Curriculum

Content Area: Science

Grade Level(s): Grade 2

Date Revised: July 30, 2019

Date Adopted_____

Course Description:

Unit 1 Engineering Design Process: In this unit, students will ask questions, make observations, and gather information to define a problem. Students will use a design process to solve a problem and compare the strengths and weaknesses of multiple design solutions.

Unit 2 Matter: In this unit, students will describe and classify materials by their observable properties. Use evidence to describe how heating and cooling cause changes to matter and describe reversible and irreversible changes to matter. Explore how an object can be taken apart and its pieces used to make another object.

Unit 3 Earth's Surface: In this unit, students will gather information to identify where water is located on Earth and develop maps to represent locations of land and water on Earth.

Unit 4 Changes to Earth's Surface: In this unit, students will use evidence to explain that some changes to Earth happen slowly and some changes happen quickly. Students will also find solutions to prevent wind and water from changing the land.

Unit 5 Environments for Living Things: In this unit, students will investigate what plants and animals need to live and grow and develop models to show how plants depend on animals. Explore environments to identify observable patterns. Observe plants and animals to compare diversity of life in water and land habitats.

Total Number of Units: 5

Pacing Guide

Unit	Week	Standard NJSLS	Skill **What we want students to"DO"**
1:Engineering Design Process	2 Days	**K-2-ETS1-1**	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
	3 Days	**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.
	7 Days	**K-2-ETS1-3**	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

2: Matter	5 Days	**2-PS1-1**	Plan and construct an investigation to describe and classify different kinds of materials by their observable properties.
	5 Days	**2-PS1-2**	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose.
	5 Days	**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.
	7 Days	**2-PS1-4**	Construct an argument with evidence that some changes caused by heating and cooling can be reversed and some cannot.

3: Earth's Surface	5 Days 7 Days	**2-ESS2-2** **2-ESS2-3**	Develop a model to represent the shapes and kinds of land and bodies of water in an area. Obtain information to identify where water is found on Earth and that it can be solid or liquid.
4: Changes to Earth's Surface	8 Days 9 Days	**2-ESS1-1** **2-ESS2-1**	Use information from several sources to provide evidence that Earth events can occur quickly or slowly. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

5: Environments for Living Things	5 Days	**2-LS2-1**	Plan and conduct an investigation to determine if plants need sunlight and water to grow.
	5 Days	**2-LS2-2**	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
	5 Days	**2-LS4-1**	Make observations of plants and animals to compare the diversity of life in different habitats.
	7 Days	**2-ESS1-1**	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

Unit 1: Engineering Design Process
Time Frame: 12 Days

Essential Questions

What is a design process?
How can we compare design solutions?

Standards

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATION

K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
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.
K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

DISCIPLINARY CORE IDEAS

- **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. 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.
- **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.
- **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.

SCIENCE and ENGINEERING PRACTICES

Developing and Using Models

- Develop a simple model based on evidence to represent a proposed object or tool.

Asking Questions and Defining Problems

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

Analyzing and Interpreting Data

- Analyze data from tests of an object or tool to determine if it works as intended.

CROSS CUTTING CONCEPTS

Structure and Function

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

CONNECTIONS TO MATH

MP.2 Reason abstractly and quantitatively
MP.4 Model with mathematics
MP.5 Use appropriate tools strategically
2.MD.D.10 Draw a picture graph and a bar graph with up to four categories. Solve simple put-together, take-apart, and compare problems using a bar graph.

CONNECTIONS TO ELA

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.
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.
W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
SL.2.5 Use multimedia; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

TECHNOLOGY:

8.2.2.C.4 Identify designed products and brainstorm how to improve one used in the classroom.
8.2.2.C.6 Investigate a product that has stopped working and brainstorm ideas to correct the problem.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.2 Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.

HIGHLIGHTED CAREER READY PRACTICES:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.
CRP6. Demonstrate creativity and innovation.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

SEL PRACTICES & COMPETENCIES:

- Self-Management
- Social Awareness
- Responsible Decision-Making
- Relationship Skills

Overall Goal (What is the big idea?) Students will ask questions, make observations, and gather information to define a problem, use a design process to solve a problem, compare the strengths and weaknesses of multiple design solutions.

Pre-Assessment: Beginning Year Test Unit 1 Pretest: Engineering Design Process

(SLO) Student Learning Objectives (with standards)	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
K-2-ETS1-1 K-2-ETS1-2 **We are learning to ask questions, make observations, and gather information to define a problem to be solved through a design process.**	**Essential Vocabulary:** engineer, design process, solution, strengths, weaknesses -focus on how to define and solve a problem -explore the five steps of a design process engineers use to solve problems	Apply What You Know Self Check Lesson Check	NJSLS MP.2, MP.4 MP.5, 2.MD.D.10 NJSLS. RI.2.1,W.2.6, SL.2.5 **Exploration 1 Define and Delimiting Engineering Problems** *Students will identify how classroom items solve problems, how it works and the materials used to make the object.*	**RTI/Extra Support:** Supply students with flashcards that identify each step of the design process. Have students place them in order. **ELL/ELD Strategy:** Make use of labeled diagrams to understand the content and develop vocabulary in context.

	-ask questions, make observations, and gather information -explore how to improve designs and how the structure of a design is related to its purpose **Instructional Strategies:** Anchor chart KWL chart Think-Pair-Share Evidence Notebook		*Suggested materials include classroom supplies, such as a stapler, scissors and tape.* Show students classroom objects. Allow students to work with a partner to brainstorm answers: *What is this? What problem does it solve? How does it work? Why is it shaped this way? What types of things were used to make it?* Have students choose any object in the classroom and brainstorm what the object is and how its design helps solve a problem. Allow each pair to present their object to the class. NJSLS MP.2,MP.4 MP.5, 2.MD.D.10 NJSLS.RI.2.1,W.2.6, SL.2.5 **Exploration 2** **Hands on Activity:**	**Extension:** Challenge students to apply a design solution process to a problem in their own lives. Have them make a poster or slide show to communicate their results. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			Make a Better Lunchbox *Students will observe and gather information in order to plan and build a solution to designing a better lunchbox. Suggested materials include a lunchbox, water bottle, aluminum foil, waxed paper, paper towels and cotton batting.* Students will identify a problem with the lunchbox. Students will record observations and record the materials they will use in order to help solve the problem. Students will draw a plan and include labels in their design. Students will build their solution. Discuss how their designs are different and similar to others and if they solved the problem.	
K-2-ETS1-3	**Essential Vocabulary:** strengths, weaknesses	Apply What You Know Self Check Lesson Check	NJSLS. MP.2, MP.4, MP.5, 2.MD.D.10 NJSLS. W.2.6, W.2.8 **Exploration 1**	**RTI/Extra Support** In a small group, present students with a problem and two solutions. Have

We are learning to analyze and compare multiple design solutions.	-focus on comparing solutions to a problem -analyze the strengths and weaknesses of a design for a stop sign -allow students to follow the steps of a design process for a simple problem **Instructional Strategies:** KWL chart Think-Pair-Share Collaborative learning Evidence Notebook		**Hands on Activity: Test a Bridge Design** *Students will analyze a paper bridge to determine why it does not work as intended. They will use their analysis to plan, build and test a new design that improves the stability of the bridge. Suggested materials include colored pencils, paper, and books.* Students will receive materials and will test a bridge design. They will first use paper flat. They will observe and record their data. Discuss strengths and weaknesses. Students will then fold the paper like a fan and test their new design. They will observe and record their data and compare to the first design. Students will share findings.	students discuss both solutions in their group. Have them compare the two solutions and explain which solutions best solves the problem. **ELL/ELD Strategy:** Make use of labeled diagrams to understand the content and develop vocabulary in context. **Extension:** Identify a problem within the classroom, design a solution, and identify weaknesses and strengths within the design. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual

			NJSLS. MP.2, MP.4, MP.5, 2.MD.D.10 NJSLS. W.2.6, W.2.8 **Exploration 2** **Hands on Activity: Compare Strengths and Weaknesses of Design Solutions** *Students will plan two solutions and then compare the strengths and weaknesses of the solutions. Suggested materials include uncooked spaghetti, marshmallows, masking tape, scissors and string.* Have students draw a tower design. Students may work together to build one tower, following the drawing. Have students use the results of their tests as evidence to think about why one tower design supports a marshmallow better than the other design. Have students identify strengths and	and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			weaknesses of the tower.	

21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues					
21st Century Skills Targeted					
Creativity & Innovation	**Information Literacy**	**Media Literacy**	**Critical Thinking & Problem Solving**	**Communication & Collaboration**	**Life & Careers**
Build a Bridge	**Leveled Readers:** How Do Engineers Solve Problems? Ben's Engineering Project	What Engineers Do? What Makes Bridges So Strong?	Unit Project: Runaway Wagon		Take it Further: Careers in Science and Engineering Mechanical Engineer
Summative Assessments: **Unit 1 Summative Assessments:** Engineering Design Process **Unit 1 Performance Task:** Build a Water Bottle Holder **Unit 1 Performance Task Scoring:** Rubric Students will use the design process to find a solution to build a design for a water bottle holder that will keep their hands free. Students will test and improve their designs. This supports building mastery of K-2-ETS1-1, K-2-ETS1-2, and K-2-ETS1-3.					

Unit 2: Matter
Time Frame: 22 Days

Essential Questions

What are the properties of matter?
How do heating and cooling change matter?
How does matter change?
How are objects put together?

Standards

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATIONS

2-PS1-1 - Plan and construct an investigation to describe and classify different kinds of materials by their observable properties.
2-PS1-2 - Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose.
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.
2-PS1-4 - Construct an argument with evidence that some changes caused by heating and cooling can be reversed and some cannot.

DISCIPLINARY CORE IDEAS

- **PS1.A Structure and Properties of Matter** Different properties are suited to different purposes. A great variety of objects can be built up from a small set of pieces.
- **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.

SCIENCE and ENGINEERING PRACTICES

Constructing Explanations and Designing Solutions

- Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.

Engaging in Argument from Evidence

- Construct an argument with evidence to support a claim.

Science Models, Laws, Mechanisms, and Theories

- Explain Natural Phenomena Scientists search for cause and effect relationships to explain natural events.

Analyzing and Interpreting Data

- Analyze data from tests of an object or tool to determine if it works as intended.

Planning and Carrying Out Investigations

- Plan and conduct an investigation collaboratively to produce data for evidence to answer a question.

CROSS CUTTING CONCEPTS

Energy and Matter

- Objects may break into smaller pieces and be put together into larger pieces, or change shapes.

Cause and Effect

- Events have causes that generate observable pattern.

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.

CONNECTIONS TO MATH

2.MD.D.10 Draw a picture graph and a bar graph with up to four categories. Solve simple put-together, take-apart, and compare problems using a bar graph.
2.NBT.2.4 Compare two three-digit numbers based on meanings of the hundreds, tens and ones digit, using <, =, and > symbols to record the results of comparisons
2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.G.A.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
MP.4 Model with mathematics

CONNECTIONS TO ELA

W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
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.
RI.2.8 Describe how reasons support specific points the author makes in a text.

Technology:
8.1.2.A.2 Create a document using a word processing application.
8.2.2.D.1 Collaborate and apply a design process to solve a simple problem from everyday experiences.
8.2.2.D.2 Discover how a product works by taking it apart, sketching how parts fit, and putting it back together.
8.2.2.D.3 Identify the strengths and weaknesses in a product or system.

Highlighted career Ready practices:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP6. Demonstrate creativity and innovation.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

SEL Practices & Competencies:
- Self-Management
- Social Awareness
- Responsible Decision-Making
- Relationship Skills

Overall Goal (What is the big idea?)
Students will describe and classify materials by their observable properties, select and use materials based on these properties, use evidence to describe how heating and cooling cause changes to matter, use evidence to describe reversible and irreversible changes to matter, and explore how an object can be taken apart and its pieces can be used to make another object.

Pre-Assessment: Unit 2 Pretest: Matter

(SLO) Student Learning Objectives (with standards)	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections

				suggested but not limited to the following
2.PS1-1 **We are learning to use evidence to describe and classify materials based on their observable properties.**	**Essential Vocabulary:** matter, property, solid, liquid -explore properties of matter as they discover that matter can be described and classified by their properties -Identify patterns that properties have **Instructional Strategies:** Evidence Notebook Think-Pair-Share Jigsaw KWL chart Cooperative learning	Self Check Lesson Check Apply What You Know	NJSLS. MP.4, 2.MD.D.10 NJSLS. W.2.8 **Exploration 1 Hands-on Activity: Explore Properties of Matter** *Students will plan and carry out tests on each of several different materials to determine their suitability as a pillow filler.* *Suggested Materials include cotton, foam, feathers, tissues, zippered pillow case (sandwich bags that seal can replace zippered pillow case)* Pose the question: Which material makes the best filler for a pillow? Students will observe the properties of each material. Remind students to use more than one sense when observing the properties. Students will make a	**RTI/Extra Support**. Brainstorm a list of words that are associated with different properties of matter (shape, color, size, and texture). List suggestions under each category. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Have students collect a variety of materials that can be categorized by their properties and make a poster or slide show to share what they found out with the class.

			plan. Guide students to write the property tested in a data recording chart. Guide students in analyzing their data from each test of the materials. Students will use observations as evidence to determine which material will be best to fill a pillow. NJSLS. MP.4, 2.MD.D.10 NJSLS. W.2.8 **Exploration 2 Developing Possible Solutions: Nametags** *Students will create a design and share with the class. Suggested materials include various art materials.* Students will work with a partner to design name tags to be used in the classroom. Then have students share their designs with the class and have them describe these properties of the object: color, shape,	**Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, document camera, charts, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			hardness, texture, and flexibility.	
2-PS1-3 **We are learning to use observations as evidence to explain how an object made of a small set of pieces can be taken apart and made into a new object.**	**Essential Vocabulary:** matter, property, solid, liquid -explore how objects can be put together from a small set of pieces -explore how those pieces can be taken apart and reused to make another object **Instructional Strategies:** Evidence Notebook Think-Pair-Share Jigsaw Cooperative learning	Apply What You Know Self Check Lesson Check	NJSLS. 2.G.A.2 NJSLS. W.2.8 **Exploration 1 Hands-On Activity: Build Objects from Smaller Pieces** *Students will design and implement a plan to find out how many objects they can build from the same set of pieces. Suggested materials include set of small pieces.* Students will make observations of the small pieces. Discuss the characteristics of the small objects and how they affect the objects' ability to be put together. Students will make sketches of each object made. Have students tally the number of objects at the end of the investigation and share their results with other groups. Students will use	**RTI/Extra Support:** Allow students to explore building objects from smaller pieces, taking the object apart, and building a different object with the same pieces. Materials can include connecting cubes, wood blocks or interlocking blocks. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Students can research careers that involve building objects from smaller pieces or taking objects apart. Provide print and online resources. Have

			observations as evidence to answer the investigation question. NJSLS. 2.G.A.2 NJSLS. W.2.8 **Exploration 2** **Take it Further: Careers in Science - Architect** *Students will investigate how architects design buildings.* Students will brainstorm types of materials architects might use when designing structures. Have students plan and draw a design of a building they would like to build. Students will share their drawings with classmates and explain how they used smaller pieces to make up their structure.	students share research with class. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, document camera, charts, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.
2-PS1-4 **We are learning to use evidence to describe**	**Essential Vocabulary:** melts, freezes	Apply What You Know Self Check Lesson Check	NJSLS. 2.NBT.A.4 NJSLS. RI.2.1 **Exploration 1** **Hands-on Activity: Explore Cooling**	**RTI/Extra Support:** Supply students with additional pictures of examples of liquids and

how heating and cooling matter may cause changes that can be observed.	-explore how heating and cooling can cause changes to matter -Identify that the changes generate observable patterns **Instructional Strategies:** Evidence Notebook Think-Pair-Share Jigsaw KWL chart Cooperative learning		*Students will explore how cooling causes changes to different materials, such as a flower, ice-cube tray, and orange juice. Students will identify patterns based on these events. Suggested materials include a flower, container of orange juice, an ice cube tray and a paper plate.* Students will begin by observing the solid and the liquid. Have students record their observations, including observations based on senses other than vision. Have students pour the liquid and solid into the ice-cube tray. Place the ice cube tray in the freezer. The next day, have students observe the materials and record observations. Students will analyze results and identify causes and effects.	solids and how these materials change from solid to liquid or from liquid to solid. Provide students with context of how these changes take place. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Complete research on gases and on how heating can change liquids to gases. Students can create a poster that illustrates the three states of matter of one material (water) and how it changes states. **Suggested Strategies for Students with Special Needs:**

			NJSLS. 2.NBT.A.4 NJSLS. RI.2.1 **Exploration 2: Matter Can Change: Melting Crayons** *Students will observe what happens when heat is applied to an object. Suggested materials include crayons, wax paper and a hair dryer.* Have students observe and list the properties of a crayon. After laying crayons on wax paper, apply heat with a hair dryer. Have students observe the crayons melting. Students will discuss with a partner the effects of applying heat to the crayons. Students will use details from their observations as evidence to how heat can cause changes to matter.	Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, document camera, charts, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.
2-PS1-4	**Essential Vocabulary:** reversible, irreversible	Apply What You Know Self Check Lesson Check	NJSLS. 2.OA.A.1 NJSLS. RI.2.8 **Exploration 1**	**RTI/Extra Support:** Provide additional opportunity for

We are learning to construct an argument with evidence that some changes to matter can be reversed and some cannot.	-explore that some changes to matter are reversible and some are not -observe patterns in reversible and irreversible changes caused by heating and cooling **Instructional Strategies:** KWL chart Think pair share Collaborative learning Evidence notebook Question-answer relationship (QAR)		**Hands-On Activity: Explore Changes to Matter** *Students will make a claim about the reversibility or irreversibility of changes caused by cooking in a microwave. They will support their claim with evidence from their observations during the exploration. Suggested materials include microwave, uncooked food such as popcorn kernels or raw egg, plastic measuring cup.* Have students observe uncooked food using senses of sight, touch as smell. Students should record as many properties of the food as they can. Place food in the microwave and have students observe the cooked food. Students will again record observations and use observations as	hands-on discovery. Allow students to explore freezing, melting and cooking; or show videos of cooking to demonstrate irreversible change and videos of making ice pops to demonstrate reversible change. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Have students research types of reversible and irreversible changes that are not caused by heating or cooling. Students can share what they find by making a poster or other display.

			evidence to analyze results and identify causes and effects. NJSLS. 2.OA.A.1 NJSLS. RI.2.8 **Exploration 2 Reversible Changes** *Students will observe the pattern that freezing and melting cause reversible changes to matter. Students will use observations to identify cause and effect relationships. Suggested materials include a bottle of lemonade, access to a freezer, and a thermometer.* Have students observe the lemonade at room temperature. Record list of properties. Put the lemonade in the freezer overnight. The next day, have students observe the frozen lemonade and discuss what happens when you	**Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, document camera, charts, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			put lemonade in the freezer. Later in the day, observe and record evidence to tell what happens when you take the lemonade out of the freezer and leave it at room temperature. Discuss patterns observed when liquid is cooled in a freezer and when heat is added back to the lemonade.	

21st Century Theme Targeted –Global Awareness: Using 21st century skills to understand and address global issues

21st Century Skills Targeted

Creativity & Innovation	Information Literacy	Media Literacy	Critical Thinking & Problem Solving	Communication & Collaboration	Life & Careers
	Leveled Readers: What Can We Learn About Matter? Making Coins	Changing States of Matter	**Unit Project:** Explore Melting		Take It Further: People is Science - Dr. Eugene Tssui Take It Further: How Foods Change

Summative Assessments: (include rubrics & exemplars)
Unit 2 Summative: Matter

Unit 2 Performance Task: Build a Model Boat
Unit 2 Performance Task Scoring: Rubric
Students will design tests and analyze data to determine which materials have properties best suited for their model boat. This supports building mastery of 2-PS1-1, 2-PS1-2, 2-PS1-3, and 2-PS1-4.

Unit 3: Earth's Surface
Time Frame: 12 Days

Essential Questions

Where is water found on Earth?
How can we map land and water?

Standards

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATIONS

2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.
2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.

DISCIPLINARY CORE IDEAS

- **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.

- **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.
- **ESS2.A Earth Materials and Systems** Wind and water can change the shape of the land.
- **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.

SCIENCE and ENGINEERING PRACTICES

Developing and Using Models

- Develop a model to represent patterns in the natural world.

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.

CROSS CUTTING CONCEPTS

Patterns

- Patterns in the natural world can be observed.

Stability and Change

- Things may change rapidly or slowly.

Influence of Engineering, Technology and Science on Society and the Natural World

- Developing and using technology has impacts on the natural world.

Science Addresses Questions About the Natural World and Material World

- Scientists study the natural and material world.

CONNECTIONS TO MATH

2.NBT.A.4 Compare two three-digit numbers based on meanings of the hundreds, tens and ones digits, using <, =, and > symbols to record the results of comparisons.

2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names and expanded form.

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.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.
MP.2 Reason abstractly and quantitatively
MP.4 Model with mathematics

CONNECTIONS TO ELA
W.2.8 Recall information from experiences, or gather information from provided sources to answer a question.

TECHNOLOGY:
8.1.2.A.2 Create a document using a word processing application.
8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums)
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.1.2.F.1 Use geographic mapping tools to plan and solve problems.

HIGHLIGHTED CAREER READY PRACTICES:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.

SEL PRACTICES & COMPETENCIES:
- Self-Management
- Social Awareness
- Responsible Decision-Making
- Relationship Skills

Overall Goal (What is the big idea?) Students will gather information to identify where water is located on Earth and develop maps to represent locations of land and water on Earth.

Pre-Assessment: Unit 4 Pretest: Earth's Surface

(SLO) Student Learning Objectives (with standards)	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
2-ESS2-3 **We are learning to gather information to identify that water is found in ponds, lakes, rivers and oceans on Earth.**	-explore the concept that water can be found on Earth -explore the different bodies of water -explore the concept that water exists in solid and liquid form -explore the topic of conserving and protecting Earth's water and observe bodies of water near where they live **Instructional Strategies:** KWL chart Concept web Jigsaw collaboration Evidence Notebook	Apply What You Know Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.NBT.A.4, 2MD.D.10 NJSLS. W.2.8 **Exploration 1** **Hands-on Activity 1: Locate Bodies of Water** *Students will use a variety of resources to obtain information about bodies of water near where they live and make a poster to share information. Suggested materials include resources about the area where you live, poster board and art materials.* Discuss the question that will need to be answered: *What bodies of water are located near where I live?* Guide the students to make a plan to research	**ELL/ELD Strategy:** Have students use index cards to write features of bodies of water (one feature per card). Have students sort the cards into pond, lake, river and ocean. **Extension:** Have students work in pairs to make a game that teaches about bodies of water. Students will include facts about different bodies of water. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers

	Think-Pair-Share		bodies of water where they live. After students research and record their data, have them share the information with their group members. Allow time for students to create a poster to show information and to include titles and labels. NJSLS. MP.2, MP.4, 2.NBT.A.4, 2MD.D.10 NJSLS. W.2.8 **Exploration 2 Collaboration Activity** *Students will work with peers in a collaboration activity to research and share facts about bodies of water. Students will need to be provided with access to print and online resources.* Divide students into four groups. Assign each group a body of water: pond, lake, river, ocean. Challenge students to identify facts about their assigned	instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			body of water. Then reorganize the students into groups of four with one child representing each body of water. Students will share their facts with the rest of their group. Students will make a poster to illustrate and label the four bodies of water.	
2-ESS2-2 **We are learning to develop a map to identify where land and water are located**	**Essential Vocabulary:** map, map title, map key, compass rose -explore maps as drawings or models that show where things are located -explore how a map shows different types of land and bodies of water -Identify parts of a map, including map title, map key, and compass rose -Use a map key to interpret a map of the United States	Apply What You Know Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.NBT.A.3, 2.MD.D.B.5 NJSLS. W.2.8 **Exploration 1 Hands-On Activity: Make a Map** *Students will need poster board and art materials.* Children will create a map of their school playground, including a map key and a compass rose. Guide students to make a plan for their map. Take students to a playground and have them record observations. When creating maps, remind students to include all	**RTI/Extra Support** Have students work in pairs and make a list of the types of land shown on the physical map of the United States. Students should identify the color used for each type of land. **Extension:** Have students research online or in books to find a map of a city or state in the United States that shows water, mountains, hills, plains, deserts, and/or water. Students should share

	Instructional Strategies: Jigsaw collaboration Evidence Notebook Think-Pair-Share Cooperative learning		parts they included in their plans. Have groups share and compare their maps and look for patterns. NJSLS. MP.2, MP.4, 2.NBT.A.3, 2.MD.D.B.5 NJSLS. W.2.8 **Exploration 2** **Hands on Activity: Plan a Field Trip** *Students will need poster board, art materials, and a map of a field trip destination, such as a zoo, museum, or amusement park.* Have students work in small. Provide each group with a map and access to an online virtual tour of an amusement park, zoo, museum, or other destination. Students will use the map and the tour to plan a field trip. Students will then share their plan with the class. Make sure children explain how they used	their maps with the rest of the class. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			the map and virtual tour to help plan their visit.	

21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues					
21st Century Skills Targeted					
Creativity & Innovation	**Information Literacy**	**Media Literacy**	**Critical Thinking & Problem Solving**	**Communication & Collaboration**	**Life & Careers**
	Leveled Readers: **Why Are Resources Important?** **All About Rocks**	**https://zoo.sandiegozoo.org/**	**Unit Project: Explore Ocean Water**		**Take It Further: Careers in Science & Engineering: Mapmakers** **Take it Further: People in Science & Engineering: John G. Ferris**
Summative Assessments: **Unit 3 Summative Earth's Surface** **Unit 3 Performance Task : Map an Island** **Unit 3 Performance Task Scoring: Rubric** Students will develop a model (map) to show where land and water are located to represent patterns in the natural world. This supports building mastery of 2-ESS2-2 and 2-ESS2-3.					

Unit 4: Changes to Earth's Surface **Time Frame: 22 Days**
Essential Questions
What changes on Earth happen slowly? What changes on Earth happen quickly? How can we prevent wind from changing the land?

How can we prevent water from changing the land?

Standards

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATIONS

2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

DISCIPLINARY CORE IDEAS

- **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.
- **ESS2.A Earth Materials and Systems** Wind and water can change the shape of the land.
- **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.

SCIENCE and ENGINEERING PRACTICES

Constructing Explanations and Designing Solutions

- Make observations from several sources to construct an evidence-based account for natural phenomena.

CROSS CUTTING CONCEPTS

Stability and Change

- Things may change slowly or rapidly.

Influence of Engineering, Technology and Science on Society and the Natural World

- Developing and using technology has impacts on the natural world.

Science Addresses Questions About the Natural World and Material World

- Scientists study the natural and material world.

CONNECTIONS TO MATH

2.NBT.A.1 Understand place value.

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.
MP.2 Reason abstractly and quantitatively.
MP.4 Model with mathematics.
MP.5 Use appropriate tools strategically.

CONNECTIONS TO ELA
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.
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).
W.2.8 Recall information from experiences or gather information from provided sources to answer a question.
SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.

TECHNOLOGY:
8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.
8.1.2.F.1 Use geographic mapping tools to plan and solve problems.

HIGHLIGHTED CAREER READY PRACTICES:
CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP5. Consider the environmental, social and economic impacts of decisions.
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
SEL PRACTICES & COMPETENCIES:

- Self-Management
- Social Awareness
- Responsible Decision-Making
- Relationship Skills

Overall Goal (What is the big idea?) Students will use evidence to explain that some changes to Earth happen slowly and some changes happen quickly. Students will find solutions to prevent wind and water from changing the land.
Pre-Assessment: Unit 5 Pretest Changes to Earth's Surface

(SLO) Student Learning Objectives (with standards)	**Student Learning Strategies**	**Formative Assessment ***suggested but not limited to the following*** **	**Activities ***suggested but not limited to the following*** **	**Modifications & Reflections ***suggested but not limited to the following*** **
2-ESS1-1 **We are learning to provide evidence that some changes to Earth happen slowly over time.**	**Essential Vocabulary:** weathering, erosion -observe how weathering by wind, water, ice and plants causes Earth's surface to change slowly -observe how erosion by wind, water, and ice cause slow changes to Earth **Instructional Strategies:** -Cooperative learning -Evidence Notebook -Think-pair-share -KWL chart -Question-answer relationship (QAR)	Apply What You Know Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.NBT.A.1 NJSLS. RI.2.1, W.2.7, W.2.8, SL.2.2 **Exploration 1: Hands-On Activity - Model Erosion** Students will build a model of a stream to observe what happens to Earth's Surface during erosion by water. *Suggested materials to build the stream include small rocks, soil, sand, foil tray or plastic tub, small book, container of water and plastic cup.* As students finish building their model, have students record observations. Remind students to pour the	**RTI/Extra Support:** Ask students to find more pictures of streams on the internet or in books. Have them draw a picture that predicts what the stream will look like in 1,000 years. **Extension:** Group students into groups of three. Assign each student one of the following topics: Cape Hatteras Lighthouse, Arches National Park, and the Great Lakes. Have students research the changes caused by weathering or erosion in these locations. Have them share their findings with the class.

			water on slowly and record observations after the water has been added. Encourage students to think about how their model changed after pouring the water and use their observations as evidence to explain the connection between their model and water erosion. NJSLS. MP.2, MP.4, 2.NBT.A.1 NJSLS. RI.2.1, W.2.7, W.2.8, SL.2.2 **Exploration 2: Modeling Erosion with Rocks** *Students will make observations of the weathering process using rocks and sandpaper.* Students will observe a rock and record observations. Students will rub the rock for 5 minutes using	**Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			sandpaper. Students will observe the rock again and use observations as their evidence to relate this process to weathering.	
2-ESS1-1 **We are learning to provide evidence that some changes to Earth happen quickly over time.**	**Essential Vocabulary:** earthquake, volcano, landslide, hurricane, flood -explore how earthquakes, volcanoes, landslides, hurricanes and floods cause Earth's surface to change quickly **Instructional Strategies:** - evidence notebooks - Think-pair-share - cooperative learning - KWL chart -Question-answer relationship (QAR)	Apply What You Know Lesson Check Self Check	NJSLS.MP.2, MP.4, 2.NBT.A.1 NJSLS. W.2.6, W.2.7 **Exploration 1** **Hands on Activity: Model Quick Changes on Earth** *Students will build a model to observe what happens to the Earth's surface during a flood. Suggested materials include water, container, rocks, soil, sand and disposable gloves.* Students will use materials to make a model of land. Students will draw a picture and record their observations before adding the water. Students will then pour water into their model to simulate a flood. Have	**RTI/Extra Support** Provide students with two sets of flash cards. One set will contain pictures of events, such as an earthquake, flood, volcano, hurricane and landslide. The second set will contain the words for each event. Have students match the correct word with its event. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson to assist children with strategies to summarize chunks of content. **Extension:**

			students draw a second picture and write about what their model looks like now that is has been flooded. Students will compare and analyze the before and after pictures and compare results with another group. Discuss how the differences they saw tell how water can quickly change Earth's surface. NJSLS.MP.2, MP.4, 2.NBT.A.1 NJSLS. W.2.6, W.2.7 **Exploration 2: Apply What You Know Earthquakes** *Students will model an earthquake and make observations to how it can change Earth's surface. Materials include graham crackers.* Students will break a graham cracker in half	Challenge students to search for information on one of the events that happened in the area they live. Students will make a poster or slideshow to present these facts about the event to the class. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			and put the two pieces back together so they touch. Students will move the two pieces together in a back and forth motion two times. Students will observe what happens to the crackers and record observations in their Evidence Notebook. Students will use evidence to describe how it is similar to what happens to the Earth's surface during an earthquake.	
2-ESS2-1 **We are learning to compare design solutions that prevent wind and water from changing the land.**	**Essential Vocabulary:** windbreaks, dike -focus on ways to prevent erosion to the land caused by wind and water -explore how wind and water cause the land to change over time -explore ways to prevent changes to land through	Apply What You Know Lesson Check Self Check	NJSLS. MP.2, MP.4, MP.5, 2.MD.B.5 NJSLS. RI.2.1 **Exploration 1: Prevent Water from Changing Land** *Students will design, test and redesign possible solutions to prevent water from changing the land.* *Suggested Materials include disposable gloves, soil, a small cup, plastic tub, water,*	**RTI/Extra Support** Provide students with a variety of pictures that show different solutions. Take students on a walk around the school and point out different solutions, such as a retaining wall or bushes planted on a hillside. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the

	the use of different types of technology **Instructional Strategies:** Cooperative learning Evidence Notebook Think-pair-share KWL chart		*toothpicks, craft sticks, chenille sticks, small rock, glue or tape, and clay or modeling clay.* Students will first build a model. Discuss what a model is and why it's important to build a model. Students will then pour the water into their model and record observations and data about the changes made to their model. Students will implement a solution to slow down or prevent changes by the water. Students will then pour water into their new model with the water damage prevention design. Record observations and data about the changes made to their new model design. NJSLS. MP.2, MP.4, MP.5, 2.MD.B.5 NJSLS. RI.2.1 **Exploration 2:**	lesson to assist children with strategies to summarize chunks of content. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Challenge students to research different words that can be used to describe words of wind. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are

			Take It Further: Geotechnical Engineer *Discuss wind or water damage in your area. Students will design a structure to reduce damage from wind or water.* Students will work with a small group to research different structures that could prevent or slow down the problem. Students will build a design structure that would reduce damage from wind or water. Students will draw and label their design and share ideas to a partner.	complex, allow students to complete the first several steps before giving more directions.

21st Century Theme Targeted – Global Awareness: Using 21st century skills to understand and address global issues					
21st Century Skills Targeted					
Creativity & Innovation	**Information Literacy**	**Media Literacy**	**Critical Thinking & Problem Solving**	**Communication & Collaboration**	**Life & Careers**
Unit Project: Make a Windbreak	**Leveled Readers:** Why Are Resources Important? All About Rocks	Fast Land Changes Slow Land Changes	**Unit Performance Task -** Build an Earthquake-Proof Structure		**Take It Further:** Geotechnical Engineer

					Take It Further: **People in Science & Engineering: Dr. Rosaly M.C. Lopes**

Summative Assessments:
Unit 4 Summative Changes to Earth's Surface
Unit 4 Performance Task: Build an Earthquake-Proof Structure
Unit 4 Performance Task Scoring: Rubric
Students will plan and design a solution to a problem in order to compare and test possible designs of an earthquake-proof structure that will impact the natural world. This supports building mastery of 2-ESS1-1 and 2-ESS2-1.

Unit 5: Environments for Living Things
Time Frame: 22 Days

Essential Questions

What do plants need?
How do plants depend on animals?

What plants and animals live in water habitats?
What plants and animals live in land habitats?

Standards

Standards / CPIs (cumulative Progress Indicators) taught and assessed:

PERFORMANCE EXPECTATIONS

2-LS2-1 - Plan and conduct an investigation to determine if plants need sunlight and water to grow.
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.
2-ESS1-1 - Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

DISCIPLINARY CORE IDEAS

- **LS2.A Interdependent Relationships in Ecosystems** Plants depend on water and light to grow. Plants depend on animals for pollination or to move their seeds around.
- **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.
- **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.
- **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.

SCIENCE and ENGINEERING PRACTICES

Planning and Carrying Out Investigation

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. Make observations(firsthand or from media) to collect data which can be used to make comparisons.

Developing and Using Models

- Develop a simple model based on evidence to represent a proposed object or tool.

Scientific Knowledge is Based on Empirical Evidence

- Scientists look for patterns and order when making observations about the world.

Constructing Explanations and Designing Solutions

- Make observations from several sources to construct an evidence-based account for natural phenomena.

CROSS CUTTING CONCEPTS

Cause and Effect

- Events have causes that generate observable patterns.

Structure and Function

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

Stability and Change

- Things may change slowly or rapidly.

CONNECTIONS TO MATH

2.OA.C.4 Use addition to find the total numbers of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
MP.2 Reason abstractly and quantitatively.
MP.4 Model with mathematics.

CONNECTIONS TO ELA

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).
W.2.8 Recall information from experiences or gather information from provided sources to answer a question.

TECHNOLOGY:

8.1.2.A.2 Create a document using a word processing application.
8.1.2.A.4 Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.2.E.1 Use digital tools and online resources to explore a problem or issue.

HIGHLIGHTED CAREER READY PRACTICES:

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason. CRP5. Consider the environmental, social and economic impacts of decisions.

SEL PRACTICES & COMPETENCIES:

- Self-Management
- Social Awareness

- Responsible Decision-Making
- Relationship Skills

Overall Goal (What is the big idea?) Students will investigate what plants and animals need to live and grow and develop models to show how plants depend on animals. Explore environments to identify observable patterns. Observe plants and animals to compare diversity of life in water and land habitats.

Pre-Assessment: Unit 3 Pretest Environments for Living Things

Please include interdisciplinary connections resources and plan in each activity

(SLO) Student Learning Objectives (with standards)	Student Learning Strategies	Formative Assessment ***suggested but not limited to the following***	Activities ***suggested but not limited to the following***	Modifications & Reflections ***suggested but not limited to the following***
2-LS2-1 **We are learning to construct an argument with evidence that plants are living things that need certain things to grow and to stay healthy.**	**Essential Vocabulary:** nutrients, pollen, habitat - focus on what plants need to be healthy and grow - explore the things of a plant needs(water, sunlight, air, nutrients, and space) and why plants need these elements	Evidence Notebook Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.OA.C.4 NJSLS. W.2.7, W.2.8 **Exploration 1: Hands-On Activity: Explore What a Plant Needs** *Students need 2 large clear plastic containers, measuring cup, water, red food coloring, 2 celery stalks with leaves, and a red crayon per group.* Students work in groups to plan and conduct an investigation to see how	**RTI/Extra Support:** Display an illustration of a labeled plant and use flash cards to describe the purpose of each plant. Then match the purpose to the part of the plant shown in the illustration. **Extension:** Have students to think about other parts of a plant might have, such as seeds, flowers, and fruits. Use resources to identify other parts and

	- investigate how a plant uses water to get what it needs **Instructional Strategies:** - Evidence notebooks - Think-pair-share - Cooperative learning - Jigsaw -Question-answer relationship (QAR)		water moves through plants by having two containers filled with water. Add red food coloring to one container and place the celery stalks in each container. Leave the plants in the cups until the next day. Observe and record observations. Analyze results and identify the cause and effects, look for patterns. Students will use data to serve as evidence to answer questions. NJSLS. MP.2, MP.4, 2.OA.C.4 NJSLS. W.2.7, W.2.8 **Exploration 2: Comparing 2 plants** *After observing a healthy and unhealthy*	what they do and present their findings to the class. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson to assist children with strategies to summarize chunks of content. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions,

			plant, students will use observations as evidence to determine what plants need to be healthy. *Suggested materials include a healthy and unhealthy plant.* After observing a healthy and unhealthy plant, students will document observations in Evidence Notebook. Students will provide evidence to describe what the unhealthy plant needs to look more like the healthy plant. Students will also identify patterns observed.	such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.
2-LS2-2 **We are learning to develop a simple model to show how plants depend on animals within their environment.**	**Essential Vocabulary:** Pollen -focus on how plants depend on animals for pollination and seed dispersal from one location to another -explore ways animals move plants seeds based	Evidence Notebook Lesson Check Self Check	NJSLS. MP.4, 2.MD.D.10 NJSLS. SL.2.5 **Exploration 1: Hands-On Activity: Plan and Build a Model Tool** *Students need 3 kinds of seeds, straws,toothpicks, craft sticks, masking tape, string*	**RTI/Extra Support** Provide children with additional pictures and videos of pollen in flowers and animals transporting it. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the

	on their shape and structure -plan and build a model tool to move seeds -explore how animals move pollen so new plants may grow **Instructional Strategies:** Cooperative learning Evidence Notebook Think-pair-share KWL chart		Students make a plan to build a tool that will pick up and move different seeds and record the plan. Students select materials and design a model, test tool to find out which seeds it can move and record data. Students identify how the shape and structure of tool affected how it worked. NJSLS. MP.4, 2.MD.D.10 NJSLS. SL.2.5 **Exploration 2: Animals Helping Plants** *Students will use resources to determine how an animal can help a plant. Suggested materials include online and print resources.* Have students work in small groups to research how animals help plants (spreading of seeds and spreading of pollen).	lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Students can research pollen and how it is needed for plants to make new seeds. Students can share their findings with the class. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first

			Students will discuss the kinds of animals that might have helped the plant. Students will provide evidence to support their answers. Students will create a slideshow to document ways an animal can help a plant and provide evidence to support their ideas. Students will share with classmates.	several steps before giving more directions.
2-LS4-1 **We are learning to make observations of plants and animals to compare the diversity of life in water habitats.**	**Essential Vocabulary:** habitat -focus on living things found in the habitats within a pond, river delta, and tide pool -explore why specific plants and animals live in each habitat -compare the diversity of life found within different habitats **Instructional Strategies:**	Evidence Notebook Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.MD.D.10 NJSLS. W.2.7, W.2.8 **Exploration 1: Hands-On Activity Make a Model Habitat** *Students will plan and build a model of a tide pool habitat. They will observe the habitat and identify patterns. Suggested materials include a plastic container, various rocks, markers, rubber sea creatures and water.*	**RTI/Extra Support:** Make a chart to compare a pond, river, delta, and tide pool. Work with children to list the features of each place as well as the plants and animals in each one. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on

	Cooperative learning Evidence Notebook Think-pair-share KWL chart Jigsaw		Students will plan a model for their habitat. Remind students to use their plan as they build the model. Have students use drawings and words to record their observations. Allow students to analyze their results and compare models with classmates to identify patterns and share what they know about tide pools. NJSLS. MP.2, MP.4, 2.MD.D.10 NJSLS. W.2.7, W.2.8 **Exploration 2: Collaboration Activity Life in a Pond** *Students will work with peers in a collaboration activity to research and share facts about plants and animals in a pond (lilly, iris, dragonfly, crayfish, sunfish and tadpole). Students will need to be provided*	examples of materials when possible. **Extension:** Have students research another water habitat, such as the sea floor, shallow seas, or salt marshes. Student can make visual display (poster, slide show or diorama) to share the information. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures.

			with access to print and online resources and art materials. Divide students into six groups. Assign each group an animal or plant (listed above). Challenge students to identify facts about their assigned animal/plant. Then reorganize the students into groups of six with one child representing each animal/plant. Students will share their facts with the rest of their group. Students will work together to make a poster of a pond to include drawings, labels and facts.	When directions are complex, allow students to complete the first several steps before giving more directions.
2-LS4-1 **We are learning to make observations of plants and animals to compare the diversity of life in land habitats.**	**Essential Vocabulary:** habitat - explore living things found in land habitats within a rainforest, forest, and savanna - explore the relationships and	Evidence Notebook Lesson Check Self Check	NJSLS. MP.2, MP.4, 2.MD.D.10 NJSLS, W.2.7, W2.8 **Explorations 1: Hands-On Activity Make a Habitat Exhibit** *Students will make a plan to research and compare plants and*	**RTI/Extra Support** Explore additional habitats by having children identify animals that live in different places. Example, an elephant could live in a zoo. Keep a chart of how

	characteristics of plants and animals that live in each habitat - compare plants and animals across the habitats **Instructional Strategies:** Cooperative learning Evidence Notebook Think-pair-share KWL chart		*animals that live in a habitat and display their results in an exhibit. Suggested materials include books and fact cards about animals, pencils, poster board, and makers.* Present students with the question: How can you compare plants and animals that live in a habitat? Students will work with a group to decide which habitat to explore. Assist students in narrowing down the plants and animals within the same habitat and discuss what information they want to collect. Guide students as they research and record observations. Allow groups to make a poster or slide show about their selected plants and animals. Have students display and present their exhibits to classmates. Students will then	many different habitats the children can locate. **ELL/ELD Strategy:** Point out all labels, pictures, captions and headings throughout the lesson. Discuss real-life connections to content and provide hands-on examples of materials when possible. **Extension:** Take a virtual field trip to a zoo. Discuss where the animals in the zoo live in their natural habitat. Discuss how the zoo accommodates the needs of different animals that live there. **Suggested Strategies for Students with Special Needs:** Work in cooperative groups or with partners. Allow students to respond orally or illustrate answers instead of responding in

			analyze the results of the research and look for patterns within the habitats. NJSLS. MP.2, MP.4, 2.MD.D.10 NJSLS, W.2.7, W2.8 **Exploration 2: Rainforest Habitat** *Students will create a flipbook to illustrate and provide facts about the rainforest. Suggested materials include paper, art materials and research resources.* Students will begin by creating a flipbook to illustrate the layers of the rainforest. On the cover, students will illustrate what each layer of the rainforest looks like. On the inside flap, students will list facts about each layer. Students will choose an animal that lives in the rainforest and explore	a written format. Use a combination of visual and auditory directions, such as the star board, charts, document camera, or pictures. When directions are complex, allow students to complete the first several steps before giving more directions.

			reasons to tell why the rainforest is a good place for that animal to live. Students will discuss their ideas and record answers in Evidence Notebooks.	

21st Century Theme Targeted –Global Awareness: Using 21st century skills to understand and address global issues					
21st Century Skills Targeted					
Creativity & Innovation	**Information Literacy**	**Media Literacy**	**Critical Thinking & Problem Solving**	**Communication & Collaboration**	**Life & Careers**
	Leveled Readers: **How Do Living Things Survive in Their Environments?** **Meet the Amazing Monarch Butterfly**	**Habitats**	**Unit Project: Explore Plant Habitats**		**Take It Further: Where Plants Grow** **Take It Further Careers in Science: Marine Biologist**
Summative Assessments: **Unit 5 Summative: Environments for Living Things** **Unit 5 Performance Task: Observe an Ant Farm** **Unit 5 Performance Task Scoring: Rubric** Students will carry out an investigation to observe animals in order to compare their lives within an ant farm habitat and to identify how its shape and stability relate to its function. This supports building mastery of 2-LS2-1, 2-LS2-2, 2-LS4-1, and 2-ESS1-1					