

A Correlation of
Elevate Science
Grade 4, ©2019



To the
Oklahoma
2020 Academic Standards for Science
Grade 4

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Introduction

The following document demonstrates how the ***Elevate Science***, ©2019 program supports Oklahoma 2020 Academic Standards for Science. Correlation references include the Student Edition, Teacher Edition, and online Realize™ digital resources.

Elevate Science is a comprehensive K-5 science program that focuses on active, student-centered learning. It builds students' critical thinking, questioning, and collaboration skills, and fuels interest in STEM and creative problem solving while supporting literacy development for elementary-age learners. Developed to support Next Generation Science Standards (NGSS), ***Elevate Science*** integrates three-dimensional learning of the Scientific and Engineering Practices, Crosscutting Concepts (CCC), and Disciplinary Core Ideas (DCIs).

The ***Elevate Science*** blended **print** and **digital** curriculum engages students in phenomena-based inquiry and hands-on investigations.

- Problem-based learning Quests put students on a journey of discovery
- Engineering-focused features infuse STEM learning
- Coding and innovation engage students and build 21st century skills

The Teacher's Edition of ***Elevate Science*** helps elementary educators teach science with confidence: Scaffolding, ELD, differentiated instruction, and an instructional organization based upon the 5E learning model, (Engage, Explore, Explain, Extend/Elaborate, Evaluate), provide all the support needed for successful teaching practices. Professional development offers point-of-use support. A full-view approach to inquiry and testing provides new options for a variety of hands-on labs and assessments for three-dimensional learning.

Elevate Science prepares students for the challenges of tomorrow, building strong reasoning skills and critical thinking strategies as they engage in explorations, formulate claims, and gather and analyze data that promote evidence-based argument. Designed for today's classroom, preparing students for tomorrow's world. ***Elevate Science*** promises to:

- Elevate thinking.
- Elevate learning.
- Elevate teaching.

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Energy (PS3)	
Performance Expectations	
<p>4.PS3.1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p>	<p>SE/TE: uConnect Lab: How can you compare the energy of objects?, 4 uInvestigate Lab: How does starting height affect and object's energy?, 7 Motion and Energy, 12 Quest Check-In: Energy, Speed, and Motion, 13 Evidence-Based Assessment, 46-47 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Lesson 1, Energy, Speed and Moving Objects>Video: Energy, Speed and Moving Objects</p>
Disciplinary Core Ideas	
<p>4.PS3.1.DCI.1 The faster a given object is moving, the more energy it possesses.</p>	<p>SE/TE: uInvestigate Lab: How does starting height affect and object's energy?, 7 Quest Check-In: Energy, Speed, and Motion, 13 Evidence-Based Assessment, 46-47 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Lesson 1, Energy, Speed and Moving Objects>Video: Energy, Speed and Moving Objects</p>

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Science and Engineering Practices	
4.PS3.1.SEP.1 Constructing Explanations: Use evidence (e.g., measurements, observations, patterns) to construct an explanation.	<p>SE/TE: uConnect Lab: How can you compare the energy of objects?, 4 uInvestigate Lab: How does starting height affect and object's energy?, 7 Quest Check-In: Energy, Speed, and Motion, 13 uInvestigate Lab: How does energy transfer between objects?, 17 Quest Connection, 20 Evidence-Based Assessment, 46-47 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>TE Only: Focus on Mastery, 2, 7, 13</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions</p>
Crosscutting Concepts	
4.PS3.1.CCC.1 Patterns: Patterns can be used as evidence to support an explanation.	<p>SE/TE: Literary Connection: Cause and Effect, 5 Reading Check, 9 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 STEM Quest Check-I Lab: How does modeling help you understand a collision?, 22-23</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions</p>

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Performance Expectations	
<p>4.PS3.2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</p>	<p>SE/TE: STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 STEM Connection, 24 uInvestigate Lab: How does heat move?, 25 Visual Literacy Connection: How is energy Question It!, 29 Sound Energy, 30 Quest Check-In: Crash It!, 32 uInvestigate Lab: How does electric energy flow in circuits?, 35 STEM Quest Check-In Lab: How does an electric circuit help prevent collisions?, 40-41</p> <p>Realize™ Digital Resources: Energy and Motion >Lesson 2, Collisions>Video: Collisions;>Interactivity: The Transfer of Kinetic Energy >Lesson 3, Energy Transfer>Interactivity: How Does Thermal Energy Move? >Topic Close>Quest Findings: Energy Changes in Collisions</p>
Disciplinary Core Ideas	
<p>4.PS3.2.DCI.1 Energy can be moved from place to place by moving objects or through sound, light, or electric currents.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 5 Energy, 8 Energy in Motion, 9 Visual Literacy Connection: How does energy affect particles of matter?, 10-11 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 Light Energy, 29 Sound Energy, 30 Quest Check-In: Crash It!, 32 uInvestigate Lab: How does electric energy flow in circuits?, 35 Moving Electric Charges, 37 Quest Findings: Energy Changes in Collisions, 42 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Lesson 1, Energy, Speed, and Moving Objects>Video: Energy, Speed, and Moving Objects</p>

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4.PS3.2.DCI.2 Energy is present whenever there are moving objects, sound, light, or heat.	SE/TE: Literacy Connection: Cause and Effect, 5 Energy, 8 Energy in Motion, 9 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 Light Energy, 29 Question It!, 29 Sound Energy, 30
4.PS3.2.DCI.3 When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.	SE/TE: Literacy Connection: Cause and Effect, 5 Quest Connection, 8 Energy in Motion, 9 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 Model It!, 20 Sound Energy, 30 Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions
4.PS3.2.DCI.4 Light also transfers energy from place to place.	SE/TE: Light Energy, 29 Question It!, 29
4.PS3.2.DCI.5 Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light.	SE/TE: Visual Literacy Connection: How does energy affect particles of matter?, 10-11 Visual Literacy Connection: How is energy transferred?, 26-27 Curriculum Connection, 34 uInvestigate Lab: How does electric energy flow in circuits?, 35 Moving Electric Charges, 37 Quest Findings: Energy Changes in Collisions, 43 2

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Science and Engineering Practices	
<p>4.PS3.2.SEP.1 Planning and Carrying Out Investigations: Make observations to produce data to serve as the basis for evidence for an explanation of a phenomena or test a design solution.</p>	<p>SE/TE: uConnect Lab: How can you compare the energy of objects?, 4 uBe a Scientist: Force and Speed, 12 uInvestigate Lab: How does energy transfer between objects?, 17 uInvestigate Lab: How does heat move?, 25 uInvestigate Lab: How does electric energy flow in circuits?, 35 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>TE Only: Focus on Mastery, 17, 25, 35</p> <p>Realize™ Digital Resources: Energy and Motion >Lesson 2, Collisions>Video: Collisions;>Interactivity: The Transfer of Kinetic Energy >Lesson 3, Energy Transfer>Interactivity: How Does Thermal Energy Move? >Topic Close>Quest Findings: Energy Changes in Collisions</p>
Crosscutting Concepts	
<p>4.PS3.2.CCC.1 Energy and Matter: Energy can be transferred in various ways and between objects.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 5 Quest Connection, 8 Energy, 8 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 STEM Quest Check-In Lab: How does modeling help Quest Connection, 30 Quest Check-In: Crash It!, 32 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Topic Close>Quest Findings: Energy Changes in Collisions</p>

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Performance Expectations	
4.PS3.3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.	SE/TE: Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Quest Connection, 20 Other Energy Changes, 20-21 uBe a Scientist: Construct a Cradle, 21
Disciplinary Core Ideas	
4.PS3.3.DCI.1 When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.	SE/TE: Literacy Connection: Cause and Effect, 5 Quest Connection, 8 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 Model It!, 20 Quest Connection, 20 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Quest Check-In: Crash It!, 32 Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Lesson 2, Collisions>Video: Collisions;>Interactivity: The Transfer of Kinetic Energy >Topic Close>Quest Findings: Energy Changes in Collisions

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<p>4.PS3.3.DCI.2 When objects collide, the contact forces transfer energy so as to change the objects' motions.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 5 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Quest Connection, 20 Other Energy Changes, 20-21 Lesson 2 Check, 21 uBe a Scientist: Construct a Cradle, 21 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Quest Check-In: Crash It!, 32</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Topic Close>Quest Findings: Energy Changes in Collisions</p>
Science and Engineering Practices	
<p>4.PS3.3.SEP.1 Asking Questions: Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.</p>	<p>SE/TE: uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Ask Question, EM0</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions</p>

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Crosscutting Concepts	
<p>4.PS3.3.CCC.1 Energy and Matter: Energy can be transferred in various ways and between objects.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 5 Quest Connection, 8 Energy, 8 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Sound Energy, 30 Sound Waves, 31 Quest Connection, 30 Quest Check-In: Crash It!, 32 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Topic Close>Quest Findings: Energy Changes in Collisions</p>
Performance Expectations	
<p>4.PS3.4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*</p>	<p>SE/TE: STEM Quest Check-In Lab: How can an electric circuit help prevent collisions?, 40-41 uInvestigate Lab: How can a potato provide energy to a light bulb?, 57 Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 uInvestigate Lab: How does a windmill capture wind energy?, 75 STEM Quest Check-In Lab: How can the sun make a motor work?, 80</p> <p>Realize™ Digital Resources: Human Uses of Energy >Topic Launch>Quest Kickoff: Power from the People >Lesson 1, Energy Conversions>Interactivity: Electrical Energy Changes Forms >Topic Close>Quest Findings: Power from the People</p>

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Disciplinary Core Ideas	
4.PS3.4.DCI.1 Energy can be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.	<p>SE/TE: Curriculum Connection, 34 Moving Electric Charges, 37 Electric Circuits, 38 STEM Quest Check-In Lab: How can an electric circuit help prevent collisions?, 40-41 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 Quest Findings: Power from the People, 92</p> <p>Realize™ Digital Resources: Energy and Motion >Lesson 4, Electric Circuits>Interactivity: Making an Electrical Circuit;>Choosing the Best Circuit Design Human Uses of Energy >Lesson 1, Energy Conversions>Interactivity: Electrical Energy Changes Forms</p>
4.PS3.4.DCI.2 The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use.	<p>SE/TE: Energy, 8 Energy at Rest, 9 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 1, Energy Conversions>Interactivity: Electrical Energy Changes Forms</p>
4.PS3.4.DCI.3 Possible solutions to a problem are limited by available materials and resources (constraints). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.	<p>SE/TE: STEM Quest Check-In Lab: How can an electric circuit help prevent collisions?, 40-41 Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 Quest Findings: Power from the People, 92 Designing Solutions, EM11</p>
4.PS3.4.DCI.4 The success of a designed solution is determined by considering the desired features of a solution (criteria).	<p>SE/TE: Quest Connection, 37 STEM Quest Check-In Lab: How can an electric Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 Quest Findings: Power from the People, 92 Designing Solutions, EM11</p>

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4.PS3.4.DCI.5 Engineers improve existing technologies or develop new ones.	<p>SE/TE: Engineering Connection, 6 Engineering Practice Toolbox: Design a Solution, 20 STEM Quest Check-In Lab: How can an electric circuit help prevent collisions?, 40-41 Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 Engineering Connection, 74 uEngineer It!: Hold That Phone, 82-83 Quest Findings: Power from the People, 92 Career Connection: Electrical Engineer, 93</p> <p>Realize™ Digital Resources: Human Uses of Energy >Topic Launch>Quest Kickoff: Power from the People >Lesson 3, Renewable Energy Sources>uEngineer It! Video: Hold That Phone >Topic Close>Quest Findings: Power from the People</p>
Science and Engineering Practices	
4.PS3.4.SEP.1 Designing Solutions: Apply scientific ideas to solve design problems.	<p>SE/TE: Quest Check-In: Energy, Speed, and Motion, 13 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 STEM Quest Check-In Lab: How can an electric circuit help prevent collisions?, 40-41 Career Connection: Vehicle Safety Engineer, 43 Quest Check-In: Human Power, 63 Design It!, 70 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 uInvestigate Lab: How does a windmill capture wind energy?, 75 STEM Quest Check-In Lab: How can the sun make a motor work?, 80 uEngineer It STEM: Hold that phone!, 82-83</p> <p>Realize™ Digital Resources: Human Uses of Energy >Topic Launch>Quest Kickoff: Power from the People >Topic Close>Quest Findings: Power from the People</p>

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Crosscutting Concepts	
<p>4.PS3.4.CCC.1 Energy and Matter: Energy can be transferred in various ways and between objects.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 5 Quest Connection, 8 Energy, 8 Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Other Energy Changes, 20-21 Lesson 2 Check, 21 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Quest Connection, 30 Quest Check-In: Crash It!, 32 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p>Realize™ Digital Resources: Energy and Motion >Topic Launch>Quest Kickoff: Energy Changes in Collisions >Topic Close>Quest Findings: Energy Changes in Collisions</p>

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Waves and Their Applications in Technologies for Information Transfer (PS4)	
Performance Expectations	
4.PS4.1 Develop and use a model of waves to describe patterns in terms of amplitude and wavelength, and to show that waves can cause objects to move.	<p>SE/TE: uConnect Lab: How do we describe waves?, 104 uInvestigate Lab: How does a wave carry energy?, 107 Visual Literacy Connection: How does a wave move?, 110-111 uInvestigate Lab: What patterns can waves make?, 117 Visual Literacy Connection: How do wave patterns move?, 120-121 uDemonstrate Lab: How can you model a light or sound wave?, 148-149</p> <p>Realize™ Digital Resources: Waves and Information >Lesson 1, Property of Waves>Video: Properties of Waves>Interactivity: Sound</p>
Disciplinary Core Ideas	
4.PS4.1.DCI.1 Waves, which are regular patterns of motion, can be made in water by disturbing the surface.	<p>SE/TE: uConnect Lab: How do we describe waves?, 104 Wave Energy, 112 uInvestigate Lab: What patterns can waves make?, 117 uBe a Scientist, 118 Wave Patterns, 119</p>
4.PS4.1.DCI.2 When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach.	<p>SE/TE: Visual Literacy Connection: How does a wave move?, 110-111 Wave Energy, 112 uInvestigate Lab: What patterns can waves make?, 117 Wave Patterns, 119</p>

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<p>4.PS4.1.DCI.3 Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).</p>	<p>SE/TE: uInvestigate Lab: How does a wave carry energy?, 107 Wave Characteristics, 109 Visual Literacy Connection: How does a wave move?, 110-111 Lesson 1 Check, 112 uInvestigate Lab: What patterns can waves make?, 117 uBe a Scientist, 118 Quest Connection, 118 Patterns in Wave Characteristics, 118 Visual Literacy Connection: How do wave patterns move?, 120-121 Waves Can Combine, 122</p> <p>Realize™ Digital Resources: Waves and Information >Lesson 1, Property of Waves>Video: Properties of Waves</p>
Science and Engineering Practices	
<p>4.PS4.1.SEP.1 Developing and Using Models: Develop a model using an analogy, example, or abstract representation to describe a scientific principle.</p>	<p>SE/TE: uConnect Lab: How do we describe waves?, 104 uInvestigate Lab: How does a wave carry energy?, 107 Visual Literacy Connection: How does a wave move?, 110-111 uEngineer It!: Crack That Code, 114-115 uInvestigate Lab: What patterns can waves make?, 117 Visual Literacy Connection: How do wave patterns move?, 120-121 STEM Quest Check-In Lab, 123 uDemonstrate Lab: How is light reflected?, 125 Visual Literacy Connection: How does your eye see color:, 128-129 STEM Quest Check-In Lab: How can you send a message with light:, 132-133 uInvestigate Lab: How can information from waves be translated?, 135 uDemonstrate Lab: How can you model a light or sound wave?, 148-149</p> <p>TE Only: Focus on Mastery, 107, 113, 125, 127</p>

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Crosscutting Concepts	
4.PS4.1.CCC.1 Patterns: Similarities and differences in patterns can be used to sort and classify designed products.	<p>SE/TE: Visual Literacy Connection: How does a wave move?, 110-111 uInvestigate Lab: What patterns can waves make?, 117 Wave Patterns, 119 Visual Literacy Connection: How do wave patterns move?, 120-121 Waves Can Combine, 122 Digital and Analog Signals, 138 uDemonstrate Lab: How can you model a light or sound wave?, 148-149</p> <p>Realize™ Digital Resources: Waves and Information >Lesson 2, Patterns of Waves>Interactivity: The Doppler Effect</p>
Performance Expectations	
4.PS4.2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	<p>SE/TE: uInvestigate Lab: How is light reflected?, 125 uBe a Scientist: Light Reflection, 126 Visual Literacy Connection: How does your eye see color?, 128-129 Topic Assessment, 145</p> <p>Realize™ Digital Course: Oklahoma Science Activity Develop a Model: How Objects Are Seen</p>
Disciplinary Core Ideas	
4.PS4.2.DCI.1 An object can be seen when light reflected from its surface enters the eyes.	<p>SE/TE: uBe a Scientist: Light Reflection, 126 Seeing Objects, 127 Waves You Cannot See, 131 Lesson 3 Check, 131 Topic Assessment, 144-145</p> <p>Realize™ Digital Resources: Waves and Information >Lesson 3, Waves and the Electromagnetic Spectrum>Video: Waves and the Electromagnetic Spectrum</p>

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Science and Engineering Practices	
4.PS4.2.SEP.1 Developing and Using Models: Develop a model to describe phenomena.	<p>SE/TE: uInvestigate Lab: How is light reflected?, 125 uBe a Scientist: Light Reflection, 126 Design It!, 127 Visual Literacy Connection: How does your eye see color?, 128-129 Topic Assessment, 145 uDemonstrate Lab: How can you model a light or sound wave?, 148-149</p> <p>Realize™ Digital Course: Oklahoma Science Activity Develop a Model: How Objects Are Seen</p>
Crosscutting Concepts	
4.PS4.2.CCC.1 Cause and Effect: Cause and effect relationships are routinely identified.	<p>SE/TE: uInvestigate Lab: How is light reflected?, 125 Properties of Light Waves, 126 Seeing Objects, 127 Visual Literacy Connection: How does your eye see color?, 128-129</p> <p>TE Only: Focus on Mastery, 128</p> <p>Realize™ Digital Resources: Waves and Information >Lesson 3, Waves and the Electromagnetic Spectrum>Video: Waves and the Electromagnetic Spectrum</p>

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Performance Expectations	
4.PS4.3 Generate and compare multiple solutions that use patterns to transfer information.*	<p>SE/TE: uEngineer it!, Crack That Code, 114-115 STEM Quest Check-In Lab, 123 STEM Quest Check-In Lab: How can you send a message with light?, 132-133 uInvestigate Lab: How can information from waves be translated?, 135 Quest Check-In: Compare Codes, 140 Topic Assessment, 144-145</p> <p>TE Only: Focus on Mastery, 123, 132, 135: Engineering Design Process, 142</p> <p>Realize™ Digital Resources: Waves and Information >Topic Launch>Quest Kickoff: Be a Message Master! >Lesson 4, Waves and Information>Video: Waves and Information>Virtual Lab: Call Galactic Neighbors;>Interactivity: Sending and Receiving Information >Topic Close>Quest Findings: Be a Message Master!</p>
Disciplinary Core Ideas	
4.PS4.3.SDCI.1 Digitized information can be transmitted over long distances without significant degradation.	<p>SE/TE: Curriculum Connection, 134 Waves Outside the Visible Spectrum, 136 Radio Waves, 136 How Do Cell Phone Calls Work?, 137 Digital and Analog Signals, 138 Solve It with Science, 141 Digital Tools, EM3</p> <p>Realize™ Digital Resources: Waves and Information >Topic Launch>Quest Kickoff: Be a Message Master! >Topic Close>Quest Findings: Be a Message Master!</p>
4.PS4.3.SDCI.2 High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa.	<p>SE/TE: uEngineer It!: Hold That Phone, 82-83 How Do Cell Phone Calls Work?, 137 Technology Mimics Life, 139 Solve It with Science, 141 Digital Tools, EM3</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 3, Renewable Energy Sources>uEngineer It! Video: Hold That Phone</p>

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4.PS4.3.SDCI.3 Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	<p>SE/TE: uEngineer It!: Hold That Phone, 82-83 Quest Check-In: Communicating Tent to Tent, 113 STEM Quest Check-In Lab: How can you send a message with sound?, 123 STEM Quest Check-In Lab: How can you send a message with light?, 132-133 Quest Check-In: Compare Codes, 140 Designing Solutions, EM11</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 3, Renewable Energy Sources>uEngineer It! Video: Hold That Phone</p>
Science and Engineering Practices	
4.PS4.3.SEP.1 Designing Solutions: Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.	<p>SE/TE: uEngineer it!, Crack That Code, 114-115 STEM Quest Check-In Lab: How can you send a message with sound?, 123 Quest Check-In: How can you send a message with light?, 132-133 uInvestigate Lab: How can information from waves be translated?, 135 Quest Check-In: Compare Codes, 140</p> <p>TE Only: Focus on Mastery, 123, 132, 135: Engineering Design Process, 142</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 3, Renewable Energy Sources>uEngineer It! Video: Hold That Phone Waves and Information >Topic Launch>Quest Kickoff: Be a Message Master! >Topic Close>Quest Findings: Be a Message Master!</p>
Crosscutting Concepts	
4.PS4.3.CCC.1 Patterns: Similarities and differences in patterns can be used to sort and classify designed products.	<p>SE/TE: Quest Check-In: Communicating Tent to Tent, 113 STEM Quest Check-In Lab: How can you send a message with sound?, 123 Quest Check-In: How can you send a message with light?, 132-133 Digital and Analog Signals, 138 Quest Check-In: Compare Codes, 140 Quest Findings: Be a Message Master, 142</p> <p>TE Only: Focus on Mastery, 138</p>

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From Molecules to Organisms: Structure and Processes (LS1)	
Performance Expectations	
<p>4.LS1.1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>	<p>SE/TE: Structures, 284 Functions, 285 Visual Literacy Connection: What are some functions of internal leaf structures?, 286-287 Photosynthesis, 288-289 Quest Check-In Lab: How can you observe a plant’s vascular system in action?, 290-291 Investigate Lab: How are leaf coverings different?, 293 Visual Literacy Connection, 296-297 Lesson 2 Check, 298 Quest Check-In: Throwing Seeds Around 299 Investigate Lab: How can you compare the stomachs of cows and dogs?, 301 Visual Literacy Connection: How do lungs and gills compare?, 304-305 Lesson 3 Check, 306 Visual Literacy Connection: What do exoskeletons do?, 310-311 Quest Connection, 312 Solve it with Science: Why do animals shed their exoskeletons?, 315</p> <p>TE Only: Focus on Mastery, 289, 293, 296; Scaffolded Questions, 303</p> <p>Realize™ Digital Resources: Structures and Functions >Topic Launch>Quest Kickoff: Let Plants and Animals Inspire You! >Lesson 1, Internal Structures and Functions of Plants>Interactivity: The Structure of Flowers >Lesson 2, External Structures and Functions of Plants>Interactivity: Leaves, Roots, and Stems >Lesson 3, Internal Structures and Functions of Animals>Interactivity: Eating Food and Making Food >Lesson 4, External Structures and Functions of Animals>Interactivity: External Structure of Plants and Animals >Topic Close>Quest Findings: Let Plants and Animals Inspire You!</p>

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Disciplinary Core Ideas	
<p>4.LS1.1.DCI.1 Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.</p>	<p>SE/TE: Structures, 284 Functions, 285 Visual Literacy Connection: What are some functions of internal leaf structures?, 286-287 Photosynthesis, 288-289 uInvestigate Lab: How are leaf coverings different?, 293 External Structures of a Plant, 294 Stems and Their Coverings, 295 Visual Literacy Connection: What structures do flowering plants use to reproduce?, 296-297 Lesson 2 Check, 298 Quest Check-In: Throwing Seeds Around 299 Animal Structures for Support, 302 Structure of the Animal Heart, 303 Visual Literacy Connection: How do lungs and gills compare?, 304-305 Structure of the Animal Brain, 306 Visual Literacy Connection: What do exoskeletons do?, 310-311 Other External Structures of Animals, 312 Animal Characteristics, 313 Solve it with Science: Why do animals shed their exoskeletons?, 315 Topic Assessment, 328-329 Evidence-Based Assessment, 330-331</p> <p>Realize™ Digital Resources: Structures and Functions >Topic Launch>Quest Kickoff: Let Plants and Animals Inspire You! >Lesson 1, Internal Structures and Functions of Plants>Interactivity: The Structure of Flowers >Lesson 2, External Structures and Functions of Plants>Interactivity: Leaves, Roots, and Stems</p>

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Science and Engineering Practices	
<p>4.LS1.1.SEP.1 Engaging in Argument from Evidence: Construct an argument with evidence, data, and/or a model.</p>	<p>SE/TE: Quest Check-In Lab: How can you observe a plant's vascular system in action?, 290-291 Visual Literacy Connection, 296-297 Lesson 2 Check, 298 Quest Check-In: Throwing Seeds Around, 299 uInvestigate Lab: How can you compare the stomachs of cows and dogs?, 301 Visual Literacy Connection: How do lungs and gills compare?, 304-305 Structure of the Animal Brain, 306 Visual Literacy Connection: What do exoskeletons do?, 310-311 Other External Structures of Animals, 312 Animal Characteristics, 313</p> <p>TE Only: Scaffolded Questions. 303</p> <p>Realize™ Digital Resources: Structures and Functions >Topic Launch>Quest Kickoff: Let Plants and Animals Inspire You! >Topic Close>Quest Findings: Let Plants and Animals Inspire You!</p>

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Crosscutting Concepts	
<p>4.LS1.1.CCC.1 Structure and Function: Substructures have shapes and parts that serve functions.</p>	<p>SE/TE: Structures, 284 Functions, 285 Visual Literacy Connection: What are some functions of internal leaf structures?, 286-287 Photosynthesis, 288-289 uInvestigate Lab: How are leaf coverings different?, 293 External Structures of a Plant, 294 Stems and Their Coverings, 295 Visual Literacy Connection: What structures do flowering plants use to reproduce?, 296-297 Adaptations of Flowers, 298 Quest Check-In: Throwing Seeds Around 299 Animal Structures for Support, 302 Structure of the Animal Heart, 303 Visual Literacy Connection: How do lungs and gills compare?, 304-305 Structure of the Animal Brain, 306 Visual Literacy Connection: What do exoskeletons do?, 310-311 Other External Structures of Animals, 312 Animal Characteristics, 313</p> <p>Realize™ Digital Resources: Structures and Functions >Topic Launch>Quest Kickoff: Let Plants and Animals Inspire You! >Topic Close>Quest Findings: Let Plants and Animals Inspire You!</p>

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Performance Expectations	
4.LS1.2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	SE/TE: uInvestigate Lab: How can you locate an object using only sound?, 317 uEngineer It!: Eye See You!, 324-325 uDemonstrate Lab: How do earthworms respond to stimuli?, 332-333
Disciplinary Core Ideas	
4.LS1.2.DCI.1 Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain.	SE/TE: Engineering Connection, 316 Visual Literacy Connection: How do elephants respond to stimulus?, 318-319 Animal Responses to Smells, 320 Lesson 5 Check, 322 Quest Check-In: Sound Off!, 323 uEngineer It!: Eye See You!, 324-325 uDemonstrate Lab: How do earthworms respond to stimuli?, 332-333
4.LS1.2.DCI.2 Animals are able to use their perceptions and memories to guide their actions.	SE/TE: Engineering Connection, 316 Visual Literacy Connection: How do elephants respond to stimulus?, 318-319 Behaviors and Survival, 322 Lesson 5 Check, 322 Quest Check-In: Sound Off!, 323 uEngineer It!: Eye See You!, 324-325 uDemonstrate Lab: How do earthworms respond to stimuli?, 332-333
Science and Engineering Practices	
Developing and Using Models: Use a model to test interactions concerning the functioning of a natural system.	SE/TE: uInvestigate Lab: How can you locate an object using only sound?, 317 uBe a Scientist: Test Your Senses, 320 uEngineer It!: Eye See You!, 324-325 uDemonstrate Lab: How do earthworms respond to stimuli?, 332-333
Crosscutting Concepts	
4.LS1.2.CCC.1 Systems and System Models: A system can be described in terms of its components and their interactions.	SE/TE: Visual Literacy Connection: How do elephants respond to stimulus?, 318-319 Behaviors and Survival, 322 Quest Check-In: Sound Off!, 323 uEngineer It!: Eye See You!, 324-325 uDemonstrate Lab: How do earthworms respond to stimuli?, 332-333

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Earth’s Place in the Universe (ESS1)	
Performance Expectations	
<p>4.ESS1.1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.</p>	<p>SE/TE: uConnect Lab: Where are fossils found in rock layers?, 246 uInvestigate Lab: What patterns do fossils follow?, 249 Rock Formations, 251 Rock Strata Can Change, 251 STEM Math Connection: Canyonlands, 255 Engineering Connection, 258 uInvestigate Lab: How can rock layers show change?, 259 Fossil Clues on Earth, 260 Crosscutting Concepts Toolbox: Patterns, 261 Visual Literacy Connection: How can layers of rock change:,262-263 Quest Connection, 264 Quest Check-In Lab: What does a core sample tell us?, 266-267 Topic Assessment, 270-271 Evidence-Based Assessment, 272-273 uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p>Realize™ Digital Resources: The History of Planet Earth >Topic Launch>Quest Kickoff: Dig for the Truth >Lesson 1, Patterns in Fossils and Rock Formations>Interactivity: Patterns in Fossils and Rock Formations >Topic Close>Quest Findings: Dig for the Truth</p>

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Disciplinary Core Ideas	
<p>4.ESS1.1.DCI.1 Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes.</p>	<p>SE/TE: <ul style="list-style-type: none"> uInvestigate Lab: What patterns do fossils follow?, 249 Fossils, 250 Quest Connection, 250 Rock Formations, 251 Rock Strata Can Change, 251 A Colorful Change, 252 Lesson 1 Check, 253 STEM Math Connection: Canyonlands, 255 uInvestigate Lab: How can rock layers show change?, 259 Fossil Clues on Earth, 260 Mass Extinctions, 265 Quest Check-In Lab: What does a core sample tell us?, 266-267 Topic Assessment, 270-271 <p>Realize™ Digital Resources: The History of Planet Earth >Topic Launch>Quest Kickoff: Dig for the Truth >Lesson 1, Patterns in Fossils and Rock Formations>Video: Patterns in Fossils and Rock Formations;>Interactivity: Patterns in Fossils and Rock Formations >Lesson 2, Evidence of Change from Fossils and Rock Formations>Video: Evidence of Change from Fossils and Rock Formations; >Virtual Lab: Layers of Time >Topic Close>Quest Findings: Dig for the Truth</p> </p>

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4.ESS1.1.DCI.2 The presence and location of certain fossil types indicate the order in which rock layers were formed.	<p>SE/TE: uInvestigate Lab: What patterns do fossils follow?, 249 Fossils, 250 Rock Formations, 251 Geologic Time Scale, 253 Quest Check-In: Existing Evidence, 254 uInvestigate Lab: How can rock layers show change?, 259 Index Fossils, 261 Quest Connection, 264 Comparing Rock Layers, 264 Quest Check-In Lab: What does a core sample tell us?, 266-267 Topic Assessment, 270-271 Evidence-Based Assessment, 272-273 uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p>Realize™ Digital Resources: The History of Planet Earth >Topic Launch>Quest Kickoff: Dig for the Truth >Lesson 1, Patterns in Fossils and Rock Formations>Video: Patterns in Fossils and Rock Formations;>Interactivity: Patterns in Fossils and Rock Formations >Topic Close>Quest Findings: Dig for the Truth</p>
Science and Engineering Practices	
4.ESS1.1.SEP.1 Constructing Explanations: Identify the evidence that supports particular points in an explanation.	<p>SE/TE: uConnect Lab, 246 uInvestigate Lab: What patterns do fossils follow?, 249 uInvestigate: How can rock layers show change?, 259 Visual Literacy Connection: How can layers of rock change?, 262-263 Quest Connection, 264 Quest Check-In Lab: What does a core sample tell us?, 266-267 Evidence-Based Assessment, 272-273 uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p>TE Only: Focus on Mastery, 249, 255, 259, 262, 266</p> <p>Realize™ Digital Resources: The History of Planet Earth >Topic Launch>Quest Kickoff: Dig for the Truth >Lesson 2, Evidence of Change from Fossils and Rock Formations>Video: Evidence of Change from Fossils, Rock Formations;>Virtual Lab: Layers of Time >Topic Close>Quest Findings: Dig for the Truth</p>

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Crosscutting Concepts	
4.ESS1.1.CCC.1 Patterns: Patterns can be used as evidence to support an explanation.	<p>SE/TE: uConnect Lab: Where are fossils found in rock layers?, 246 uInvestigate Lab: What patterns do fossils follow?, 249 Quest Check-In: Existing Evidence, 254 Crosscutting Concepts Toolbox: Patterns, 261 Quest Check-In Lab: What does a core sample tell us?, 266-267 uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p>TE Only: Focus on Mastery, 254; Crosscutting Concepts: Toolbox, 261</p> <p>Realize™ Digital Resources: The History of Planet Earth >Topic Launch>Quest Kickoff: Dig for the Truth >Lesson 1, Patterns in Fossils and Rock Formations>Video: Patterns in Fossils and Rock Formations;>Interactivity: Patterns in Fossils and Rock Formations >Topic Close>Quest Findings: Dig for the Truth</p>
Earth's Systems (ESS2)	
Performance Expectations	
4.ESS2.1 Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.	<p>SE/TE: uConnect Lab: How can rain affect land?, 154 uInvestigate Lab: How can a rock wear away?, 185 uBe a Scientist: Weathering, 186 STEM Quest Check-In Lab: How does water affect landforms?, 192 Evidence-Based Assessment, 198-199</p> <p>Realize™ Digital Resources: Earth's Features >Lesson 4, Weathering and Erosion>Video: Weathering and Erosion;>Interactivity: Our Changing Landscape >Topic Close>Quest Findings: Does X Mark the Spot? That's Up to You!</p>

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Disciplinary Core Ideas	
4.ESS2.1.DCI.1 Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.	<p>SE/TE: uConnect Lab: How can rain affect land?, 154 uInvestigate Lab: How can a rock wear away?, 185 uBe a Scientist: Weathering, 186 Quest Connection, 187 Erosion, 188 Movement of Particles, 189 Changes in Landforms over Time, 191 Extreme Science: Powerful Plants, 193 Topic Assessment, 196-197 Evidence-Based Assessment, 198-199</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 4, Weathering and Erosion>Video: Weathering and Erosion;>Interactivity: Our Changing Landscape >Topic Close>Quest Findings: Does X Mark the Spot? That’s Up to You!</p>
Science and Engineering Practices	
4.ESS2.1.SEP.1 Planning and Carrying Out Investigations: With guidance, plan and conduct an investigation with peers.	<p>SE/TE: uConnect Lab: How can rain affect land?, 154 uInvestigate Lab: How can a rock wear away?, 185 uBe a Scientist: Weathering, 186 STEM Quest Check-In Lab: How does water affect landforms?, 192</p> <p>TE Only: Focus on Mastery, 185, 182</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 4, Weathering and Erosion>Video: Weathering and Erosion;>Interactivity: Our Changing Landscape</p>
Crosscutting Concepts	
4.ESS2.1.CCC.1 Cause and Effect: Cause and effect relationships are routinely identified, tested, and used to explain change.	<p>SE/TE: uConnect Lab: How can rain affect land?, 154 uInvestigate Lab: How can a rock wear away?, 185 Quest Connection, 187 STEM Quest Check-In Lab: How does water affect landforms?, 192 Extreme Science: Powerful Plants, 193 Quest Findings: 194 Evidence-Based Assessment, 198-199</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 4, Weathering and Erosion>Video: Weathering and Erosion;>Interactivity: Our Changing Landscape</p>

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Performance Expectations	
4.ESS2.2 Analyze and interpret data from maps to describe patterns of Earth’s features.	<p>SE/TE: Sports Connection, 156 Quest Connection, 158 Types of Maps, 159 Visual Literacy Connection: How can you see the same place in different ways?, 160-161 Resource Maps, 162 Lesson 1 Check, 162 Quest Check-In: The Making of a Legend, 163 Patterns of Earthquakes and Volcanoes, 169 Crosscutting Concepts Toolbox: Patterns, 169 Visual Literacy Connection: How can a physical map help me locate different landforms?, 170-171 Evidence-Based Assessment, 198-199</p> <p>TE Only: Focus on Mastery, 160, 163</p> <p>Realize™ Digital Resources: Earth’s Features >Topic Launch>Quest Kickoff: Does X Mark the Spot? That’s Up to You! >Lesson 2, Patterns of Earth's Features>Video: Patterns of Earth's Features;>Interactivity: The Shape of the Land >Topic Close>Quest Findings: Does X Mark the Spot? That’s Up to You!</p>
Disciplinary Core Ideas	
4.ESS2.2.DCI.1 The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns.	<p>SE/TE: Patterns of Mountains, 168 Crosscutting Concepts Toolbox: Patterns, 169 Patterns of Earthquakes and Volcanoes, 169 Patterns Under the Ocean, 172 Lesson 2 Check, 172 Quest Check-In: A Changing Landscape, 173</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 2, Patterns of Earth's Features>Video: Patterns of Earth's Features;>Interactivity: The Shape of the Land</p>

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4.ESS2.2.DCI.2 Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans.	<p>SE/TE: Science Practice Toolbox: Cite Evidence, 168 Crosscutting Concepts Toolbox: Patterns, 169 Patterns of Earthquakes and Volcanoes, 169</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 2, Patterns of Earth's Features>Video: Patterns of Earth's Features;>Interactivity: The Shape of the Land</p>
4.ESS2.2.DCI.3 Major mountain chains form inside continents or near their edges.	<p>SE/TE: Types of Maps, 159 Patterns of Mountains, 168 Patterns of Earthquakes and Volcanoes, 169 Lesson 2 Check, 172</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 2, Patterns of Earth's Features>Video: Patterns of Earth's Features;>Interactivity: The Shape of the Land</p>
4.ESS2.2.DCI.4 Maps can help locate the different land and water features where people live and in other areas of Earth.	<p>SE/TE: Sports Connection, 156 Quest Connection, 158 Read a Map, 158 Types of Maps, 159 Visual Literacy Connection: How can you see the same place in different ways?, 160-161 Lesson 1 Check, 162 Resource Maps, 162 Quest Check-In: The Making of a Legend, 163 Visual Literacy Connection: How can a physical map help me locate different landforms?, 170-171 Quest Check-In: A Changing Landscape, 173 Topic Assessment, 197</p> <p>Realize™ Digital Resources: Earth’s Features >Lesson 1, Maps and Data>Video: Maps and Data</p>

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Science and Engineering Practices	
4.ESS2.2.SEP.1 Analyzing and Interpreting Data: Analyze and interpret data to make sense of phenomena using logical reasoning.	<p>SE/TE: <ul style="list-style-type: none"> Investigate Lab: How do tools help us?, 157 Read a Map, 158 Types of Maps, 159 Visual Literacy Connection: How can you see the same place in different ways?, 160-161 Resource Maps, 162 Lesson 1 Check, 162 Quest Check-In: The Making of a Legend, 163 Where are major landforms?, 167 Quest Connection, 169 </p> <p>TE Only: Focus on Mastery, 157, 160, 163</p> <p>Realize™ Digital Resources: Earth's Features >Topic Launch>Quest Kickoff: Does X Mark the Spot? That's Up to You! >Topic Close>Quest Findings: Does X Mark the Spot? That's Up to You!</p>
Crosscutting Concepts	
4.ESS2.2.CCC.1 Patterns: Patterns can be used as evidence to support an explanation.	<p>SE/TE: <ul style="list-style-type: none"> Patterns of Mountains, 168 Crosscutting Concepts Toolbox: Patterns, 169 Patterns of Earthquakes and Volcanoes, 169 Patterns Under the Ocean, 172 Lesson 2 Check, 172 Assessment, 198 </p> <p>TE Only: Focus on Mastery, 169</p> <p>Realize™ Digital Resources: Earth's Features >Lesson 2, Patterns of Earth's Features>Video: Patterns of Earth's Features;>Interactivity: The Shape of the Land</p>

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Earth and Human Activity (ESS3)	
Performance Expectations	
<p>4.ESS3.1 Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.</p>	<p>SE/TE: uConnect Lab: How are energy resources used?, 54 Using Energy, 58 Fuels, 58 Curriculum Connection, 64 Fossil Fuels, 66 Coal, 66 Connecting Concepts Toolbox: Energy and Matter, 66 Petroleum, 67 Visual Literacy Connection, 68-69 Natural Gas, 70 Design It!, 70 Nuclear Fuel, 71 Engineering Connection, 74 Visual Literacy Connection: Is renewable energy all around?, 76-77 Renewable Fuel, 78 Hydropower, 78 Energy That Does Not Run Out, 79 STEM Connection, 84 uInvestigate Lab: Why is oil clean up so hard?, 85 Impact of Energy Production, 86 Quest Connection, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 Quest Check-In: Impact Inspections, 91 Evidence-Based Assessment, 96-97 uDemonstrate Lab: How can energy resource usage change?, 98-99</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 4, Environmental Impacts of Energy Use>Video: Environmental Impacts of Using Energy</p>

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Disciplinary Core Ideas	
<p>4.ESS3.1.DCI.1 Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways.</p>	<p>SE/TE: Curriculum Connection, 64 Fossil Fuels, 66 Petroleum, 67 Visual Literacy Connection: Where do fossil fuels come from?, 68-69 Natural Gas, 70 Design It!, 70 Lesson 2 Check, 71 Visual Literacy Connection: Is renewable energy all around?, 76-77 STEM Connection, 84 ulInvestigate Lab: Why is oil cleanup so hard?, 85 Impact of Energy Production, 86 Impact of Obtaining Fuel, 87 Quest Connection, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 Lesson 4 Check, 90 Quest Check-In: Impact Inspections, 91 Topic Assessment, 94-95 Evidence-Based Assessment, 96-97</p> <p>TE Only: Connecting Concepts, 66; 21st Century Skills, 71</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 4, Environmental Impacts of Energy Use>Video: Environmental Impacts of Using Energy;>Interactivity: Human Activity and the Environment</p>

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4.ESS3.1.DCI.2 Some resources are renewable over time, and others are not.	<p>SE/TE: Fossil Fuels, 66 Coal, 66 Petroleum, 67 Visual Literacy Connection: Where do fossil fuels come from?, 68-69 Natural Gas, 70 Nuclear Fuel, 71 Lesson 2 Check, 71 Engineering Connection, 74 STEM uInvestigate Lab: How does a windmill capture with energy, 75 Visual Literacy: Is renewable energy all around?, 76-77 Renewable Fuel, 78 Hydropower, 78 Energy That Does Not Run Out, 79 Lesson 3 Check, 79 Topic Assessment, 94-95 Evidence-Based Assessment, 96-97</p> <p>Realize™ Digital Resources: Human Uses of Energy >Lesson 2, Nonrenewable Energy Sources>Video: Nonrenewable Energy Sources;>Interactivity: Fossil Fuels >Lesson 3, Renewable Energy Sources>Video: Renewable Energy Sources;>Interactivity: Natural Resources</p>
Science and Engineering Practices	
4.ESS3.1.SEP.1 Obtaining, Evaluating, and Communicating Information: Obtain and combine information from books and other reliable media to explain phenomena.	<p>SE/TE: uConnect Lab: How are energy resources used?, 54 Connecting Concepts Toolbox: Energy and Matter, 66 Visual Literacy Connection: Where do fossil fuels come from?, 68-69 Natural Gas, 70 Nuclear Fuel, 71 Engineering Connection, 74 Visual Literacy: Is renewable energy all around?, 76-77 Renewable Fuel, 78 Energy That Does Not Run Out, 79 STEM Connection, 84 uInvestigate Lab: Why is oil clean up so hard?, 85 Impact of Energy Production, 86 Science Practice Toolbox, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 uDemonstrate Lab: How can energy resource usage change?, 98-99</p>

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Continued:	Continued: TE Only: Crosscutting Concepts, 66; 21 st Century Skills, 71; Science Practice Toolbox, 87 Realize™ Digital Resources: Human Uses of Energy >Lesson 4, Environmental Impacts of Energy Use>Video: Environmental Impacts of Using Energy
Crosscutting Concepts	
4.ESS3.1.CCC.1 Cause and Effect: Cause and effect relationships are routinely identified, tested, and used to explain change.	SE/TE: STEM ulnvestigate Lab: How can a potato provide energy to a light bulb?, 57 STEM Connection, 84 Impact of Energy Production, 86 Impact of Obtaining Fuel, 87 Impact of Nuclear Power, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 TE Only: Scaffolded Questions, 59, 66, 86 Realize™ Digital Resources: Human Uses of Energy >Lesson 4, Environmental Impacts of Energy Use>Video: Environmental Impacts of Using Energy;>Interactivity: Human Activity and the Environment

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Performance Expectations	
<p>4.ESS3.2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*</p>	<p>SE/TE: uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Connection, 211 Quest Check-In: Beware: Hot Ash!, 215 Quest Check-In: Water Warnings, 224 STEM Engineering Connection, 226 uInvestigate Lab: Where should you build an earthquake-safe structure?, 227 Plan It!, 228 Long-Term Effects of Hazards, 229 Lesson 3 Check, 231 Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Topic Assessment, 236-237 uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p> <p>Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Lesson 1, Tectonic Hazards>uEngineer It! Interactivity: Bridging the Gap >Topic Close>Quest Findings: Protect the City! Hazard Incoming!</p>
Disciplinary Core Ideas	
<p>4.ESS3.2.DCI.1 A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions).</p>	<p>SE/TE: Curriculum Connection, 208 uInvestigate Lab: How can a large wave affect land?, 209 Earthquakes, 210 uBe a Scientist: Earthquake Evidence, 210 Hazards of Earthquakes, 211 Visual Literacy Connection: What happens during a tsunami?, 212-213 Volcanoes, 214 Quest Check-In: Beware: Hot Ash!, 215 uEngineer It!: Warning!, 216-217 Solve it With Science: Where is the greatest earthquake risk?, 225 Short -Term Effects of Hazards, 228 Long-Term Effects of Hazards, 229 Topic Assessment, 236-237 Evidence-Based Assessment, 238-239</p>

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Continued:	Continued: Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Lesson 1, Tectonic Hazards>uEngineer It! Interactivity: Bridging the Gap >Topic Close>Quest Findings: Protect the City! Hazard Incoming!
4.ESS3.2.DCI.2 Humans cannot eliminate the hazards but can take steps to reduce their impacts.	SE/TE: uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Connection, 211 Quest Check-In: Beware: Hot Ash!, 215 uEngineer It!: Warning!, 216-217 Sports Connection, 218 Quest Check-In: Water Warnings, 224 STEM Engineering Connection, 226 uInvestigate Lab: Where should you build an earthquake-safe structure?, 227 Plan It!, 228 Predict Natural Hazards, 230 When Hazards Strike, 231 Lesson 3 Check, 231 Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Evidence-Based Assessment, 238-239 uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241 Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Lesson 1, Tectonic Hazards>uEngineer It! Interactivity: Bridging the Gap >Topic Close>Quest Findings: Protect the City! Hazard Incoming!

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4.ESS3.2.DCI.3 Testing a solution involves investigating how well it performs under a range of likely conditions.	<p>SE/TE: uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 uInvestigate Lab: Where should you build an earthquake-safe structure?, 227 Quest Check-In Lab: How can you reduce hazard damage?, 232-233 uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p> <p>Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Topic Close>Quest Findings: Protect the City! Hazard Incoming!</p>
4.ESS3.2.DCI.4 Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.	<p>SE/TE: uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 STEM Engineering Connection, 226 uInvestigate Lab: Where should you build an earthquake-safe structure?, 227 Quest Check-In Lab: How can you reduce hazard damage?, 232-233 uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p> <p>Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Topic Close>Quest Findings: Protect the City! Hazard Incoming!</p>
Science and Engineering Practices	
4.ESS3.2.SEP.1 Designing Solutions: Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.	<p>SE/TE: uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 Quest Check-In Lab: How can you reduce hazard damage?, 232-233 uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p> <p>Realize™ Digital Resources: Earth’s Natural Hazards >Topic Launch>Quest Kickoff: Protect the City! Hazard Incoming! >Topic Close>Quest Findings: Protect the City! Hazard Incoming!</p>

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To the
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Crosscutting Concepts	
<p>4.ESS3.2.CCC.1 Cause and Effect: Cause and effect relationships are routinely identified and used to explain change.</p>	<p>SE/TE: Literacy Connection: Cause and Effect, 207 uInvestigate Lab: How can a large wave affect land?, 209 Earthquakes, 210 Literacy Toolbox: Cause and Effect, 211 Visual Literacy Connection: What happens during a tsunami?, 212-213 Lesson 1 Check, 214 Sports Connection, 218 uInvestigate Lab: How does snow sliding quickly down a mountain impact people?, 219 Visual Literacy Connection: How much rainfall is enough?, 220-221 Blizzards, Hurricanes, and Tornadoes, 222 Landslides and Avalanches, 223 Short-Term Effects of Hazards, 228 Science Practice Toolbox: Cause and Effect, 229 Topic Assessment, 237 Evidence-Based Assessment, 238-239</p> <p>TE Only: Focus on Mastery, 212, 223, 228; Science Practice Toolbox, 229</p> <p>Realize™ Digital Resources: Earth’s Natural Hazards >Lesson 1, Tectonic Hazards>Interactivity: Tectonic Events</p>

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