

ROCK FAMILIES

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Title: Rock Families

Level: Middle School

Time: 30 minutes including presentation to the class

KERA Goals: 1.15

Objective:

Students will understand that all rocks belong to one of three rock families.

Background Information:

Scientists believe that the earth was formed about four and one-half billion years ago. The outer layer was a white-hot mass of rock. It's been cooling down ever since. But still, beneath the thin crust of the earth lies rock hotter than you could ever imagine.

Sometimes the hot rock below the earth's crust pushes up through a volcano. Sometimes the earth moves, showing us that we live on an ever changing planet that we cannot control. Mountains push through the earth's crust. Yet these mighty mountains can be turned into rocks by erosion, which is the wearing away of mountains by wind, water, sun, freezing, and thawing.

There are three major types of rock: IGNEOUS, SEDIMENTARY, and METAMORPHIC. Igneous rock is molten rock that flows from volcanoes as lava. It is also formed from the molten MAGMA in the MANTLE of the earth. The magma moves upward into the earth's crust, where it cools forming rock and crystals. Igneous rocks make up almost 64% of the rock in the earth's crust. Examples of igneous rocks are granite, basalt, and obsidian.

Sedimentary rock is formed by erosion. Wind, rain, sun, and frost wear even the hardest rock into tiny fragments. These small particles of rock, shell fragments, plant material, muds and sands accumulate in layers. Over millions of years, under the pressure of their increasing weight the sediments harden to form solid rock. Gravels become conglomerates, muds become shales, and sands become sandstone. Limestone is formed as a chemical precipitate from sea water. Some sedimentary rocks such as gypsum and salt are formed by evaporation of water in hot, dry environments. Coal is formed from peat, which is an accumulation of decayed plants usually associated with swamps. Sedimentary rocks make up about 8 % of the Earth's crust.

Finally, metamorphic rock is formed by the action of heat and pressure on igneous and sedimentary rocks. The physical and mineralogical properties of these rocks are completely changed. Examples of metamorphic rocks are schist, marble, and gneiss. This rock family makes up the remaining 28% of the rock in the earth's crust.

Activity:

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The following rock families have the characteristics indicated.

Igneous - fire formed magma / lava melted rock

Sedimentary - formed from smaller pieces of rock and/or sediments cemented together
(coal is an example)

Metamorphic - either igneous or sedimentary rock that is changed by intense heat or pressure

Divide the class into three groups. Have each group take the name igneous, sedimentary, or metamorphic. Ask each of the student groups to act out the characteristics of their rock name. They may get clues for their creative rock drama by listing the characteristics of each rock family on the chalkboard before the activity begins.

Adapted from materials provided by The Society for Mining, Metallurgy, and Exploration, Inc.