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, P2.3 **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 2 Try It! Part 1 Try It! Part 2 Try It! Part 2 Investigate It! 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, P2.3 **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 Try It! Part 2 Try It! Part 2 Investigate It! 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:** P2.2, P2.3 **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 2 Try It! Part 1 Try It! Part 2 Try It! Part 2 Investigate It! Design It!

Forces and Interactions

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Forces and Motion: • Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.)	**Lesson:** 1.2	*Students who demonstrate understanding can:* **Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.** **Clarification Statement:** Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all. **Assessment Boundary:** Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.
Types of Interactions: • Objects in contact exert forces on each other.	**Lesson:** 1.2	

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

Chapter 1

Science and Engineering Practices: Planning and Carrying Out Investigations
• 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.

Connections to Nature of Science

Scientific Investigations Use a Variety of Methods
• Science investigations use a variety of methods, tools, and techniques.

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Conduct short research projects that build knowledge about a topic. • Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.	• Reason abstractly and quantitatively. • Use appropriate tools strategically. • Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

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 99a. 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.

Forces and Interactions

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Forces and Motion: • The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.)	**Lesson:** 1.1	*Students who demonstrate understanding can:* **Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.** **Clarification Statement:** Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw. **Assessment Boundary:** Assessment does not include technical terms such as period and frequency.

Crosscutting Concepts: Patterns

• Patterns of change can be used to make predictions.

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 or test a design solution.

Connections to Nature of Science

Science Knowledge is Based on Empirical Evidence

• Science findings are based on recognizing patterns.

ELA/Literacy	Mathematics
• Conduct short research projects that build knowledge about a topic. • Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.	• Reason abstractly and quantitatively. • Construct viable arguments and critique the reasoning of others. • Model with mathematics. • Use appropriate tools strategically. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. • Develop understanding of fractions as numbers.

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 99b. These activities may be used with Chapter 1.

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Forces and Interactions

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Types of Interactions: • Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.	**Lesson:** 1.2, 2.6	*Students who demonstrate understanding can:* **Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.** **Clarification Statement:** Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force. **Assessment Boundary:** Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.

Crosscutting Concepts: Cause and Effect — **Chapters 1 and 2**
• Cause and effect relationships are routinely identified, tested, and used to explain change.

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

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). • Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.	• Make sense of problems and persevere in solving them. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

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 99c. These activities may be used with Chapter 1 or 2.

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Forces and Interactions

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Types of Interactions: • Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other.	**Lessons:** 1.2, 2.6	*Students who demonstrate understanding can:* **Define a simple design problem that can be solved by applying scientific ideas about magnets.*** **Clarification Statement:** Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other. **Assessment Boundary:** N/A

Crosscutting Concepts: *Connections to Engineering, Technology, and Applications of Science*

Chapters 1 and 2

Interdependence of Science, Engineering, and Technology

• Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process.

Science and Engineering Practices: Asking Questions and Defining Problems

• Define a simple problem that can be solved through the development of a new or improved object or tool.

ELA/Literacy	Mathematics
N/A	• Make sense of problems and persevere in solving them. • Model with mathematics. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units -- whole numbers, halves, or quarters. • Develop understanding of fractions as numbers.

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 99d. 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.

Inheritance and Variation of Traits: Life Cycles and Traits

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Growth and Development of Organisms: • Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	**Lessons:** 3.1, 3.4, 3.5, 4.3	*Students who demonstrate understanding can:* **Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.** **Clarification Statement:** Changes different organisms go through during their life form a pattern. **Assessment Boundary:** Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.

Crosscutting Concepts: Patterns
• Patterns of change can be used to make predictions.

Chapters 3, 4, and 5

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

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence
• Science findings are based on recognizing patterns.

ELA/Literacy	Mathematics
• Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). • Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details.	• Model with mathematics. • Number and Operations in Base Ten • Number and Operations --Fractions

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 245a. These activities may be used with Chapter 3, 4, or 5.

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

Inheritance and Variation of Traits: Life Cycles and Traits

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Natural Selection: • Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.	**Lesson:** 4.2	*Students who demonstrate understanding can:* **Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.** **Clarification Statement:** Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring. **Assessment Boundary:** N/A

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

Chapter 4

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

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	• Reason abstractly and quantitatively. • Model with mathematics. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units --whole numbers, halves, or quarters.

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 245b. 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.

Inheritance and Variation of Traits: Life Cycles and Traits

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Inheritance of Traits: • Many characteristics of organisms are inherited from their parents.	**Lessons:** 3.4, 4.2	*Students who demonstrate understanding can:* **Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.** **Clarification Statement:** Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans. **Assessment Boundary:** Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.
Variation of Traits: • Different organisms vary in how they look and function because they have different inherited information.	**Lesson:** 4.2	

Crosscutting Concepts: Patterns — **Chapters 3 and 4**
- Similarities and differences in patterns can be used to sort and classify natural phenomena.

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

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	• Reason abstractly and quantitatively. • Model with mathematics. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

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 245c. These activities may be used with Chapter 3 or 4.

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

Inheritance and Variation of Traits: Life Cycles and Traits

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Inheritance of Traits: • Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment.	**Lessons:** 3.1, 4.2	*Students who demonstrate understanding can:* **Use evidence to support the explanation that traits can be influenced by the environment.** **Clarification Statement:** Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; a pet dog that is given too much food and little exercise may become overweight. **Assessment Boundary:** N/A
Variation in Traits: • The environment also affects the traits that an organism develops.	**Lessons:** 3.3, 4.2	

Crosscutting Concepts: Cause and Effect

Chapter 4

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

Science and Engineering Practices: Constructing Explanations and Designing Solutions

• Use evidence (e.g., observations, patterns) to support an explanation.

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	• Reason abstractly and quantitatively. • Model with mathematics. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units —whole numbers, halves, or quarters.

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 245d. 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.

Interdependent Relationships in Ecosystems

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Evidence of Common Ancestry and Diversity: • Some kinds of plants and animals that once lived on Earth are no longer found anywhere. • Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.	**Lesson:** 5.4 **Lesson:** 5.4	*Students who demonstrate understanding can:* **Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** **Clarification Statement:** Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms. **Assessment Boundary:** Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.

Crosscutting Concepts: Scale, Proportion, and Quantity **Chapter 5**
• Observable phenomena exist from very short to very long time periods.

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

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write opinion pieces on topics or texts, supporting a point of view with reasons. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.	• Reason abstractly and quantitatively. • Model with mathematics. • Use appropriate tools strategically. • Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units —whole numbers, halves, or quarters.

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 245e. 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.

Interdependent Relationships in Ecosystems

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Social Interactions and Group Behavior: • Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.	**Lesson:** 5.1	*Students who demonstrate understanding can:* **Construct an argument that some animals form groups that help members survive.** **Clarification Statement:** N/A **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect

Chapter 5

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

Science and Engineering Practices: Engaging in Argument from Evidence

• Construct an argument with evidence, data, and/or a model.

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write opinion pieces on topics or texts, supporting a point of view with reasons.	• Model with mathematics. • Number and Operations in Base Ten

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 245f. 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.

Interdependent Relationships in Ecosystems

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Adaptation: • For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.	**Lessons:** 5.1, 5.3	*Students who demonstrate understanding can:* **Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.** **Clarification Statement:** Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other. **Assessment Boundary:** N/A

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

Science and Engineering Practices: Engaging in Argument from Evidence
• Construct an argument with evidence.

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write opinion pieces on topics or texts, supporting a point of view with reasons. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	• Reason abstractly and quantitatively. • Model with mathematics. • Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

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 245g. 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.

Interdependent Relationships in Ecosystems

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Ecosystem Dynamics, Functioning, and Resilience: • When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.	**Lessons:** 3.1, 5.1, 5.2, 5.3	*Students who demonstrate understanding can:* **Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*** **Clarification Statement:** Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms. **Assessment Boundary:** Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.
Biodiversity and Humans: • Populations live in a variety of habitats, and change in those habitats affects the organisms living there.	**Lessons:** 5.1, 5.3	

Crosscutting Concepts: Systems and System Models — **Chapters 3 and 5**
• A system can be described in terms of its components and their interactions.

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: Engaging in Argument from Evidence
• Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Determine the main idea of a text; recount the key details and explain how they support the main idea. • Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. • Write opinion pieces on topics or texts, supporting a point of view with reasons. • Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.	• Reason abstractly and quantitatively. • Model with mathematics.

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 245h. These activities may be used with Chapter 3 or 5.

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

Weather and Climate

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Weather and Climate: • Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next.	**Lessons:** 6.2, 6.3	*Students who demonstrate understanding can:* **Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** **Clarification Statement:** Examples of data at this grade level could include average temperature, precipitation, and wind direction. **Assessment Boundary:** Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.

Crosscutting Concepts: Patterns **Chapter 6**
• Patterns of change can be used to make predictions.

Science and Engineering Practices: Analyzing and Interpreting Data
• Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships.

ELA/Literacy	Mathematics
N/A	• Reason abstractly and quantitatively. • Model with mathematics. • Use appropriate tools strategically. • Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. • Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in bar graphs.

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 289a. 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.

Weather and Climate

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Weather and Climate: • Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years.	**Lesson:** 6.2	*Students who demonstrate understanding can:* **Obtain and combine information to describe climates in different regions of the world.** **Clarification Statement:** N/A **Assessment Boundary:** N/A

Crosscutting Concepts: Patterns
• Patterns of change can be used to make predictions.

Chapter 6

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

ELA/Literacy	Mathematics
• Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. • Compare and contrast the most important points and key details presented in two texts on the same topic. • Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.	• Reason abstractly and quantitatively. • Model with mathematics.

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 289b. 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.

Weather and Climate

Disciplinary Core Ideas	Where You Will Find It	Performance Expectations
Natural Hazards: • A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.	**Lesson:** 6.4	*Students who demonstrate understanding can:* **Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*** **Clarification Statement:** Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lighting rods. **Assessment Boundary:** N/A

Crosscutting Concepts: Cause and Effect

Chapter 6

• Cause and effect relationships are routinely identified, tested, 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 (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones).

Connections to Nature of Science

Science is a Human Endeavor

• Science affects everyday life.

Science and Engineering Practices: Engaging in Argument from Evidence

• Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

ELA/Literacy	Mathematics
• Write opinion pieces on topics or texts, supporting a point of view with reasons. • Conduct short research projects that build knowledge about a topic.	• Reason abstractly and quantitatively. • Model with mathematics.

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 289c. 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.