

A Correlation of
Virginia Elevate Science
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To the
Loudoun County Public Schools
Life Science Rubric

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

LCPS Life Science Rubric

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Life Science emphasizes a more complex understanding of change, cycles, patterns, and relationships in the living world. Students build on basic principles related to these concepts by exploring the cellular organization and the classification of organisms; the dynamic relationships among organisms, populations, communities, and ecosystems; and change as a result of the transmission of genetic information from generation to generation. Students build on their scientific investigation skills through more independent identification of questions and planning of investigations. Students evaluate the usefulness and limits of models and support their conclusions using evidence. Technologies and scientific tools, including graphing calculators, computers, and probeware are used when appropriate and feasible. Mathematics, computational thinking, and experience in the engineering design process gain importance as students advance in their scientific thinking.

Resources Meet the LCPS Science Philosophy and Practice

Criteria	Correlation: Must address the identified need. When appropriate, provide examples in the resource. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
Instructional resources should develop students' ability to know, use, and interpret scientific explanations of the natural world; including developing and using models.	<p><i>Virginia Elevate Science</i> requires students to engage in scientific inquiry as they engage, think, investigate, and interact with natural phenomena through the variety of investigations designed to integrate elements of three-dimensional learning, such as developing and using models, interpreting and analyzing data, research activities, problem-based exercises and more. Organized by thematic topics, students 'experience' science through a variety of scaffolded hands-on, inquiry activities (uConnect, uInvestigate, uDemonstrate) designed to build their understanding of science concepts as they create explanations to explain phenomena about their natural world.</p> <p>For examples, please see the following: ATE: uConnect Lab: How is Your Body Organized?, 134-135 uDemonstrate Lab: Changes in an Ecosystem, 358-361</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources should develop students' ability to generate and evaluate scientific evidence and explanations; including developing and using models.</p>	<p><i>Virginia Elevate Science</i> is designed to facilitate the development of the students' ability to generate and evaluate scientific evidence and explanations through activities that integrate elements of three-dimensional learning, such as analyzing and interpreting data, constructing explanations, designing solutions, developing and using models, and more. The Quest problem-based learning scenario provides a context for student learning and affords them the opportunity to develop models, generate data, and gather evidence to support their explanations of scientific phenomena.</p> <p>For examples, please see the following: ATE: uDemonstrate Lab: Reaction Research, 196-199 uDemonstrate Lab: A Bony Puzzle, 492-495</p>
<p>Instructional resources should develop students' ability to understand the nature and development of scientific knowledge; When appropriate, instructional resources present multiple scientific perspectives and interpretations of scientific ideas as a representation of how science develops understanding of the natural world.</p>	<p>A variety of student-centered activities are incorporated in each topic that provide students with multiple perspectives on a theme. Science is presented as a 'quest' to discover knowledge and uncover new ideas, and not presented as a collection of facts to memorize. Students are encouraged to be active participants in their learning as they find solutions to real-world problems and participate in their learning 'adventure'. The <i>Virginia Elevate Science</i> program empowers students to ask questions, consider alternative ideas, evaluate evidence and engage in discourse to argue from evidence.</p>
<p>Instructional resources should develop students' ability to participate productively in scientific practices and discourse.</p>	<p><i>Virginia Elevate Science</i> puts students on a path toward success in science learning and connects performance expectations within and across grades, creating a balanced and coherent sequence designed to deepen student understanding and develop their ability to participate productively in scientific practices and discourse. The investigations, including the Quest Finding (their solution ideas to the topic's Quest challenge) requires students to engage in the practice of 'arguing from evidence' as they present and defend their solution ideas or explain their data. Teacher Edition prompts help guide the classroom discourse and facilitate student conversations.</p> <p>For examples, please see the following: ATE: Differentiated Instruction, 55 Spark a Discussion, 391 Focus on Mastery!, 412</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources reflect current best practices in the field of science instruction (pedagogy).</p>	<p>Students and teachers will benefit from Savvas’ (formerly Pearson) experience in developing instructional materials informed by a strong research base. Savvas is the only major publisher that consistently invests in outside validation studies that meet the rigorous criteria of the What Works Clearinghouse. A research team, including educational research methodologists, has been working with Savvas to integrate scientific research practices into the development of our curricula.</p> <p>In <i>Virginia Elevate Science</i>, that research is represented in the following features:</p> <ul style="list-style-type: none">▪ Topics introduced with a phenomenon to engage students in the learning and encourages discourse and discovery.▪ Topic organization which is built around problem-based learning scenarios called Quests. These PBLs provide context for student learning and actively engages the learner in finding solutions to the presented real-world topic challenge. <p>To support engagement and address multiple learning modalities, the digital platform hosts a variety of interactive multimedia resources (video, simulations, interactivities, virtual labs) that further student understanding of the core science concepts. These resources reflect the best practices in teaching science to adolescents, utilizing a blend of print and digital media for student learning.</p>
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**Science Textbook Correlation to LCPS Science Office Criteria and
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<p>Materials consistently provide development and application of concepts and scientific practices through the exploration and use of appropriate technologies.</p>	<p>Flexible classroom management tools within the digital platform provide freedom and control to use a digital, print, or blended format. The inquiry activities in <i>Virginia Elevate Science</i> are designed to engage students in hands-on science—making observations, planning investigations, designing solutions and analyzing evidence. Students work like scientists and engineers to understand authentic, real-world phenomena through a variety of lab experiences designed for to meet the specific learning objectives of the SOLs. The digital platform provides powerful data gathering interactive experiences to engage students in the exploration of the science concepts. These resources can be used for personalizing learning through data-driven instruction. The assessment resources include technology-enhanced items that allow students to develop and apply concepts and scientific practices and experience next generation assessment formats.</p>
<p>Resource provides opportunities to engage in a meaningful scientific investigation of a watershed (stream or bay) as defined by the Virginia Department of Education (MWEE)</p>	<p><i>Virginia Elevate Science</i> provides opportunities for students to engage in the types of investigative essential experiences as described by the Chesapeake MWEE. The student investigations promote active, student-focused questioning, the collection and analysis of self-generated data, and gets them involved in going out-of-doors to explore the natural environment. In several topics in each grade, the Quest real-world problem reflects an environmental theme and encourages students to be active in the promotion of community-based solutions. These student experiences can be found in the topics where the concepts of ecosystems, habitat diversity and human impact on the environment are explored.</p> <p>Please see the following: ATE: Topic 5, Quest: Mystery at Pleasant Pond Also see <i>Virginia Elevate Science Grade 6</i>.</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Resource provides opportunities for students to engage in computational thinking by solving problems that logically organize and classify data and use a series of steps (algorithms).</p>	<p><i>Virginia Elevate Science</i> puts students on a path toward success in science learning by making science relevant and meaningful for today’s students and teaching them to work similarly to that of actual scientists and engineers. Scientific inquiry, investigating phenomena, computational thinking, problem-solving and analysis and application of core concepts are emphasized as a goal for all students. In many of the investigations and intext response prompts, students are gathering and generating data, engaging in grade appropriate computational thinking exercises, and applying mathematical algorithms as a way to interpret and analyze the data they have generated. The <i>Virginia Elevate Science</i> program also includes correlations to grade level mathematics standards.</p> <p>For examples, please see the following: ATE: Math Toolbox: Monitoring Sodium Intake, 162 uDemonstrate Lab: Clean and Green, 252-255 Math Toolbox: Relationships in an Energy Pyramid, 281</p>
<p>Resources provide opportunities for students to use technology to learn science content and science process skills.</p>	<p>Virtual labs, interactive simulations and videos, along with an interactive student e-text all provide opportunities for students to use technology to learn and practice science concepts and skills. Our innovative technology-enhanced items, performance-based assessments, and adaptive learning programs help measure and build key 21st-century skills in learners of all abilities—including the elements of conceptual understanding, basic and procedural skills, and problem solving.</p> <p>For examples, please see the following: ATE: Literacy Connection, 46, 350 My Discovery, 293</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

Resources provide opportunities for students to explore advances in technology and scientific discovery that have occurred since your last publication date.

The intuitive digital path is more than an ancillary to *Virginia Elevate Science*; it is a vital component of our approach to learning that places the student at the center of the process of discovery. The digital path enables students to explore science in a way that emphasizes their own quest for knowledge and creativity. By organizing the material in topics, students can explore advances in technology and scientific discovery that develop beyond publication of printed materials. The uEngineer It! investigations and STEM activities encourage students to research and make use of current advances in science and apply those to their Quest solutions. The **Engineering Design Notebook** promotes research into current technologies as students design and devise their own innovation solutions to the engineering challenge of the topic.

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2018 Life Science Standards of Learning and Curriculum Framework**

Resources Support the LCPS Mission, Core Beliefs and Strategic Goals

<https://bit.ly/2VV3IDB>

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<p>Instructional resources support the potential for integration into Project-Based Learning (PBL).</p>	<p>Phenomena-Based Quests: Each topic engages students with a phenomena-based learning scenario called a ‘Quest’. The Quest contains a real-world problem for them to solve as they explore the science concept and develop the necessary science inquiry skills. A topic opening phenomenon and Essential Question open the topic and puts students on that path toward experiencing the topic content and skills. Students investigate the phenomena and use their experiences, the e-text photos, diagrams, and other visual elements to apply them to the concepts they are learning. The scaffolded labs throughout the topic introduce core ideas in context as students ‘experience’ science while they gain new knowledge in the hands-on setting.</p> <p>For examples, please see the following: ATE: The Essential Question, 1 Quest Kickoff, 2-3 Pasteur’s Experiment, 11</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources provide opportunities for Personalized Learning and the exercise of student voice and choice.</p>	<p>Teachers can individualize the instruction by assigning different resources to either individual students or group of students. Many of the uInvestigate activities give students the opportunity to develop their own plans to conduct the investigation. <i>Virginia Elevate Science</i> Teacher Edition offers comprehensive differentiation instruction and intervention support to address the needs of all learners—whether they are struggling, on-level, or advanced learners. This support provides system-driven opportunities to personalize learning for students and a library of resources to support the teacher in personalizing instruction and allowing students to exercise their voice and choice.</p>
<p>Instructional resources include grade level performance assessments that are formative and summative.</p>	<p>Learning outcomes are at the heart of each assessment we create, including those in our science worktexts. There are two types of performance assessments at the end of each topic- the Evidence-based assessment and the uDemonstrate investigation lab. Both of these assessments require students to demonstrate their understating of topic concepts through its application in a new setting.</p> <p>Our innovative technology-enhanced items, performance-based formative and summative assessments, and adaptive learning programs help measure and build key 21st-century skills in learners of all abilities—including the elements of conceptual understanding, basic and procedural skills, and problem solving. In print assessments includes lesson checks, investigation checks, and end-of-topic assessments.</p>
<p>Instructional resources support individual, small group, and whole class learning opportunities and collaboration.</p>	<p><i>Virginia Elevate Science</i> provides opportunities for students to work individually, in small, cooperative groups and engage in science and engineering practices as a whole class. Teacher Edition provides suggested grouping guidelines for the different hands-on activities, and other student interactions. The digital platform allows for group collaboration and the sharing of ideas through the Google integration tools. Teachers are able to group and assign students into learning cohorts based on ability, need and class preferences.</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources consistently include content promoting use of critical thinking skills and problem-solving approaches and provide opportunities for students to use critical thinking skills and problem solving through a process of sustained inquiry.</p>	<p><i>Virginia Elevate Science</i> includes a variety of opportunities for students to practice and demonstrate critical-thinking and problem-solving skills. The uEngineer It activities highlight open-ended problem solving. The digital interactives encourage critical-thinking and analysis. The performance-based tasks, research projects, inquiry investigations, labs, open-ended response questions, multiple choice questions, drag-and-drop questions, and other content that provides opportunities for students to use critical thinking and problem solving through a process of sustained inquiry.</p>
<p>Materials consistently promote the introduction of concepts through concrete experiences.</p>	<p><i>Virginia Elevate Science</i> is designed for students to ‘experience’ science and not just read about it. Every lesson begins with the hands-on activity called uInvestigate, giving them concrete experiences to engage their minds and make science real. Up-to-date, accurate, themed topics are used to build knowledge in each unit, emphasizing the common characteristics of a unifying, relevant concept and promoting in-depth understanding through daily lessons. The Quest challenge uses real-world challenges to set a context for student learning. Visual analogies connect difficult concepts to real world issues to help students better understand the concepts presented.</p> <p>For examples, please see the following: ATE: Case Study: Agents of Infection, 156-157 Structure of the Heart, 172 Quest Findings, 195</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources provide opportunities for students to apply learning in real-world situations.</p>	<p><i>Virginia Elevate Science</i> is designed for students to ‘experience’ science and not just read about it. Every lesson begins with the hands-on activity called uInvestigate, giving them concrete experiences to engage their minds and make science real. Up-to-date, accurate, themed topics are used to build knowledge in each unit, emphasizing the common characteristics of a unifying, relevant concept and promoting in-depth understanding through daily lessons. The Quest challenge uses real-world challenges to set a context for student learning. Visual analogies connect difficult concepts to real world issues to help students better understand the concepts presented.</p> <p>For examples, please see the Teacher Edition: ATE: Connect to the Real World: Museum Curator, 62 Connect to the Real World: Labeling Requirements in Restaurants, 159 Connect to the Real World: Human Teeth and Mouth, 437</p>
<p>Materials consistently provide the appropriate level of abstraction and appropriate practical/real-life examples.</p>	<p>A rigorous curriculum offers students equal opportunities to develop understanding, practice key concepts and skills, and apply these concepts and skills in real-world or abstract situations. <i>Virginia Elevate Science</i> includes engaging real-life visuals, a write-in student text with practical examples and a consistent organization that aids student learning.</p>
<p>Materials consistently provide sufficient, grade-level appropriate examples of applications of concepts to promote depth of understanding.</p>	<p>Materials present current, scientifically accurate, and grade-appropriate scientific information, phenomena, and representations. Outside fact-checkers verify data used and authenticity of identified facts. A full research bibliography is available showing the research reviewed and sources cited that informed development of <i>Virginia Elevate Science</i>.</p>

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2018 Life Science Standards of Learning and Curriculum Framework**

Resources are Inclusive, Accessible, Culturally Responsive, and Free of Bias	
Criteria	Correlation: Must address the identified need. When appropriate, provide examples in the resource. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
<p>Instructional resources represent women, people of different ages, religious, ethnic and racial minorities and persons with disabilities in many different environments and occupations, and in the roles of current science career fields.</p>	<p>Savvas systematically develops its educational products and vets its partnership products by implementing criteria and standards that reflect multiethnic, multiracial, and multicultural perspectives. Over the years, we have worked with numerous experts and consultants from universities and other educational institutions to provide a broad perspective in our educational materials.</p> <p>While creating high-quality educational content, our standards are aimed at the following:</p> <ul style="list-style-type: none"> ▪ Integrating multicultural experiences into program content so students see themselves as part of what is valued in the school’s curriculum ▪ Fostering self-esteem for greater academic achievement ▪ Empowering students to act effectively in a democratic society and reach their full potential ▪ Reducing prejudice by showing multicultural friendships and people from different backgrounds, working, playing, and living together <p>Our educational materials consider the needs of all students and are designed to provide a fair, balanced representation of various cultural groups and members, including racial, ethnic and religious groups; males and females; older people; and people with disabilities.</p>
<p>Instructional resources are free from stereotypes which assign a rigid set of characteristics to all members of a group.</p>	<p>Educational materials consider the needs of all students, are free from stereotypes, and are designed to provide a fair, balanced representation of various cultural groups and members, including racial, ethnic and religious groups; males and females; older people; and people with disabilities.</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>Instructional resources provide teachers with strategies for meeting the needs of Advanced Learners, English Learners and Special Education students.</p>	<p>Instructional materials provide LCPS teachers with research-based social and emotional learning curriculum and materials for all learners, including students who receive special education services and students who receive gifted and talented services. Instructional materials also provide differentiating instruction based on diverse learners (i.e., sections provide scaffolds for ELLs and students with disabilities, teacher guidance in the introductory section, etc.) and scaffolded tools for remediation (for example, appendix resources for writing and editing, teacher guidance for assigning reading, etc.). The Savvas Realize platform include multiple resources that teachers can assign to support individual student learning goals.</p>
<p>Instructional resources include accessibility features and tools for Advanced Learners, English Learners and Special Education students.</p>	<p>Instructional materials provide LCPS students with compliant, accessible resources. Our digital development team ensures that the online resources have embedded tools and features designed to make sure all students can access the activities, text and assessments.</p> <p>For examples, please see the following: ATE: ELD Support, 29 Differentiated Instruction, 89</p>
<p>Instructional resources include Tier 2 and Tier 3 vocabulary necessary to support English Learners and Special Education students.</p>	<p>LCPS can be confident in high-quality instructional materials and services that are developed for quality, efficacy, and usability, and are based on critical foundational research and proven classroom results. <i>Virginia Elevate Science</i> was developed to meet the needs of a diverse, high-need student population, including economically disadvantaged students, underrepresented racial/ethnic groups, and large populations of ELLs.</p> <p>For examples, please see the following: ATE: Differentiated Instruction, 89 ELD Support, 317</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

2018 Life Science Standards of Learning	
STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
<p>LS.2 The student will investigate and understand that all living things are composed of one or more cells that support life processes, as described by the cell theory. Key ideas include</p>	
<p>a) the development of the cell theory demonstrates the nature of science;</p>	<p>ATE: Topic 2: The Cell Systems Cell Theory, pp. 68-70 Literacy Connection: Determine Central Ideas, p. 68 Plan It!, Plastic or Wood, p. 71 Lesson 1 Check: #2-#4, #7, p. 74 Topic 2 SOL Review: 3. Apply Concepts, p. 122 Science and Engineering Handbook: Scientific Theories, p. SEP 10</p>
<p>b) cell structure and organelles support life processes;</p>	<p>ATE: Topic 1: Living Things in the Biosphere Cellular Organization, pp. 8-9 uEngineer It!: A Disease Becomes a Cure, p. 39</p> <p>Topic 2: The Cell Systems Quest Kickoff, pp. 62-63 Cells, p. 67 Parts of a Cell, pp. 77-82 Moving Materials Intro and Out of Cells, pp. 87-91 Energy and Cellular Respiration, pp. 113-116 Case Study: The Mighty Mole-Rat, pp. 120-121</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>c) similarities and differences between plant and animal cells determine how they support life processes;</p>	<p>ATE: Topic 1: Living Things in the Biosphere Characteristics of Plants, pp. 42-45 Characteristics of Animals, pp. 46-49</p> <p>Topic 2: The Cell Systems Plant and Animal Cell Differences, pp. 78-79 Chloroplasts, p. 81 Vacuoles, p. 82 Lesson 2 Check: Determine Differences, p. 85 Stage 3: Cytokinesis, p. 100 Case Study: The Mighty Mole-Rat, p. 120-121</p>
<p>d) cell division is the mechanism for growth and reproduction; and</p>	<p>ATE: Topic 2: The Cell Systems The Functions of Cell Division, p. 95 Phases of the Cell Cycle, pp. 96-97 The Cell Cycle, pp. 96-100 Math Toolbox, p. 97 Plant Cytokinesis, Figure 5, p. 100 Lesson 4 Check: #1, #3, #5, #6, p. 101 Topic 2 SOL Review: #10-#12, p. 122</p>
<p>e) cellular transport (osmosis and diffusion) is important for life processes.</p>	<p>ATE: Topic 2: The Cell Systems Passive Transport, pp. 88-91 Reading Check: Write Informative Text, p. 89 Model It!, p. 90 Active Transport, p. 91 Crossing the Cell Membrane, p. 91 Lesson 3 Check: Compare and Contrast, p. 93</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

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<p>LS.3 The student will investigate and understand that there are levels of structural organization in living things. Key ideas include</p>	
<p>a) patterns of cellular organization support life processes;</p>	<p>ATE: Topic 2: The Cell Systems Cells, p. 67 Extraordinary Science: Viewing Cells Through a “Thermal Lens, p. 75 Photosynthesis, pp. 106-107 Energy and Cellular Respiration, pp. 113-116 Evidence-Based Assessment, pp. 124-125</p> <p>Topic 3: Human Body Systems Levels of Organization, pp. 138-139 Human Organ Systems, pp. 140-143 Nervous System, pp. 183-185</p>
<p>b) unicellular and multicellular organisms have comparative structures; and</p>	<p>ATE: Topic 2: The Cell Systems Cells, p. 67 Principles of Cell Theory, p. 70 Lesson 1 Check: #5, p. 74 Parts of a Cell, p. 77 Cells Working Together, p. 83</p> <p>Topic 3: Human Body Systems Case Study: Agents of Infection, pp. 156-157</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

c) similar characteristics determine the classification of organisms.

ATE:

Topic 1: Living Things in the Biosphere

Quest Kickoff, pp. 2-3

uConnect Lab: Is It an Animal?, pp. 4-5

Classifying Organisms, pp. 19-23

Using a Taxonomic Key, p. 23

Extraordinary Science: Classification: What's a Panda?, p. 27

Microorganisms, p. 29

Bacteria, pp. 32-34

Vertebrates, pp. 48-49

**Science Textbook Correlation to LCPS Science Office Criteria and
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<p>LS.4 The student will investigate and understand that there are chemical processes of energy transfer which are important for life. Key ideas include</p>	
<p>a) photosynthesis is the foundation of virtually all food webs; and</p>	<p>ATE: Topic 2: The Cell Systems Photosynthesis, pp. 106-107 Photosynthesis Is the Key, p. 108</p> <p>Topic 5: Ecosystems Energy and Matter Transfer pp. 278-279 Topic 5 Evidence-Based Assessment, pp. 296-297</p> <p>CT: Realize™ Digital Resources: Topic 2 uInvestigate Lab: Energy from the Sun Topic 5, Lesson 2, Enrichment: Building an Ocean Food Web Topic 5, Lesson 2, Interactivity: Energy Roles and Flows</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>b) photosynthesis and cellular respiration support life processes.</p>	<p>ATE: Topic 2: The Cell Systems Energy from the Sun, p. 104 Making and Obtaining Food, p. 105 Photosynthesis, pp. 106-107 Energy and Cellular Respiration, pp. 113-116 Lesson 6 Check: #3, #6, p. 119</p> <p>Topic 5: Ecosystems Carbon and Oxygen Cycles, pp. 288-289 Reading Check: Summarize Text, p. 289 Quest Check-In, p. 292</p>
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LS.5 The student will investigate and understand that biotic and abiotic factors affect an ecosystem. Key ideas include	
a) matter moves through ecosystems via the carbon, water, and nitrogen cycles;	ATE: Topic 5: Ecosystems uConnect Lab: Every Breath You Take, pp. 260-261 Water Cycle, pp. 286-287 The Water Cycle, p. 287 Carbon and Oxygen Cycles, pp. 288-289 Nitrogen Cycle in Ecosystems, pp. 290-291 Nitrogen Cycle, p. 290 Lesson 3 Check: #1-#3, p. 292 Topic 5 SOL Review: #17, p. 295

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>b) energy flow is represented by food webs and energy pyramids; and</p>	<p>ATE: Topic 5: Ecosystems Energy Roles in an Ecosystem, pp. 275-277 Energy and Matter Transfer, pp. 278-281 Energy Pyramid, p. 280 Math Toolbox, p. 281 Reading Check: Summarize Text, p. 281 Lesson 2 Check: #1, p. 282 Evidence-Based Assessment, pp. 296-297 uDemonstrate Lab: Last Remains, pp. 298-301</p>
<p>c) relationships exist among producers, consumers, and decomposers.</p>	<p>ATE: Topic 5: Ecosystems Energy Roles in an Ecosystem, pp. 275-277 Model It!, p. 279 Energy Pyramids, p. 280 Math Toolbox, p. 281 Lesson 2 Check: Evaluate Information, p. 282 Evidence-Based Assessment, pp. 296-297 uDemonstrate Lab: Last Remains, pp. 298-301</p> <p>Topic 6: Populations, Communities, and Ecosystems Competition and Predation, pp. 311-313</p>

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<p>LS.6 The student will investigate and understand that populations in a biological community interact and are interdependent. Key ideas include</p>	
<p>a) relationships exist between predators and prey and these relationships are modeled in food webs;</p>	<p>ATE: Topic 5: Ecosystems Food Webs, p. 278 Model It!, p. 279 Topic 5 SOL Review: Develop Models, p. 294 Evidence-Based Assessment, pp. 296-297 uDemonstrate Lab: Last Remains, pp. 298-301</p> <p>Topic 6: Populations, Communities, and Ecosystems Competition and Predation, pp. 311-313 Model It!, p. 312 Math Toolbox, p. 313</p>
<p>b) the availability and use of resources may lead to competition and cooperation;</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Competition, p. 311 Shorebird Competition, p. 311 Symbiotic Relationships, pp. 316-318 Literacy Connection: Determine Central Ideas, p. 316 Mutualism and Commensalism, Figure 7, p. 317</p>

**Science Textbook Correlation to LCPS Science Office Criteria and
2018 Life Science Standards of Learning and Curriculum Framework**

<p>c) symbiotic relationships support the survival of different species; and</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Symbiotic Relationships, pp. 316-318 Literacy Connection: Determine Central Ideas, p. 316 Mutualism and Commensalism, Figure 7, p. 317 Reading Check: Integrate with Visuals, p. 318 Lesson 1 Check: Identify, p. 319 Topic 6 SOL Review: #2, #4, p. 354</p>
<p>d) the niche of each organism supports survival.</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Niche, pp. 310 A Safari Guide's Q & A, p. 310 Lesson 1 Check: Construct Explanations, p. 319 Niche Diversity, p. 334 A Narrow Niche, p. 334 Topic 6 SOL Review: #1, p. 354</p>

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LS.7 The student will investigate and understand that adaptations support an organism’s survival in an ecosystem. Key ideas include	
a) biotic and abiotic factors define land, marine, and freshwater ecosystems; and	ATE: Topic 5: Ecosystems Biotic Factors, p. 264 Abiotic Factors, p. 264 Design It!, p. 264 Biotic and Abiotic Factors of Ecosystems, p. 265 Factors of Land Ecosystems, p. 265 Deciduous Forest, Figure 3, p. 265 Factors of Marine Ecosystems, p. 266 Case Study, pp. 272-273
b) physical and behavioral characteristics enable organisms to survive within a specific ecosystem.	ATE: Topic 8: Natural Selection and Change Over Time Comparison Among the Islands, p. 444 CT: Realize™ Digital Resources: Topic 8, Lesson 1, Interactivity: Adaptations and Variations Topic 8, Lesson 1, Virtual Lab: Animal Feeding Adaptations Topic 8, Lesson 1, Virtual Lab: Animal Feeding Adaptations Worksheet Topic 8, Lesson 1, uInvestigate Lab: How do Species Change Over Time? Topic 8, Lesson 2, Interactivity: Mice Selection on the Prairie Topic 8, Lesson 2, Virtual Lab: Natural Selection in Butterfly Behavior

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STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
LS.8 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time. Key ideas include	
a) organisms respond to daily, seasonal, and long-term changes;	<p>ATE: Topic 4: Reproduction and Growth Factors Affecting Growth, pp. 238-239</p> <p>Topic 6: Populations, Communities, and Ecosystems uConnect Lab: How Communities Change, pp. 306-307 Ecosystem Disruptions and Changes, pp. 324-325</p> <p>CT: Realize™ Digital Resources: Topic 4 Quick Lab: Seasonal Changes Topic 4, Worksheet: Cyclic Behaviors Topic 8, Lesson 1, uInvestigate Lab: How Do Species Change Over Time?</p>

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<p>b) changes in the environment may increase or decrease population size; and</p>	<p>ATE: Topic 5: Ecosystems Quest Kickoff, pp. 258-259 Math Toolbox, p. 268 Factors That Limit Population Growth, p. 270 Case Study, pp. 272-273 Topic 5 SOL Review: Construct Explanations, p. 294</p> <p>Topic 6: Populations, Communities, and Ecosystems Ecosystem Disruptions and Population Survival, p. 324 Succession, p. 325 Lesson 2 Check: Engage in Argument, p. 328</p>
<p>c) large-scale changes such as eutrophication, climate changes, and catastrophic disturbances affect ecosystems.</p>	<p>ATE: Topic 5: Ecosystems Factors That Limit Population Growth, p. 270 uEngineer It!: Eating Oil, p. 283 Extraordinary Science, p. 293</p> <p>Topic 6: Populations, Communities, and Ecosystems Large-Scale Changes, pp. 314-315 Eutrophication, Figure 5, p. 314 Succession, pp. 321-322 Ecosystem Disruptions and Population Survival, pp. 324-325 Careers: Ecology in Action, p. 329</p>

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<p>LS.9 The student will investigate and understand that relationships exist between ecosystem dynamics and human activity. Key ideas include</p>	
<p>a) changes in habitat can disturb populations;</p>	<p>ATE: Topic 5: Ecosystems Factors That Limit Population Growth, p. 270 Case Study, pp. 272-273 uEngineer It!: Eating Oil, p. 283 Evidence-Based Assessment, pp. 296-297</p> <p>Topic 6: Populations, Communities, and Ecosystems Quest Kickoff, pp. 304-305 Ecosystem Disruptions and Population Survival, p. 324 Human Impact, pp. 337-340 Evidence-Based Assessment., pp. 355-356</p>

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<p>b) disruptions in ecosystems can change species competition; and</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Biodiversity, pp. 334-338 uDemonstrate Lab: Changes in an Ecosystem, pp. 358-361</p> <p>CT: Realize™ Digital Resources: Topic 6, Lesson 1, uInvestigate Lab: Competition and Predation Topic 6, Research Activity: Invasive Species</p>
<p>c) variations in biotic and abiotic factors can change ecosystems.</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Ecosystems and Human Interactions, pp. 326-327 Human Impact, p. 337</p> <p>CT: Realize™ Digital Resources: Topic 4, Interactivity: Factors Affecting Growth Topic 5, Quest: Mystery at Pleasant Pond Topic 5, Interactivity: There’s No Place Like Home</p>

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STANDARD	Correlation: Must address both the standards and the curriculum framework. Use page number and ATE for Annotated Teacher Edition or CT for Core Technology. (Identify no more than 8 correlations.)
LS.10 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key ideas include	
a) DNA has a role in making proteins that determine organism traits;	ATE: Topic 4: Reproduction and Growth Sexual Reproduction, p. 208 Topic 7: Genes and Heredity Quest Kickoff, pp. 364-365 Career: Chromosome Counselors, p. 389 The Genetic Code, p. 391 Making Proteins, pp. 394-395 Protein Synthesis, pp. 396-397 Chromosomes Size, p. 403 Evidence-Based Assessment, pp. 424-425
b) the role of meiosis is to transfer traits to the next generation; and	ATE: Topic 7: Genes and Heredity Forming Sex Cells, pp. 385-387 Swapping Genetic Material, p. 385 Meiosis: Sequence, p. 386 Comparing Meiosis and Mitosis, p. 387 Topic 7 SOL Review: Apply Concepts, p. 422

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c) Punnett squares are mathematical models used to predict the probability of traits in offspring.

ATE:

Topic 7: Genes and Heredity

Making a Punnett Square, pp. 374-375

Lesson 1 Check: Interpret Data, p. 377

Inheriting Sex Chromosomes, p. 402

Lesson 4 Check: Develop Models, p. 411

Topic 7 SOL Review: Use a Model, p. 422

uDemonstrate Lab: Make the Right Call, pp. 426-429

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<p>LS.11 The student will investigate and understand that populations of organisms can change over time. Key ideas include</p>	
<p>a) mutation, adaptation, natural selection, and extinction change populations;</p>	<p>ATE: Topic 6: Populations, Communities, and Ecosystems Adaptations and Survival, pp. 309-310 Ecosystem Disruptions and Population Survival, p. 324 Species Extinction, p. 335</p> <p>Topic 7: Genes and Heredity Types of Mutations, pp. 404-405 Mutation Effects, p. 407</p> <p>Topic 8: Natural Selection and Change Over Time How Natural Selection Works, p. 449 Selection, p. 450 Model It!, p. 451</p>

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<p>b) the fossil record, genetic information, and anatomical comparisons provide evidence for evolution; and</p>	<p>ATE: Topic 8: Natural Selection and Change Over Time uConnect Lab: Walking Whales, pp. 434-435 Comparisons Among the Islands, p. 443 The Fossil Record, pp. 465-467 Fossil Evidence of Evolution, pp. 468-469 Comparisons of Anatomy, pp. 470-471 Extraordinary Science: DNA, Fossils, and Evolution, p. 487 Case Study: Could Dinosaurs Roar?, pp. 476-477 uDemonstrate Lab: A Bony Puzzle, pp. 492-495</p>
<p>c) environmental factors and genetic variation, influence survivability and diversity of organisms.</p>	<p>ATE: Topic 4: Reproduction and Growth Quest Kickoff, pp. 202-203 Environmental Factors, p. 214 Growth and Development of Organisms, p. 237 Evidence-Based Assessment, pp. 250-251</p> <p>Topic 6: Populations, Communities, and Ecosystems Factors Affecting Biodiversity, pp. 334-336</p> <p>Topic 7: Genes and Heredity Environmental Factors, pp. 406-407</p> <p>Topic 8: Natural Selection and Change Over Time How Natural Selection Works, p. 449 Selection, p. 450</p>