

Rock and Erode (3-5th grades) Pre-Visit Activities

Vocabulary List and Student Definitions (elementary level):

- **Rock:** a natural, solid material made of one or more minerals
- **Mineral:** a natural, inorganic, solid found in rocks
- **Atom:** the smallest part of an element, the building blocks to all matter
- **Igneous:** rocks that form under conditions of intense heat, hot molten lava that cools and hardens
- **Metamorphic:** rocks that form under conditions of intense heat and pressure in the deep layers of the earth's crust
- **Sedimentary:** rocks formed from materials deposited as sediment by water, wind, or ice
- **Crust:** Outer most layer of the Earth that is made of solid rocks and minerals.
- **Sand:** loose grains of rock or minerals found on beaches, in deserts and in soil.
- **Pebble:** a small round stone that has been worn smooth by wind or water.
- **Soil:** the top layer or the Earth's land surface.

Teacher Background and Supporting Information

1. Rock and Mineral Formation

a. What are rocks and minerals?

- i. Natural, inorganic (nonliving) solids that have a crystal structure and are arranged in a specific geometric pattern, with unique physical properties.
- ii. Minerals are made of elements.
- iii. Rocks are made of two or more minerals.
- iv. A solid mass made of one type of mineral is called a mineral specimen. A solid mass made of two or more minerals is called a rock specimen.

b. How do rocks form?

- i. Rocks are continuously being formed, worn down, and then formed again. This is known as the Rock Cycle. Just like water travels in a cycle or continuous path (water cycle), so do rocks! However, rocks take thousands and millions of years to change and go through the cycle.

c. Rock Types:

- i. Rocks can be divided into three types. They are classified by how they form.
 1. Igneous – the word igneous means “from fire.” Igneous rocks form from molten rock under the earth's surface, called magma. As it erupts onto the earth's surface, in the form of lava, it cools and hardens (Helpful hint – igneous mean from fire, to ignite means to set fire).
 2. Sedimentary – rocks formed from grains of sand, mud, and pebbles (sediment). Layers of sediments pile up at the bottom of rivers, lakes, or oceans. Due to high pressure as each new layer forms the grains form into rocks.

3. Metamorphic – the words meta and morph mean “to change.” Metamorphic rocks used to be igneous or sedimentary, but due to movement of the earth’s crust and high heat and pressure they were changed.

Student Activities

1. How many is a million?
 - a. Create a sheet of paper (half sheet) with 20 rows of 100 dots per row at 16 pt font size. You may have to adjust the margins. The total number of dots on a half sheet of paper will be 2,000.
 - b. Ask students to predict how many dots exist on the page. After they have shared their predictions tell them there are approximately 2,000. If each dot represents a year, how many dots would they circle to show their age? Ask them to think of the oldest person they know and try to circle the number of dots to represent that person’s age.
 - c. Tape each sheet of dots onto a large wall to create one large sheet. Figure out the total number of dots on the wall.
 - Example: 25 students = 25 sheets.
 - 1 sheet = 2,000 dots.
 - 25 sheets x 2,000 dots = 50,000 total dots.
 - *Challenge students to figure out how many sheets it would take to reach one million dots. (Answer = 500 sheets).
 - iv. Remind them that it takes thousands and millions of years for the rock cycle to occur and make changes. That’s an enormous number of years and very long process!
2. Read-a-loud:
 - a. The Rock Factory: A Story about the Rock Cycle by Jacqui Bailey and Mathew Lilly
 - b. Let’s Go Rock Collecting by Roma Gans
3. Incredible, Edible Rocks
 - a. Provide students with rock samples of the three types.
 - b. As they investigate each sample, heat chocolate chips and marshmallows over low heat in a saucepan (leaving a small sample of unmelted chips and marshmallows to the side). The melted chips and marshmallows represent igneous rock.
 - c. Next, provide each “mineral” ingredient in separate bowls.
 - d. Provide each student with a Dixie cup with some peanut butter (*or Fluffer Nutter if there are nut allergies*) and allow students to choose 2-3 minerals to add. The mixture of minerals represents sedimentary rock, specifically conglomerate.
 - e. Lastly, have students place the mixture between two pieces of waxed paper (add a marshmallow) and apply pressure to blend the minerals. This represents metamorphic rock.
 - f. Enjoy the tasty treat!