

# Grade 2 Science Scope and Sequence

## Unit of Study 1: Relationships in Habitats (15 days)

Standards that appear this unit: 2-LS4-1, 2-LS2-1, 2-LS2-2 \*, K-2-ETS1-2

<b>2. Interdependent Relationships in Ecosystems</b>		
<p>Students who demonstrate understanding can:</p> <p><b>2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.</b>  <span style="color: red;">[Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.]</span>  <span style="color: red;">[Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]</span></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>		
<p style="text-align: center; background-color: #003366; color: white; padding: 2px;"><b>Science and Engineering Practices</b></p> <p><b>Planning and Carrying Out Investigations</b>            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"> <li>▪ Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><b>Connections to Nature of Science</b></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <ul style="list-style-type: none"> <li>▪ Scientists look for patterns and order when making observations about the world. (2-LS4-1)</li> </ul>	<p style="text-align: center; background-color: #ff9800; color: white; padding: 2px;"><b>Disciplinary Core Ideas</b></p> <p><b>LS4.D: Biodiversity and Humans</b></p> <ul style="list-style-type: none"> <li>▪ 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)</li> </ul>	<p style="text-align: center; background-color: #008000; color: white; padding: 2px;"><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>▪ N/A</li> </ul>
<p><i>Connections to other DCIs in second grade:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-levels:</i> <b>3.LS4.C</b> (2-LS4-1); <b>3.LS4.D</b> (2-LS4-1); <b>5.LS2.A</b> (2-LS4-1)</p>		
<p><i>Common Core State Standards Connections:</i></p>		
<p><i>ELA/Literacy –</i></p> <p><b>W.2.7</b> 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><b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)</p> <p><i>Mathematics –</i></p> <p><b>MP.2</b> Reason abstractly and quantitatively. (2-LS4-1)</p> <p><b>MP.4</b> Model with mathematics. (2-LS4-1)</p> <p><b>2.MD.D.10</b> 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>		

<b>2. Interdependent Relationships in Ecosystems</b>		
Students who demonstrate understanding can: <b>2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow.</b> [Assessment Boundary: Assessment is limited to testing one variable at a time.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p><b>Science and Engineering Practices</b>  <b>Planning and Carrying Out Investigations</b>                  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"> <li>▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>LS2.A: Interdependent Relationships in Ecosystems</b></p> <ul style="list-style-type: none"> <li>▪ Plants depend on water and light to grow. (2-LS2-1)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>▪ Events have causes that generate observable patterns. (2-LS2-1)</li> </ul>
Connections to other DCIs in second grade: N/A		
Articulation of DCIs across grade-levels: <b>K.LS1.C</b> (2-LS2-1); <b>K-ESS3.A</b> (2-LS2-1) <b>5.LS1.C</b> (2-LS2-1)		
Common Core State Standards Connections: ELA/Literacy – <b>W.2.7</b> 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) <b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1) Mathematics – <b>MP.2</b> Reason abstractly and quantitatively. (2-LS2-1) <b>MP.4</b> Model with mathematics. (2-LS2-1) <b>MP.5</b> Use appropriate tools strategically. (2-LS2-1)		

<b>2. Interdependent Relationships in Ecosystems</b>		
Students who demonstrate understanding can: <b>2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. *</b>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas</b>	<b>Crosscutting Concepts</b>
<b>Developing and Using Models</b> 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. <ul style="list-style-type: none"> <li>Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)</li> </ul>	<b>LS2.A: Interdependent Relationships in Ecosystems</b> <ul style="list-style-type: none"> <li>Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)</li> </ul> <b>ETS1.B: Developing Possible Solutions</b> <ul style="list-style-type: none"> <li>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)</li> </ul>	<b>Structure and Function</b> <ul style="list-style-type: none"> <li>The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)</li> </ul>
<i>Connections to other DCIs in second grade:</i> N/A		
<i>Articulation of DCIs across grade-levels:</i> <b>K.ETS1.A</b> (2-LS2-2); <b>5.LS2.A</b> (2-LS2-2)		
<i>Common Core State Standards Connections:</i>		
<i>ELA/Literacy –</i>		
<b>SL.2.5</b> 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)		
<i>Mathematics –</i>		
<b>MP.4</b> Model with mathematics. (2-LS2-2)		
<b>2.MD.D.10</b> 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)		

<b>K-2. Engineering Design</b>		
Students who demonstrate understanding can: <b>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.</b>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b> <b>Developing and Using Models</b> 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. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)	<b>Disciplinary Core Ideas</b> <b>ETS1.B: Developing Possible Solutions</b> ▪ 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)	<b>Crosscutting Concepts</b> <b>Structure and Function</b> ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)
<p><i>Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:</i> <b>Kindergarten:</b> K-PS2-2, K-ESS3-2</p> <p><i>Connections to K-2-ETS1.B: Developing Possible Solutions to Problems include:</i> <b>Kindergarten:</b> K-ESS3-3, <b>First Grade:</b> 1-PS4-4, <b>Second Grade:</b> 2-LS2-2</p> <p><i>Connections to K-2-ETS1.C: Optimizing the Design Solution include:</i> <b>Second Grade:</b> 2-ESS2-1</p>		
<p><i>Articulation of DCIs across grade-bands: <b>3-5.ETS1.A</b> (K-2-ETS1-2); <b>3-5.ETS1.B</b> (K-2-ETS1-2); <b>3-5.ETS1.C</b> (K-2-ETS1-2)</i></p>		
<p><i>Common Core State Standards Connections:</i> <i>ELA/Literacy –</i> <b>SL.2.5</b> 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)</p>		

## Unit of Study 2: Properties of Matter (20 days)

**Standards that appear this unit: 2-PS1-1, 2-PS1-2\*, K-2-ETS1-3**

<b>2. Structure and Properties of Matter</b>		
Students who demonstrate understanding can: <b>2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</b> [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center;"><b>Science and Engineering Practices</b></p> <p><b>Planning and Carrying Out Investigations</b></p> 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. <ul style="list-style-type: none"> <li>▪ Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>PS1.A: Structure and Properties of Matter</b></p> <ul style="list-style-type: none"> <li>▪ 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)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>▪ Patterns in the natural and human designed world can be observed. (2-PS1-1)</li> </ul>
Connections to other DCIs in second grade: N/A		
Articulation of DCIs across grade-levels: <b>5.PS1.A</b> (2-PS1-1)		
Common Core State Standards Connections: ELA/Literacy – <p><b>W.2.7</b> 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)</p> <p><b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1)</p> Mathematics – <p><b>MP.4</b> Model with mathematics. (2-PS1-1)</p> <p><b>2.MD.D.10</b> 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)</p>		

<b>2. Structure and Properties of Matter</b>		
Students who demonstrate understanding can: <b>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.*</b> [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center;"><b>Science and Engineering Practices</b></p> <p><b>Analyzing and Interpreting Data</b></p> Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. <ul style="list-style-type: none"> <li>Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>PS1.A: Structure and Properties of Matter</b></p> <ul style="list-style-type: none"> <li>Different properties are suited to different purposes. (2-PS1-2)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><b>Connections to Engineering, Technology, and Applications of Science</b></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2)</li> </ul>
Connections to other DCIs in second grade: N/A		
Articulation of DCIs across grade-levels: <b>5.PS1.A</b> (2-PS1-2)		
Common Core State Standards Connections: ELA/Literacy – <b>RI.2.8</b> Describe how reasons support specific points the author makes in a text. (2-PS1-2) <b>W.2.7</b> 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-PS1-2) <b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-2) Mathematics – <b>MP.2</b> Reason abstractly and quantitatively. (2-PS1-2) <b>MP.4</b> Model with mathematics. (2-PS1-2) <b>MP.5</b> Use appropriate tools strategically. (2-PS1-2) <b>2.MD.D.10</b> 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-PS1-2)		

<b>K-2. Engineering Design</b>		
Students who demonstrate understanding can: <b>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.</b>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b> <b>Analyzing and Interpreting Data</b> Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. <ul style="list-style-type: none"> <li>Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)</li> </ul>	<b>Disciplinary Core Ideas</b> <b>ETS1.C: Optimizing the Design Solution</b> <ul style="list-style-type: none"> <li>Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)</li> </ul>	<b>Crosscutting Concepts</b> N/A
Connections to K-2-ETS1.A: <i>Defining and Delimiting Engineering Problems</i> include: <b>Kindergarten:</b> K-PS2-2, K-ESS3-2 Connections to K-2-ETS1.B: <i>Developing Possible Solutions to Problems</i> include: <b>Kindergarten:</b> K-ESS3-3, <b>First Grade:</b> 1-PS4-4, <b>Second Grade:</b> 2-LS2-2 Connections to K-2-ETS1.C: <i>Optimizing the Design Solution</i> include: <b>Second Grade:</b> 2-ESS2-1		
Articulation of DCIs across grade-bands: <b>3-5.ETS1.A</b> (K-2 -ETS1-3); <b>3-5.ETS1.B</b> (K-2-ETS1-3); <b>3-5.ETS1.C</b> (K-2-ETS1-3)		
Common Core State Standards Connections: ELA/Literacy – <b>W.2.6</b> With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-3) <b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-3) Mathematics – <b>MP.2</b> Reason abstractly and quantitatively. (K-2-ETS1-3) <b>MP.4</b> Model with mathematics. (K-2-ETS1-3) <b>MP.5</b> Use appropriate tools strategically. (K-2-ETS1-3) <b>2.MD.D.10</b> 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-ETS1-3)		

## Unit of Study 3: Changes to Matter (15 days)

**Standards that appear this unit: 2-PS1-3, 2-PS1-4**

<b>2. Structure and Properties of Matter</b>		
Students who demonstrate understanding can: <b>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.</b> [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b> <b>Constructing Explanations and Designing Solutions</b> 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. <ul style="list-style-type: none"> <li>▪ Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3)</li> </ul>	<b>Disciplinary Core Ideas</b> <b>PS1.A: Structure and Properties of Matter</b> <ul style="list-style-type: none"> <li>▪ Different properties are suited to different purposes. (2-PS1-3)</li> <li>▪ A great variety of objects can be built up from a small set of pieces. (2-PS1-3)</li> </ul>	<b>Crosscutting Concepts</b> <b>Energy and Matter</b> <ul style="list-style-type: none"> <li>▪ Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)</li> </ul>
<i>Connections to other DCIs in second grade:</i> N/A		
<i>Articulation of DCIs across grade-levels:</i> <b>4.ESS2.A</b> (2-PS1-3); <b>5.PS1.A</b> (2-PS1-3); <b>5.LS2.A</b> (2-PS1-3)		
<i>Common Core State Standards Connections:</i> <b>ELA/Literacy</b> – <ul style="list-style-type: none"> <li><b>W.2.7</b> 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-PS1-3)</li> <li><b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-3)</li> </ul>		



<b>2. Structure and Properties of Matter</b>		
<p>Students who demonstrate understanding can:</p> <p><b>2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.</b> [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.]</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>		
	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>PS1.B: Chemical Reactions</b></p> <ul style="list-style-type: none"> <li>▪ 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)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Cause and Effect</b></p> <ul style="list-style-type: none"> <li>▪ Events have causes that generate observable patterns. (2-PS1-4)</li> </ul>
<p><i>Connections to other DCIs in second grade:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-levels:</i> <b>5.PS1.B</b> (2-PS1-4)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p><b>RI.2.1</b> 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)</p> <p><b>RI.2.3</b> Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)</p> <p><b>RI.2.8</b> Describe how reasons support specific points the author makes in a text. (2-PS1-4)</p> <p><b>W.2.1</b> 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)</p>		

## Unit of Study 4: The Earth’s Land and Water (20 days)

**Standards that appear this unit: 2-ESS2-3, 2-ESS2-2**

<b>2.Earth’s Systems: Processes that Shape the Earth</b>		
Students who demonstrate understanding can:		
<b>2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.</b>		
The performance expectations above were developed using the following elements from the NRC document: <i>A Framework for K-12 Science Education</i>		
<p style="text-align: center; margin: 0;"><b>Science and Engineering Practices</b></p> <p><b>Obtaining, Evaluating, and Communicating Information</b></p> <p>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"> <li>▪ 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)</li> </ul>	<p style="text-align: center; margin: 0;"><b>Disciplinary Core Ideas</b></p> <p><b>ESS2.C: The Roles of Water in Earth’s Surface Processes</b></p> <ul style="list-style-type: none"> <li>▪ Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)</li> </ul>	<p style="text-align: center; margin: 0;"><b>Crosscutting Concepts</b></p> <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>▪ Patterns in the natural world can be observed. (2-ESS2-3)</li> </ul>
Connections to other DCIs in second grade: <b>2.PS1.A</b> (2-ESS2-3)		
Articulation of DCIs across grade-levels: <b>5.ESS2.C</b> (2-ESS2-3)		
Common Core State Standards Connections:		
ELA/Literacy –		
<b>W.2.6</b>	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)	
<b>W.2.8</b>	Recall information from experiences or gather information from provided sources to answer a question. (2-ESS2-3)	

<b>2. Earth’s Systems: Processes that Shape the Earth</b>		
Students who demonstrate understanding can: <b>2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.</b> [Assessment Boundary: Assessment does not include quantitative scaling in models.]		
The performance expectations above were developed using the following elements from the NRC document: <i>A Framework for K-12 Science Education</i> :		
<p><b>Science and Engineering Practices</b></p> <p><b>Developing and Using Models</b> 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"> <li>▪ Develop a model to represent patterns in the natural world. (2-ESS2-2)</li> </ul>	<p><b>Disciplinary Core Ideas</b></p> <p><b>ESS2.B: Plate Tectonics and Large-Scale System Interactions</b></p> <ul style="list-style-type: none"> <li>▪ Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)</li> </ul>	<p><b>Crosscutting Concepts</b></p> <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>▪ Patterns in the natural world can be observed. (2-ESS2-2)</li> </ul>
<i>Connections to other DCIs in second grade:</i> N/A		
<i>Articulation of DCIs across grade-levels:</i> <b>4.ESS2.B</b> (2-ESS2-2); <b>5.ESS2.C</b> (2-ESS2-2)		
<i>Common Core State Standards Connections:</i>		
<i>ELA/Literacy –</i>		
<b>SL.2.5</b> 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)		
<i>Mathematics –</i>		
<b>MP.2</b> Reason abstractly and quantitatively. (2-ESS2-2)		
<b>MP.4</b> Model with mathematics. (2-ESS2-2)		
<b>2.NBT.A.3</b> Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)		

## Unit of Study 5: Changes to Earth’s Land (30 days)

**Standards that appear this unit: 2-ESS1-1, 2-ESS2-1\*, K-2-ETS1-1, K-2-ETS1-2**

<b>2. Earth’s Systems: Processes that Shape the Earth</b>		
Students who demonstrate understanding can: <b>2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.</b> [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.]		
The performance expectations above were developed using the following elements from the NRC document: <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center; background-color: #4f81bd; color: white; margin: 0;"><b>Science and Engineering Practices</b></p> <p style="margin: 0;"><b>Constructing Explanations and Designing Solutions</b></p> <p style="margin: 0;">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"> <li>▪ Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)</li> </ul>	<p style="text-align: center; background-color: #e67e22; color: white; margin: 0;"><b>Disciplinary Core Ideas</b></p> <p style="margin: 0;"><b>ESS1.C: The History of Planet Earth</b></p> <ul style="list-style-type: none"> <li>▪ Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1)</li> </ul>	<p style="text-align: center; background-color: #2e8b57; color: white; margin: 0;"><b>Crosscutting Concepts</b></p> <p style="margin: 0;"><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>▪ Things may change slowly or rapidly. (2-ESS1-1)</li> </ul>
<i>Connections to other DCIs in second grade:</i> N/A		
<i>Articulation of DCIs across grade-levels:</i> <b>3.LS2.C</b> (2-ESS1-1); <b>4.ESS1.C</b> (2-ESS1-1); <b>4.ESS2.A</b> (2-ESS1-1)		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p><b>RI.2.1</b> 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)</p> <p><b>RI.2.3</b> 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><b>W.2.6</b> 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><b>W.2.7</b> 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><b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)</p> <p><b>SL.2.2</b> 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><i>Mathematics –</i></p> <p><b>MP.4</b> Model with mathematics. (2-ESS1-1)</p> <p><b>2.NBT.A</b> Understand place value. (2-ESS1-1)</p>		

2. Earth’s Systems: Processes that Shape the Earth		
Students who demonstrate understanding can: <b>2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.</b> * [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.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center;"><b>Science and Engineering Practices</b></p> <p><b>Constructing Explanations and Designing Solutions</b>                  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"> <li>▪ Compare multiple solutions to a problem. (2-ESS2-1)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>ESS2.A: Earth Materials and Systems</b></p> <ul style="list-style-type: none"> <li>▪ Wind and water can change the shape of the land. (2-ESS2-1)</li> </ul> <p><b>ETS1.C: Optimizing the Design Solution</b></p> <ul style="list-style-type: none"> <li>▪ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (<i>secondary to 2-ESS2-1</i>)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>▪ Things may change slowly or rapidly. (2-ESS2-1)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><b>Connections to Engineering, Technology, and Applications of Science</b></p> <p><b>Influence of Engineering, Technology, and Science on Society and the Natural World</b></p> <ul style="list-style-type: none"> <li>▪ Developing and using technology has impacts on the natural world. (2-ESS2-1)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><b>Connections to Nature of Science</b></p> <p><b>Science Addresses Questions About the Natural and Material World</b></p> <ul style="list-style-type: none"> <li>▪ Scientists study the natural and material world. (2-ESS2-1)</li> </ul>
Connections to other DCIs in second grade: N/A		
Articulation of DCIs across grade-levels: <b>K.ETS1.A</b> (2-ESS2-1); <b>4.ESS2.A</b> (2-ESS2-1); <b>4.ETS1.A</b> (2-ESS2-1); <b>4.ETS1.B</b> (2-ESS2-1); <b>4.ETS1.C</b> (2-ESS2-1); <b>5.ESS2.A</b> (2-ESS2-1)		
Common Core State Standards Connections: ELA/Literacy – <b>RI.2.3</b> Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS2-1) <b>RI.2.9</b> Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1) Mathematics – <b>MP.2</b> Reason abstractly and quantitatively. (2-ESS2-1) <b>MP.4</b> Model with mathematics. (2-ESS2-1) <b>MP.5</b> Use appropriate tools strategically. (2-ESS2-1) <b>2.MD.B.5</b> 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)		

<b>K-2.Engineering Design</b>		
Students who demonstrate understanding can: <b>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.</b>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b>  <b>Asking Questions and Defining Problems</b> Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. <ul style="list-style-type: none"> <li>▪ Ask questions based on observations to find more information about the natural and/or designed world. (K-2-ETS1-1)</li> <li>▪ Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)</li> </ul>	<b>Disciplinary Core Ideas</b>  <b>ETS1.A: Defining and Delimiting Engineering Problems</b> <ul style="list-style-type: none"> <li>▪ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)</li> <li>▪ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)</li> <li>▪ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)</li> </ul>	<b>Crosscutting Concepts</b>  N/A
<i>Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:</i> <b>Kindergarten:</b> K-PS2-2, K-ESS3-2 <i>Connections to K-2-ETS1.B: Developing Possible Solutions to Problems include:</i> <b>Kindergarten:</b> K-ESS3-3, <b>First Grade:</b> 1-PS4-4, <b>Second Grade:</b> 2-LS2-2 <i>Connections to K-2-ETS1.C: Optimizing the Design Solution include:</i> <b>Second Grade:</b> 2-ESS2-1		
<i>Articulation of DCIs across grade-bands: <b>3-5.ETS1.A</b> (K-2-ETS1-1); <b>3-5.ETS1.C</b> (K-2-ETS1-1)</i>		
<i>Common Core State Standards Connections:</i> ELA/Literacy – <b>RI.2.1</b> Ask and answer such questions as <i>who, what, where, when, why, and how</i> to demonstrate understanding of key details in a text. (K-2-ETS1-1) <b>W.2.6</b> 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) <b>W.2.8</b> Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1) Mathematics – <b>MP.2</b> Reason abstractly and quantitatively. (K-2-ETS1-1) <b>MP.4</b> Model with mathematics. (K-2-ETS1-1) <b>MP.5</b> Use appropriate tools strategically. (K-2-ETS1-1) <b>2.MD.D.10</b> 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)		

<b>K-2. Engineering Design</b>		
Students who demonstrate understanding can: <b>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.</b>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<b>Science and Engineering Practices</b> <b>Developing and Using Models</b> 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. ▪ Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)	<b>Disciplinary Core Ideas</b> <b>ETS1.B: Developing Possible Solutions</b> ▪ 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)	<b>Crosscutting Concepts</b> <b>Structure and Function</b> ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)
<p><i>Connections to K-2-ETS1.A: Defining and Delimiting Engineering Problems include:</i> <b>Kindergarten:</b> K-PS2-2, K-ESS3-2</p> <p><i>Connections to K-2-ETS1.B: Developing Possible Solutions to Problems include:</i> <b>Kindergarten:</b> K-ESS3-3, <b>First Grade:</b> 1-PS4-4, <b>Second Grade:</b> 2-LS2-2</p> <p><i>Connections to K-2-ETS1.C: Optimizing the Design Solution include:</i> <b>Second Grade:</b> 2-ESS2-1</p>		
<p><i>Articulation of DCIs across grade-bands: <b>3-5.ETS1.A</b> (K-2-ETS1-2); <b>3-5.ETS1.B</b> (K-2-ETS1-2); <b>3-5.ETS1.C</b> (K-2-ETS1-2)</i></p>		
<p><i>Common Core State Standards Connections:</i> <i>ELA/Literacy –</i> <b>SL.2.5</b> 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)</p>		

