

# Geology

The Study of Rocks & Minerals

## Rocks vs. Minerals

Minerals can be shiny like diamonds or dull like coal but one thing they all have in common is that they are made of only one main material.

Rocks! They can be hard and they can be soft but do you know what makes them a true rock?

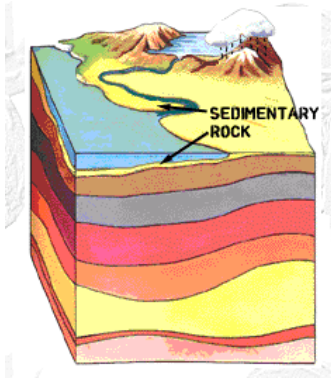
It is the stuff they are made of! Rocks are made up of one or more minerals.



### Three basic types of Rocks:

- Sedimentary
- Igneous
- Metamorphic

# How Sedimentary Rock Is Formed



For thousands, even millions of years, little pieces of our earth have been eroded--broken down and worn away by wind and water. These little bits of our earth are washed downstream where they settle to the bottom of the rivers, lakes, and oceans. Layer after layer of eroded earth is deposited on top of each. These layers are pressed down more and more through time, until the bottom layers slowly turn into rock.



**Sandstone Rocks** are sedimentary rocks made from small grains of the minerals quartz and feldspar. They often form in layers as seen in this picture. They are often used as building stones.



**Limestone Rocks** are sedimentary rocks that are made from the mineral calcite which came from the beds of evaporated seas and lakes and from sea animal shells. This rock is used in concrete and is an excellent building stone for humid regions.



**Shale Rock** is a type of sedimentary rock formed from clay that is compacted together by pressure. They are used to make bricks and other material that is fired in a kiln.

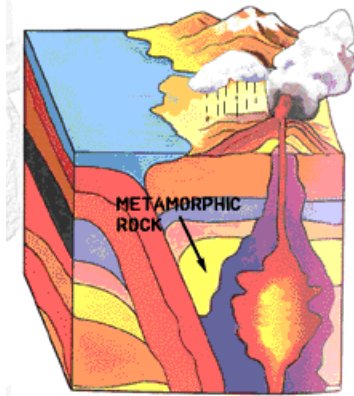


**Conglomerate Rocks** are sedimentary rocks. They are made up of large sediments like sand and pebbles. The sediment is so large that pressure alone cannot hold the rock together; it is also cemented together with dissolved minerals.



**Gypsum Rocks** are sedimentary rocks made up of sulfate mineral and formed as the result of evaporating sea water in massive prehistoric basins. It is very soft and is used to make Plaster of Paris, casts, molds, and wallboards.

# How Metamorphic Rock Is Formed



Metamorphic rocks are rocks that have "morphed" into another kind of rock. These rocks were once igneous or sedimentary rocks. How do sedimentary and igneous rocks change? The rocks are under tons and tons of pressure, which fosters heat build up, and this causes them to change. If you exam metamorphic rock samples closely, you'll discover how flattened some of the grains in the rock are.

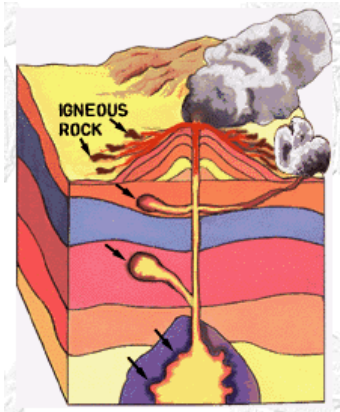


**Schist Rocks** are metamorphic. These rocks can be formed from basalt, an igneous rock; shale, a sedimentary rock; or slate, a metamorphic rock. Through tremendous heat and pressure, these rocks were transformed into this new kind of rock.



**Gneiss Rocks** are metamorphic. These rocks may have been granite, which is an igneous rock, but heat and pressure changed it. You can see how the mineral grains in the rock were flattened through tremendous heat and pressure and are arranged in alternating patterns.

# How Igneous Rock Is Formed



Igneous rocks are called fire rocks and are formed either underground or above ground. Underground, they are formed when the melted rock, called magma, deep within the earth becomes trapped in small pockets. As these pockets of magma cool slowly underground, the magma becomes igneous rocks.

Igneous rocks are also formed when volcanoes erupt, causing the magma to rise above the earth's surface. When magma appears above the earth, it is called lava. Igneous rocks are formed as the lava cools.



**Granite Rocks** are igneous rocks which were formed by slowly cooling pockets of magma that were trapped beneath the earth's surface. Granite is used for long lasting monuments and for trim and decoration on buildings.



**Scoria Rocks** are igneous rocks which were formed when lava cooled quickly above ground. You can see where little pockets of air had been. Scoria is actually a kind of glass and not a mixture of minerals.



**Pumice Rocks** are igneous rocks which were formed when lava cooled quickly above ground. You can see where little pockets of air had been. This rock is so light, many will actually float in water. Pumice is actually a kind of glass and not a mixture of minerals. Because it is so light, it is used quite often as a decorative landscape stone. Ground to a powder, it is used as an abrasive in polish compounds and in Lava© soap.



**Obsidian Rocks** are igneous rocks that form when lava cools quickly above ground. Obsidian is actually glass and not a mixture of minerals. The edges of this rock are very sharp.

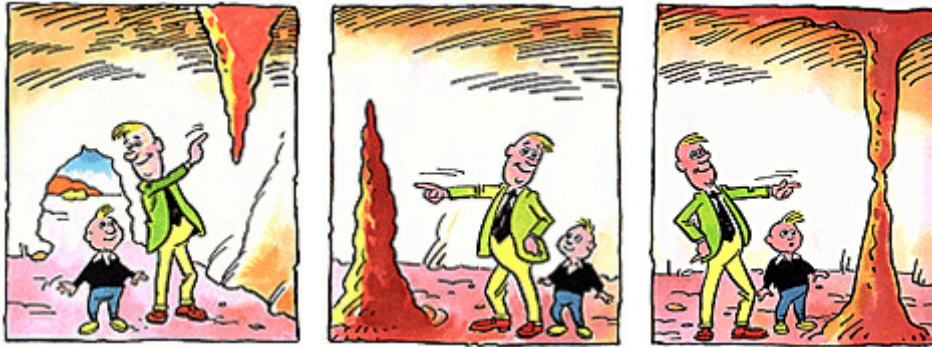
## ***Stalactites and Stalagmites***

**stalactite** (stuh LAK tight")

A conical or roughly cylindrical shape formed by dripping water and hanging from the roof of a cave like an icicle; usually composed of calcium carbonate.

**stalagmite** (stuh LAG might")

A conical shape formed upward from the floor of a cave by the action of dripping water from a stalactite; usually composed of calcium carbonate.



This is a stalactite.

This is a stalagmite.

Uh, this is a *stalemate*.

Draw a picture of a cave with a stalactite and stalagmite.

# Label the Volcano Diagram

## Definitions

**ash cloud** - an ash cloud is the cloud of ash that forms in the air after some volcanic eruptions.

**conduit** - a conduit is a passage through which magma (molten rock) flows in a volcano.

**crust** - the crust is Earth's outermost, rocky layer.

**lava** - lava is molten rock; it usually comes out of erupting volcanoes.

**magma chamber** - a magma chamber contains magma (molten rock) deep within the Earth's crust.

**side vent** - a side vent is a vent in the side of a volcano.

**vent** - a vent is an opening in the Earth's surface through which volcanic materials erupt.

