Science - Grade 2

Unit Title: **Grade 2 - Unit 1: Relationships in Habitats**

Why do we see different living things in different habitats?

In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 2-LS4-1, 2-LS2-1, 2-LS2-2, and K-2-ETS1-1.

Stage 1: Desired Results

Standards & Indicators:

- **NJSLS – Science**
  - **Science and Engineering Practices (SEP)**
    - Planning and Carrying Out Investigations
      - Plan and conduct investigations collaboratively to produce evidence to answer a question. (1PS4-1),(2-LS2-1)
    - Planning and Carrying Out Investigations
      - Make observations (firsthand or from media) to collect data that can be used to make comparisons. (2-LS4-1)
    - Developing and Using Models
      - Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)
    - Asking Questions and Defining Problems
      - Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
      - Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)
  - **Disciplinary Core Ideas (DCI)**
    - 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)
    - LS2.A: Interdependent Relationships in Ecosystems
      - Plants depend on water and light to grow. (2LS2-1)
      - Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)
    - ETS1.B: Developing Possible Solutions
      - Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.(secondary to 2-LS2-2)
    - ETS1.A: Defining and Delimiting Engineering Problems
      - A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
      - Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
      - Before beginning to design a solution, it is important to clearly understand the problem. (K2-ETS1-1)
  - **Crosscutting Concepts (CCC)**
    - Cause and Effect
      - Events have causes that generate observable patterns. (2-LS2-1)
    - Structure and Function
      - The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2), (K-2-ETS1-2)

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- Connections to Nature of Science
  - Scientific Knowledge is Based on Empirical Evidence
    - Scientists look for patterns and order when making observations about the world. (2-LS4-1)

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.2.CI.1	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).	Brainstorming can create new, innovative ideas
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	

Central Idea / Enduring Understanding:

In this unit of study, students develop an understanding of what plants need to grow and how plants depend on animals for seed dispersal and pollination. Students also compare the diversity of life in different habitats. The crosscutting concepts of *cause and effect* and *structure and function* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade appropriate proficiency in *planning and carrying out investigations* and *developing and using models*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential/Guiding Question:

- Why do we see different living things in different habitats?
- How does the diversity of plants and animals compare among different habitats?
- What do plants need to live and grow?
- Why do some plants rely on animals for reproduction?

Content:

- People look for patterns and order when making observations about the world.
- There are many different kinds of living things in any area, and they exist in different places on land and in water.
- Events have causes that generate observable patterns.
- Plants depend on water and light to grow.
- The shape and stability of structures of natural and designed objects are related to their function.
- Plants depend on animals for pollination or to move their seeds around.
- 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.

Skills (Student Learning Objectives):

- 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-LS4-1)
- 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-LS2-1)
- Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.* (2-LS2-2)
- Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)

Interdisciplinary Connection(s):

- **NJSLS – Math**
  - MP.2: Reason abstractly and quantitatively.
  - MP.4: Model with mathematics.
  - MP.5: Use appropriate tools strategically.

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- 2.DL.4: 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.

- **NJSLS – English Language Arts**
  - W.WR.2.5: Generate questions about a topic and locate related information from a reference source to obtain information on that topic through shared and independent research.
  - SL.UM.2.5: Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
  - W.SE.2.6: Prioritize information provided by different sources on the same topic while gathering ideas and planning to write about a topic.
  - RI.CR.2.1: Ask and answer such questions as *who, what, where, when, why,* and *how* in an informational text to demonstrate understanding of key details in a text.

Stage 2: Assessment Evidence

Performance Task(s):

- "Inquiry labs"
- STEM activities
- Formative assessment: "Lesson Check" blackline masters
- "Got It?" self-assessments in each lesson
- Complete graphic organizers
- Performance Expectations
- Inquiry Apply It!
- Unit Assessments

Other Evidence:

- Post-activity discussion questions
- Review Vocabulary Smart Cards
- Students elaborate in "Science Notebooks"
- Students make connections to the "Unlock the Big ?" in each lesson.
- Have students restate or contrast topics in each lesson

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Pearson Chapter 2 - Lesson 1: What are the parts of the plant?

- Inquiry:
  - Students will observe and describe how space affects plant growth - Try It!
  - STEM Activity - Trap It and Learn
- Engage:
  - Envision It! - Have children circle the plant part that brings water from the soil to the stem.
- Explore:
  - My Planet Diary - Did You Know?
- Explain:
  - Have children read Plant Needs, Plant Parts, and Seed Plants and answer the questions
- Elaborate:
  - Have children make drawings of three seeds and of the plant each seed produces
- Evaluate:
  - Formative Assessment

Resources:

Pearson Chapter 2 - Lesson 1

- Inquiry:
  - Try It, What do plants need to be healthy? SE p. 64, TE, p.64
  - SE pp. 66-75, TE pp. 66-75
- Engage:
  - Envision It! Activity SE pp. 76-77, TE pp. 76-77
- Explore:
  - SE p. 76, TE p. 81a
- Explain:
  - SE pp. 77-81, TE pp. 77-81
- Elaborate:
  - Student Science Notebook
  - TE p. 81
- Evaluate:
  - Lesson Check Blackline Master TE p. 81b

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Pearson Chapter 2 - Lesson 2: What are some kinds of animals? ● Engage: ○ Envision It! - Have children discuss how they would group animals. ● Explore: ○ My Planet Diary - Did You Know? ● Explain: ○ Have children read Animal Groups, Animals with Backbones, and Animals Without Backbones and answer the questions. ● Elaborate: ○ Explain to children some differences between frogs and toads. Have children discuss how these differences affect how these two types of amphibians live. ● Evaluate: ○ Formative Assessment	**Pearson Chapter 2 - Lesson 2** ● Engage: ○ Envision It! Activity SE pp. 82-83, TE pp. 82-83 ● Explore: ○ SE p. 82, TE p. 87a ● Explain: ○ SE pp. 83-87, TE pp. 83-87 ● Elaborate: ○ Student Science Notebook ○ TE p. 84 ● Evaluate: ○ Lesson Check Blackline Master TE p. 87b
Pearson Chapter 2 - Lesson 3: What are some parts of animals? ● Engage: ○ Envision It! - Have children circle the part of a bird that it uses to get food. ● Explore: ○ Explore It! - How do ears compare? ● Explain: ○ Have children read Animal Needs, Animal Body Parts, and Staying Safe and answer the questions ● Elaborate: ○ Have children choose a bird to draw and write how the shape of its beak helps it eat ● Evaluate: ○ Formative Assessment	**Pearson Chapter 2 - Lesson 3** ● Engage: ○ Envision It! Activity SE pp. 88-89, TE pp. 88-89 ● Explore: ○ SE p. 88, TE p. 93a ● Explain: ○ SE pp. 89-93, TE pp. 89-93 ● Elaborate: ○ Science Student Notebook ○ TE p. 91 ● Evaluate: ○ Lesson Check Blackline Master TE p. 93b
Pearson Chapter 2 - Lesson 4 - Where do plants and animals live? ● Engage: ○ Envision It! - Have children draw an animal that lives in the rainforest. ● Explore: ○ Explore It! Where can plants live? ○ What do these habitats have that meet the plants and animals needs? ● Explain: ○ Have children read Habitats, Forest, Ocean, Desert, Wetland, and Rain Forest and answer the questions. ○ Discuss Go Green on p. 97. Discuss climate change/keeping the habitats clean	**Pearson Chapter 2 - Lesson 4** ● Engage: ○ Envision It! Activity SE pp. 94-95, TE pp. 94-95 ● Explore: ○ SE p. 94, TE p. 99a ● Explain: ○ SE pp. 95-99, TE pp. 95-99

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and how that could affect these different habitats, plants, and animals. ● Elaborate: ○ Have children illustrate a habitat, including the plants and animals that live in it, and write a description of the habitat. Include what this habitat has that is important for the plants and animals needs. Describe the effect on the plant or animal if Climate change affected this habitat. ● Evaluate: ○ Formative Assessment	● Elaborate: ○ Student Science Notebook ○ TE p. 99 ● Evaluate: ○ Lesson Check Blackline Master TE p. 99b
Pearson Chapter 2 - Lesson 5: How do living things get food? ● Engage: ○ Envision It! - Have children draw what they think will eat corn. ● Explore: ○ Explore It! What is the order of a food chain? ● Explain: ○ Have children read Energy from Food, Food Chains, and Predator and Prey and answer the questions. ● Elaborate: ○ Have children make a food chain about what they ate for breakfast or lunch ● Evaluate: ○ Formative Assessment	**Pearson Chapter 2 - Lesson 5** ● Engage: ○ Envision It! Activity SE pp. 100-101, TE p. 100-101 ● Explore: ○ SE p. 100, TE p. 103a ● Explain: ○ SE pp. 101-103, TE pp. 101-103 ● Elaborate: ○ Student Science Notebook ○ TE p. 102 ● Evaluate: ○ Lesson Check Blackline Master TE p. 103b
Unit Cumulative Activities: ● Performance Expectation Activities ● Inquiry- Investigate It! ● Inquiry - Apply It! ● Performance-Based Assessment	**Unit Cumulative Activities:** ● TE pp. 117a, 117b, 117c ● SE pp. 104-105, TE pp. 105a-105d ● SE pp. 114-115 ● SE pp. 116-117, TE pp. 116-117
Additional learning opportunities/strategies: ● Utilize online resources and web links to support learning.	**Additional resources:** ● Bozemanscience.com ● http://ngss.nsta.org/ ● https://www.teachingchannel.org/ngss

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Advanced Leveled Content Reader	On-Level Content Reader	Below-Level Content Reader	Below-Level Content Reader Utilize the support flaps in the leveled readers to provide support

Use project- based science learning to connect science with observable phenomena.	Use project-based science learning to connect science with observable phenomena.	Use project-based science learning to connect science with observable phenomena. Utilize the If/Then strategies in the RTI section of the lesson/chapter Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).	before-reading support (KWL charts, word webs), during-reading support (visual vocabulary support, strategies to determine word meanings, questioning while reading), and after-reading support (summative assessment, activity). Utilize the ELL lesson plan to identify content and language objectives. Use project-based science learning to connect science with observable phenomena. When using the write-in student edition, refer to graphic organizers, photographs, illustrations, and models Use Envision it! to frontload the lesson by activating prior knowledge and building background knowledge. Utilize the ELL handbook for best practices and instructional strategies. Follow the specific “ELL Support” for each chapter in the TE. Support is given through scripted text, graphic organizers, etc.

Unit Title: Grade 2 - Unit 2: Properties of Matter

How do the properties of materials determine their use?

In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of patterns, cause and effect, and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Stage 1: Desired Results

Standards & Indicators:

- **NJSLS – Science**
  - **Science and Engineering Practices**
    - Planning and Carrying Out Investigations

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- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.(2-PS1-1)
- Analyzing and Interpreting Data
  - Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2)
- Analyzing and Interpreting Data
  - Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

- **Disciplinary Core Ideas**
  - 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)
  - ETS1.C: Optimizing the Design Solution
    - Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)
- **Crosscutting Concepts**
  - Patterns
    - Patterns in the natural and human designed world can be observed. (2-PS1-1)
  - Cause and Effect
    - Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2
  - Connections to Engineering, Technology, and Applications of Science
    - Influence of Engineering, Technology, and Science, on Society and the Natural World
      - Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2)

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.2.CI.1	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).	Brainstorming can create new, innovative ideas
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.

Interdisciplinary Connection(s):

- **NJSLS – Math**
  - MP.2: Reason abstractly and quantitatively.
  - MP.4: Model with mathematics.
  - MP.5: Use appropriate tools strategically.
  - 2.DL.4: 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.
- **NJSLS – English Language Arts**
  - W.WR.2.5: Generate questions about a topic and locate related information from a reference source to obtain information on that topic through shared and independent research.
  - W.SE.2.6: Prioritize information provided by different sources on the same topic while gathering ideas and planning to write about a topic.

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- RI.AA.2.7: Describe and identify the logical connections of how reasons support specific points the author makes in a text.

Stage 2: Assessment Evidence

Performance Task(s):

- "Inquiry labs"
- STEM activities
- Formative assessment: "Lesson Check" blackline masters
- "Got It?" self-assessments in each lesson
- Complete graphic organizers
- Performance Expectations
- Inquiry Apply It!
- Unit Assessments

Other Evidence:

- Post-activity discussion questions
- Review Vocabulary Smart Cards
- Students elaborate in "Science Notebooks"
- Students make connections to the "Unlock the Big ?" in each lesson.
- Have students restate or contrast topics in each lesson

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Pearson Chapter 1 - Lesson 1: What are some properties of matter?

- Inquiry:
  - Students will observe evaporation rates in open and closed containers.
  - STEM Activity - Trails That Last
- Engage:
  - Envision It! - Have children identify an object that sank in a tank of water and draw an object that might float.
- Explore:
  - Explore It! - How can you classify matter?
- Explain:
  - Have children read Matter, Properties of Matter, Color and Texture, Shape and Size, Sink or Float, and Temperature and answer the questions.
- Elaborate:
  - Have children describe classroom objects and measure them using appropriate tools.
- Evaluate:
  - Formative Assessment

Pearson Chapter 1 - Lesson 2: What are solids, liquids, and gasses?

- Engage:
  - Envision It! - Have children identify solids and liquids.
- Explore:
  - My Planet Diary - Did You Know?
- Explain:

Resources:

Pearson Chapter 1 - Lesson 1

- Inquiry:
  - Try It, What affects evaporation? SE p. 4, TE, p.4
  - SE pp. 6-15, TE pp. 6-15
- Engage:
  - Envision It! Activity SE pp. 16-17, TE pp. 16-17
- Explore:
  - SE p. 16, TE p. 23a
- Explain:
  - SE pp. 17-23, TE pp. 17-23
- Elaborate
  - Student Science Notebook
  - TE p. 21
- Evaluate:
  - Lesson Check Blackline Master TE p. 23b

Pearson Chapter 1 - Lesson 2

- Engage:
  - Envision It! Activity SE pp. 24-25, TE pp. 24-25
- Explore:
  - SE p. 24, TE p. 29a
- Explain:

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Have children read Solids, Liquids, and Gases and answer the questions.

Elaborate:

Have children undertake a “State of Matter” hunt and record their findings.

Evaluate:

Formative Assessment

Additional learning opportunities/strategies:

Utilize online resources and web links to support learning.

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SE pp. 25-29, TE pp. 25-29

Elaborate

Student Science Notebook
TE p. 28

Evaluate:

Lesson Check Blackline Master TE p. 29b

Additional resources:

Bozemanscience.com
http://ngss.nsta.org/
https://www.teachingchannel.org/ngss

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<td>Advanced Leveled Content Reader

Use project-based science learning to connect science with observable phenomena.</td>
<td>On-Level Content Reader

Use project-based science learning to connect science with observable phenomena.</td>
<td>Below-Level Content Reader

Use project-based science learning to connect science with observable phenomena.

Utilize the If/Then strategies in the RTI section of the lesson/chapter

Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).</td>
<td>Below-Level Content Reader

Utilize the support flaps in the leveled readers to provide support before-reading support (KWL charts, word webs), during-reading support (visual vocabulary support, strategies to determine word meanings, questioning while reading), and after-reading support (summative assessment, activity).

Utilize the ELL lesson plan to identify content and language objectives.

Use project-based science learning to connect science with observable phenomena.

When using the write-in student edition, refer to graphic organizers, photographs, illustrations, and models

Use Envision it! to frontload the lesson by activating</td>
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			prior knowledge and building background knowledge. Utilize the ELL handbook for best practices and instructional strategies. Follow the specific "ELL Support" for each chapter in the TE. Support is given through scripted text, graphic organizers, etc.

Unit Title: Grade 2 - Unit 3: Changes to Matter

How can objects change?
Are all changes reversible?

In this unit of study, students continue to develop an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of cause and effect and energy and matter are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations, designing solutions, and engaging in argument from evidence. Students are also expected to use these practices to demonstrate understanding of the core ideas.
This unit is based on 2-PS1-3 and 2-PS1-4.

Stage 1: Desired Results

Standards & Indicators:

- **NJSLS – Science**
  - **Science and Engineering Practices**
    - Analyzing and Interpreting Data
      - Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)
    - Constructing Explanations and Designing Solutions
      - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3)
    - Engaging in Argument from Evidence
      - Construct an argument with evidence to support a claim. (2-PS1-4)
  - **Disciplinary Core Ideas**
    - PS1.A: Structure and Properties of Matter
      - Different properties are suited to different purposes. (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)
  - **Crosscutting Concepts**
    - Cause and Effect
      - Events have causes that generate observable patterns. (2-PS1-4) Energy and Matter
      - Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2PS1-3)
    - Connections to Nature of Science
      - Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

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

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).	Brainstorming can create new, innovative ideas.
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).	
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	

Central Idea / Enduring Understanding:
In this unit of study, students continue to develop an understanding of observable properties of materials through analysis and classification of different materials. The crosscutting concepts of *cause and effect* and *energy and matter* are called out as organizing concepts for these disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in *constructing explanations*, *designing solutions*, and *engaging in argument from evidence*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential/Guiding Question:
- How can objects change?
- Are all changes reversible?
- In what ways can an object made of a small set of pieces be disassembled and made into a new object?
- Can all changes caused by heating or cooling be reversed?

Content:
- Objects may break into smaller pieces and be put together into larger pieces or change shapes.
- Different properties are suited to different purposes.
- A great variety of objects can be built up from a small set of pieces.
- People search for cause-and-effect relationships to explain natural events.
- Events have causes that generate observable patterns.
- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.

Skills (Student Learning Objectives):
- 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-PS1-3)
- 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-PS1-4)

Interdisciplinary Connection(s):

NJSLS – English Language Arts

- RI.CR.2.1: Ask and answer such questions as *who, what, where, when, why,* and *how* in an informational text to demonstrate understanding of key details in a text.
- RI.IT.2.3: Describe the connection between a series of historical events, scientific ideas or concepts or steps in a sequence within a text .
- RI.AA.2.7: Describe and identify the logical connections of how reasons support specific points the author makes in a text.

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- W.AW.2.1: With prompts and support, write opinion pieces to present an idea with reasons or information.
- W.AW.2.1.A: Introduce an opinion.
- W.AW.2.1.B: Support the opinion with facts, definitions, concrete details, text evidence, or other information and examples related to the topic.
- W.AW.2.1.C: Provide a conclusion.
- W.SE.2.6: Prioritize information provided by different sources on the same topic while gathering ideas and planning to write about a topic.
- W.SE.2.7: Engage in both collaborative and independent writing tasks regularly, including extended and shorter time frames.

Stage 2: Assessment Evidence

Performance Task(s):

- "Inquiry labs"
- STEM activities
- Formative assessment: "Lesson Check" blackline masters
- "Got It?" self-assessments in each lesson
- Complete graphic organizers
- Performance Expectations
- Inquiry Apply It!
- Unit Assessments

Other Evidence:

- Post-activity discussion questions
- Review Vocabulary Smart Cards
- Students elaborate in "Science Notebooks"
- Students make connections to the "Unlock the Big ?" in each lesson.
- Have students restate or contrast topics in each lesson

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Pearson Chapter 1 - Lesson 3: What are some ways matter can change?

- Engage:
  - Envision It! - Have children describe how a balloon's size and shape can be changed.
- Explore:
  - Explore It! - How can you change clay?
- Explain:
  - Have children read Changing Matter; Mold It, Fold It, Tear It, Bend It; Other Ways Matter Can Change, Mix and Separate Matter; and Water Mixtures and answer the questions
- Elaborate:
  - Have children make up riddles using physical properties and changes that can be made to a material as clues
- Evaluate:
  - Formative Assessment

Pearson Chapter 1 - Lesson 4: How can water change?

- Engage:
  - Envision It! - Have children describe how ice changes in the sun.
- Explore:
  - Explore It! How much water is in each cup?

Resources:

Pearson Chapter 1 - Lesson 3

- Engage:
  - Envision It! Activity SE pp. 30-31, TE pp. 30-31
- Explore:
  - SE p. 30, TE p. 35a
- Explain:
  - SE pp. 31-35, TE pp. 31-35
- Elaborate
  - Student Science Notebook
  - TE p. 33
- Evaluate:
  - Lesson Check Blackline Master TE p. 35b

Pearson Chapter 1 - Lesson 4

- Engage:
  - Envision It! Activity SE pp. 36-37, TE pp. 36-37
- Explore:
  - SE p. 36, TE p. 39a

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● Explain: ○ Have children read Changing Shape, and answer the Cooling Matter, and Heating Matter and questions. ● Elaborate: ○ Have children choose a prompt and draw a picture that shows changes in the environment. ● Evaluate: ○ Formative Assessment **Pearson Chapter 1 - Lesson 5: How can you combine materials?** ● Engage: ○ Envision It! - Have children identify what materials make up the bridge and the buildings. ● Explore: ○ Explore It! How can you build a bridge? ● Explain: ○ Have children read Properties of Materials, Combining Materials, Combined Materials, Materials in Bridges, Building Materials, and Materials in Towers and answer the questions. ● Elaborate: ○ Have children write to describe the benefits of using Earth-friendly building materials ● Evaluate: ○ Formative Assessment **Performance Expectation Activity:** <u>Students who demonstrate understanding can</u>: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. ● Engage*:* ○ Plan a method of classification based on the observable properties of materials ● Procedure: ○ For each group prepare a bowl that contains a rubber eraser, a metal screw, a plastic toy building brick, a cotton ball, and a paper clip. ○ Ask guided questions and have students sort their materials ○ Have children work in small groups. ○ Have each group sort its set of materials based on the classification system it has developed. ● Support:	● Explain: ○ SE pp. 37-39, TE pp. 37-39 ● Elaborate: ○ Student Science Notebook ○ TE p. 39 ● Evaluate: ○ Lesson Check Blackline Master TE p. 39b **Pearson Chapter 1 - Lesson 5** ● Engage: ○ Envision It! Activity SE pp. 40-41, TE pp. 40-41 ● Explore: ○ SE p. 40, TE p. 47a ● Explain: ○ SE pp. 41-47, TE pp. 41-47 ● Elaborate: ○ Student Science Notebook ○ TE p. 46 ● Evaluate: ○ Lesson Check Blackline Master TE p. 47b **Performance Expectation Activity:** ● TE p. 61a

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○ Encourage children to try a variety of classification schemes, based on the materials provided ○ Remind students to classify their objects based on one property only ● Evaluate: ○ Students should communicate that different materials have different properties ○ Classify materials based on their properties	
Performance Expectation Activity: <u>Students who demonstrate understanding can:</u> Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. ● Engage: ○ Analyze data to determine which materials are best suited to absorb water under a potted plant. ● Procedure: ○ Prepare materials for each group ○ Ask guided questions ○ Have children form small groups to observe and record number of droppers full of water each material can absorb. ○ Have students analyze data and determine which material would best soak up water leaking from a plant. ● Support: ○ Encourage children to set up a data table before they begin their tests. ○ Within their groups, have children take turns carrying out the test and recording the data. ● Evaluate: ○ Students should carry out tests related to the properties of materials. ○ Analyze data to determine which material would work best to absorb water leaking from a plant.	**Performance Expectation Activity:** ● TE p. 61b
Performance Expectation Activity: <u>Students who demonstrate understanding can:</u> 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. ● Engage: ○ Use the same set of objects to create different structures. ● Procedure: ○ Provide children with a small number of plastic building bricks. ○ Ask guided questions and provide direction.	**Performance Expectation Activity:** ● TE p. 61c

○ Have children tell about their new structure and compare and contrast their two structures. ○ Using their observations as evidence, students should write descriptive paragraph about how small set of building blocks can be assembled in different ways to make different structures. ● Support: ○ Have children work in pairs. ○ Provide 15-30 bricks per pair, with shapes, sizes, and kinds of bricks varying from pair to pair. ○ Children should use the same set of building blocks to create both structures, and should use all of the bricks provided for each of their structures. ○ Encourage children to record their observations of each structure in a chart, perhaps drawing each picture. ● Evaluate: ○ Children should build at least two different structures using all of the same building blocks. ○ Clearly record their observations of each structure they create. ○ Compare and contrast the different structures. ○ Observe that both structures contained the same pieces. ○ Identify that one structure was a different shape and had bricks arranged differently than the other structure. ○ Include descriptions of their observations in a paragraph.	
Performance Expectation Activity: <u>Students who demonstrate understanding can:</u> Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. ● Engage: ○ Use evidence to tell how some changes caused by heating or cooling can or cannot be reversed. ● Procedure: ○ Provide children with examples of changes caused by heating and cooling. ○ Ask guided questions. ○ Provide sample materials, and allow children to examine sample materials. ○ Challenge them to determine which changes can be reversed and which cannot.	**Performance Expectation Activity:** ● TE p. 61d

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Have children propose and try reasonable ways/ methods to reverse changes and report on whether the change was reversed.
Have children write a paragraph that constructs an argument based on the results of their investigation.

Support:

Children may work in groups, with different groups being given different materials that have been changed by heating and cooling.
Other examples of changes caused by heating and cooling include a partly burned piece of paper and a cold stick of butter.
Teacher may want to model how to construct an argument in a paragraph.

Evaluate:

Children should describe one example of a reversible change caused by heating or cooling and one example of a change that cannot be reversed.
Use supporting evidence in a paragraph to argue which changes can be reversed and which cannot.

Unit Labs:

Inquiry - Investigate It!
Inquiry - Apply It!

Additional learning opportunities/strategies:

Utilize online resources and web links to support learning.

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Unit Labs:

SE pp. 48-49, TE pp. 49a-49d
SE pp. 58-59

Additional resources:

Bozemanscience.com
http://ngss.nsta.org/
https://www.teachingchannel.org/ngss

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Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Advanced Leveled Content Reader Use project-based science learning to connect science with observable phenomena.	On-Level Content Reader Use project-based science learning to connect science with observable phenomena.	Below-Level Content Reader Use project-based science learning to connect science with observable phenomena. Utilize the If/Then strategies in the RTI section of the lesson/chapter	Below-Level Content Reader Utilize the support flaps in the leveled readers to provide support before-reading support (KWL charts, word webs), during-reading support (visual vocabulary support, strategies to determine word meanings, questioning while reading), and after-reading support (summative assessment, activity).

		Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).	Utilize the ELL lesson plan to identify content and language objectives. Use project-based science learning to connect science with observable phenomena. When using the write-in student edition, refer to graphic organizers, photographs, illustrations, and models Use Envision it! to frontload the lesson by activating prior knowledge and building background knowledge. Utilize the ELL handbook for best practices and instructional strategies. Follow the specific "ELL Support" for each chapter in the TE. Support is given through scripted text, graphic organizers, etc.

Unit Title: Grade 2 - Unit 4: The Earth's Land and Water

Where do we find water?

In this unit of study, students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concept of patterns is called out as an organizing concept for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in developing and using models and obtaining, evaluating, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas.
This unit is based on 2-ESS2-3 and 2-ESS2-2.

Stage 1: Desired Results

Standards & Indicators:

- **NJSLS – Science**
  - **Science and Engineering Practices (SEP)**
    - Obtaining, Evaluating, and Communicating Information
      - Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3)
    - Developing and Using Models
      - Develop a model to represent patterns in the natural world. (2-ESS2-2)
  - **Disciplinary Core Ideas (DCI)**
    - 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)

Science - Grade 2

- ■ 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)
- ○ **Crosscutting Concepts (CCC)**
  - ■ Patterns
    - Patterns in the natural world can be observed. (2ESS2-2),(2-ESS2-3)

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.2.2.ETW.1	Classify products as resulting from nature or produced as a result of technology.	The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals. Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants. Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment.
8.2.2.ETW.2	Identify the natural resources needed to create a product.	
8.2.2.ETW.3	Describe or model the system used for recycling technology.	
8.2.2.ETW.4	Explain how the disposal of or reusing a product affects the local and global environment.	

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).	Brainstorming can create new, innovative ideas.
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).	
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	

Central Idea / Enduring Understanding:
In this unit of study, students use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. The crosscutting concept of *patterns* is called out as an organizing concept for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *developing and using models* and *obtaining, evaluating, and communicating information*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential/Guiding Question:
- Where do we find water?
- How can we identify where water is found on Earth and if it is solid or liquid?
- In what ways can you represent the shapes and kinds of land and bodies of water in an area?

Content:
- Patterns in the natural world can be observed.

Skills (Student Learning Objectives):

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• Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. • Patterns in the natural world can be observed. • Maps show where things are located. One can map the shapes and kinds of land and water in any area.	• Obtain information to identify where water is found on Earth and that it can be solid or liquid. (2-ESS2-3) • 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-ESS2-2)

Interdisciplinary Connection(s):

- **NJSLS – Math**
  - MP.2: Reason abstractly and quantitatively.
  - MP.4: Model with mathematics.
  - 2.NBT.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
  - 2.NBT.5: With accuracy and efficiency add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- **NJSLS – English Language Arts**
  - W.WP.2.4: With guidance and support from adults and peers, develop and strengthen writing as needed by planning, revising and editing.
  - W.WR.2.5: Generate questions about a topic and locate related information from a reference source to obtain information on that topic through shared and independent research.
  - W.SE.2.6: Prioritize information provided by different sources on the same topic while gathering ideas and planning to write about a topic.
  - SL.UM.2.5: Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
• “Inquiry labs” • STEM activities • Formative assessment: “Lesson Check” blackline masters • “Got It?” self-assessments in each lesson • Complete graphic organizers • Performance Expectations • Inquiry Apply It! • Unit Assessments	• Post-activity discussion questions • Review Vocabulary Smart Cards • Students elaborate in “Science Notebooks” • Students make connections to the “Unlock the Big ?” in each lesson. • Have students restate or contrast topics in each lesson

Stage 3: Learning Plan

Learning Opportunities/Strategies:	Resources:

Pearson Chapter 3 - Lesson 1: What are some properties of matter?
• Inquiry:
  ○ Students will collect and analyze data to infer the proportions of water and land on Earth.
  ○ STEM Activity - How Can You Make Recycled Paper?
• Engage:
	Pearson Chapter 3 - Lesson 1
	• Inquiry:
	  ○ Try It, How Much Water and Land are on Earth? SE p. 120, TE, p.120
	  ○ SE pp. 122-131, TE pp. 122-131
	• Engage:

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○ Envision It! - Have children describe various types of land and water in a photo. ● Explore: ○ My Planet Diary Connections ● Explain: ○ Have children read Land and Water, Landforms, The Ocean, Lakes and Ponds, Rivers and Streams, and Glaciers and answer the questions. ● Elaborate: ○ Discuss with children where islands such as Hawaii are located and have them think about means of transportation that people use to travel to these islands. ● Evaluate: ○ Formative Assessment **Performance Expectation Activity:** <u>Students who demonstrate understanding can</u>: Develop a model to represent the shapes and kinds of land and bodies of water in an area. ● *Engage* ○ Develop models of land and water features on Earth's surfaces. ● Procedure ○ Review different types of landforms and bodies of water by scanning through photos from the text, magazines, or internet sources to examine and identify each feature. ○ Tell children they will take virtual field trip to observe and model its natural features. ○ Children should work in small groups and choose area to explore. ○ Assign computers and guide children in using online mapping and sketch or download features of area. ○ Groups will use observations to create a model of a landform and/or body of water in area. Model can be map, diagram, drawing, 3-D model, diorama, dramatization, comic strip, or storyboard. ○ Provide materials to inspire creativity and guide students with selecting materials. ○ Invite students to present completed models to the class. ● Support ○ Provide many materials (as per TE directions) ○ Take children for walk to identify and describe any landforms or bodies of water that are present.	○ Envision It! Activity SE pp. 132-133, TE pp. 132-133 ● Explore: ○ SE p. 132, TE p. 137a ● Explain: ○ SE pp. 133-137, TE pp. 133-137 ● Elaborate: ○ Student Science Notebook ○ TE p. 135 ● Evaluate: ○ Lesson Check Blackline Master TE p. 137b **Performance Expectation Activity:** ● TE p. 159c

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○ Have students sketch observations of their surroundings. ● Evaluate ○ Children should research landforms and bodies of water to model. ○ Design and create models of landforms and bodies of water. ○ Describe the features of their models. **Performance Expectation Activity:** Students who demonstrate understanding can: Obtain information to identify where water is found on Earth and that it can be solid or liquid. ● *Engage:* ○ Obtain information about bodies of water on Earth and make a chart to compare them. ● Procedure: ○ Show children globe and ask guiding questions. ○ Have students work in pairs and provide guidance for finding information using text features. ○ Have children illustrate charts that show where water is found on Earth. Provide guidance as necessary. ● Support: ○ Review the features of a chart. ○ Provide charts with the first column filled in as a guide. ● Evaluate: ○ Children should research sources of water. ○ Create charts showing where water is found. ○ Identify liquid and solid bodies of water. **Additional learning opportunities/strategies:** ● Utilize online resources and web links to support learning	**Performance Expectation Activity:** ● TE p. 159d **Additional resources:** ● Bozemanscience.com ● http://ngss.nsta.org/ ● https://www.teachingchannel.org/ngss

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Advanced Leveled Content Reader Use project- based science learning to connect science with observable phenomena.	On-Level Content Reader Use project-based science learning to connect science with	Below-Level Content Reader Use project-based science learning to	Below-Level Content Reader Utilize the support flaps in the leveled readers to provide support before-reading support (KWL charts, word webs), during-reading

	observable phenomena.	connect science with observable phenomena. Utilize the If/Then strategies in the RTI section of the lesson/chapter Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).	support (visual vocabulary support, strategies to determine word meanings, questioning while reading), and after-reading support (summative assessment, activity). Utilize the ELL lesson plan to identify content and language objectives. Use project-based science learning to connect science with observable phenomena. When using the write-in student edition, refer to graphic organizers, photographs, illustrations, and models Use Envision it! to frontload the lesson by activating prior knowledge and building background knowledge. Utilize the ELL handbook for best practices and instructional strategies. Follow the specific "ELL Support" for each chapter in the TE. Support is given through scripted text, graphic organizers, etc.

Unit Title: Grade 2 - Unit 5: Changes to Earth's Land

In what ways do humans slow or prevent wind or water from changing the shape of the land?

In this unit of study, students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. The crosscutting concepts of stability and change; structure and function; and the influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in asking questions and defining problems, developing and using models, and constructing explanations and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.
This unit is based on 2-ESS1-1, 2-ESS2-1, K-2-ETS1-1, and K-2-ETS1-2.

Stage 1: Desired Results

Standards & Indicators:

- **NJSLS – Science**
  - **Science and Engineering Practices (SEP)**
    - Constructing Explanations and Designing Solutions
      - Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1)

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- Compare multiple solutions to a problem. (2ESS2-1)
- Asking Questions and Defining Problems
  - Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1)
  - Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)
- Developing and Using Models
  - Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS12)

- **Disciplinary Core Ideas (DCI)**
  - 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 observe. (2-ESS1-1)
  - ESS2.A: Earth Materials and Systems
    - Wind and water can change the shape of the land. (2-ESS2-1)
  - ETS1.A: Defining and Delimiting Engineering Problems
    - A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)
    - Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)
    - Before beginning to design a solution, it is important to clearly understand the problem. (K-2ETS1-1)
  - ETS1.B: Developing Possible Solutions
    - Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2ETS1-2)
- **Crosscutting Concepts (CCC)**
  - Stability and Change
    - Things may change slowly or rapidly. (2-ESS11)
    - Things may change slowly or rapidly. (2-ESS21)
  - Structure and Function
    - The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)
  - Connections to Engineering, Technology, and Applications of Science
    - Influence of Engineering, Technology, and Science on Society and the Natural World
      - Developing and using technology has impacts on the natural world. (2-ESS2-1)
  - Connections to Nature of Science
    - Science Addresses Questions About the Natural and Material World
      - Scientists study the natural and material world. (2-ESS2-1)

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.2.2.ETW.1	Classify products as resulting from nature or produced as a result of technology.	The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals. Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants.
8.2.2.ETW.2	Identify the natural resources needed to create a product.	
8.2.2.ETW.3	Describe or model the system used for recycling technology.	
8.2.2.ETW.4	Explain how the disposal of or reusing a product affects the local and global environment.	

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		Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment.
Career Readiness, Life Literacies and Key Skills		
Standard	**Performance Expectations**	**Core Ideas**
9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).	Brainstorming can create new, innovative ideas.
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2)	Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).	
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).	
9.4.2.TL.5	Describe the difference between real and virtual experiences.	Digital tools have a purpose.

Central Idea / Enduring Understanding:

- In this unit of study, students apply their understanding of the idea that wind and water can change the shape of land to compare design solutions to slow or prevent such change. The crosscutting concepts of *stability and change*; *structure and function*; and *the influence of engineering, technology, and science on society and the natural world* are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in *asking questions and defining problems*, *developing and using models*, and *constructing explanations and designing solutions*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Essential/Guiding Question:

- In what ways do humans slow or prevent wind or water from changing the shape of the land?
- What evidence can we find to prove that Earth events can occur quickly or slowly?
- In what ways do humans slow or prevent wind or water from changing the shape of the land?

Content:

- Some events happen very quickly; others occur very slowly over a time period much longer than one can observe.
- Things may change slowly or rapidly.
- Developing and using technology has impacts on the natural world.
- Scientists study the natural and material world.
- The shape and stability of structures of natural and designed objects are related to their function(s).
- Wind and water can change the shape of the land.

Skills (Student Learning Objectives):

- Use information from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.] (2-ESS1-1)
- Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*[Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and

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- Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
- A situation that people want to change or create can be approached as a problem to be solved through engineering.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.
- Before beginning to design a solution, it is important to clearly understand the problem.
- 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.

different designs for using shrubs, grass, and trees to hold back the land.] (2-ESS2-1)

- Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)
- 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. (K-2-ETS1-2)

Interdisciplinary Connection(s):

- **NJSLS – Math**
  - MP.2: Reason abstractly and quantitatively.
  - MP.4: Model with mathematics.
  - MP.5: Use appropriate tools strategically.
  - 2.NBT.1:Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
  - 2.DL. 4: 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.
- **NJSLS – English Language Arts**
  - RI.CR.2.1: Ask and answer such questions as *who, what, where, when, why,* and *how* in an informational text to demonstrate understanding of key details in a text.
  - RI.IT.2.3: Describe the connection between a series of historical events, scientific ideas or concepts or steps in a sequence within a text .
  - W.WP.2.4: With guidance and support from adults and peers, develop and strengthen writing as needed by planning, revising and editing.
  - W.WR.2.5: Generate questions about a topic and locate related information from a reference source to obtain information on that topic through shared and independent research.
  - W.SE.2.6: Prioritize information provided by different sources on the same topic while gathering ideas and planning to write about a topic.
  - SL.II.2.2: Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
  - SL.UM.2.5: Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
  - RI.CT.2.8: Compare and contrast two informational versions of the same idea or topic by different authors or authors from different cultures.

Stage 2: Assessment Evidence

Performance Task(s):

- "Inquiry labs"
- STEM activities
- Formative assessment: "Lesson Check" blackline masters
- "Got It?" self-assessments in each lesson
- Complete graphic organizers

Other Evidence:

- Post-activity discussion questions
- Review Vocabulary Smart Cards
- Students elaborate in "Science Notebooks"
- Students make connections to the "Unlock the Big ?" in each lesson.

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• Performance Expectations • Inquiry Apply It! • Unit Assessments	• Have students restate or contrast topics in each lesson

Stage 3: Learning Plan

Learning Opportunities/Strategies:	**Resources:**

Pearson Chapter 3 - Lesson 2: What Changes Land?
• Engage:
  ○ Envision It! - Have children discuss how a volcanic eruption changes the land.
• Explore:
  ○ Explore It! How does the Earth's surface move during an earthquake?
• Explain:
  ○ Have children read Changes on Earth, Earthquakes and Volcanoes, Weathering and Erosion, Water Changes the Land, and Other Causes of Erosion and answer the questions.
• Elaborate:
  ○ Have children develop Frayer models to differentiate between weathering and erosion.
• Evaluate:
  ○ Formative Assessment
	Pearson Chapter 3 - Lesson 2
	• Engage:
	  ○ Envision It! Activity SE pp. 138-139, TE pp. 138-139
	• Explore:
	  ○ SE p. 138, TE p. 143a
	• Explain:
	  ○ SE pp. 139-143, TE pp. 139-143
	• Elaborate:
	  ○ Student Science Notebook
	  ○ TE p. 140
	• Evaluate:
	  ○ Lesson Check Blackline Master TE p. 143b

Pearson Chapter 3 - Lesson 3: What is a Fossil?
• Engage:
  ○ Envision It! - Have children identify and label various fossils.
• Explore:
  ○ Explore It! What can a fossil show?
• Explain:
  ○ Have children read Fossils, How Fossils Form, and What Fossils Show and answer the questions.
• Elaborate:
  ○ Tell children that fossils may form in tar pits. Have children write about how fossils form in mud and sand and in tar pits.
• Evaluate:
  ○ Formative Assessment
	Pearson Chapter 3 - Lesson 3
	• Engage:
	  ○ Envision It! Activity SE pp. 144-145, TE pp. 144-145
	• Explore:
	  ○ SE p. 144, TE p. 147a
	• Explain:
	  ○ SE pp. 145-147, TE pp. 145-147
	• Elaborate:
	  ○ Student Science Notebook
	  ○ TE p. 146
	• Evaluate:
	  ○ Lesson Check Blackline Master TE p. 147b

Performance Expectation Activity: Students who demonstrate understanding can: Use information from several sources to provide evidence that Earth events can occur quickly or slowly. • Engage:	**Performance Expectation Activity:** • TE p. 159a

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○ Observe and evaluate evidence of changes to Earth's surface. ● Procedure: ○ Students will observe school grounds for evidence of natural events that change Earth's surface. ○ Students need to prepare 3-column chart to organize notes. ○ Children will work in pairs and fill out their charts with their observations during Earth events hunt. ○ In classroom, lead students on virtual field trip where they record their observations on same chart. Show video of volcanic eruption. ● Support: ○ Review the types of events that occur quickly and the types that occur slowly. ○ Ask guiding questions regarding evidence of fast or slow Earth events outside. ○ Review rules and safety procedures. ○ Provide required materials. ● Evaluate: ○ Students should complete their charts with observations and descriptions of at least two different Earth events. ○ Distinguish between Earth events that occur quickly and Earth events that occur slowly. ○ Support their ideas using observations from the outdoor field trip and from the virtual field trip.	
Performance Expectation Activity: <u>Students who demonstrate understanding can:</u> Compare multiple solutions designed to show or prevent wind or water from changing the shape of the land. ● Engage: ○ Compare different approaches to erosion prevention. ● Procedure: ○ Explain that people have designed a variety of solutions to slow or prevent erosion on hillsides where people live, work, and travel. ○ Provide and explain three examples of solutions to control erosion and characteristics of each. ○ Have students make Venn diagram to compare three solutions designed to prevent erosion on hillsides. ● Support:	**Performance Expectation Activity:** ● TE p. 159b

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○ Show children photos of different types of erosion-control solutions. Other examples may also be included. ○ Have children use Venn diagram to choose and compare three provided solutions. ○ As children work on diagrams, ask guiding questions to prompt their thinking. Have students explain their answers. ● Evaluate: ○ Students should create Venn diagrams that show similarities and differences in the solutions to erosion control. ○ Evaluate the relative benefits and drawbacks of each solution. **Unit Labs:** ● Inquiry- Investigate It! ● Inquiry - Apply It! **Additional learning opportunities/strategies:** ● Utilize online resources and web links to support learning.	**Unit Labs:** ● SE pp. 148-149, TE p. 49a-49d ● SE pp. 156-157 ● **Additional resources:** ● Bozemanscience.com ● http://ngss.nsta.org/ ● https://www.teachingchannel.org/ngss

Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation.

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Advanced Leveled Content Reader Use project- based science learning to connect science with observable phenomena.	On-Level Content Reader Use project-based science learning to connect science with observable phenomena.	Below-Level Content Reader Use project-based science learning to connect science with observable phenomena. Utilize the If/Then strategies in the RTI section of the lesson/chapter Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs,	Below-Level Content Reader Utilize the support flaps in the leveled readers to provide support before-reading support (KWL charts, word webs), during-reading support (visual vocabulary support, strategies to determine word meanings, questioning while reading), and after-reading support (summative assessment, activity). Utilize the ELL lesson plan to identify content and language objectives. Use project-based science learning to connect science with observable phenomena. When using the write-in student edition, refer to graphic organizers,

		charts, data tables, multimedia, modeling).	photographs, illustrations, and models Use Envision it! to frontload the lesson by activating prior knowledge and building background knowledge. Utilize the ELL handbook for best practices and instructional strategies. Follow the specific “ELL Support” for each chapter in the TE. Support is given through scripted text, graphic organizers, etc.

Science Pacing Guide

Grade 2

MP	Units	Unit TOTAL*	Cumulative TOTAL**
MP1	**Unit 1 – Relationships in Habitats** Chapter 2: Try It!, Lesson 1, Lesson 2, Lesson 3, Lesson 4, and Lesson 5	20 days	20 days
MP1-2	**Unit 2 – Properties of Matter** Chapter 1: Try It!, Lesson 1, and Lesson 2	20 days	40 days
MP2	**Unit 3 – Changes to Matter** Chapter 1: Lesson 3, Lesson 4, Lesson 5, and Perf. Expectation Activities	20 days	60 days
MP2-3	**Unit 4 – The Earth's Land and Water** Chapter 3: Try It!, Lesson 1, Performance Expectation Activities	20 days	80 days
MP3	**Unit 5 – Changes to Earth's Land** Chapter 3: Lesson 2, Lesson 3, Performance Expectation Activities	20 days	100 days
MP1-3	**FLEX DAYS**	12 days	112 days

* Unit Total is inclusive of introduction, instruction, assessment, labs, projects, etc. for that particular unit.

** Cumulative Total is a running total, inclusive of prior and current units.