The rock cycle shows how different rocks form over time. Volcanic rock, sand and sediments, sedimentary rock and metamorphic rock are all stages of the rock cycle. Rocks moving through the rock cycle renew the surface of Earth.

Moving through the rock cycle
Rocks move through the rock cycle in different ways. Not every rock follows the same pathway. A rock blasted from a volcano might stay on Earth’s surface for millions of years and break down slowly. Another rock blasted from a volcano might go straight back under the surface and melt.

Rocks change from one type to another as they move through the rock cycle.

This rock formation in Ireland has stayed unchanged on Earth’s surface for millions of years.
Volcanic rock

New volcanic rock is formed from lava or magma in this stage of the rock cycle. Lava is the name given to melted rock on Earth’s surface. When it is below the surface, it is called magma. Volcanic rocks form when magma erupts from a volcano. The hot liquid lava cools quickly on the surface. As it cools, it hardens into solid rock. Different types of lava have different minerals in them, and form different types of volcanic rock.

Slow-cooling magma

Magma can cool to form solid rock while still underground, as well as erupting from a volcano. Rocks that have cooled under the surface are only seen when the surrounding soil erodes away. They can also be seen when sudden events, such as earthquakes, lift them to the surface.
Sedimentary rock

The next stage of the rock cycle is layers of sediments being pressed together to form sedimentary rock. This stage occurs after large amounts of sediments, weathered from rocks, are carried and dropped by wind and water. Fast-flowing rivers carry sediments downstream. As they slow down, sediments sink to the bottom of the river as deposits. Thick sedimentary layers build up slowly over millions of years.

Forming sedimentary rock

Sedimentary rock often forms under water. Sediments collect at river mouths, in shallow lakes and seas, and on the ocean floor. Plant and animal material can add to sediments. As thick sedimentary layers build up, the weight of the top layers presses the lower layers into solid rock.

Types of sedimentary rock

Different types of sediment form different types of sedimentary rock. Sandstone is made from grains of sand weathered from older rocks. The sand is cemented together and hardened by pressure to form new rock. Silt and clay form a rock called shale. Limestone is formed of the shells of tiny animals that lived long ago. Coal is the remains of plants that lived long ago.
Metamorphic rock

In the next stage of the rock cycle, volcanic and sedimentary rocks change form to become metamorphic rocks. Metamorphic rock gets its name from the Greek words 'meta', meaning 'change', and 'morph', meaning 'form'. Rocks can be changed, or metamorphosed, by heat and pressure deep under Earth's surface. Even metamorphic rocks can be changed to form another type of metamorphic rock.

Heat and pressure

Below Earth’s crust, extreme heat and pressure can melt rocks. Some rocks do not melt, but the crystals inside them change, forming metamorphic rocks. Heat from deep inside Earth can ‘bake’ a rock and change its form. Limestone can be metamorphosed in this way to become marble. Shale is metamorphosed by intense heat and pressure to form slate.

This metamorphic rock was folded by the movement of Earth’s crust.

Metamorphic rock forms under heat and pressure.