

**The Proof is in the Rocks**  
**Using Inquiry to Discover Weathering and Erosion**

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**4<sup>th</sup> Grade Science**

**Standard III:** Students will understand the basic properties of rocks, the processes involved in the formation of soils, and the needs of plants provided by soil.

**Objective 2:** Explain how the processes of weathering and erosion change and move materials that become soil.

**Indicator: b.** Distinguish between weather and erosion.

**Science Intended Learning Outcomes**

**1- Use science process and thinking skills**—c, d, f, h

**4- Communicate effectively using science language and reasoning**—a, b, c

**Background Information:**

Weathering and erosion on Earth's surface is happening all around us all the time. Sometimes it happens so slowly or subtly that we don't know it is happening. Other times it can happen quickly right before our eyes. It is important for students to know what weathering is and how it is different from erosion. The definition of weathering is the physical breakdown of the rocks on Earth's surface into smaller pieces of rock or sand. The definition of erosion is the movement of sediments and rocks from one place to another. The students will look at the pictures provided to look for evidences of weathering and erosion in the rocks, mountain, and canyons of Utah.

**Weathering**

Definition: The physical breakdown of the rocks on Earth's surface into smaller piece of rock or sand.

**Erosion**

Definition: The physical movement of sediments and rocks from one place to another by forces of nature.

## **Activity I**

### **Picture Observation for Discovering Evidences of Weathering and Erosion**

1. Put the students into groups of four and give each student at least three scenic pictures showing weathering and erosion.
2. Have the students look at the pictures provided for them and write down evidences in their journals of weathering and erosion. They may see a gouge in the side of the mountain, a shelf on a huge rock formation, or rocks at the bottom of a large hill. Explain to them to be very descriptive of what they see looking at these pictures. At this point, they don't need to put them into categories of weathering and erosion. They just need to write down evidences of the breaking down of rocks, evidences where rock and sediment material used to be, and evidences that rock and sediments are in places that are unnatural.

**Here are some evidences they may see, but don't tell them this part yet. It is not comprehensive, but has a lot of ideas for you to help them discover.**

Broken sediments at the base of hills and mountains

Small and large holes in rock

Spaces between rock spires joined near the bottom of rock formations

Gaps between rock formations on the ground

Pointed spires

Layers exposed on rock formations

Canyons in the mountains

Overhangs over water and rock

Vertical dug-out crevices on sides of the mountains

Slick, vertical rock

Ground dug out where the part of the ground is lower than other parts

Water levels visible on mountainsides

Fan-looking sediments below crevices and canyons

Cracks in rocks

Gouges in the rocks and mountains

Big scoops of rock gone from the mountains (valleys)

Mountain peaks are thin

## **Activity II**

### **Discussion of the Picture Observation**

1. After the students have had a few minutes to discover the evidences of weathering and erosion, have a class discussion of what they found.
2. As the students are sharing what they have found, put these facts on chart paper so they can all see it. Later it will be hung on the wall for later confirmation of their finding.
3. Have the students raise their hands and describe what they have found. They need to point to their picture and tell about it.
4. After they have fifteen to twenty evidences of weathering and erosion written on their chart paper, tell them that they are going to see how this happens through the wonder processes of the natural means nature has to offer to “sculpture” the mountains, hillsides, rock formations, etc. These nature forces are temperature change, ice expansion, running water, wind, gravity, wind, plants, animals, and waves.
5. Now go onto the activities of weathering and erosion.

**Next, do the weathering and erosion experiments before you do Activity III.**

### **Activity III**

#### **Making a Connection Between the Pictures and Experiments**

1. Pass out the scenic pictures again of weathering and erosion.
2. Put the students in their same groups they were in doing Activity I. Make sure the students have their logbooks of the weathering and erosion experiments.
3. First have them look at their weathering logbooks. Have them find the evidences on their pictures that support each of the experiments showing weathering.
4. Then have them look at their erosion logbooks. Have them find the evidences on their pictures that support each of the experiments showing erosion.
5. Have a class discussion of their discoveries. Use the chart paper for a reference. If more discoveries of weathering and erosion are found during this second discussion, write it down on the chart paper.