

WHERE IS OUR LAND GOING?

(MODIFIED FOR ADEED)

INSTRUCTIONS



Science Concept:

The erosive action of water can redistribute sediment to create other landforms such as deltas and canyons.

GLEs Addressed:

Science

[5] SD2.1 The students demonstrate an understanding of the forces that shape Earth by describing how wind and water tear down and build up the Earth's surface resulting in new land formations (i.e., deltas, moraines, and canyons).

[5] SA2.1 The student will demonstrate an understanding of the attitudes and approaches to scientific inquiry by supporting their statements with facts from a variety of resources and by identifying their sources.

Writing

[5] W2.2.2 The student writes for a variety of purposes and audiences by writing in a variety of nonfiction forms using appropriate information and structure (i.e., step-by-step directions, descriptions, observations, or report writing).

Vocabulary:

formation - the act of giving form or shape to something or of taking form

erosion - wearing away by the action of water, wind or glacial ice

delta - a landform formed at the mouth of a river where that riverflows into an ocean, sea, estuary, lake, reservoir, flat arid area, or another river

canyon - a deep valley with steep sides, often with a stream flowing through it

current - a flowing; flow, as of a river; something that flows, as a stream

sediment - mineral or organic matter deposited by water, air or ice

deposit - an item that is delivered or left

redistribution - being arranged or classified again

Materials:

- Video showing active coastal erosion due to loss of permafrost in a storm, provided by USGS, *Time-lapse video of bluff erosion on Barter Island, Alaska* https://youtu.be/k2AQnpcW_HY.
- Images of deltas and canyons.
- Plastic tubs (3' L X 2'W, one for each group)
- Twigs
- Sand (one 10 lb bag per group)
- Rocks (one 10 lb bag per group)
- PVC pipe (one 2' long 3" piece for each group)
- Pitchers (one per group)
- Buckets (one [five gallon] per group)
- STUDENT PRETEST
- STUDENT WORKSHEET: "Where Is Our Land Going?"

Activity Preparation:

1. Access and bookmark the video referenced in the materials list above. If the video listed is no longer available, locate another online video that shows the erosive action of a storm.

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2. Locate online images of deltas and canyons. Bookmark or download these images to show students during the class.

Activity Procedure:

Please refer to the assessment task and scoring rubric located at the end of these instructions. Discuss the assessment descriptors with the class before teaching this lesson.

Gear Up

Process Skills: observing and questioning

1. Give STUDENT PRETEST:
 - What is a delta? Draw and explain.
 - What is a canyon? Draw and explain.
 - Show a short video about the 2003 storm in Shishmaref, Alaska, or a video that shows the erosive action of a storm. The video is available online (http://www.shishmarefrelocation.com/resources/videos/shish_storm_2003_edited.mpg).
 - Present images of deltas and canyons.

Explore

Process Skills: observing, communicating, measuring, inferring, developing models, describing, investigating

2. Ask:
 - How is a delta formed?
 - How is a canyon formed?
3. Using the materials supplied, students will create a model of a riverbed with the option of choosing either sand or rocks. They will investigate:
 - Effects water has on their river.
 - Sediment redistribution on the river.
 - Different landforms created by redistribution of sediment.

Generalize

Process Skills: questioning, communicating, inferring, describing and making generalizations

4. How were the sediments redistributed?
5. What factors contributed to the rate of redistribution?
6. How does the width of the river affect the flow of the river and distribution of the sediments?
7. How does erosion affect our lives/ecosystems?

Apply

Process Skills: communicating, analyzing data, investigating, making generalizations

8. Create a Venn diagram to compare and contrast what has been learned about the redistribution of sediments caused by rivers with the erosion in Shishmaref, Alaska caused by erosive action of waves.
9. As an extension, write a summary paragraph to explain similarity and differences as shown by the Venn diagram.

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Assessment Task:

Students will identify and describe changes in landforms due to the redistribution of sediments by using the pictures of deltas and canyons. Using the resources that the teacher has provided, students will illustrate delta and canyon formations in science journals while citing resources that they used.

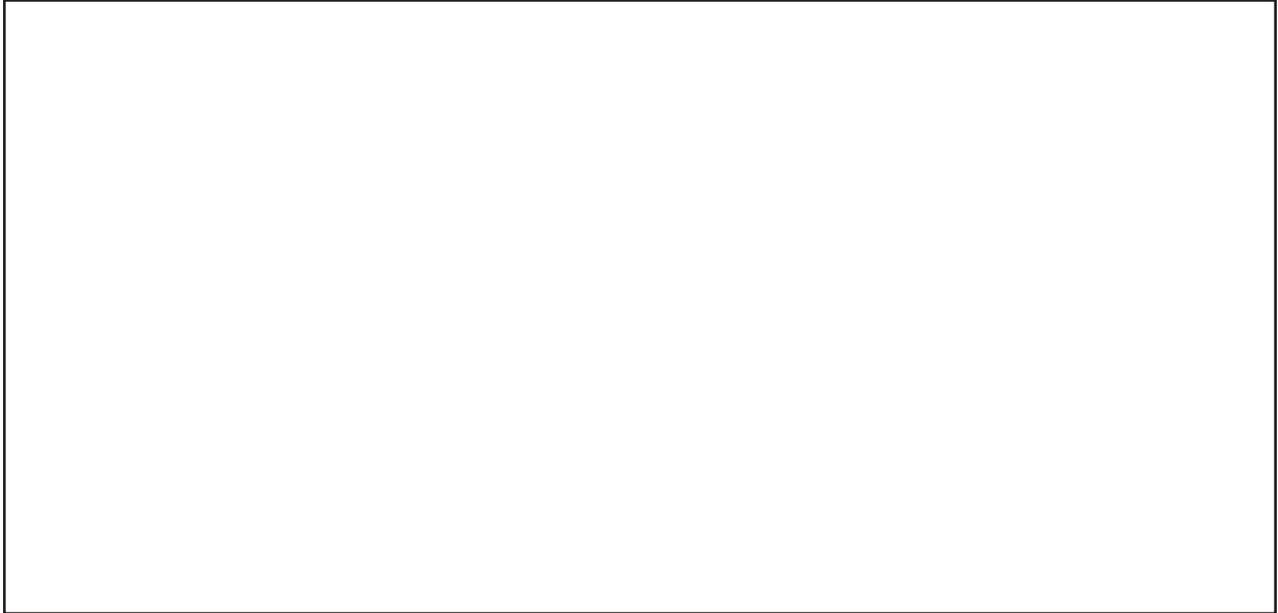
Rubric:

| | Below Proficient | Proficient | Above Proficient |
|--------------------------|---|--|---|
| Science Content Standard | Student can describe one or less land formations created by the redistribution of sediment due to the erosive action of water. | Student can identify and describe at least two land formations created by the redistribution of sediment due to the erosive action of water. | Student can identify and describe more than two land formations created by the redistribution of sediment due to the erosive action of water. |
| Process Skills | States one fact in journals based on the website selected by the instructor/teacher dealing with erosion in different areas of the world. | States two facts in journals based on the website selected by the instructor/teacher dealing with erosion in different areas of the world. | States three or more facts in journals based on the website selected by the instructor/teacher dealing with erosion in different areas of the world. |
| Scientific Illustrations | Fails to or does not attempt to clearly illustrate concepts of new land formations using drawings, pictures, diagrams or other media. | Clearly illustrates concepts of new land formations using drawings, pictures, diagrams or other media. | Clearly illustrates concepts of new land formations using drawings, pictures, diagrams or other media and can explain how these changes can affect their lives. |

NAME: _____

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Directions: Draw a picture of the riverbed that you created and show what happened when you pour the water in.



1. How were the sediments redistributed?
2. What factors contributed to the rate of redistribution?
3. How does the width of the river affect the flow of the river and distribution of the sediments.
4. How does erosion affect our lives/ecosystems?

NAME: _____

STUDENT PRETEST

Directions: Define and/or draw a picture to explain the following terms:

1. What is a delta?

2. What is a canyon?