
Earth Changes

Overview

This lesson and related activities are designed to give students hands-on experience in analyzing the effects of regional erosional deposition and weathering.

Grade: 7

TEKS

Scientific Processes

7.1 A

7.2 A, B, C, D, E

7.3 C, D

7.4 A

Science Concepts

7.14 B

Vocabulary

Weathering

Erosion

Deposition

Materials

Clear plastic box

Sand

Gravel

Sticky notes

Water

Digital cameras

Notepads

Downloadable Sheets

*Cause and Effect Cards

*Erosional Effects

*Answer Key for Cause and Effect Cards

Pre-Eastman Classroom Activities

Before Class Begins:

1. Prepare a clear plastic box by placing a pile of sand and gravel on one end of the container.
2. Have a container of water close by for pouring into the box.
3. Copy enough Cause and Effect Cards for one set per pair of students.

Lesson:

1. Display a clear plastic box with a pile of sand and gravel at one end. Pose the question: How can we get the sand and gravel to the other end of the box without touching it?
2. In groups, allow students time to discuss various methods of moving the sand and gravel. Students will write their ideas on sticky notes. Each group should present their ideas to the class.
3. The teacher will guide students in a discussion of weathering, erosion, and deposition using the activity as a model.
4. Students will then determine natural and man-made forces that correspond to the ideas on the sticky notes. (Example: Blowing on the sand corresponds to wind.)
5. Using the clear box as a model, extend the discussion to include the effects of the erosion and deposition. Elevate one end of the box and analyze the effect of gravity on deposition. Then pour a small amount of water into the upper end of the box while it is tilted. Have students observe and note the effects of the moving water on the sand.
6. Pass out the Cause and Effect Cards. In pairs, students will match a cause to its corresponding effect.
7. Debrief the class on the effects of erosion and deposition in nature.

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In The Field

1. Prior to leaving the school, make sure you have:
 - Digital cameras
 - Notepads
 - Pens or pencils
 - First Aid Kit
2. Set behavior expectations and go over safety issues with the students. Remind students that they are not to touch or put anything into their mouths without permission.
3. For a brief focus activity, have each student select a pine cone or other small item from the forest floor. Students should form a circle. Instruct them to gently toss their items into the center of the circle. Explain that in this model the items represent sediment and the students represent agents of erosion (gravity, running water, wind). The formation in the center of the circle resulted from the students modeling erosion and deposition.
4. Students will be detectives in the forest and look for places where sediment has been deposited. They will record this area with the digital camera and then note any inferences about agents of erosion responsible for the formation.

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Post-Eastman Classroom Activities

Supplies needed:

- Computer with photo software
1. Download pictures taken in the forest to a CD or onto the computer.
 2. As a class, look at each picture and let students share their inferences regarding cause and effect in each area. Make predictions on a timeline of events leading to the observed formation and include predictions of future changes. Repeat this with two or three other different pictures.
 3. In pairs, students should select one of the scenarios from the Erosional Effects downloadable sheets. They will then research the details of the processes involved for their chosen topic. Their finished product will be a paper analyzing the causes and effects of the situation and a set of drawings detailing how the process works.

CAUSE CARDS

Copy and then cut these cards apart so students can match them with the Effect Cards.

<p style="text-align: center;">CAUSE</p> <p>As a river empties into an ocean, it slows down.</p>	<p style="text-align: center;">CAUSE</p> <p>Layers of rock break loose from slopes of mountains.</p>
<p style="text-align: center;">CAUSE</p> <p>Heavy rains or melting snow and ice saturate sediments.</p>	<p style="text-align: center;">CAUSE</p> <p>Farmers plant rows of trees along the edges of their fields.</p>
<p style="text-align: center;">CAUSE</p> <p>Water flows around a new building.</p>	<p style="text-align: center;">CAUSE</p> <p>Plants are removed from the soil in an area that receives little rainfall.</p>
<p style="text-align: center;">CAUSE</p> <p>Wind constantly erodes sand particles.</p>	<p style="text-align: center;">CAUSE</p> <p>Wind blows sediments against an obstacle such as a rock or clump of grass.</p>

EFFECT CARDS

Copy and then cut these cards apart so students can match them with the Cause Cards.

<p>EFFECT</p> <p>Sediments build up and eventually form a dune.</p>	<p>EFFECT</p> <p>A triangular area of sediment, called a delta, forms.</p>
<p>EFFECT</p> <p>A huge jumbled pile of rock forms.</p>	<p>EFFECT</p> <p>Dunes migrate across the land.</p>
<p>EFFECT</p> <p>Sediments flow downhill over the surface of the ground.</p>	<p>EFFECT</p> <p>Soil erosion is reduced.</p>
<p>EFFECT</p> <p>Channels are cut into the earth's surface.</p>	<p>EFFECT</p> <p>Soil erosion is increased.</p>

ANSWER KEY TO CAUSE AND EFFECT CARDS

Cause

Effect

- | Cause | Effect |
|---|--|
| 1. As a river empties into an ocean, it slows down. | 1. A triangular area of sediment, called a delta, is formed. |
| 2. Layers of rock break loose from slopes of mountains. | 2. A huge jumbled pile of rock forms. |
| 3. Heavy rains or melting snow and ice saturate sediments. | 3. Sediments flow downhill over the surface of the ground. |
| 4. Farmers plant rows of trees along the edges of their fields. | 4. Soil erosion is reduced. |
| 5. Water flows around a new building. | 5. Channels are cut into the earth's surface. |
| 6. Plants are removed from the soil in an area that received little rainfall (desertification). | 6. Soil erosion is increased. |
| 7. Wind constantly erodes sand particles. | 7. Dunes migrate across the land. |
| 8. Wind blows sediments against an obstacle such as a rock or clump of grass. | 8. Sediments build up and eventually form a dune. |

EROSIONAL EFFECTS

Choose one of the following scenarios to research. Write a paper detailing the processes involved in the situation, specifically describing the causes and effects. Also create a set of drawings detailing how the processes work.

Choice One:

During the 1930s, the United States experienced a phenomenon called the Dust Bowl. States in the Great Plains region experienced repeated dust storms. Farmers had replaced deep-rooted grasses with shallow-rooted grains. A severe drought hit the area and strong winds stripped away much of the topsoil.

Choice Two:

In ancient civilizations, societies always began by rivers. This holds true with ancient Egypt and the Nile River. The Nile would flow through the volcanic highlands of eastern Africa before flowing through Egypt. As the Nile would flood the banks each year, the farmers would trap the floodwaters in their fields to catch all the nutrients and minerals in the sediment.

Choice Three:

Real estate agents report that people like to live where there is a good view. Houses and apartments are commonly built beside rivers and lakes and on the sides of hills and mountains. Using your knowledge of the effects of gravity and water, decide if steep slopes and river banks are good places for people to live.