

Sediments on the Move

Content Statements Addressed:

Earth's surface has specific characteristics and landforms that can be identified.

The Surface of Earth changes due to weathering.

The surface of Earth changes due to erosion and deposition.

Summary

Students will explore how various landforms are made as a result of **erosion** and **deposition** from water and ice flow. This activity is best for small groups (3-5)

Materials Needed Per Group:

- Large cookie sheet
- Wax paper
- 1 Cup of sand
- 1 Sifter
- Large straw or funnel
- 1 Cup water
- Pump spray-bottle
- Thick book for propping up tray
- Masking tape
- Spoon

- Pipettes
- Student Procedure and Data Sheet (1 for each student)
- Another large shallow tray
- Paper towels for clean up

For Extension Activities

- Several pre-made glaciers(from "What About Ice" activity)
- ½ cup Gak (see recipe)

Procedure:

Rain and Stream Erosion

1. Place the book in the center of the workspace. Lay the cookie sheet on it so that one end is higher than the other, producing an incline.
2. Tape a piece of wax paper to cover the cookie sheet.
3. Place a tray under the lower end of the sheet to catch runoff.
4. Using a spoon and sifter, sprinkle sand over the entire surface of the cookie sheet.
5. Once all of the sand has been placed, choose a tool to add water with.
 - a. To simulate rain, use the spray bottle
 - b. To simulate streams, use the pipettes
6. Have students hypothesize as to how the sand was parted. Was it pushed by the water or did it absorb it? Have students record their observations with a summary and diagram.

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7. Remove the wax paper and sand from the cookie sheet.
8. Using a new piece of wax paper, wrinkle it into a ball and then flatten out again.
9. Repeat steps 2 through 5.
10. How did results compare?

Glacial Erosion

1. Pre-mix $\frac{1}{2}$ cup of Gak for each group. (Recipe attached)
2. Place the book in the center of the workspace. Lay the cookie sheet on it so that one end is higher than the other, producing an incline.
3. Tape a piece of wax paper to cover the cookie sheet.
4. Place a tray under the lower end of the sheet to catch runoff.
5. Using a spoon and sifter, sprinkle sand over the entire surface of the cookie sheet. Add sprinkle some small pebbles and gravel as well.
6. Place blob of gak at the highest point on the cookie sheet.
7. Have students record their observations.
8. How did the movement of their glaciers effect the landscape?

Discussion Points:

After the water is added and able to sit, students should notice a depression directly above the sugar. Ask them to note all observations.

After recording this observation, let students know that the model simulates groundwater added to layers of rock and sediments. Some of these sediments represent limestone. Limestone is degradable by carbonic acid. Carbonic Acid is formed when the carbon dioxide in the atmosphere is picked up by rainwater as it completes the water cycle. This weak acid slowly dissolves the limestone deposits and can leave caves underground. These caves can form sinkholes.

After the activity, try asking these questions. Be sure to let students discuss their results and hypotheses before explaining the phenomenon.

- How does the amount of water added affect the landscape? Did the different tools they used to add water affect the landscape differently?
 - Students might notice that more water carries more sediments.
 - Water delivered gradually will move less sediment than water all at once.
- Ask students what landforms they think could be formed by this process. Show pictures of various canyons, waterfalls, deltas and beaches.

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Data Collection Sheet

Observer

Name: _____

Date: _____

We want to know:

- What is **weathering**?
- What is **erosion**?
- How are **weathering** and **erosion** different?
- What is **deposition**?
- How do these processes shape the land over time?

What do you observe?	Trial #1	Trial #2
Diagram		
Narrative Description		
What conclusions can you make?		