THE ROCK CYCLE

It is the sequence of processes in which rock changes from one form to another and destroys again and again formed by various geological processes.

Steps involved in the rock cycle

The three main processes that can change the rock are as follows;

1. Cooling and crystallization; Deep inside the earth the temperatures that create magma are very high. Magma is in liquid form. The magma may reach the Earth surface by a huge explosion through a volcano ,or sometimes it comes out slowly through the cracks .As magma cools slowly ,crystals grow to form igneous rock. If the magma cools slowly the crystals grow larger, as it happens if magma remains deep within the Earth. When the magma cools rapidly, the crystals form will be very small.
2. Weathering and erosion; Rocks are worn down by water, wind ,ice and even by plants and animals. Over a period of time, wind, water, and ice can break larger rocks into sediments. Moving water, wind, and glaciers carry these pieces of rocks from one place to another. The sediments are deposited and dropped somewhere. Then the sediments may be compressed ad glued together, and these forms a sedimentary rock.
3. Metamorphism; within the crust ,when the rock gets exposed to extreme conditions of heat and pressure, it undergoes metamorphism .The compete rock does not melt with metamorphism ,the rock changes due to extreme conditions of heat and pressure. A metamorphic rock may contain new structures or the texture of a mineral. The rock cycle does not have any beginning or end.it keeps on continuing.
* Igneous rock; Are types of rocks that are formed when molten rock cools to a solid state.
* Metamorphic rock; Are formed when rocks are subjected to high heat, high pressure ,hot mineral -rich fluids or more commonly, combination of these factors.
* Sedimentary rocks; Are types of rocks that are formed by the accumulation or deposition of mineral or organic particles at Earth surface ,followed by sedimentation.

*Formation of igneous rocks;* They are formed through the cooling and solidification of magma (lava). As hot, molten rock rises to the surface ,it undergoes changes in temperature and pressure that cause it to cool., solidify, and crystallize.

*Formation of sedimentary rocks;* Are formed from deposits of pre-existing rocks or pieces of once-living organism that accumulate on the earths surface. If sediments are buried deeply ,it becomes compacted and cemented, forming sedimentary rock.

*Formation of metamorphic rocks;* Are formed when rocks are subjected to high heat, high pressure ,hot mineral -rich fluids or more commonly ,some combination of these are found deep within the Earth or where tectonic plates meet.

IGNEOUS ROCKS

* *Texture;* Refers to the features that we see in the rock such as the mineral sizes or the presence of glass, fragmented material, or vesicles(holes) in the igneous rock.
* *Composition;* Is the breakdown of rock by chemical mechanisms.

Types of texture in igneous rocks

* Aphanitic texture; this texture describes very fine- grained rock where individual crystals can be seen only with the aid of a microscope.
* Phaneritic texture; refers to igneous rocks with large ,visible crystals because the rock formed slowly in an underground magma chamber.
* Porphyritic texture; Is an igneous rock texture in which large crystals are set in a finer -grained or glassy groundmass.
* Vesicular texture; Is a volcanic rock texture characterized by a rock being pitted with many cavities at its surface and inside.
* Glassy texture; occur during some volcanic eruptions when the lava is quenched so rapidly that crystallization cannot occur.
* Pegmatitic texture; Is one in which the mineral grains are exceptionally large.

*Examples of igneous rock-forming minerals*

*Minera*l ***Formula***

1. Quartz SiO2
2. Olivine (Mg,Fe)2siO4
3. Pyroxenes R2[Si2O6]
4. Amphiboles R14[(OH)4Si16O44]
5. Micas XY2-3Z4O10(OH)2
6. Garnet R3R2(SiO4)3
7. Calcite CaCO3
8. Feldspar KAISi3O8

D**EFINITIONS OF TERMS**

* Ultramafi**c-**An igneous rock with extremely low silica composition, being made of almost all olivine and pyroxene.
* Mafic- An igneous rock that is dominated by the silicates, pyroxene ,amphibole ,olivine and mica.
* Intermediate- Are grey in color and contain somewhat equal amounts of minerals that are light and dark in color.
* Felsic- Are igneous rock that are rich in feldspar and silicon.

*Grouping of rocks*

1. Peridotite -Intrusive, Ultramafic
2. Basalt -Extrusive, Mafic
3. Gabbro-Intrusive, mafic
4. Andesite-extrusive, Intermediate
5. Diorite-Intrusive, Intermediate
6. Rhyolite-Extrusive, Felsic
7. Granite-Intrusive, Felsic

***TYPES OF VOLCANOES***

* Composite volcanoes- are steep-sided volcanoes composed of many layers of volcanic rocks, usually made from high-viscosity lava ,ash and rock debris.
* Cinder cones- are circular or oval cones made up of small fragments of lava from a single vent that have been blown up.]
* Shield volcano- Are volcanoes shaped like a bowl or shield in the middle with long gentle slopes made by basaltic lava flows.