

1. Because sedimentary rocks have been changed by heat and/or pressure or both, the rock is changed substantially. It is often harder because it has undergone great internal pressures. It also has a different crystal structure.
2. Shale changes to Slate
Sandstone changes to Quartzite
Limestone changes to Marble
Slate changes to Phyllite
Phyllite changes to Schist
Granite changes to Gneiss
3. There are many commercial uses for Metamorphic rocks. SLATE is very hard and is often used for building roofs and floors; MARBLE is also a much used building material. It is used for the exteriors of buildings and for monuments and statues because it carves well; some metamorphic rocks are used for grinding and abrasives.
4. Building construction, floors, statues and other artwork; finely ground marble is even a filler in some foods including ice cream.

5. One of the most simple tests for marble is to place diluted hydrochloric acid on the specimen. The acid will cause the calcium carbonate to fizz as it releases carbon dioxide. Even vinegar (acidic acid) will have a chemical reaction but may be slower.
6. METAMORPHIC ROCKS are often found in the mountains because in the mountain building process there is a great deal of heat and pressure to help change existing rocks.

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The Physical Geography Series

Metamorphic Rocks

KG1163

TEACHER'S GUIDE

Glossary

Crystal - A solid, bounded by natural, regular plane surfaces formed by the growth of a crystal lattice.

Dynamic Metamorphism - Metamorphism of a rock by means of pressure.

Foliation - A parallel or nearly parallel structure in metamorphic rocks along which the rock tends to split into flakes or twin slabs.

Gneiss - A coarse-grained foliate breaking along irregular surfaces and commonly containing prominently alternating layers of light-colored and dark-colored minerals.

Hornfels - A tough, generally massive nonfoliate containing scattered crystals of high temperature minerals.

Magma - Molten silicate materials beneath the earth's surface including crystals derived from them and gases dissolved in them.

Marble - A nonfoliate metamorphic rock consisting mainly of calcite or dolomite.

Metamorphic Rock - A rock formed within the earth's crust by the transformation of pre-existing rock as a result of high temperature, high pressure or both.

Mica Schist - A rock composed chiefly of muscovite, quartz and biotite in various proportions.

Phyllite - A very highly lustrous, high-grained foliate parting along smooth or irregular surfaces.

Quartzite - A quartz-rich, nonfoliate metamorphic rock.

Schist - A well-foliated metamorphic rock in which the component flaky minerals are distinctly visible.

Sedimentary Rock - A rock formed by cementation of sediment or by other processes acting at ordinary temperatures at or close beneath the surface of the earth.

Slate - A fine-grained foliated metamorphic rock that splits along smooth planes into very thin plates.

Thermo-Dynamic Metamorphism - Metamorphism of a rock by means of heat & pressure.

Thermo Metamorphism - Metamorphism of a rock by means of heat.

Suggested Teaching Activities

1. Make a diagram showing the origin of molten rock and the various kinds of metamorphic rock that could be found as you move away from the center.

2. It has been traditionally thought that granite is an igneous rock that is the result of crystallization of a molten mass of rock. Some scientists today consider that granite is a metamorphic rock. List some possible arguments why they might think that this is so.

Quiz

1. Why is a metamorphic rock different than a sedimentary rock?
2. Make up a chart showing the types of metamorphic rock that have been formed from sedimentary rocks.
3. What commercial uses have been found for metamorphic rocks?
4. Marble is a metamorphic rock that has been formed from limestone. What are some uses of marble?
5. What is a chemical test for calcium carbonate, the chemical ingredient of marble?
6. Where do you think metamorphic rock might be found if you wanted to find some?