

TRB 5:2 - Activity 1: Weathering and Erosion

Summary

Students will complete a variety of activities that demonstrate how weathering and erosion change Earth's surface.

Materials

15 rough, sandstone, limestone, or shale (sedimentary) rocks.

Three same size containers with lids (such as 32-ounce Gatorade bottles, wide mouth).

Three clear cups or jars.

A pen, paper, and masking tape, to label both the cans and the clear jars with A, B and C.

(Expand this activity by using an acid such as vinegar or lemon juice to show chemical erosion)

Background for Teachers

Two forces, weathering and erosion, are constantly at work wearing away the rocks that make up Earth's crust. Weathering causes rocks to fragment, crack, crumble, or break down chemically. Erosion loosens and carries away the rock debris caused by weathering. Over time these two forces, working together, can change the shape of the land.

Intended Learning Outcomes

1-Use science process and thinking skills.

2-Manifest scientific attitudes and interests.

3-Understand science concepts and principles.

Instructional Procedures

Invitation to Learn:

Brainstorm all the ways the surface of Earth can change. Take the list and put into three categories: weathering, erosions, and other. Discuss these findings and how long they take in each category.

Using pictures, discuss that Earth's surface has gone through weathering and erosion.

Instructional Procedures:

All kinds of rocks weather, but not in the same way or at the same rate. It all depends on the mineral composition of the rock, as well as where the rock is located. Here is a closer look at the way rock weathers through the water erosion process.

Separate the stones into three piles of five and put each pile onto a sheet of paper.

Label each can and jar "A," "B," and "C," and put five rocks in each.

Fill can "A" half way with water and put in the stones from pile "A." Do the same with pile "B," and with pile "C." Let the stones stand in the water overnight.

Pass the jar around to the students. Instruct them to hold can "A" in both hands and shake it hard about 10 times each, about 1,000 shakes.

Remove the stones from can "A" and pour the water into jar "A". Observe the stones and the water.

Using the same process, give can "B" about 300 shakes (you may rest between shakes).

Remove the stones and pour water into can "B." Once again, observe the stones and the water.

Do not shake can "C." Remove the stones and pour the water into jar "C." Observe the stones and the water.

Compare the three piles of stones and the three jars of water. Ask the students: "How do the piles of stones differ?" "Can you explain why?" "Which pile acted as a control group? Why?"

"How do the jars of water differ?" "How does this show what happens to rocks and stones

through the water erosion process?"

Let the three jars of water sit overnight. Have the class observe any differences or changes.

Explain that we have just learned the process of weathering. Erosion continues the work that weathering starts. It helps loosen particles and transport-weathered material. Erosion by way of waves, wind, glaciers, gravity, running water, etc., causes change in geological features.

Valleys, canyons, buttes, and drakes are all examples. The main agent of erosion is running water. It probably does more to wear away the land than all the other geologic agents combined. Ice, wind, plants and animals also affect landscape.

Extensions

Make a Mountain Block Cube Color and fold the various ways in which erosion occurs.

Fill an ice cube tray with sand and saturate it with water. Freeze it. Pop out the ice cubes and use them to replicate glacial movement down a valley. Slide the sand/ice cube across a piece of shale. Observe the scuffed surface. Use a regular ice cube as a control.

Have students fill a plastic Easter egg with water, close it, then freeze it. Students can see the ice crack the egg. This shows the freeze and thaw cycle.

Fill a beaker to a certain measure with colored water. (Using colored water will help students see measurements better.) Freeze the water. Have students look at the measure line when the water is frozen.

Assessment Plan

Students will go on a "Wear it Away Walk," by walking outside in the schoolyard and observing signs of erosion, weathering and deposition. Look for signs of erosion on hillsides. Look for loose rocks and soil at the bases of slopes. Observe any plant growth that slowed down erosion. Write down as many weathering and erosion observations as you can.

Bibliography

This lesson is part of the [Fifth Grade Science Teacher Resource Book](#). The TRB3 is designed to be your textbook in teaching science curriculum to your students. This book covers all the objectives of each standard and benchmark. If taught efficiently, a student should do well on the End-of-Level (CRT) tests. The TRB3 is designed for teachers who know very little about science, as well as for teachers who have a broad understanding of science.

Authors

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