Next Generation Science Standards* Correlation

Engineering Design	Where You Will Find It
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	**Skills Handbook:** P2.1, P2.2 **STEM Activities:** Chapter 1 STEM Activity Chapter 2 STEM Activity Chapter 3 STEM Activity Chapter 4 STEM Activity Chapter 5 STEM Activity Chapter 6 STEM Activity Part 1 STEM Activity Part 2 STEM Activity **Inquiry Labs:** Chapter 3 Try It! Chapter 3 Lesson 2 Explore It! Chapter 3 Investigate It! Chapter 4 Lesson 4 Explore It! Chapter 6 Investigate It! Part 1 Investigate It! Part 2 Try It! Part 2 Lesson 2 Explore It! Part 2 Investigate It! Part 2 Design It!
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.	**Skills Handbook:** P2.1, P2.2 **STEM Activities:** Chapter 1 STEM Activity Chapter 2 STEM Activity Chapter 3 STEM Activity Chapter 4 STEM Activity Chapter 5 STEM Activity Chapter 6 STEM Activity Part 1 STEM Activity Part 2 STEM Activity **Inquiry Labs:** Part 1 Investigate It! Part 2 Try It! Part 2 Investigate It! Part 2 Design It!
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype.	**Skills Handbook:** P2.1, P2.2 **STEM Activities:** Chapter 1 STEM Activity Chapter 2 STEM Activity Chapter 3 STEM Activity Chapter 4 STEM Activity Chapter 5 STEM Activity Chapter 6 STEM Activity Part 1 STEM Activity Part 2 STEM Activity **Inquiry Labs:** Chapter 3 Try It! Chapter 3 Lesson 2 Explore It! Chapter 3 Investigate It! Chapter 4 Lesson 4 Explore It! Chapter 6 Investigate It! Part 1 Investigate It! Part 2 Try It! Part 2 Lesson 2 Explore It! Part 2 Investigate It! Part 2 Design It!

Energy

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Definitions of Energy: • The faster a given object is moving, the more energy it possesses.	**Lessons:** 1.1, 2.2	*Students who demonstrate understanding can:* **Use evidence to construct an explanation relating the speed of an object to the energy of that object.** **Clarification Statement:** N/A **Assessment Boundary:** Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.

Crosscutting Concepts: Energy and Matter — **Chapter 1 and Chapter 2**
• Energy can be transferred in various ways and between objects.

Science and Engineering Practices: Constructing Explanations and Designing Solutions
• Use evidence (e.g., measurements, observations, patterns) to construct an explanation.

ELA/Literacy	Mathematics
• Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. • Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. • Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. • Draw evidence from literary or informational texts to support analysis, reflection, and research.	• Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. • Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement sc. • Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111a. These activities may be used with Chapter 1 or 2.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Energy

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Definitions of Energy: • Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	**Lessons:** 1.1, 3.1, 3.2	*Students who demonstrate understanding can:* **Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.** **Clarification Statement:** N/A **Assessment Boundary:** Assessment does not include quantitative measurements of energy.
Conservation of Energy and Energy Transfer: • 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.	**Lessons:** 1.1, 1.2, 1.4, 2.1, 3.2	
• Light also transfers energy from place to place.	**Lessons:** 1.3, 3.2	
• 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.	**Lessons:** 1.2, 1.2, 3.1, 3.2	

Crosscutting Concepts: Energy and Matter
• Energy can be transferred in various ways and between objects.

Chapter 1 and 3

Science and Engineering Practices: Planning and Carrying Out Investigations
• Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	• Model with mathematics. • Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition Guide* on page 111b. These activities may be used with Chapter 1 or 3.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Energy

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Definitions of Energy: • Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	**Lesson:** 1.1	*Students who demonstrate understanding can:* **Ask questions and predict outcomes about the changes in energy that occur when objects collide.** **Clarification Statement:** Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact. **Assessment Boundary** Assessment does not include quantitative measurements of energy.
Conservation of Energy and Energy Transfer: • 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.	**Lesson:** 1.1 **Lesson:** 2.1 **Lessons:** 1.2, 2.1	
Relationship Between Energy and Forces: • When objects collide, the contact forces transfer energy so as to change the objects' motions.	**Lesson:** 2.1	

Crosscutting Concepts: Energy and Matter — **Chapter 1 and 2**
• Energy can be transferred in various ways and between objects.

Science and Engineering Practices: Asking Questions and Defining Problems
• Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	**N/A**

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111c. These activities may be used with Chapter 1 or 2.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Energy

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Conservation of Energy and Energy Transfer: • Energy can also be transferred from place to place by electrical 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.	**Lessons:** 1.2, 3.1, 3.2	*Students who demonstrate understanding can:* **Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*** **Clarification Statement:** Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device. **Assessment Boundary:** Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light or sound.
Energy in Chemical Processes and Everyday Life: • The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use.	**Lesson:** 1.1	
Defining Engineering Problems: • 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.	**Skills Handbook:** P2.1, P2.2	

Crosscutting Concepts: Energy and Matter
• Energy can be transferred in various ways and between objects.

Chapter 1, 3, and Skills Handbook P2

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World
• Engineers improve existing technologies or develop new ones.

Connections to Nature of Science

Science is a Human Endeavor
• Most scientists and engineers work in teams.
• Science affects everyday life.

Science and Engineering Practices: Constructing Explanations and Designing Solutions
• Apply scientific ideas to solve design problems.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	• Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111d. These activities may be used with Chapter 1 or 3.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Energy

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Natural Resources: • 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.	**Lessons:** 5.3, 5.5	*Students who demonstrate understanding can:* **Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.** **Clarification Statement:** Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels. **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect **Chapter 5**
• Cause and effect relationships are routinely identified and used to explain change.

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology
• Knowledge of relevant scientific concepts and research findings is important in engineering.

Influence of Engineering, Technology, and Science on Society and the Natural World
• Over time, people's needs and wants change, as do their demands for new and improved technologies.

Science and Engineering Practices: Obtaining, Evaluating, and Communicating Information
• Obtain and combine information from books and other reliable media to explain phenomena.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. • Draw evidence from literary or informational texts to support analysis, reflection, and research.	• Reason abstractly and quantitatively. • Model with mathematics. • Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 229a. These activities may be used with Chapter 5.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Waves: Waves and Information

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Wave Properties: • 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 wave except when the water meets a beach. • Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).	**Lessons:** 1.2 **Lesson:** 1.2	*Students who demonstrate understanding can:* **Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.** **Clarification Statement:** Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves. **Assessment Boundary:** Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.

Crosscutting Concepts: Patterns

Chapter 1

• Similarities and differences in patterns can be used to sort and classify natural phenomena.

Science and Engineering Practices: Developing and Using Models

• Develop a model using an analogy, example, or abstract representation to describe a scientific principle.

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

• Science findings are based on recognizing patterns.

ELA/Literacy	Mathematics
• Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	• Model with mathematics. • Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111e. These activities may be used with Chapter 1.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Waves: Waves and Information

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Information Technologies and Instrumentation: • 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.	**Lessons:** 1.1, 1.2 **Skills Handbook:** P2.1	*Students who demonstrate understanding can:* **Generate and compare multiple solutions that use patterns to transfer information.*** **Clarification Statement:** Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text. **Assessment Boundary:** N/A
Optimizing The Design Solution: • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	**Skills Handbook:** P2.2	

Crosscutting Concepts: Patterns — **Chapter 1 and Skills Handbook P2**
- Similarities and differences in patterns can be used to sort and classify designed products.

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology
- Knowledge of relevant scientific concepts and research findings is important in engineering.

Science and Engineering Practices: Constructing Explanations and Designing Solutions
- Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

ELA/Literacy	Mathematics
• Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. • Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	N/A

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111f. These activities may be used with Chapter 1.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Structure, Function, and Information Processing

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Electromagnetic Radiation: • An object can be seen when light reflected from its surface enters the eyes.	**Lesson:** 1.3	*Students who demonstrate understanding can:* **Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** **Clarification Statement:** N/A **Assessment Boundary:** Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified.

Chapter 1

Science and Engineering Practices: Developing and Using Models
• Develop a model to describe phenomena.

ELA/Literacy	Mathematics
• Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	• Model with mathematics. • Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 111g. These activities may be used with Chapter 1.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Structure, Function, and Information Processing

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Structure and Function: • Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	**Lessons:** 4.1, 4.2, 4.3, 4.4, 4.5	*Students who demonstrate understanding can:* **Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** **Clarification Statement:** Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. **Assessment Boundary:** Assessment is limited to macroscopic structures within plant and animal systems.

Crosscutting Concepts: Systems and System Models
• A system can be described in terms of its components and their interactions.

Chapter 4

Science and Engineering Practices: Engaging in Argument from Evidence
• Construct an argument with evidence, data, and/or a model.

ELA/Literacy	Mathematics
• Write opinion pieces on topics or texts, supporting a point of view with reasons and information.	• Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 229a. These activities may be used with Chapter 4.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Structure, Function, and Information Processing

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Information Processing: • 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.	**Lesson:** 4.6	**4-LS1-2** *Students who demonstrate understanding can:* **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.** **Clarification Statement:** Emphasis is on systems of information transfer. **Assessment Boundary:** Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.

Crosscutting Concepts: Systems and System Models
• A system can be described in terms of its components and their interactions.

Chapter 4

Science and Engineering Practices: Developing and Using Models
• Use a model to test interactions concerning the functioning of a natural system.

ELA/Literacy	Mathematics
• Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.	N/A

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 229b. These activities may be used with Chapter 4.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Earth's Systems: Processes that Shape the Earth

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
The History of Planet Earth: • 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.	**Lessons:** 5.5, 6.2, 6.4	*Students who demonstrate understanding can:* **Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.** **Clarification Statement:** Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock. **Assessment Boundary:** Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.

Crosscutting Concepts: Patterns — **Chapter 5 and 6**
- Patterns can be used as evidence to support an explanation.

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems
- Science assumes consistent patterns in natural systems.

Science and Engineering Practices: Constructing Explanations and Designing Solutions
- Identify the evidence that supports particular points in an explanation.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. • Draw evidence from literary or informational texts to support analysis, reflection, and research.	• Reason abstractly and quantitatively. • Model with mathematics. • Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on pages 229c or 295d. These activities may be used with Chapter 5 or 6.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Earth's Systems: Processes that Shape the Earth

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Earth Materials and Systems: • Rainfall helps to shape the land and affects the type 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.	**Lesson:** 6.3	*Students who demonstrate understanding can:* **Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.** **Clarification Statement:** Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow. **Assessment Boundary:** Assessment is limited to a single form of weathering or erosion.
Biogeology • Living things affect the physical characteristics of their regions.	**Lessons:** 5.2, 6.3	

Crosscutting Concepts: Cause and Effect
• Cause and effect relationships are routinely identified, tested, and used to explain change.

Chapter 6

Science and Engineering Practices: Planning and Carrying Out Investigations
• Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge through investigation of different aspects of a topic. • Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	• Reason abstractly and quantitatively. • Model with mathematics. • Use appropriate tools strategically. • Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. • Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 295a. These activities may be used with Chapter 6.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Earth's Systems: Processes that Shape the Earth

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Plate Tectonics and Large-Scale System Interactions: • The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth.	**Lessons:** 6.3, 6.4	*Students who demonstrate understanding can:* **Analyze and interpret data from maps to describe patterns of Earth's features.** **Clarification Statement:** Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes. **Assessment Boundary:** N/A

Crosscutting Concepts: Patterns **Chapter 6**
• Patterns can be used as evidence to support an explanation.

Science and Engineering Practices: Analyzing and Interpreting Data
• Analyze and interpret data to make sense of phenomena using logical reasoning.

ELA/Literacy	Mathematics
• Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	• Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 295b. These activities may be used with Chapter 6.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

Earth's Systems: Processes that Shape the Earth

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Natural Hazards: • 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.	**Lessons:** 6.4	*Students who demonstrate understanding can:* **Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*** **Clarification Statement:** Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity. **Assessment Boundary:** Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.
Designing Solutions to Engineering Problems: • Testing a solution involves investigating how well it performs under a range of likely conditions.	**Skills Handbook:** P1.1, P1.4 ,P2.2	

Crosscutting Concepts: Cause and Effect

Chapter 6 and Skills Handbook P1, P2

• Cause and effect relationships are routinely identified and used to explain change.

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World

• Engineers improve existing technologies or develop new ones to increase their benefits, to decrease known risks, and to meet societal demands.

Science and Engineering Practices: Constructing Explanations and Designing Solutions

• Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

ELA/Literacy	Mathematics
• Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. • Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	• Reason abstractly and quantitatively. • Model with mathematics. • Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Activities for the Performance Expectation as well as the ELA/Literacy and/or Mathematics connections can be found in the *Teacher's Edition* on page 295c. These activities may be used with Chapter 6.

* The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.