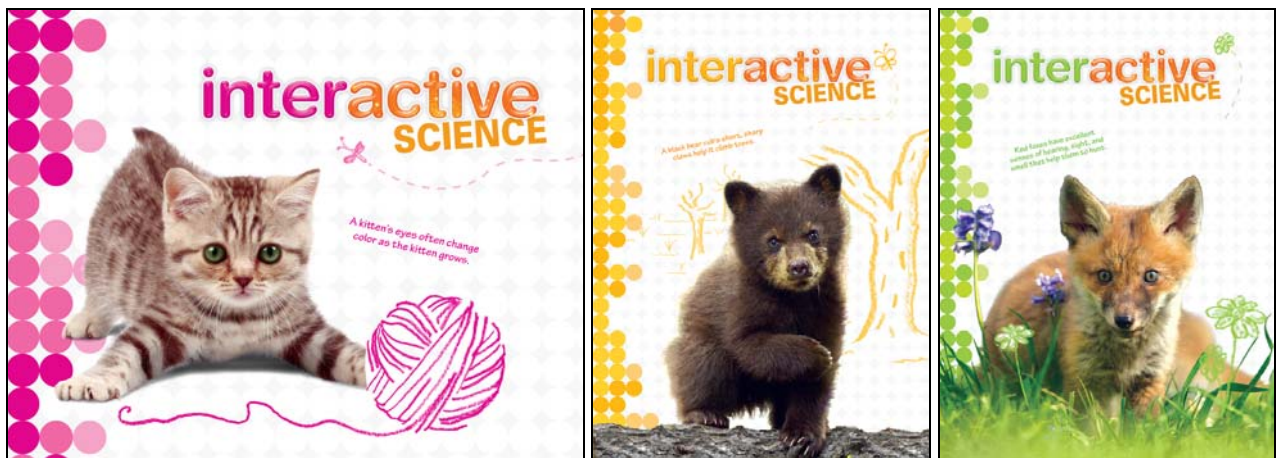


A Correlation of

Interactive Science

Grades Kindergarten - 2

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To the

2014 Oregon Science Standards (NGSS)

Oregon Department of Education Standards Arranged by Disciplinary Core Ideas

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K-LS1 From Molecules to Organisms: Structures and Processes		
<p>Students who demonstrate understanding can:</p> <p>K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.] Chapter 2 Performance Expectation Activity, 71a</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) <p>SE Only: 21, Try It!; 35, Lesson 3; 36, Lesson 4; 37, Lesson 5 TE Only: 41, SEP: Analyzing and Interpreting Data; 42, Try It!; 52-57; 71a, Performance Expectation Activity; 71a, ELA/Literacy</p> <hr/> <p>Connections to Nature of Science</p> <p>Scientific Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (K-LS1-1) <p>SE Only: 21, Try It!; Lesson 3; 36, Lesson 4; 37, Lesson 5 TE Only: 42, Try It!; 52-57; 71a, Performance Expectation Activity</p>	<p>LS1.C: Organization for Matter and Energy Flow in Organisms</p> <ul style="list-style-type: none"> All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1) <p>SE Only: 21, Try It!; 34, Lesson 2; 35, Lesson 3; 36, Lesson 4; 37, Lesson 5 TE Only: 36, Social Studies; 37, Rhyme; 39A-39B, Leveled Content Reader Support; 42, Try It!; 50-57; 58, 21st Century Learning; 66, Chapter 2 Test-Questions 3, 4; 67, Chapter 2 Test-Question 5; 69, Write Plant Sentences; 71a, Performance Expectation Activity; 71a, ELA/Literacy; 71c, Performance Expectation Activity</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) <p>SE Only: 21, Try It!; 35, Lesson 3; 36, Lesson 4; 37, Lesson 5 TE Only: 40, CCC: Patterns; 42, Try It!; 52-57; 69, Write Plant Sentences; 71a, Performance Expectation Activity</p>
<p><i>Connections to other DCIs in kindergarten:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 1.LS1.A (K-LS1-1); 2.LS2.A (K-LS1-1); 3.LS2.C (K-LS1-1); 3.LS4.B (K-LS1-1); 5.LS1.C (K-LS1-1); 5.LS2.A (K-LS1-1)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)</p> <p><i>Mathematics –</i></p> <p>K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-LS1-1)</p>		

NOTE:

Kindergarten includes:

From Molecules to Organisms: Structures and Processes, Earth’s Systems, Earth and Human Activity, Motion and Stability: Forces and Interactions, and Energy, Engineering Design

K-ESS2 Earth's Systems		
<p>Students who demonstrate understanding can:</p> <p>K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.] Chapter 3 Performance Expectation Activity, 109a</p> <p>K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.] Chapter 2 Performance Expectation Activity, 71b</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-ESS2-1) <p>SE Only: 42, Try It!; 55, Lesson 2; 56, Lesson 3 TE Only: xxxvi-xxxvii, QUEST; 77A-77B, Leveled Content Reader Support; 79, SEP: Analyzing and Interpreting Data; 88-91; 107, Make a Weather Calendar; 109a, Performance Expectation Activity; 109a, ELA/Literacy</p> <p>Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).</p> <ul style="list-style-type: none"> Construct an argument with evidence to support a claim. (K-ESS2-2) <p>SE Only: 38, Lesson 6 TE Only: 36, Social Studies; 58-59; 71b, Performance Expectation Activity</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">Connections to Nature of Science</p> <p>Science Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (K-ESS2-1) 	<p>ESS2.D: Weather and Climate</p> <ul style="list-style-type: none"> Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1) <p>SE Only: 42, Try It!; 57, Lesson 4 TE Only: xxxvi-xxxvii, QUEST; 80, Try It!; 92-93; 104, Chapter 3 Test-Questions 3, 4; 105, Chapter 3 Test-Question 6; 107, Make a Weather Calendar; 109a, Performance Expectation Activity; 109a, ELA/Literacy</p> <p>ESS2.E: Biogeology</p> <ul style="list-style-type: none"> Plants and animals can change their environment. (K-ESS2-2) <p>SE Only: 38, Lesson 6; 39 Investigate It! TE Only: 58-59; 60, Investigate It!; 67, Chapter 2 Test-Question 6</p> <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2) 	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (K-ESS2-1) <p>SE Only: 42, Try It!; 55, Lesson 2; 56, Lesson 3 TE Only: 78, CCC: Patterns; 80, Try It!; 77A-77B, Leveled Content Reader Support; 88-91; 107, Make a Weather Calendar; 109a, Performance Expectation Activity; 109a, ELA/Literacy</p> <p>Systems and System Models</p> <ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. (K-ESS2-2) <p>SE Only: 38, Lesson 6 TE Only: 58-59; 69, Make an Animal World; 71b, Performance Expectation Activity; 71c, Performance Expectation Activity</p>

<p>SE Only: 42, Try It!; 55, Lesson 2; 56, Lesson 3 TE Only: 77A-77B, Leveled Content Reader Support; 79, SEP: Analyzing and Interpreting Data; 80, Try It!; 88-91; 107, Make a Weather Calendar; 109a, Performance Expectation Activity; 109a, ELA/Literacy</p>		
<p><i>Connections to other DCIs in kindergarten:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 2.ESS2.A (K-ESS2-1); 3.ESS2.D (K-ESS2-1); 4.ESS2.A (K-ESS2-1); 4.ESS2.E (K-ESS2-2); 5.ESS2.A (K-ESS2-2)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)</p> <p>W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (K-ESS2-2)</p> <p>W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-ESS2-1)</p> <p>R.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)</p> <p><i>Mathematics –</i></p> <p>MP.2 Reason abstractly and quantitatively. (K-ESS2-1)</p> <p>MP.4 Model with mathematics. (K-ESS2-1)</p> <p>K.CC.A Know number names and the count sequence. (K-ESS2-1)</p> <p>K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-ESS2-1)</p> <p>K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count. (K-ESS2-1)</p>		

K-ESS3 Earth and Human Activity		
<p>Students who demonstrate understanding can:</p> <p>K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.] Chapter 2 Performance Expectation Activity, 71c</p> <p>K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.* [Clarification Statement: Emphasis is on local forms of severe weather.] Chapter 3 Performance Expectation Activity, 109b</p> <p>K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.* [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.] Chapter 3 Performance Expectation Activity, 109e</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the designed world. (K-ESS3-2) <p>SE Only: 44-53, STEM Activity; 75, Lesson 1; 65-74, STEM Activity TE Only: 82-83, STEM Activity; 109b, Performance Expectation Activity; 117, SEP: Asking Questions and Defining Problems; 124-125</p> <p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Use a model to represent relationships in the natural world. (K-ESS3-1) <p>SE Only: 23-32, STEM Activity; 39, Investigate It! TE Only: 44-45, STEM Activity; 60, Investigate It!; 64-65, Activity Card Support; 69, Make an Animal World; 71c, Performance Expectation Activity; 71c, ELA/Literacy</p>	<p>ESS3.A: Natural Resources</p> <ul style="list-style-type: none"> Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1) <p>SE Only: 21, Try It!; 34, Lesson 2; 35, Lesson 3; 36, Lesson 4; 37, Lesson 5; 58, Lesson 5 TE Only: 36, Social Studies; 37, Rhyme; 39A-39B, Leveled Content Reader Support; 42, Try It!; 50-57; 71a, ELA/Literacy; 71c, Performance Expectation Activity; 94-95</p> <p>ESS3.B: Natural Hazards</p> <ul style="list-style-type: none"> Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2) <p>SE Only: 61, Ready for the Weather TE Only: xxxvi-xxxvii, QUEST; 92, 21st Century Learning; 99, Activate Prior Knowledge; 99, Teach with Visuals; 109b, Performance Expectation Activity; 109b, ELA Literacy</p> <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-ESS3-2),(K-ESS3-3) <p>SE Only: 55, Lesson 2; 60, Investigate It!; TE Only: 78, CCC Patterns; 88, Envision It!; 88-89; 98, Investigate It!; 102-103, Activity Card Support</p> <p>SE Only: 21, Try It! 35, Lesson 3; 36, Lesson 4; 37, Lesson 5 TE Only: 40, Try It!; 49, Cause and Effect; 53, Explain; 53, Elaborate; 55, Elaborate; 57 Elaborate; 71b, Performance Expectation Activity</p> <p>Systems and System Models</p> <ul style="list-style-type: none"> Systems in the natural and designed world have parts that work together. (K-ESS3-1) <p>SE Only: 38, Lesson 6 TE Only: 58-59; 69, Make an Animal World; 71b, Performance Expectation Activity; 71c, Performance Expectation Activity</p>

<p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) <p>SE Only: 61, Ready for the Weather TE Only: xxxvi-xxxvii, QUEST; 74, Reading; 77A-77B, Leveled Content Reader Support; 81, 21st Century Learning; 92, 21st Century Learning; 96, 21st Century Learning; 99, Teach with Visuals; 109b, Performance Expectation Activity; 109c, ELA Literacy</p> <ul style="list-style-type: none"> Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas. (K-ESS3-3) <p>SE Only: 21, Try It!; 23-32, STEM Activity; TE Only: 42, Try It!; 44-45, STEM Activity; 69, Make an Animal World; 71c, Performance Expectation Activity; 71c, ELA/Literacy</p>	<p>SE Only: 38, Lesson 6; 59, Lesson 6 TE Only: 58-59; 96-97; 104, Chapter 3 Test–Question 2; 148, Social Studies; 109e, Performance Expectation Activity</p> <p>ETS1.A: Defining and Delimiting an Engineering Problem</p> <ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (<i>secondary to K-ESS3-2</i>) <p>SE Only: 42, Try It!; 44-53, STEM Activity; 60, Investigate It!; 75, Lesson 1; 76, Lesson 2; 79, Lesson 5 TE Only: xxxvi-xxxvii, QUEST; 80, Try It!; 82-83, STEM Activity; 98, Investigate It!; 107, Make a Weather Calendar; 109a, Performance Expectation Activity; 109b, Performance Expectation Activity; 109b, ELA/Literacy; 109c, Performance Expectation Activity; 124-127; 132-133</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (<i>secondary to K-ESS3-3</i>) <p>SE Only: 21, Try It!; 23-32, STEM Activity; 39, Investigate It! TE Only: 42, Try It! 43, Extend the Lesson; 44-45, STEM Activity; 60, Investigate It!; 67, Chapter 2 Test-Question 6; 69, Make an Animal World; 71a, ELA/Literacy; 109e, Performance Expectation Activity</p>	<p style="text-align: center;">----- Connections to Engineering, Technology, and Applications of Science</p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> People encounter questions about the natural world every day. (K-ESS3-2) <p>SE Only: 41, Chapter 3, Earth and Sky; 42, Try It!; 43, Draw Conclusions; 44-53, STEM Activity; 75, Lesson 1; TE Only: 77B, Leveled Content Reader Support; 78, Read Aloud: Is it night or day?; 80, Try It!; 82-83, STEM Activity; 109b, Performance Expectation Activity; 109b, ELA/Literacy; 124-125</p> <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <p>People depend on various technologies in their lives; human life would be very different without technology. (K-ESS3-2)</p> <p>SE Only: 61, Ready for the Weather TE Only: 81, 21st Century Learning; 92, 21st Century Learning; 99, Teach with Visuals</p>
<p><i>Connections to other DCIs in kindergarten:</i> K.ETS1.A (K-ESS3-2),(K-ESS3-3)</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 1.LS1.A (K-ESS3-1); 2.ESS1.C (K-ESS3-2); 2.ETS1.B (K-ESS3-3); 3.ESS3.B (K-ESS3-2); 4.ESS3.A (K-ESS3-3); 4.ESS3.B (K-ESS3-2); 5.LS2.A (K-ESS3-1); 5.ESS2.A (K-ESS3-1); 5.ESS3.C (K-ESS3-3)</p>		
<p><i>Common Core State Standards Connections:</i> <i>ELA/Literacy –</i></p> <p>RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-ESS3-2) W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (<i>K-ESS3-3</i>) SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-ESS3-2) SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail. (<i>K-ESS3-1</i>)</p> <p><i>Mathematics –</i></p> <p>MP.2 Reason abstractly and quantitatively. (<i>K-ESS3-1</i>) MP.4 Model with mathematics. (<i>K-ESS3-1</i>),(<i>K-ESS3-2</i>) K.CC Counting and Cardinality (<i>K-ESS3-1</i>),(<i>K-ESS3-2</i>)</p>		

K-PS2 Motion and Stability: Forces and Interactions	
<p>Students who demonstrate understanding can:</p> <p>K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.] Chapter 1 Performance Expectation Activity, 33a</p> <p>K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.* [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.] Chapter 1 Performance Expectation Activity, 33b</p>	

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1) <p>SE Only: 2, Try It!; 4-13, STEM Activity; 18, Investigate It!; 77, Lesson 3; 99, Investigate It! TE Only: 9, SEP: Planning and Carrying Out Investigations; 10, Inquiry; 12-13, STEM Activity; 24, Investigate It!; 28-29, Activity Card Support; 33a, Performance Expectation Activity; 33b, Performance Expectation Activity; 128-129; 166, Investigate It!</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2) <p>SE Only: 10-13, STEM Activity; 18, Investigate It!; 99, Investigate It! TE Only: 9, SEP: Planning and Carrying Out Investigations; 10, Inquiry; 12-13, STEM Activity; 24, Investigate It!; 33b, Performance Expectation Activity; 166, Investigate It!</p> <p>Connections to Nature of Science</p>	<p>PS2.A: Forces and Motion</p> <ul style="list-style-type: none"> Pushes and pulls can have different strengths and directions. (K-PS2-1),(K-PS2-2) <p>SE Only: 3, Let’s Read Science!; 10-11, STEM Activity; 15, Lesson 2; 16, Lesson 3; 17, Lesson 4; 18, Investigate It! TE Only: 7A-7B, Leveled Content Reader Support; 11, Let’s Read Science!; 18-23; 24, Investigate It!; 33, Write About Pushes and Pulls; 33a, Performance Expectation Activity</p> <ul style="list-style-type: none"> Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2) <p>SE Only: 2, Try It!; 3, Let’s Read Science!; 4-13, STEM Activity; 15, Lesson 2; 16, Lesson 3; 17, Lesson 4; 18, Investigate It! TE Only: 4, Reading; 5, Writing; 5, Teacher Background; 7A-7B, Leveled Content Reader Support; 12-13, STEM Activity; 18, Envision It!; 18-23; 24, Investigate It!; 28-29, Activity Card Support; 33, Write About Pushes and Pulls; 33b, Performance Expectation Activity</p> <p>PS2.B: Types of Interactions</p> <ul style="list-style-type: none"> When objects touch or collide, they push on one another and can change motion. (K-PS2-1) <p>SE Only: 15, Lesson 2; 17, Lesson 4 TE Only: 7A-7B, Leveled Content Reader Support; 18-19; 22-23; 31, Chapter 1 Test, Question 6</p>	<p>Cause and Effect</p> <ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2) <p>SE Only: 2, Try It!; Activity 3, Home Activity; 4-13, STEM Activity; 18, Investigate It! TE Only: 8, CCC: Cause and Effect; 10, Try It!; 12-13, STEM Activity; 22, Differentiated Instruction; 24, Investigate It!; 28-29, Activity Card Support; 33a, Performance Expectation Activity</p>

<p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Scientists use different ways to study the world. (K-PS2-1) <p>SE Only: 63, Try It!;75, Lesson 1; 76, Lesson 2; 77, Lesson 3</p> <p>TE Only: 33b, ELA/Literacy; 115A-115B, Leveled Content Reader Support; 118, Try It!; 124-127</p>	<p>PS3.C: Relationship Between Energy and Forces</p> <ul style="list-style-type: none"> A bigger push or pull makes things go faster. (secondary to K-PS2-1) <p>SE Only: 4-13, STEM Activity; 16, Lesson 3; 17, Lesson 4; 18, Investigate It!</p> <p>TE Only: 7A-7B, Leveled Content Reader Support; 8-9; 12-13, STEM Activity; 20-23; 24, Investigate It!; 33, Write About Pushes and Pulls</p> <p>ETS1.A: Defining Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (secondary to K-PS2-2) <p>SE Only: 4-13, STEM Activity; 19, Slide Engineer</p> <p>TE Only: 12-13, STEM Activity; 25, STEM</p>	
<p><i>Connections to other DCIs in kindergarten:</i> K.ETS1.A (K-PS2-2); K.ETS1.B (K-PS2-2)</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 2.ETS1.B (K-PS2-2); 3.PS2.A (K-PS2-1),(K-PS2-2); 3.PS2.B (K-PS2-1); 4.PS3.A (K-PS2-1); 4.ETS1.A (K-PS2-2)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>RI.K.1 With prompting and support, ask and answer questions about key details in a text. (K-PS2-2)</p> <p>W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS2-1)</p> <p>SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. (K-PS2-2)</p> <p><i>Mathematics –</i></p> <p>MP.2 Reason abstractly and quantitatively. (K-PS2-1)</p> <p>K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. (K-PS2-1)</p> <p>K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-PS2-1)</p>		

K-PS3 Energy		
<p>Students who demonstrate understanding can:</p> <p>K-PS3-1. Make observations to determine the effect of sunlight on Earth’s surface. [Clarification Statement: Examples of Earth’s surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.] Chapter 3 Performance Expectation Activity, 109c</p> <p>K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.* [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.] Chapter 3 Performance Expectation Activity, 109d</p> <p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to collect data that can be used to make comparisons. (K-PS3-1) <p>SE Only: 44-53, STEM Activity; 60, Investigate It! TE Only: 82-83, STEM Activity; 98, Investigate It!; 109c, Performance Expectation Activity</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) <p>SE Only: 44-53, STEM Activity TE Only: 82-83, STEM Activity; 109d, Performance Expectation Activity; 175, Write About Solving a Need</p>	<p>PS3.B: Conservation of Energy and Energy Transfer</p> <ul style="list-style-type: none"> Sunlight warms Earth’s surface. (K-PS3-1),(K-PS3-2) <p>SE Only: 44, STEM Activity; 56, Lesson 3; 60, Investigate It! TE Only: 82, STEM Activity; 90-91; 98, Investigate It!; 102-103, Activity Card Support; 109c, Performance Expectation Activity; 109c, ELA/Literacy</p>	<p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (K-PS3-1),(K-PS3-2) <p>SE Only: 55, Lesson 2; 60, Investigate It!; TE Only: 78, CCC Patterns; 88, Envision It!; 88-89; 98, Investigate It!; 102-103, Activity Card Support</p>

<p style="text-align: center;"><i>Connections to Nature of Science</i></p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Scientists use different ways to study the world. (K-PS3-1) <p>SE Only: 61, Ready for the Weather; 75, Lesson 1; 76; Lesson 2; 77, Lesson 3; 78, Lesson 4; 79, Lesson 5</p> <p>TE Only: 99, Teach with Visuals; 124-125; 126-127, 128; 130-131; 132-133; 142, Part 1 Text- Questions 1-4; 143, Part 1 Test- Question 5</p>		
<p><i>Connections to other DCIs in kindergarten:</i> K.ETS1.A (K-PS3-2); K.ETS1.B (K-PS3-2)</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 1.PS4.B (K-PS3-1),(K-PS3-2); 2.ETS1.B (K-PS3-2), 3.ESS2.D (K-PS3-1); 4.ETS1.A (K-PS3-2)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2)</p> <p><i>Mathematics –</i></p> <p>K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-PS3-1),(K-PS3-2)</p>		

K-2-ETS1 Engineering Design	
<p>Students who demonstrate understanding can:</p> <p>K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. Chapter 3 Performance Expectation Activity, 109d Scratch Away! STEM Activity, 44-45 Cool Down! STEM Activity, 82-83 How Can You Make a Crayon Box? STEM Activity, 156-157</p> <p>K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. Scratch Away! STEM Activity, 44-45 Cool Down! STEM Activity, 82-83 How Can You Make a Crayon Box? STEM Activity, 156-157</p> <p>K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. Chapter 1 Performance Expectation Activity, 33b Scratch Away! STEM Activity, 44-45 Cool Down! STEM Activity, 82-83 How Can You Make a Crayon Box? STEM Activity, 156-157</p>	

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) <p>SE only: 24-25, STEM Activity; 45-47, STEM Activity; 75, Lesson 1 TE Only: 117, SEP: Asking Questions and Defining Problems; 153, SEP: Asking Questions and Defining Problems; 124, Activate Prior Knowledge; 125, ELL Support; 125, Formative Assessment</p> <ul style="list-style-type: none"> Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) <p>SE only: 4, Find a Problem; 23, Find a Problem; 44, Find a Problem; 65, Find a Problem; 86, Find a Problem; 96, Lesson 1 TE Only: 12, STEM Activity; 44, STEM Activity; 82, STEM Activity; 109d, Performance Expectation Activity; 120, STEM Activity; 156, STEM Activity; 160, Envision It!; 160, Activate Prior Knowledge; 160, For Interactive Whiteboard Classrooms; 160, Differentiated Instruction; 161, ELL Support; 161, Explain; 161, Elaborate; 161, Formative Assessment; 164, Differentiated Instruction</p>	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) <p>SE only: 4-13, STEM Activity; 23-32, STEM Activity; 44-53, STEM Activity; 65-74, STEM Activity; 86-95, STEM Activity; 96, Lesson 1; 99, Investigate It! TE Only: 12-13, STEM Activity; 44-45, STEM Activity; 82-83, STEM Activity; 109d, Performance Expectation Activity; 120-121, STEM Activity; 156-157, STEM Activity, 166, Investigate It!</p> <ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) <p>SE only: 4-13, STEM Activity; 23-32, STEM Activity; 44-53, STEM Activity; 65-74, STEM Activity; 86-95, STEM Activity; 96, Lesson 1 TE Only: 12-13, STEM Activity; 44-45, STEM Activity; 82-83, STEM Activity; 109d, Performance Expectation Activity; 120-121, STEM Activity; 156-157, STEM Activity</p>	<p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2) <p>SE only: 44-53, STEM Activity; 86-93, STEM Activity TE Only: 82-83, STEM Activity; 116, CCC: Structure and Function and Effect; 152, CCC: Structure and Function; 156-157, STEM Activity</p>

<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) <p>SE only: 23-32, STEM Activity; 44-53, STEM Activity TE Only: 44-45, STEM Activity; 71c, Performance Expectation Activity; 82-83, STEM Activity</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3) <p>SE only: 10-11, Record and Share; 30, Make and Test; 31, Record and Share; 51, Make and Test; 52, Record and Share; 72, Make and Test; 73, Record and Share; 93, Make and Test; 94, Record and Share TE Only: 12-13, STEM Activity; 33b, Performance Expectation Activity; 44-45, STEM Activity; 82-83, STEM Activity; 109a, Performance Expectation Activity; 120-121, STEM Activity; 156-157, STEM Activity</p>	<ul style="list-style-type: none"> Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>SE only: 4, STEM Activity; 23, STEM Activity; 44, STEM Activity; 65, STEM Activity; 86, STEM Activity; 96, Lesson 1; 97, Lesson 2 TE Only: 12, STEM Activity; 44, STEM Activity; 82, STEM Activity; 109d, Performance Expectation Activity; 120, STEM Activity; 156, STEM Activity; 160, Envision It!; 160, Activate Prior Knowledge; 160, For Interactive Whiteboard Classrooms; 160, Differentiated Instruction; 161, ELL Support; 161, Explain; 161, Elaborate; 161, Formative Assessment; 164, Differentiated Instruction</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2) <p>SE only: 8-9, Make and Test; 23-32, STEM Activity; 44-53, STEM Activity; 68, Draw; 71, Make and Test; 89, Draw; 92, Make and Test; 97, Lesson 2; 98, Lesson 3 TE Only: 12-13, STEM Activity; 44-45, STEM Activity; 82-83, STEM Activity; 109d, Performance Expectation Activity; 120-121, STEM Activity; 156-157, STEM Activity; 162, Envision It!; 162, Activate Prior Knowledge; 162, For Interactive Whiteboard Classrooms; 163, ELL Support; 161, Explain; 163, Elaborate; 163, Formative Assessment; 164, Envision It!; 164, Activate Prior Knowledge; 164, For Interactive Whiteboard Classrooms; 164, Differentiated Instruction; 165, ELL Support; 165, Explain; 165, Elaborate; 165, Formative Assessment</p>	
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	<p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3) <p>SE only: 10-11, Record and Share; 31, Record and Share; 52, Record and Share; 73, Record and Share; 94, Record and Share; 98, Lesson 3</p> <p>TE Only: 12-13, STEM Activity; 44-45, STEM Activity; 82-83, STEM Activity; 109d, Performance Expectation Activity; 120-121, STEM Activity; 156-157, STEM Activity; 164, Differentiated Instruction; 165, Compare and Contrast</p>	
<p><i>Connections to other DCIs in this grade-band:</i> <i>Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include: Kindergarten:</i> K-PS2-2, K-ESS3-2 <i>Connections to K-2-ETS1.B: Developing Possible Solutions Problems include: Kindergarten:</i> K-ESS3-3, First Grade: 1-PS4-4, Second Grade: 2-LS2-2 <i>Connections to K-2-ETS1.C: Optimizing the Design Solution include: Second Grade:</i> 2-ESS2-1</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 3-5.ETS1.A (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3); 3-5.ETS1.B (K-2-ETS1-2); 3-5.ETS1.C (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3)</p>		
<p><i>Common Core State Standards Connections:</i> ELA/Literacy – RI.2.1 Ask and answer such questions as <i>who, what, where, when, why, and how</i> to demonstrate understanding of key details in a text. (2-ESS1-1) W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3) W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3) SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) Mathematics – MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3)</p>		

* This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.

L-LS1 From Molecules to Organisms: Structures and Processes

Students who demonstrate understanding can:

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]
Chapter 2 Performance Expectation Activity, 99a

1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]
Chapter 2 Performance Expectation Activity, 99b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1) <p>SE/TE: 48-57, STEM Activity; 99, Design a Helmet; 208, Explore It!; 208-213, Lesson 3; 222-227, Design It! TE Only: 99a, Performance Expectation Activity</p> <p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2) <p>SE/TE: 47, Let’s Read Science; 96-97, Apply It! TE Only: 44C, Reading; 44G-44H, Leveled Content Reader Support; 45, SEP: Obtaining, Evaluating, and Communicating Information; 99a, ELA/Literacy; 99b, Performance Expectation Activity; 99b, ELA/Literacy; 99c, Performance Expectation Activity; 99c, ELA/Literacy</p>	<p>LS1.A: Structure and Function</p> <ul style="list-style-type: none"> All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) <p>SE/TE: 62-63, Animal Groups; 64-67, Lesson 2; 72-77, Lesson 3; 94, Chapter Review – Lessons 2, 3; 96-97, Apply It!; 98, Draw a Picture; 99, Design a Helmet TE Only: 44G-44H, Leveled Content Reader Support; 63b, Lesson 1 Check – Questions 1, 2; 67a, My Planet Diary; 67b, Lesson 2 Check – Questions 1-6; 77a, My Planet Diary; 77b, Lesson 3 Check – Questions 1-5; 95b, Chapter 2 Test – Question 6</p> <p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2) <p>SE/TE: 69, Seeds to Trees; 70, Life Cycle of a Plant; 72-77, Lesson 4; TE Only: 71b, Lesson 3 Check – Question 3; 77b, Lesson 4 Check – Questions 1-5; 99b, Performance Expectation Activity</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2) <p>SE/TE: 46, Try It!; 68, Explore It!; 70-71, Life Cycle of a Plant; 73, Animal Life Cycles; 74-75, Life Cycle of a Sea Turtle; 76-77, Life Cycle of a Grasshopper; 82, Explore It!; 98, Draw a Picture TE Only: 44, CCC: Patterns; 71a, Explore It!; 95, Chapter Review – Lesson 4; 99b, Performance Expectation Activity</p> <p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1) <p>SE/TE: 66, Roots, Stems, and Leaves; 84, Kinds of Animals; 85, Different Animals of One Kind; 94; Chapter Review - Lesson 2 TE Only: 99a, Performance Expectation Activity; 99a, ELA/Literacy; 140, CCC: Structure and Function; 186, CCC: Structure and Function</p>

<p style="text-align: center;">Connections to Nature of Science</p> <p>Scientific Knowledge is Based on Empirical Evidence Scientists look for patterns and order when making observations about the world. (1-LS1-2) SE/TE: 70-71, Life Cycle of a Plant; 73, Animal Life Cycles; 74-75, Life Cycle of a Sea Turtle; 76-77, Life Cycle of a Grasshopper; 98, Draw a Picture TE Only: 44, CCC: Patterns; 95, Chapter Review – Lesson 4; 99b, Performance Expectation Activity</p>	<p>LS1.D: Information Processing Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1) SE/TE: 72-77, Lesson 4; 84, Kinds of Animals; 95, Chapter Review – Lesson 4; 96-97, Apply It!; 99, Design a Helmet TE Only: 71b, Lesson 3 Check – Question 4; 99a, Performance Expectation Activity; 99b, Performance Expectation Activity</p>	<p style="text-align: center;">Connections to Engineering, Technology, and Applications of Science</p> <p>Influence of Engineering, Technology, and Science on Society and the Natural World <ul style="list-style-type: none"> ▪ Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (1-LS1-1) SE/TE: 204-207, Lesson 2 TE Only: 99a, Performance Expectation Activity; 186G-186H, Leveled Content Reader Support; 207b, Lesson 2 Check – Questions 1-6</p>
<p><i>Connections to other DCIs in first grade:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-bands:</i> K.ETS1.A (1-LS1-1); 3.LS2.D (1-LS1-2); 4.LS1.A (1-LS1-1); 4.LS1.D (1-LS1-1); 4.ETS1.A (1-LS1-1)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>RI.1.1 Ask and answer questions about key details in a text. (1-LS1-2) RI.1.2 Identify the main topic and retell key details of a text. (1-LS1-2) RI.1.10 With prompting and support, read informational texts appropriately complex for grade. (1-LS1-2) W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS1-1)</p> <p><i>Mathematics –</i></p> <p>1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and one digits, recording the results of comparisons with the symbols $>$, $=$, and $<$. (1-LS1-2) 1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning uses. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1-LS1-2) 1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. (1-LS1-2) 1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. (1-LS1-2)</p>		

NOTE, Grade 1 includes: From Molecules to Organisms: Structures and Processes, Heredity: Inheritance and Variation of Traits, Earth’s Place in the Universe, Waves and their Applications in Technologies for Information Transfer, and Engineering Design

L-LS3 Heredity: Inheritance and Variation of Traits		
<p>Students who demonstrate understanding can:</p> <p>1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.] Chapter 2 Performance Expectation Activity, 99c</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1) <p>SE/TE: 46, Try It!; 54-55, Make and Test; 68, Explore It!; 82, Explore It!; 86-87, Investigate It! TE Only: 44G-44H, Leveled Content Reader Support; 85a, Explore It!; 87a-87d, Activity Card Support; 99c, Performance Expectation Activity;</p>	<p>LS3.A: Inheritance of Traits</p> <ul style="list-style-type: none"> Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1) <p>SE/TE: 44-45, How is a young orangutan like its mother?; 72-73, Envision It!; 75, A baby sea turtle...; 76, Life Cycle of a Grasshopper; 78-81, Lesson 5; 95, Chapter Review – Lesson 5 TE Only: 44C, Critical Thinking; 44G-44H, Leveled Content Reader Support; 81a, Explore It!; 81b, Lesson 5 Check, Question 4; 95a, Chapter 2 Test – Question 3; 95b, Chapter 2 Test – Question 8; 99c, Performance Expectation Activity</p> <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1) <p>SE/TE: 46, Try It!; 82-85, Lesson 6; TE Only: 44G-44H, Leveled Content Reader Support; 81, 21st Century Learning; 85a, Explore It!; 85b, Lesson 6 Check – Question 5; 94, ELL Support</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1) <p>SE/TE: 46, Try It!; 68, Explore It!; 70-71, Life Cycle of a Plant; 73, Animal Life Cycles; 74-75, Life Cycle of a Sea Turtle; 76-77, Life Cycle of a Grasshopper; 82, Explore It!; 98, Draw a Picture TE Only: 44, CCC: Patterns; 71a, Explore It!; 95, Chapter Review – Lesson 4; 99b, Performance Expectation Activity</p>
<p>Connections to other DCIs in first grade: N/A</p>		
<p>Articulation of DCIs across grade-bands: 3.LS3.A (1-LS3-1); 3.LS3.B (1-LS3-1)</p>		

1-ESS1 Earth's Place in the Universe		
<p>Students who demonstrate understanding can:</p> <p>1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.] Chapter 3 Performance Expectation Activity, 139a</p> <p>1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.] Chapter 3 Performance Expectation Activity, 139b</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2) <p>SE/TE: 102, Try It!; 118, Explore It!; 128-129, Investigate It!; 136-137, Apply It!; 142, Try It!; 168, Explore It!</p> <p>TE Only: 123a, Explore It!; 139b, Performance Expectation Activity; 139b, ELA/Literacy; 139b, Mathematics; 171a, Explore It!</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1) <p>SE/TE: 102, Try It!; 118, Explore It!; 119, Write; 121, Draw; 122, At-Home Lab; 125, Write; 126, Write; 127, Lightning Lab; 139, Day and Night; 139, Sunrise, Sunset</p> <p>TE Only: 101, SEP: Analyzing and Interpreting Data; 116, Science Notebook; 123a, Explore It!; 127a, My Planet Diary; 129c, Guided Inquiry; 139a, Performance Expectation Activity; 139a, ELA/Literacy; 139b, Performance Expectation Activity</p>	<p>ESS1.A: The Universe and its Stars</p> <ul style="list-style-type: none"> Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) <p>SE/TE: 118-123, Lesson 2; Chapter Review – Lesson 2; 139, Day and Night</p> <p>TE Only: 100C, Reading; 100C, Social Studies; 123a, Explore It!; 123b, Lesson 2 Check – Questions 1-5; 139a, Performance Expectation Activity</p> <p>ESS1.B: Earth and the Solar System</p> <ul style="list-style-type: none"> Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2) <p>SE/TE: 122, Sunrise and Sunset; 125, Spring; 126, Summer and Fall; 127, Winter; 139, Sunrise, Sunset</p> <p>TE Only: 100C, Writing; 139b, Performance Expectation Activity</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1) <p>SE/TE: 102, Try It!; 118-123, Lesson 2; 125, Spring; 126, Summer and Fall; 127, Winter; 139, Day and Night; 139, Sunrise, Sunset</p> <p>TE Only: 100, CCC: Patterns; 116, Science Notebook; 123a, Explore It!; 127b, Lesson 3 Check – Question 2; 139a, Performance Expectation Activity; 139b, Performance Expectation Activity</p>

<i>Connections to other DCIs in first grade: N/A</i>	
<i>Articulation of DCIs across grade-bands: 3.PS2.A (1-ESS1-1); 5.PS2.B (1-ESS1-1),(1-ESS1-2); 5-ESS1.B (1-ESS1-1),(1-ESS1-2)</i>	
<i>Common Core State Standards Connections:</i>	
<i>ELA/Literacy –</i>	
W.1.7	Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-ESS1-1),(1-ESS1-2)
W.1.8	With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1),(1-ESS1-2)
<i>Mathematics –</i>	
MP.2	Reason abstractly and quantitatively. (1-ESS1-2)
MP.4	Model with mathematics. (1-ESS1-2)
MP.5	Use appropriate tools strategically. (1-ESS1-2)
1.OA.A.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)
1.MD.C.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2)

Standards Arranged by Disciplinary Core Ideas

1-PS4 Waves and their Applications in Technologies for Information Transfer

Students who demonstrate understanding can:

- 1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.** [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]
Chapter 1 Performance Expectation Activity, 43a
- 1-PS4-2. Make observations to construct an evidence-based account that objects can be seen only when illuminated.** [Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]
Chapter 1 Performance Expectation Activity, 43b
- 1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.** [Clarification Statement: Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror).] [Assessment Boundary: Assessment does not include the speed of light.]
Chapter 1 Performance Expectation Activity, 43c
- 1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.*** [Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drum beats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]
Chapter 1 Performance Expectation Activity, 43d

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3) <p>SE/TE: 4, Try It!; 27, Lightning Lab; 32-33, Investigate It!; 40-41, Apply It!; 128-129, Investigate It!</p> <p>TE Only: xlv-xlv, STEMQuest; 3, SEP: Planning and Carrying Our Investigations; 26, Lightning Lab; 33a-33d, Activity Card Support; 43c, Performance Expectation Activity; 171, Differentiated Instruction</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-PS4-2) <p>SE/TE: 6-15, STEM Activity; 28, Explore It!; 40-41, Apply It!; 128-129, Investigate It!</p> <p>TE Only: 43b, Performance Expectation Activity; 43b, ELA/Literacy</p>	<p>PS4.A: Wave Properties</p> <ul style="list-style-type: none"> Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) <p>SE/TE: 6-15, STEM Activity; 28, Explore It!; 29, Sounds; 32-33, Investigate It!;</p> <p>TE Only: 31, Professional Development Note; 31a, Explore It!; 31b, Lesson 4 Check – Questions 1, 4; 33a-33d, Activity Card Support; 43a, Performance Expectation Activity</p> <p>PS4.B: Electromagnetic Radiation</p> <ul style="list-style-type: none"> Objects can be seen only when light is available to illuminate them. Some objects give off their own light. (1-PS4-2) <p>SE/TE: 17, Energy; 24-25, Envision It!; 24-27, Lesson 3; 40-41, Apply It!; 128-129, Investigate It!</p> <p>TE Only: xlv-xlv, STEMQuest; 27, 21st Century Learning; 27b, Lesson 3 Check – Questions 1-4; 43b, Performance Expectation Activity; 43b, ELA/Literacy</p> <ul style="list-style-type: none"> Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences 	<p>Connections to Engineering, Technology, and Applications of Science</p> <p>Influence of Engineering, Technology, and Science, on Society and the Natural World</p> <ul style="list-style-type: none"> People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4) <p>SE/TE: 16, My Planet Diary; 17, Energy; 24, My Planet Diary; 34</p> <p>TE Only: 2C, Social Studies; 2D, Writing; 2G-2H, Leveled Content Reader Support; 19a, My Planet Diary; 27a, My Planet Diary; 43d, ELA/Literacy; 186C, Social Studies; 186G-186H, Leveled Content Reader Support</p>

Standards Arranged by Disciplinary Core Ideas

<ul style="list-style-type: none"> Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4) <p>SE/TE: 6-15, STEM Activity; 43, Send a Message with Sound; 128-129, Investigate It; 144-153, STEM Activity</p> <p>TE Only: xlv-xlv, STEMQuest; 3, SEP: Planning and Carrying Our Investigations; 43d, Performance Expectation Activity</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">Connections to Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Science investigations begin with a question. (1-PS4-1) <p>SE/TE: 40-41, Apply It!; 154-157, Lesson 1; 169, Picture Clues; 170, Scientific Method</p> <p>TE Only: 140G-104H, Leveled Content Reader Support; 141, SEP: Asking Questions and Defining Problems; 157b, Lesson 1 Check – Questions 4, 5</p> <ul style="list-style-type: none"> Scientists use different ways to study the world. (1-PS4-1) <p>SE/TE: 154-157, Lesson 1; 158-161, Lesson 2; 162-167, Lesson 3; 168-171, Lesson 4; 172-175, Lesson 5; 178, Hubble Space Telescope; 184-185, Chapter Review – Lessons 1-5</p> <p>TE Only: 43b, ELA/Literacy; 140G-140H, Leveled Content Reader Support; 157b, Lesson 1 Check – Questions 1-5; 161b, Lesson 2 Check – Questions 1-6; 167b, Lesson 3 Check – Questions 1-6; 171b, Lesson 4 Check – Questions 1-6; 175b, Lesson 5 Check – Questions 1-5</p>	<p>with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1-PS4-3)</p> <p>SE/TE: 4, Try It!; 26, Light Shines Through; 27, What Light Can Do; 39, Chapter Review – Lesson 3; 40-41, Apply It!; 43, Make a Presentation</p> <p>TE Only: xlv-xlv, STEMQuest; 2C, Art; 27b, Lesson 3 Check – Questions 3, 4; 39b, Chapter 1 Test – Question 5; 43c, Performance Expectation Activity</p> <p>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4) <p>SE/TE: 6-15, STEM Activity; 29, Sounds; 43, Send a Message with Sound; 202, Solve Problems</p> <p>TE Only: 43a, Performance Expectation Activity; 43d, ELA/Literacy</p>	
<p><i>Connections to other DCIs in first grade: N/A</i></p>		
<p><i>Articulation of DCIs across grade-bands: K.ETS1.A (1-PS4-4); 2.PS1.A (1-PS4-3); 2.ETS1.B (1-PS4-4); 4.PS4.C (1-PS4-4); 4.PS4.B (1-PS4-2); 4.ETS1.A (1-PS4-4)</i></p>		
<p><i>Common Core State Standards Connections:</i></p> <p>ELA/Literacy –</p> <p>W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. (1-PS4-2)</p> <p>W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-PS4-1),(1-PS4-2),(1-PS4-3),(1-PS4-4)</p> <p>W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1),(1-PS4-2),(1-PS4-3)</p> <p>SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1),(1-PS4-2),(1-PS4-3)</p> <p>Mathematics –</p> <p>MP.5 Use appropriate tools strategically. (1-PS4-4)</p> <p>1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4)</p> <p>1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-PS4-4)</p>		

K-2 ETS1 Engineering Design	
<p>Students who demonstrate understanding can:</p> <p>K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. Chapter 1 Performance Expectation Activity, 43d Let’s Talk! STEM Activity, 6-15 What’s Over the Wall? STEM Activity, 144-153 Reach, Grab, Pull STEM Activity, 190-199 Design It! What do pill bugs need?, 222-227</p> <p>K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. Chapter 2 Performance Expectation Activity, 99a Let’s Talk! STEM Activity, 6-15 What’s Over the Wall? STEM Activity, 144-153 Try It! How can you design a top?, 189 Reach, Grab, Pull STEM Activity, 190-199</p> <p>K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. Chapter 1 Performance Expectation Activity, 43d Try It! How can you design a top?, 189 Explore It! Which tool works better?, 200 Explore It! Which design works best?, 208</p>	

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) <p>SE/TE: 99, Design a Helmet; 128-129, Investigate It!; 139, Day and Night; 208, Explore It!; 214-215, Investigate It!; 222-227, Design It! TE Only: 187, SEP: Developing and Using Models; 213a, Explore It!; 215a-215c, Activity Card Support</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3) <p>SE/TE: 12-13, Make and Test; 33, Analyze</p>	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) <p>SE/TE: 6-15, STEM Activity; 48-57, STEM Activity; 104-113, STEM Activity; 144-153, STEM Activity; 190-199, STEM Activity; 202, Solve Problems; 203, Help People; 208, A Problem and a Goal; 222-227, Design It! TE Only: 186G-186H, Leveled Content Reader Support</p> <ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) <p>SE/TE: 6, Let’s Talk; 7, Find a Problem; 8-9, Plan and Draw; 10, Choose Materials; 48, Mix It Up!; 49, Find a Problem; 50-51, Plan and Draw; 52, Choose Materials; 104, How Does a Greenhouse Work?; 105, Find a Problem; 106-107, Plan and Draw; 108, Choose Materials; 144, What’s</p>	<p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2) <p>SE/TE: 6-15, STEM Activity; 48-57, STEM Activity; 66, Roots, Stems, and Leaves; 84, Kinds of Animals; 85, Different Animals of One Kind; 104-113, STEM Activity; 144-153, STEM Activity; 178, Hubble Space Telescope; 222-227, Design It! TE Only: 99a, Performance Expectation Activity; 140, CCC: Structure and Function; 186, CCC: Structure and Function</p>

<p>and Conclude; 54-55, Make and Test; 110-111, Make and Test; 150-151, Make and Test; 196-197, Make and Test; 208, Explore It!; 215, Analyze and Conclude; 226-227, Record and Share 228, Test Materials TE Only: 213a, Explore It!</p>	<p>Over the Wall?; 145, Find a Problem; 146-147, Plan and Draw; 148, Choose Materials; 190, Reach, Grab, Pull; 191, Find a Problem; 192-193, Plan and Draw; 194, Choose Materials; 222-227, Design It! TE Only: 186G-186H, Leveled Content Reader Support</p> <ul style="list-style-type: none"> ▪ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>SE/TE: 7, Find a Problem; 8-9, Plan and Draw; 10, Choose Materials; 49, Find a Problem; 50-51, Plan and Draw; 52, Choose Materials; 105, Find a Problem; 106-107, Plan and Draw; 108, Choose Materials; 145, Find a Problem; 146-147, Plan and Draw; 148, Choose Materials; 191, Find a Problem; 192-193, Plan and Draw; 194, Choose Materials; 210, Plan and Draw; 211, Choose Materials; 222, Find a Problem; 223, Plan and Draw; 224, Choose Materials TE Only: 186G-186H, Leveled Content Reader Support</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2) <p>SE/TE: 7, Question 2; 8, Question 4; 11, Question 10; 12, Question 12; 14, Question 15; 15, Question 18; 49, Question 2; 51, Question 7; 53, Question 10; 55, Question 12; 57, Question 16; 105, Question 2; 107, Question 5; 109, Question 9; 110, Question 11; 111, Question 12; 113, Question 16; 145, Question 2; 146, Questions 3, 4; 147, Question 5; 148, Question 6; 149, Question 9; 151, Question 12; 153, Question 16; 191, Question 2; 192, Question 4; 195, Question 9; 196, Question 11; 199, Question 18; 223, Question 3; 210, Lightning Lab; 225, Question 7 TE Only: 186G-186H, Leveled Content Reader Support</p>	
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	<p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> ▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3) <p>SE/TE: 14-15, Record and Share; 56-57, Record and Share; 112-113, Record and Share; 152-153, Record and Share; 198-199, Record and Share; 226-227, Record and Share</p> <p>TE Only: 186G-186H, Leveled Content Reader Support</p>	
<p><i>Connections to other DCIs in this grade-band:</i> <i>Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:</i> Kindergarten: K-PS2-2, K-ESS3-2 <i>Connections to K-2-ETS1.B: Developing Possible Solutions Problems include:</i> Kindergarten: K-ESS3-3, First Grade: 1-PS4-4, Second Grade: 2-LS2-2 <i>Connections to K-2-ETS1.C: Optimizing the Design Solution include:</i> Second Grade: 2-ESS2-1</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 3-5.ETS1.A (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3); 3-5.ETS1.B (K-2-ETS1-2); 3-5.ETS1.C (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3)</p>		
<p><i>Common Core State Standards Connections:</i> ELA/Literacy – RI.2.1 Ask and answer such questions as <i>who, what, where, when, why,</i> and <i>how</i> to demonstrate understanding of key details in a text. (2-ESS1-1) W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3) W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3) SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2) Mathematics – MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3)</p>		

* This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.

2-LS2 Ecosystems: Interactions, Energy, and Dynamics		
<p>Students who demonstrate understanding can:</p> <p>2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.] Chapter 2 Performance Expectation Activity, 117a</p> <p>2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.* Chapter 2 Performance Expectation Activity, 117b</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2) <p>SE/TE: 88, Explore It!; 100, Explore It!; 114-115, Apply It!; 208-217, STEM Activity; 232, Lightning Lab TE Only: 63, SEP: Developing and Using Models; 93a, Explore It!; 103a, Explore It!; 117b, Performance Expectation Activity</p> <p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1) <p>SE/TE: 64, Try It!; 79, Go Green; 94, Explore It!; 104-105, Investigate It!; 116, Light and Seeds TE Only: 105a-105c, Activity Card Support; 117a, Performance Expectation Activity</p>	<p>LS2.A: Interdependent Relationships in Ecosystems</p> <ul style="list-style-type: none"> Plants depend on water and light to grow. (2-LS2-1) <p>SE/TE: 64, Try It!; 77, Plant Needs; 94, Explore It!; 96, Forest; 99, Wetland/Rain Forest; 101, Energy from Food; 104-105, Investigate It!; 116, Light and Seeds TE Only: 62G-62H, Leveled Content Reader Support; 105a-105d, Activity Card Support; 117a, Performance Expectation Activity</p> <ul style="list-style-type: none"> Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) <p>SE/TE: 79, Plant Parts; 81, Seed plants; 96, Forest TE Only: 117b, Performance Expectation Activity</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (secondary to 2-LS2-2) <p>SE/TE: 66-75, STEM Activity; 79, Draw; 87, Draw; 88, Explore It!; 90, Lightning Lab; 114-115, Apply It! TE Only: 62C, Social Studies; 93a, Explore It!; 117b, Performance Expectation Activity</p>	<p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (2-LS2-1) <p>SE/TE: 64, Try It!; 77, Plant Needs; 79, Go Green; 104-105, Investigate It!; 116, Light and Seeds TE Only: 62, CCC: Cause and Effect; 105c, Guided Inquiry; 117a, Performance Expectation Activity</p> <p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2) <p>SE/TE: 78-79, Plant Parts; 84-85, Animals with Backbones; 86-87, Animals Without Backbones; 90-91, Animal Body Parts; 114-115, Apply It!; 232-233, Animal Body Parts as Tools TE Only: 63, SEP: Developing and Using Models; 117b, Performance Expectation Activity</p>
<p>Connections to other DCIs in second grade: N/A</p>		
<p>Articulation of DCIs across grade-bands: K.LS1.C (2-LS2-1); K.ESS3.A (2-LS2-1); K.ETS1.A (2-LS2-2); 5.LS1.C (2-LS2-1); 5.LS2.A (2-LS2-2)</p>		

Common Core State Standards Connections:

ELA/Literacy –

- W.2.7** Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1)
- W.2.8** Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1)
- SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

Mathematics –

- MP.2** Reason abstractly and quantitatively. (2-LS2-1)
- MP.4** Model with mathematics. (2-LS2-1),(2-LS2-2)
- MP.5** Use appropriate tools strategically. (2-LS2-1)
- 2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS2-2)

NOTE:

Grade 2 includes:

Ecosystems: Interactions, Energy, and Dynamics, Biological Evolution: Unity and Diversity, Earth’s Place in the Universe, Earth’s Systems, Matter and Its Interactions, and Engineering Design

2-LS4 Biological Evolution: Unity and Diversity		
<p>2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.] Chapter 2 Performance Expectation Activity, 117c</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1) <p>SE/TE: 65, Let’s Read Science; 66-78, STEM Activity; 94, Explore It!; 104-105, Investigate It!; 117, Make Observations; 180, Science Skills</p> <p>TE Only: xlv-xlv, Quest; 97, Professional Development Note; 117c, Performance Expectation Activity; 117c, ELA/Literacy; 117c, Mathematics</p> <hr style="border-top: 1px dashed black;"/> <p style="text-align: center;">Connections to Nature of Science</p> <p>Scientific Knowledge is Based on Empirical Evidence</p> <ul style="list-style-type: none"> Scientists look for patterns and order when making observations about the world. (2-LS4-1) <p>SE/TE: 100-103, Lesson 5</p> <p>TE Only: 103a, Explore It; 103b, Lesson 5 Check – Questions 1, 6; 117c, Performance Expectation Activity</p>	<p>LS4.D: Biodiversity and Humans</p> <ul style="list-style-type: none"> There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) <p>SE/TE: 76, My Planet Diary; 82, My Planet Diary; 94-99, Lesson 4; 113, Chapter Review – Lesson 4; 116, Put on a Play; 117, Write a Song</p> <p>TE Only: xlv-xlv, Quest; 62G-62H, Leveled Content Reader Support; 99a, Explore It; 99b, Lesson 4, Check – Questions 1-5; 113b, Chapter 2 Test – Questions 5, 8; 117c, Performance Expectation Activity</p>	
<p><i>Connections to other DCIs in second grade:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 3.LS4.C (2-LS4-1); 3.LS4.D (2-LS4-1); 5.LS2.A (2-LS4-1)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p>W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS4-1)</p> <p>W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)</p> <p><i>Mathematics –</i></p> <p>MP.2 Reason abstractly and quantitatively. (2-LS4-1)</p> <p>MP.4 Model with mathematics. (2-LS4-1)</p> <p>2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS4-1)</p>		

2-ESS1 Earth's Place in the Universe		
<p>Students who demonstrate understanding can:</p> <p>2-ESS1-1. Use observations from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.] Chapter 3 Performance Expectation Activity, 159a</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-ESS1-1) <p>SE/TE: 138, Explore It!; 141, Lightning Lab; 144, Explore It!; 148-149, Investigate It!; 158, Erosion TE Only: 119, SEP: Constructing Explanations and Designing Solutions; 159a, Performance Expectation Activity; 159a, ELA/Literacy</p>	<p>ESS1.C: The History of Planet Earth</p> <ul style="list-style-type: none"> Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) <p>SE/TE: 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion TE Only: 118, Professional Development Note; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity</p>	<p>Stability and Change</p> <ul style="list-style-type: none"> Things may change slowly or rapidly. (2-ESS1-1) <p>SE/TE: 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion TE Only: 118, CCC: Stability and Change; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity</p>
<p><i>Connections to other DCIs in second grade:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-bands:</i> 3.LS2.C (2-ESS1-1); 4.ESS1.C (2-ESS1-1); 4.ESS2.A (2-ESS1-1)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p>ELA/Literacy –</p> <p>RI.2.1 Ask and answer such questions as <i>who, what, where, when, why, and how</i> to demonstrate understanding of key details in a text. (2-ESS1-1)</p> <p>RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)</p> <p>W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)</p> <p>W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)</p> <p>W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)</p> <p>SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)</p> <p>Mathematics –</p> <p>MP.2 Reason abstractly and quantitatively. (2-ESS1-1)</p> <p>MP.4 Model with mathematics. (2-ESS1-1)</p> <p>2.NBT.A Understand place value. (2-ESS1-1)</p>		

2-ESS2 Earth's Systems		
<p>Students who demonstrate understanding can:</p> <p>2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.] Chapter 3 Performance Expectation Activity, 159b</p> <p>2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.] Chapter 3 Performance Expectation Activity, 159c</p> <p>2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid. Chapter 3 Performance Expectation Activity, 159d</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> Develop a model to represent patterns in the natural world. (2-ESS2-2) <p>SE/TE: 138, Explore It!; 141, Lightning Lab; 144, Explore It!; 146, At-Home Lab; 159, Model Earthquake Damage TE Only: 135, 21st Century Learning; 159c, Performance Expectation Activity</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> Compare multiple solutions to a problem. (2-ESS2-1) <p>SE/TE: 122-131, STEM Activity; 159, Model Earthquake Damage TE Only: 159b, Performance Expectation Activity; 159b, ELA/Literacy</p>	<p>ESS2.A: Earth Materials and Systems</p> <ul style="list-style-type: none"> Wind and water can change the shape of the land. (2-ESS2-1) <p>SE/TE: 133, Land and Water; 139, Changes on Earth; 140, Earthquakes and Volcanoes; 141, Weathering and Erosion; 142, Water Changes the Land; 143, Other Causes of Erosion; 148-149, Investigate It!; 154-155, Chapter Review, Lesson 2; 158, Erosion TE Only: 118D, Teacher Background; 118G, Leveled Content Reader Support; 118, Talk About the Picture; 140, Differentiated Instruction; 143b, Lesson 2 Check, Questions 1, 2, 4; 149a-149d, Investigate It!; 155a, Chapter 3 Test – Questions 3, 4; 155b, Chapter 3 Test – Question 8; 159a, Performance Expectation Activity</p> <p>ESS2.B: Plate Tectonics and Large-Scale System Interactions</p> <ul style="list-style-type: none"> Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2) <p>SE/TE: 120, Try It!; 133, Land and Water; 159, Make a Puzzle TE Only: 134, At-Home Lab; 135, Elaborate; 155a, Chapter 3 Test – Questions 1, 6; 159a, ELA/Literacy; 159c, Mathematics; 176, Science, Social Studies</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3) <p>SE/TE: 120, Try It!; 134-137; 148-149, Investigate It!; 156-157, Apply It!; 158, Erosion; 196-197, Investigate It! TE Only: 118D, Teacher Background; 118G-118H, Leveled Content Reader Support; 136, Explain; 149c, Guided Inquiry; 159c, Mathematics; 159d, Performance Expectation Activity; 197c, Guided Inquiry</p> <p>Stability and Change</p> <ul style="list-style-type: none"> Things may change slowly or rapidly. (2-ESS2-1) <p>SE/TE: 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion TE Only: 118, CCC: Stability and Change; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity</p>

<p>Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.</p> <ul style="list-style-type: none"> Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3) <p>SE/TE: 158, Make a Poster TE Only: 140, Differentiated Instruction; 143, Differentiated Instruction; 159a, Performance Expectation Activity; 159a, ELA/Literacy; 159c, Performance Expectation Activity; 159c, ELA/Literacy; 159d, Performance Expectation Activity</p>	<p>ESS2.C: The Roles of Water in Earth’s Surface Processes</p> <ul style="list-style-type: none"> Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3) <p>SE/TE: 120, Try It!; 133, Land and Water; 135, Water surrounds an island; 136, The Ocean/Lakes and Ponds; 137, Rivers and Streams/Glaciers; 154, Chapter Review – Lesson 1; 159, Make a Puzzle TE Only: 137b, Lesson 1 Check – Question 4; 159c, Performance Expectation Activity; 159d, Performance Expectation Activity; 159d, ELA/ Literacy</p> <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (secondary to 2-ESS2-1) <p>SE/TE: 122-131, STEM Activity TE Only: 159b, Performance Expectation Activity</p>	<p>----- Connections to Engineering, Technology, and Applications of Science</p> <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> Developing and using technology has impacts on the natural world. (2-ESS2-1) <p>SE/TE: 122-131, STEM Activity; 139, Changes on Earth TE Only: 122, Background; 140, Differentiated Instruction; 141, Professional Development Note; 159b, Performance Expectation Activity; 159b, ELA/Literacy</p> <p>----- Connections to Nature of Science</p> <p>Science Addresses Questions About the Natural and Material World</p> <ul style="list-style-type: none"> Scientists study the natural and material world. (2-ESS2-1) <p>SE/TE: 174-177, Lesson 1; 198, Shonte Wright; 202, Part 1 Review – Lessons 1, 2 TE Only: 160G, Leveled Content Reader Support; 160, Talk About the Picture; 177a, My Planet Diary; 177b, Lesson 1 Check – Questions 1-5</p>
<p><i>Connections to other DCIs in second grade: 2.PS1.A (2-ESS2-3)</i></p>		
<p><i>Articulation of DCIs across grade-bands: K.ETS1.A (2-ESS2-1); 4.ESS2.A (2-ESS2-1); 4.ESS2.B (2-ESS2-2); 4.ETS1.A (2-ESS2-1); 4.ETS1.B (2-ESS2-1); 4.ETS1.C (2-ESS2-1); 5.ESS2.A (2-ESS2-1); 5.ESS2.C (2-ESS2-2),(2-ESS2-3)</i></p>		
<p><i>Common Core State Standards Connections:</i> <i>ELA/Literacy –</i></p> <p>RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS2-1)</p> <p>RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)</p> <p>W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS2-3)</p> <p>W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS2-3)</p> <p>SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)</p> <p><i>Mathematics –</i></p> <p>MP.2 Reason abstractly and quantitatively. (2-ESS2-1),(2-ESS2-2)</p> <p>MP.4 Model with mathematics. (2-ESS2-1),(2-ESS2-2)</p> <p>MP.5 Use appropriate tools strategically. (2-ESS2-1)</p> <p>2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)</p> <p>2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)</p>		

2-PS1 Matter and Its Interactions	
Students who demonstrate understanding can:	
<p>2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] Chapter 1 Performance Expectation Activity, 61a</p>	
<p>2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.] Chapter 1 Performance Expectation Activity, 61b</p>	
<p>2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] Chapter 1 Performance Expectation Activity, 61c</p>	
<p>2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.] Chapter 1 Performance Expectation Activity, 61d</p>	

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <ul style="list-style-type: none"> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1) <p>SE/TE: 6-15, STEM Activity; 48-49, Investigate It!; 58-59, Apply It! 148-149, Investigate It!; 196-197, Investigate It! TE Only: 3, SEP: Planning and Carrying Out Investigations; 49a-49c, Activity Card Support; 59, Possible Extensions; 61a, Performance Expectation Activity; 197a-197c, Activity Card Support</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2) <p>SE/TE: 12-15, STEM Activity; 49, Investigate It! TE Only: 49b, Investigate It!; 61b, Performance Expectation Activity</p>	<p>PS1.A: Structure and Properties of Matter</p> <ul style="list-style-type: none"> Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) <p>SE/TE: 16-23, Lesson 1; 24-29, Lesson 2; 36, Explore It!; 38, Cooling Matter; 41, Properties of Materials; 56, Chapter Review – Lessons 1, 2; 58-59, Apply It!; 60, Group Objects; 181, Classify</p> <ul style="list-style-type: none"> Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) <p>SE/TE: 6-15, STEM Activity; 40-47, Lesson 5; 57, Chapter 1 Review – Lesson 5; 225, Choose Materials TE Only: 20, Professional Development Note; 22, Evaluate; 33, Professional Development Note; 42, Professional Development Note; 43, Differentiated Instruction; 47, Common Misconception; 47a, Explore It!; 47b, Lesson 5 Check – Questions 3, 4; 57b, Chapter 1 Test – Question 8; 61b, Performance Expectation Activity; 61b, ELA/Literacy; 225, 21st Century Learning</p> <ul style="list-style-type: none"> A great variety of objects can be built up from a small set of pieces. (2-PS1-3) <p>SE/TE: 32, Mold It, Fold It, Tear It, Bend</p>	<p>Patterns</p> <ul style="list-style-type: none"> Patterns in the natural and human designed world can be observed. (2-PS1-1) <p>SE/TE: 16, Explore It!; 18, At-Home Lab; 27, At-Home Lab; 36, Explore It!; 194, Record Data; 196-197, Investigate It! TE Only: 39a, Explore It!; 118G-118H, Leveled Content Reader Support; 197a-197c, Activity Card Support</p> <p>Cause and Effect</p> <ul style="list-style-type: none"> Events have causes that generate observable patterns. (2-PS1-4) <p>SE/TE: 4, Try It!; 24, My Planet Diary; 27, At-Home Lab; 38, Lightning Lab; 148-149, Investigate It!; 196-197, Investigate It!; 206, Try It!; 222, Explore It! TE Only: 29a, My Planet Diary; 197a-197c, Activity Card Support; 227a, Explore It!</p> <ul style="list-style-type: none"> Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) <p>SE/TE: 4, Try It!; 38, Lightning Lab; 58-59, Apply It!; 148-149, Investigate It!; 222, Explore It! TE Only: 23, Common Misconceptions; 58, Science Misconception; 149a-149d, Activity Card Support</p> <p>Energy and Matter</p> <ul style="list-style-type: none"> Objects may break into smaller pieces and be put together into larger pieces,

<p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.</p> <ul style="list-style-type: none"> ▪ Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3) <p>SE/TE: 4, Try It!; 18, At-Home Lab; 27, At-Home Lab; 48-49, Investigate It! TE Only: 49a-49c, Activity Card Support; 61c, Performance Expectation Activity</p> <p>Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).</p> <ul style="list-style-type: none"> • Construct an argument with evidence to support a claim. (2-PS1-4) <p>SE/TE: 30, Explore It!; 32, Draw; 33, Write; 188-191, Lesson 4 TE Only: 32-33 Explain; 35a, Explore It!; 61d, Performance Expectation Activity; 61d, ELA/Literacy; 191a, Explore It!; 191b, Lesson 4 Check – Questions 1-5</p> <hr style="border: 0.5px dashed black;"/> <p style="text-align: center;">Connections to Nature of Science Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena</p> <ul style="list-style-type: none"> ▪ Scientists search for cause and effect relationships to explain natural events. (2-PS1-4) <p>SE/TE: 4, Try It!; 27, At-Home Lab; 38, Lightning Lab TE Only: 61d, Performance Expectation Activity; 61d, ELA/Literacy</p>	<p>It; 34, Mix and Separate Matter; 40-47, Lesson 5; 57, Chapter Review – Lesson 5; 61, Make a Presentation TE Only: 35a, Explore It!; 47a, Explore It!; 47b, Lesson 5 Check – Questions 3, 4; 61c, Performance Expectation Activity; 61c, ELA/Literacy</p> <p>PS1.B: Chemical Reactions</p> <ul style="list-style-type: none"> ▪ Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4) <p>SE/TE: 5, Let’s Read Science; 24, My Planet Diary; 33, Other Ways Matter Can Change; 38, Cooling Matter; 38, Lightning Lab; 39, Heating Matter; 50, From Sand to Glass; 56, Chapter 1 Review – Lesson 3; 60, Cool a Balloon TE Only: 2G-2H, Leveled Content Reader Support; 20, Professional Development Note; 39b, Chapter 1 Lesson Check – Questions 2-4; 61d, Performance Expectation Activity; 61d, ELA/Literacy</p>	<p>or change shapes. (2-PS1-3)</p> <p>SE/TE: 30-35, Lesson 3; 40-47, Lesson 5; 57, Chapter 1 Review - Lesson 3; 61, Make a Presentation TE Only: 2, CCC: Energy and Matter; 35a, Explore It!; 35b, Lesson 3 Check – Questions 1-4; 61c, Performance Expectation Activity; 61c, ELA/Literacy</p> <hr style="border: 0.5px dashed black;"/> <p style="text-align: center;">Connections to Engineering, Technology, and Applications of Science</p> <p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> ▪ Every human-made product is designed by applying some knowledge of the natural world and is built by using natural materials. (2-PS1-2) <p>SE/TE: 6-15, STEM Activity; 45, Materials in Bridges TE only: 20, Professional Development Note</p>
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<i>Connections to other DCIs in second grade:</i> N/A	
<i>Articulation of DCIs across grade-bands:</i> 4.ESS2.A (2-PS1-3); 5.PS1.A (2-PS1-1),(2-PS1-2),(2-PS1-3); 5.PS1.B (2-PS1-4); 5.LS2.A (2-PS1-3)	
<i>Common Core State Standards Connections:</i>	
<i>ELA/Literacy –</i>	
RI.2.1	Ask and answer such questions as <i>who, what, where, when, why,</i> and <i>how</i> to demonstrate understanding of key details in a text. (2-PS1-4)
RI.2.3	Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)
RI.2.8	Describe how reasons support specific points the author makes in a text. (2-PS1-2),(2-PS1-4)
W.2.1	Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., <i>because, and, also</i>) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)
W.2.7	Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1-2),(2-PS1-3)
W.2.8	Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)
<i>Mathematics –</i>	
MP.2	Reason abstractly and quantitatively. (2-PS1-2)
MP.4	Model with mathematics. (2-PS1-1),(2-PS1-2)
MP.5	Use appropriate tools strategically. (2-PS1-2)
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1),(2-PS1-2)

K-2 Engineering Design		
<p>Students who demonstrate understanding can:</p> <p>K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. Trails That Last STEM Activity, 6-15 Trap It and Learn! STEM Activity, 66-75 All Bound Up! STEM Activity, 208-217 Design It! How would you design a pencil?, 242-247</p> <p>K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. Chapter 2 Performance Expectation Activity, 117b Strike Up a Band! STEM Activity, 164-173 All Bound Up! STEM Activity, 208-217 Investigate It! How can a machine ring a bell? 234-235 Design It! How would you design a pencil?, 242-247</p> <p>K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. Trails that Last STEM Activity, 6-15 Chapter 3 Performance Expectation Activity, 159b All Bound Up! STEM Activity, 208-217 Explore It! How can you keep warm water warm?, 222 Design It! How would you design a pencil?, 242-247</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.</p> <ul style="list-style-type: none"> Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) <p>SE/TE: 58, Apply It!; 156, Apply It!; 174-177, Lesson 1; 190, Ask a Question TE Only: 117a, Performance Expectation Activity; 143, Differentiated Instruction; 197a, Activity Card Support</p> <ul style="list-style-type: none"> Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) <p>SE/TE: 6-7, Find a Problem; 67, Find a Problem; 122-123, Find a Problem; 164-165, Find a Problem; 208-209, Find a Problem; 242, Find a Problem TE Only: 160G-160H, Leveled Content Reader Support</p>	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) <p>SE/TE: 6-15, STEM Activity; 66-75, STEM Activity; 122-131, STEM Activity; 164-173, STEM Activity; 208-217, STEM Activity; 222-227, Lesson 2; 242-247, Design It!; 248, Design a Solution TE Only: 160G-160H, Leveled Content Reader Support; 227a, Explore It!; Lesson 2 Check- Questions 1-5</p> <ul style="list-style-type: none"> Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) <p>SE/TE: 6-7, Find a Problem; 66-67, Find a Problem; 122-123, Find a Problem; 164-165, Find a Problem; 208-209, Find a Problem; 242-243, Find a Problem; 248, Find a Problem TE Only: 160G-160H, Leveled Content Reader Support</p>	<p>Structure and Function</p> <ul style="list-style-type: none"> The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2) <p>SE/TE: 45, Materials in Bridges; 47, Materials in Towers; 182, Explore It!; 183, Tools; 184-185, More Tools TE Only: 47a, Explore It!; 117b, Performance Expectation Activity; 187, 21st Century Learning; 187a, Explore It!; 204, CCC: Structure and Function</p>

<p>Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) <p>SE/TE: 6-15, STEM Activity; 40, Explore It!; 47, Explore It!; 88, Explore It!; 144, Explore It!; 159, Model Earthquake Damage; 232, Lightning Lab TE Only: 63, SEP: Developing and Using Models; 93a, Explore It!; 135, 21st Century Learning; 147a, Explore It!</p> <p>Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> ▪ Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3) <p>SE/TE: 12-13, Make and Test; 72-73, Make and Test; 74, Question 13; 114-115, Apply It!; 128-129, Make and Test; 130, Record and Share; 170-171, Make and Test; 214-215, Make and Test; 235, Analyze and Conclude; 245, Make and Test TE Only: 61b, Performance Expectation Activity; 205, SEP: Analyzing and Interpreting Data</p>	<ul style="list-style-type: none"> ▪ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>SE/TE: 6-7, Find a Problem; 8-9, Plan and Draw; 10-11, Choose Materials; 66-67, Find a Problem; 68-69, Plan and Draw; 70-71, Choose Materials; 122-123, Find a Problem; 124-125, Plan and Draw; 126-127, Choose Materials; 164-165, Find a Problem; 166-167, Plan and Draw; 168-169, Choose Materials; 208-209, Find a Problem; 210-211, Plan and Draw; 212-213, Choose Materials; 242, Find a Problem; 243, Plan and Draw; 244, Choose Materials; 248, Find a Problem TE Only: 160G-160H, Leveled Content Reader Support</p> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> ▪ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people. (K-2-ETS1-2) <p>SE/TE: 7, Question 3; 11, Question 9; 67, Question 2; 69, Question 6; 71, Question 9; 72, Question 10; 73, Question 12; 75, Question 15; 128, Question 12; 130, Question 15; 165, Question 2; 166, Question 3; 169, Question 9; 170, Question 10; 173, Question 17; 210, Question 3; 211, Question 6; 213, Question 9; 214, Question 10; 217, Question 15; 243, Question 3 TE Only: 160G-160H, Leveled Content Reader Support</p> <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> ▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3) <p>SE/TE: 9, Question 6; 12-13, Make and Test; 14-15, Record and Share; 74-75, Record and Share; 131, Record and Share; 172-173, Record and Share; 216-217, Record and Share; 246-247, Record and Share TE Only: 160G-160H, Leveled Content Reader Support</p>	
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Connections to other DCIs in this grade-band:

Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include: Kindergarten: K-PS2-2, K-ESS3-2

Connections to K-2-ETS1.B: Developing Possible Solutions Problems include: Kindergarten: K-ESS3-3, First Grade: 1-PS4-4, Second Grade: 2-LS2-2

Connections to K-2-ETS1.C: Optimizing the Design Solution include: Second Grade: 2-ESS2-1

Articulation of DCIs across grade-bands: 3-5.ETS1.A (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3); 3-5.ETS1.B (K-2-ETS1-2); 3-5.ETS1.C (K-2-ETS1-1),(K-2-ETS1-2),(K-2-ETS1-3)

Common Core State Standards Connections:

ELA/Literacy –

RI.2.1 Ask and answer such questions as *who, what, where, when, why, and how* to demonstrate understanding of key details in a text. (2-ESS1-1)

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1),(K-2-ETS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1),(K-2-ETS1-3)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

Mathematics –

MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3)

MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3)

MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3)

2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1),(K-2-ETS1-3)

* This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.