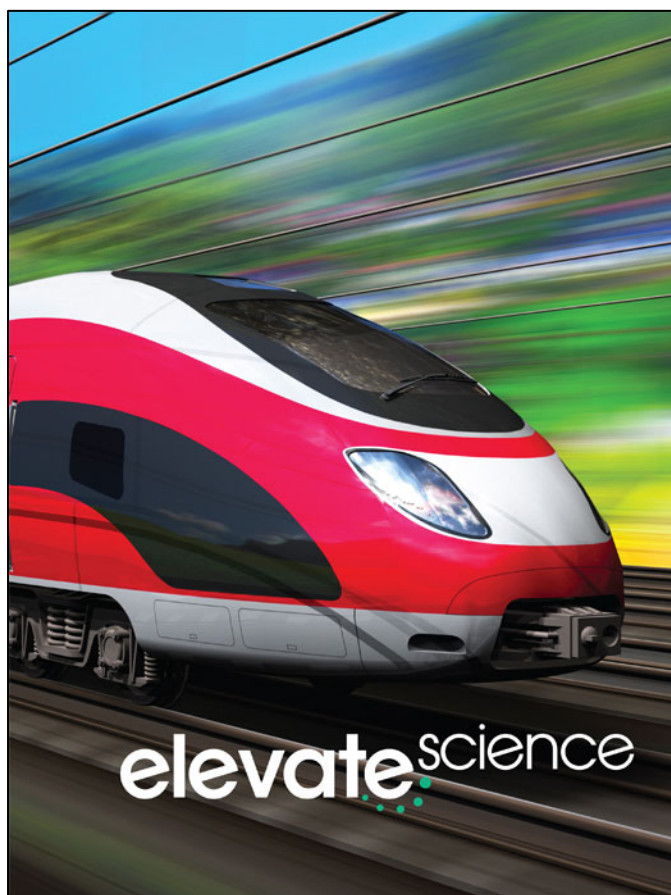


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**To the**  
**Next Generation Science Standards**  
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**Introduction**

The following document demonstrates how the ***Elevate Science* ©2019** program supports Montgomery County's Next Generation Science Curriculum. 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 21<sup>st</sup> 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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<b>4-PS3 Energy</b>	
<b>Performance Expectation</b>	
<b>4-PS3-1.</b> Use evidence to construct an explanation relating the speed of an object to the energy of that object.	<p><b>SE/TE:</b>            Quest Kickoff: Energy Changes in Collisions, 2-3            uConnect Lab: How can you compare the energy of objects?, 4            uInvestigate Lab: How does starting height affect and object's energy?, 7            uBe a Scientist: Force and Speed, 12            Quest Check-In: Energy, Speed, and Motion, 13            Quest Findings: Energy Changes in Collisions, 42</p> <p><b>Realize™ Digital Resources:</b>  <b>Energy and Motion</b>            &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Energy Changes in Collisions            &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Energy Changes in Collisions</p>
<b>Disciplinary Core Ideas</b>	
<b>PS3.A: Definitions of Energy</b>	
The faster a given object is moving, the more energy it possesses.	<p><b>SE/TE:</b>            Quest Kickoff: Energy Changes in Collisions, 2-3            uConnect Lab: How can you compare the energy of objects?, 4            uInvestigate Lab: How does starting height affect and object's energy?, 7            Energy, 8            Visual Literacy: How does energy affect particles of matter?, 10-11            Motion and Energy, 12            uBe a Scientist: Force and Speed, 12            Quest Check-In: Energy, Speed, and Motion, 13            Quest Findings: Energy Changes in Collisions, 42</p> <p><b>Realize™ Digital Resources:</b>  <b>Energy and Motion</b>            &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Energy Changes in Collisions            &gt;Lesson 1, Energy, Speed, and Moving Objects&gt;Video: Energy, Speed, and Moving Objects;&gt;Interactivity: Skateboarding Energy;&gt;Virtual Lab: Propeller Speed and Thrust            &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Energy Changes in Collisions</p>

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<b>Science and Engineering Practices</b>	
<b>Constructing Explanations and Designing Solutions</b> Use evidence (e.g., measurements, observations, patterns) to construct an explanation.	<b>SE/TE:</b> uConnect Lab: How can you compare the energy of objects?, 4 ulInvestigate Lab: How does starting height affect and object's energy?, 7  <b>Realize™ Digital Resources:</b> <b>Energy and Motion</b> >Lesson 1, Energy, Speed, and Moving Objects> Interactivity: Skateboarding Energy;>Virtual Lab: Propeller Speed and Thrust
<b>Crosscutting Concepts</b>	
<b>Energy and Matter</b> Energy can be transferred in various ways and between objects.	<b>SE/TE:</b> Visual Literacy: How does energy affect particles of matter?, 10-11
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<b>4-PS3-2.</b> Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	<b>SE/TE:</b> ulInvestigate Lab: How does energy transfer between objects?, 17 STEM Quest Check-In: How does modeling help you understand a collision?, 22-23 ulInvestigate Lab: How does heat move?, 25 ulInvestigate Lab: How does electric energy flow in circuits?, 35 STEM Quest Check-In: How can an electric circuit help prevent collisions?, 40-41 uDemonstrate Lab: What affects energy transfer?, 48-49

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<b>Disciplinary Core Ideas</b>	
<b>PS3.A: Definitions of Energy</b>	
Energy can be moved [transferred] from place to place by moving objects or through sound, light, or electric currents.	<p><b>SE/TE:</b>  Sports Connection, 16  uInvestigate Lab: How does energy transfer between objects?, 17  STEM Quest Check-In: How does modeling help you understand a collision?, 22-23  uInvestigate Lab: How does heat move?, 25  Visual Literacy: How is energy transferred?, 26-27  Energy and Particle Motion, 28  Light Energy, 29  Sound Energy, 30  Sound Waves, 31  Curriculum Connection, 34  uInvestigate Lab: How does electric energy flow in circuits?, 35  Electric Charge, 36  Moving Electric Charges, 37  Electric Circuits, 38  Resistance, 39  STEM Quest Check-In: How can an electric circuit help prevent collisions?, 40-41  uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p><b>Realize™ Digital Resources:</b>  <b>Energy and Motion</b>  &gt;Lesson 2, Collisions&gt;Video: Collisions;&gt;Interactivity: The Transfer of Kinetic Energy  &gt;Lesson 3, Energy Transfer&gt;Video: Energy Transfer;&gt;Interactivity: How Does Thermal Energy Move?  &gt;Lesson 4, Electric Circuits&gt;Video: Electric Circuits;&gt;Interactivity: Making an Electric Circuit</p>

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<b>PS3.B: Conservation of Energy and Energy Transfer</b>	
<p>Energy is present whenever there are moving objects, sound, light, or heat. 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. Light also transfers energy from place to place. 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.</p>	<p><b>SE/TE:</b> Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 STEM Quest Check-In: How does modeling help you understand a collision?, 22-23 uInvestigate Lab: How does heat move?, 25 Visual Literacy: How is energy transferred?, 26-27 Energy and Particle Motion, 28 Light Energy, 29 Sound Energy, 30 Sound Waves, 31 Curriculum Connection, 34 uInvestigate Lab: How does electric energy flow in circuits?, 35 Electric Charge, 36 Moving Electric Charges, 37 Electric Circuits, 38 Resistance, 39 STEM Quest Check-In: How can an electric circuit help prevent collisions?, 40-41 uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p><b>Realize™ Digital Resources:</b> <b>Energy and Motion</b> &gt;Lesson 2, Collisions&gt;Video: Collisions;&gt;Interactivity: The Transfer of Kinetic Energy &gt;Lesson 3, Energy Transfer&gt;Video: Energy Transfer;&gt;Interactivity: How Does Thermal Energy Move? &gt;Lesson 4, Electric Circuits&gt;Video: Electric Circuits;&gt;Interactivity: Making an Electric Circuit</p>

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<b>Science and Engineering Practices</b>	
<b>Planning and Carrying Out Investigations</b> Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.	<b>SE/TE:</b> uInvestigate Lab: How does energy transfer between objects?, 17 STEM Quest Check-In: How does modeling help you understand a collision?, 22-23 uInvestigate Lab: How does heat move?, 25 uInvestigate Lab: How does electric energy flow in circuits?, 35 STEM Quest Check-In: How can an electric circuit help prevent collisions?, 40-41 uDemonstrate Lab: What affects energy transfer?, 48-49
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<b>PS3.A: Definitions of Energy</b>	
Energy can be moved from place to place by moving objects or through sound, light, or electric currents,	<p><b>SE/TE:</b> Sports Connection, 16 uInvestigate Lab: How does energy transfer between objects?, 17 Visual Literacy Connection: Energy Changes in a Collision, 18-19 Engineering Practices Toolbox: Design a Solution, 20 uBe a Scientist: Construct a Cradle, 21 Other Energy Changes, 20-21 Reading Check, 21 Visual Literacy: How is energy transferred?, 26-27 Energy and Particle Motion, 28 Light Energy, 29 Question It!, 29 Sound Energy, 30 Sound Waves, 31 Quest Check-In: Crash It!, 32 uInvestigate Lab: How does electric energy flow in circuits?, 35 Moving Electric Charges, 37</p> <p><b>Realize™ Digital Resources:</b> <b>Energy and Motion</b> &gt;Lesson 1, Energy, Speed and Moving Objects&gt;Video: Energy, Speed and Moving Objects;&gt;Interactivity: Climb, Slide, Spin and Swing;&gt;Interactivity: Skateboarding Energy;&gt;Quiz: Energy, Speed, and Moving Objects &gt;Lesson 3, Energy Transfer&gt;Video: Energy Transfer;&gt;Interactivity: How Does Thermal Energy Move?;&gt;Quiz: Energy Transfer &gt;Lesson 4, Electric Circuits&gt;Video: Electric Circuits;&gt;Quiz: Electric Circuits</p>

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<b>Next Generation Science Standards Grade 4, DCI Arrangement</b>	<b>Elevate Science ©2019 Grade 4</b>
<b>PS3.B: Conservation of Energy and Energy Transfer</b>	
<p>Energy is present whenever there are moving objects, sound, light, or heat. 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.</p>	<p><b>SE/TE:</b>            uConnect Lab: How can you compare the energy of objects?, 4            ulnvestigate Lab: How does starting height affect an object's energy?, 7            Energy, 8            Motion and Energy, 12            uBe a Scientist: Force and Speed, 12            Quest Check-In: Energy, Speed, and Motion, 13            ulnvestigate Lab: How does energy transfer between objects?, 17            Visual Literacy Connection: Energy Changes in a Collision, 18-19            Other Energy Changes, 20            Quest Connection, 20            Other Energy Changes, 20-21            ulnvestigate Lab: How does heat move?, 25            Visual Literacy Connection: How is energy transferred?, 26-27            Energy and Particle Motion, 28            Light Energy, 29            Sound Energy, 30            Sound Waves, 31            Topic Assessment, 44-45            Evidence-Based Assessment, 46-47            uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p><b>Realize™ Digital Resources:</b>  <b>Energy and Motion</b>            &gt;Lesson 1, Energy, Speed and Moving Objects&gt;Video: Energy, Speed and Moving Objects;&gt;Interactivity: Climb, Slide, Spin and Swing;&gt;Interactivity: Skateboarding Energy;&gt;Quiz: Energy, Speed, and Moving Objects            &gt;Lesson 2, Collisions&gt;Video: Collisions;&gt;Interactivity: The Transfer of Kinetic Energy;&gt;Quiz: Collisions            &gt;Lesson 3, Energy Transfer&gt;Video: Energy Transfer;&gt;Interactivity: How Does Thermal Energy Move? &gt;Quiz: Energy Transfer</p>

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<b>Next Generation Science Standards Grade 4, DCI Arrangement</b>	<b>Elevate Science ©2019 Grade 4</b>
<b>PS3.C: Relationship Between Energy and Forces</b>	
When objects collide, the contact forces transfer energy so as to change the objects' motions.	<p><b>SE/TE:</b> 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 STEM Quest Check-In Lab: How does modeling help you understand a collision?, 22-23 Quest Check-In: Crash It!, 32 Quest Findings: Energy Changes in Collisions, 42</p> <p><b>Realize™ Digital Resources:</b> <b>Energy and Motion</b> &gt;Lesson 2, Collisions&gt;Video: Collisions;&gt;Interactivity: The Transfer of Kinetic Energy;&gt;Quiz: Collisions</p>
<b>Science and Engineering Practices</b>	
<p><b>Asking Questions and Defining Problems</b> Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause-and-effect relationships.</p>	<p><b>SE/TE:</b> uConnect Lab: How can you compare the energy of objects?, 4 uInvestigate Lab: How does starting height affect an object's energy?, 7 uBe a Scientist: Force and Speed, 12 uInvestigate Lab: How does energy transfer between objects?, 17 uDemonstrate Lab: What affects energy transfer?, 48-49 Science Practices: Ask Questions, 384</p> <p><b>Realize™ Digital Resources:</b> <b>Energy and Motion</b> &gt;Lesson 2, Collisions&gt;Interactivity: The Transfer of Kinetic Energy</p>

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<b>Crosscutting Concepts</b>	
<p><b>Energy and Matter:</b> Energy can be transferred in various ways and between objects.</p>	<p><b>SE/TE:</b>            Energy, 8            Energy at Rest/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            uInvestigate Lab: How does heat move?, 25            Visual Literacy Connection: How is energy transferred?, 26-27            Energy and Particle Motion, 28            uDemonstrate Lab: What affects energy transfer?, 48-49</p> <p><b>Realize™ Digital Resources:</b>  <b>Energy and Motion</b>            &gt;Lesson 1, Energy, Speed and Moving Objects&gt;Video: Energy, Speed and Moving Objects;&gt;Interactivity: Climb, Slide, Spin and Swing            &gt;Lesson 2, Collisions&gt;Video: Collisions;&gt;Interactivity: The Transfer of Kinetic Energy            &gt;Lesson 3, Energy Transfer&gt;Video: Energy Transfer;&gt;Interactivity: How Does Thermal Energy Move?;&gt;Quiz: Energy Transfer</p>

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<b>Performance Expectation</b>	
<p><b>4-PS3-4.</b> Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</p>	<p><b>SE/TE:</b> STEM Quest Kickoff: Power from the People, 52-53 uInvestigate Lab: How can a potato provide energy to a light bulb?, 57 Quest Check-In: Human Power, 63 STEM uInvestigate Lab: How do we find oil?, 65 Design It!, 70 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!: Hold that Phone, 82-83 STEM Quest Findings: Power to the People, 92</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Power to the People &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Power to the People</p>
<b>Disciplinary Core Ideas</b>	
<b>PS3.B: Conservation of Energy and Energy Transfer</b>	
<p>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. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.</p>	<p><b>SE/TE:</b> STEM Quest Kickoff: Power from the People, 52-53 uInvestigate Lab: How can a potato provide energy to a light bulb?, 57 Using Energy, 58 Plan It!. 59 Visual Literacy Connection: How is electric power generated from chemical energy?, 60-61 Storing Chemical Energy, 62 Quest Connection, 62 Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 STEM Quest Findings: Power to the People, 92</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Lesson 1, Energy Conversion&gt;Interactivity: Electrical Energy Changes Forms &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Power to the People</p>

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<b>PS3.D: Energy and Chemical Processes and Everyday Life</b>	
<p>The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use.</p>	<p><b>SE/TE:</b> STEM Quest Kickoff: Power from the People, 52-53 Storing Chemical Energy, 62 Quest Connection, 62 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 uEngineer It!: Hold that Phone, 82-83 STEM Quest Findings: Power to the People, 92</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Power to the People &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Power to the People</p>
<b>ETS1.A: Defining an Engineering Problem</b>	
<p>Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). 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>	<p><b>SE/TE:</b> STEM Quest Kickoff: Power from the People, 52-53 Quest Check-In: Human Power, 63 STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 STEM Quest Check-In Lab: How can the sun make a motor work?, 80 uEngineer It!: Hold that Phone, 82-83 STEM Quest Findings: Power to the People, 92 Science and Engineering Practices Handbook: Engineering Practices: Defining Problems, EM10 Science and Engineering Practices Handbook: Engineering Practices: Designing Solutions, EM11</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Power to the People &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Power to the People</p>

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<b>Science and Engineering Practices</b>	
<b>Constructing Explanations and Designing Solutions</b> Apply scientific ideas to solve design problems.	<b>SE/TE:</b> Visual Literacy Connection: How is electrical energy generated from chemical energy?, 60-61 Quest Check-In: Human Power, 63 STEM uInvestigate Lab: How do we find oil?, 65 Visual Literacy Connection: Where do fossil fuels come from?, 68-69  <b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> >Lesson 1, Energy Conversion>Interactivity: Electrical Energy Changes Forms
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<b>Energy and Matter</b> Energy can be transferred in various ways and between objects.	<b>SE/TE:</b> STEM Quest Check-In Lab: How can you use a battery to produce motion?, 72-73 STEM Quest Check-In Lab: How can the sun make a motor work?, 80
<b>4-PS4 Waves and their Applications in Technologies for Information Transfer</b>	
<b>Performance Expectation 4-PS4-1</b>	
Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	<b>SE/TE:</b> uConnect Lab: How do we describe waves?, 104 uInvestigate Lab: How does a wave carry energy?, 107 Wave Characteristics, 109 Visual Literacy Connection: How does a wave move?, 111 Visual Literacy Connection: How do wave patterns move?, 120-121 uDemonstrate Lab: How can you model a light or soundwave?, 148-149
<b>Disciplinary Core Ideas</b>	
<b>PS4.A: Wave Properties</b> Waves, which are regular patterns of motion, can be made in water by disturbing the surface. 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 waves except when the water meets a beach.	<b>SE/TE:</b> Wave Energy, 112 uInvestigate Lab: What patterns can waves make?, 117 uBe a Scientist: Ripples, 118 Wave Patterns, 119 Crosscutting Concepts Toolbox: Patterns, 119 Visual Literacy Connection: How do wave patterns move?, 120-121  <b>Realize™ Digital Resources:</b> <b>Waves and Information</b> >Lesson 2, Patterns of Waves>Video: Patterns of Waves

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Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).	<p><b>SE/TE:</b> Wave Characteristics, 109 Visual Literacy Connection: How does a wave move?, 110-111 Patterns in Wave Characteristics, 118</p> <p><b>Realize™ Digital Resources:</b> <b>Waves and Information</b> &gt;Lesson 1, Properties of Waves&gt;Video: Properties of Waves;&gt;Quiz: Properties of Waves</p>
<b>Science and Engineering Practices</b>	
<p><b>Developing and Using Models</b> Develop a model using an analogy, example, or abstract presentation to describe a scientific principle.</p>	<p><b>SE/TE:</b> 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?, 111 uDemonstrate Lab: How can you model a light or soundwave?, 148-149 Science Practices: Developing and Using Models, EM6</p>
<p><b>Scientific Knowledge is Based on Empirical Evidence</b> Science findings are based on recognizing patterns.</p>	<p><b>SE/TE:</b> uConnect Lab: How do we describe waves?, 104 Visual Literacy Connection: How do wave patterns move?, 120-121</p>
<b>Crosscutting Concepts</b>	
<p><b>Patterns</b> Similarities and differences in patterns can be used to sort, classify, and analyze simple rates of change for natural phenomena.</p>	<p><b>SE/TE:</b> Wave Characteristics, 109 uInvestigate Lab: What patterns can waves make?, 117 Patterns in Wave Characteristics, 118 uBe a Scientist: Ripples, 118 Wave Patterns, 119 Crosscutting Concepts Toolbox: Patterns, 119 Visual Literacy Connection: How do wave patterns move?, 120-121</p> <p><b>Realize™ Digital Resources:</b> <b>Waves and Information</b> &gt;Lesson 2, Patterns of Waves&gt;Video: Patterns of Waves</p>



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<b>Performance Expectation 4-PS4-2</b>	
Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	<p><b>SE/TE:</b>            uInvestigate Lab: How is light reflected?, 125            uBe a Scientist: Light Reflection, 126            Design It!, 127            Topic Assessment, 145            uEngineer It! Model STEM: Eye See You!, 324</p> <p><b>Realize™ Digital Resources:</b>  <b>Human Body Systems</b>            &gt;Lesson 3, Nervous System&gt;Virtual Lab: Building a System</p>
<b>Disciplinary Core Ideas</b>	
<b>PS4.B: Electromagnetic Radiation</b> An object can be seen when lighted reflected from its surface enters the eye.	<p><b>SE/TE:</b>            Seeing Objects, 127            Lesson 3 Check, 131            Topic Assessment, 144-145            uConnect Lab: How do your eyes respond to differences in lighting?, 280            uEngineer It! Model STEM: Eye See You!, 324            Visual Literacy Connection: What are sensory organs?, 360</p> <p><b>Realize™ Digital Resources:</b>  <b>Waves and Information</b>            &gt;Lesson 3, Waves and the Electromagnetic Spectrum&gt;Interactivity: Light Energy and Vision;&gt;Quiz: Waves and the Electromagnetic Spectrum  <b>Human Body Systems</b>            &gt;Lesson 3, Nervous System&gt; Virtual Lab: Building a System</p>
<b>Science and Engineering Practices</b>	
<b>Developing and Using Models</b> Develop a model to describe phenomena.	<p><b>SE/TE:</b>            uInvestigate Lab: How is light reflected?, 125            uBe a Scientist: Light Reflection, 126            uDemonstrate Lab: How can you model a light or sound wave?, 148-149            uEngineer It! Model STEM: Eye See You!, 324            Science Practices: Developing and Using Models, EM6</p> <p><b>Realize™ Digital Resources:</b>  <b>Human Body Systems</b>            &gt;Lesson 3, Nervous System&gt; Virtual Lab: Building a System</p>

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<b>Crosscutting Concepts</b>	
<p><b>Cause and Effect</b> Cause and effect relationships are routinely identified.</p>	<p><b>SE/TE:</b> ulInvestigate Lab: How is light reflected?, 125 Properties of Light Waves, 126 Seeing Objects, 127</p> <p><b>Realize™ Digital Resources:</b> <b>Waves and Information</b> &gt;Lesson 3, Waves and the Electromagnetic Spectrum&gt; Interactivity: Light Energy and Vision;&gt;Quiz: Waves and the Electromagnetic Spectrum</p>
<b>Performance Expectation</b>	
<p><b>4-PS4-3.</b> Generate and compare multiple solutions that use patterns to transmit information.</p>	<p><b>SE/TE:</b> STEM Quest Kickoff: Be a Message Master, 102-103 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 ulInvestigate Lab: How can information from waves be translated?, 135 Engineering Practices Toolbox: Design Solutions, 139 Quest Check-In: Compare Codes, 140</p> <p><b>Realize™ Digital Resources:</b> <b>Waves and Information</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Be a Message Master &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Be a Message Master</p>

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<b>Disciplinary Core Ideas</b>	
<b>PS4.C: Information Technologies and Instrumentation:</b>	
Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. When in digitized form, information can be recorded, stored for future recovery, and transmitted over long distances without significant degradation of the wave.	<p><b>SE/TE:</b> Curriculum Connection, 134 uInvestigate Lab: How can information from waves be translated?, 135 Waves Outside the Visible Spectrum, 136-137 Digital and Analog Signals, 138 Technology Mimics Life, 139 Engineering Practices Toolbox: Design Solutions, 139</p> <p><b>Realize™ Digital Resources: Waves and Information</b> &gt;Lesson 4, Waves and Information&gt;Video: Waves and Information;&gt;Virtual Lab: Call the Galactic Neighbors;&gt;Interactivity: Sending and Receiving Information</p>
<b>ETS1.C: Optimizing the Designed Solution</b>	
Different solutions need to be tested in order to determine which of the best solves the problem, given the criteria and the constraints.	<p><b>SE/TE:</b> STEM Quest Kickoff: Be a Message Master, 102-103 uInvestigate Lab: How can information from waves be translated?, 135 Engineering Practices Toolbox: Design Solutions, 139 Quest Check-In: Compare Codes, 140 Quest Findings: Be a Message Master, 142</p> <p><b>Realize™ Digital Resources: Waves and Information</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Be a Message Master &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Be a Message Master</p>

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<b>Science and Engineering Practices</b>	
<p><b>Constructing Explanations and Designing Solutions</b> Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.</p>	<p><b>SE/TE:</b> STEM Quest Kickoff: Be a Message Master, 102-103 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 uInvestigate Lab: How can information from waves be translated?, 135 Engineering Practices Toolbox: Design Solutions, 139 Quest Check-In: Compare Codes, 140 Science and Engineering Practices Handbook: Engineering Practices: Designing Solutions, EM11 Science and Engineering Practices Handbook: Engineering Practices: Optimizing Solutions, EM13</p> <p><b>Realize™ Digital Resources: Waves and Information</b> &gt;Topic Launch&gt;Quest Kickoff&gt;Video: Be a Message Master &gt;Topic Close&gt;Quest Findings&gt;Interactivity: Be a Message Master</p>
<b>Crosscutting Concepts</b>	
<p><b>Patterns</b> Similarities and differences in patterns can be used to sort and classify designed products.</p>	<p><b>SE/TE:</b> Digital and Analog Signals, 138</p> <p><b>Realize™ Digital Resources: Waves and Information</b> &gt;Lesson 4, Waves and Information&gt;Video: Waves and Information;&gt;Virtual Lab: Call the Galactic Neighbors;&gt;Interactivity: Sending and Receiving Information</p>

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<b>4-LS1 From Molecules to Organisms: Structures and Processes</b>	
<b>Performance Expectation 4-LS1-1</b>	
<p>Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p>	<p><b>SE/TE:</b>  <ul style="list-style-type: none"> <li>uInvestigate Lab: What parts are inside a flower?, 283</li> <li>Visual Literacy Connection What are some functions of internal leaf structures?, 286-287</li> <li>Quest Check-In Lab: How can you observe a plant’s vascular system in action?, 290-291</li> <li>Visual Literacy Connection: Which structures do flowering plants use to reproduce?, 296-297</li> <li>uInvestigate Lab: How can you compare the stomachs of cows and dogs?, 301</li> <li>Visual Literacy Connection: How do lungs and gills compare?, 304-305</li> <li>Solve it with Science: Why do animals shed their exoskeletons?, 315</li> <li>Topic Assessment, 328-329</li> <li>Evidence-Based Assessment, 330-331</li> </ul> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 1, Internal Structures and Functions of Plants&gt; Interactivity: The Structure of Flowers            &gt;Lesson 2, External Structures and Functions of Plants&gt; Virtual Lab: Partners in Pollination            &gt;Lesson 3, Internal Structures and Functions of Animals&gt; Interactivity: Eating Food and Making Food;&gt;Quiz: Internal Structures and Functions of Animals            &gt;Lesson 4, External Structures and Functions of Animals&gt; Interactivity: External Structures of Plants and Animals</p> </p>

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<b>Disciplinary Core Ideas</b>	
<p><b>LS1.A: Structure and Function</b> Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.</p>	<p><b>SE/TE:</b> Structures, 284 Functions, 285 Visual Literacy Connection What are some functions of internal leaf structures?, 286-287 Photosynthesis, 288 Quest Check-In Lab: How can you observe a plant's vascular system in action?, 290-291 External Structures of a Plant, 294 Stems and Their Coverings, 295 Visual Literacy Connection: Which structures do flowering plants use to reproduce?, 296-297 Investigate Lab: How can you compare the stomachs of cows and dogs?, 301 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 Quest Check-In: Fish Float and Sink, 307 STEM Investigate La: How can you design a protective insect shell?, 309 Visual Literacy Connection: What do exoskeletons do?, 310-311 Other External Structures of Animals, 312 Quest Check-In: Lobster Claws, 314 Solve it with Science: Why do animals shed their exoskeletons?, 315 Topic Assessment, 328-329 Evidence-Based Assessment, 330-331</p> <p><b>Realize™ Digital Resources:</b> <b>Structures and Functions</b> &gt;Lesson 1, Internal Structures and Functions of Plants&gt; Interactivity: The Structure of Flowers;&gt;Quiz: Internal Structures and Functions of Plants &gt;Lesson 2, External Structures and Functions of Plants&gt;Video: External Structures and Functions of Plants;&gt;Virtual Lab: Partners in Pollination &gt;Lesson 3, Internal Structures and Functions of Animals&gt; Interactivity: Eating Food and Making Food;&gt;Quiz: Internal Structures and Functions of Animals &gt;Lesson 4, External Structures and Functions of Animals&gt;Video: External Structures and Functions of Animals;&gt;Interactivity: External Structures of Plants and Animals;&gt;Quiz: External Structures and Functions of Animals</p>

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<b>Science and Engineering Practices</b>	
<p><b>Engaging in Argument from Evidence</b> Construct an argument with evidence, data, and/or a model.</p>	<p><b>SE/TE:</b>  <ul style="list-style-type: none"> <li>ulInvestigate Lab: What parts are inside a flower?, 283</li> <li>Visual Literacy Connection What are some functions of internal leaf structures?, 286-287</li> <li>Quest Check-In Lab: How can you observe a plant's vascular system in action?, 290-291</li> <li>ulInvestigate Lab: How are leaf coverings different?, 293</li> <li>Visual Literacy Connection: Which structures do flowering plants use to reproduce?, 296-297</li> <li>ulInvestigate Lab: How can you compare the stomachs of cows and dogs?, 301</li> <li>Visual Literacy Connection: How do lungs and gills compare?, 304-305</li> <li>Solve it with Science: Why do animals shed their exoskeletons?, 315</li> <li>Topic Assessment, 328-329</li> <li>Evidence-Based Assessment, 330-331</li> <li>Science Practices: Engaging in Arguments from Evidence, EM7</li> </ul> </p> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 1, Internal Structures and Functions of Plants&gt; Interactivity: The Structure of Flowers            &gt;Lesson 2, External Structures and Functions of Plants&gt; Virtual Lab: Partners in Pollination            &gt;Lesson 3, Internal Structures and Functions of Animals&gt; Interactivity: Eating Food and Making Food;&gt;Quiz: Internal Structures and Functions of Animals            &gt;Lesson 4, External Structures and Functions of Animals&gt; Interactivity: External Structures of Plants and Animals</p>

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<b>Crosscutting Concepts</b>	
<p><b>Systems and System Models</b> A system can be described in terms of its components and their interactions.</p>	<p><b>SE/TE:</b> Structures, 284 Functions, 285 Photosynthesis, 288 Quest Check-In Lab: How can you observe a plant's vascular system in action?, 290-291 uConnect Lab: Which body parts work together to do a task?, 338 Tissues, Organs and Organ Systems, 342 Respiratory System, 343 Circulatory System, 344-345 Skeletal System, 352 Muscular System, 353 Visual Literacy Connection: How do we skate on ice?, 354-355 Digestive System, 368 Excretory System 370 Reproductive System, 371 Immune System 372-373 Topic Assessment, 378-379</p> <p><b>Realize™ Digital Resources:</b> <b>Structures and Functions</b> &gt;Lesson 1, Internal Structures and Functions of Plants&gt;Video: Internal Structures and Functions of Plants &gt;Lesson 3, Internal Structures and Functions of Animals&gt; Interactivity: Eating Food and Making Food</p> <p><b>Human Body Systems</b> &gt;Lesson 1, Circulatory and Respiratory Systems&gt;Video: Circulatory and Respiratory Systems;&gt;Interactivity: Follow the Flow;&gt;Quiz: Circulatory and Respiratory Systems &gt;Lesson 2, Skeleton, Muscles, and Skin&gt;Interactivity: Systems that Help You Move;&gt;Quiz: Skeleton, Muscles, and Skin &gt;Lesson 4, Digestive, Reproductive, and Other Systems&gt;Video: Digestive, Reproductive, and Other Systems&gt;Interactivity: Digested: Tale of the Eaten Apple;&gt;Quiz: Digestive, Reproductive, and Other Systems</p>



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<b>Performance Expectation 4-LS1-2</b>	
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.	<p><b>SE/TE:</b>            uInvestigate Lab: How can you locate an object using only sounds?, 317            uEngineer It! Model STEM: Eye See You!, 324-325            uInvestigate Lab: Which parts of the body are more sensitive?, 359            STEM Quest Check-In Lab: How can you test signals to and from your brain?, 364-365</p> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 5, Plant and Animal Responses to the Environment&gt;uEngineer It! Video: Eye see you!  <b>Human Body Systems</b>            &gt;Lesson 3, Nervous System&gt;Virtual Lab: Building a System</p>
<b>Disciplinary Core Ideas</b>	
<p><b>LS1.D: Information Processing</b>            Different sense receptors are specialized for particular kinds of information which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.</p>	<p><b>SE/TE:</b>            Engineering Connection, 316            uInvestigate Lab: How can you locate an object using only sounds?, 317            Visual Literacy Connection: How do elephants respond to stimuli?, 318-319            Animal Responses to Smell, 320            uBe a Scientist: Test Your Senses, 320            Quest Check-In: Sound Off!, 323            uEngineer It! Model STEM: Eye See You!, 324-325            uInvestigate Lab: Which parts of the body are more sensitive?, 359            Visual Connection: What are sensory organs?, 360-361            Brain, 362            uBe a Scientist: Reaction Time, 362            STEM Quest Check-In Lab: How can you test signals to and from your brain?, 364-365            uDemonstrate Lab: How do your sensory organs gather information?, 382-383</p> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 5, Plant and Animal Responses to the Environment&gt;Video: Plant and Animal Responses to the Environment;&gt;Interactivity: Plants and Animals Respond to the Environment;&gt;Quiz: Plant and Animal Responses to the Environment</p>

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<b>Science and Engineering Practices</b>	
<p><b>Developing and Using Models</b> Use a model to test interactions concerning the functioning of a natural system.</p>	<p><b>SE/TE:</b>  <ul style="list-style-type: none"> <li>uInvestigate Lab: How can you locate an object using only sounds?, 317</li> <li>uEngineer It! Model STEM: Eye See You!, 324-325</li> <li>uInvestigate Lab: Which parts of the body are more sensitive?, 359</li> <li>STEM Quest Check-In Lab: How can you test signals to and from your brain?, 364-365</li> <li>Science Practices: Developing and Using Models, EM6</li> </ul> </p> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 5, Plant and Animal Responses to the Environment&gt;uEngineer It! Video: Eye see you!  <b>Human Body Systems</b>            &gt;Lesson 3, Nervous System&gt;Virtual Lab: Building a System</p>
<b>Crosscutting Concepts</b>	
<p><b>Systems and System Models</b> A system can be described in terms of its components and their interactions.</p>	<p><b>SE/TE:</b>            Structures, 284            Functions, 285            Photosynthesis, 288            Quest Check-In Lab: How can you observe a plant's vascular system in action?, 290-291            uConnect Lab: Which body parts work together to do a task?, 338            Tissues, Organs and Organ Systems, 342            Respiratory System, 343            Circulatory System, 344-345            Skeletal System, 352            Muscular System, 353            Visual Literacy Connection: How do we skate on ice?, 354-355            Digestive System, 368            Excretory System 370            Reproductive System, 371            Immune System 372-373            Topic Assessment, 378-379</p> <p><b>Realize™ Digital Resources:</b>  <b>Structures and Functions</b>            &gt;Lesson 1, Internal Structures and Functions of Plants&gt;Video: Internal Structures and Functions of Plants            &gt;Lesson 3, Internal Structures and Functions of Animals&gt; Interactivity: Eating Food and Making Food</p>

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<b>4-ESS1 Earth’s Place in the Universe</b>	
<b>Performance Expectation 4-ESS1-1</b>	
<p>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><b>SE/TE:</b>            Quest Kickoff: Dig for the Truth, 244-245            uConnect Lab: Where are fossils found in rock layers?, 246            uInvestigate Lab: What patterns do fossils follow?, 249            Rock Formations, 251            A Colorful Change, 252            STEM Math Connection: Canyonlands, 255            uInvestigate Lab: How can rock layers show change?, 259            Fossil Clues on Earth, 260            Index Fossils, 261            Crosscutting Concepts Toolbox: Patterns, 261            Visual Literacy Connection: How can layers of rock change?, 262-263            Comparing Rock Layers, 264            uBe a Scientist: Be a Rock Hound, 264            Quest Findings: Dig for the Truth, 268            Topic Assessment, 270-271            Evidence-Based Assessment, 272-273            uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p><b>Realize™ Digital Resources:</b>  <b>History of the Planet Earth</b>            &gt;Lesson 1, Patterns in Fossils and Rock Formations&gt;Video: Patterns in Fossils and Rock Formations;&gt;Interactivity: Patterns in Fossils and Rock Formations;&gt;Quiz: Patterns in Fossils and Rock Formations            &gt;Lesson 2, Evidence of Change from Fossils and Rock Formations&gt;Video: Evidence of Change from Fossils and Rock Formations;&gt;Interactivity: Evidence of Change from Fossils and Rock Formations;&gt;Quiz: Evidence of Change from Fossils and Rock Formations</p>

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<b>Disciplinary Core Ideas</b>	
<p><b>ESS1.C: The History of Planet Earth</b> Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.</p>	<p><b>SE/TE:</b> Earthquakes, 210 uBe a Scientist: Earthquake Evidence, 210 Quest Kickoff: Dig for the Truth, 244-245 uConnect Lab: Where are fossils found in rock layers?, 246 uInvestigate Lab: What patterns do fossils follow?, 249 Rock Formations, 251 A Colorful Change, 252 STEM Math Connection: Canyonlands, 255 uInvestigate Lab: How can rock layers show change?, 259 Fossil Clues on Earth, 260 Index Fossils, 261 Crosscutting Concepts Toolbox: Patterns, 261 Visual Literacy Connection: How can layers of rock change?, 262-263 Comparing Rock Layers, 264 uBe a Scientist: Be a Rock Hound, 264 Quest Findings: Dig for the Truth, 268 Topic Assessment, 270-271 Evidence-Based Assessment, 272-273 uDemonstrate Lab: How can you correlate rock layers?, 274-275</p> <p><b>Realize™ Digital Resources:</b> <b>Earth’s Natural Hazards</b> &gt;Lesson 1, Tectonic Hazards&gt;Interactivity: Tectonic Events <b>History of the Planet Earth</b> &gt;Lesson 1, Patterns in Fossils and Rock Formations&gt;Video: Patterns in Fossils and Rock Formations;&gt;Interactivity: Patterns in Fossils and Rock Formations;&gt;Quiz: Patterns in Fossils and Rock Formations &gt;Lesson 2, Evidence of Change from Fossils and Rock Formations&gt;Video: Evidence of Change from Fossils and Rock Formations;&gt;Interactivity: Evidence of Change from Fossils and Rock Formations;&gt;Quiz: Evidence of Change from Fossils and Rock Formations</p>

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<b>Science and Engineering Practices</b>	
<p><b>Constructing Explanations and Designing Solutions</b> Identify the evidence that supports particular points in an explanation.</p>	<p><b>SE/TE:</b>            uBe a Scientist: Earthquake Evidence, 210            uConnect Lab: Where are fossils found in rock layers?, 246            uInvestigate Lab: What patterns do fossils follow?, 249            Quest Check-In: Existing Evidence, 254            uInvestigate Lab: How can rock layers show change?, 259            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            Science Practices: Constructing Explanations, EM6</p> <p><b>Realize™ Digital Resources:</b>  <b>History of the Planet Earth</b>            &gt;Lesson 1, Patterns in Fossils and Rock Formations&gt;Video: Patterns in Fossils and Rock Formations;&gt;Interactivity: Patterns in Fossils and Rock Formations            &gt;Lesson 2, Evidence of Change from Fossils and Rock Formations&gt;Video: Evidence of Change from Fossils and Rock Formations;&gt;Interactivity: Evidence of Change from Fossils and Rock Formations</p>

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<b>Crosscutting Concepts</b>	
<p><b>Patterns</b> Patterns can be used as evidence to support an explanation.</p>	<p><b>SE/TE:</b> uConnect Lab: Where are fossils found in rock layers?, 246 uInvestigate Lab: What patterns do fossils follow?, 249 uInvestigate Lab: How can rock layers show change?, 259 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><b>Realize™ Digital Resources:</b> <b>History of the Planet Earth</b> &gt;Lesson 1, Patterns in Fossils and Rock Formations&gt;Video: Patterns in Fossils and Rock Formations;&gt;Interactivity: Patterns in Fossils and Rock Formations;&gt;Quiz: Patterns in Fossils and Rock Formations</p>
<p><b>Scientific Knowledge Assumes an Order and Consistency in Natural Systems</b> Science assumes consistent patterns in natural systems.</p>	<p><b>SE/TE:</b> uConnect Lab: Where are fossils found in rock layers?, 246 uInvestigate Lab: What patterns do fossils follow?, 249 uInvestigate Lab: How can rock layers show change?, 259 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><b>Realize™ Digital Resources:</b> <b>History of the Planet Earth</b> &gt;Lesson 2, Evidence of Change from Fossils and Rock Formations&gt;Video: Evidence of Change from Fossils and Rock Formations;&gt;Interactivity: Evidence of Change from Fossils and Rock Formations;&gt;Quiz: Evidence of Change from Fossils and Rock Formations</p>

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<b>4-ESS2 Earth's Systems</b>	
<b>Performance Expectation 4-ESS2-1</b>	
Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	<p><b>SE/TE:</b>  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><b>Realize™ Digital Resources:</b>  <b>Earth's Features</b>  &gt;Lesson 4, Weathering and Erosion&gt;Interactivity: Our Changing Landscape</p>
<b>Disciplinary Core Ideas</b>	
<b>ESS2.A Earth Materials and Systems</b> 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><b>SE/TE:</b>  uConnect Lab: How can rain affect land?, 154  uInvestigate Lab: How can a rock wear away?, 185  Chemical Weathering, 186  Physical Weathering, 187  Erosion, 188  Movement of Particles, 189  Deposition, 190  Changes in Landforms over Time, 191  &gt;Lesson 4 Check, 191  STEM Quest Check-In Lab: How does water affect landforms?, 192  Extreme Science: Powerful Plants, 193  Topic Assessment, 196-197</p> <p><b>Realize™ Digital Resources:</b>  <b>Earth's Features</b>  &gt;Lesson 4, Weathering and Erosion&gt;Video: Weathering and Erosion;&gt; Interactivity: Our Changing Landscape;&gt;Quiz: Weathering and Erosion</p>
<b>ESS2.E Biogeology</b> Living things affect the physical characteristics of their regions.	<p><b>SE/TE:</b>  Extreme Science: Powerful Plants, 193</p> <p><b>Realize™ Digital Resources:</b>  <b>Earth's Features</b>  &gt;Lesson 4, Weathering and Erosion&gt;Interactivity: Our Changing Landscape</p>

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<b>Science and Engineering Practices</b>	
<p><b>Planning and Carrying Out Investigations</b> Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon.</p>	<p><b>SE/TE:</b> 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 Science Practices: Carry Out Investigations, EM1</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Features</b> &gt;Lesson 4, Weathering and Erosion&gt;Interactivity: Our Changing Landscape</p>
<b>Crosscutting Concepts</b>	
<p><b>Cause and Effect</b> Cause and effect relationships are routinely identified, tested, and used to explain change.</p>	<p><b>SE/TE:</b> uConnect Lab: How can rain affect land?, 154 uInvestigate Lab: How can a rock wear away?, 185 Chemical Weathering, 186 Physical Weathering, 187 Erosion, 188 Movement of Particles, 189 Deposition, 190 Changes in Landforms over Time, 191 &gt;Lesson 4 Check, 191 STEM Quest Check-In Lab: How does water affect landforms?, 192 Extreme Science: Powerful Plants, 193 Topic Assessment, 196-197 Volcanoes, 214 &gt;Lesson 1 Check, 214 Science Practice Toolbox: Cause and Effect, 229</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Features</b> &gt;Lesson 4, Weathering and Erosion&gt;Video: Weathering and Erosion;&gt; Interactivity: Our Changing Landscape;&gt;Quiz: Weathering and Erosion</p>



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<b>4-ESS3 Earth and Human Activity</b>	
<b>Performance Expectation 4-ESS3-1</b>	
<p>Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.</p>	<p><b>SE/TE:</b>  uConnect Lab: How are energy resources used?, 54  Using Energy/Fuels, 58  Fossil Fuels/Coal, 66  Crosscutting Concepts Toolbox: Energy and Matter, 66  Petroleum, 67  Visual Literacy Connection: Where do fossil fuels come from?, 68-69  Natural Gas, 70  Visual Literacy Connection: Is renewable energy all around?, 76-77  Renewable Fuel/Hydropower, 78  Crosscutting Concepts Toolbox: Energy and Matter, 78  Energy That Does Not Run Out, 79  Impact of Energy Production, 86  Impact of Obtaining Fuel, 87  Science Practice Toolbox: Obtaining and Evaluating Information, 87  Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89  Impact of Transporting Fuels, 90  Topic Assessment, 94-95  Evidence-Based Assessment, 96-97  uDemonstrate Lab: How can energy resource usage change?, 98-99</p> <p><b>Realize™ Digital Resources:</b>  <b>Human Uses of Energy</b>  &gt;Lesson 1, Energy Conversions&gt;Video: Natural Resources and Energy;&gt;Quiz: Energy Conversions  &gt;Lesson 2, Nonrenewable Energy Sources&gt;Video: Nonrenewable Energy Sources;&gt;Interactivity: Fossil Fuels;&gt;Quiz: Nonrenewable Energy Sources  &gt;Lesson 3, Renewable Energy Sources&gt;Video: Renewable Energy Sources;&gt;Interactivity: Natural Resources;&gt;Quiz: Renewable Energy Sources  &gt;Lesson 4, Environmental Impacts of Energy Use&gt;Video: Environmental Impacts of Using Energy;&gt;Interactivity: Human Activity and the Environment;&gt;Quiz: Environmental Impacts of Energy Use</p>

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<b>Disciplinary Core Ideas</b>	
<p><b>ESS3.A Natural Resources</b> Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not.</p>	<p><b>SE/TE:</b> uConnect Lab: How are energy resources used?, 54 Using Energy/Fuels, 58 Fossil Fuels/Coal, 66 Crosscutting Concepts Toolbox: Energy and Matter, 66 Petroleum, 67 Visual Literacy Connection: Where do fossil fuels come from?, 68-69 Natural Gas, 70 Visual Literacy Connection: Is renewable energy all around?, 76-77 Renewable Fuel/Hydropower, 78 Crosscutting Concepts Toolbox: Energy and Matter, 78 Energy That Does Not Run Out, 79 Impact of Energy Production, 86 Impact of Obtaining Fuel, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 Topic Assessment, 94-95 Evidence-Based Assessment, 96-97 uDemonstrate Lab: How can energy resource usage change?, 98-99</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Lesson 1, Energy Conversions&gt;Video: Natural Resources and Energy;&gt;Quiz: Energy Conversions &gt;Lesson 2, Nonrenewable Energy Sources&gt;Video: Nonrenewable Energy Sources;&gt;Interactivity: Fossil Fuels;&gt;Quiz: Nonrenewable Energy Sources &gt;Lesson 3, Renewable Energy Sources&gt;Video: Renewable Energy Sources;&gt;Interactivity: Natural Resources;&gt;Quiz: Renewable Energy Sources &gt;Lesson 4, Environmental Impacts of Energy Use&gt;Video: Environmental Impacts of Using Energy;&gt;Interactivity: Human Activity and the Environment;&gt;Quiz: Environmental Impacts of Energy Use</p>

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<b>Science and Engineering Practices</b>	
<p><b>Obtaining, Evaluating, and Communicating Information</b> Obtain and combine information from books and other reliable media to explain phenomena.</p>	<p><b>SE/TE:</b> uConnect Lab: How are energy resources used?, 54 Using Energy/Fuels, 58 Fossil Fuels/Coal, 66 Crosscutting Concepts Toolbox: Energy and Matter, 66 Petroleum, 67 Visual Literacy Connection: Where do fossil fuels come from?, 68-69 Natural Gas, 70 Visual Literacy Connection: Is renewable energy all around?, 76-77 Renewable Fuel/Hydropower, 78 Crosscutting Concepts Toolbox: Energy and Matter, 78 Energy That Does Not Run Out, 79 Impact of Energy Production, 86 Impact of Obtaining Fuel, 87 Science Practice Toolbox: Obtaining and Evaluating Information, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 Topic Assessment, 94-95 Evidence-Based Assessment, 96-97 uDemonstrate Lab: How can energy resource usage change?, 98-99 Science Practices: Habits of Mind, EM8</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Lesson 1, Energy Conversions&gt;Video: Natural Resources and Energy;&gt;Quiz: Energy Conversions &gt;Lesson 2, Nonrenewable Energy Sources&gt;Video: Nonrenewable Energy Sources;&gt;Interactivity: Fossil Fuels;&gt;Quiz: Nonrenewable Energy Sources &gt;Lesson 3, Renewable Energy Sources&gt;Video: Renewable Energy Sources;&gt;Interactivity: Natural Resources;&gt;Quiz: Renewable Energy Sources &gt;Lesson 4, Environmental Impacts of Energy Use&gt;Video: Environmental Impacts of Using Energy;&gt;Interactivity: Human Activity and the Environment;&gt;Quiz: Environmental Impacts of Energy Use</p>

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<b>Crosscutting Concepts</b>	
<p><b>Cause and Effect</b> Cause and effect relationships are routinely identified and used to explain change.</p>	<p><b>SE/TE:</b> Impact of Energy Production, 86 Impact of Obtaining Fuel, 87 Visual Literacy Connection: How can the use of energy damage ecosystems?, 88-89 Impact of Transporting Fuels, 90 Evidence-Based Assessment, 96-97</p> <p><b>Realize™ Digital Resources:</b> <b>Human Uses of Energy</b> &gt;Lesson 4, Environmental Impacts of Energy Use&gt;Video: Environmental Impacts of Using Energy;&gt;Interactivity: Human Activity and the Environment;&gt;Quiz: Environmental Impacts of Energy Use</p>
<b>Performance Expectation 4-ESS3-2</b>	
<p>Generate and compare multiple solutions to reduce the impacts of natural Earth Processes on humans.</p>	<p><b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 uEngineer It! Design STEM Warning!, 216-217 Quest Check-In: Water Warnings, 224 STEM uInvestigate lab: Where should you build an earthquake-safe structure?, 227 Plan It!, 228 &gt;Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234 STEM uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> &gt;Lesson 3, Impacts of Natural Hazards&gt;Virtual Lab: Withstanding Earth's Natural Hazards</p>

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<b>Disciplinary Core Ideas</b>	
<p><b>ESS3.B Natural Hazards</b> A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts.</p>	<p><b>SE/TE:</b> Quest Kickoff: Protect the City! Hazard Incoming!, 204-205 Curriculum Connection, 208 Earthquakes, 210 Hazards of Earthquakes, 211 Quest Connection, 211 Visual Literacy Connection: What happens during a tsunami?, 212-213 Volcanoes, 214 Quest Check-In: Beware Hot Ash!, 215 Engineering Connection, 226 Long-Term Effects of Hazards, 229 When Hazards Strike, 231 Quest Findings: Protect the City! Hazard Incoming!, 234</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> &gt;Lesson 1, Tectonic Hazards&gt;Video: Tectonic Hazards;&gt;Interactivity: Tectonic Events;&gt;Quiz: Tectonic Hazards &gt;Lesson 3, Impacts of Natural Hazards&gt;Video: Impacts of Natural Hazards;&gt;Virtual Lab: Withstanding Earth's Natural Hazards;&gt;Quiz: Impacts of Natural Hazards</p>
<p><b>ETS1.B Designing Solutions to Engineering Problems</b> Testing a solution involves investigating how well it performs under a range of likely conditions.</p>	<p><b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 uInvestigate Lab: How can a large wave affect land?, 209 uEngineer It! Design STEM: Warning!, 216-217 STEM uInvestigate Lab: Where should you build an earthquake-safe structure?, 227 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 STEM uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241</p>

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<b>Science and Engineering Practices</b>	
<p><b>Constructing Explanations and Designing Solutions</b> Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.</p>	<p><b>SE/TE:</b> Quest Kickoff: Protect the City! Hazard Incoming!, 204-205 uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware Hot Ash!, 215 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234 STEM uDemonstrate Lab: How can homes be designed to be more earthquake resistant?, 240-241 Engineering Practices: Designing Solutions: EM11</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> &gt;Lesson 3, Impacts of Natural Hazards&gt;Virtual Lab: Withstanding Earth's Natural Hazards</p>
<b>Crosscutting Concepts</b>	
<p><b>Cause and Effect</b> Cause and effect relationships are routinely identified, tested, and used to explain change.</p>	<p><b>SE/TE:</b> Literacy Connection: Cause and Effect, 207 Curriculum Connection, 208 Earthquakes, 210 uBe a Scientist: Earthquake Evidence, 210 Hazards of Earthquakes, 211 Visual Literacy Connection: What happens during a tsunami?, 212-213 Volcanoes, 214 &gt;Lesson 1 Check, 214 Engineering Connection, 226 Short-Term Effects of Hazards, 228 Long-Term Effects of Hazards, 229 Science Practice Toolbox: Cause and Effect, 229 Topic Assessment, 236-237 Evidence-Based Assessment, 238-239</p> <p><b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> &gt;Lesson 1, Tectonic Hazards&gt;Video: Tectonic Hazards;&gt;Interactivity: Tectonic Events;&gt;Quiz: Tectonic Hazards &gt;Lesson 3, Impacts of Natural Hazards&gt;Video: Impacts of Natural Hazards;&gt; Quiz: Impacts of Natural Hazards</p>

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<b>3-5 ETS1 Engineering, Science, and the Application of Technology</b>	
<b>Performance Expectation 4-ETS1-1</b>	
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	<b>SE/TE:</b> Quest Kickoff STEM: Let Plants and Animals Inspire You!, 278-279 STEM ulnvestigate Lab: How can you design a protective insect shell?, 309 Quest Check-In: Lobster Claws, 314 Quest Findings STEM: Let Plants and Animals Inspire You!, 326 Engineering Practices: Defining Problems, EM10
<b>Disciplinary Core Ideas</b>	
<b>ETS1.A: Defining and Delimiting Engineering Problems</b> Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). 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.	<b>SE/TE:</b> Engineering Practices Toolbox: Design Solutions, 139 Quest Kickoff STEM: Let Plants and Animals Inspire You!, 278-279 STEM ulnvestigate Lab: How can you design a protective insect shell?, 309 Quest Check-In: Lobster Claws, 314 Quest Findings STEM: Let Plants and Animals Inspire You!, 326 Engineering Practices: Designing Solutions, EM11  <b>Realize™ Digital Resources:</b> <b>Human Body Systems</b> >Lesson 3, Nervous System>Virtual Lab: Building a System
<b>Science and Engineering Practices</b>	
<b>Asking Questions and Defining Problems</b> Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.	<b>SE/TE:</b> Quest Kickoff STEM: Let Plants and Animals Inspire You!, 278-279 STEM ulnvestigate Lab: How can you design a protective insect shell?, 309 Quest Check-In: Lobster Claws, 314 Quest Findings STEM: Let Plants and Animals Inspire You!, 326 Engineering Practices: Defining Problems, EM10
<b>Crosscutting Concepts</b>	
<b>Influence of Engineering, Technology, and Science on Society and the Natural World</b> People’s needs and wants change over time, as do their demands for new and improved technologies.	<b>SE/TE:</b> Technology Mimics Life, 139

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<b>Performance Expectation 4-ETS1-2</b>	
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234
<b>Disciplinary Core Ideas</b>	
<b>ETS1.B: Developing Possible Solutions</b> Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs.	<b>SE/TE:</b> uInvestigate Lab: How can a rock wear away?, 185 STEM Quest Check-In Lab: How does water affect landforms?, 192 Quest Check-In: Beware: Hot Ash!, 215 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234  <b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> uEngineer It! Interactivity: Bridging the Gap
<b>Science and Engineering Practices</b>	
<b>Constructing Explanations and Designing Solutions</b> Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234 Engineering Practices: Designing Solutions, EM11 Engineering Practices: Optimizing Solutions, EM13
<b>Crosscutting Concepts</b>	
<b>Influence of Engineering, Technology, and Science on Society and the Natural World</b> Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.	<b>SE/TE:</b> Science Practice Toolbox: Ask Questions, 187 uEngineer It! Design STEM: Warning!, 216-217  <b>Realize™ Digital Resources:</b> <b>Earth's Natural Hazards</b> uEngineer It! Interactivity: Bridging the Gap



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<b>Performance Expectation 4-ETS1-3</b>	
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234
<b>Disciplinary Core Ideas</b>	
<b>ETS1.B: Developing Possible Solutions</b> Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234EM11
<b>ETS1.C: Optimizing the Design Solution</b> Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234
<b>Science and Engineering Practices</b>	
<b>Planning and Carrying Out Investigations</b> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.	<b>SE/TE:</b> uConnect Lab: How can you reduce the impact of rapidly sliding soil?, 206 Quest Check-In: Beware: Hot Ash!, 215 >Lesson 3 Check, 231 STEM Quest Check-In Lab: How can you reduce hazard damage?, 232-233 Quest Findings: Protect the City! Hazard Incoming!, 234

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