

Reasons Why Rocks Look the Way They Do

Igneous Rocks

1. Granite:

- a. When magma is left inside the shaft of a volcano or under the ground of a magma pool, it will take thousands of years to cool.
- b. During this cooling time, the minerals in the magma begin to crystalize and build on each other and get bigger and bigger until they are able to be seen.
- c. This rock is called **granite**.
- d. The three minerals seen in granite are mica (black), feldspar (white or pink), and quartz (clear).

2. Basalt, scoria, and pumice:

- a. When lava comes out of the shaft of the volcano and flows down the side of the volcano, there are particles of different weights in the lava.
- b. As the lava is flowing down the mountainside in liquid form, the heavy particles that have metal in them sink to the bottom and gather together.
- c. The lighter weighted particles rise up to the top and gather together.
- d. The middle weighted particles find their place between the heavy particles and the lighter weighted particles and gather together.
- e. When these particles harden, the heavy particles turn into **basalt**, the lighted weighted particles turn into **pumice**, and the middle weighted particles turn into **scoria**.
- f. The holes in basalt, scoria, and pumice are made from gases that are trapped in the lava and can't escape quickly. The rocks harden while the gases are still in the rocks.

3. Obsidian:

- a. When lava comes out of the shaft of the volcano and goes straight into the water it cools instantly.
- b. This instant cooling causes the lava to harden into a black, glass-like material called **obsidian**.
- c. When it cools instantly, it contracts (shrinks) and pushes the gases out of the rock so it doesn't have holes in it.

Sedimentary Rocks

1. Sedimentary rocks begin at the tops of mountains.
 - a. During the winter, the temperature being cold can cause rocks to break apart called weathering. These rocks break down into sediments which are pebbles, sand, silt, and clay.
 - b. These sediments are of different weights: pebbles being the heaviest, sand being the next heaviest, and silt and clay being the lightest in weight.
2. The snow that gathered in the mountains during the winter melt in the spring. The melted snow (water) flows down the mountainside. It is the pull of gravity that makes the water run down the mountainside. How steep the slope regulates how fast the water will flow down the mountainside.
 - a. The mountain is very steep at the top of the mountain and the water flows very fast from the top of the mountain. However, as the slope gets less, the flow of the water gets less and less as it gets to the bottom of the mountainside.
3. The stream at the top of the mountain flowing really fast has enough energy to carry the pebbles, sand, silt, and clay down the side of the mountain. However, as the slope gets less, the energy of the water is less
 - a. When the energy gets less because of the changing slope, the energy of the water can't carry the pebbles any more. The pebbles drop off near the top of the lake the water is going in. The sand, silt, and clay move on down the mountainside.
 - b. As the slope of the mountain gets even less, the energy of the water is less and can't carry the sand any more. The sand drops off farther down the side of the mountain.
 - c. The silt and clay being very light in weight are carried down to the bottom of the lake.
 - d. At the very bottom of the lake, the silt and clay mix with dead plants, fish bones, and shelled animals.
4. Many millions of years later, there is uplift and the water is pushed away, and the sediments of the pebbles, sand, silt, and clay dry in the sun.
 - a. When these rocks harden they turn into rocks. However, they are still quite soft because they can break easily.
 - i. The pebbles turn into **conglomerate**.
 - ii. The sand turns into **sandstone**.
 - iii. The silt and clay turn into **shale**.
 - iv. The silt and clay that mixed with the dead plants, fish bones and shelled animals turn into **limestone**.

Metamorphic Rocks

1. Metamorphic rocks are rocks that have changed into a new rock from another type of rock. This change is always caused by the rocks being heated.
 - a. Volcanoes can activate again and magma will flow through the shaft of the volcano.
 - b. When this happens the magma will heat the rocks that that have been formed on the inside of the volcano and on the outside of the volcano.
 - c. When rocks are heated again, this lets the particles in the rocks melt a little bit.
 - d. When they melt into each other a new rock is formed.
 - e. Because they are heated, they go through slow cooling again and the minerals will crystalize. They will become sparkly or shiny.
2. When sedimentary rocks and igneous rocks are heated they change into new rocks.
 - a. Conglomerate when heated turns into **metaconglomerate**.
 - b. Sandstone when heated turns into **quartzite**.
 - c. Shale when heated turns into **slate**.
 - d. If slate continues to be heated turns into **schist**.
 - e. Limestone when heated turns into **marble**.
 - f. Granite when heated turns into **gneiss**.