

What are rocks?

Most rocks are simply mixtures of minerals although some, like pure marble, are made up of only one mineral, but this is unusual. The crystals of the various minerals that make up a type of rock can be readily visible (as in granite) or can be microscopic (as in basalt).

Many rocks can be incredibly attractive, with beautiful colours and textures. Marble is perhaps the best known decorative stone but there are hundreds of other stunning stones that are nowadays in great demand. Many decorative stones that were popular in Victorian times are now almost impossible to obtain, the location of the original quarries now either lost or inaccessible.

The rocks of the Earth's crust fall into three groups: **igneous**, **sedimentary** and **metamorphic**.

The three types of rocks

Igneous rocks

Igneous rocks are rocks that were once molten and they have solidified either at or near the surface (volcanic) or more slowly at depth (plutonic). Basalt is a typical volcanic rock which was erupted from a volcano and cooled quickly. It contains tiny crystals of various minerals usually only visible under a microscope. Granite is a typical plutonic rock and it contains much larger crystals due to the slow cooling of the rock at great depth. Igneous rocks cannot, of course, contain fossils.

Sedimentary rocks

Sedimentary rocks are the most common rocks on the surface of the Earth. These rocks were mostly formed by sediment accumulating at the bottom of a sea or lake and most fossils found in these rocks are of marine or freshwater plants and animals. The sediments may have hardened (e.g. limestone, sandstone) or remain relatively soft (e.g. sand, clay), but they are all called rock by geologists.

Metamorphic rocks

Metamorphic rocks are formed when any kind of rock has been altered by heat or pressure or both. High temperatures and pressures exist beneath mountain ranges and igneous and sedimentary rocks can be recrystallised and changed to this new type of rock. Marble, slate and gneiss are metamorphic rocks.

The creation of these three types of rocks forms part of a natural cycle called, not surprisingly, **the 'rock cycle'**:

Igneous rocks form as a result of crystallisation of molten rock (magma). When exposed at the Earth's surface, weathering and erosion breaks down igneous rocks into **sediments**, which become cemented through the process of **lithification** (which literally means 'turning to stone') into **sedimentary rocks**. Both igneous and sedimentary rocks may be subjected to intense heat and/or pressure creating **metamorphic rocks**, which have completely different minerals and textures. This process is called **metamorphism**. Ultimately all three rock types can be eroded to form new sediments, or melted at depth to produce magma, thus completing the cycle.