

## Type of Rock: Igneous

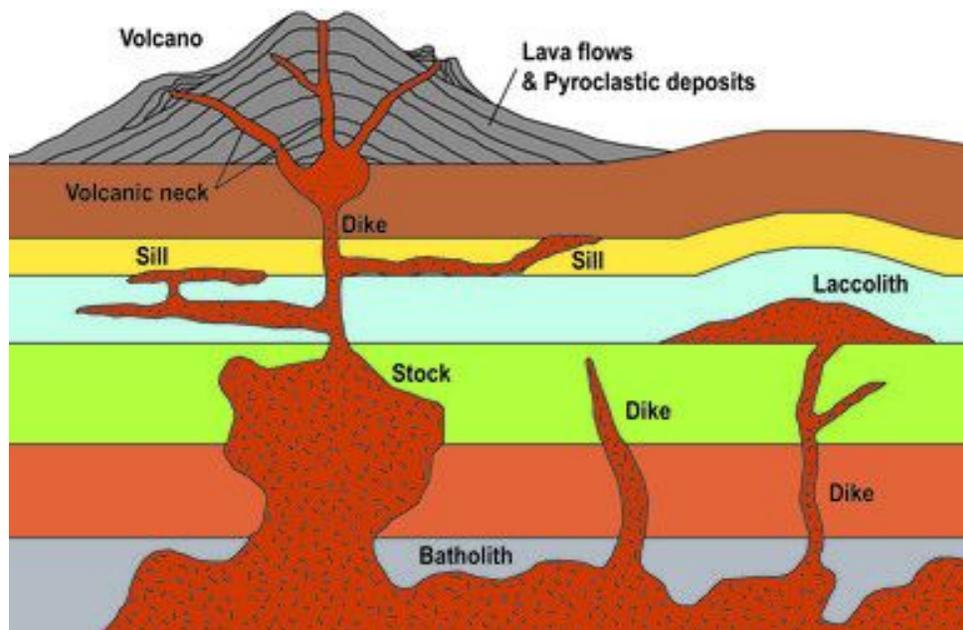
Igneous rock is the most common material in the Earth's crust. In fact, 95 percent of the first ten miles of the Earth's crust is made up of igneous rock. We don't always see igneous rock because it is often hidden under a thin layer of sedimentary rock and loose sediment.

Igneous rocks form when liquid rock called magma cools and hardens. Most igneous rocks crystallize and solidify below the Earth's surface and are called intrusive igneous rocks. If volcanic lava cools and hardens above the Earth's surface, extrusive igneous rocks are formed.

All igneous rocks are identified on the basis of composition and texture. There are only about a dozen minerals that determine the composition, or what the rocks are made up of. Igneous rocks with high silica content are typically lighter in weight and color. Igneous rocks that are rich in iron and magnesium are dark and heavy.

The rate at which the rocks cool from the liquid magma determines their texture. Slow cooling produces coarse-textured minerals. Granite, for example, cools very slowly, maybe over a period of 10,000 years. Granite is the most abundant igneous rock on Earth. It can be made up of a variety of minerals like quartz, mica, feldspar, and hornblend.

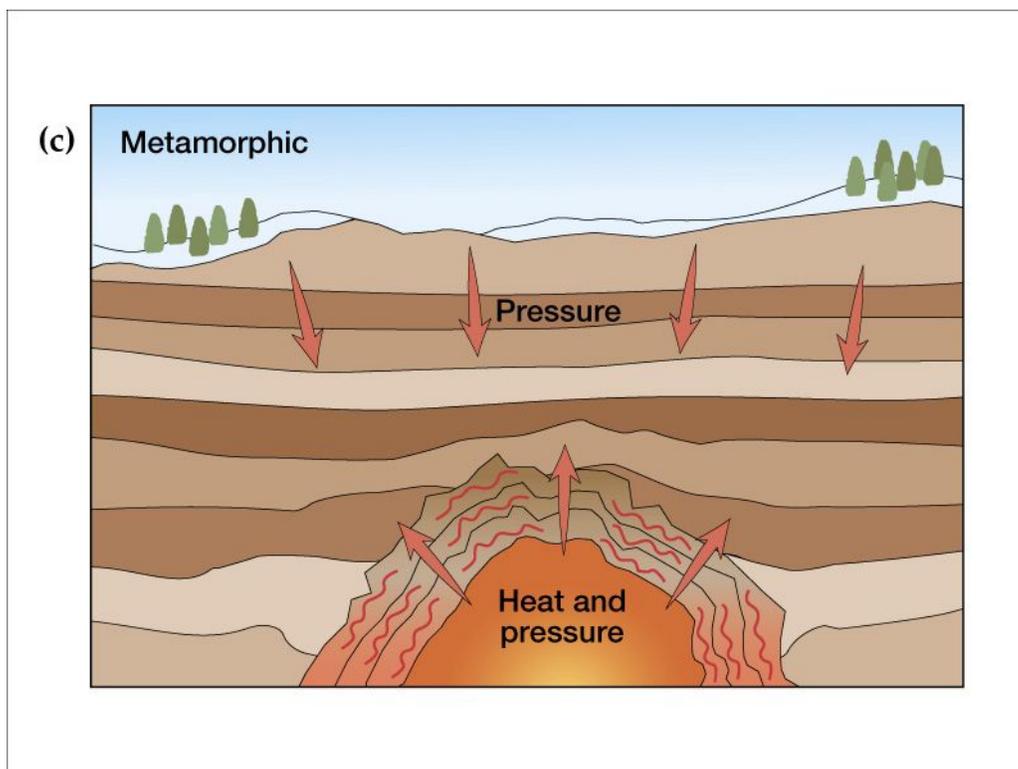
When magma or volcanic lava cools quickly, the igneous rocks formed are made of fine-textured minerals. Basalt, a very common volcanic igneous rock in Oregon, forms when lava cools very rapidly. Many times, such rapid cooling will even trap small gas bubbles in the rock.



## Type of Rock: Metamorphic Rocks

Metamorphic rocks were originally either sedimentary or igneous rocks. Later, they were changed. Metamorphosis means a noticeable or complete change of character, appearance or condition. With a combination of heat and pressure, and usually with some chemical action, some sedimentary and igneous rocks that are buried deep beneath the surface of the Earth become metamorphic rocks. The tremendous heat and pressure deep in the Earth cause a re-crystallization of the original rock, resulting in a different mineral composition than the original "parent" rocks. Rocks can be subjected to additional forces over time and be metamorphosed more than once.

Just like igneous and sedimentary rocks, metamorphic rocks are identified based on texture and composition. The textures of metamorphic rock can be grouped into two categories: granular, where the grains are made up of one type of mineral and are not layered, and foliated where the minerals are layered. You can tell foliated metamorphic rock apart from sedimentary rock because even though there are different layers visible, each layer in a foliated metamorphic rock appears to be made of the same mineral throughout, whereas sedimentary rocks will often have different layers of varying types of minerals, rocks, shells, etc.



# Type of Rock: Sedimentary Rocks

Although most of the Earth's crust is made up of igneous rock, you are probably more familiar with the sedimentary rocks that cover nearly three quarters of the Earth's surface. What happens when sediments like mud, silt, gravel, or sand are pressed together with great pressure? Sedimentary rock is formed! Sand becomes sandstone; gravel, small rocks and shells become conglomerates; mud and clay become shale.

As new layers of sediments are deposited on top of older layers, pressure from the upper layers pushes down on the lower layers. If the sediments are small, they can stick together and form solid rock. This process is called compaction. Larger particles won't stick together with pressure alone and need to be cemented together with the help of other minerals that cause the sediments to stick to each other and form rock.

Layered sedimentary rocks can be distinguished from layered (foliated) metamorphic rocks because you can still see individual particles in the sedimentary rock. The layers of sedimentary rock are also made of different types of particles.

