

CURRICULUM

FOR

SCIENCE

GRADE 1

This curriculum is part of the Educational Program of Studies of the Rahway Public Schools.

ACKNOWLEDGMENTS

Dr. Susan Dube, Program Supervisor of Math, Science & Technology Education

The Board acknowledges the following who contributed to the preparation of this curriculum.

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Subject/Course Title:
Science
Grade 1

Date of Board Adoption:
September 19, 2023

RAHWAY PUBLIC SCHOOLS CURRICULUM

Science

Grade 1

PACING GUIDE

Unit	Title	Pacing
1	Earth's Place in the Universe	3 weeks
2	Sound and Light	6 weeks
3	Plants and Animals	9 weeks

ACCOMMODATIONS

<p>504 Accommodations:</p> <ul style="list-style-type: none"> ● Provide scaffolded vocabulary and vocabulary lists. ● Provide extra visual and verbal cues and prompts. ● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials. ● Provide links to audio files and utilize video clips. ● Provide graphic organizers and/or checklists. ● Provide modified rubrics. ● Provide a copy of teaching notes, especially any key terms, in advance. ● Allow additional time to complete assignments and/or assessments. ● Provide shorter writing assignments. ● Provide sentence starters. ● Utilize small group instruction. ● Utilize Think-Pair-Share structure. ● Check for understanding frequently. ● Have student restate information. ● Support auditory presentations with visuals. ● Weekly home-school communication tools (notebook, daily log, phone calls or email messages). ● Provide study sheets and teacher outlines prior to assessments. ● Quiet corner or room to calm down and relax when anxious. ● Reduction of distractions. ● Permit answers to be dictated. ● Hands-on activities. ● Use of manipulatives. ● Assign preferential seating. ● No penalty for spelling errors or sloppy handwriting. ● Follow a routine/schedule. ● Provide student with rest breaks. ● Use verbal and visual cues regarding directions and staying on task. ● Assist in maintaining agenda book. 	<p>IEP Accommodations:</p> <ul style="list-style-type: none"> ● Provide scaffolded vocabulary and vocabulary lists. ● Differentiate reading levels of texts (e.g., Newsela). ● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials. ● Provide extra visual and verbal cues and prompts. ● Provide links to audio files and utilize video clips. ● Provide graphic organizers and/or checklists. ● Provide modified rubrics. ● Provide a copy of teaching notes, especially any key terms, in advance. ● Provide students with additional information to supplement notes. ● Modify questioning techniques and provide a reduced number of questions or items on tests. ● Allow additional time to complete assignments and/or assessments. ● Provide shorter writing assignments. ● Provide sentence starters. ● Utilize small group instruction. ● Utilize Think-Pair-Share structure. ● Check for understanding frequently. ● Have student restate information. ● Support auditory presentations with visuals. ● Provide study sheets and teacher outlines prior to assessments. ● Use of manipulatives. ● Have students work with partners or in groups for reading, presentations, assignments, and analyses. ● Assign appropriate roles in collaborative work. ● Assign preferential seating. ● Follow a routine/schedule.
<p>Gifted and Talented Accommodations:</p> <ul style="list-style-type: none"> ● Differentiate reading levels of texts (e.g., Newsela). ● Offer students additional texts with higher lexile levels. ● Provide more challenging and/or more supplemental readings and/or activities to deepen understanding. ● Allow for independent reading, research, and projects. ● Accelerate or compact the curriculum. ● Offer higher-level thinking questions for deeper analysis. ● Offer more rigorous materials/tasks/prompts. ● Increase number and complexity of sources. ● Assign group research and presentations to teach the class. ● Assign/allow for leadership roles during collaborative work and in other learning activities. 	<p>ML Accommodations:</p> <ul style="list-style-type: none"> ● Provide extended time. ● Assign preferential seating. ● Assign peer buddy who the student can work with. ● Check for understanding frequently. ● Provide language feedback often (such as grammar errors, tenses, subject-verb agreements, etc...). ● Have student repeat directions. ● Make vocabulary words available during classwork and exams. ● Use study guides/checklists to organize information. ● Repeat directions. ● Increase one-on-one conferencing. ● Allow student to listen to an audio version of the text. ● Give directions in small, distinct steps. ● Allow copying from paper/book. ● Give student a copy of the class notes.

- Provide written and oral instructions.
- Differentiate reading levels of texts (e.g., Newsela).
- Shorten assignments.
- Read directions aloud to student.
- Give oral clues or prompts.
- Record or type assignments.
- Adapt worksheets/packets.
- Create alternate assignments.
- Have student enter written assignments in criterion, where they can use the planning maps to help get them started and receive feedback after it is submitted.
- Allow student to resubmit assignments.
- Use small group instruction.
- Simplify language.
- Provide scaffolded vocabulary and vocabulary lists.
- Demonstrate concepts possibly through the use of visuals.
- Use manipulatives.
- Emphasize critical information by highlighting it for the student.
- Use graphic organizers.
- Pre-teach or pre-view vocabulary.
- Provide student with a list of prompts or sentence starters that they can use when completing a written assignment.
- Provide audio versions of the textbooks.
- Highlight textbooks/study guides.
- Use supplementary materials.
- Give assistance in note taking
- Use adapted/modified textbooks.
- Allow use of computer/word processor.
- Allow student to answer orally, give extended time (time-and-a-half).
- Allow tests to be given in a separate location (with the ESL teacher).
- Allow additional time to complete assignments and/or assessments.
- Read question to student to clarify.
- Provide a definition or synonym for words on a test that do not impact the validity of the exam.
- Modify the format of assessments.
- Shorten test length or require only selected test items.
- Create alternative assessments.
- On an exam other than a spelling test, don't take points off for spelling errors.

UNIT OVERVIEW

Content Area: Science

Unit Title: Earth's Place in the Universe

Target Course/Grade Level: 1

Unit Summary: This unit will explore what the universe is and what the Earth's place is in it. The planet Earth is a tiny part of a vast universe that has developed over a huge expanse of time. Students will understand these patterns can be used to explain many of Earth's phenomena, such as day and night, seasons, tides, and phases of the moon. They will also learn about engineering design and how to solve problems using models.

Approximate Length of Unit: 3 weeks

LEARNING TARGETS

NJ Student Learning Standards:

- **1-ESS1-1:** Use observations of the sun, moon, and stars to describe patterns that can be predicted.
 - **DCI:** Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.
- **1-ESS1-2:** Make observations at different times of year to relate the amount of daylight to the time of year.
 - **DCI:** Seasonal patterns of sunrise and sunset can be observed, described and predicted.
- **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.
 - **DCI:** A situation that people want to change or create can be approached as a problem to be solved through engineering.
 - **DCI:** Asking questions, making observations, and gathering information are helpful in thinking about problems.
 - **DCI:** Before beginning to design a solution, it is important to clearly understand the problem.
- **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.
 - **DCI:** 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-ETS1-3:** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Career Readiness, Life Literacies, and Key Skills:

- **9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1,6.1.2.CivicsCM.2).
- **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
- **9.4.2.DC.2:** Explain the importance of respecting the digital content of others.
- **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 (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

Interdisciplinary Connections and Standards:

ELA:

- **W.1.7** Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-ESS1-1), (1-ESS1-2)
- **W.1.8** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2)
- **K-2-ETS1-1** - Ask questions, make observations, and gather information about a situation people want to change.
 - **ELA Connection:** Students can use their knowledge of engineering design to write fictional or nonfictional stories about people who are trying to solve problems. They could also create a graphic organizer to help them plan their solutions
- **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.
 - **ELA Connection:** Students can use their knowledge of engineering design to write instructions for how to build a model. They could also create a presentation to share their findings with the class
- **K-2-ETS1-3** - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.
 - **ELA Connection:** Students can use their knowledge of data analysis to write reports or create presentations. They could also create graphs or charts to illustrate their finding

Social Studies:

- **K-2-ETS1-1** - Ask questions, make observations, and gather information about a situation people want to change.
 - **Social Studies Connection:** Students could research a problem that is facing their community, such as flooding or pollution. They could then develop a plan to solve the problem.
 - **Standards: SS.K-5.H.4** - Analyze the effects of human activity on the environment.

- 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.
 - **Social Studies Connection:** Students could research the different ways that people have used tools and technology to solve problems throughout history. They could then create a model or presentation to share their findings.
 - **Standards: SS.K-5.H.5** - Describe the ways people have changed the environment to meet their needs.
- K-2-ETS1-3 - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.
 - **Social Studies Connection:** Students could research different ways that people have solved the same problem in different cultures. They could then compare the effectiveness of the different solutions.
 - **Standards: SS.K-5.H.6** - Compare different ways that people have solved problems over time.

Math:

- **MP.2** Reason abstractly and quantitatively. (1-ESS1-2)
- **MP.4** Model with mathematics. (1-ESS1-2)
- **MP.5** Use appropriate tools strategically. (1-ESS1-2)
- **1.OA.A.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2)
- **1.MD.C.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1-ESS1-2)
- K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change.
 - **Math Connection:** Students could use their knowledge of graphs and charts to represent data about the amount of water that is used in their community. They could then use this data to make a plan to reduce water usage.
 - **Standards: 2.MD.C.10** - Represent data with tables, bar graphs, pictographs, and line graphs.
 - **Activity:** Students could collect data about the amount of water that is used in their homes each day. They could then create a graph to represent this data. They could then use this data to make a plan to reduce water usage.
- 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.
 - **Math Connection:** Students could use their knowledge of area and volume to design a water bottle that will hold the most water for a given amount of space. They could then build their designs and test them to see how well they work.
 - **Standards: 2.MD.C.6** - Relate volume to the number of unit cubes that fill a container.
 - **Activity:** Students could brainstorm different designs for a water bottle. They could then build their designs and test them to see how well they work.
- K-2-ETS1-3 - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.
 - **Math Connection:** Students could use their knowledge of data analysis to compare the effectiveness of two different designs for a water bottle. They could then use this data to make a recommendation about which design is the most effective.
 - **Standards: 2.MD.C.10** - Represent data with tables, bar graphs, pictographs, and line graphs.

- Activity: Students could test two different designs for a water bottle. They could then collect data about how well each design works. They could then use this data to make a recommendation about which design is the most effective.

Unit Understandings:

Students will understand that ...

- The sun rises in the morning and sets in the evening.
- Day and night is caused by the Earth's rotation.
- How the Sun appears to travel across the sky and that this is due to the Earth's motion, not the Sun's.
- There are four seasons.
- Summer has the longest amount of daylight and winter has the least amount of daylight.
- At night, you can see the Moon and stars.
- The Moon does not shine.
- The Moon appears to grow and shrink in the sky based on how much reflected sunlight we can see.
- Because the Sun is so close, its brightness keeps us from seeing other stars during the day.

Unit Essential Questions:

- What is the pattern of the sun's location?
- Can the patterns of the day sky be predicted?
- What creates day and night?
- What are the four seasons?
- What patterns can be predicted with the seasons?
- How does the amount of daylight change with the seasons?
- Does the Moon create its own light?
- How does the Moon's appearance change over time?
- Why can we only see stars at night?

Knowledge and Skills:

Students will know...

- All four seasons
- The relationship between the earth, moon and stars
- At night, you can see the Moon and stars.
- The Moon does not shine.
- The Moon appears to grow and shrink in the sky based on how much reflected sunlight we can see.
- Because the Sun is so close, its brightness keeps us from seeing other stars during the day.

Students will be able to...

- Make predictions about the Sun's location at various times of the day.
- Make predictions about the Moon's phases.

- Explain how the Earth’s rotation creates day and night
- Explain how the Sun’s presence during the day keeps other stars from being seen.
- Compare and contrast the four seasons, in particular the amount of sunlight, during the summer and winter months

EVIDENCE OF LEARNING

Common Assessments:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- **Common Assessment:** See assessment folder for links to end of unit assessments
- Performance based assessments
- Teacher observation

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- **Earth’s Place in the Universe Presentation:**  Earth's Place in the Universe Presentation.pptx
- **Video: Daytime Sky**
 - Here Comes the Sun: https://njctl.org/video/?v=6FB0rDsR_rc
- **Videos: Day & Night**
 - <https://njctl.org/video/?v=WrcCRKsTYGs>
 - <https://njctl.org/video/?v=hWkKSkI3gkU>
- **Videos: The Seasons**
 - <https://njctl.org/video/?v=WlzS11CFRYg>
- **Videos: The Nighttime Sky**
 - <https://njctl.org/video/?v=sjkPeexEdyI>
- **Videos: The Moon**
 - <https://njctl.org/video/?v=yXe0yxyzYkjo> (view from start to 1:19 only)
- **Earth’s Place in the Universe Worksheets:**
 -  Earth's Place in the Universe Unit Worksheets.docx
- **Hands-on Investigations:** Provide hands-on investigations and experiments related to the standards. Offer different levels of complexity or challenge within each investigation to accommodate varying abilities. For example, students could explore the effects of weathering and erosion using simple materials like sand, water, and rocks, while more advanced learners could investigate erosion rates using different soil types.
- **Visual and Manipulative Supports:** Use visual aids, charts, diagrams, and manipulatives to support understanding and engagement. For instance, use models or drawings to illustrate the different layers of soil or the water cycle. Provide physical manipulatives, such as rock samples or soil samples, for students to observe and explore.
- **Collaborative Learning:** Encourage collaborative learning experiences where students can work in pairs or small groups. Assign tasks that promote cooperation, such as creating a poster or

presentation together, conducting research as a team, or participating in a group discussion. This allows students to benefit from peer support and diverse perspectives.

- **Differentiated Reading Materials:** Provide leveled reading materials related to the science standards. Offer a range of texts at different reading levels or provide audio versions for students who may struggle with reading comprehension. Accompany the readings with comprehension questions or graphic organizers tailored to different reading abilities.
- **Technology Integration:** Utilize technology tools and resources to support differentiated instruction. Offer interactive websites, educational videos, or digital simulations that cater to different learning styles and abilities. Students can explore virtual environments, watch videos on topics like weather patterns or engineering design, or engage in online simulations related to the standards.
- **Choice Boards or Menus:** Offer choice boards or menus that provide a variety of activities related to the standards. Students can choose from options that align with their interests and learning styles. For example, they may select to create a weather report, design an erosion prevention structure, or conduct research on different plant adaptations.
- **Scaffolded Support:** Provide scaffolds and supports to help students build understanding. Break down tasks into smaller steps, provide sentence starters or graphic organizers, and offer additional examples or explanations as needed. Differentiate the level of guidance and support based on individual student needs.
- **Personalized Projects:** Allow students to pursue personalized projects or investigations related to the standards. Provide opportunities for students to explore topics of interest, conduct independent research, and present their findings to the class. This promotes autonomy and ownership of learning.
- **Formative Assessment and Feedback:** Regularly assess student understanding using formative assessment strategies. Use a variety of methods, such as observation, questioning, and self-assessment, to gauge comprehension. Provide timely feedback and opportunities for students to reflect on their learning and set goals.
- **Individualized Support:** Offer individualized support and intervention for students who require additional assistance or accommodations. Provide targeted interventions, differentiated resources, or modified assignments to meet their specific needs. Collaborate with support staff or specialists to ensure appropriate accommodations or modifications are in place.

RESOURCES

Teacher Resources:

- Unit Presentation:  Earth's Place in the Universe Presentation.pptx
- [Standards Document](#)
- [Evidence Statement | Next Generation Science Standards](#)
- <https://nap.nationalacademies.org/read/13165/chapter/11#173>
- [Generation Genius](#)
- [Mystery Science](#)
- [Edpuzzle](#)
- [Discovery Education](#)
- [ThinkLink](#)
- [Kahoot](#)

- [Legends of Learning](#)
- [PBS Kids](#)
- [ReadWorks](#)

Equipment Needed:

- pictures of seasons
- books
- pictures of Earth, Moon, Sun and Stars
- pictures or models of earth

UNIT OVERVIEW

Content Area: Science

Unit Title: Sound and Light

Target Course/Grade Level: 1

Unit Summary: Sounds are made when something vibrates. These sounds can be loud or soft and high or low. We use sound and light to communicate. A shadow is made when something blocks the light. Sound and light are used to communicate and we use a variety of devices to see and hear these communications.

Approximate Length of Unit: 6 weeks

LEARNING TARGETS

NJ Student Learning Standards

Science:

- **1-PS4-1** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]
- **1-PS4-2** Make observations to construct an evidence-based account that objects can be seen only when illuminated. [Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]
- **1-PS4-3** Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. [Clarification Statement: Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror). 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.] [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.]

Career Readiness, Life Literacies, and Key Skills:

- **9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1,6.1.2.CivicsCM.2).
- **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

- **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
- **9.4.2.DC.2:** Explain the importance of respecting the digital content of others.
- **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 (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).

Interdisciplinary Connections and Standards:

ELA:

- **W.1.2** Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. (1-PS4-2)
- **W.1.7** Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-PS4-1), (1-PS4-2), (1-PS4-3), (1-PS4-4)
- **W.1.8** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1), (1-PS4-2), (1-PS4-3)
- **SL.1.1** Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1), (1-PS4-2), (1-PS4-3)

Math:

- **MP.5** Use appropriate tools strategically. (1-PS4-4)
- **1.MD.A.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4)
- **1.MD.A.2** Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (1-PS4-4)

Unit Understandings:

Students will understand that...

- Sound vibrations are communication
- Light is communicated through shadows and dark and light

Unit Essential Questions:

- What is sound and how does it travel?
- What causes different sounds?
- Can we see more with or without light?
- What happens when an object is in the light path?
- What is a shadow and what causes a shadow?
- What is the difference between transparent, translucent, opaque and reflective surfaces?
- How does light react to different surfaces?
- What is communication?
- How do we use lights and sound to communicate?
- What types of devices do we use to communicate?

Knowledge and Skills:

Students will know...

- Vibrations cause sounds.
- Sound can make objects vibrate.
- We need light to see objects around us.
- Light can pass through transparent objects.
- Some light can pass through translucent objects.
- No light can pass through opaque objects.
- Light bounces off of reflective surfaces.
- Shadows are caused by opaque objects blocking the light source.
- We use lights and sound to communicate.
- We use a variety of devices to communicate.

Students will be able to...

- Explain how sound is created.
- Explain what causes different sounds.
- Explain that we need a light source in order to see objects around us.
- Define and explain the differences between opaque, transparent, translucent, and reflection.
- Explain what causes shadows.
- Identify different ways we use lights and sound to communicate.
- Explain why it is important to communicate in different ways.
- Identify different devices we use to communicate.

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- **Common Assessment:** See assessment folder for links to end of unit assessment
- Performance based assessment
- Teacher Observations

Learning Activities

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- **Hands-on Investigations:** Provide hands-on investigations and experiments related to the standards. Offer different levels of complexity or challenge within each investigation to accommodate varying abilities. For example, students could explore the effects of weathering and erosion using simple materials like sand, water, and rocks, while more advanced learners could investigate erosion rates using different soil types.

- **Visual and Manipulative Supports:** Use visual aids, charts, diagrams, and manipulatives to support understanding and engagement. For instance, use models or drawings to illustrate the different layers of soil or the water cycle. Provide physical manipulatives, such as rock samples or soil samples, for students to observe and explore.
- **Collaborative Learning:** Encourage collaborative learning experiences where students can work in pairs or small groups. Assign tasks that promote cooperation, such as creating a poster or presentation together, conducting research as a team, or participating in a group discussion. This allows students to benefit from peer support and diverse perspectives.
- **Differentiated Reading Materials:** Provide leveled reading materials related to the science standards. Offer a range of texts at different reading levels or provide audio versions for students who may struggle with reading comprehension. Accompany the readings with comprehension questions or graphic organizers tailored to different reading abilities.
- **Technology Integration:** Utilize technology tools and resources to support differentiated instruction. Offer interactive websites, educational videos, or digital simulations that cater to different learning styles and abilities. Students can explore virtual environments, watch videos on topics like weather patterns or engineering design, or engage in online simulations related to the standards.
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- **Scaffolded Support:** Provide scaffolds and supports to help students build understanding. Break down tasks into smaller steps, provide sentence starters or graphic organizers, and offer additional examples or explanations as needed. Differentiate the level of guidance and support based on individual student needs.
- **Personalized Projects:** Allow students to pursue personalized projects or investigations related to the standards. Provide opportunities for students to explore topics of interest, conduct independent research, and present their findings to the class. This promotes autonomy and ownership of learning.
- **Formative Assessment and Feedback:** Regularly assess student understanding using formative assessment strategies. Use a variety of methods, such as observation, questioning, and self-assessment, to gauge comprehension. Provide timely feedback and opportunities for students to reflect on their learning and set goals.
- **Individualized Support:** Offer individualized support and intervention for students who require additional assistance or accommodations. Provide targeted interventions, differentiated resources, or modified assignments to meet their specific needs. Collaborate with support staff or specialists to ensure appropriate accommodations or modifications are in place.

RESOURCES

Teacher Resources:

- Video: *What Do You Hear?* [What Do You Hear](#)
- **Video:** *What is Sound?* [What is Sound?](#)
- Waves Unit Presentation:  Sound and Light Waves Grade 1.pptx
- Waves Unit Worksheets:  *Sound Unit Worksheets Grade 1.docx*

- Seeing Sound Labs: [w Seeing Sound Waves Labs.docx](#)

Equipment Needed:

- FOSS Kit
- Books on sound
- Videos on sound
- Instruments
- <https://njctl.org/materials/resources/sound-waves-and-light-waves-practice-sheets/attachments/>

UNIT OVERVIEW

Content Area: Science

Unit Title: Plants and Animals

Target Course/Grade Level: 1

Unit Summary: Students investigate how plants and animals use their external structures to help them survive, grow, and meet their needs. Then students are challenged to apply their learning 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.

Approximate Length of Unit: 9 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

- **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.]
- **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).]
- **1-LS3-1** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.]
- **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.
 - **DCI:** A situation that people want to change or create can be approached as a problem to be solved through engineering.
 - **DCI:** Asking questions, making observations, and gathering information are helpful in thinking about problems.
 - **DCI:** Before beginning to design a solution, it is important to clearly understand the problem.

- **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.
 - **DCI:** 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-ETS1-3:** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
 - **DCI:** Because there is always more than one possible solution to a problem, it is useful to compare and test designs.

Career Readiness, Life Literacies, and Key Skills:

- **9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
- **9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
- **9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
- **9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
- **9.4.2.DC.2:** Explain the importance of respecting the digital content of others.
- **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 (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
- **9.4.2.IML.4:** Compare and contrast the way information is shared in a variety of contexts (e.g., social, academic, athletic) (e.g., 2.2.2.MSC.5, RL.2.9).
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Interdisciplinary Connections and Standards:

ELA:

- **RI.1.1** Ask and answer questions about key details in a text. (1-LS3-1)
- **W.1.7** Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-ESS1-1), (1-ESS1-2)
- **W.1.8** With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2)
- **K-2-ETS1-1** - Ask questions, make observations, and gather information about a situation people want to change.
 - **ELA Connection:** Students can use their knowledge of engineering design to write fictional or nonfictional stories about people who are trying to solve problems. They could also create a graphic organizer to help them plan their solutions
- **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.
 - **ELA Connection:** Students can use their knowledge of engineering design to write instructions for how to build a model. They could also create a presentation to share their findings with the class
- **K-2-ETS1-3** - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.

- **ELA Connection:** Students can use their knowledge of data analysis to write reports or create presentations. They could also create graphs or charts to illustrate their findings.

Social Studies:

- K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change.
 - **Social Studies Connection:** Students could research a problem that is facing their community, such as flooding or pollution. They could then develop a plan to solve the problem.
 - Standards: SS.K-5.H.4 - Analyze the effects of human activity on the environment.
- 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.
 - **Social Studies Connection:** Students could research the different ways that people have used tools and technology to solve problems throughout history. They could then create a model or presentation to share their findings.
 - Standards: SS.K-5.H.5 - Describe the ways people have changed the environment to meet their needs.
- K-2-ETS1-3 - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.
 - **Social Studies Connection:** Students could research different ways that people have solved the same problem in different cultures. They could then compare the effectiveness of the different solutions.
 - Standards: SS.K-5.H.6 - Compare different ways that people have solved problems over time.

Math:

- MP.2 Reason abstractly and quantitatively. (1-ESS1-2)
- MP.4 Model with mathematics. (1-ESS1-2)
- MP.5 Use appropriate tools strategically. (1-ESS1-2)
- 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1- LS3-1)
- K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change.
 - **Math Connection:** Students could use their knowledge of graphs and charts to represent data about the amount of water that is used in their community. They could then use this data to make a plan to reduce water usage.
 - Standards: 2.MD.C.10 - Represent data with tables, bar graphs, pictographs, and line graphs.
 - Activity: Students could collect data about the amount of water that is used in their homes each day. They could then create a graph to represent this data. They could then use this data to make a plan to reduce water usage.
- 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.
 - **Math Connection:** Students could use their knowledge of area and volume to design a water bottle that will hold the most water for a given amount of space. They could then build their designs and test them to see how well they work.
 - Standards: 2.MD.C.6 - Relate volume to the number of unit cubes that fill a container.
 - Activity: Students could brainstorm different designs for a water bottle. They could then build their designs and test them to see how well they work.

- K-2-ETS1-3 - Analyze data from tests of two objects designed to solve the same problem to compare the effectiveness of the designs.
 - **Math Connection:** Students could use their knowledge of data analysis to compare the effectiveness of two different designs for a water bottle. They could then use this data to make a recommendation about which design is the most effective.
 - Standards: 2.MD.C.10 - Represent data with tables, bar graphs, pictographs, and line graphs.
 - Activity: Students could test two different designs for a water bottle. They could then collect data about how well each design works. They could then use this data to make a recommendation about which design is the most effective.

Unit Understandings:

Students will understand that...

- Plants and animals are living things.
- All living things have external parts.
- Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves and survive.
- Humans mimic how animals use their bodies.
- Animals respond to their environments.
- Animals have offspring.
- Animals can give live birth or lay eggs.
- Animals protect their young before they are born.
- Animal babies are similar but not exactly like their parents.
- Animals have inherited and learned behaviors.
- Most animal parents provide their offspring with food, shelter, protection and education.
- What a plant is.
- Plants have different parts that help them survive and grow.
- A plant grows from a seed.
- Parent plants and offspring are similar but not exactly the same.
- Plants respond to their environments.

Unit Essential Questions:

- What is a living thing?
- Why do animals have different eyes and ears?
- What do animals use their hands for?
- Why do animals have different types of feet?
- What do animal mouths tell us about an animal?
- How do different animals move?
- How do animals use their bodies to protect themselves?
- How do humans mimic animals?
- What is an offspring?
- How are offspring similar to their parents?
- How are offspring different than their parents?
- What is an inherited behavior?
- What is a learned behavior?
- How do animal parents care for their young?
- What is a plant?
- What are the different parts of a plant?
- What is the function of the stem, leaves, and roots?

- What is a seed?
- How does a seed grow?
- How are parent plants and offspring similar?
- How do plants change as they grow?
- How do plants respond to their environment?

Knowledge and Skills:

Students will be able to...

- Describe the function of each animal body part.
- Describe/list external parts of an animal.
- Explain how animals respond to their environment to help them survive.
- Describe what an offspring is.
- Identify similarities and differences between animal parents and offspring.
- Describe how animal parents care for their offspring.
- List parts of a plant (roots, stems, leaves, flowers, and fruit).
- Describe the function of each part of a plant.
- Explain how parent plants and offspring look similar.
- Explain how plants respond to their environment to help them survive.

EVIDENCE OF LEARNING

Assessment:

- **Common Assessment:**
- Teacher Observation
- Skillsheets

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- **Hands-on Investigations:** Provide hands-on investigations and experiments related to the standards. Offer different levels of complexity or challenge within each investigation to accommodate varying abilities. For example, students could explore the effects of weathering and erosion using simple materials like sand, water, and rocks, while more advanced learners could investigate erosion rates using different soil types.
- **Visual and Manipulative Supports:** Use visual aids, charts, diagrams, and manipulatives to support understanding and engagement. For instance, use models or drawings to illustrate the different layers of soil or the water cycle. Provide physical manipulatives, such as rock samples or soil samples, for students to observe and explore.
- **Collaborative Learning:** Encourage collaborative learning experiences where students can work in pairs or small groups. Assign tasks that promote cooperation, such as creating a poster or presentation together, conducting research as a team, or participating in a group discussion. This allows students to benefit from peer support and diverse perspectives.

- **Differentiated Reading Materials:** Provide leveled reading materials related to the science standards. Offer a range of texts at different reading levels or provide audio versions for students who may struggle with reading comprehension. Accompany the readings with comprehension questions or graphic organizers tailored to different reading abilities.
- **Technology Integration:** Utilize technology tools and resources to support differentiated instruction. Offer interactive websites, educational videos, or digital simulations that cater to different learning styles and abilities. Students can explore virtual environments, watch videos on topics like weather patterns or engineering design, or engage in online simulations related to the standards.
- **Choice Boards or Menus:** Offer choice boards or menus that provide a variety of activities related to the standards. Students can choose from options that align with their interests and learning styles. For example, they may select to create a weather report, design an erosion prevention structure, or conduct research on different plant adaptations.
- **Scaffolded Support:** Provide scaffolds and supports to help students build understanding. Break down tasks into smaller steps, provide sentence starters or graphic organizers, and offer additional examples or explanations as needed. Differentiate the level of guidance and support based on individual student needs.
- **Personalized Projects:** Allow students to pursue personalized projects or investigations related to the standards. Provide opportunities for students to explore topics of interest, conduct independent research, and present their findings to the class. This promotes autonomy and ownership of learning.
- **Formative Assessment and Feedback:** Regularly assess student understanding using formative assessment strategies. Use a variety of methods, such as observation, questioning, and self-assessment, to gauge comprehension. Provide timely feedback and opportunities for students to reflect on their learning and set goals.
- **Individualized Support:** Offer individualized support and intervention for students who require additional assistance or accommodations. Provide targeted interventions, differentiated resources, or modified assignments to meet their specific needs. Collaborate with support staff or specialists to ensure appropriate accommodations or modifications are in place.

RESOURCES

Teacher Resources:

- **Living Things Presentation:**  [Living Things Presentation Grade 1.pptx](#)
- **Structure & Function Lab:** [Structure & Function Lab](#)
- **Plants Presentation:**  [Plants Grade 1.pptx](#)
- Foss kit: Plants and Animals
- Foss books: Plants and Animals
- [Generation Genius](#)
- [Mystery Science](#)
- [Edpuzzle](#)
- [Discovery Education](#)
- [ThinkLink](#)
- [Kahoot](#)
- [Legends of Learning](#)

- [PBS Kids](#)
- [ReadWorks](#)

Equipment Needed:

- Non fiction books
- Videos
- Photographs
- Interactive sites: national geographic kids,