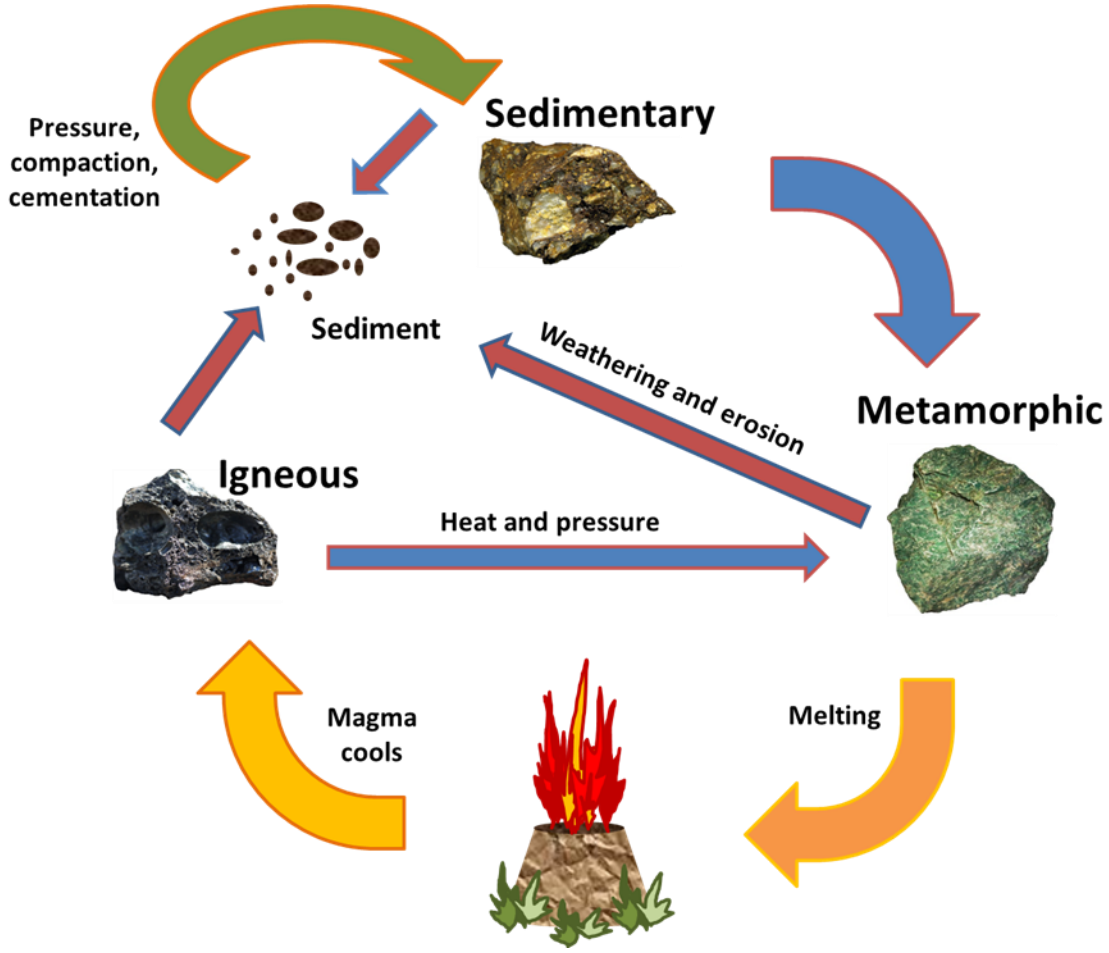
WOW! on Wheels – STEM Labs

EARTH SCIENCE ROCKS!

Introductory Information – Student Packet



Igneous: These types of rocks are formed when the molten magma (underground) from the core of the earth cools and hardens. When the magma comes to the surface it is called lava. When it cools slowly, sometimes small crystals are formed and the rock glitters. When it cools quickly, the surface is shiny and smooth (glassy). Gas bubbles may also become trapped, leaving tiny spaces or holes in the rock.

Metamorphic: These rocks are formed under the earth's surface over hundreds of years. Intense pressure and heat squeeze particles and fuse them together. You may observe layers in the rock, or crystals formed by minerals growing over time on the surface. The layers are the result of heat and pressure pushing and fusing the material together. Different grains, or textures, may be present. Metamorphic rocks have been changed from one form, the parent rock, to another by heat and pressure. For example, shale (sedimentary) is the parent rock of slate.

Sedimentary: These rocks are formed when sediment (small particles, mud, sand, shells, and bone) accumulate in layers and become cemented, or stuck, together. This often happens when the material settles at the bottom of a body of water. These rocks are usually softer and break apart and scratch more easily. You may even find fossils in sedimentary rocks! Wavy horizontal lines, layers, grains, or a dusty texture may be present in these rocks.

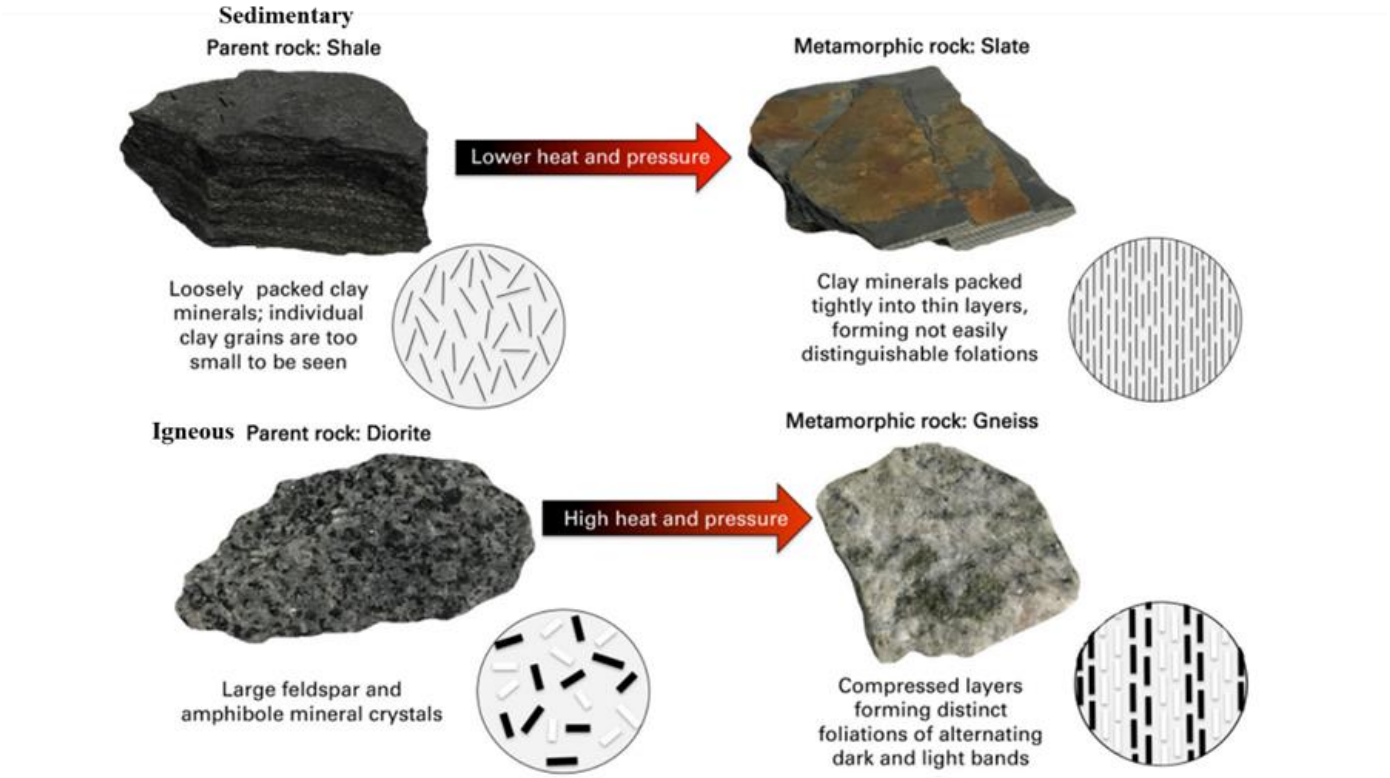
Minerals vs Rocks:
A **mineral** is a naturally occurring inorganic element or compound. It has its own well-ordered internal structure and a characteristic chemical composition, crystal form, and properties.

A **rock** are aggregates (collections) of one or more different minerals.

Think of minerals as the ingredients for a rock! To make a sandwich, you would layer many ingredients together, but those ingredients alone are not a sandwich. The type of sandwich (rock) you have depends on the ingredients (minerals) used to build it. Further, the "mineral" bread is made up of specific elements. While a sandwich (our rock) can have many variations, the bread (our mineral) has specific elements that make it up. So the same minerals can make different rocks, but the minerals themselves have a set composition (make-up), although some can come in different forms (think hamburger bun vs sliced bread; see gypsum and mica).

The Parent rock (or material):

This is the precursor, or what another rock is formed from. This can be the soil, sand, or other material (sedimentary) or a different type of rock that has undergone another process. For example, when limestone (sedimentary) undergoes intense heat and pressure it becomes marble.



https://www.oogeep.org/wp-content/uploads/2019/05/Geology-4.5-May-2019.pdf

Igneous Rocks:

Extrusive (volcanic) rocks form when magma flows out to the surface (extrudes) and becomes lava that cools into rock or explodes out into the atmosphere and falls to the earth as rock. The cooling time for these types of rock may be seconds to months.


Extrusive: Obsidian


Intrusive: Dolerite

Intrusive (plutonic) rocks cool slowly without ever reaching the earth's surface first. These rocks often have a coarse, crystal like texture. The cooling time may take thousands of years for intrusive rocks and millions of years for the plutonic varieties.

Sedimentary Rocks:

Clastic rocks are composed of fragments (clasts/ broken pieces) of preexisting minerals and rock.


Clastic: Conglomerate


Intrusive: Dolerite

Non-clastic (chemical) rocks are formed through chemical reactions, such as the evaporation of water from sediment or precipitation and accumulation in water. They are also created from the remains of plants and animals, so may contain fossils.

Metamorphic Rocks:

Foliated rocks have identifiable layers, textures, or patterns.

Non-foliated don't have layers or patterns and are classified based on composition.