

Toms River Science Curriculum

Board Approved: April 2016

Course: Life Science
Grade Level: 2

Title of Unit: Interdependent Relationships in Ecosystems

Stage 1 - Desired Results

Understandings:

Students will understand that.....

- plants need water and light.
- plants depend on animals for pollination or to move their seeds around.
- a habitat contains basic needs for an organism to survive (examples: water, food, and shelter).
- different habitats have many different kinds of living things in them (biodiversity) .

Essential Questions:

- What do plants need to grow?
- How do plants depend on animals for seed dispersion and pollination?
- How does habitat affect the diversity of living things?

Knowledge:

Students will know.....

- plants depend on water and light to grow.
- plants depend on animals for pollination or to move their seeds around.
- there are many different kinds of living things in any area, and they exist in different places on land and in water.

Skills:

Students will be able to.....

- make observations to compare the diversity of plants and animals in different habitats.
- develop a simple model that mimics the function of an animal dispersing seeds or pollinating plants.
- plan and conduct an investigation to determine if plants need sunlight and water to grow.

Standards: (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21st-century life and careers.)

NGSS:

- 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.

CCSS:

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.
- 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.

Mathematics

- 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 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.

Stage 2- Assessment Evidence:

- Students identify and describe the phenomenon and purpose of the investigation, which include answering a question about whether plants need sunlight and water to grow.
- Students describe collected evidence for: plant growth with light and water, plant growth with light but without water, plant growth without light but with water, plant growth without light and water.
- Students collaboratively develop an investigative plan in which students describe the plants used, the light source, how plants will be kept with and without light in both the light/dark test and the water/no water test.
- Students identify and describe the phenomenon and purpose of an investigation, which includes comparisons of plant and animal diversity of life in different habitats.
- Based on a given plan for the investigation, students describe the following evidence to be collected:
 - Descriptions based on observations (firsthand or from media) of habitats, including land habitats (e.g., playground, garden, forest, parking lot) and water habitats (e.g., pond, stream, lake).
 - Descriptions based on observations (firsthand or from media) of different types of living things in each habitat (e.g., trees, grasses, bushes, flowering plants, lizards, squirrels, ants, fish, clams).
 - Comparisons of the different types of living things that can be found in different habitats.
- Students collect, record, and organize data on different types of plants and animals in the habitats.
- Students develop a simple model that mimics the function of an animal in seed dispersal or pollination of plants. Students identify the relevant components of their model, including those components that mimic the natural structure of an animal that helps it disperse seeds (e.g., hair that snares seeds, squirrel cheek pouches that transport seeds) or that mimic the natural structure of an animal that helps it pollinate plants (e.g., bees have fuzzy bodies to which pollen sticks, hummingbirds have bills that transport pollen). The relevant components of the model include: relevant structures of the animal, relevant structures of the plant, pollen or seeds from plants.
- In the model, students describe relationships between components, including evidence that the developed model mimics how plant and animal structures interact to move pollen or disperse seeds. Students describe the relationships between components that allow for movement of pollen or seeds. Students describe the relationships between the parts of the model they are developing and the parts of the animal they are mimicking.
- Students use the model to describe how the structure of the model gives rise to the function, and how the structure-function relationships in the natural world that allow some animals to disperse seeds or pollinate plants.
- Students will observe and describe (firsthand or from media) including land habitats (playground, parking lot, garden, forest, and water habitats such as a pond, lake, or river.
- Students will describe living things in a habitat based on observation such as trees, grasses,

bushes, flowering plants, lizards, squirrels, ants, fish, clams.

- Students collect, record, and organize data on different types of plants and animals in the habitats.

Stage 3 – Learning Plan

Learning Activities:

- Nature walk around school to identify different habitats and/or biodiversity.
- [White tailed deer game. Keeping the forest balanced.](#)
- [Woodland Habitat Hunt](#)
- [Several good biodiversity activities - forestinfo.org](#)
- [What Do Birds Need to Survive?](#)
- [Celery Experiment](#) All plants need water.
- [Gems of Biodiversity Classroom Activity](#)
- [Graphing Data Collected in Gems of Biodiversity](#)
- [Seed Dispersal Methods Website](#)
- [Exploring plants - What seeds need to grow and seed dispersal](#)
- [Why Do We Need Bees](#)
- [Powerpoint on Seed Dispersal](#)
- [Engineer Your Own Hand Pollinator](#)
- [Pollination Power Lesson](#)
- [Seeds on the Move](#)
- [Pollinating - The Bees have It! Lesson Plan](#)
- [San Diego Zoo - wants and needs of organisms](#)
- [Plant Life Teacher's Guide](#)

Suggested Formative Assessment Probes

Uncovering Student Ideas in Primary Science

Is It a Plant pgs. 15-19

Seeds in a Bag pgs. 25-29

Senses pgs. 35-38

Big and Small Seeds pgs. 39-42

Uncovering Student Ideas in Science, Volume 2

Needs of Seeds pgs. 101-106

Is It a Plant pgs. 93-99

Notes: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

Course: Physical Science Grade Level: 2	Title of Unit: Structure and Properties of Matter
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Stage 1 - Desired Results	
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<p>Understandings:</p> <p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> ● Matter exists as different substances that have various observable properties. ● Properties such as strength, flexibility, hardness, texture, and absorbency determine the purpose of matter. ● Objects can be built from smaller parts. ● Some materials experience permanent changes when heated or cooled, while others have changes that are reversible. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ● How are different forms of matter similar and different from one another? ● How do the properties of materials relate to their use? ● How can materials be assembled or disassembled to change their purpose? ● How does heating and cooling change matter?
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<p>Knowledge:</p> <p><i>Students will know.....</i></p> <ul style="list-style-type: none"> ● Matter can exist in various forms, both solid and liquid, depending on the temperature. ● Matter can be described and classified by its observable properties. ● Properties such as strength, flexibility, hardness, texture, and absorbency determine the purpose of matter. ● A great variety of objects can be built up from a small set of pieces 	<p>Skills:</p> <p><i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. ● Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. ● Make observations to construct an evidence based account of how an object made of a small set of pieces can be disassembled ● Construct an argument with evidence that some change caused by heating or cooling can be reversed and some cannot.
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<p>Standards: (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21st-century life and careers.)</p>	
<p>NGSS:</p> <ul style="list-style-type: none"> ● 2-PSI-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. ● 2-PSI-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. ● 2-PSI-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-PSI-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. 	

**CCSS:
ELA**

- RI.2.8 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-3)
- W.2.6 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1),(2- PS1-2)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1),(2-PS1-2),(K-2-ETS1-3)

Mathematics

- 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.
- 2.MD.D.9 Solve simple put-together, take-apart, and compare problems 1 using information presented in a bar graph.

Stage 2- Assessment Evidence:

Performance Tasks and other evidence:

Students who understand the concepts can:

- Design simple tests to gather evidence to support or refute student ideas about causes.
- 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 an intended purpose. (Assessment of quantitative measurements is limited to length.)
- Examples of properties could include: Strength, Flexibility, Hardness, Texture, Absorbency

Stage 3 – Learning Plan

Learning Activities:

- Separate objects based on observable properties.
 - [Structures and Properties of Matter](#)
- Formulate and explain a classification system for organizing objects.
 - [Characteristics of Matter Online Game](#)
- Work together to brainstorm a list of possible structures that could be built with different materials. For example, students could build bridges or houses.
 - Select one structure from the list and determine the intended purpose of that structure.
 - Select two or three different materials that could be used to build the structure.
 - Investigate the physical properties of the materials, including shape, strength, flexibility, hardness, texture, or absorbency.
 - Collect and analyze data to determine whether or not the given materials have properties that are suited for the intended purpose of the selected structure.
 - In groups, use one of the materials to build the structure. (Teachers should have different groups use different materials.)
 - Test and compare how each structure performs. Because there is always more than one possible solution to a problem, it is useful to compare the strengths and weaknesses of each structure and each material used.
 - [Parachutes for thrill seeking gummy bears](#)

- [Engineer a Birdhouse](#)
- [Examining Strength of Paper Shapes](#)

Suggested Formative Assessment Probes

Uncovering Student Ideas in Primary Science

Sink and Float pgs. 45-48

Watermelon and Grape pgs. 49-52

Is It Matter pgs. 53-57

Snap Blocks pgs. 59-62

Back and Forth pgs. 63-66

Uncovering Student Ideas in Science, Volume 1

Is It Matter pgs. 79-84

Cookie Crumbles pgs. 61-65

Uncovering Student Ideas in Science, Volume 3

Is It a Solid, pgs. 25-

Notes: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.

Course: Earth Science Grade Level: 2	Title of Unit: Earth Systems and Earth's Place in the Universe
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Stage 1 - Desired Results

<p>Understandings:</p> <p><i>Students will understand that.....</i></p> <ul style="list-style-type: none"> ● some events happen very quickly such as volcanic explosions and earthquakes; others, such as the erosion of rocks, occur very slowly over a time period much longer than one can observe. ● wind and water can change the shape of land. ● you can map the shapes and kinds of land and water in any area. ● humans have designed multiple solutions to slow or prevent wind or water from changing the shape of the land, such as dikes, windbreaks, and using shrubs, grass, and trees. ● 	<p>Essential Questions:</p> <ul style="list-style-type: none"> ● What are different kinds of land and bodies of water? ● Where is water found? ● How and why have humans tried to slow or prevent wind or water from changing the shape of the land?
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<p>Knowledge:</p> <p><i>Students will know.....</i></p> <ul style="list-style-type: none"> ● wind and water can change the shape of the land. ● maps show where things are located. ● one can map the shapes and kinds of land and water in any area. ● water is found in oceans, rivers, lakes and ponds. ● water exists as solid ice and in liquid form. ● some events happen very quickly, such as volcanic explosions and earthquakes; others, such as erosion, occur very slowly over a time period much longer than one can observe. 	<p>Skills:</p> <p><i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● apply their understanding of the idea that wind and water can change the shape of land in order to compare design solutions that slow or prevent such change. ● use information and models to identify and represent the shapes and kinds of land and bodies of water in an area. ● use information and models to identify and represent bodies of water in an area where water is found on Earth. ● identify whether water found on the Earth is solid or liquid.
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<p>Standards: (Note: Include reference to relevant standards in the Core Content Area as well as technology and 21st-century life and careers.)</p>	
<p>NGSS:</p> <ul style="list-style-type: none"> ● 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. ● 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.

CCSS:

ELA

- 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.2.9: Compare and contrast the most important points presented by two texts on the same topic.

Mathematics

- 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 1,000 using base-10 numerals, number names, and expanded form.
- 2.MDB.5: Use addition and subtraction with 100 to solve word problems involving lengths that are given in the same unit.

Stage 2- Assessment Evidence:

Performance Tasks and other evidence:

- Students describe the evidence from observations (firsthand or from media; e.g., books, videos, pictures, historical photos), including:
 - That some Earth events occur quickly (e.g., the occurrence of flood, severe storm, volcanic eruption, earthquake, landslides, erosion of soil).
 - That some Earth events occur slowly.
 - Some results of Earth events that occur quickly.
 - Some results of Earth events that occur very slowly (e.g., erosion of rocks, weathering of rocks). The relative amount of time it takes for the given Earth events to occur (e.g., slowly, quickly, hours, days, years).
- Students make observations using at least three sources.
- Students develop a model (i.e., a map) that identifies the relevant components, including components that represent both land and bodies of water in an area.
- In the model, students identify and describe relationships between components using a representation of the specific shapes and kinds of land (e.g., playground, park, hill) and specific bodies of water (e.g., creek, ocean, lake, river) within a given area.
- Students use the model to describe the patterns of water and land in a given area (e.g., an area may have many small bodies of water; an area may have many different kinds of land that come in different shapes).
- Students describe that because they can map the shapes and kinds of land and water in any area, maps can be used to represent many different types of areas.
- Students use books and other reliable media as sources for scientific information to answer scientific questions about:
 - Where water is found on Earth, including in oceans, rivers, lakes, and ponds.
 - The idea that water can be found on Earth as liquid water or solid ice (e.g., a frozen pond, liquid pond, frozen lake).
 - Patterns of where water is found, and what form it is in.

Stage 3 – Learning Plan

Learning Activities:

- [How Can Water Change the Shape of Land?](#) Making a sand tower and using water and a dropper to create and record changes.
- [Slow Land Changes Brain Pop](#) video and slow land change activities for students
- [Build a Dam](#) engineering - a real world scenario for students to plan, design, and build a beaver's dam
- [Quick or Slow? I've Got to Know!](#)
- [How Mountains are Made..\(a Model Using a Milkyway\)](#)
- [How Can Wind Change the Shape of the Land?](#) Making a sand tower and students blow through a straw to create changes in the sand tower.
- [Incredible, Edible Earth Changes \(A Model Using Graham Crackers and Whipped Cream\)](#) This activity explores land masses (graham crackers) and their movements.
- [Preventing Wind Erosion](#) Engineering activity where students try to determine what could be used to block wind.
- [Water Erosion: Cause and Effect](#)

Suggested Formative Assessment Probe

Uncovering Student Ideas in Primary Science

What Makes up a Mountain pgs. 93-96

Notes: Indicate any special considerations as well as materials, resources (online, print, video, audio) or equipment.