

# Station 1: Chemical Erosion

## Materials:

- Petri dishes or trays
- Chalk (Or rock samples that contain mineral calcite like limestone, marble, etc.)
- Other rock samples (granite, brick, etc)
- Vinegar or lemon juice
- Eyedroppers
- Magnifying glasses
- Paper towels
- Plastic bin for collecting completed experiments

## Preparation:

1. Prepare trays with rock samples (1 per pair of students).
2. Prepare small containers with acid solution (vinegar). Add droppers to containers.
3. Set out magnifying glasses, one per student.
4. Set out paper towels.

## Instructions:

1. Take one of the rocks and place it in the petri dish.
2. Slowly add drops of lemon juice/vinegar to the rock using the eye dropper.
3. Observe the rock with the magnifying glass.
4. Record your observations on your Erosion Worksheet. (Specifically, did the rock bubble when you placed the weak acid on it?)
5. Discuss with your partners why you think such a reaction occurred.
6. Remove the rock, dry it off, and set it off to the side with the rest of the rocks. Repeat with remaining rock samples.
7. When finished, students are to place petri dishes and acid in the large plastic bins.

## Station 2: Water Erosion

### Materials:

- Large plastic container (Use clear plastic tray with high sides)
- Moist soil
- 12 coins, poker chips or small plastic action figures
- Watering can (one with several holes in the spout)
- Water
- Ruler
- Paper towels and towels (if things get really messy)

### Preparation:

- Docents can prefill the plastic containers before class arrives or have the students fill them during the experiment.
- Set up an area outside where the bags of soil can be placed. This will help eliminate messes inside the classroom.
- Have containers filled with plastic pieces (or coins or poker chips or toys)
- Have watering cans filled and ready to use.

### Instructions:

1. Have the students fill their containers with soil. Or docents can pre-fill containers.
2. In a large container, form a mountain of soil about 3 inches across (wide at the top) and about 5 or 6 inches tall in the container. Firmly press down the soil.
3. Press the coins/chips/action figures into the surface of the dirt/clay. (Place them at different angles with the edge protruding out; leave about half the object showing.)
4. Create a rainstorm by pouring water on the mountain with the watering can.
5. Record your observations. (Are the coins sticking out more or less? What does the bottom of the mountain look like?)
6. Remove the coins and put them in the large plastic bin. These will be washed later along with the large plastic containers.
7. Drain the water outside in the grass or around the trees.
8. Place used soil in a large plastic container or pot to use for other experiments.

### **Station 3: Glacier Erosion**

#### Materials:

- Ice cubes (1 for each pair of students)
- Modeling clay (do NOT use Play-Doh®)
- Tray
- Sand
- Paper towels

#### Preparation:

1. Freeze ice cubes ahead of time.
2. Have modeling clay ready.
3. Put sand in small containers.

#### **Instructions:**

1. Take a ball of clay from the container (approximately 1-2 inches in diameter).
2. Flatten the clay onto the surface on the tray.
3. Press an ice cube against the flattened clay and move it back and forth several times.
4. Record your observations. (Does anything happen to the clay when you rub the ice cube on it?)
5. Place a small pile of sand on the clay and then place the ice cube on top of the sand for 1-2 minutes.
6. Pick up the ice cube and observe the surface of the cube that was touching the sand and record your observations. (What does the bottom of the ice cube look like?)
7. Place the same side of the ice cube on the sandy part of the clay and move it back and forth several times.
8. Remove the ice cube and wipe away the sand from the surface of the clay.
9. Record your observations. (What does the texture of the surface of the clay feel like?)
10. Discuss what happened. Even though glaciers move slowly, they will gradually remove loose material from its surface as it melts. In addition to removing material, rock fragments become embedded in the bottom and sides which act as an abrasive, grinding and scouring bedrock which later form walls & floors of mountain valleys. Glacier erosion also occurs in the form of melting. 90% of solar radiation from snow & ice is reflected back out into space, but the rest is absorbed and causes melting & erosion.
11. Throw away the clay and remaining ice and sand.