

2nd Grade Unit 4 - Changes to Earth's Land

Content Area: **Science**
Course(s): **Science Grade 2**
Time Period: **MP4**
Length: **22 days**
Status: **Published**

NJSLS - Science

SCI.K-2-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.
SCI.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.
SCI.2-ESS1-1	Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
SCI.2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

Science and Engineering Practices

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)

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. (2-ESS1-1)

ESS2.A: Earth Materials and Systems

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

ETS1.A: Defining and Delimiting Engineering Problems

A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)

Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)

Before beginning to design a solution, it is important to clearly understand the problem. (K-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)

Crosscutting Concepts

Stability and Change

Things may change slowly or rapidly. (2-ESS1-1, 2-ESS2-1)

Structure and Function

The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-

ETS1-2)

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)

Science Addresses Questions About the Natural and Material World

Scientists study the natural and material world. (2-ESS2-1)

Rationale and Transfer Goals

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

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

Students are also expected to use these practices to demonstrate an understanding of the core ideas.

Enduring Understandings

Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.

Essential Questions

What evidence can we find to prove that Earth events can occur quickly or slowly?

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

Content - What will students know?

- Some events happen very quickly; others occur very slowly over a time period much longer than one can observe.
- Things may change slowly or rapidly.
- Developing and using technology has impacts on the natural world.
- Scientists study the natural and material world.
- The shape and stability of structures of natural and designed objects are related to their function(s).
- Wind and water can change the shape of the land.
- Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
- A situation that people want to change or create can be approached as a problem to be solved through engineering.
- Asking questions, making observations, and gathering information are helpful in thinking about problems.
- Before beginning to design a solution, it is important to clearly understand the problem.
- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.

Skills - What will students be able to do?

- Make observations from several sources to construct an evidence-based account for natural phenomena.
- 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, and erosion of rocks.
- 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 or different designs for using shrubs, grass, and trees to hold back the land.

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

Activities - How will we teach the content and skills?

- Mystery Science Works of Water Lesson 4
- Mystery Science Works of Water Lesson 5
- Whole group instruction and discussion.
- Read Alouds
- Group and Individual Projects
- Hands-on discovery when possible; creating models
- Webquests/Internet “field trips”

Evidence/Assessments - How will we know what students have learned?

- Mystery Science Works of Water Lesson 4 Assessment
- Mystery Science Works of Water Lesson 5 Assessment
- Mystery Science Works of Water Performance Assessment
- Teacher Observation
- Student projects/models
- Exit Tickets
- Tests/Quizzes

- [Grade 2 Science Unit 4 Benchmark](#)

Spiraling for Mastery

Content or Skill for this Unit	Spiral Focus from Previous Unit	Instructional Activity
N/A	<p>Kindergarten: A situation that people want to change or create can be approached as a problem to be solved through engineering.</p> <p>Kindergarten: Asking questions, making observations, and gathering information are helpful in thinking about problems.</p> <p>Kindergarten: Before beginning to design a solution, it is important to clearly understand the problem.</p> <p>Kindergarten: 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.</p> <p>Kindergarten: Because there is always more than one possible solution to a problem, it is useful to compare and test design.</p>	<p>K-2-ETS1-1 Activities</p> <p>K-2-ETS1-2 Activities</p>

21st Century Life and Careers

WRK.9.1.2.CAP.1

Make a list of different types of jobs and describe the skills associated with each job.

Career Readiness, Life Literacies, & Key Skills

TECH.9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
TECH.9.4.2.CI.2	Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
TECH.9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
TECH.9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
TECH.9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
TECH.9.4.2.IML.3	Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).

Interdisciplinary Connections/Companion Standards

NJSLS 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. (2-ESS1-1, K-2-ETS1-1)

RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1, 2-ESS2-1)

RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)

W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1, K-2-ETS1-1)

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1, K-2-ETS1-1)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)

NJSLS Mathematics

MP.2 Reason abstractly and quantitatively. (2-ESS1-1, 2-ESS2-1, K-2-ETS1-1)

MP.4 Model with mathematics. (2-ESS1-1, 2-ESS2-1, K-2-ETS1-1)

MP.5 Use appropriate tools strategically. (2-ESS2-1, K-2-ETS1-1)

2.NBT.A Understand place value. (2-ESS1-1)

2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

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. (K-2-ETS1-1)

English Language Arts

Students participate in shared research to gather information about Earth events from texts and other media and digital resources. They will use this information to answer questions and describe key ideas and details about ways in which the land can change and what causes these changes. Students should also have opportunities to compose a writing piece, either independently or collaboratively with peers, using digital tools to produce and publish their writing. Students should describe connections between Earth events and the changes they cause, and they should include photographs, videos, poems, dioramas, models, drawings, or other visual displays of their work, when appropriate, to clarify ideas, thoughts, and feelings.

Mathematics

Students have multiple opportunities to reason abstractly and quantitatively as they gather information from media sources. Students can organize data into picture graphs or bar graphs in order to make comparisons. For example, students can graph rainfall amounts. Students can use the data to solve simple addition and subtraction problems using information from the graphs to determine the amount of change that has occurred to local landforms. For example, a gully was 17 inches deep before a rainstorm and 32 inches deep after a rainstorm. How much deeper is it after the rainstorm? Students must also have an understanding of place value as they encounter the varying timescales on which Earth events can occur. For example, students understand that a period of thousands of years is much longer than a period of hundreds of years, which in turn is much longer than a period of tens of years. In addition, teachers should give students opportunities to work with

large numbers as they describe length, height, size, and distance when learning about Earth events and the changes they cause. For example, students might write about a canyon that is 550 feet deep, a river that is 687 miles long, or a forest that began growing about 200 years ago.