

WHAT IS

A ROCK?



Background Information

Rocks are present in our daily lives, rocks are beneath our feet everywhere we go, whether solid or molten. A **rock** is a solid, naturally occurring substance composed of minerals. A **mineral** is a naturally occurring, solid, inorganic substance that has a crystalline structure. Common examples of minerals are coal, quartz, and marble. Minerals are also everywhere we look, in our technology, food, and in our buildings and architecture. There are three main categories of rocks; sedimentary, igneous, and metamorphic. Sedimentary rocks are composed of many smaller rocks that have been “glued” together, either through lithification or precipitation. Igneous rocks are formed when magma or lava begin to cool and crystalize. This means igneous rocks can form at the surface of the Earth or below the Earth’s crust. Metamorphic rocks form when a rock is exposed to high heat and pressure, resulting in plastic deformation of the existing rock. The rock cycle describes the process in which one type of rock can transition to another type of rock.

A **fossil** is the preserved remains, or traces of remains, of ancient organisms. Fossils can form through many different processes, though the most common is known as permineralization. This occurs when a bone, piece of wood, or shell is covered by sediment. If mineral-rich water is able to flow through the pore spaces of the sediment, it will deposit minerals into open spaces in a bone, for example, completely replacing the empty spaces. Over time, the leftover organic material will rot away and all that will be left are the minerals that were deposited by the water.

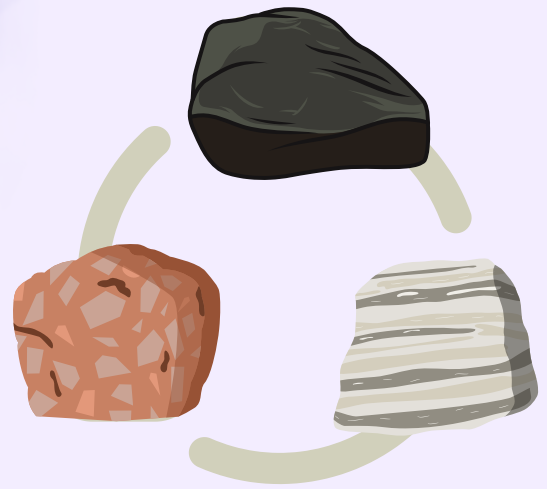
Next Generation Science Standards (NGSS) Met:

- 5-PS1-3. Make observations and measurements to identify materials based on their properties.



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Objective

Students will analyze items (rocks and non-rocks) and form observations based on their physical traits. Students will use their observations to formulate a definition of a rock. Students will use critical thinking skills to evaluate their definition of a rock when presented with items that may not be a rock but fit their current definition. Students will understand the definition of a rock and how to apply it.

Key Vocabulary:

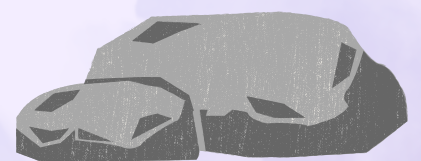
- **Definition:** the meaning of a word
- **Object:** something we can see and touch
- **Examine:** look closely at something, in detail
- **Trait:** a quality of something
- **Rock:** a solid, naturally occurring substance generally composed of minerals
- **Mineral:** substances naturally formed in the Earth, typically solid, inorganic, have a crystalline structure and are formed by geological processes
- **Fossil:** the preserved remains, or traces of remains, of ancient organisms

Materials Needed:

- Rocks, minerals, and/or fossils
- Other items like dirt, ice, wood, plastic, pavement/concrete
- Dry-erase markers/chalk
- Whiteboard/chalkboard access
- Worksheet

Preparation:

1. Collect about 4-5 rocks, minerals, and/or fossils per each group of 3-4 students, try to collect a wide variety.
2. Collect the other items such as soil, ice, plastic, pavement, etc., the idea is to get items that are not rocks but may fit students' initial definitions.



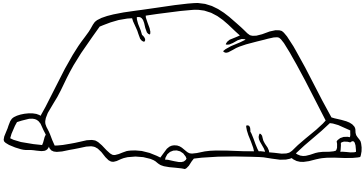
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Note: This lesson typically requires about 45 minutes.

Timeline and Procedure:

- 2.5 minutes - Conduct a quick informal assessment of what students already know and create engagement.
 - Ask, Where do you find rocks? What creates rocks? What *is* a rock?
- 5 minutes - Introduce the task of examining and defining a rock and ensure students are familiar with the vocabulary listed above, with the exception of a rock, mineral, and fossil.
- 7.5 minutes - Students are broken into groups of 3-4 and given their set of rocks. Instruct students to work together in their group to observe the rocks they have and their traits. Students should draw what they observe as well. Students then create a definition of a rock as a group. They should consider, what traits does a item need to be classified as a rock? What type of traits would disqualify an item from being a rock?
- 5 minutes - Students come together to discuss their definitions as a class. Together, the class will work to combine all of their ideas into a class definition.
- 10 minutes - Each group will reunite to work on one or two other items (soil, ice, plastic, pavement, etc.) and determine if they are rocks or not based on their previous definition. If they think their previous definition was inaccurate or not specific enough, they should adjust accordingly and provide reasoning behind the change.
- 7.5 minutes - Students will come together as a class to discuss their specific items and why or why not it is a rock. If they determined they needed to change their definition, they should explain why they decided to do so and what their new definition of a rock is.
- 5 minutes - As a class, a new definition is reached and the teacher guides the definition to the scientifically accepted definition. The teacher also shares definition of a mineral and a fossil and explains how they are all interconnected yet different.
- 2.5 minutes - Conduct a quick informal assessment to see what students know now.
 - Ask again, What is a rock? What is the definition of a rock?
 - Other objects may be quickly shown to check students ability to correctly identify rocks and non-rocks.



Rock Observations

Name: _____

First Observations

Draw pictures!



What do you observe?: _____



Define a rock: _____

Second Observations

Draw pictures!



What do you observe?: _____



Now, update your definition: _____
