE: Defining the Atom: 102-104 The Atomic Nucleus: 107-109 Lesson Check: 104, 109 Chapter Assessment: 122-124 CHEMystery: 133 Lab Manual: 46-48	2. research and evaluate contributions to the evolution of the atomic theory.					
SE/TE: The Quantum Mechanical Model: 130 Lesson Check: 132 Chapter Assessment: 152 TE Only: Checking for Understanding: 131	3. describe atoms using the Quantum Model.					

<p>SE/TE: Electron Arrangement in Atoms: 134-137 Lesson Check: 137, 173, 199 Electron Configuration in Groups: 170-173 Chapter Assessment: 186-188 Standardized Test Prep: 191 Ions: 194-199</p>	<p>4. produce electron configurations and orbital diagrams for any element on the periodic table and predict the chemical properties of the element from the electronic configuration.</p>				
<p>SE/TE: Half-Cells and Cell Potentials: 737-743 Lesson Check: 743, 751 Chemistry & You: Everyday Matter: 744 Small-Scale Lab: 752</p>	<p>5. plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles.</p>				
<p>SE/TE: Vapor Pressure: 427-428 Boiling Point: 428-430 Lesson Check: 430, 524, 531, 537 Properties of Solutions: 518-523 Sample Problem: 524 Concentration of Solutions: 525-530 Colligative Properties of Solutions: 534-537 Chemistry & You: Everyday Matter: 532-533 Small-Scale Lab: 545</p> <p>Lab Manual: 174-178, 190-194, 196-202, 204-210</p>	<p>6. investigate the solubility of various materials in water and determine experimentally the effects of temperature, concentration and vapor pressure on solution properties.</p>				
<p>SE/TE: Nuclear Radiation: 876-879 Nuclear Transformation: 880-886 Lesson Check: 886, 891 Small-Scale Lab: 887 Fission and Fusion: 888-891 Chapter Assessment: 900</p>	<p>7. develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion and radioactive decay.</p>				

<p>SE/TE: Intermolecular Attractions and Molecular Properties: 252-253 Lesson Check: 253 Small-Scale Lab: 254 Chapter Assessment: 256-259 CHEMystery: 259</p> <p>Lab Manual: 174-178, 244-246</p>	<p>8. communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.*</p>				
<p>Chemical Reactions</p>					
<p>SE/TE: Oxidation Numbers: 701-706 Lesson Check: 706, 715 Describing Redox Equations: 707-715 Small-Scale Lab: 717 Chapter Assessment: 720-723 CHEMystery: 723 Standardized Test Prep: 725</p> <p>Lab Manual: 92-96, 276-278, 280-286</p>	<p>9. construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.</p>				
<p>SE/TE: Types of Chemical Reactions: 356, 367 Sample Problem: 359 Lesson Check: 367, 673 Reactions in Aqueous Solutions: 369-373 Chapter Assessment: 377-380 Standardized Test Prep: 381</p> <p>Lab Manual: 92-96, 180-182, 252-254, 276-278, 288-290</p>	<p>10. predict the products, write and classify balanced chemical reactions including single replacement, double replacement, composition, decomposition, combustion and neutralization reactions.</p>				

<p>SE/TE: Electrolytic Cells: 745-751 CHEMystery: 757</p> <p>TE Only: Performance Task: 753</p>	<p>11. design a properly working electrolytic cell based on redox principles.</p>				
<p>SE/TE: Acid-Base Theories: 646-650 Lesson Check: 652</p>	<p>12. compare and contrast the Arrhenius and Bronsted-Lowry definitions of acids and bases.</p>				
<p>SE/TE: The pH Concept: 656-659 Measuring pH: 660-661 Quick Lab: 662 Lesson Check: 652</p> <p>TE Only: Performance Task: 682</p> <p>Lab Manual: 247-250, 259, 270</p>	<p>13. compare methods of measuring pH:</p> <ul style="list-style-type: none"> • indicators • indicator papers • pH meters. 				
<p>SE/TE: CHEMystery: 379</p> <p>Lab Manual: 257-258, 266</p>	<p>14. predict the product of an acid-base reaction.</p>				
<p>SE/TE: The Flow of Energy: 556-560 Exceptions to the Octet Rule: 235 Bond Dissociations Energies: 236-237</p>	<p>15. develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.</p>				

<p>SE/TE: Thermochemical Equations: 565-568 Lesson Check: 568, 601 Factors Affecting Reaction Rates: 598-601 Factors Affecting Equilibrium: Le Chatelier's Principle: 612-615</p> <p>Lab Manual: 92-96, 161, 218-224, 227-230</p>	<p>16. apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.</p>				
<p>SE/TE: Factors Affecting Equilibrium: Le Chatelier's Principle: 612-615 Equilibrium Constraints: 616-617 Lesson Check: 620</p> <p>Lab Manual: 230</p>	<p>17. refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. *</p>				
<p>SE/TE: Percent Yield: 405 Sample Problem: 406</p> <p>Lab Manual: 28-32</p>	<p>18. use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.</p>				
<p>SE/TE: Sample Problem: 309, 311 Interpret Data: 312 Molecular Mass: 312-315 Lesson Check: 315, 323 Mole-Mass and Mole-Volume Relationships: 317-323</p> <p>Lab Manual: 218-224, 149-154, 232-236</p>	<p>19. generate mole conversions that demonstrate correct application of scientific notation and significant:</p> <ul style="list-style-type: none"> • mass to number of particles • number of particles to volume • volume to mass. 				

<p>SE/TE: The Combined Gas Law: 462-463 Sample Problem: 462 Lesson Check: 463 Math Tune-up: Gas Law Problems: 479</p> <p>Lab Manual: 149-154, 156-162, 164-166</p>	<p>20. perform calculations using the combined gas laws.</p>				
<p>SE/TE: The Mole: A Measurement of Matter: 306-316 The Combined Gas Law: 462-463 Sample Problem: 391, 462, 527 Lesson Check: 315, 323, 391, 463 Math Tune-up: Gas Law Problems: 479</p> <p>Lab Manual: 205-211, 219-224, 233-236, 245-246, 261-266</p>	<p>21. perform the following “mole” calculations showing answers rounded to the correct number of significant figures:</p> <ul style="list-style-type: none"> • molarity • percentage composition • empirical formulas • molecular formulas • formulas of hydrates • mole-mole and mass-mass stoichiometry • determination of limiting reactant • theoretical yield. 				
<p>Engineering, Technology, and Applications of Science</p>					
<p>Engineering Design</p>					
<p>SE/TE: Green Chemistry: 52, 83, 270, 407, 440, 576, 681, 803 Chemistry & You: Technology: 397, 502-503</p> <p>TE Only: 21st Century Learning: 441, 502, 576, 602, 784</p>	<p>22. analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</p>				

<p>SE/TE: Chemistry & You: Technology: 502-503</p> <p>TE Only: 21st Century Learning: 397, 440, 502, 576, 602, 784</p>	<p>23. design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</p>						
<p>SE/TE: Chemistry & You: Technology: 502-503, 576-577</p> <p>TE Only: Extend: 477 21st Century Learning: 397, 440, 502, 576, 602, 784 Connect to Engineering: 735</p>	<p>24. evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.</p>						
<p>TE Only: 21st Century Learning: 397, 440, 502, 576, 602, 784</p>	<p>25. use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</p>						
<p>Science Literacy</p>							
<p>Reading- Key Ideas and Details</p>							
<p>SE/TE: CHEMystery: 193, 221, 305, 449, 551, 593, 691 Chemistry & You: Everyday Matter: 163, 355</p> <p>Lab Manual: 146, 250</p>	<p>26. cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p>						

<p>SE/TE: Big Idea: 159, 419, 487, 593, 797 Chemistry & You: 133 CHEMystery: 189 Lesson Check: 454</p> <p>TE Only: Informal Assessment: 675 Connect to Physics: 143</p> <p>Lab Manual: 25-32</p>	<p>27. determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p>				
<p>This objective is addressed throughout. See, for example: SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818 The Mole: A Measurement of Matter: 306-316 The Combined Gas Law: 462-463 Sample Problem: 391, 462, 527 Lesson Check: 315, 323, 391, 463 Math Tune-up: Gas Law Problems: 479</p> <p>TE Only: 21st Century Learning: 163</p> <p>Lab Manual: 38-44, 50-52, 80-84, 149-154, 227-231</p>	<p>28. follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p>				

Reading- Craft and Structure						
<p>This objective is addressed throughout. See, for example: SE/TE: Vocabulary: 134, 174, 306, 450, 578, 728</p> <p>TE Only: Building Vocabulary: 307, 457, 469, 595, 665, 775 Foundations for Math: 65, 87, 459, 560, 623 Performance Task: 788</p> <p>Lab Manual: 63-66, 73-78, 101-108, 189-194, 203-210, 217-224</p>	<p>29. determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>					
<p>SE/TE: Lesson Check: 37, 41 Skills Tune-Up: Names and Formulas: 297 Chemistry & You: Technology: 13, 476, 576-577 Chemistry & You: Green Chemistry: 52-53 Chemistry & You: Everyday Matter: 163</p> <p>Lab Manual: 101-108, 225-230, 255-258</p>	<p>30. analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.</p>					
<p>SE/TE: Small-Scale Lab: 120, 324, 475, 635, 752, 849 Quick Lab: 17, 109, 279, 437, 571, 750, 818</p> <p>TE Only: Explore: 243, 352 Teacher Demo: 35, 40, 76, 211, 421</p> <p>Lab Manual: 164-166, 184-188</p>	<p>31. analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p>					

Reading- Integration of Knowledge and Ideas						
<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: Performance Tasks: 185 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	<p>32. integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p>					
<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Chemistry & You: Technology: 12-13</p> <p>TE Only: Performance Tasks: 718 21st Century Learning: 502, 532, 803, 867</p>	<p>33. evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>					

<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355 Quick Lab: 17, 109, 207, 279, 354, 437, 467, 571, 750, 818</p> <p>TE Only: Performance Tasks: 185, 255, 509, 584, 636 21st Century Learning: 317, 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 23-24, 119-120, 141-146, 157-163, 185-189, 249-251</p>	<p>34. synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p>				
<p>Reading- Range of Reading and Level of Text Complexity</p>					
<p>This objective is addressed throughout. See, for example: SE/TE: Lesson Check: 253, 283, 315, 367, 568, 620, 693 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Informal Assessment: 5, 19, 91, 137, 452, 501 21st Century Learning: 163, 397, 576, 602, 663, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p> <p>Lab Manual: 69-73, 102-109, 119-121, 201-203, 288-291, 307-310</p>	<p>35. by the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.</p>				

Writing- Text Types and Purposes						
<p>SE/TE: Chemistry & You: Technology: 867</p> <p>TE Only: 21st Century Learning: 502, 532, 744, 803, 867 Performance Task: 718</p> <p>Lab Manual: 306-310</p>	<p>36. write arguments focused on <i>discipline-specific content</i>.</p> <ul style="list-style-type: none"> introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons and evidence. develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values and possible biases. use words, phrases and clauses, as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. provide a concluding statement or section that follows from or supports the argument presented. 					

<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: Performance Tasks: 185 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 23-24, 119-120, 141-146, 157-163, 185-189, 249-251</p>	<p>37. write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p> <ul style="list-style-type: none"> introduce a topic and organize complex ideas, concepts and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures and tables), and multimedia when useful to aid comprehension. develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. use varied transitions and sentence structures to link the major sections of the text, create cohesion and clarify the relationships among complex ideas and concepts. use precise language, domain-specific vocabulary and techniques such as metaphor, simile and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). 				
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Writing- Production and Distribution of Writing						
<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355 Lesson Check: 253, 283, 315, 367, 568, 620, 693 Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 23-24, 34-36, 119-120, 141-146, 157-163, 185-189, 249-251</p>	38. produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and audience.					
<p>SE/TE: Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	39. develop and strengthen writing as needed by planning, revising, editing, rewriting or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.					

<p>TE Only: 21st Century Learning: 163, 397, 440, 576, 602, 700, 744, 867 Performance Tasks: 255, 509, 584, 636</p>	<p>40. use technology, including the Internet, to produce, publish and update individual or shared writing products in response to ongoing feedback, including new arguments or information.</p>				
<p>Writing- Research to Build and Present Knowledge</p>					
<p>SE/TE: Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	<p>41. conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</p>				
<p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 532, 576, 602, 663, 700, 744, 867</p>	<p>42. gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p>				

<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355 Lesson Check: 253, 283, 315, 367, 568, 620, 693</p> <p>Chapter Assessment: 214-217, 510-513, 411-415, 638-641, 684-688</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 52, 72, 146, 202, 250, 310, 312</p>	<p>43. draw evidence from informational texts to support analysis, reflection and research.</p>				
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Writing- Range of Writing					
<p>SE/TE: CHEMystery: 1, 193, 341, 379, 513, 645 Quick Lab: 354 Chemistry & You: Green Chemistry: 52, 270, 440, 681, 803 Chemistry & You: Careers: 284, 455, 663, 774, 853 Chemistry & You: Everyday Matter: 316, 355</p> <p>TE Only: Performance Task: 185, 442, 636, 509, 584 21st Century Learning: 397, 576, 602, 663, 700, 744, 867</p> <p>Lab Manual: 50-52, 102-108, 140-146, 174-178, 204-210, 306-310</p>	<p>44. write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes and audiences.</p>				