

Erosion

Grade-Level Expectations

The exercises in these instructional tasks address content related to the following science grade-level expectation(s):

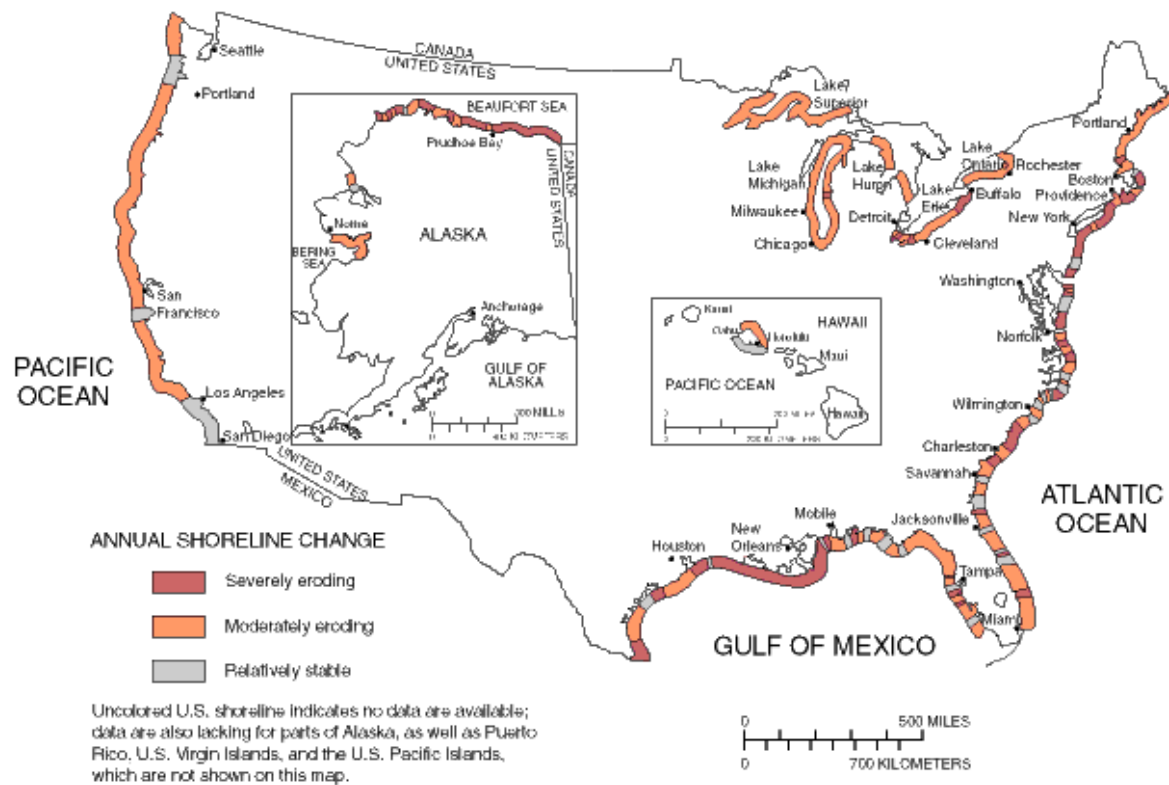
ESS-E-A5 Demonstrate and explain how Earth’s surface is changed as a result of slow and rapid processes (e.g., sand dunes, canyons, volcanoes, earthquakes) (GLE 63)

Contents

- These instructional tasks contain a set of document- or resource-based exercises about *erosion*.
- Teachers may choose to use or modify the tasks as part of an instructional lesson or as a formative or summative assessment.
- The printable student version excludes teacher directions.

	Objective(s)
Scaffolding Exercise 1	<ul style="list-style-type: none"> • Interpret data on a map • Build background knowledge about erosion and erosion prevention
Scaffolding Exercise 2	<ul style="list-style-type: none"> • Read and analyze sources to gather background information about erosion • Construct a chart to organize information about erosion
Scaffolding Exercise 3	<ul style="list-style-type: none"> • Formulate a valid cause to a known effect
Culminating Exercise	<ul style="list-style-type: none"> • Demonstrate understanding of scientific investigations • Draw reasonable conclusions based on given information
Scoring Rubric	
Scoring Notes	
Printable Student Version	

Scaffolding Exercise 1



Teacher Directions:

Have students work with a partner to describe at least **four** pieces of data this map details. Discuss the ideas as a class. Students then choose one area marked as “severely eroding” and research the causes of the erosion and the steps that are being taken to prevent land loss. Students write an informational podcast script to teach others about their findings.

Teacher Directions:

Have students independently read the article found at

<http://www.scholastic.com/browse/article.jsp?id=3758050>. In collaborative groups, students research erosion using a variety of sources then construct and complete the following chart.

Causes of Rapid Erosion	Causes of Slow Erosion	Effects of Erosion

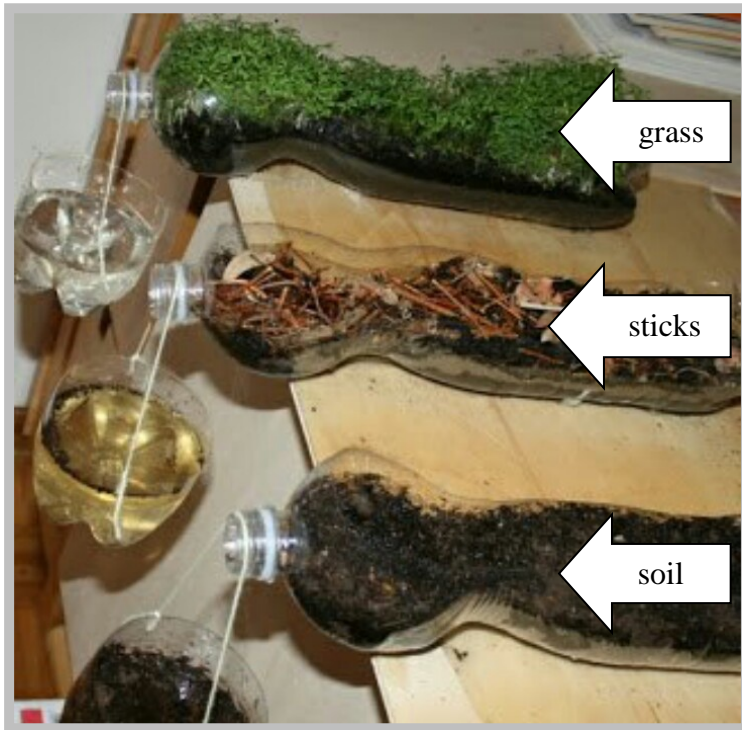
Scaffolding Exercise 3



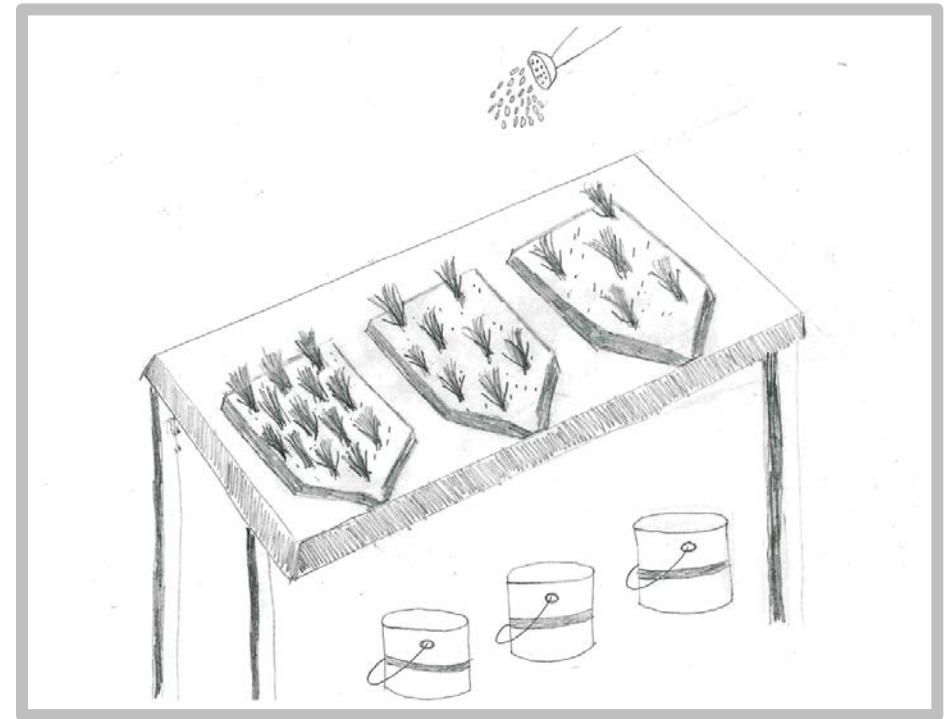
Teacher Directions:

Display the picture above. Have students work with a partner to write a fictional news article detailing the event(s) causing the house to fall. (rapid or slow erosion)

Culminating Exercise



Investigation 1: Which material is best?



Investigation 2: Is more better?

A farmer dug a pond and needed to decide what to do around the pond to stop the soil from eroding. First he performed Investigation 1. Based on his findings from Investigation 1, the farmer planned and performed Investigation 2.

Part 1: Describe what the farmer did in both investigations and draw reasonable conclusions for his experiments.

Part 2: Describe what the farmer should do around his pond to keep the soil from eroding?

Rubric

Key Elements:

- A.** Response clearly describes investigation 1.
- B.** Response clearly describes investigation 2.
- C.** Student draws a reasonable conclusion for investigation 1 **and** investigation 2.
- D.** Student describes what the farmer should do around his pond to keep the soil from eroding.

4 Points

Response includes all four key elements.
Response contains no scientific errors.

3 Points

Response includes three of the four key elements.
Response may include scientific errors.

2 Points

Response includes two of the four key elements.
Response may include scientific errors.

1 Point

Response includes one of the four key elements.
Response may include scientific errors.

A well-developed response should demonstrate a correct and thorough understanding of Earth’s processes such as erosion. The response should be clear, include specific details, show a higher level of reasoning skills where appropriate, and address the key elements of the task.

Scoring Notes

Student responses will not be an exact imitation of the responses below. These are given only as examples.

A. Response clearly describes investigation 1.

First, the farmer got 3 bottles and cut them in half. He filled each one with a different type of material. He filled one with only dirt, one with dirt and sticks, and one with dirt and grass. The farmer tied cups to the bottles to catch the water in after it “rained.” The farmer pretended to make it rain by pouring water in each bottle. He observed as the water went through the materials.

B. Response clearly describes investigation 2.

Next, the farmer wanted to see if he needed to plant a little bit of grass or a lot of grass. He planned a new experiment. He took 3 boxes and planted different amounts of grass in them. He planted a little bit of grass in one box. He planted a medium amount of grass in the second box. He planted a lot of grass in the third box. Then the farmer made it “rain” again and observed as the water went through the boxes.

C. Student draws reasonable conclusions for investigation 1 **and** investigation 2.

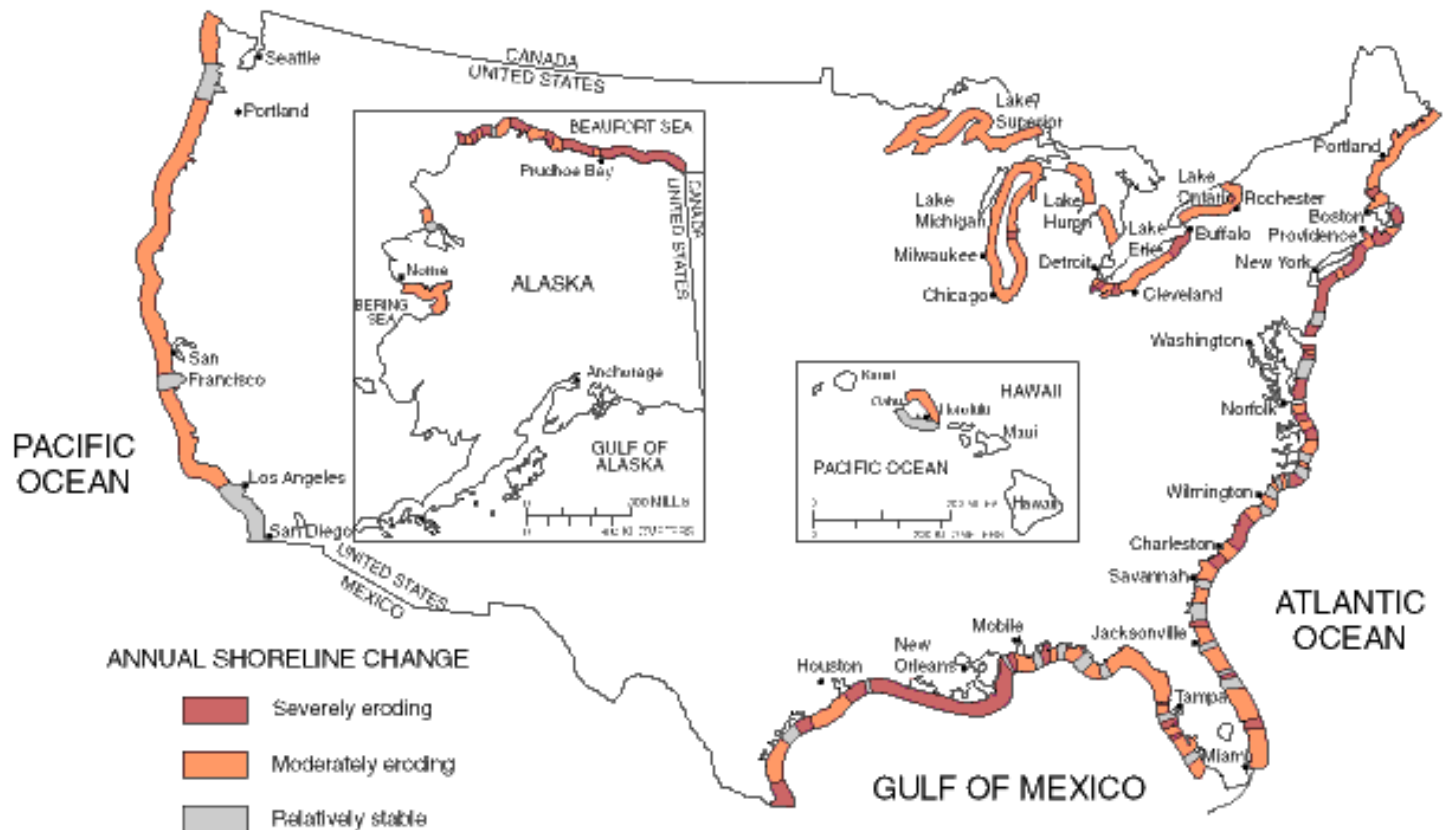
In Investigation 1, the farmer found that the grass held the dirt in place the best.

In Investigation 2, the farmer found that the box with the most grass held the dirt the best.

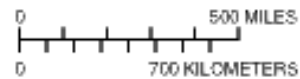
D. Student describes what the farmer should do around his pond to keep the soil from eroding.

The farmer should plant a lot of grass around his pond to keep the soil from eroding or washing away.

**Printable
Student Version**



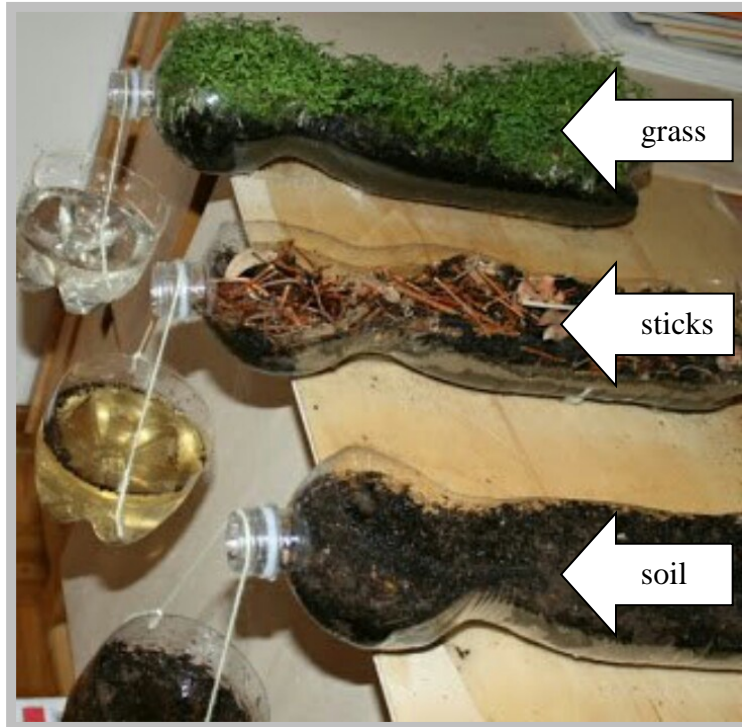
Uncolored U.S. shoreline indicates no data are available; data are also lacking for parts of Alaska, as well as Puerto Rico, U.S. Virgin Islands, and the U.S. Pacific Islands, which are not shown on this map.



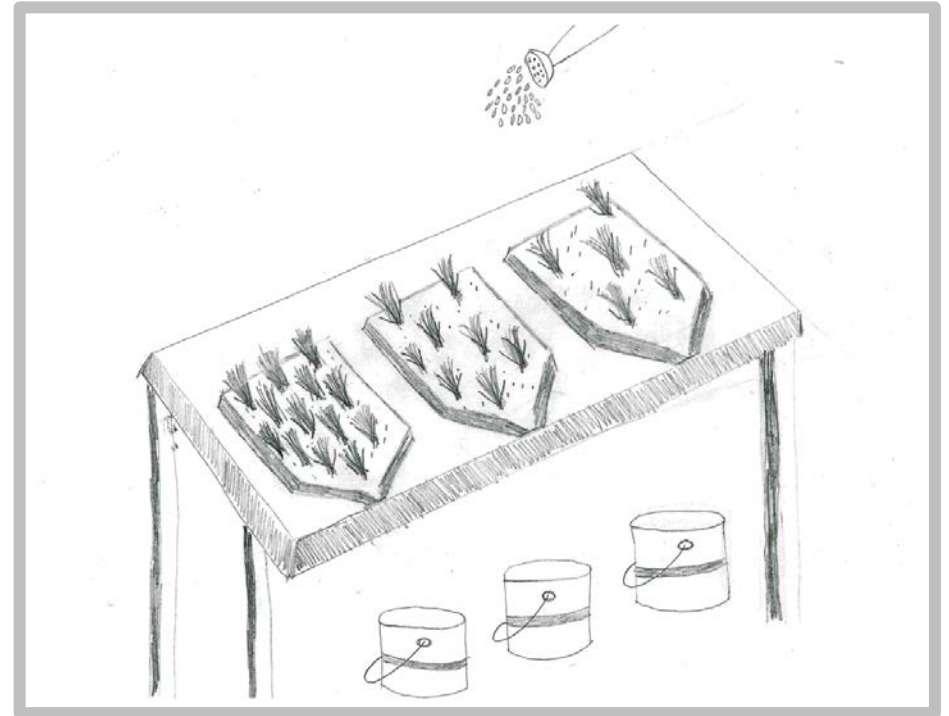
Causes of Rapid Erosion	Causes of Slow Erosion	Effects of Erosion



Work with a partner to write a fictional news article detailing the event(s) causing the house to fall.



Investigation 1: Which material is best?



Investigation 2: Is more better?

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Part 2: Describe what the farmer should do around his pond to keep the soil from eroding?