ROCKS

If you know how to read them, rocks can tell a story. They can reveal where they came from, how fast they cooled, how far they traveled, how much pressure and heat they endured. Knowing some basic facts about rocks makes it possible to know a great deal about the rocks and the geologic history of a given area.

How Are Rocks Classified?

There are three major groupings of rocks: igneous, metamorphic, and sedimentary.

Igneous rocks are formed when liquid rock (magma in the Earth and lava when it pours onto the surface) cools. Igneous rocks are classified based on their color (which tells something of their chemical composition) and the size of the grains or crystals in the rock. Darker igneous rocks are high in iron and magnesium and come from the Earth's mantle (like basalt). Lighter igneous rocks are higher in silica content and form nearer the surface in the Earth's crust (like granite).

Sedimentary rocks are divided into three categories: the clastic sedimenta… ke sandstone … ks that form when … nd biochemica… ces of shells accu… cks are then subdi… of the grains four…

Metamorphic rocks are divided into two groups, the foliated metamorphic rocks (such as slate and schist) and massive, non-foliated metamorphic rocks (such as marble and quartzite).

Lesson Checkpoint:
What are the three major categories of rocks?

Igneous Rocks

Formation

Igneous rocks form when liquid rock cools and hardens. Liquid rock that is under the crust is called magma. When it pours out onto the Earth's surface, it is then called lava.

Dark igneous rocks come from the Earth's mantle. They are dark because they contain high concentrations of iron and magnesium. As a result, they are more dense. The mantle rock that pours out onto the ocean floors is this dense, dark igneous rock. It is called basalt. The ocean ous rocks are referre

As igneous ols and minerals fo e crust, it is very low nese igneous ro al crust has large a red igneous rocks are referred to as felsic.

Classification

Igneous rocks are classified based on color and grain size. Dark igneous rocks with visible crystals include basalt and gabbro. The dark igneous rock that is glassy is called obsidian. Sometimes lava is frothed up with gasses, producing a very light weight rock called pumice. Pumice is the only rock that can float on water. Light colored igneous rock that does not have visible crystals is called syenite. Light colored igneous rock that has visible crystals is called granite.

There is a special circumstance in which the magma cooled so slowly that the crystals grew to be so large that they weigh tons. This special igneous deposit is called a pegmatite.

Crystal size in igneous rocks seems to be connected to the length of time the crystal had to grow. Obsidian (volcanic glass) has no visible crystals because it cooled immediately. Granite has larger, visible crystals because it cooled more slowly. Pegmatite crystals are enormous because they cooled, literally, over many thousands of years.

Uses

Igneous rocks are used primarily in the building industry for making and decorating business buildings and homes. Some igneous rocks, like pumice, are used as an abrasive. The feldspar from granites and pegmatites is used to make porcelain and glass.

Lesson Checkpoint:
Which is the only rock that can float on water?

Sedimentary Rock

Classific

Ther is formed in different nation.

Formatio

- **Clastic** her preexist and transported by water and wind and are redeposited elsewhere. The sediments accumulate and lithify (that is, become solid rock). A well-sorted clastic rock, such as sandstone, indicates the sediments have traveled a long distance and have been affected by great energy from water and/or wind. A poorly sorted clastic rock, such as conglomerate, has traveled a considerably shorter distance (in other words, it is nearer to its source rock).

- **Chemical sedimentary rocks** are sedimentary rocks that formed through chemical precipitation. When the situation is just right, dissolved lime in ocean water can precipitate out of the water and settle on the ocean floor. It accumulates and, in time, solidifies into limestone. Chemical sedimentary rock is very fine grained and shows no signs of life, such as fossilized remains.

- **Biochemical or organic sedimentary rocks** form when the shell remains of organisms collect on the ocean floor. There they solidify, becoming fossils and a layer of limestone. A special type of organic sedimentary rock called coquina is formed by the accumulation of shell fragments. In this case, the shell fragments have not fossilized, but are the original shell material.

Uses

Sedimentary rock is occasionally used in construction. Most limestone is crushed and used to make concrete. It is also crushed and used in road construction.

Lesson Checkpoint:
Which type of sedimentary rock is formed from other rocks?

Metamorphic Rock

Classification

Metamorphic rock is rock that is changed. The word "metamorphosis" is derived from two Greek words which literally mean "to change form." Any type of rock – igneous, sedimentary, and metamorphic - can be metamorphosed into a new metamorphic rock.

There are two categories of metamorphic rocks. Both are formed as the result of intense heat and pressure deep in the Earth's crust. The categories are foliated and non-foliated (or massive) metamorphic rocks. The difference is determined by the original rock that is being changed by the heat and pressure.

Formation

Foliated metamorphic rocks begin as clay and siltstone. As heat and pressure change the siltstone, the particles in the siltstone grow. As they grow larger, different metamorphic rocks are formed. The first to form is slate. As the grains continue to grow, the rock becomes phyllite. As the grains grow even larger, the phyllite becomes schist, and then it becomes gneiss. If the heat and pressure becomes too great, the gneiss can actually melt down and become magma. All of these rocks show some form of layering which is called foliation; therefore, they are called foliated metamorphic rocks.

Non-foliated metamorphic rocks begin as either limestone or sandstone. When limestone is metamorphosed, its grains grow and become more dense and compact. The metamorphic rock that forms is called marble. The same happens with sandstone which becomes the metamorphic rock called quartzite.

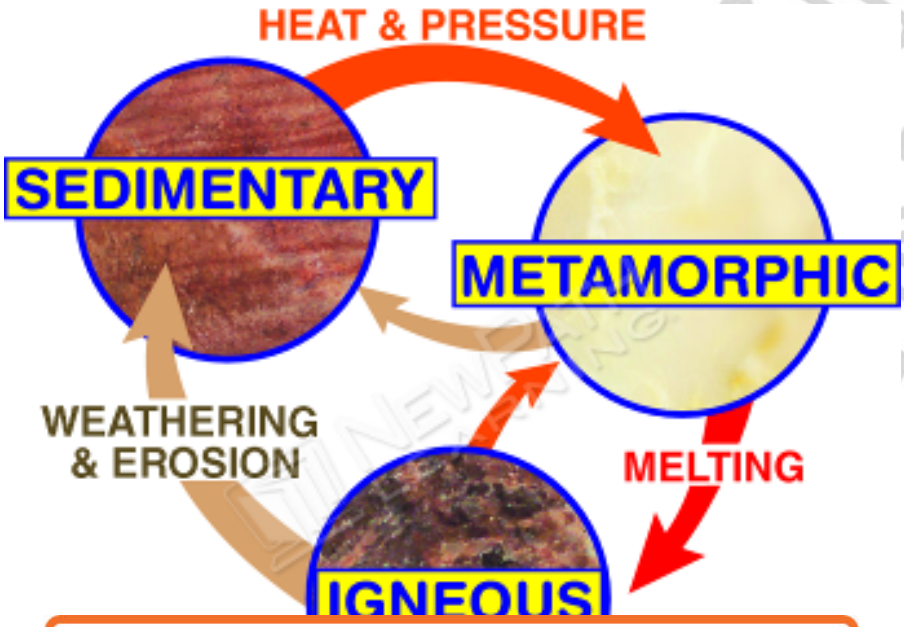
Rock can be metamorphosed when it comes in contact with a body of liquid rock [PREVIEW] When intense pre[PREVIEW]es of two tectonic pl[PREVIEW] metamorp[PREVIEW]phism.

Uses

Metamorpl[PREVIEW]ses. Occasional[PREVIEW]rphic rock that are useful for other purposes. For example, the garnet from Gore Mountain, New York is used to make abrasives like sandpapers. Marble is used to make decorative items like statues, columns, and smaller carved items.

Lesson Checkpoint: What two conditions help form metamorphic rocks?

The Rock Cycle



The "rock
transform ock types.
Any of the ified (solidified) to become a sedimentary rock. Any of the rock types can be subjected to intense heat and pressure and be transformed into a metamorphic rock. Any of the rock types can be heated to the point of melting and then cool to become an igneous rock. The graphic below shows the rock cycle well. The Earth is a dynamic planet and its rocks are constantly changing.