

Agents of Erosion

4th Grade

Daniel F. Fink, Lashonda Orrell, Lila Levendoski

References:

- Columbus Public Schools SLC Guide

Benchmarks:

SLC 15: Identify evidence and show example of changes in Earth's surface.

Objectives:

Students will observe and identify the effects of weathering and geological activities in their environments as well as in the reports of events such as storms, floods, earthquakes, or volcanoes.

Materials:

- Loose and unconsolidated dirt
- Rough rocks
- Cups of water with lids
- Sand paper [50 grit recommended]
- Pitcher of water
- Small trays [like diner trays]
- Smooth rocks
- Tubs to catch eroding soil

Initial Demonstration:

Pass out rocks that are smoothed due to weathering/erosion and rocks that are rough and un-weathered. Have the students observe the rocks. Record their observations on the board.

Target Observations:

- Some of the rocks are smooth while some are rough.
- Some rocks have smooth and rough features at the same time.

Target Model:

- Rocks, buildings, roads, and sidewalks are changed by natural processes.
- Rough rocks are worn smooth by abrasion.
- Water [and the particles in the water] can cause this abrasion.

Procedure:

1. Divide the class into groups.
2. Have the students pick up a rock and rub it with sandpaper and make observations about both the sandpaper and the effects that the sandpaper has on the rocks.
3. Have the students take a handful of the soil and drop it into the tub of water and make observations. [some of the soil falls to the bottom and some sits in solution]. Now have them put the lids on the cups and swirl it around and make more observations [rest of dirt goes up into solution].

Target Observations:

- The sandpaper is rough and rubs off part of the rocks. This is called abrasion.

Target Model:

- The soil/sand in the water is like the particles on the sandpaper. Just as the sandpaper abrades the rocks, water that is carrying particles can abrade rocks.
- The faster the water is moving the more material/particles the water can carry and the more force that the particles are rubbed against the rocks.

Procedure:

1. Have each group place a few cups of dirt on the end of a tray in a small pile.
2. Have the students blow [wind] on the pile of dirt and make observations. Then reform the pile.
3. Have the students tip the tray at an angle until the dirt starts to slide. Make observations and reform the pile.
4. Have the students hold the tray at an angle shallower than will cause the dirt pile to subside. Have them pour water on the dirt pile and make observations.

Target Observations:

- The dirt moved when students blew on it.
- The dirt moved when the tray was lifted to a steep enough angle.
- The dirt moved when water was poured on it.

Target Revised Model:

- Erosion can be caused by wind, gravity, and water.

Summary:

Students have seen first hand the mechanisms of weathering and erosion. They should be aware of the differences between these two processes that can change the appearance of the Earth.