Unit One Earth's Land and Water

2nd Grade: Suggested Pacing: 5 weeks/ end of MP1

Unit Summary: 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. 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.

Vocabulary: boulder, canyon, downstream, erosion, flow, lake, landslide, liquid, ocean, rapidly, river, slowly, solid, weathering

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

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

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

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

- **2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing 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 different designs for using shrubs, grass, and trees to hold back the land.*

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

  ● 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.

Enduring Understandings	Essential Question
Students will understand that: ● Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form.	**How and why is Earth constantly changing?** **Questions to Guide Instruction**

• Wind and water can change the shape of the land. • The changes in the shape of land can be quick or slow and people can do build things to change how quick it happens.	• *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?* • *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?*

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions • Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1) • Compare multiple solutions to a problem. (2-ESS2-1) **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-ETS1-2)	**ESS2.C: The Role 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) 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) **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	**Stability and Change** • Things may change slowly or rapidly. (2-ESS1-1) **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)

	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-2-ETS1-1) **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-2-ETS1-2)	

Stage 2 – Model Assessments	
Summative Performance Task(s) ● Performance Task #1: (2-ESS2-3, 2-ESS2-2) Students will illustrate a map that represents landforms and bodies of water in an area. The illustration must include several types of landforms and water (both solid and liquid forms). ● Performance Task #2: (2-ESS1-1, 2-ESS2-1) In this task, students will work collaboratively to illustrate and explain how water causes beach erosion and present a solution to beach erosion. ● Make Your Own Erosion! ● Writing Task: Imagine you are a big rock high in	**Formative Evidence:** *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?* ***Students who understand the concepts are able to:*** ● Develop a model to represent the shapes and kinds of land and bodies of water in an area. *(Assessment does not include quantitative scaling in models.)*

the mountains that gets washed down into a river during a thunderstorm. Write a story telling what happens to you and where you end up. Mystery Science Assessments are available for both the end of each mystery and the end of each unit. Rubric Options: Primary Science Rubric This rubric is appropriate for use with younger children. It shows how a seed develops, from being planted to becoming a flowering plant. Each growth level represents a different level of performance. Science Rubric The Exemplars Science Rubric is based on the following science standards: The National Research Council and the American Association for the Advancement of Science and New Standards. It includes four criteria: use of scientific tools, science reasoning and strategies, science concepts and,use of data and communication.	*What evidence can we find to prove that Earth events can occur quickly or slowly?* ***Students who understand the concepts are able to:*** ● Use information from several sources to provide evidence that Earth events can occur quickly or slowly. *(Assessment does not include quantitative measurements of timescales.)* Some examples of these events include: ○ Volcanic explosions ○ Earthquakes ○ Erosion of rocks. *In what ways do humans slow or prevent wind or water from changing the shape of the land?* ***Students who understand the concepts are able to:*** ● Compare multiple solutions to a problem. ● Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. Examples of solutions could include: ● Different designs of dikes and windbreaks to hold back wind and water ● Different designs for using shrubs, grass, and trees to hold back the land.

Stage 3 – Learning Plan Resources and Activities
Suggested Resources for Planning:

Mystery Science: Work of Water: Erosion and Earth's Surface
Mystery Lessons 1-4
"Optional Extras" are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery's topic, assessments, and suggestions for supplemental activities.

Mystery 1: If you floated down a river, where would you end up?

Standard:2-ESS2-2, 2-ESS2-3
Target:

- I can develop a model to represent the shapes and kinds of land and bodies of water.
- I can obtain information to identify where water is found on Earth and that it can be solid or liquid.

Videos:
Landforms, Hey!
Exploring Landforms and Bodies of Water for Kids
2-ESS1-1, 2-ESS2-1 Why Do Rivers Curve?
The Wonder of Science- A Changing Earth
Magic School Bus Rocks and Rolls

Epic Books: Available through Clever

Mystery 2: Why is there sand at the beach?

Standard:2-ESS2-1, 2-ESS2-2
Target:

- I can compare multiple solutions designed to slow or prevent wind or water
- I can develop a model to represent the shapes and kinds of land and bodies of water.
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- ***2.ESS1-1, 2-ESS2-2 Augmented Reality Sandbox***

The Wonder of Science- A Changing Earth
Weathering and Erosion
When Water Moves Sediments Water on Earth

Videos:
Bill Nye-Erosion
Magic School Bus Rocks and Rolls

Mystery 3: What's strong enough to make a canyon?

Standard:2-ESS1-1, 2-ESS2-1, and 2-ESS2-2
Target:

- I can use information from several sources to provide evidence that Earth events can occur quickly or slowly.
- I can compare multiple solutions designed to slow or prevent wind or water
- I can develop a model to represent the shapes and kinds of land and bodies of water.

2-ESS1-1, 2-ESS2-1 How was the Grand Canyon Formed?

2-ESS2-3 Glacier National Park is Melting Away

The Wonder of Science- A Changing Earth

Landform Reading Passages

ReadWorks.org
Weathering and Erosion
A Grand Old Canyon

Reading AZ

Videos:
How Glaciers Change the World!
The Grand Canyon!

Mystery 4: How can you stop a landslide?

Standard: 2-ESS2-1, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3
Target:

- I can compare multiple solutions designed to slow or prevent wind or water

- I can ask questions, make observations, and gather information about a situation people want to change, develop possible solutions through the development of a new or improved object or tool, and choose the best design solution.
- I can develop a simple sketch, drawing, or model to illustrate how an object can solve a given problem.
- I can analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of each.

2-ESS1-1, 2-ESS2-1 Epic Mudslide Caught on Camera

Books:

Earth's Landforms and Bodies of Water by Natalie Hyde
Cracking Up - A Story About Erosion by Jacqui Bailey
Earth's Landforms and Bodies of Water by Natalie Hyde

Readworks.org:

Weathering and Erosion
A Dangerous Landslide

Unit Two Properties and Changes of Matter

2nd Grade: Suggested Pacing: 5 weeks/ end of MP2

Unit Summary: In this unit of study, students demonstrate an understanding of observable properties of materials through analysis and classification and testing of different materials.

Vocabulary: classify, disassemble, gas, liquid, matter, properties, reversible, solid, temperature

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

Performance Expectations: (PE) (Established Goals / Content Standards)

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

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

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

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

- **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.**

Enduring Understandings:	Essential Questions
• Different kinds of matter exist and many of them can be either solid or liquid, depending on the temperature. • Matter can be described and classified by its observable properties. • Different properties of materials make them	**How do the properties of materials determine their use?** *How can we sort objects into groups that have similar properties?* *Why are some materials better for a house than others?*

suited to different purposes. ● Objects may break into smaller pieces and be put together into larger pieces or change shapes. ● Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.	*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?*

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● 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** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ● Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ● Make observations (firsthand or from media) to	**PS1.A: Structure and Properties of Matter** Different kinds of matter exist and many of them can be either solid or liquid, depending on the temperature. ● Matter can be described and classified by its observable properties. (2-PS1-1) ● Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) ● A great variety of objects can be built up from a small set of pieces. (2-PS1-3) **PS1.B: Chemical Reactions** Heating or cooling a substance may cause changes that can be observed. ● Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4)	**Patterns** Patterns in the natural and human designed world can be observed. (2-PS1-1) **Cause and Effect** Events have causes that generate observable patterns. (2-PS1-4) ● Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) **Energy and Matter** Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3) --- **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

construct an evidence-based account for natural phenomena. (2-PS1-3) **Engaging in Argument from Evidence** Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). • Construct an argument with evidence to support a claim. (2- PS1-4) ---------------------- **Connections to Nature of Science** **Science Models, Laws, Mechanisms, and Theories** • Explain Natural Phenomena Scientists search for cause and effect relationships to explain natural events. (2-PS1-4)		world. (2-PS1-2)

Stage 2 – Model Assessments	
Summative Performance Task(s): **Performance Task #1: (2-PS1-1)** Sort objects into groups according to their properties. Explain how groups were determined. **Performance Task #2**: (**2-PS1-3)** Design and create two different real world structures using the same building materials. Devise an argument supporting how the same materials are used for different purposes.	**Formative Evidence:** **How do the properties of materials determine their use?** *How can we sort objects into groups that have similar properties?* **Students who understand the concepts can:** • Plan and conduct an investigation to describe and classify different kinds of material by their observable properties. Observations could include color, texture, hardness, and flexibility. *Why are some materials better for a house than others?* ***Students who understand the concepts can:***

expected results for each experiment. Defend your predictions. Mystery Science Assessments are available for both the end of each mystery and the end of each unit. Primary Science Rubric This rubric is appropriate for use with younger children. It shows how a seed develops, from being planted to becoming a flowering plant. Each growth level represents a different level of performance. Science Rubric The Exemplars Science Rubric is based on the following science standards: The National Research Council and the American Association for the Advancement of Science and New Standards. It includes four criteria: use of scientific tools, science reasoning and strategies, science concepts and use of data and communication.	• Analyze data from tests of an object or tool to determine if it works as intended. • Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of each. *In what ways can an object made of a small set of pieces be disassembled and made into a new object?* **Students who understand the concepts are able to:** • *Break objects into smaller pieces and put them together into larger pieces or change shapes.* *Can all changes caused by heating or cooling be reversed?* **Students who understand the concepts are able to:** • Construct an argument with evidence that some changes caused by heating or cooling can be reversed, and some cannot. *(Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include: cooking an egg, heating paper)*

Stage 3 – Learning Plan
Suggested Resources for Planning: **Mystery Science: Material Magic** *Properties and Phases of Matter*: **Mystery Lessons 1-5** “Optional Extras” are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery’s topic, assessments, and suggestions for supplemental activities.

Mystery 1: Why do we wear clothes?

Standard:2-PS1-1, 2-PS1-2, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3

Target:

- I can plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- I can analyze data obtained from testing different materials and determine which materials have the properties best suited for the intended purpose.
- I can ask questions, make observations, and gather information about a situation people want to change, develop possible solutions through the development of a new or improved object or tool, and choose the best design solution.
- I can develop a simple sketch, drawing, or model to illustrate how an object can solve a given problem.
- I can analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of each.

Videos:

Bill Nye Properties of Matter

Matter Compilation: Crash Course Kids

Mystery 2: Can you really fry an egg on a sidewalk?

Standard:2-PS1-1, 2-PS1-2

Target:

- I can plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- I can analyze data obtained from testing different materials and determine which materials have the properties best suited for the intended purpose.

Mystery 3: Why are so many toys made out of plastic?

Standard:2-PS1-1, 2-PS1-2, 2-PS1-4

Target:

- I can plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- I can analyze data obtained from testing different materials and determine which materials have the properties best suited for the intended purpose.
- I can construct an argument with evidence that some changes caused by heating and cooling can be

reversed and some cannot.

Mystery 4: What materials might be invented in the future?

Standard: 2-PS1-1, 2-PS1-2, K-2-ETS1-1, K-2-ETS1-2
Target:

- I can plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- I can analyze data obtained from testing different materials and determine which materials have the properties best suited for the intended purpose.
- I can ask questions, make observations, and gather information about a situation people want to change, develop possible solutions through the development of a new or improved object or tool, and choose the best design solution.
- I can develop a simple sketch, drawing, or model to illustrate how an object can solve a given problem.

The Wonder of Science- Matter and Materials

ReadWorks.org

Epic Books:

Mystery 5: Could you build a house out of paper?

Standard: 2-PS1-2, 2-PS1-3, K-2-ETS1-2, K-2-ETS1-3
Target:

- I can ask questions, make observations, and gather information about a situation people want to change, develop possible solutions through the development of a new or improved object or tool, and choose the best design solution.
- I can develop a simple sketch, drawing, or model to illustrate how an object can solve a given problem.

Epic Books/Read Alouds:

What Are Atoms? by Lisa Trumbauer
What Is Matter? by Don L. Curry
Wax to Crayons by Inez Snyder
Amazing Materials by Sally Hewitt
What's the Matter in Mr. Whiskers' Room? by Michael Elsohn Ross
Change It! Solids, liquids, gases and you by Adrienne Mason
What is the World Made Of? All about solids, liquids, and gases by Kathleen Weidner
Zoehfeld *Solids, Liquids, and Gases* by The Ontario Science Centre

Videos: ***Bill Nye Properties of Matter*** ***Matter Compilation: Crash Course Kids***

Unit 3 Biodiversity of Life

Grade 2: Suggested Pacing: 5 weeks / end of MP3

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)
Unit Summary In this unit of study, students compare the diversity of life in different habitats. Students will develop a sense of wonder for biodiversity: the range and variety of animals found on Earth. **Vocabulary: classifying, diversity, habitat, species**
Performance Expectations: : (PE) (Established Goals / Content Standards) ● **2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.** ○ Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats. ○ *Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.*

Enduring Understandings	**Essential Questions**
Students will understand that: ● 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.	***Why do we see different living things in different habitats?***

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.	**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.	Students identify **patterns** in animal's characteristics in order to group them. Students identify **patterns** in frog calls in order to determine how biodiverse a habitat is. Students explore the **cause and effect** relationship between bird feeder design and the type of food in it and the types of birds that visit it.

Make observations (firsthand or from media) to collect data which can be used to make comparisons. **Connections to Nature of Science** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world.		

Stage 2 –Model Assessment	
Summative Performance Task(s): **Performance Task # 1:** Create a Triorama that illustrates a habitat. Include several living things (plant and animal) in the drawing. Describe why that ecosystem has those specific living things. **Performance Task #2 :** Use classroom materials to create a model of an imaginary animal according to the classification characteristics. Identify, describe, and illustrate the animal's habitat. Create oral presentation explaining how their animal survives in their habitat. Mystery Science Assessments are available for both the end of each mystery and the end of each unit. Optional Rubrics: • Primary Science Rubric This rubric is appropriate for use with younger children. It shows how a seed develops, from being planted to becoming a flowering plant. Each growth level represents a different level of performance.	**Formative Evidence:** *Why do we see different living things in different habitats?* ***Students who understand the concepts can:*** • Look for patterns and order when making observations about the world. • Make observations to collect data that can be used to make comparisons. • Make observations of plants and animals to compare the diversity of life in different habitats.

• Science Rubric The Exemplars Science Rubric is based on the following science standards: The National Research Council and the American Association for the Advancement of Science and New Standards. It includes four criteria: use of scientific tools, science reasoning and strategies, science concepts and, use of data and communication.	

Stage 3 – Learning Plan
Suggested Resources for Planning: **Mystery Science: Animal Adventures:** Animal Biodiversity**- Mystery Lessons 1-3** “Optional Extras” are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery’s topic, assessments, and suggestions for supplemental activities. **Mystery 1: How many different kinds of animals are there?** Standard:2-LS4-1 Target: - I can make observations of plants and animals to compare the diversity of life in different habitats **Videos:** **Amazing Animal Groups** 2-LS2-1 Farming Fish with Vegetables

Mystery 2: Why do frogs say “ribbit”?
Standard:2-LS4-1
Target:

- I can make observations of plants and animals to compare the diversity of life in different habitats.

Mystery 3: How could you get more birds to visit a bird feeder?

Standard:2-LS4-1, K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3
Target:

- I can make observations of plants and animals to compare the diversity of life in different habitats.
- I can ask questions, make observations, and gather information about a situation people want to change, develop possible solutions through the development of a new or improved object or tool, and choose the best design solution.
- I can develop a simple sketch, drawing, or model to illustrate how an object can solve a given problem.
- I can analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of each.

The Mystery of the Missing Bees

2-LS4-1 Exploring Microhabitats
2-LS4-1 Virtual Field Trips

Books:
Read Aloud(s)
My Home in the Rainforest by J. Patrick Lewis
Water Habitats by Bobbie Kalman

Reading A-Z:

Animals, Animals
Multilevel Book, Informational (nonfiction), 83 words, Level E (Grade 1),
ELL EditionEarth's Water
Informational (nonfiction), 240 words, Level H (Grade 1)
Multilevel Book also available in levels K and N
Animal Discoveries
Informational (nonfiction), 1,203 words, Level U (Grade 4)
Multilevel Book also available in levels O and R
Legs, Wings, Fins, and Flippers

ReadWorks.org:
What’s the Big Idea About Biodiversity?
Spot the Species
Water and the Earth
Living Things and their Habitats Animals

Unit Four Plant Adaptations

2nd grade/ 5 weeks / Start of MP4

Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)
Unit Summary 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. **Vocabulary: biodiversity, communicate, dispersing, ecosystems, photosynthesis, pollinating**
Performance Expectations: (PE) (Established Goals / Content Standards) ● **2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.** ○ *Assessment Boundary: Assessment is limited to testing one variable at a time.* ● **2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.** ● **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.**

Enduring Understanding	**Essential Question**
Students will understand that: ● 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.	***Why do we see different living things in different habitats?*** *What do plants need to live and grow?* *Why do some plants rely on animals for reproduction?*

Science & Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**
Planning and Carrying Out Investigations ● Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(2-LS2-1) ● Make observations (firsthand or from media) to collect data that can be used to make comparisons.	**LS2.A: Interdependent Relationships in Ecosystems** ● Plants depend on water and light to grow.(2-LS2-1) ● Plants depend on animals for pollination or to move their seeds	**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

(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)	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. (K-2-ETS1-1)	objects are related to their function(s). (2-LS2-2), (K-2-ETS1-2) --------------------------------- ***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)

Stage 2 –Model Assessments	
Summative Performance Task(s): **Performance Task #1**: Invent and design a machine or product a human can use to disperse seeds like an animal. Describe how the product replicates how the seed is carried and dispersed by the animal in its habitat.	**Formative Evidence:** *What do plants need to live and grow?* **Students who understand the concepts can:** ● Plan and conduct an investigation to determine whether plants need sunlight and water to grow. *Why do some plants rely on animals for reproduction?* **Students who understand the concepts can:**

Mystery Science Assessments are available for both the end of each mystery and the end of each unit. **Audience:** • Primary Science Rubric This rubric is appropriate for use with younger children. It shows how a seed develops, from being planted to becoming a flowering plant. Each growth level represents a different level of performance. • Science Rubric The Exemplars Science Rubric is based on the following science standards: The National Research Council and the American Association for the Advancement of Science and New Standards. It includes four criteria: use of scientific tools, science reasoning and strategies, science concepts and, use of data and communication.	• Develop a simple model that mimics the function of an animal dispersing seeds or pollinating plants. • 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.

Stage 3 – Learning Plan
Suggested Resources for Planning: **Mystery Science: Plant Adventures: *Plant Adaptation*   Mystery Lessons 1-5** “Optional Extras” are extensions to each Mystery. We recommend you use them during your unit or to extend the length of each unit. They include an informational text reading that builds on the Mystery’s topic, assessments, and suggestions for supplemental activities. **Tower Garden lessons**

Mystery 1: How did a tree travel halfway around the world?

Standard:2-LS2-2

Target:

- I can develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

The Wonder of Science- Ecosystems

Videos:

Magic School Bus Goes to Seed

2-LS2-1, 2-LS2-2, 2-LS4-1 Plant Your Socks

Mystery 2: Do plants eat dirt?

Standard:2-LS2-1, 2-LS4-1

Target:

- I can plan and conduct an investigation to determine if plants need sunlight and water to grow.
- I can make observations of plants and animals to compare the diversity of life in different habitats.

Mystery 3: Why do trees grow so tall?

Standard:2-LS2-1

Target:

- I can plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-1, 2-LS2-2 Why Do Sunflowers Follow the Sun?

Mystery 4: Should you water a cactus?

Standard:2-LS2-1, 2-LS4-1
Target:

- I can plan and conduct an investigation to determine if plants need sunlight and water to grow.
- I can make observations of plants and animals to compare the diversity of life in different habitats.

Mystery 5: Where do plants grow best?

Standard:2-LS2-1, 2-LS4-1
Target:

- I can plan and conduct an investigation to determine if plants need sunlight and water to grow.
- I can make observations of plants and animals to compare the diversity of life in different habitats.
-

2-LS2-1 Corn Cob Sprouting in Water

Books:
Read Aloud(s)
Flip, Float, Fly Seeds on the Move by JoAnn Early Macken
From Seed to Plant by Gail Gibbons
Tree of Life: The Incredible Biodiversity of Life on Earth (CitizenKid)

What Do You Find on a Saguaro Cactus? (Ecosystems Close Up) by Megan Kopp

Be a Friend to Trees A Sense of Wonder- by Patricia Lauber

Reading AZ:
About Trees
Informational (nonfiction), 769 words, Level P (Grade 2)
I Am Your New Plant
Informational (nonfiction), 82 words, Level E (Grade 1)
The Mighty Saguaro Cactus
Informational (nonfiction), 1,473 words, Level U (Grade 4)
The Plant
Concept book (nonfiction), 17 words, Level aa (Grade K)
Plant Defenses
Informational (nonfiction), 437 words, Level L (Grade 2)
A Seed Grows
Informational (nonfiction), 133 words, Level G (Grade 1)

ReadWorks.org: **What Lives in the Desert? What is a Desert?** **Parts of a Tree** **Seeds Need to Move Trees** **Plant Growth** **A Plant that Preys** **How Plants get Water and Food Wind Helps Plants Grow Stories About Growing Plants** **Plants Make their Own Food What Plants Need** **How Plants Work** **What do Plants Need?** **Fruits and Plants** **How Plants Grow Plants and their Seeds**

Second Grade Science
Course Compendium

UNITS OF STUDY*

Unit 1- *Earth's Land and Water*
Unit 2- *Properties of Matter*
Unit 3- *Biodiversity of Life*
Unit 4- *Plant Adaptations*

INTERDISCIPLINARY CONNECTIONS

ELA Standards:

- 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.2.3.Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- RI.2.8. Describe how reasons support specific points the author makes in a text.
- RI 2.9. Compare and contrast the most important points presented by two texts on the same topic.
- 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.2.7. 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.2.5. Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

MATH Standards

- MP.2. Reason abstractly and quantitatively.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- 2. NBT.A.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- 2. MD.B.5Use 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. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.
- 2. 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.

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

21st Century Life and Careers

- **CRP2.** Apply appropriate academic and technical skills.
- **CRP4.** Communicate clearly and effectively and with reason.
- **CRP6.** Demonstrate creativity and innovation.
- **CRP11.** Use technology to enhance productivity.
- **9.2.4.A.3** Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
- **9.2.4.A.4** Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Technology

- **8.2.2.B.4** Identify how the ways people live and work has changed because of technology.
- **8.2.2.C.1** Brainstorm ideas on how to solve a problem or build a product.

<table>
<tr><th colspan="3">GENERAL CONSIDERATIONS FOR DIVERSE LEARNERS</th></tr>
<tr><th>English Language Learners</th><th>Students Receiving Special Education Services</th><th>Advanced Learners</th></tr>
<tr>
<td rowspan="3">
• WIDA Can Do Descriptors for Kindergarten*
• WIDA Essential Actions Handbook
• FABRIC Paradigm
• Wall Township ESL Grading Protocol

*Use WIDA Can Do Descriptors in coordination with Student Language Portraits (SLPs).

Potential Accommodations for ELLs

• Personal glossary
• Text-to-speech
• Extended time
• Simplified / verbal instructions
• Frequent breaks
• Small group/One to one
• Additional time
• Review of directions
• Student restates information
</td>
<td rowspan="3">
• New Jersey Tiered System of Supports
• National Center on Universal Design for Learning - About UDL
• UDL Checklist
• UDL Key Terms

Students within this class receiving Special Education/Section 504 programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP)/504 Plans due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, instruction is differentiated based upon the student's needs. The IEP/504 Plan acts as a supplemental curriculum guide inclusive of instructional strategies that support each specific learner.

Potential Accommodations for Special Education

Presentation accommodations:
• Listen to audio recordings instead of reading text
• Pre-teach unknown vocabulary through pictures or
</td>
<td>
• Knowledge and Skill Standards in Gifted Education for All Teachers
• Pre-K-Grade 12 Gifted Programming Standards
• Gifted Programming Glossary of Terms

Potential Accommodations for Advanced Learners

• Use of high level academic vocabulary/texts
• Problem-based learning
• Pre-assess to condense curriculum
• Interest-based research
• Authentic problem-solving
• Homogeneous grouping opportunities
</td>
</tr>
<tr><th>Students with 504 Plans</th></tr>
<tr><td>Teachers are responsible for implementing</td></tr>
</table>

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

• Extra visual and verbal cues and prompts • Preferential seating • Verbal and visual cues regarding directions and staying on task • Checklists • Immediate feedback	videos, and relate to prior knowledge • Work with fewer items per page and/or materials in a larger print size • Use a visual blocker • Use visual presentations of verbal material, such as word webs and visual organizers • Be given a written list of instructions/picture cues **Response accommodations**: • Give responses in a form (oral or written) that's easier for him/her • Dictate answers to a scribe • Capture responses on an audio recorder • Use a spelling dictionary or electronic spell-checker • Use a word processor to give responses in class • Use a calculator or table of "math facts" **Setting accommodations**: • Work or take a test in a different setting, such as a quiet room with few distractions • Sit where he/she learns best (for example, near the teacher) • Take a test in small group setting **Timing accommodations**: • Take more time to complete a task or a test • Have extra time to process oral information and directions • Take frequent breaks, such as after completing a task **Assignment modifications**: • Complete fewer or different homework problems than peers • Shorten assignment • Answer fewer or different test questions • Create alternate projects or assignments	designated services and strategies identified on a student's 504 Plan.
At Risk Learners / Differentiation Strategies		
Alternative Assessments Choice Boards Games and Tournaments Group Investigations Guided Reading Learning Contracts Leveled Rubrics Literature Circles	Independent Research & Projects Multiple Intelligence Options Project-Based Learning Varied Supplemental Activities Varied Journal Prompts or RAFT Writing Tiered Activities/Assignments Tiered Products Graphic Organizers	Jigsaw Think-Tac-Toe Cubing Activities Exploration by Interest Flexible Grouping Goal-Setting with Students Homework Options Open-Ended Activities

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*

Multiple Texts Personal Agendas	Choice of Books/Activities Mini-Workshops to Reteach or Extend Think-Pair-Share by readiness or interest Use of Collaboration of Various Activities	Use of Reading Buddies Varied Product Choices Stations/Centers Work Alone/Together

**See individual units for Pacing Guide, NJSLS Standards, Transfer Skills, Enduring Understandings, Essential Questions, Learning Objectives, Key Vocabulary, Skills, Resources, & Assessments*