

# The Rock Cycle

No matter where you go in the world, if you pick up a rock, it's either going to be an igneous rock, a sedimentary rock, or a metamorphic rock. The way we determine which group a rock belongs in is by how it's formed.

## Igneous Rocks

All igneous rocks start off as molten (hot, liquid) rock. The terms magma and lava both mean "molten rock." When molten rock is still beneath the earth's surface, we call it magma. When it erupts onto the surface, we call it lava. One important difference between lava and magma is how long it takes them to cool and solidify into a rock. As molten rock is cooling, the minerals that form the rock begin to grow. The longer it takes to cool and solidify, the bigger the minerals grow. Granite is a great example of an igneous rock that cooled from magma. The minerals in this rock grew large enough to be easily seen by the naked eye. Basalt is a lava rock commonly found in Oregon. Its minerals are so small they can't be seen. When lava cools so quickly that it doesn't have time to form minerals, it creates a glass, which is what obsidian is.

## Sedimentary Rocks

Sedimentary rocks form from preexisting rock that breaks down through erosion by wind and water. The rock pieces are called sediment, and these sediments are carried away to a new place by wind, water, or a glacier where they are deposited, or dropped off. As the sediments build layer upon layer, the pressure on the bottom sediments increases and compacts them. Water seeping into the sediments creates a natural cement that binds the pieces together to make a rock. The important thing about sedimentary rocks is these are the rocks you'll find fossils in.

## Metamorphic Rocks

A metamorphic rock starts off as either an igneous, sedimentary, or low-grade metamorphic rock and changes into a new kind of rock. This change happens under intense heat and pressure and occurs in places like deep underground or at the collision zone of tectonic plates. When the original rock, which is called a protolith, is put under heat and pressure, some or all of its minerals are replaced, atom by atom, to form new minerals. In rocks with flat or long minerals, the pressure squeezes those minerals so they line up to form a platy or sheet-like structure that can tell us the direction from which the pressure was applied. If there were no flat or long minerals in the protolith, the minerals won't line up no matter how much pressure you put them under.

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If you put a metamorphic rock under so much heat and pressure that it melts, when it recools it will be an igneous rock. If, on the other hand, that metamorphic rock ends up at the top of a mountain and erodes into sediment, and then those sediments become cemented together, it will now be a sedimentary rock. This process is called the rock cycle. New rocks are constantly being made from old rocks. The type of new rock that an old rock becomes depends upon what process it goes through.