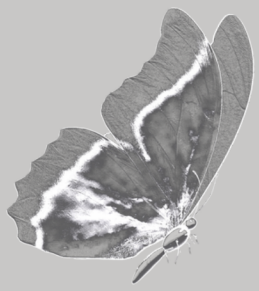
Metamorphic Rocks

Met.a.mor.phose (verb)
"change or cause to change completely in form or nature"



Metamorphic rocks begin their lives as other types of rocks (sedimentary, igneous, or another metamorphic rock) but are substantially changed or altered by high heat, high pressure, hot fluids, or a combination of these factors.

Metamorphic Processes

High heat, high pressure, and/or hot water creates new minerals or rearranges existing minerals in a rock

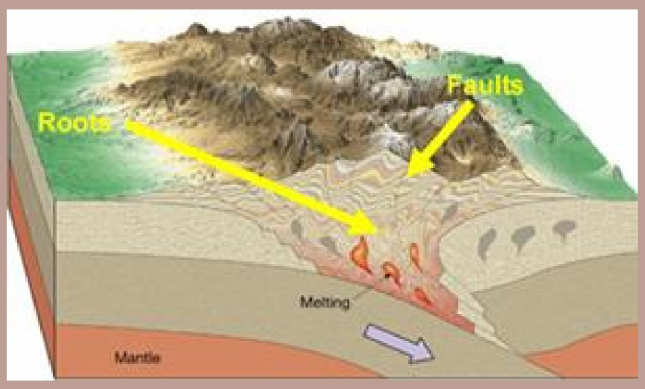
Rocks don't melt during this process (this would create igneous rocks!), but are substantially transformed into denser, more compact rocks

Minerals in metamorphic rocks are squished, squeezed, and smeared, sometimes even forming lines or stripes of minerals

Metamorphism Locations

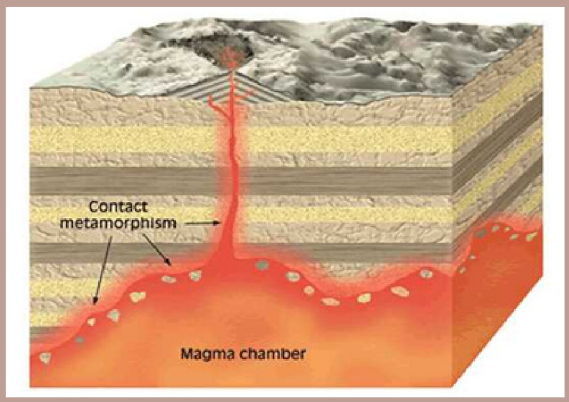
Regional Metamorphism

Regional metamorphism commonly takes place at convergent tectonic plate boundaries, where mountains are created due to excessive heat and pressure. This type of metamorphism occurs over large areas, deep inside the Earth, at temperatures that exceed 900 degrees Fahrenheit.



Contact Metamorphism

Contact metamorphism takes place when hot magma intrudes into a pre-existing rock. Heat from the magma intrusion causes the rocks it touches to metamorphose. This type of metamorphism occurs at a smaller scale than regional metamorphism. Contact metamorphism can occur within a few inches of an intrusion up to several hundred feet.



Types of Metamorphic Rocks

Foliated

- Created during regional metamorphism
- Temps & pressures are high enough to alter and/or create minerals
- Minerals get squeezed, squished, and smeared
- Creates a foliated (sheet-like) texture that gives the rock a striped appearance

Slate | Phyllite | Schist | Gneiss

Increasing grade of metamorphism

Low heat
Low pressure

High heat
High pressure

Non-Foliated

- Created during contact metamorphism
- Temperatures are high during formation, but pressures are relatively low
- Lack the sheet-like or striped texture of foliated rocks
- Can form from rocks that have blocky minerals, like quartz and calcite

Marble | Quartzite | Hornfels | Anthracite Coal

It's All in the Family

Every metamorphic rock has a **parent rock** - the source rock that experienced the metamorphism. Check out what metamorphism can do to limestone, shale, and granite!

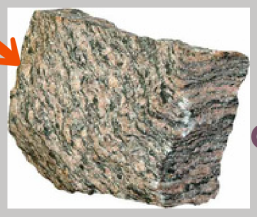
Limestone

Marble

Shale

Slate

Granite



Gneiss