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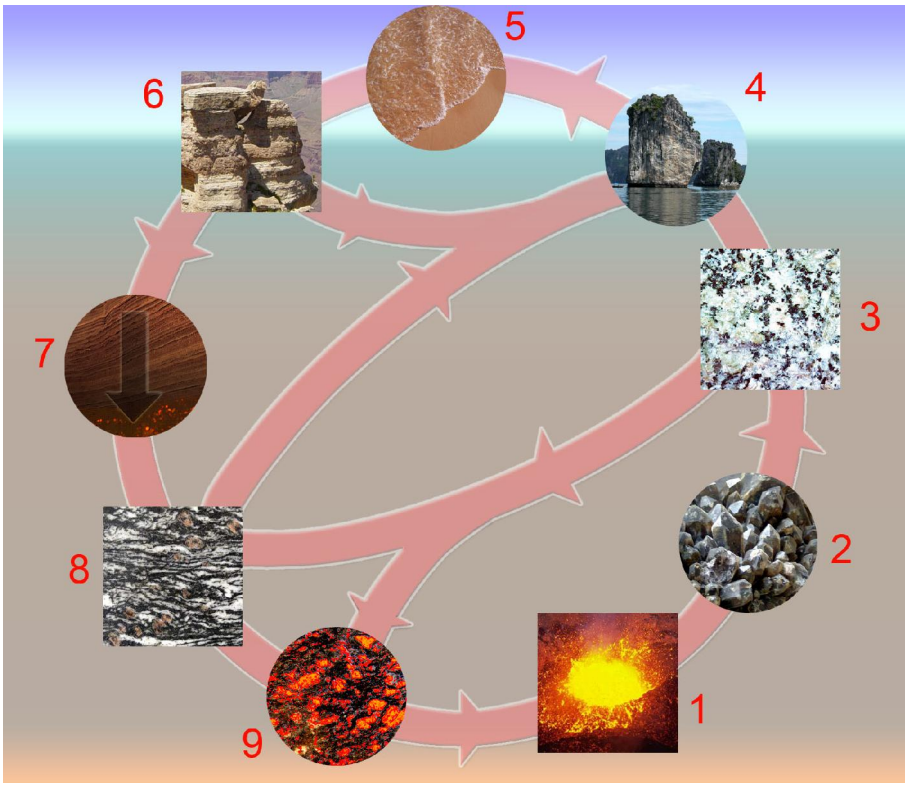
Rock Cycle/Composition of Rocks



Rock is a composition of minerals found in the earth. They can be classified into three categories: igneous, sedimentary, or metamorphic.

- **Igneous** – Formed by the cooling of liquid magma. Igneous rock formed below the surface is called intrusive (granite), or if it is formed on the surface it is extrusive (basalt).
- **Sedimentary** – As rocks are exposed to the elements such as wind and rain, they are worn down. Sediment is carried away from the rock and as it accumulates under pressure sedimentary rock is formed. This type of rock (limestone, sandstone, etc.) covers ¾ of the earth's surface.
- **Metamorphic** – If sedimentary rock or igneous rock is exposed to high temperature and pressure it forms metamorphic rock. This can happen deep in the earth or at plate boundaries. Examples of this type of rock are quartz and slate.

The Cycle

1. Liquid Magma 2.Cooling off
3. Igneous rock 4. Erosion
5. Sediment 6. Sedimentary rock
7. Subduction 8. Metamorphic rock

The rock cycle begins when magma is released from inside the earth and cools to form igneous rock. Most of the igneous rock that forms lies beneath the surface of the earth and is called intrusive. If it forms above the surface it is called extrusive. Extrusive rock is mostly formed at divergent boundaries. Igneous rock makes up about ninety-five percent of the earth's crust and is valued for the many ores that it contains. Also, igneous rock is used to provide historical information about the earth.

The cycle continues with a transformation into sedimentary rock. As igneous rock is exposed to the elements it is broken down. Wind, rain, rivers, ice, and many other natural forces cause rock sediment to be carried away. This sediment slowly accumulates in such places as the bottom of lakes. As the sediment builds up immense pressure compresses it into a rock. This process, called lithification, turns the sediment into layers of rock called strata. These strata cover most of the earth and are ordered for the most part with the newest on top and oldest on bottom. This is the principle of superposition. Sedimentary rock holds geologic value in that it shows the many changes that earth has gone through as well as housing many fossils.

In metamorphic rock, the protolith (any previous type of rock) undergoes metamorphism to become metamorphic. This happens under immense pressure and

temperature and causes structural change in the rock. This can happen deep under the earth or at plate boundaries and results in crystallization of the rock. Metamorphic rock gives us clues about the heat and pressure that exists deep in the earth.

This cycle is driven largely by plate tectonics. Plate interactions such as the mid-Atlantic ridge spreading cause magma to form igneous rock. Subduction zones carry igneous and sedimentary rock into the earth to be transformed into metamorphic rock. Any rock type can be melted back down into lava or worn down into sediment. The rock cycle is a dynamic part of the earth.

Metamorphic Rock

Sedimentary Rock

Igneous Rock

Questions

1. What is Igneous rock?
2. What is Sedimentary rock?
3. What is Metamorphic rock?
4. How do the three rock types change from one to another?