

THE ROCK CYCLE

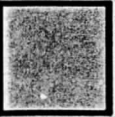


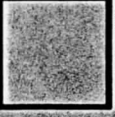
Rocks are the masses of material that make up the earth's crust. A rock may consist of a single mineral, as quartz, gypsum, or dolomite, but most rocks contain several minerals. Soil, gravel, sand, and clay are examples of unconsolidated rock material. The Rock Cycle is a representation of how rocks interact with the rock forming processes. The rocks of the earth's crust are classified into three types, igneous, metamorphic, or sedimentary, according to their origin. Much of geology is concerned with the interactions among the forces that produce these three rock types. As illustrated on the Rock Cycle Chart, these forces may be briefly described as follows:

Weathering involves both the chemical and physical breakdown of rock at or near the earth's surface. This erosion results in the accumulation of sediments.
Lithification is the transformation of a sediment into a rock. Processes involved are cementation, compaction with removal of water, and in many instances, recrystallization.

Melting is the heating of rocks to form magma (molten lava) usually at considerable depths.
Cooling is the decrease in temperature of magma at or below the earth's surface resulting in the formation of igneous rocks.
Metamorphism is the process by which rocks of any type are changed by heat, pressure, stress, shear, or chemically active solutions.

METAMORPHIC ROCKS



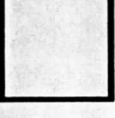

Metamorphic rocks are rocks that have been changed either in texture or in mineral composition by any of the following: heat, pressure, stress (directed pressure), shear, or chemically active solutions or gases. Any rock of any type (sedimentary, igneous, or other metamorphic) can be subjected to any one or any combinations of the above agents, so there is an enormous variety of resulting metamorphic rocks.

			
Gneiss	Schist	Slate	Marble

SEDIMENTS





Sediments are materials deposited by the process of erosion including running water, wind, waves, currents, ice, and gravity. When these deposits are consolidated, they become sedimentary rocks.

Although by volume, sediments and sedimentary rocks comprise only 5 or 6 percent of the crust, they actually cover about 75 percent of the earth's surface. These sediments would include those on the floor of the oceans, as well as the sands of desert areas and the soils used for agricultural purposes, forests, and grasslands.

			
Gravel	Sand	Silt	Clay

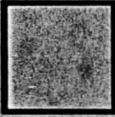
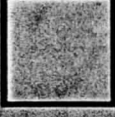
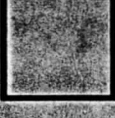
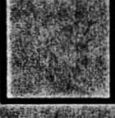
IGNEOUS ROCKS

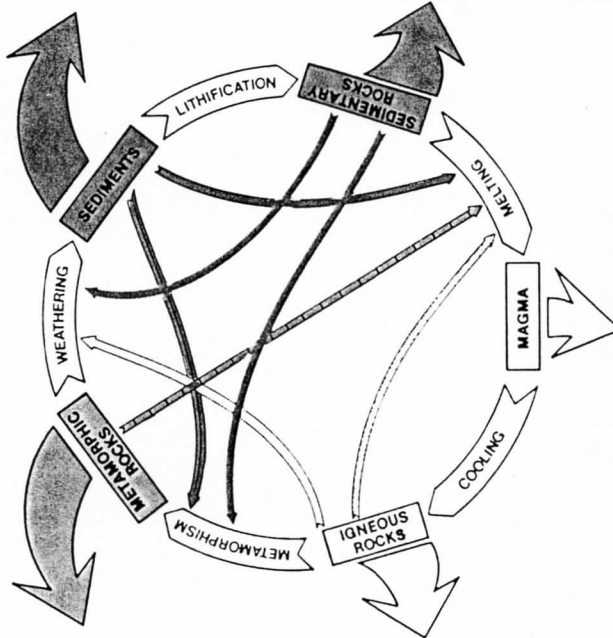
Igneous rocks are formed by the cooling and crystallization of a magma. A magma is a natural hot melt composed of a solution of rock-forming materials (largely silicates) and some gases that are held in solution by pressure. Rocks that crystallize deep in the earth are termed intrusive (granite and gabbro). Rocks formed at the surface from the action of volcanoes (lava flows) are termed extrusive (rhyolite and basalt).

			
Granite	Gabbro	Rhyolite	Basalt

SEDIMENTARY ROCKS

Sedimentary rocks are formed at or near the surface of the earth. Most of these sediments are deposited in beds or layers by water or wind as a result of weathering (erosion). Sedimentary rocks can be classified by their mode of origin as clastic, chemical, precipitates, or organic. Clastic rocks are composed of rock fragments or mineral grains broken from any type of pre-existing rock. Precipitated rocks may result from chemical precipitation from fresh or salt water. Organic sediments may form from either plant or animal particles.

			
Conglomerate	Shale	Limestone	Sandstone



MAGMA

Molten rock material at great depths is called magma. Rock-forming materials (mainly silicates) and some volatile materials (mainly steam) are held in solution or a molten state by extreme pressure. Molten rock material observed in lava flows is no longer under pressure and the trapped gases and steam are free to separate. The cooling process of magma at great depths may occur over a very long period of time.

Name: _____

Date: _____ Period: _____

The Rock Cycle

1. What are rocks relationship to minerals?
2. What is the rock cycle?
3. Define weathering.
4. Define lithification.
5. Define metamorphism.
6. Why is there such a large variety of metamorphic rocks?
7. Give two examples of intrusive igneous rocks.
8. What percentage of rocks in the earth's crust are sedimentary?
9. Where do most sediments come from?
10. What is the main rock-forming material?