

Lesson Outline for Teaching

Lesson 2: Rocks

A. What is a rock?

1. A rock is defined as a naturally occurring solid mixture composed of minerals, organic matter, glass, smaller rock fragments, or any combination of these.
2. The individual particles in rocks are called grains; they give clues about how the rock formed.

B. Classifying Rocks

1. Rocks are classified based on how they form.
2. There are three main categories of rocks: igneous rocks, sedimentary rocks, and metamorphic rocks.
3. Most rocks on Earth are igneous rocks.
 - a. Igneous rock forms from molten rock, which is called magma when it is below Earth's surface and lava after it erupts onto Earth's surface.
 - b. As the molten rock cools, crystals of minerals start to grow; these become the grains of newly forming igneous rocks.
 - c. Lava at Earth's surface cools quickly, so the crystals that form are small; geologists describe the texture of igneous rocks with small crystals as fine-grained.
 - d. Magma that is deep below Earth's surface cools slowly, so the crystals that form have time to grow large. Geologists describe the texture of igneous rocks with crystals of this size as coarse-grained.
4. Rock and mineral fragments that are loose or suspended in water are called sediment and are the source material for sedimentary rock.
 - a. The process by which sediment becomes sedimentary rock is called lithification.
 - b. The grain shape of igneous rocks can be described as rounded or angular.
5. One kind of rock forms when other types of rock are changed due to extreme high temperatures and pressure. The original rock is called parent rock; the resulting rock is metamorphic rock.
 - a. In the process of metamorphism, parent rock is squeezed, heated, or exposed to hot fluid.
 - b. One characteristic of many metamorphic rocks is foliation—the process by which flat minerals line up due to uneven pressures being applied to the rock, giving these rocks, such as gneiss, a layered appearance.

C. Rocks in Everyday Life

1. Granite is a(n) igneous rock that is hard and durable, which makes it useful for constructing structures such as fountains; pumice is a soft igneous rock that contains hard glass, which makes it useful for polishing and cleaning.

Lesson Outline continued

2. Sedimentary rocks, such as sandstone and limestone, are naturally layered, and so they make good building stones; limestone is a(n) sedimentary rock that is used to make cement.
3. Metamorphic rocks that are foliated split into flat pieces; for example slate is used as a durable, fireproof stone for roofing; marble is a(n) metamorphic rock that is soft enough to carve for in detailed sculptures.

Discussion Question

Where are some places that you see rock used in your everyday life? Describe the rock, tell what it is used for, classify the type of rock you think it is, and explain your answer.

Students might describe the use of sedimentary rock, such as sandstone and limestone, used in particular buildings; they might also notice such rock used in paving stones; they might realize that halite is a sedimentary rock that is ground up and used for de-icing roads. They might notice the use of the metamorphic rock slate as a roofing material in older buildings and the metamorphic rock marble used in sculptures and also for decoration in buildings or for countertops. They might notice places where the igneous rock granite is used in monuments or as a countertop; they might be aware of the igneous rock pumice used in particular types of cleansers.