



**Totowa Public Schools**

**Science**

**Grade 1**

**Aligned to NJSL Standards**

**Revised and BOE Adopted: 08/31/2022**

## Units of Study & Pacing Guide

<u>Unit of Study</u>	<u>Timeline</u>	<u>Notes</u>
Unit 1: Objects and Patterns in the Sky	12 Weeks	Science shares time with Social Studies.
Unit 2: Sound/ Light	12 Weeks	Science shares time with Social Studies.
Unit 3: Plant and Animals Structure	12 Weeks	Science shares time with Social Studies. Lessons in this unit satisfy Climate Change mandate.
		<a href="#">Curricular Mandate List</a>

<b>Title</b>	Objects and Patterns in the Sky
<b>Unit Duration</b>	12 Weeks
<b>Unit Summary &amp; Rationale</b>	<i>In this unit of study, students observe, describe, and predict some patterns in the movement of objects in the sky. The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to 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 relate shadows changing throughout the day to the sun's position moving across the sky.</i>
<b>Unit Goals</b>	
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>• What patterns do you see in the moon?</li> <li>• What changes does the sun make in a day?</li> <li>• Can you see the stars during the day?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• The moon looks different because it revolves around the earth.</li> <li>• It rises on one side of the sky and sets in another.</li> <li>• Stars can only be seen at night</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Observe and use patterns in the natural world as evidence and to describe phenomena.</li> <li>• Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.</li> <li>• Use observations of the sun, moon, and stars to describe patterns that can be predicted. Examples of patterns could include: The sun and moon appear to rise in one part of the sky, move across the sky, and set. Stars other than our sun are visible at night but not during the day.</li> <li>• Explore careers in scienc.</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>	In correlation with the NGSS, students must demonstrate the following as summative assessments:

	<p>1-ESS1-1., Use observations of the sun, moon, and stars to describe patterns that can be predicted.</p> <p>1-ESS1-2., Make observations at different times of year to relate the amount of daylight to the time of year.</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>	<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.</p> <p><a href="#">How Do Wind Turbines Work?   Department of Energy (Climate Change)</a></p> <p><a href="#">Wind Power Station (Climate Change)</a></p> <p><a href="#">Kids Britannica (Climate Change)</a></p> <p><a href="#">A Guide to Climate Change for Kids (Climate Change)</a></p> <p><a href="#">What Is the Greenhouse Effect?   NASA Climate Kids (Climate Change)</a></p> <p><a href="#">Who Is Katherine Johnson?   Free Reading Passages and Literacy Resources (Amistad Law)</a></p> <p><a href="#">Approved Class Resource List</a></p>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>NJ 2020 SLS: Science</b>	
<i>Standards</i>	
<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</p>	

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.]

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.]

*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.

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2)

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

- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)

*Disciplinary Core Ideas (DCI)*

ESS1.A: The Universe and its Stars

- Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1)

ESS1.B: Earth and the Solar System

- Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)

*Crosscutting Concepts*

Patterns

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1),(1-ESS1-2)

Scientific Knowledge Assumes an Order and

- Science assumes natural events happen today as they happened in the past. (1-ESS1-1)
- Many events are repeated. (1-ESS1-1)

Consistency in  
Natural Systems

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

- RI.1.1. Ask and answer questions about key details in a text.
- RI.1.2. Identify the main topic and retell key details of a text.
- RI.1.3. Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- RI.1.4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
- RI.1.5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
- RI.1.6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
- RI.1.7. Use the illustrations and details in a text to describe its key ideas.
- RI.1.10. With prompting and support, read informational texts at grade level text complexity or above.
- 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.
- 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. ◦ A. Follow agreed-upon norms for discussions (e.g., 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 responding to the comments of others through multiple exchanges. ◦ C. Ask questions to clear up any confusion about the topics and texts under discussion.
- SL.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- SL.1.3. Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.

**NJ: 2016 SLS: Mathematics**

- 1.G.A.3: Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.
- 1.OA.A.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

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

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

- 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>• Relationship Skills</li> <li>• Establish and maintain healthy relationships</li> <li>• Utilize positive communication and social skills to interact effectively with others</li> </ul>

<b>Title</b>	Sound and Light
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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 the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. The idea that light travels from place to place can be understood by students at this level by placing objects made with different materials in the path of a beam of light and determining the effect of the different materials. The crosscutting concept of cause and effect is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade appropriate proficiency in planning and carrying out investigations, 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 do they make silly sounds in cartoons?</li> <li>• Where do sounds come from?</li> <li>• What if there were no windows?</li> <li>• Can you see in the dark?</li> <li>• How could you see a secret message from someone far away?</li> <li>• How do boats find their way in the fog?</li> </ul>
<b>Enduring Understandings</b>	<ul style="list-style-type: none"> <li>• When something vibrates it can make sounds and things move back and forth quickly.</li> <li>• Objects can be seen in the dark when it gives off its own light.</li> <li>• Shadows are the dark spots made when something blocks light.</li> <li>• We can solve a problem by drawing a picture or making a model</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Design simple tests to gather evidence to support or refute ideas about cause and effect relationships.</li> <li>• Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.</li> <li>• Make observations (e.g., in a completely dark room, using a pinhole box, using video of a cave explorer with a flashlight) to construct an evidence based account that objects can be seen only when illuminated (from an external light source or by an object giving off its own light).</li> <li>• Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question.</li> </ul>



- Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. Materials can be: – Transparent (clear plastic, glass) – Translucent (wax paper, thin cloth) – Opaque (cardboard, construction paper) • Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
- 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.
- Ask questions based on observations to find more information about the natural and/or designed world.
- Define a simple problem that can be solved through the development of a new or improved object or tool.
- Ask questions, make observations, and gather information about a situation people want to change improved object or tool. • Develop a simple model based on evidence to represent a proposed object or tool. • 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. • Use tools and materials provided to design a device that solves a specific problem. • Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. • Examples of devices could include: A light source to send signals Paper cup and string telephones A pattern of drum beats.
- Explore careers in science.

<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>	<ul style="list-style-type: none"> <li>• Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.</li> <li>• Make observations to construct an evidence-based account that objects can be seen only when illuminated.</li> </ul>

	<ul style="list-style-type: none"> <li>• Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</li> <li>• Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light</li> <li>• Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.</li> </ul>
<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. <a href="#">Approved Class Resource List</a></p>
<b>Content &amp; Interdisciplinary Standards</b>	
<b>NJ 2020 SLS: Science</b>	
<i>Standards</i>	
<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.</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.</p> <p>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</p>	

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.]

1-PS4-2., Make observations to construct an evidence-based account that objects in darkness 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.]

1-PS4-3., Plan and conduct investigations 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.]

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.]

### *Science and Engineering Practices*

Asking Questions and Defining Problems - Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions.

- Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
- Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

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 simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)

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 investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(1-PS4-3)

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. (1-PS4-2)
- Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)

Scientific Investigations Use a Variety of Methods - Science investigations begin with a question. (1-PS4-1)

- Scientists use different ways to study the world. (1-PS4-1)

*Disciplinary Core Ideas (DCI)*

ETS1.A: Defining and Delimiting Engineering Problems

- A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
- Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
- Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)

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. (K-2-ETS1-2)

PS4.A: Wave Properties

- Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)

PS4.B: Electromagnetic Radiation

- Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2)
- 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 with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1-PS4-3)

PS4.C: Information Technologies and Instrumentation

- People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)

*Crosscutting Concepts*

Structures and Functions

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

Cause and Effect

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1),(1-PS4-2),(1-PS4-3)

Connections to Engineering, Technology, and Applications of Science

- Influence of Engineering, Technology, and Science, on Society and the Natural World
- People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)

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

- RI.1.1. Ask and answer questions about key details in a text.
- RI.1.2. Identify the main topic and retell key details of a text.
- RI.1.3. Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- RI.1.4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
- RI.1.5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
- RI.1.6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
- RI.1.7. Use the illustrations and details in a text to describe its key ideas.
- RI.1.10. With prompting and support, read informational texts at grade level text complexity or above.
- 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.
- 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. ○ A. Follow agreed-upon norms for discussions (e.g., 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 responding to the comments of others through multiple exchanges. ○ C. Ask questions to clear up any confusion about the topics and texts under discussion.
- SL.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- SL.1.3. Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.

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

- 1.NBT.B.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols  $>$ ,  $=$ , and  $<$ .

- 1.MD.A.2: Using non-standard units (e.g. paperclips, blocks), express the length of an object as a whole number of length units, by laying 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. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
- MP.5 Use appropriate tools strategically.
- 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.
- 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.MD.B.3: Tell and write time in hours and half-hours using analog and digital clocks.
- 1.NBT.A.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
- 1.O.A.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

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

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

- 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**

**21st Century Connections**

- Creativity and Innovation
- Information and Media Literacy
- Critical Thinking and Problem Solving

	<ul style="list-style-type: none"> <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>• Self-Management</li> <li>• Understand and practice strategies for managing one's own emotions, thoughts, and behaviors.</li> <li>• Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals</li> </ul>

<b>Title</b>	Plants and Animal Structure
<b>Unit Duration</b>	12 Weeks
<b>Unit Summary &amp; Rationale</b>	<i>In this unit of study, students develop an understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs, as well as how the behaviors of parents and offspring help offspring survive. The understanding that young plants and animals are like, but not exactly the same as, their parents is developed. Lessons in this unit satisfy NJ Mandates in Climate Change.</i>
<b>Unit Goals</b>	

<b>Essential Questions</b>	How can humans mimic how plants and animals use their external parts to help them survive and grow? 2. How are plants designed to grow, adapt and survive? 3. How are animals designed to grow, adapt and survive? 4. How can we use the design process to solve a need?
<b>Enduring Understandings</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).</li> <li>• Different animals use their body parts to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air.</li> <li>• Plants have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.</li> <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.</li> <li>• Human needs and desires determine which new tools are developed. Various tools can improve daily tasks and quality of life.</li> <li>• Limitations (constraints) must be considered when engineering designs.</li> <li>• Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.</li> <li>• Individuals collect, use, and display data about individuals and the world around them.</li> <li>• Data can be used to make predictions about the world.</li> </ul>
<b>Learning Outcomes</b>	<ul style="list-style-type: none"> <li>• Observe and use patterns in the natural world as evidence and to describe phenomena.</li> <li>• Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.</li> <li>• Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</li> <li>• Examples of patterns could include features plants or animals share.</li> <li>• Examples of observations could include that leaves from the same kind of plant are the same shape but can differ in size and that a particular breed of puppy looks like its parents but is not exactly the same.</li> <li>• Observe and describe how the shape and stability of structures of natural and designed objects are related to their functions.</li> <li>• Use materials to design a device that solves a specific problem or design a solution to a specific problem.</li> </ul>



- Use materials to design a solution to a human problem that mimics how plants and/or animals use their external parts to help them survive, grow, and meet their needs: 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. • Detecting intruders by mimicking eyes and ears.
- Develop a simple model based on evidence to represent a proposed object or tool.
- 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.
- Use the design process to build a product (e.g. a shoe or house projects) by mimicking how plants and/or animals use parts to help them survive, grow and/or meet needs. 9. Collaborate with peers to identify a problem that the product may solve. 10. Select tools and materials for the product. 11. Identify limits of the design process. 12. Explain the purpose of the product. 13. Identify some natural resources used to create the product.
- Explain how climate change affects plants and animals.
- Discover how they can prevent climate change by reducing, reusing and recycling objects or tools.
- Understand how they can take care of the Earth, participate in creating a tool for birds to use and explain how this correlates to climate change
- To understand how they can prevent climate change by reducing, reusing, and recycling a variety of objects or tools
- Explore careers in science.

<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>	<ul style="list-style-type: none"> <li>• 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.</li> </ul>

	<ul style="list-style-type: none"> <li>• Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.</li> <li>• Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents</li> </ul> <p>Assessments could include projects, summative assessments, lab skills, reading passages, and demonstrations that verify the knowledge and skills learned</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.
<b>Content &amp; Interdisciplinary Standards</b>	
<b>NJ 2020 SLS: Science</b>	
<i>Standards</i>	
<p>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.]</p> <p>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).]</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</p>	

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.]

*Science and Engineering Practices*

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. (1-LS3-1)
- Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1- 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.

- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)

Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world. (1-LS1-2)

*Disciplinary Core Ideas (DCI)*

LS1.A: Structure and Function

- 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)

LS1.B: Growth and Development of Organisms

- 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)

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)

LS3.A: Inheritance of Traits

- 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)

LS3.B: Variation of Traits

- Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)

K-2-ETS1-1

- Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.

*Crosscutting Concepts*

Structures and Functions	<ul style="list-style-type: none"> <li>• The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)</li> </ul>
Patterns	<ul style="list-style-type: none"> <li>• Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2),(1-LS3-1)</li> </ul>
Influence of Science, Engineering and Technology 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. (1-LS1-1)</li> </ul>

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

- RI.1.1. Ask and answer questions about key details in a text.
- RI.1.2. Identify the main topic and retell key details of a text.
- RI.1.3. Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- RI.1.4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
- RI.1.5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
- RI.1.6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
- RI.1.7. Use the illustrations and details in a text to describe its key ideas.
- RI.1.10. With prompting and support, read informational texts at grade level text complexity or above.
- 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.

- 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.
  - A. Follow agreed-upon norms for discussions (e.g., 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 responding to the comments of others through multiple exchanges.
  - C. Ask questions to clear up any confusion about the topics and texts under discussion.
- SL.1.2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- SL.1.3. Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.

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

- 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.MD.A.2: Express the length of an object as a whole number of length units, by laying 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. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
- 1.MD.C Represent and interpret data.

### **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.
- 8.2.2.ED.3: Select and use appropriate tools and materials to build a product using the design process.
- 8.2.2.ED.4: Identify constraints and their role in the engineering design process.
- 8.2.2.ITH.1: Identify products that are designed to meet human needs or wants.
- 8.2.2.ITH.2: Explain the purpose of a product and its value.
- 8.2.2.ITH.5: Design a solution to a problem affecting the community in a collaborative team and explain the intended impact of the solution.
- 8.2.2.ETW.1: Classify products as resulting from nature or produced as a result of technology.
- 8.2.2.ETW.2: Identify the natural resources needed to create a product.
- 8.1.2.DA.1: Collect and present data, including climate change data, in various visual formats.

- 8.1.2.DA.3: Identify and describe patterns in data visualizations.
- 8.1.2.DA.4: Make predictions based on data using charts or graphs.

**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>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>
<b>SEL</b>	<ul style="list-style-type: none"> <li>• Utilize positive communication and social skills to interact effectively with others</li> <li>• Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways</li> </ul>

**Accommodations & Modifications**

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

<p 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 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 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 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 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 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.