

Formation of metamorphic rocks

How they are formed

Igneous, sedimentary and metamorphic rocks can become buried below the Earth's surface, owing to the movements of the Earth's plates. They are subject to forces from the huge weight of soil, sediments and other rocks above them. They are also subjected to very high temperatures, although not quite hot enough to melt the rock.

This heat and pressure can change the composition and appearance of the minerals in these rocks. This change is called metamorphism and the rocks that are formed this way are called metamorphic rocks.

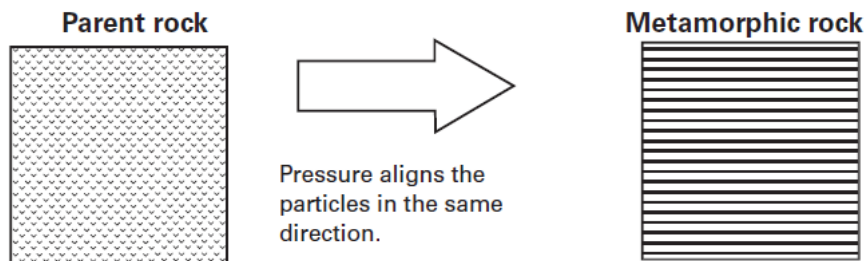
The changes that occur during the formation of metamorphic rocks depend on these factors:

- the type of original rock
- the amount of heat to which the rock is exposed
- the amount of pressure caused by the weight of the rocks above
- the time it takes the change to happen.

Examples of the formation of some metamorphic rocks

Original Rock		Metamorphic Rock
Shale	Mainly pressure ➔	Slate
Shale	Heat + pressure ➔	Schist
Granite	Pressure + heat ➔	Gneiss
Sandstone	Mainly heat ➔	Quartzite
Limestone	Mainly heat ➔	Marble

The new metamorphic rocks are generally hard and spotty or layered in appearance, owing to new minerals being formed in them. The pressure can change the position of the particles, aligning them in the same direction. This gives many metamorphic rocks a layered or banded appearance.



Metamorphic rocks themselves can be reburied and remetamorphised. This can make identifying the original 'parent' rock difficult.

This information sheet is an extract of the publication *The Science of Mining*, published by the Queensland Resources Council and the Queensland Department of Natural Resources, Mines and Energy, 2004.

