



ST. LAWRENCE HIGH SCHOOL

JESUIT MINORITY INSTITUTION



CLASS 5

SUB: GENERAL SCIENCE

STUDY MATERIALS

DATE: 08.05.2020

The 3 types of rocks are:

1. Igneous
2. Sedimentary
3. Metamorphic

Igneous Rocks:

Igneous rocks are formed when magma cools and turns into a rock. This cooling can either be intrusive, where the magma pool gradually cools and the magma solidifies into an igneous rock. Alternatively, the cooling can be extrusive, where the magma is cooled very quickly such as during a volcanic eruption.

Igneous rocks are the "new kinds" in the rock cycle. They're the new rock on the block, ready to start fresh.



Basalt lava flow in Hawaii, a perfect example of an extrusive igneous rock.

Examples of igneous rocks

- Granite, Basalt, Pumice, Obsidian

Sedimentary Rocks:

Sedimentary rocks are made up of pieces of older rocks (igneous, metamorphic, and sedimentary) and organic remains (shells, bone, etc.). When rocks break apart from erosion they are transported by rivers and streams to lakes and oceans. As the sediment piles up it is compressed and heated in the Earth. Eventually, the high pressures and temperatures lithify the loose sediment into a sedimentary rock. Sedimentary rocks are the "recyclers" of the rock cycle, they take any other rock and turn it into a new one.



Arizona is

carved from sandstone, a sedimentary rock.

There are 3 types of Sedimentary rocks

1. Clastic Sedimentary rocks: occurs when there is building up of tiny pieces of broken rocks. These are deposited due to mechanical weathering and lithification of rocks through compaction and cementation. Eg: Conglomerate.
2. Chemical : occurs when components of water evaporates and previously dissolved minerals left behind. Eg: Rock salt

3. Organic: Animal or plant debris, contains calcium accumulates and piles up on the floor of water bodies over years to create organic sedimentary rocks.
Eg:Coal.

Examples of sedimentary rocks

- Sandstone, Limestone, Shale, Conglomerate

Metamorphic Rocks:

Metamorphic rocks form from a previously existing rock, be it igneous, sedimentary or even an older metamorphic rock. Rocks turn metamorphic when they are subjected to very high heat and pressure. This alters the chemical and structural makeup of the minerals within the rock, changing it into a new metamorphic rock. If the rock is heated enough, it fully melts and if cooled would be an igneous rock.

Metamorphic rocks are the "change makers" of the rock cycle. They take what was once a rock and change it into a new rock!



A colorful example of Slate, a metamorphic rock used as the building source.

Examples of metamorphic rocks

- Marble, Gneiss, Schist, Slate

There are two types of metamorphism (change) that can cause this:

- **Contact metamorphism** (or **thermal metamorphism**) — rocks are so close to magma that they start to partially melt and change their properties. You can have

recrystallization, fusing between crystals and a lot of other chemical reactions. Temperature is the main driver here.

- **Regional metamorphism (or dynamic metamorphism)** — this typically happens when rocks are deep underground and they are subjected to massive pressure — so much so that they often become elongated, destroying the original features. Pressure (often times with temperature) is the main driver here.

They can be divided into many categories, but they are typically split into:

- **Foliated metamorphic rocks** — pressure squeezes or elongates the crystals, resulting in a clear preferential alignment. Eg. Schist.
- **Non-foliated metamorphic rocks** — the crystals have no preferential alignment. Some rocks, such as marble (the metamorphized version of limestone), are made of minerals that simply don't elongate, no matter how much stress you apply. Eg. Quartzite.

Metamorphic rocks can form in different conditions, in different temperatures (up to 200 °C) and pressures (up to 1500 bars). By being buried deep enough for a long enough time, a rock will become metamorphic. They can form from tectonic processes such as continental collisions, which cause horizontal pressure, friction and distortion; they can also form when the rock is heated up by the intrusion of magma from the Earth's interior.

Ms. Beline Jermy Peter