



**Totowa Public Schools**

**Science**

**Grade 2**

**Aligned to NJSL Standards**

**Revised and BOE Adopted: 08/31/2022 & 12/14/2022**

## Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1: Earth's Systems	12 Weeks	This unit contains lessons which satisfy the Climate Change Mandate.
Unit 2: Structure and Properties of Matter	12 Weeks	
Unit 3: Relationships of Ecosystems	12 Weeks	This unit contains lessons which satisfy the Climate Change Mandate.
		<a href="#">Curricular Mandate List</a>

<b>Title</b>	Earth's Systems
<b>Unit Duration</b>	12 Weeks
<b>Unit Summary &amp; Rationale</b>	<i>In this unit of study, students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concept of patterns is called out as an organizing concept for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas. Students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. The crosscutting concepts of stability and change; structure and function; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, developing and using models, and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.</i>
<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How does the Earth's changes occur?</li> <li>• What changes the shape of the land?</li> <li>• What shows where things are located?</li> <li>• What are the forms of water and where is it found?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• Changes of the plant Earth can happen very slowly, and very quickly.</li> <li>• Wind and water change the shape of the land.</li> <li>• Maps show where items are located.</li> <li>• Water is found in the ocean, rivers, lakes, and ponds. Water exists in solid ice and liquid form.</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Use evidence to explain that some changes to Earth happen slowly.</li> <li>• Find solutions to prevent wind from changing the land.</li> <li>• Understand how technology has impacted the natural world.</li> <li>• Explain how scientists study the natural and material world.</li> <li>• Understand the design process.</li> </ul>

- Career Exploration - Explore careers related to farming and geoengineering.
- **Climate Change - Explain why and how climate change happens, the impact it has on our local and global communities, and how to act in informed and sustainable ways**

<b>Assessment Evidence</b>	
<b>Formative</b>	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
<b>Summative</b>	<p>In correlation with the NGSS, students must demonstrate the following as summative assessments:</p> <p>2-ESS1-1., Use information from several sources to provide evidence that Earth events can occur quickly or slowly.</p> <p>2-ESS2-1., Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*</p> <p>[2-ESS2-2., Develop a model to represent the shapes and kinds of land and bodies of water in an area.</p> <p>Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.</p>
<b>Alternative and Benchmark</b>	<p>Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes.</p> <p>Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments</p> <p><a href="#">Formative, Summative, Alternative and Benchmark Assessments</a></p>
<b>Resources to Promote Learning</b>	
<b>Resources &amp; Equipment Needed</b>	Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials, Extension Activity: Bodies of Water Demo & Venn Diagram

Activity, Crayons, Scissors, Markers, Paper, Graph Paper, Rulers, Tape, Construction Paper. [Second Grade Science Labs, Approved Class Resource List](#),

## Content & Interdisciplinary Standards

### NJ 2020 SLS: Science

#### *Standards*

2-ESS1-1., Use information 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.]

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.]

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.]

2-ESS2-3., Obtain information to identify where water is found on Earth and that it can be solid or liquid.

#### *Science and Engineering Practices*

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.

- Develop a model to represent patterns in the natural world. (2-ESS2-2)

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.

Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)

- Compare multiple solutions to a problem. (2-ESS2-1)

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.

- 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)

<i>Disciplinary Core Ideas (DCI)</i>	
<p>ESS1.C: The History of Planet Earth</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>ESS2.A: Earth Materials and Systems</p> <ul style="list-style-type: none"> <li>Wind and water can change the shape of the land. (2-ESS2-1)</li> </ul> <p>ESS2.B: Plate Tectonics and Large-Scale System Interactions</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>ESS2.C: The Roles of Water in Earth’s Surface Processes</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>ETS1.C: Optimizing the Design Solution</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. (secondary to 2-ESS2-1)</li> </ul>	
<i>Crosscutting Concepts</i>	
Patterns	
Stability and Change	<ul style="list-style-type: none"> <li>Things may change slowly or rapidly. (2-ESS2-1)</li> </ul>
Influence of Engineering, Technology, and Science on Society and the Natural World	<ul style="list-style-type: none"> <li>Influence of Engineering, Technology, and Science on Society and the Natural World</li> </ul>
Science Addresses Questions About the Natural and Material World	<ul style="list-style-type: none"> <li>Scientists study the natural and material world. (2-ESS2-1)</li> </ul>
<b>NJ: 2016 SLS: English Language Arts</b>	
<ul style="list-style-type: none"> <li>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)</li> <li>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)</li> </ul>	

- 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)
- 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)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
- 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)

**NJ: 2016 SLS: Mathematics**

- 2.NBT.A Understand place value. (2-ESS1-1)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 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)

**2020 SLS: Computer Science & Design Thinking**

**NJSLS Performance Expectations (By the end of 2nd Grade)**

- 8.2.2.ED.1: Communicate the function of a product or device.
- 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
- 8.1.2.DA.4: Make predictions based on data using charts or graphs.
- 8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.

**2020 SLS: Career Readiness, Life Literacies, and Key Skills**

**NJSLS Performance Expectations (By the end of 2nd Grade)**

- 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work
- 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives
- 9.4.2.CT.3: Use a variety of types of thinking to solve problems
- 9.4.2.IML.3: Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults
- 9.4.2.IML.1: Identify a simple search term to find information in a search engine or digital resource.

Interdisciplinary/21st Century Connections	
<b>21st Century Connections</b>	<ul style="list-style-type: none"> <li>• Creativity and Innovation</li> <li>• Information and Media Literacy</li> <li>• Critical Thinking and Problem Solving</li> <li>• Technology Literacy</li> </ul>
<b>Health/Physical Education</b>	<ul style="list-style-type: none"> <li>• 2.1.2.EH.3: Demonstrate self-control in a variety of settings (e.g., classrooms, playgrounds, special programs).</li> <li>• 2.1.2.EH.4: Demonstrate strategies for managing one's own emotions, thoughts and behaviors.</li> </ul>
<b>Social Studies</b>	<ul style="list-style-type: none"> <li>• 6.1.2.GeoHE.1: Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.</li> </ul>
<b>SEL</b>	<ul style="list-style-type: none"> <li>• Responsible Decision Making - Evaluate personal, ethical, safety, and civic impact of decisions.</li> <li>• Relationship Skills - Identify who, when, where, or how to seek help for oneself or others when needed</li> <li>• <a href="#">New Jersey Social and Emotional Learning Competencies and Sub-Competencies.docx</a></li> </ul>

<b>Title</b>	Structures and Properties of Matter
<b>Unit Duration</b>	12 Weeks
<b>Unit Summary &amp; Rationale</b>	<p><i>In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of patterns, cause and effect, and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas. Students continue to develop an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of cause and effect and energy and matter are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations, designing solutions, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas.</i></p>



<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• How can you explain the structure, properties, and interactions of matter?</li> <li>• How do particles combine to form the variety of matter one observes?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• Properties of matter (such as strength, hardness, flexibility and texture).</li> <li>• Certain materials are best suited for different purposes.</li> <li>• An object built out of a small set of pieces can be deconstructed and built into a different object.</li> <li>• Properties of solids, liquids, and gas.</li> <li>• Some substances can experience reversible changes and some cannot.</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Be able to identify material properties.</li> <li>• Be able to classify materials.</li> <li>• Be able to identify and explain the phases and changes of matter.</li> <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> <li>• Analyze data from tests of an object or tool to determine if it works as intended. (2- PS1-2)</li> <li>• Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.</li> <li>• Construct an argument with evidence to support a claim.</li> <li>• Search for cause and effect relationships to explain natural events.</li> </ul>
<b>Assessment Evidence</b>	
<b>Formative</b>	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
<b>Summative</b>	<p>In correlation with the NGSS, students must demonstrate the following as summative assessments:</p> <ul style="list-style-type: none"> <li>• 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.</li> <li>• 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.</li> </ul>

	<ul style="list-style-type: none"> <li>• 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</li> <li>• 2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.</li> </ul> <p>Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.</p>
<b>Alternative and Benchmark</b>	<p>Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes.</p> <p>Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments</p> <p><a href="#">Formative, Summative, Alternative and Benchmark Assessments</a></p>
<b>Resources to Promote Learning</b>	
<b>Resources &amp; Equipment Needed</b>	<p>Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials, Crayons, Scissors, Markers, Paper, Graph Paper, Rulers, Tape, Construction Paper. <a href="#">Second Grade Science Labs Structures of Matter Lab Approved Class Resource List</a></p>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>NJ 2020 SLS: Science</b>	
<i>Standards</i>	
<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.]</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.]</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.]</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.]  
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.]

*Science and Engineering Practices*

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.

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)

Analyzing and Interpreting Data - Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.

- Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)

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.

- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3)

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).

- Construct an argument with evidence to support a claim. (2-PS1-4)

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

- Science searches for cause and effect relationships to explain natural events. (2-PS1-4)

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.

- Compare multiple solutions to a problem. (2-ESS2-1)

*Disciplinary Core Ideas (DCI)*

PS1.A: Structure and Properties of Matter

- 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)
- Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3)
- A great variety of objects can be built up from a small set of pieces. (2-PS1-3)

PS1.B: Chemical Reactions

- 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)

ESS2.A: Earth Materials and Systems

- Wind and water can change the shape of the land. (2-ESS2-1)

ETS1.C: Optimizing the Design Solution

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (2-ESS2-1)

*Crosscutting Concepts*

Patterns	<ul style="list-style-type: none"><li>• Patterns in the natural and human designed world can be observed. (2-PS1-1)</li></ul>
Cause and Effect	<ul style="list-style-type: none"><li>• Events have causes that generate observable patterns. (2-PS1-4)</li><li>• Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2)</li></ul>
Energy and Matter	<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>
Stability and Change	<ul style="list-style-type: none"><li>• Things may change slowly or rapidly.</li></ul>
Influence of Engineering, Technology, and Science, on Society and the Natural World	<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><li>• Developing and using technology has impacts on the natural world. (2-ESS2-1)</li></ul>
Science Addresses Questions About the Natural and Material World	<ul style="list-style-type: none"><li>• Scientists study the natural and material world. (2-ESS2-1)</li></ul>

### **NJ: 2016 SLS: English Language Arts**

- 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.
- RI.2.3, Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- RI.2.8, Describe how reasons support specific points the author makes in a text.
- RI.2.9, Compare and contrast the most important points presented by two texts on the same topic.
- 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., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
- 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).
- W.2.8, Recall information from experiences or gather information from provided sources to answer a question.
- SL.2.1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. ○ A. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). ○ B. Build on others' talk in conversations by linking their explicit comments to the remarks of others. ○ C. Ask for clarification and further explanation as needed about the topics and texts under discussion.
- SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL.2.3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

### **NJ: 2016 SLS: Mathematics**

- MP.2, Reason abstractly and quantitatively.
- MP.4, Model with mathematics.
- MP.5, Use appropriate tools strategically.
- 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.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.

**2020 SLS: Computer Science & Design Thinking**

**NJSLS Performance Expectations (By the end of 2nd Grade)**

- 8.2.2.ED.1: Communicate the function of a product or device.
- 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
- 8.1.2.DA.4: Make predictions based on data using charts or graphs.
- 8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.

**2020 SLS: Career Readiness, Life Literacies, and Key Skills**

**NJSLS Performance Expectations (By the end of 2nd Grade)**

- 9.2.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job.
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work.
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan.
- 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g. inductive, deductive).
- 9.4.2.IML.1: Identify a simple search term to find information in a search engine or digital resource.

**Interdisciplinary/21st Century Connections**

<b>Connections and Skills</b>	<ul style="list-style-type: none"> <li>• Creativity and Innovation</li> <li>• Information and Media Literacy</li> <li>• Critical Thinking and Problem Solving</li> <li>• Technology Literacy</li> </ul>
<b>Health/Physical Education</b>	<ul style="list-style-type: none"> <li>• 2.1.2.EH.3: Demonstrate self-control in a variety of settings (e.g., classrooms, playgrounds, special programs).</li> <li>• 2.1.2.EH.4: Demonstrate strategies for managing one's own emotions, thoughts and behaviors.</li> </ul>
<b>SEL</b>	<ul style="list-style-type: none"> <li>• Responsible Decision Making - Evaluate personal, ethical, safety, and civic impact of decisions.</li> <li>• <a href="#">New Jersey Social and Emotional Learning Competencies and Sub-Competencies.docx</a></li> </ul>

<b>Title</b>	Interdependent Relationships in Ecosystems
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<b>Unit Duration</b>	12 Weeks
<b>Unit Summary &amp; Rationale</b>	<i>In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas. Lessons in this unit satisfy Climate Change Mandate.</i>
<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• What do plants depend on to grow?</li> <li>• What do plants depend on animals for?</li> <li>• Where do living things exist?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• Plants depend on animals for pollination to grow.</li> <li>• Plants need water and light to grow.</li> <li>• Living things exist in many places in land and in water.</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Look for patterns and order when making observations about the world.</li> <li>• Make observations (firsthand or from media) to collect data that can be used to make comparisons.</li> <li>• Make observations of plants and animals to compare the diversity of life in different habitats. (Note: The emphasis is on the diversity of living things in each of a variety of different habitats; assessment does not include specific animal and plant names in specific habitats.) Observe patterns in events generated by cause-and-effect relationships.</li> <li>• Observe differences between climate and weather</li> <li>• Plan and conduct an investigation collaboratively to produce data to serve as a basis for evidence to answer a question.</li> <li>• Plan and conduct an investigation to determine whether plants need sunlight and water to grow.</li> <li>• Describe how the shape and stability of structures are related to their function.</li> <li>• Develop a simple model based on evidence to represent a proposed object or tool.</li> <li>• Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.</li> </ul>

- 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.
- Explain how plants and animals are impacted by changes in the climate.
- Identify and explain the difference between climate and weather.
- Identify the link between the earth's systems-land, air, living things and water- and how if one changes it impacts all systems
- Climate Change - Develop possible solutions to climate change.

<b>Assessment Evidence</b>	
<b>Formative</b>	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
<b>Summative</b>	<p>In correlation with the NGSS, students must demonstrate the following as summative assessments:</p> <ul style="list-style-type: none"> <li>• 2-LS2-1., Plan and conduct an investigation to determine if plants need sunlight and water to grow.</li> <li>• 2-LS2-2., Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.</li> <li>• 2-LS4-1., Make observations of plants and animals to compare the diversity of life in different habitats.</li> </ul> <p>Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.</p>
<b>Alternative and Benchmark</b>	<p>Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes.</p> <p>Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments</p> <p><a href="#">Formative, Summative, Alternative and Benchmark Assessments</a></p>
<b>Resources to Promote Learning</b>	



<b>Resources &amp; Equipment Needed</b>	Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, BrainPop Jr., Assorted lab materials., Assorted lab materials, Crayons, Scissors, Markers, Paper, Graph Paper, Rulers, Tape, Construction Paper <a href="#">Second Grade Science Labs Approved Class Resource List</a>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>NJ 2020 SLS: Science</b>	
<i>Standards</i>	
<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.]</p> <p>2-LS2-2., Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*</p> <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.]</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.</p>	
<i>Science and Engineering Practices</i>	
<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"> <li>• Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)</li> </ul> <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"> <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> <li>• Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1)</li> </ul> <p>Connections to Nature of Science - Scientific Knowledge is Based on Empirical Evidence Scientists look for patterns and order when making observations about the world. (2-LS4-1)</p>	

- Analyzing and Interpreting Data - Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.
- Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

*Disciplinary Core Ideas (DCI)*

LS2.A: Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow. (2-LS2-1)

Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

LS4.D: Biodiversity and Humans

- 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)

ETS1.B: Developing Possible Solutions

- 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)

ETS1.C: Optimizing the Design Solution

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

*Crosscutting Concepts*

Cause and Effect

- Events have causes that generate observable patterns. (2-LS2-1)

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)
- The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)

**NJ: 2016 SLS: English Language Arts**

- 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.
- RI.2.3, Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- RI.2.8, Describe how reasons support specific points the author makes in a text.
- RI.2.9, Compare and contrast the most important points presented by two texts on the same topic.

- 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., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
- 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).
- W.2.8, Recall information from experiences or gather information from provided sources to answer a question.
- SL.2.1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
  - A. Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
  - B. Build on others' talk in conversations by linking their explicit comments to the remarks of others.
  - C. Ask for clarification and further explanation as needed about the topics and texts under discussion.
- SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL.2.3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
- SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

### **NJ: 2016 SLS: Mathematics**

- MP.2, Reason abstractly and quantitatively.
- MP.4, Model with mathematics.
- MP.5, Use appropriate tools strategically.
- 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.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.

### **2020 SLS: Computer Science & Design Thinking**

#### **NJSLS Performance Expectations (By the end of 2nd Grade)**

- 8.2.2.ED.1: Communicate the function of a product or device.
- 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
- 8.1.2.DA.4: Make predictions based on data using charts or graphs.

- 8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.

**2020 SLS: Career Readiness, Life Literacies, and Key Skills**

**NJSLS Performance Expectations (By the end of 2nd Grade)**

- 9.2.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job.
- 9.4.2.CI.2: Demonstrate originality and inventiveness in work.
- 9.4.2.CT.2: Identify possible approaches and resources to execute a plan.
- 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g. inductive, deductive).
- 9.4.2.IML.1: Identify a simple search term to find information in a search engine or digital resource.

**Interdisciplinary/21st Century Connections**

<b>Connections and Skills</b>	<ul style="list-style-type: none"> <li>• Creativity and Innovation</li> <li>• Information and Media Literacy</li> <li>• Critical Thinking and Problem Solving</li> <li>• Technology Literacy</li> </ul>
<b>Health/Physical Education</b>	<ul style="list-style-type: none"> <li>• 2.1.2.EH.3: Demonstrate self-control in a variety of settings (e.g., classrooms, playgrounds, special programs).</li> <li>• 2.1.2.EH.4: Demonstrate strategies for managing one's own emotions, thoughts and behaviors.</li> <li>• 2.1.2.PP.1: Define reproduction.</li> <li>• 2.1.2.PP.2: Explain the ways in which parents may care for their offspring (e.g., animals, people, fish).</li> </ul>
<b>Social Studies</b>	<ul style="list-style-type: none"> <li>• 6.1.2.GeoPP.1: Explain the different physical and human characteristics that might make a location a good place to live (e.g., landforms, climate and weather, resource availability).</li> <li>• 6.1.2.Geo.HE.1: Explain how seasonal weather changes, climate, and other environmental characteristics affect people's lives in a place or region.</li> </ul>

**Accommodations & Modifications**

**Special Education Students, 504 students, English Language Learners, Students at-Risk Based on Students' Individual Needs**

<p style="text-align: center;"><b>Time/General</b></p> <ul style="list-style-type: none"> <li>• Allow extra time</li> <li>• Repeat and clarify directions</li> <li>• Provide breaks in between tasks</li> <li>• Have student verbalize directions</li> <li>• Provide timelines/due dates for reports and projects</li> </ul>	<p style="text-align: center;"><b>Processing</b></p> <ul style="list-style-type: none"> <li>• Provide extra response time</li> <li>• Have student verbalize steps</li> <li>• Repeat directions</li> <li>• Provide small group instruction</li> <li>• Include partner work</li> </ul>	<p style="text-align: center;"><b>Comprehension</b></p> <ul style="list-style-type: none"> <li>• Provide reading material on student's level</li> <li>• Have student underline important points</li> <li>• Assist student on how to use context clues to identify words/phrases</li> <li>• Ensure short manageable tasks</li> </ul>
<p style="text-align: center;"><b>Tests/Quizzes/Grading</b></p> <ul style="list-style-type: none"> <li>• Provide extended time</li> <li>• Provide study guides</li> <li>• Limit number of responses</li> </ul>	<p style="text-align: center;"><b>Behavior/Attention</b></p> <ul style="list-style-type: none"> <li>• Establish classroom rules</li> <li>• Write a contract with the student specifying expected behaviors</li> <li>• Provide preferential seating</li> <li>• Re-focus student as needed</li> <li>• Reinforce student for staying on task</li> </ul>	<p style="text-align: center;"><b>Organization</b></p> <ul style="list-style-type: none"> <li>• Monitor the student and provide reinforcement of directions</li> <li>• Verify the accurateness of homework assignments</li> <li>• Display a written agenda</li> </ul>

**ELL, Enrichment, Gifted & Talented Strategies**

Accommodations Based on Students' Individual Needs

ELL Strategies

- Provide explicit, systematic instruction in vocabulary.
- Ensure that ELLs have ample opportunities to talk with both adults and peers and provide ongoing feedback and encouragement.
- Expose ELLs to rich language input.
- Scaffolding for ELLs language learning.

- Encourage continued L1 language development.
- Alphabet knowledge
- Phonological awareness
- Print awareness
- Design instruction that focuses on all of the foundational literacy skills.
- Recognize that many literacy skills can transfer across languages.
- English literacy development by helping ELLs make the connection between what they know in their first language and what they need to know in English.
- Graphic organizers
- Modified texts
- Modified assessments
- Written/audio instruction
- Shorter paragraph/essay length
- Homogeneously grouped by level

Accommodations Based on Students' Individual Needs:

Enrichment Strategies

- Evaluate vocabulary
- Elevate Text Complexity
- Incorporate inquiry based assignments and projects
- Extend curriculum
- Balance individual, small group and whole group instruction
- Provide tiered/multi-level activities
- Include purposeful learning centers
- Provide open-ended activities and projects
- Offer opportunities for heterogeneous grouping to work with age and social peers as well as homogeneous grouping to provide time to work with individual peers
- Provide pupils with experiences outside the 'regular' curriculum

- Alter the pace the student uses to cover regular curriculum in order to explore topics of interest in greater depth/breadth within their own grade level
- Require a higher quality of work than the norm for the given age group
- Promote higher level of thinking and making connections.
- Focus on process learning skills such as brainstorming, decision making and social skills
- Use supplementary materials in addition to the normal range of resources.
- Encourage peer to peer mentoring
- Integrate cross-curricular lessons
- Incorporate real-world problem solving activities
- Facilitate student-led questioning and discussions

#### Gifted & Talented Strategies

- More elaborate, complex, and in-depth study of major ideas, problems, and themes that integrate knowledge within and across systems of thought.
- Development and application of productive thinking skills to enable students to reconceptualize existing knowledge and/or generate new knowledge.
- Explore constantly changing knowledge and information and develop the attitude that knowledge is worth pursuing in an open world.
- Encourage exposure to, selection, and use of appropriate and specialized resources.
- Promote self-initiated and self-directed learning and growth.
- Provide for the development of self-understanding and the understanding of one's relationship to persons, societal institutions, nature, and culture.
- Flexible pacing
- Use of more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace. If they master a particular unit, they need to be provided with more advanced learning activities, not more of the same activity.
- Questions that require a higher level of response and/or open-ended questions that stimulate inquiry, active exploration, and discovery.
- Encourage students to think about subjects in more abstract and complex ways

- Activity selection based on student interests, that encourage self-directed learning
- Group interaction and simulations
- Guided self-management
- Encourage students to demonstrate what they have learned in a wide variety of forms that reflect both knowledge and the ability to manipulate ideas.
- Engage students in active problem-finding and problem-solving activities and research.
- Provide students opportunities for making connections within and across systems of knowledge by focusing on issues, themes, and ideas.