



## Discover Erosion

**Pre-visit activity** connection to Energizer Weather and Nature

**Grade level/standards: Kindergarten** NGSS K-ESS2-1; **2<sup>nd</sup> grade** NGSS 2-ESS1-1, 2-ESS2-1;  
**4<sup>th</sup> grade** NGSS 4-ESS2-1

**Concepts:** Splash erosion, wind erosion, water or fluvial erosion

### **Materials needed:**

#### Experiment #1

1. Large piece of white paper
2. Dropper or pipette
3. Shallow saucer
4. 2-3 tablespoons of soil

#### Experiment #2

1. 5-10 cups of soil to create a hill
2. A hair dryer with cylindrical barrel
3. A trough for a wind chamber (This can be made of 90-degree-angled frame for 2 x 4 boards for Plexiglass sides or whatever material you have available.)
4. Wooden craft sticks or coins

#### Experiment #3

1. Large container such as a bucket filled with dirt
2. Coffee can to hold water
3. A place to sit the container that is above the erosion table
4. A flat plastic child's sled or a long board to create a slope to create the erosion table
5. A long sheet of plastic to cover the plastic sled or board and to catch the runoff water
6. Large container for collection of the runoff water
7. A small rectangular wood block
8. Plastic or rubber tubing

### **Procedure:**

1. Before starting the demonstrations read the book "Erosion" by Becky Olien (ages 6-9) or "Erosion: How Land Forms and How It Changes" by Darlene Stille (ages 10-13) or another book that introduces erosion.
2. Discuss with the students the various types of erosion. Create a chart on white paper or on the smartboard.
3. Conduct the following demonstrations:

- a. *Splash erosion*. Holding the dropper/pipette approximately 1 meter above the saucer filled with dirt, ask students to predict what will happen when the water is dropped on the saucer full of dirt. Demonstrate several splashes. Ask: "What type of erosion is this?" (splash erosion). Discuss erosion patterns within the affected area.
- b. *Wind erosion*. Move or direct attention toward the wind erosion set-up. Ask students to predict the results of turning on the blow dryer. Allow a student to turn the dryer on low. Observe and discuss the changing landscape. Ask: "What type of erosion is this demonstration?" (wind erosion). Stand a couple of craft sticks or coins in the soil and allow the dryer to continue blowing while observing demonstration #3.
- c. *Water (fluvial) erosion*. Move or direct attention to the slope set-up. Ask a student to cover the entire surface of the plastic-covered board with soil. Pat into place. Fill coffee can with water and place on shelf above erosion slope. Have a student hold the can firmly in place. Fill the tubing with water. Have a student cover one end of the tube with his or her finger. Submerge tubing in coffee can and hold in place. Another student should place his or her finger over the other end of the tubing. Ask students to predict what will happen when the lower end of the tube is placed in the soil. (Water should siphon through the tube and flow steadily through the soil.) Observe and discuss the resulting land forms. Introduce the terms *water (fluvial) erosion*, and *rills* if they appear. Stand a block of wood in the resulting soil bank along the flowing stream. Discuss how this could represent construction of buildings in the area and observe effects of the water flow. Lay the wood block on its side in an attempt to dam the water. Discuss resulting changes in the flow and landforms.

### What's Happening:

- o **Soil** is the thin and loosely packed layer of earth materials composed of decaying organic matter and weathered minerals which provides nutrients, physical support, and adequate amounts of air and water for plant growth.
- o **Rills** are cuts made in the soil due to the action of flowing water as it picks up sediments in the soil. Over time, rills may grow to become gullies, creek beds, rivers, the Grand Canyon, etc.
- o **Forces** which drive erosion include *physical forces* (also known as *mechanical forces*) such as wind, flowing water, flooding, gravity, temperature shifts (expansion and contraction), evaporation due to the sun, and glacial ice melts
- o **Running water (fluvial) erosion** is when the force of moving water dislodges rocks and other solid particles which are carried along by the water. These particles scrape and scour the soil, loosening it and carrying it away.

- **Wind (aeolian) erosion** is most destructive in areas where there is little to no ground cover and small rocks, sand, and silt are blown across the land.

**Book List:**

1. Erosion: Changing Earth's Surface by Robin Koontz
2. Cracking Up: A Story about Erosion by Jacqui Bailey
3. The Disapproving Mountain and Other Earth Mysteries by Louise Spilsbury
4. Soil Erosion and How to Prevent It by Natalie Hyde
5. Weathering and Erosion by Maria Nelson
6. Erosion by Becky Olien
7. Erosion: How Land Forms and How It Changes by Darlene Stille

**Extension Activities:**

1. Do a scavenger hunt around your school to determine what types of erosion is occurring.
2. Write an article for a newspaper describing one type of erosion, the problems it creates, and solutions.
3. Read one of the books and create a book talk for the class.

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