Washington Township School District

The mission of the Washington Township Public Schools *is to provide a safe educational environment for all students to attain the skills and knowledge specified in the New Jersey Core Curriculum Content Standards at all grade levels so as to ensure their full participation in our global society as responsible, self-directed, and civic-minded citizens.*

Course Title:	**Science**
Grade Level(s):	**2nd**

Duration:	*Full Year:*	**X**	*Semester:*		*Marking Period:*	
Course Description:	The Washington Township School District first grade curriculum uses an integrated approach to general science that focuses on units in physical, life, and earth science. By using this approach, teachers are able to meet the needs of all students while aligning with the New Jersey Model Curriculu, the Next Generation Science Standards, and the New Jersey Student Learning Standards. Hands-on activities are stressed and include student discovery experiments, problem solving, model building, cooperative learning, technology integration, classroom discussion, teacher demonstrations, and writing opportunities for research and self-expression. Interdisciplinary subject areas are incorporated whenever possible. Students are introduced to the use of scientific tools and methods used for investigations. The course is designed to be implemented using the 5E Model of Instruction: Engage, Explore,Explain, Extend/Elaborate, and Evaluate. The major topics of study for second grade are taken specifically from the Next Generation Science Standards: ● Structure and Properties of Matter ● Interdependent Relationships in Ecosystems ● Earth's Systems: Processes that Shape the Earth ● Engineering Design					
Grading Procedures:	Refer to individual unit tests for percentages that equate for Secure, Developing and Beginning grades.					
Primary Resources:	National Geographic Learning Exploring Science Second Grade Program					

Washington Township Principles for Effective Teaching and Learning

- Implementing a standards-based curriculum
- Facilitating a learner-centered environment
- Using academic target language and providing comprehensible instruction
- Adapting and using age-appropriate authentic materials
- Providing performance-based assessment experiences
- Infusing 21st century skills for College and Career Readiness in a global society

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Written: _____

Revised: _____

BOE Approval: _____

Unit Title: Structures and Properties of Matter (Physical Science)

Unit Description: Students will investigate matter. First students will explore solids and liquids. Then they will explore the properties of matter. Students will identify shape, color and texture. Next students will recognize how matter can change. Throughout the unit, students will engage in activities to think like a scientist and engineer. At the conclusion of the unit the students will connect the concepts of matter, properties, and changes in matter with the work of a Materials Scientist.

Unit Duration: Marking Period 2

Desired Results

Standard(s):

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]

2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]

2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]

Indicators:

PS1.A: Structure and Properties of Matter

- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) □
- Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3)
- A great variety of objects can be built up from a small set of pieces. (2-PS1-3)

PS1.B: Chemical Reactions

- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)

Understandings:
Students will understand that…

- Recognize that everything is made of matter and that different kinds of matter exist.
- Describe the properties of a liquid, including that water is a liquid when the temperature is above freezing.
- Identify solids as a kind of matter and describe the properties of solids.
- Observe solids and liquids in different containers.
- Conclude that a solid has a definite shape and a liquid takes the shape of its container.
- Recognize that matter can be described and classified by its properties.
- Recognize that color is a property of matter.
- Define texture and recognize that it is a property of matter that can be observed and described.
- Describe objects as hard or soft.
- Recognize bending and stretching as characteristics of flexibility, a property of materials.
- Recognize that the ability to sink or float is a property of objects.
- Plan and conduct an investigation to observe and classify objects based on their properties.
- Make predictions about the absorption of different materials.
- Draw evidence-based conclusions about which materials absorb the most water.
- Describe how large objects can be built from many small pieces.
- Observe and conclude that objects made of many pieces can be disassembled and made into a new object.
- Identify water in its solid and liquid states.
- Describe how water changes when it is cooled.
- Describe how ice changes when it is heated.
- Recognize that freezing and melting can happen over and over again.
- Recognize that heating causes some changes to matter that cannot be reversed.
- Construct an argument based on evidence that some changes caused by heating or cooling can be reversed and some cannot.
- Connect the concepts of matter, properties, and changes in matter with the work of a materials scientist

Essential Questions:

- What is matter?
- What are properties of matter?
- How can matter change?

Assessment Evidence

Performance Tasks:

Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation.

- Lesson 4 (Pg. 10)- Investigate Solids and Liquids – Demonstrate that a solid had a definite shape and a liquid takes the shape of its container.
- Lesson 12 (Pg. 26)- Investigate Materials that Absorb– Demonstrate how different materials absord liquid.

Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 11 (pg. 24) – Show how to classify objects based on their properties.
- Lesson 14 (Pg. 30) Show how many small objects can be made into one larger object.

Lesson 18 (Pg. 38) – Construct an argument based on evidence.

Other Evidence:

Students will demonstrate their understandings through:

- Science Notebook Entries
- Science in a Snap (Additional Investigations) in Lessons 7, 8, 9, 15, 16)

Unit Test

Benchmarks:

Unit Test Percentages (Based on 20 questions):

Secure = 80% - 100%

Developing = 60% - 79%

Beginning = Below 60%

Learning Plan

Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook and Website, Student Science Notebook
Learning Activities:

Lesson and Duration	Activties	Supplemental Materials
Lesson 1 (TG pages 4-5) Matter NGSS PS1.A Different kinds of matter exist and many of them can be solid or liquid, depending on temperature. (2-PS1-1) Objective: Recognize that everything is made of matter and that different kinds of matter exist	**Engage:** Students share knowledge about water and sand. **Explore:** Preview then read pages 4-5. **Explain:** Define Matter-anything that takes up space. Describe matter-observing its color, shape, size, and how it feels to the touch. **Elaborate**: In groups students will observe, describe and write about solids and liquids. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Wooden, foam or plastic block (enough for each group to have one). • Small cup filled with water (enough for each group to have one).

1 Day		
Lesson 2 (TG pages 6-7) Liquids PS1.A: Structure and Properties of Matter Different kinds of matter exist and many of them can be solid or liquid, depending on temperature. (2-PS1-1) Objective: Describe the properties of a liquid, including that water is a liquid when the temperature is above freezing. 1 Day	**Engage:** Students recall that water is a liquid. Ask students what happens to liquids as they are poured from one container to another. **Explore**: Have students look a photo of river and record observations in science notebook. Preview and read pages 6-7. **Explain:** Define liquid and its properties. Students will observe as you pour liquid into a pitcher and then into two different transparent containers. This shows that liquids flow and change shape. **Elaborate:** Investigate further with different colored liquids, honey and hand soap. Record observations in science notebook. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Pitcher/bucket • 2 transparent containers of different shapes/sizes • Water • Food coloring • Honey • Hand Soap • Safety goggles
Lesson 3 (TG pages 8-9) Solids NGSS PS1.A: Structure and Properties of Matter Different kinds of matter exist and many of them can be solid or liquid, depending on temperature. (2-PS1-1 Objective: Identify solids as a kind of matter and describe the properties of solids. 1 Day	**Engage**: Have students discuss a time where they have gone ice skating, sledding or ice fishing. Then ask about a time they went swimming in a lake, pool or ocean. How do you think ice, snow, and water are alike? How are they different? **Explore**: Preview then read pages 8-9. **Explain**: Define and Identify Solids, Contrast solids and liquids, describe how liquids become solids. **Elaborate:** Extend your thinking about how solids change. conduct mini experiment on p.9. **Evaluate**: Have students record their answers to the Wrap It Up questions in their science notebook.	• Cups • Ice cubes • Cloth • foil
Lesson 4 (TG pages 10-11) Investigate: Solids and Liquids PS1.A: Structure and Properties of Matter Matter can be described and classified by its observable properties. (2-PS1-1) Objectives- -Observe solids and liquids in different containers**.** -Conclude that a solid has a definite shape and a liquid takes the shape of its container.	**Engage:** Recall what was learned from the previous lessons using a Venn diagram. **Explore:** Guide students through investigation read pages 10-11. **Explain:** Have students share their observations and conclusions with other groups. **Elaborate:** Have students repeat the experiment using different solids and liquids as well as a variety of different containers. **Evaluate:** "Wrap It Up" - Describe and Identify understandings.	**For Groups of 4** • Graduated cylinder • 2 plastic cups • Marble • Water • Containers of various sizes • Variety of liquids

1 Day		
Lesson 5 (TG pages 12-13) Properties NGSS PS1.A: Structure and Properties of Matter Matter can be described and classified by its observable properties. (2-PS1-1) Objective: Recognize that matter can be described and classified by its properties. 1 Day	**Engage:** Choose an object to show the class then have them describe the object's physical characteristics. **Explore:** Preview then read pages 12-13. **Explain:** Define properties, identify shape as a property of matter, use properties to describe matter. **Elaborate:** Working in pairs students will create a scavenger hunt based on properties. They will exchange notebooks with another group and complete their hunt. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	Object of your chocie for class to observe.
Lesson 6 (TG pages 14-15) Color PS1.A: Structure and Properties of Matter. Matter can be described and classified by its observable properties. (2-PS1-1) Objective: Recognize that color is a property of matter. 1 Day	**Engage:** Ask each student to name his or her favorite color. Record responses on a bar graph. **Explore:** Preview then read pages 14-15. **Explain:** Describe properties and color by asking probing questions. Sort a variety of objects by size and color. **Elaborate:** Using red, yellow and blue finger paint allow students to mix different combinations of colors. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Small objects (e.x. paperclips, counters, crayons, attribute shapes.) • Paper plates • Cotton Swabs • Red, yellow and blue finger paint.
Lesson 7 (TG pages 16-17) Texture NGSS PS1.A: Structure and Properties of Matter. Matter can be described and classified by its observable properties. (2-PS1-1) Objective: Define texture and recognize that it is a property of matter that can be observed and described. 1 Day	**Engage:** Write the words *rough, smooth, hard,* and *soft* on the board. Invite volunteers to share what each word means. **Explore:** Preview then read pages 16-17 **Explain:** Define Texture, compare textures by completing the science in a snap activity. **Elaborate:** In groups give students a box with objects of various textures. Each student will close their eyes and feel each object recording in their notebooks what they think the objects are. Once all group members have had a turn they will open the box and share their results. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Shoe box or some small box (1 for each group • Objects of various textures (enough for 4-5 per box).

Lesson 8 (TG pages 18-19) Hard and Soft NGSS PS1.A: Structure and Properties of Matter Matter can be described and classified by its observable properties. (2-PS1-1) Objective: Describe objects as hard or soft. 1 Day	**Engage:** Write the words *hard* and *soft* on the board. Invite volunteers to use each word in a sentence. Then ask students to give examples of objects that can be described as either hard or soft. **Explore:** Preview then read pages 18-19 **Explain:** Describe Objects as Hard and Soft, Contrast Hard and Soft Objects. **Elaborate:** Analyze Clues about Objects activity in pairs. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 9 (TG pages 20-21) Bend and Stretch NGSS S1.A: Structure and Properties of Matter Matter can be described and classified by its observable properties. (2-PS1-1) Objective: Recognize bending and stretching as characteristics of flexibility, a property of materials. 1 Day	**Engage:** Ask students to reach up, discuss what you are doing. Then do the same after they bend down to touch their toes. **Explore:** Preview then read pages 20-21 **Explain:** Define Flexibility, Compare and Contrast Bending and Stretching, Demonstrate Flexibility. Have students do the *SCIENCE in a SNAP* activity to investigate the flexibility of different objects. **Elaborate:** Make slime with the class and discuss how it bends and stretches. Also discuss if they think it is a solid or liquid and why. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Glue • Water • Food coloring • Borax • Bowl and spoon • Safety goggles
Lesson 10 (TG pages 22-23) Sink and Float NGSS PS1.A: Structure and Properties of Matter Different properties are suited to different purposes. (2-PS1-2), (2-PS1-3) Objective: Recognize that the ability to sink or float is a property of objects. 1 Day	**Engage:** Have students share experiences they have had while swimming. **Explore:** Preview then read pages 22-23 **Explain:** Contrast Floating and Sinking, Experiment With Sinking and Floating, Recognize Why Some Objects Must Sink or Float. **Elaborate:** In small groups, give groups a golf ball and a ping pong ball. In their notebooks they will write predictions and findings if the balls will sink or float. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• Small clear storage tub • Water • Paper clip • Rock • Pencil • Wooden block • Marble • Golf ball • Ping pong ball

Lesson 11 (TG pages 24-25b) Plan and Investigate- classify objects based on their properties NGSS 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials based on their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] Objective: Plan and conduct an investigation to observe and classify objects based on their properties. 1 Day	**Engage:** Read the opening paragraph on page 24 together, discuss. Plan and carry out an investigation. **Explore:** Preview then read pages 24-25. Have students make a table for recording their observations in their science notebook. **Explain:** Analyze and interpret data. Share and explain your results. **Elaborate:** Tell students to suppose that they have to repeat the investigation using only their sense of sight. Have each group redesign their investigation around this change. Have students share with the class how their original plan was affected. **Evaluate:** Check to make sure students have answered questions, added drawings, planned their investigation in steps, and recorded their observations in their science notebook. Then ask students these questions. Have them record the answers in their science notebook. • How are the materials you classified alike and different? • If you were to repeat this investigation, would you do anything differently? **Student Rubric** **Teacher Rubric**	*For groups of 4:* Students will need a wide range of objects to conduct the investigation. Objects should come in a variety of sizes, shapes, and colors. Some suggestions include paper clips, rubber balls, marbles, crayons, erasers, blocks, counters, unifix cubes, rubber bands, rocks, shells, and clay. You may also suggest that students use a hand lens to observe objects up close
Lesson 12 (TG pages 26-27) NGSS 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [*Assessment Boundary: Assessment of quantitative measurements is limited to length.* Objective: Make predictions about the absorption of different materials. Draw evidence-based conclusions about which materials absorb the most water. 1 Day	**Engage:** Have students recall a time when they spilled water or another liquid. **Explore:** Guide students through the investigation. Read pages 26–27 together. Complete investigation. **Explain:** At the end of the experiment, have students share their observations and conclusions with other groups. **Elaborate:** tell students that while some materials absorb water, other materials seal it out, or *repel* it. Ask: What are some materials that might repel water? **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	*For groups of 4:* Water; measuring cup (8 oz); 4 plastic cups (10 oz); timer; paper; aluminum foil; cotton cloth; paper towel
Lesson 13 (TG pages 28-29) Build It NGSS PS1.A: Structure and Properties of Matter A great variety of objects can be built up from a small set of pieces. (2-PS1-3) Objective: Describe how large objects can be built from many small pieces. 1 Day	**Engage:** Ask students to describe buildings and other structures, such as bridges and monuments, in their neighborhood or community. **Explore:** Preview then read pages 28-29. **Explain:** Describe Structures, Describe Materials.	

	Elaborate: Have students gather information about Roosevelt Arch. Present findings to the class. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 14 (TG pages 30-31b) Think Like a Scientist Make Observations NGSS 2-PS1-3: Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] Objective: Observe and conclude that objects made of many pieces can be disassembled and made into a new object. 1 Day	**Engage: H**ave students look again at the photos on pages 28–29. **Explore:** Preview then read pages 28-29 and ask probe questions. **Explain:** Carry out an investigation. Observe and record. Use evidence. Share and explain your results. **Elaborate:** In small groups have students choose and research a famous structure to find out what it is made of. Share findings with the class. **Evaluate:** Check that students have recorded their observations and conclusions in their science notebook. Then ask them these questions and have them record their answers in their science notebook. • How did you and your partner use the same materials differently? • How do your results answer the question?	Students will need to gather materials that can be used to build a larger object. Some suggested materials include plastic, or foam blocks; snap together blocks; building logs; unifix cubes.
Lesson 15 (TG pages 32-33) Cooling NGSS PS1.A: Structure and Properties of Matter Different kinds of matter exist and many of them can be either solid or liquid, depending on the temperature. (2-PS1-1) PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. (2-PS1-4) Objective: Identify water in its solid and liquid states. Describe how water changes when it is cooled. 1 Day	**Engage:** Ask students whether any of them use ice trays to make ice at home. Explain to students that in this lesson, they will explore how and why water changes from a liquid to a solid. **Explore:** Preview then read pages 32-33. **Explain:** Describe What Happens When Water Is Cooled. Have students observe how cooling can change water from a liquid to a solid by completing the *SCIENCE in a SNAP* activity. **Elaborate:** Tell students that fresh water and salt water freeze at different temperatures. Help students conduct research to find out what the freezing points are for fresh water and salt water and record their answers in their science notebook. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	*For groups of 4:* water in a plastic cup (100 mL); modeling clay (1 stick); small paper plate *For teacher use:* freezer Advance Preparation Arrange to have use of a freezer for at least 4 hours. Put 100 mL of tap water into each of the plastic cups.
Lesson 16 (TG pages 34-35) Heating NGSS PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these	**Engage:** Have students think about the ice they put into a beverage to cool it. **Explore:** Preview then read pages 34-35 **Explain:** Describe the Effects of Heating. Have students complete the *SCIENCE in a SNAP*	*For groups of 4:* 20 cm (8 inch) square of foil; small paper plate; ice cube; clock or timer (for class use)

changes are reversible and sometimes they are not. (2-PS1-4 Objective: Describe how ice changes when it is heated. Recognize that freezing and melting can happen over and over again. 1 Day	activity to observe how heating can cause ice to change back to liquid water. **Elaborate:** Have groups brainstorm a list of materials that could insulate ice, or keep it from melting. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 17 (TG pages 36-37) Change It? NGSS PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible and sometimes they are not. (2-PS1-4) Objective: Recognize that heating causes some changes to matter that cannot be reversed. 1 Day	**Engage:** Have students describe their experiences with helping cook food. **Explore:** Preview then read pages 36-37. **Explain:** Identify Changes, Describe Reversible and Nonreversible Changes. **Elaborate:** Make ice cream in a baggie to show students how cooling can change matter. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	• quart-size and gallon size plastic bag • ½ cup of milk • ½ cup of heavy whipping Cream • ¼ cup of sugar • ¼ teaspoon of vanilla. • \½ cup table salt • 2 cups of ice • gloves
Lesson 18 (TG pages 38-39) Make an argument NGSS 2-PS1-4: Construct and argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper. Objective: Construct an argument based on evidence that some changes caused by heating or cooling can be reversed and some cannot. 1 Day	**Engage:** Remind students that in previous lessons, they learned about heating and cooling and how these processes can cause matter to change. **Explore:** Preview then read pages 38-39. **Explain:** Make Arguments, Explain to students that they are going to make an argument about whether the changes shown in the text can be reversed. **Elaborate:** Organize students into small groups. Tell groups to suppose that they have to design an investigation that will prove that one of the changes in the photos on this spread either can or cannot be reversed. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 19 (TG pages 40-41) Materials Scientist NGSS Science Models, Laws, Mechanics, and Theories Explain Natural Phenomena. Science searches for cause and effect relationships to explain natural events. Objective: Connect the concepts of matter, properties ,and changes in matter with the work of a materials scientist. 1 Day	**Engage:** Tap Prior Knowledge, class discussion using probe questions in manual. **Explore:** Preview then read pages **Explain:** Describe the Work of a Materials Scientist, Connect Materials Science With Matter and Properties. **Elaborate:** Research Other Careers Involving Matter and Properties **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]
2.0	Students will be able to: • Define properties. • Name different properties of matter..
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.]
2.0	Students will be able to: • Define properties. • Identify materials that absorb and/or repel water.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): 2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]]
2.0	Students will be able to: • Observe that objects made of many pieces can be disassembled and made into a new object.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): 2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]
2.0	Students will be able to: • Define heating and cooling • Explain how heating and cooling can change matter.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Unit Modifications for Special Population Students	
Advanced Learners	* Extend thinking about matter (Examples on TG pg. 5) • Extend thinking about liquids and solids (TG pg. 7,9). • Extend the idea of properties by creating a scavenger hunt (TG pg. 13) • Introduce advanced vocabulary (flexible, absorb)
Struggling Learners	• Provide students with concrete examples to understand concepts of solid/liquid, hard/soft, bend/stretch, sink/float (Examples TG pg. 18,20,22) • Group students by ability to differentiate instruction or mix abilities to provide exposure to advance thinking.
English Language Learners	• Vocabulary: matter, liquid, solid, property, (provide visual, verbal and written examples together) • Provide sentence frames to assist with articulation of concepts. (TG24)
Special Needs Learners	• Limit questions to the core content of the lessons. • Provide pre-made tables for students to add to the science notebook.

Interdisciplinary Connections

Common Core State Standards Connections:

ELA/Literacy

RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4)

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)

RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2),(2-PS1-4)

W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2-PS1- 2),(2-PS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(2-PS1-3)

Mathematics

MP.2 Reason abstractly and quantitatively. (2-PS1-2)

MP.4 Model with mathematics. (2-PS1-1),(2-PS1-2)

MP.5 Use appropriate tools strategically. (2-PS1-2) 2.

MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1),(2-PS1-2)

Integration of 21st Century Skills

Indicators:

8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

8.2.2.A.4 Choose a product to make and plan the tools and materials needed.

8.2.2.B.1 Identify how technology impacts or improves life.

8.2.2.B.3 Identify products or systems that are designed to meet human needs.

8.2.2.B.4 Identify how the ways people live and work has changed because of technology.

8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.

8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.

8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.

8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.

8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.

8.2.2.D.3 Identify the strengths and weaknesses in a product or system.

8.2.2.A.5 Collaborate to design a solution to a problem affecting the community.

9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Unit Title: Interdependent Relationships in Ecosystems (**Life Science)**

Unit Description: Students will investigate plants and animals. First students will identify what plants need to live and grow. Then they will explore how different plants can only grow in certain areas. Students will describe how plants depend on animals . Next students will recognize there are many different kinds of living things in any area, and they exist in different habitats. Throughout the unit, students will engage in activities to think like a scientist and engineer. At the conclusion of the unit the students will connect the concepts of wildlife and habitat conservation with the work of a field biologist.

Unit Duration: 4th Marking period

Desired Results

Standard(s):

2-LS2-1.	Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]
2-LS2-2.	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*
2-LS4-1.	Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

Indicators:

LS2.A: Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow. (2-LS2-1)
- Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

LS4.D: Biodiversity and Humans

- There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

ETS1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary to 2-LS2-2)

Understandings:

Students will understand that…

- Identify what plants need to live and grow.
- Observe and recognize that plants depend on water and light.
- Predict and investigate the growth of plants when the amount of light is altered.
- Explain how plants depend on animals for pollination.
- Explain why plants and humans depend on bees for pollination.
- Recognize why a decline in the bee population is a problem and identify possible solutions.
- Describe how animals help move a plant's seeds.
- Develop a model that shows how animals disperse seeds.
- Conduct an investigation using the model and revise the model as necessary.
- Recognize that living things exist everywhere.
- Identify some living things that live on land and in water.
- Describe the living and nonliving things onthe sandy coast.
- Describe how living things depend on their habitat for survival.
- Describe a wetland habitat.
- Identify living things in a wetland.

Essential Questions:

- **What do plants need to live and grow?**
- **How do animals help plants?**
- **How do living things depend on their habitat for survival?**

• Describe a grassland habitat and some living things that are found there. • Observe and interpret a map to compare the diversity of living things in different African habitats. • Connect the concepts of wildlife and habitat conservation with the work of a field biologist.	

Assessment Evidence

Performance Tasks:

Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation.

- Lesson 2 (p.46) – Observe and recognize that plants depend on water and light. Predict and investigate the growth of plants when the amount of light is altered.

Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 3 (p.48)– Plan and conduct an investigation to determine whether plants need water to grow. Use evidence from an investigation to explain what happens if plants do not get water.
- Lesson 7(p.58) – Develop a model that shows how animals disperse seeds.Conduct an investigation using the model andrevise the model as necessary.
- Lesson 12 (p.70)– Observe and interpret a map to compare the diversity of living things in different African habitats.

Think Like An Engineer Lesson: - Students will engage in performance tasks in cooperative groups to design, build and test a prototype device and analyze and improve results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 5 (p.52)- Explain why plants and humans depend on bees for pollination. Recognize why a decline in the bee population is a problem and identify possible solutions.

Benchmarks:

Plants - Unit Test Percentages (Based on 12 questions):

Secure = 75% - 100%

Developing = 50% - 74%

Beginning = Below 50%

Other Evidence:

Students will demonstrate their understandings through:

- Science Notebook Entries
- Unit Tests

Learning Plan

Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook, Website and Student Science Notebook

Learning Activities:

Lesson and Duration	Activties	Supplemental Materials
Lesson 1 (TG pages 44-45) What plants need NGSS LS2.A: Independent Relationships in Ecosystem Plants depend on water and light to grow. (2-LS2-1). Objective: Identify what plants need to live and grow. 1 Day	**Engage:** Ask students whether they have houseplants or an outdoor garden at home. Follow up with probe questions in manual. **Explore:** Preview then read pages 44-45. **Explain:** Explain That Plants Depend on Light and Water, Describe How Plants' Needs Are Met. **Elaborate:** Organize students into small groups. Assign a common flowering plant to each group. Then help students conduct research to find out more about the needs of each plant and how the plant meets its needs where it lives. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 2 (TG pages 46-47) Plants and Light NGSS LS2.A: Interdependent Relationships in Ecosystems Plants depend on water and light to grow. (2-LS2-1) Objective: Observe and recognize that plants depend on water and light. Predict and investigate the growth of plants when the amount of light is altered. 1 Day *See classroom management box in manual for advance preparation. Also this lesson includes a 7 day observation period.	**Engage:** Have students recall what they learned in the previous lesson about what plants need to grow. **Explore:** Preview then read pages 46-47. Have students make a table for recording their observations in their science notebook. **Explain:** At the end of the investigation, have students share their predictions, observations, andconclusions with other groups. Continue with probe questions in manual. **Elaborate:** Ask students to infer how plants in these extreme environments are able to thrive despite not having very much water or light. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	***For groups of 4:*** 2 radish plants; masking tape; plastic spoon; water ***For teacher use:*** approximately 10 clear plastic cups (9 oz); radish seeds; potting soil; water
Lesson 3 (TG pages 48-49b) Plan and investigate NGSS 2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [*Assessment Boundary: Assessment is limited to testing one variable at a time.*]	**Engage:** Invite a volunteer to read the opening paragraph on page 48. Then have students recall the *Investigate* activity they performed in the previous lesson. Set the scene and plan an investigation. **Explore:** Preview then read pages 48-49. Conduct an investigation. Suggest that students make a table for	*For groups of 4:* clear plastic cups (9 oz); potting soil; seeds (sunflower, corn, or pinto bean) or previously grown seedlings; masking tape for labeling; plastic spoons; water; rulers; hand lenses

Objective: Plan and conduct an investigation to determine whether plants need water to grow. Use evidence from an investigation to explain what happens if plants do not get water. 1 Day *See classroom management box in manual for advance preparation.	recording their observations in their science notebook. **Explain:** Review your results. **Elaborate:** Share your results. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook. Complete teacher and student rubrics.	
Lesson 4 (TG pages 50-51) Animals Pollinate Flowers NGSS LS2.A Interdependent Relationships in Ecosystems Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) Objective: Explain how plants depend on animals for pollination. **1 Day**	**Engage:** Discuss with students how people depend on specific things every day in order to live. **Explore:** Preview then read pages 50-51. **Explain:** Differentiate Between *Pollen* and *Pollinates,* Explain Why Plants Depend on Animals for Pollination, Describe How Animals Pollinate Plants. **Elaborate:** Find Out More About Pollinators. In small groups have students conduct research on animals that pollinate. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 5 (TG pages 52-55) Save the bees! NGSS LS2.A: Interdependent Relationships in Ecosystems Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) Objective: Explain why plants and humans depend on bees for pollination. Recognize why a decline in the bee population is a problem and identify possible solutions. **1 Day**	**Engage:** Remind students that they learned about pollination in the previous lesson. Continue discussion with probe questions in manual. **Explore:** Preview then read pages 52-53 **Explain:** Identify the Problem, Identify the Solution. **Elaborate:** Research the Dependence of Plants on Pollination. Organize students into small groups and help them use the Internet to conduct research on plants and which ones are the most and least dependent on bee pollination. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 6 (TG pages 56-57) Animals spread seeds NGSS LS2.A Interdependent Relationships in Ecosystems Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) Objective: Describe how animals help move a plant's seeds. 1 Day	**Engage:** Ask students to recall a time when they have taken a walk or hike in the woods. **Explore:** Preview then read pages 56-57. **Explain:** Review Why Plants Need Animals, Describe How Animals Move Seeds. **Elaborate:** Compare the Ways Animals Help Plants. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 7 (TG pages 58-61) Develop a model	**Engage:** Set the scene. Direct students to the photo of the burrs from	*For groups of 4:* hook tape; feather; fake fur (9" × 9"); leather

NGSS 2-LS2-2. Develop a simple model of the function of an animal in dispersing seeds or pollinating plants. 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. 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, secondary to 2-LS2-2) Objective: Develop a model that shows how animals disperse seeds. Conduct an investigation using the model and revise the model as necessary. 1 Day *See classroom management box in manual for advance preparation.	the burdock plant on page 58. Ask probe questions in manual. In their science notebook, have students draw how they think burdock seeds could travel far from their parent plants. Explain that they will compare their ideas with the physical model that they make during the investigation. **Explore: C**onduct an investigation. Have students make a table for recording their observations in their science notebook. They can use the example below or come up with their own. Preview then read pages 60-61. **Explain:** Explain your model. At the end of the investigation, have students review the observations they made in their science notebook during the investigation. **Elaborate:** Organize students into small groups. Have them choose a kind of seed to investigate and draw the seed in their science notebook. Then help them use the Internet to find out how animals might help spread or move the seeds. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook. **Complete teacher and student rubric.**	
Lesson 8 (TG pages 62-63) Living things are everywhere NGSS LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) Objective: Recognize that living things exist everywhere. Identify some living things that live on land and in water. 1 Day	**Engage:** Have students list places where living things are found in and around their neighborhoods or communities. **Explore:** Preview then read pages 62-63. **Explain:** Describe Where Animals Live, Differentiate Between Water and Land Animals. **Elaborate:** Research Where Animals Live. Organize students into small groups. Assign a land or water plant or animal to each group. You may choose to use the plants and animals from the text or any others that are not shown. Then help groups conduct research on the assigned plant or animal. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 9 (TG pages 64-65) Living things on the coast	**Engage:** Have students list and describe plants and animals that they have observed in their home,yard, or neighborhood.	Various magazines, books , newspapers and internet access for elaboration activity.

NGSS LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) Objective: Describe the living and nonliving things on the sandy coast. Describe how living things depend on their habitat for survival. 1 Day	**Explore:** Preview then read pages 64-65 **Explain:** Describe Coasts, Describe the Living Things on the Sandy Coast, Describe the Way Living Things Survive in Their Environment, Explain How an Ecosystem Supports Living Things. **Elaborate:** Help students use magazines, books, newspapers, the Internet, and other sources to find examples of different coastal habitats. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 10 (TG pages 66-67) Living things in a wetland NGSS LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) Objective: Describe a wetland habitat.Identify living things in a wetland. 1 Day	**Engage: R**emind students that they have learned about the sandy coast habitat. Explain to students that in this lesson, they will be learning about a habitat called a wetland. **Explore:** Preview then read pages 66-67. **Explain:** Observe the Characteristics of a Wetland, Describe How a Wetland Habitat Supports Living Things. **Elaborate:** Help students conduct research to find out more about a wetland that is located in the community or a nearby area. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 11 (TG pages 68-69) Living things in a grassland NGSS LS4.D: Biodiversity and Humans There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) Objective: Describe a grassland habitat and some living things that are found there. 1 Day	**Engage:** Have students recall what they know or have heard about Australia. **Explore:** Preview then read pages 68-69. **Explain:** Define Grassland, Explain How Living Things in a Grassland Meet Their Needs. **Elaborate:** Research Grassland Ecosystems in the United States. Help students conduct research on prairies in the United States. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 12 (TG pages 70-71) Think like a scientist- Make observations NGSS 2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different	**Engage:** Remind students that most of the habitats shown on the map are habitats they have learned about, including grasslands and coasts. **Explore:** Preview then read pages70-71. **Explain:** Analyze the Map. Follow with probe questions from the manual. **Elaborate:** Organize students into small groups and assign each	

habitats.] [*Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.*] Objective: Observe and interpret a map to compare the diversity of living things in different African habitats. 1 Day	group one of the following areas from the map: Sahara Desert, Congo Basin, Kalahari Desert, Lake Victoria, or the island of Madagascar. Help students conduct research about their assigned area to find out more about its climate and wildlife. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	
Lesson 13 (TG pages 72-73) Science Career- Field Biologist NGSS Scientific Knowledge Is Based on Empirical Evidence Scientists look for patterns and order when making observations about the world. Objective: Connect the concepts of wildlife and habitat conservation with the work of a field biologist. 1 Day	**Engage:** Invite students to share what they know about photography. **Explore:** Preview then read pages 72-73. **Explain:** Describe the Work of a Field Biologist, and Connect Photography With Wildlife Conservation. **Elaborate:** Organize students in pairs and help them conduct research to find out more about field biology. **Evaluate:** Have students record their answers to the Wrap It Up questions in their science notebook.	

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): 2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]
2.0	Students will be able to: • Explain what plants need to live and grow.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): 2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
2.0	Students will be able to: • Describe how plants depend on animals for pollination.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s): 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]
2.0	Students will be able to: • Define habitat • Identify different habitats and what living things you can find there.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Unit Modifications for Special Population Students	
Advanced Learners	• Allow students to complete Investigations, Think Like a Scientist, Think Like an Engineer independently. • Challenge students to research concepts on their own from the Elaborate Section of each lesson.. • Introduce advanced vocabulary (pollinates)
Struggling Learners	• Provide concrete examples of what living things need. • Revisit pages with key concepts and have students point out and retell what they have learned (provide further information where gaps exist) • Ask questions where student can look for pictures in the book to provide an answer. • Focus on one habitat picture in the student text book for students to discuss (Example TG pg. 70)
English Language Learners	• Vocabulary: depend, pollen, coast, wetland, grassland (provide visual, verbal and written examples together) (make flashcards for difficult ones) • Ask yes or no questions to help describe understanding. • Provide picture cards of different habitats for students to refer to.
Special Needs Learners	• Provide concrete examples when introducing new vocabulary and concepts. • Vocabulary-Add unknown words to the student notebook to refer back to in the unit. • Provide drawings for students to add to the Science Notebook to name and/or label.

Interdisciplinary Connections

Common Core State Standards Connections:

ELA/Literacy

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1),(2-LS4-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1),(2-LS4-1)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

Mathematics

MP.2 Reason abstractly and quantitatively. (2-LS2-1),(2-LS4-1)

MP.4 Model with mathematics. (2-LS2-1),(2-LS2-2),(2-LS4-1)

MP.5 Use appropriate tools strategically. (2-LS2-1) 2.

MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems. (2-LS2-2),(2-LS4-1)

Integration of 21st Century Skills

Indicators:

8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.2.2.A.4 Choose a product to make and plan the tools and materials needed.
8.2.2.B.1 Identify how technology impacts or improves life.
8.2.2.B.3 Identify products or systems that are designed to meet human needs.
8.2.2.B.4 Identify how the ways people live and work has changed because of technology.
8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.
8.2.2.A.5 Collaborate to design a solution to a problem affecting the community.
9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals
9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

Unit Title: Earth Systems: Processes that Shape the Earth (Earth

Unit Description: Students will explore process that shape the Earth. First students will learn about events that happen quickly like earthquakes and volcanic eruptions. Then students will learn how earthquakes volcanic eruptions, weathering, erosion, flooding, wind, and water can all change the shape of the land quickly or slowly. Next students will learn about rivers, oceans, lakes and ponds. They will learn how these are formed. Then students will study how water can be found as a solid in formations like glaciers and icebergs. The unit will conclude with students studying the career of a glaciologist.

Unit Duration: Making Periods 2/3

Desired Results

Standard(s):

2.ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happened quickly and erosion of rocks, which occurs slowly.) (Assessment Boundary: Assessment does not include quantitative measurements of timescales.)

2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing that shape of the land.*(Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.

2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. (Assessment Boundary: Assessment does not include quantitative scaling in models.)

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

Indicators:

ESS1.C: The History of Planet Earth

- Some events happen very quickly; others occur very slowly, over a time period much longer than one can. (2-ESS1-1)

ESS2.A: Earth Materials and Systems

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

ESS2.B: Plate Tectonics and Large-Scale System Interactions

- Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)

ESS2.C: The Roles of Water in Earth's Surface Processes

- Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3)

ETS1.C: Optimizing the Design Solution

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

Understandings: *Students will understand…*	**Essential Questions:**
• what happens during an earthquake	• What natural weather occurrences can change the shape of land?

• how volcanic eruptions can cause rapid change to Earth's surface. • how wind and water can change the shape of the land. • that some events happen very quickly, and others occur very slowly. • how wind can change the shape of the land. • how water can change the shape of the land. • how wind and water can move sand and change the shape of the land. • how water can change the shape of the land quickly. • how to devise a way to slow or prevent erosion of soil. • how to observe pictures of Earth events to determine whether an event happened quickly or slowly. • how to cite evidence drawn from the pictures to support interpretation. • how to identify a problem caused by an Earth event that happens quickly. • how to identify the solution to the problem caused by water changing the shape of the land. • how to compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. • how to interpret the symbols on a map to identify the shapes and kinds of land and water shown. • how rivers form and connect to the ocean. • how water is found in lakes and ponds. • how lakes and ponds form. • how to develop a model to represent the shapes and kinds of land and bodies of water in an area. • how models help understand how a land is shaped. • how to describe Earth's water that exists as solid ice. • how to obtain information from a map to identify where solid and liquid water can be found on Earth. • how to connect the concept of looking for patterns and order when making observations about the world with the career of a glaciologist.	• What events change the shape of the land quickly? • What events change the land slowly?

Assessment Evidence

Performance Tasks:

Investigate Lessons – Students will practice performance tasks in cooperative groups engaging in scientific steps of an investigation.

- Lesson 7 (Pg. 88) – Observe how water can change the shape of the land quickly.

Think Like A Scientist: Plan and Investigate Lessons – Students will engage in performance tasks in cooperative groups to plan and conduct an investigation, provide evidence and use that evidence to explain results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 8 (Pg.90) – Observe photographs of events that change the shape of the land, identify the cause of each change, and use evidence from photos to support whether change occurred quickly or slowly.
- Lesson 14 (Pg. 106)- Develop a model to represent the shapes and kinds of land and bodies of water in area.
- Lesson 16 (Pg. 110)- Obtain information about where solid and liquid water can be found on Earth.

Think Like An Engineer Lessons: - Students will engage in performance tasks in cooperative groups to design, build and test a prototype device and analyze and improve results. This task will be recorded in their science notebook and evaluated by a Teacher Rubric and Student Rubric.

- Lesson 9 (Pg. 92)-Identify a problem caused by flooding. Find a solution to the problem.
- Lesson 10(Pg. 96)- Compare solutions designed to slow or prevent wind or water from changing the shape of the land.

Other Evidence:

Students will demonstrate their understandings through:

- Science Notebook Entries
- Science in a Snap (Additional Investigations) in Lesson 3 (Pg, 80)
- Unit Tests

Benchmarks:

Unit Test Percentages (Based on 18 questions):

Secure = 78% - 100%

Developing = 61% - 77%

Beginning = Below 60%

Learning Plan		
Resources: National Geographic Learning: Exploring Science Teacher's Guide, Student Book, Interactive eBook, Website and Student Science Notebook **Learning Activities:**		
Lesson and Duration	**Activties**	**Supplemental Materials**
Lesson 1- (TG pages 76-77) Earthquakes NGSS ESS1.C Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) Objective: Describe what happens during an earthquake. 1 Day	**Engage:** Ask students to share what they know about earthquakes. **Explore:** Students observe the picture of the church in Haiti on page 76-77 and describe what they see. Ask probing question to encourage exploration. Set a purpose to read to be able to describe what happens during an earthquake. Read pages 76-77. **Explain:** Define earthquake. Ask students to describe what happens during an earthquake and what kind of damage it could cause. **Elaborate:** Show different pictures of earthquakes on-line or from library books. Observe and journal about damage caused. **Evaluate:** "Wrap it Up" Recall and Observe understandings in Science Notebook.	**Website about different pictures of earthquakes or google images of earthquakes.** **Books from library with pictures of earthquake damage.**
Lesson 2 (TG pages 78-79) Volcanos NGSS ESS1.C Some events happen very quickly; others occurs slowly, over a time period much longer than one can observe. (2-ESS1-1) Objective: Explain how volcanic eruptions can cause rapid change to Earth's surface. 1 Day	**Engage:** Have students draw a picture of what comes to mind when they hear the word volcano. Share. **Explore:** Students observe the pictures on pages 78-79 and ask probing questions to encourage exploration. Set a purpose to read in order to explain how volcanic eruptions can cause rapid change in Earth's surface. Read pages 78-79. **Explain:** Define the words erupt and volcano. Students describe how volcanic eruptions can cause changes in Earth's surface. **Elaborate:** Students find out more about volcano's by looking up pictures on National Geographic kids' website. Journal. **Evaluate:** "Wrap it Up" Explain and Predict understandings in Science Notebook.	**Website with different pictures of volcanos erupting.** **Or goggle different images of volcanos.**
Lesson 3 (TG pages 80-81) Weathering and Erosion NGSS ESS1.C Some even happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A: Wind and water can change the shape of land. (2-ESS2-1)	**Engage:** Ask students to think about a windy day they experienced. **Explore:** Write the word arch on the board and draw. Ask probing questions. Set a purpose to read in order to explain how water and wind change the shape of the land. Read pages 80-81. **Explain:** Ask questions to determine how weathering and erosion are alike and different. Investigate by doing	***Website or pictures to show how weathering and erosion can change the shape of the land.** **Science in a Snap Materials:(groups of 4)** **-**sandstone -plastic jar with screw on lid

Objectives: - Explain how wind and water can change the shape of the land. -Recognize that some events happen very quickly, and other occur very slowly 1 Day	Science in a Snap activity. Discuss caption on pg. 81 and determine whether the event happened slowly or quickly. **Elaborate:** Students find out more about weathering and erosion by exploring things on the internet that can change the shape of the land (ex. Ice forms a crack in a rock, tree roots break a rock apart.) Model with clay. **Evaluate:** "Wrap it Up" Recall and Explain understandings in science notebook.	-water -hand lens
Lesson 4 (TG pages 82-83) Wind Changes the Land NGSS ESS1.C Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A: Wind and water can change the shape of the land. Objectives: -Explain how wind can change the shape of the land. -recognize that some events happen very quickly, and other occur very slowly. 1 Day	**Engage:** Have students share their experiences with wind blowing in their faces. Ask probing questions to encourage students responses. **Explore:** Have students observe the large picture on pages 82-83. Ask probing questions and review the definition of weathering. Set a purpose to read in order to explain how wind can change the shape of the land. Read pages 82-83. **Explain:** Have students look at the small picture on page 83. Ask probing questions to help explain how wind can change the shape of the land and how quickly or slowly it can occur. **Elaborate:** Help students find out more about how the wind changes the land by searching for unique rock formations online. Make a clay model. **Evaluate:** "Wrap it Up", Explain and Predict understandings in science notebook.	Website pictures of rock formations. (or google images)
Lesson 5 (TG pages 84-85) Water Changes Land NGSS ESS1.C Some events happen very quickly; others occur very slowly over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A: Wind and water can change and shape the land. (2-ESS2-1) Objectives: -Explain how water can change the shape of the land. -Recognize that some events happen very quickly, and other occur very slowly. 1 Day	**Engage:** Have students share their experiences with moving water in a river. **Explore:** Students observe the picture of the river first on pages 84-85. Ask probing questions to encourage exploration. Set a purpose to read in order to explain how water can change the shape of the land. Read pages 84-85. **Explain:** Define Gorge and Gully. Ask probing questions to explain how water can change the shape of the land and recognize how slowly it takes. **Elaborate:** Students examine more pictures of soil erosion. Extend student thinking about the erosion by drawing two examples to compare and contrast in science notebook. **Evaluate:** "Wrap it Up" Compare and Contrast and Infer understandings in science notebook.	Website pictures of soil erosion

Lesson 6 (TG pages 86-87) Wind and Water Move Sand NGSS ESS1.C Some events happened very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A: Wind and Water can change the shape of the land. (2-ESS2-1) Objectives: -Explain how wind and water can move sand and change the shape of the land. -Recognize that some events happen very quickly, and others occur very slowly. 1 Day	**Engage:** Have students share their experiences with sand and sand dunes. **Explore:** Students observe the picture of the sand dune on pg. 86-87. Ask probing questions, Set a purpose to read in order to explain how wind and water move sand and change the shape of the land. Read pages 86-87. **Explain:** Ask probing questions to help understand how wind and water can change the shape of the land. Help students recognize that wind and water can move sand quickly. **Elaborate:** Students find out more about how wind and water can change the shape of the land by making mini sand dunes. Blow on dunes with a straw. Record observations. **Evaluate:** "Wrap it Up" Summarize and Apply understandings in science notebook.	Groups of Four: • 8x12x2 plastic container. • Dry play sand • Plastic straws • Safety goggles
Lesson 7 (TG pages 88-89) Investigate – Erosion NGSS ESS1-C Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A-Wind and water can change the shape of the land. (2-ESS2-1) Objective: - Observe how water can change the shape of the land quickly. -Devise a way to slow or prevent erosion of soil. 1 Day	**Engage:** Have students look at the pictures of the gully on page 85 and the eroded beach on pg. 86. Review the effects of water on soil and sand. **Explore:** Guide students through the investigation steps on pages 90-91. **Explain:** Students share their observations and predictions. Ask what evidence shows ways to prevent erosion. **Elaborate:** Students repeat the investigation by using hills with greater or lesser slopes. **Evaluate:** "Wrap it Up" Describe and Compare and Contrast understandings in science notebook.	For Groups of 4: • 2 plastic trays (8x12x2) • Potting Soil (2 cups) • Water (200ml) • Measuring cup (8oz) • Gravel (¾ cup) • 5-6 small rocks • 3-4 chenille stems • 2-3 craft sticks For Teacher Use: • Spray Bottle with Water (16 oz)
Lesson 8 (TG pages 90-91b) Think Like a Scientist-Make Observations NGSS 2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (2-ESS1-1) Objectives: -Observe pictures of Earth events to determine whether an event happened quickly or slowly. -Cite evidence drawn from pictures to support their interpretation. 1 Day	**Engage:** Have students name events and processes that change the shape of the l Students observe the photographs on pages 88-89 and identify the objects or events shown. Define the task-Students will work together to find evidence in each picture to show whether the change in each picture happened quickly or slowly. **Explore:** Students analyze what they see and record their observations in their science notebooks. **Explain:** Students interpret and share data using evidence to support their statements and share how they thought like a scientist.	*Google pictures of erosion in New Jersey.

	Elaborate: Show students pictures of erosion from New Jersey. Repeat the activity. **Evaluate:** "Wrap it Up" Identify and cite evidence in science notebook.	
Lesson 9 (TG pages 92-95) Think Like and Engineer-Case Study-Protecting New Orleans NGSS ESS1.C Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) NGSS ESS2.A Wind and water can change the shape of the land. (2-ESS2-1) Objectives: -Identify a problem caused by an Earth event that happens quickly. -Identify the solution to a problem caused by water changing the shape of the land. 1 Day You may want to break this into two days. Day 1-Pg. 92-93 Day 2-Pg. 94-95	**Engage:** Have students share any experiences they have had with flooding or their memory of seeing pictures of a flooded area. **Explore:** Observe and discuss the pictures on pages 92-93 and 94-95. Ask probing questions. Set a purpose to read in order to identify the problem that New Orleans has and the solution. Read pages 92-95. **Explain:** Using a model show and explain the problem of building a city below sea level. Ask probing questions to identity a solution. Define levee. **Elaborate:** Students find out more about levees by researching for pictures of natural and human made levees. Draw a picture to describe. **Evaluate:** "Wrap it Up" Explain and Summarize understandings in science notebook.	• Plastic Tray with edges • Deep, round, clear dish • Long, narrow deep container • Small boxes Google images of natural and human made levees.
Lesson 10 TG (Pages 96-99) Think Like an Engineer Compare Solutions NGSS 2-ESS1.1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. NGSS K-2-ETS1-3 Analyze data from test of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. NGSS ETS1-C Because there is always more than one possible solution to a problem, it is useful to compare and test designs. Objective: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. 1 Day	**Engage:** Have students review pages 82-87 to recall how wind and water can change the shape of the land. **Explore:** Have students observe the picture of the rain garden on pg. 96-97. Have students observe pictures on pages 98-99 and describe what they see. Set a purpose to read in order to compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. Read pages 96-99. **Explain:** Define runoff. Examine solutions for reducing runoff and erosion. Have student compare solutions. **Elaborate:** Students find out more about deep rooted plants that will help in a rain garden. Search for an area around the school that would be a good place to create a raingarden to help with runoff. Journal what it would look like. Visit a rain garden if possible. **Evaluate:** "Wrap it Up" Explain, differentiate, compare and contrast understandings in science notebook.	**Google images of plants native to a rain garden.**
Lesson 11 TG (Pages 100-101) Understanding maps NGSS ESS2.B Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)	**Engage:** Have students share their experiences with using a map. **Explore:** Observe the map of South America on page 100. Ask probing questions. Set a purpose to read in order to find out what shapes and	• Paper • crayon

Objective: Interpret the symbols on a map to identify the shapes and kids of land and water shown. 1 Day	kinds of land and water this map shows. Read pages 100-101. **Explain:** Guide students to interpret the symbols on a map (map key, map scale and compass rose.) **Elaborate:** Students find out more about map symbols by creating their own physical map of an imaginary place. Students will label all text features on the map. **Evaluate:** "Wrap it Up" Draw Conclusions and Interpret understandings in science notebook.	
Lesson 12 TG (Pages 102-103) Rivers and Oceans NGSS 2-ESS2-C Water is found in the ocean, rivers, lake and ponds. Water exists as solid ice and in liquid form. Objective: Explain how rivers form and connect to the ocean. <u>1 Day</u>	**Engage:** Students share their observations about rivers and oceans. **Explore:** Read the lesson title, *Rivers and Oceans*, have students compare and contrast the two. Look at the picture of he Amazon River on pages 102-103 and ask probing questions. Set a purpose to read in order to find out about how rivers form and connect to the ocean. **Explain:** Ask probing questions to help students understand how rivers form and connect to the ocean. **Elaborate:** Find out more about streams, rivers and oceans by searching the NGK website. Guide students findings and help them create a Venn Diagram comparing the bodies of water. Students can extend their thinking by choosing a specific river to research. **Evaluate:** Students Compare and Contrast and Explain understandings in science notebook.	-National Geo. Kids Website -Venn Diagram
Lesson 13 TG (Pages 104-105) Lakes and Ponds NGSS ESS2.C-Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3) Objectives: -Explain that water is found in lakes and ponds. -Describe how lakes and ponds form. 1 Day	**Engage:** Students share experiences they have with lakes and ponds. **Explore:** Have students observe pictures on pages. 104-105 and ask probing questions. Set a purpose to read in order to find out about lakes and ponds. Read page 104-105. **Explain:** Describe how lakes and ponds form. Compare and Contrast similarities and differences. **Elaborate:** Students research more about lakes and ponds by learning about salt lakes using the internet of library books. Students create a travel poster using faces about a lake they have researched to entice tourists to visit. **Evaluate:** Students Explain and Analyze understandings in science notebook.	**Websites/Library Books about Salt Lakes.**

Lesson 14 TG (Pages 106-107b) Think Like a Scientist-Make a Model NGSS 2-ESS2-2 Develop a model to represent the shapes and kids of land and bodies of water in an area. Objectives: -Develop a model to represent the shapes and kinds of land and bodies of water in an area. -Explain how their model helps them understand how land is shaped. 1 Day	**Engage:** Set the scene by having students look at the pictures on page. 106-107. Tell students they will design a model of the land and water they see. Guide students by asking probing questions. **Explore:** Using the materials provided students will take their drawing and construct a model. **Explain:** Students will share their model they created with the class. They will cite evidence from the pictures to support their model. **Elaborate:** Students will find out more about models by comparing an object with a model of that object. Students will create a Venn Diagram to compare and contrast. **Evaluate:** Students Analyze and Compare their understandings in their science notebooks. Teacher will use a rubric to guide assessment of work.	**For Groups of Four** (Provide a variety of materials to construct a model of land and water.) -modeling clay -sheets of strudy cardboard -sand -glue -light blue tissue paper -white tissue paper -shredded green construction paper -markers -crayons -scissors
Lesson 15 (TG Pages 108-109) Ice on Earth NGSS ESS2.C-Water is found in the ocean, rivers, lake and ponds. Water exists as solid ice and in liquid form. Objective- Describe Earth's water that exists as solid ice. 1 Day	**Engage**- Have students share their experience with ice. **Explore-** Preview the lesson on pages 108-109. Set a purpose to read in order to find out about Earth's water that exists as solid ice. Read pages 108-109. **Explain-** Students will describe ice on Earth. Ask probing questions to guide their thinking and understanding. **Elaborate-** Students will find out more about glacier/icebergs and living things on them by researching on the internet. Record observations and share with classmates. **Evaluate-** Students Interpret and Recall understandings in their science notebooks.	**Websites about glaciers:** **Websites about Icebergs:**
Lesson 16- (TG Pages 110-111) Think Like a Scientist- Obtain Information NGSS 2-ESS2-3- Obtain information to identify where water is found on Earth and that it can be solid or liquid. Objective- Obtain information from a map to identify where solid and liquid water can be found on Earth. 1 Day	**Engage-** Have students look back on the map of South American on pages 100-101. Review text features of a map. **Explore-** Have students look at the world map on pages 110-111. Set a purpose to read in order to obtain information about where solid and liquid water can be found on Earth. Read pages 110-111. **Explain-** Obtain information from the map. Guide students thinking and understanding by asking probing questions. Help students use the map key and compass rose. **Elaborate-** Compare and Contrast the similarities and differences between a	**-**An orange

	map and globe. Use an orange to help model. **Evaluate-** Students Identify and Interpret understandings in their science notebooks.	
Lesson 17 (TG Pages 112-113) Science Career-Glaciologist NGSS-Connection to the Nature of Science-Scientists look for patterns and order when making observations about the world. Objective- Connect the concept of looking for patterns and order when making observations about the world with the career of a glaciologist. 1 Day	**Engage-** Have students recall what they learned about the glaciers in a previous lesson. **Explore-** Preview the lesson by looking at the pictures on pg. 112-113. Introduce the word glaciologist. Set a purpose to read in order to connect the concept of looking for patterns and order when making observations about the world with the career of a glaciologist. Read pgs. 112-113. **Explain-** Ask probing questions to help guide understanding of a glaciologist. Connect science concepts like patterns to the career of a glaciologist. Introduce Erin Pettit. **Elaborate-** Have students us the internet of library books to find out more about what glaciologist do. **Evaluate**- Students will Recall and Analyze understandings in their science notebooks.	**-Library books or websites about Glaciologists.**

Unit Learning Goal and Scale *(Level 2.0 reflects a minimal level of proficiency)*	
Standard(s): 2.ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happened quickly and erosion of rocks, which occurs slowly.) (Assessment Boundary: Assessment does not include quantitative measurements of timescales.)	
4.0	Students will be able to: In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson.
3.0	Students will be able to: • Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happened quickly and erosion of rocks, which occurs slowly.) (Assessment Boundary: Assessment does not include quantitative measurements of timescales.
2.0	Students will be able to: • Define earthquake and volcano • Name one event that changes the shape of the earth quickly. • Name one event that changes the shape of the earth slowly.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard(s):2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing that shape of the land.*(Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.	
4.0	Students will be able to: • In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson
3.0	Students will be able to: • 2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing that shape of the land.*(Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.
2.0	Students will be able to: • Define lake and pond • Name one way that you can prevent either wind or water from changing the shape of the land.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standards: 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. (Assessment Boundary: Assessment does not include quantitative scaling in models.)	
4.0	Students will be able to: • In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson
3.0	Students will be able to: • 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. (Assessment Boundary: Assessment does not include quantitative scaling in models.)
2.0	Students will be able to: • Identify the shapes of land and bodies of water on a premade model.
1.0	With help, partial success at level 2.0 content and level 3.0 content:
0.0	Even with help, no success

Standard:2-ESS2-3. Obtain information to identify where water is found on Earth and that it can by solid or liquid	
4.0	**Students will be able to:** • In addition to planning and conducting investigations at 3.0, students can • Explore, research and connect on the unit topics through the elaboration activities in each lesson
3.0	**Students will be able to:** • 2-ESS2-3. Obtain information to identify where water is found on Earth and that it can by solid or liquid
2.0	**Students will be able to:** • Define Iceberg and Glacier • Understand that water has two states, solid and liquid.
1.0	**With help, partial success at level 2.0 content and level 3.0 content:**
0.0	**Even with help, no success**

Unit Modifications for Special Population Students	
Advanced Learners	• Allow students to complete Investigations, Think Like a Scientist, Think Like an Engineer independently. • Use “Elaborate” sections of the lessons to extend student thinking. • Introduce advanced vocabulary (weathering, erosion, sediment, runoff, levee, gorge, gully)
Struggling Learners	• Refer to Learning Assessment Masters for pre-made charts to use in science notebook. (Investigations, Think Like a Scientist, Think Like an Engineer) • Pair with higher ability students when completing Investigations, Think Like a Scientist and Think Like an Engineer Lessons. • Assign different roles for group members in the investigations so all members contribute to the group.
English Language Learners	• Vocabulary volcano, earthquake, lake, pond, iceberg, glacier, erupt (provide visual, verbal and written examples together) (pair related words to these vocabulary words. Help students understand the correct structure of questions and statements (jumble words and have students place in correct structure order depending on whether it is a question or statement).
Special Needs Learners	• Refer to Learning Assessment Masters for pre-made charts to use in science notebook. (Investigations, Think Like a Scientist, Think Like an Engineer) • Conduct Investigations, Think Like a Scientist, and Think Like an Engineer by dividing into parts or modeling side by side to monitor student understanding. • Modify the steps in the investigations or questions asked in the "Wrap it Up" section at the end of every lesson.

Interdisciplinary Connections

Common Core State Standards Connections:
ELA/Literacy –
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1),(2-ESS2-1)
RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)
W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1),(2-ESS2-3)
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1),(2-ESS2-3)
SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2) **Mathematics –**
MP.2 Reason abstractly and quantitatively. (2-ESS2-1),(2-ESS2-1),(2-ESS2-2)
MP.4 Model with mathematics. (2-ESS1-1),(2-ESS2-1),(2-ESS2-2)
MP.5 Use appropriate tools strategically. (2-ESS2-1) 2.NBT.A Understand place value. (2-ESS1-1) 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

Integration of 21st Century Skills

Indicators:

8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.2.2.A.4 Choose a product to make and plan the tools and materials needed.
8.2.2.B.1 Identify how technology impacts or improves life.
8.2.2.B.3 Identify products or systems that are designed to meet human needs.
8.2.2.B.4 Identify how the ways people live and work has changed because of technology.
8.2.2.C.1 Brainstorm ideas on how to solve a problem or build a product.
8.2.2.C.2 Create a drawing of a product or device that communicates its function to peers and discuss.
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.1.2.D.1 Develop an understanding of ownership of print and nonprint information.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.
8.2.2.A.5 Collaborate to design a solution to a problem affecting the community.
9.2.4.A.1 Identify different types of work and how work can help people achieve personal and professional goals
9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.