

# Weathering and Erosion

## 4<sup>th</sup> or 5<sup>th</sup> Grade

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### **Benchmark and SLC# :**

SLC# 15: Students will better understand weathering and erosion and how it affects the surface of the earth

### **Objectives:**

To help students understand how changes occur on the surface of the earth through erosion and glaciation, and understand that weathering may be a physical or chemical change.

### **Materials:**

#### Day 1:

- Iron SOS pad
- Salt
- Limestone (or powdered limestone)
- Vinegar

#### Day 2:

- Plastic garbage bag
- Sand
- Low sided box
- Paper towels
- Elmer's Glue

#### Day 3:

- Sand
- Ice cubes made with sand at the base
- A hand sample of a soft rock like shale
- Another harder rock like granite

### **Day 1 – Intro. to Weathering:**

### **Initial Demonstration/Initial Observation:**

Ask students to predict what will happen to the salt and iron after they interact with water, and vinegar after it interacts with limestone.

### **Target Predictions:**

- Weathering is a chemical change
- The iron and water, as well as the vinegar and limestone, will undergo a chemical change
- The water and salt will undergo a physical change

### **Discussion:**

Weathering often involves materials such as iron, salt, and limestone, because they are common objects found in the earth.

### **Target Model:**

*-Weathering can be a chemical change or a physical change.*

### **Procedure:**

Perform experiments to test the predictions made by the students.

- 2) Place the iron pad in water for a couple days.
- 3) Add water to mound of salt and observe changes at regular time intervals.
- 4) Add limestone to vinegar and observe.

### **Target Observations:**

- Students will see chemical changes and physical changes:
  - i. Rust will form
  - ii. Salt will dissolve
  - iii. Limestone will fizz.

### **Discussion:**

Ask students to think of other examples of weathering. Target examples: freezing rain, rounded stone stairs etc... Which of these are physical changes. Are there any that are chemical changes?

### **Day 2-Erosion by Water:**

#### **Initial Demonstration:**

Place a mound of sand on a plastic bag in a low-sided box. Sprinkle water on top of the mound and record the observations. Continue the process until dramatic changes in the sand occur.

#### **Target Observations:**

- Water will change the shape of sand formation

#### **Target Model:**

*-Running water erodes the land.*

#### **Procedure:**

Repeat the process with a more resistant material. Mix 5-10% solution of Elmer's glue and water and add it to the sand and shape a new mound. Let this dry and then repeat the above process. This mound will be more resistant to the erosion from water because of the glue

#### **Target Observations:**

- The shape of the sand-glue formation didn't change as easily as the sand-only formation.

#### **Target Model:**

- Running water erodes the land.
- Land erodes differently depending on its properties.*

### DAY 3-Erosion by glaciers:

#### **Initial Demonstration:**

Create “glaciers” by mixing water with sand in ice cube trays and freezing the mixture. The frozen “glaciers” will be ice cubes with sand embedded in the bottom. Have students take a cube and run it over the hard rock and the softer rock in groups. Record observations.

Ice cubes will scratch rock; water will also form on rocks

#### **Target Observations:**

- The ice cubes can scratch the surface of some rocks
- Water will form on the rocks

#### **Target Model:**

- “Glaciers” can scratch rock*
- “Glaciers” can leave water behind*

#### **Discussion:**

Discuss what changes occurred in the rocks and if this is indeed erosion. Ask students what evidence they have. What can glaciers do in the real world? What role do they play in erosion?

Make sure to talk about glacial effects in Ohio and site example like striated land on Islands in Lake Erie like on Kelly’s Island.

#### **Target Revised Model:**

- “Glaciers” can scratch rock*
- “Glaciers” can leave water behind*
- Glaciers erode the land and transport materials*