

CURRICULUM

FOR

SCIENCE

GRADE 2

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

ACKNOWLEDGMENTS

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

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

Maureen Dalessio

Dr. Tiffany A. Beer, Director of Curriculum and Instruction

Subject/Course Title:
Science
Grade 2

Date of Board Adoption:
September 19, 2023

RAHWAY PUBLIC SCHOOLS CURRICULUM

Science: Grade 2

PACING GUIDE

Unit	Title	Pacing
1	Earth's Surface	7 weeks
2	Matter	4 weeks
3	Biodiversity and Plants	8 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 Surface

Target Course/Grade Level: 2

Unit Summary: This unit will explore the different shapes and kinds of land and bodies of water on Earth. Students will learn about the different states of water and how they can change. They will also learn about engineering design and how to solve problems using models.

Approximate Length of Unit: 14 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

- **2-ESS2-2:** Develop a model to present the shapes and kinds of land and bodies of water in an area.
 - **DCI:** Maps show where things are located. One can map the shapes and kinds of land and water in an area.
- **2-ESS2-3:** Obtain information to identify where water is found on Earth and that it can be solid or liquid.
 - **DCI:** Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.
- **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.
- **2-ESS1-1:** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
 - **DCI:** Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.
- **2-ESS2-1:** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
 - **DCI:** Wind and water can change the shape of the land.
- **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).
- **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:

- 2-ESS2-2 - Develop a model to represent the shapes and kinds of land and bodies of water in an area.
 - ELA Connection: Students can use their knowledge of landforms and bodies of water to write descriptive texts, poems, or stories. They could also create maps or diagrams to represent their models.
 - Standards: W.2.3, W.2.4, W.2.7
- 2-ESS2-3 - Obtain information to identify where water is found on Earth and that it can be solid or liquid.
 - ELA Connection: Students can use their knowledge of water to write informational texts, poems, or stories. They could also create posters or infographics to illustrate their findings.
 - Standards: RI.2.1, RI.2.2, RI.2.3
- 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.
 - Standards: W.2.1, W.2.2, W.2.7
- 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.
 - Standards: SL.2.1, SL.2.2, SL.2.4
- 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.
 - Standards: RI.2.1, RI.2.2, RI.2.3

Social Studies:

- 2-ESS2-2 - Develop a model to represent the shapes and kinds of land and bodies of water in an area.
 - Social Studies Connection: Students could research the different landforms and bodies of water that are found in their state or country. They could then create a map or model to represent their findings.
 - Standards: SS.K-5.G.1 - Describe the physical features of the places they live, such as mountains, rivers, and deserts.
- 2-ESS2-3 - Obtain information to identify where water is found on Earth and that it can be solid, liquid, or gas.
 - Social Studies Connection: Students could research the different ways that water has been used throughout history. They could then create a timeline or presentation to share their findings.
 - Standards: SS.K-5.G.2 - Describe the movement of water on Earth's surface, such as in rivers, oceans, and lakes.
- 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:

- 2-ESS2-2 - Develop a model to represent the shapes and kinds of land and bodies of water in an area.
 - Math Connection: Students could use their knowledge of shapes and area to create models of landforms and bodies of water. They could then measure the area of their models to compare the sizes of different landforms and bodies of water.
 - Standards: 2.MD.C.7 - Relate area to the size of a standard unit square.
 - Activity: Students could create a model of a lake using clay. They could then measure the area of their model using a square grid.
- 2-ESS2-3 - Obtain information to identify where water is found on Earth and that it can be solid, liquid, or gas.
 - Math Connection: Students could use their knowledge of measurement to track the amount of water that evaporates from a puddle over time. They could then use this data to calculate the rate of evaporation.
 - Standards: 2.MD.C.4 - Relate volume to the capacity of a standard unit.
 - Activity: Students could place a puddle of water in a sunny spot. They could then measure the amount of water in the puddle every hour for a day. They could then use this data to calculate the rate of evaporation.
- 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...

- Earth's surface features change over time due to natural processes such as weathering, erosion, and deposition.
- Water can be found in three states: solid, liquid, and gas.
- Human actions can have positive or negative impacts on the environment and Earth's resources.
- Different types of weather patterns are influenced by the interactions between the sun, Earth, and the atmosphere.
- Climate and how it relates to long-term weather patterns in specific regions.

Unit Essential Questions:

- How can we represent the shapes and kinds of land and bodies of water in an area?
- How does the shape of an object affect how it functions?
- How can we collect data to compare the effectiveness of two objects designed to solve the same problem? How can we analyze the data to make a recommendation?
- How do natural processes like weathering, erosion, and deposition shape the Earth's surface?
- How do the sun, Earth, and atmosphere interact to create different types of weather?
- What are some weather patterns we observe in different seasons and regions?
- What is climate, and how does it relate to long-term weather patterns?
- How do human actions impact the environment and Earth's resources?
- What are some ways we can reduce our impact on the environment and protect Earth's resources?
- How can we develop solutions to address environmental challenges?

Knowledge and Skills:

Students will know...

- Water is found in oceans, rivers, lakes, and ponds.
- Water exists in liquid or ice forms.

- Different landforms exist on Earth. Some of them are mountains, hills, valleys, plains, and islands.
- We can use a map to find where water and landforms are located on Earth.
- Weathering is the breaking down of the Earth's surface.
- Erosion is when rocks and soil are carried away.
- Water, wind, and ice cause weathering and erosion.
- Erosion cannot be prevented but it can be reduced.
- Some events change Earth's surface very slowly while others occur very quickly.

Students will be able to...

- Describe some of the distinguishing characteristics of oceans, rivers, lakes, and ponds.
- Recognize and name different bodies of water in pictures and on maps.
- Describe where water may exist as a liquid or as a solid (ice).
- Identify and describe characteristics of mountains, hills, valleys, plains, and islands.
- Describe weathering and erosion.
- Identify and describe the causes of erosion.
- Identify ways to reduce erosion.
- Identify and describe events that happen quickly.

EVIDENCE OF LEARNING

Common Assessments:

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

- End of unit common assessments: see assessment folder for links to common assessments

Learning Activities:

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

- 📄 Earthquake Shake Engineering Lab Grade 2.pdf
- 📄 Grade 2 Earth's Surface Presentation with Answers.pdf
- 📄 Grade 2 Earth's Surface Practice Sheets.pdf
- 📄 Land vs. Water Investigation Grade 2.pdf
- 📄 What Kind of Water is That? Investigation Grade 2.pdf
- 📄 States of Water Lab Grade 2.pdf
- 📄 Three Billy Goats Engineering Lab Grade 2.pdf
- 📄 My Very Own Island Activity Grade 2.pdf
- 📄 Extension Activity Bodies of Water Demo & Venn Diagram Activity Grade 2.pdf
- 📄 Grade 2 Changes to Earth's Surface Presentation with Answers.pdf
- 📄 Grade 2 Changes to Earth's Surface Practice Sheets.pdf
- 📄 Weathering Investigation Grade 2.pdf
- 📄 Water Erosion Lab Grade 2.pdf
- 📄 Wind Erosion Lab Grade 2.pdf

- [Glacier Demonstration Grade 2.pdf](#)

RESOURCES

Teacher Resources:

- [2nd Grade Science Course | New Jersey Center for Teaching and Learning](#)
- [Standards Document](#)
- [Evidence Statement | Next Generation Science Standards](#)
- [Generation Genius](#)
- [Mystery Science](#)
- [Edpuzzle](#)
- [Discovery Education](#)
- [ThinkLink](#)
- [Kahoot](#)
- [Legends of Learning](#)
- [PBS Kids](#)
- [ReadWorks](#)
- [Grade 2 Science Literacy Resources.pdf](#)

Equipment Needed:

Optional Depending upon Lab and Extension Activities:

- 9 x 13 aluminum pan
- antacids
- quart-sized zip-loc bags
- sandwich-sized zip-loc bags
- food coloring
- ice cube trays
- latex balloons
- mini marshmallows
- molding clay
- plastic cups (4 oz., 8 oz, & 16 oz.)
- potting soil
- rulers
- shoe boxes
- Sorting Objects (cotton balls, pencils, rocks, dice, foil)
- sand
- spray bottle
- small rocks
- small erasers
- straws
- string
- table salt
- yard stick
- balance scale
- books about bodies of water

- boxes of jello
- containers of different shapes and sizes
- globe
- world map
- pictures or videos of Earth's systems (e.g., atmosphere, hydrosphere, biosphere, geosphere)
- pictures or models of water in different forms (solid, liquid, gas)
- water cycle diagram
- models or pictures of different landforms (e.g., hills, valleys, canyons)

UNIT OVERVIEW

Content Area: Science

Unit Title: Matter

Target Course/Grade Level: 2

Unit Summary: This unit will explore the observable properties of various materials and their uses in everyday life. They investigate the three states of matter, conduct hands-on experiments to understand physical changes, and learn to classify materials based on their properties. Through engaging activities and scientific inquiry, students develop a deeper understanding of the characteristics of matter and its real-world applications.

Approximate Length of Unit: 8 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

- **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
 - **DCI:** Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.
- **2-PS1-2** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
 - **DCI:** Different properties are suited to different purposes.
- **2-PS1-3** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
 - **DCI:** Different properties are suited to different purposes.
 - **DCI:** A great variety of objects can be built up from a small set of pieces.
- **2-PS1-4** Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
 - **DCI:** Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.
- **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.
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- **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).
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- **9.4.2.DC.1:** Explain the differences between ownership and sharing of information.
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- **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).
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Interdisciplinary Connections and Standards:

ELA:

- 2-ESS2-2 - ELA Connection: L.2.4
 - Activity: Have students research different types of natural disasters and their impact on Earth's systems. They can gather information from books, articles, and online sources to answer questions about how these disasters affect the environment. Then, they can present their findings in the form of a presentation or poster.
- 2-ESS2-3 - ELA Connection: W.2.2
 - Activity: Students can write an explanatory essay about the water cycle. They should explain the different stages of the water cycle and how water changes between solid, liquid, and gas states. They can also include examples of the water cycle in real-world scenarios.
- K-2-ETS1-2 - ELA Connection: RL.2.3
 - Activity: Students can read a story or watch a video about an engineer designing a new invention. They should identify the major events and challenges the engineer faces throughout the design process and describe how the engineer responds to each challenge.

Social Studies:

- K-2-ETS1-3 - Social Studies Connection: 2.2.2.C.2

- Activity: Students can learn about how different cultures have adapted to their environments over time. They can discuss how cultural practices and technologies are influenced by the geography and resources of their regions.
- K-2-ETS1-1- Social Studies Connection: 2.4.2.C.3
 - Activity: Students can identify a community need, such as reducing litter in the neighborhood, and develop an engineering solution like designing a recycling program or creating trash bins. They can present their solutions to the class.

Math:

- K-2-ETS1-1- Math Connection: MD.2.2
 - Activity: Students can measure the length of objects used in their engineering design projects twice, using length units of different lengths. They should describe how the two measurements relate to the size of the chosen units and compare their findings.

Unit Understandings:

Students will understand that...

- Matter is anything that takes up space and has mass, and it can be classified based on its observable properties, such as color, shape, texture, hardness, flexibility, and magnetic attraction.
- Matter can undergo physical changes, like bending, cutting, or dissolving while maintaining its original properties.
- The difference between physical changes and chemical changes and where new substances are formed.

Unit Essential Questions:

- What are the different states of matter?
- How can we sort and classify matter?
- What materials are best suited for different purposes?
- What are the differences between a solid, a liquid, and a gas?
- How can matter change states?
- Are changes to substances reversible or permanent?
- Do liquids, solids, and gases have volume and weight?

Knowledge and Skills:

Students will know...

- Properties of different materials such as strength, hardness, flexibility, and texture.
- What materials are best suited for different purposes.
- An object built out of a small set of pieces can be deconstructed and built into a different object.
- Properties of solids, liquids, and gas.
- Some substances can experience reversible changes and some cannot.

Students will be able to...

- Determine different properties of objects.
- Group objects according to their properties.
- Construct an object out of a small set of pieces.
- Conduct experiments to change the state of liquids and solids.

EVIDENCE OF LEARNING

Common Assessments:

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

- **End of Unit Common Assessments:** see assessment folder for links to assessments

Learning Activities:


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

- 📄 Grade 2 Matter Presentation.pdf
- 📄 Grade 2 Three Little Pigs Engineering Lab.pdf
- 📄 Grade 2 Snowman Changes of Matter Investigation.pdf
- 📄 Grade 2 Balloon States of Matter Investigation.pdf
- 📄 Grade 2 Matter Study Guide.pdf
- 📄 Grade 2 Matter Study Guide Answer Key.pdf
- 📄 Grade 2 Matter Recording Sheet.pdf
- 📄 Grade 2 Matter Extension Activity What is Goop Lab?.pdf
- 📄 Grade 2 Matter Extension Activity Texture Investigation.pdf
- 📄 Grade 2 Matter Extension Activity Molecules and States of Matter.pdf
- 📄 Grade 2 Matter Extension Activity Melting Crayons Investigation.pdf
- 📄 Grade 2 Matter Extension Activity Inflate a Balloon Lab.pdf
- 📄 Grade 2 Matter Extension Activity Ice Cream Investigation.pdf
- 📄 Grade 2 Matter Extension Activity Humpty Dumpty Engineering Lab.pdf
- 📄 Grade 2 Matter Extension Activity Classifying Objects Investigation.pdf
- 📄 Grade 2 Matter Extension Activity Cinderella Literacy Connection.pdf
- 📄 Grade 2 Matter Extension Activity Boat Design Challenge Lab.pdf
- 📄 Grade 2 Matter Extension Activity Ball Bounce Lab.pdf
- 📄 Grade 2 Matter Extension Activity Absorbency Lab.pdf

RESOURCES

Teacher Resources:

- [2nd Grade Science Course | New Jersey Center for Teaching and Learning](#)
- [Standards Document](#)
- [Evidence Statement | Next Generation Science Standards](#)
- [Generation Genius](#)
- [Mystery Science](#)

- [Edpuzzle](#)
- [Discovery Education](#)
- [ThinkLink](#)
- [Kahoot](#)
- [Legends of Learning](#)
- [PBS Kids](#)
- [ReadWorks](#)
-  Grade 2 Science Literacy Resources.pdf

Equipment Needed:

Optional Depending upon Lab and Extension Activities:

- 1/4 Cup measuring cup
- 1 roll of aluminum foil
- baseball
- baking soda
- quart-sized zip-loc bags
- sandwich-sized zip-loc bags
- blocks
- bouncy balls
- construction paper
- corn starch
- cotton balls
- craft sticks
- broken pieces of crayons
- double-sided tape
- fabric
- foam
- food coloring
- golf ball
- large bowl
- modeling clay
- paper towels
- pennies
- ping-pong ball
- plastic plates
- plastic cups (4 oz., 8 oz)
- play dough
- rubber bands
- salt
- sandpaper
- small circular objects (ex: sequins, beads, cereal)
- sponge
- sponge ball
- straws
- sugar
- table salt
- tissues
- vanilla
- wash cloth
- whipping cream

- white vinegar

UNIT OVERVIEW

Content Area: Science

Unit Title: Biodiversity and Plants

Target Course/Grade Level: 2

Unit Summary: In this unit, students explore the rich diversity of plant life on Earth and its significance in sustaining ecosystems. They investigate the various parts of plants, their life cycles, and the role they play in providing food, shelter, and oxygen for living organisms.

Approximate Length of Unit: 16 weeks

LEARNING TARGETS

NJ Student Learning Standards:

Science:

- **2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats.
 - **DCI:** There are many different kinds of living things in any area, and they exist in different places on land and in water.
- **2-LS2-1** Plan and conduct an investigation to determine if plants need sunlight and water to grow.
 - **DCI:** Plants depend on water and light to grow.
- **2-LS2-2** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
 - **DCI:** Plants depend on animals for pollination or to move their seeds around.
- **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).
- **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:

- 2-LS2-1 - ELA Connection: W.2.2
 - Activity: Students can plan and conduct an investigation to determine if plants need sunlight and water to grow. They should write an informative/explanatory text, explaining their experimental procedure, the variables they are testing, and the results they obtained.

Social Studies:

- 2-LS4-1 Social Studies Connection: 2.4.2.A.2
 - Activity: Students can explore different regions and ecosystems around the world. They should make observations of plants and animals in each region and compare the diversity of life in different habitats. They can identify how people in these regions interact with their environment, considering how the natural resources influence human activities and cultures.

Math:

- 2-LS2-1 - Math Connection: MD.2.7
 - Activity: Plan and conduct an investigation to determine if plants need sunlight and water to grow. Students can plan and conduct an investigation to determine the time it takes for plants to grow under different conditions (with or without sunlight and water). They can record the time from the analog or digital clocks to the nearest five minutes (using a.m. and p.m.) and analyze the data to draw conclusions about the impact of sunlight and water on plant growth.

Unit Understandings:

Students will understand that...

- Living organisms, including plants and animals, depend on each other and their environments to survive.
- Plants have life cycles that include germination, growth, reproduction, and eventual death.

- Plants require specific environmental factors, such as sunlight, water, air, and nutrients, for healthy growth.

Unit Essential Questions:

- What is biodiversity?
- What is the difference between invertebrates and vertebrates?
- What is a habitat?
- What plants and animals live in the rainforest?
- What plants and animals live in the desert?
- What plants and animals live in the coral reef?
- What plants and animals live in the woodlands?
- What resources are needed for plants to grow?
- Why is photosynthesis important for plants and people?
- How does pollination occur?
- How does seed dispersal occur?

Knowledge and Skills:

Students will know...

- The meaning of biodiversity.
- Identify different types of animals.
- Different habitats have a variety of plants and animals.
- The characteristics of plants.
- The needs of plants.
- The inputs and outputs of photosynthesis.
- How pollination occurs.
- How dispersal occurs.

Students will be able to...

- Explain what biodiversity means.
- Distinguish between invertebrates and vertebrates.
- Define and identify habitats.
- Identify plants and animals that live in different habitats.
- Plan and conduct an investigation that determines plants need sunlight and water to grow.
- Describe what plants need to survive.
- Describe photosynthesis.
- Develop a simple model to show how animals disperse seeds or pollinate plants.

EVIDENCE OF LEARNING

Common Assessments:

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

- **End of Unit Assessments: see assessment folder for links to common assessments**

Learning Activities:

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

- 📄 Grade 2 Biodiversity Presentation.pdf
- 📄 Grade 2 Biodiversity Practice Sheets.pdf
- 📄 Grade 2 Biodiversity Collage Activity.pdf
- 📄 Grade 2 Zoo Habitat Engineering Lab.pdf
- 📄 Grade 2 Woodlands Research.pdf
- 📄 Grade 2 Woodlands Biodiversity Activity.pdf
- 📄 Grade 2 Rainforest Research.pdf
- 📄 Grade 2 Rainforest Biodiversity Activity.pdf
- 📄 Grade 2 Desert Research.pdf
- 📄 Grade 2 Coral Reef Research.pdf
- 📄 Grade 2 Coral Reef Biodiversity Activity.pdf
- 📄 Grade 2 Plants Presentation.pdf
- 📄 Grade 2 What Do Plants Need? Lab.pdf
- 📄 Grade 2 Extension Lab How Do Seeds Travel?.pdf
- 📄 Grade 2 Plants Extension Lessons.pdf
- 📄 Grade 2 Plants Practice Sheets.pdf

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- [Kahoot](#)
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- [PBS Kids](#)
- [ReadWorks](#)
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Equipment Needed:

Optional Depending upon Lab and Extension Activities:

- 2 1/2in length, 1 1/2in circumference, cylindrical objects
- craft sticks
- paper napkins
- plant seedlings
- plastic spoons
- pots
- potting soil
- rulers

- seeds such as milkweed, acorns, maple, etc.
- test tubes