

What are fossils?

Fossils are the preserved remains or traces of ancient animals or plants. They can give us a fascinating picture as to what life was like in the past. Fossils can be split into body or trace fossils.



Fossilised tree root from a *Lepidodendron*

Fossilised skull of a *Velociraptor*

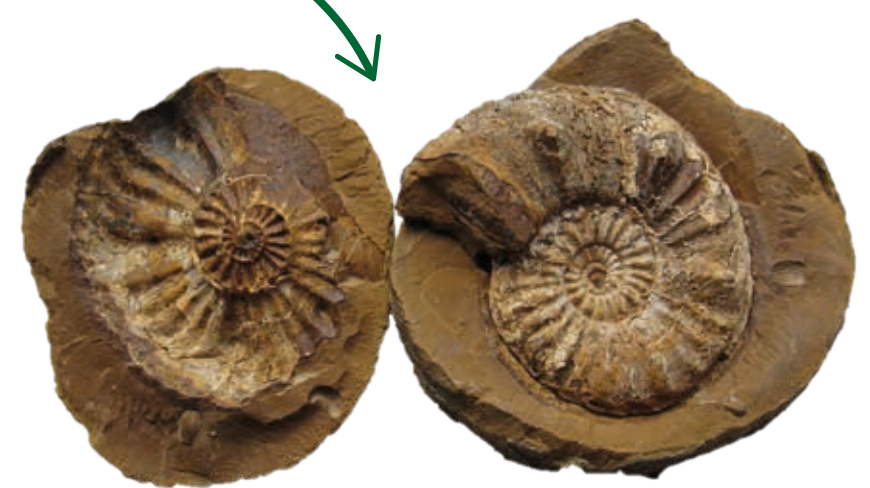


Body fossils
the remains of dead animals or plants or the imprints they leave.



Coprolite - fossilised poo!

Trace fossils
a clue that an animal or plant has been there like a footprint



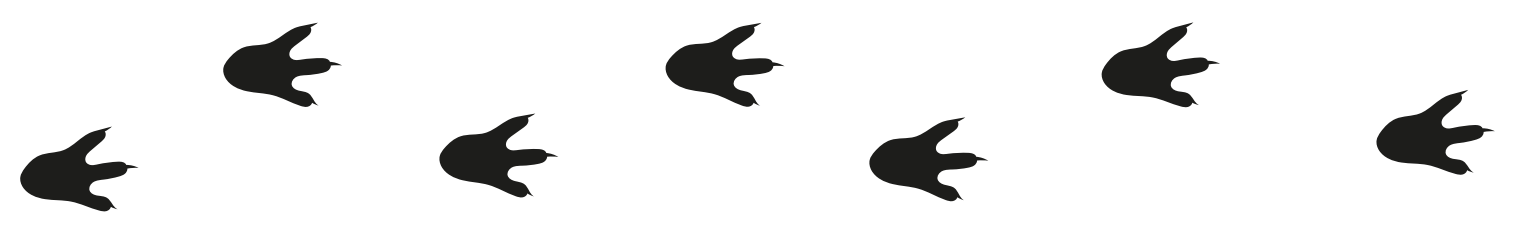
The right is the fossilised cast of an ammonite, and the left is the mould (or impression)



Fossilised worm burrows

Did you know... animal or plant remains can only be called a fossil if it is at least 10,000 years old!

Fantastic Fossils!



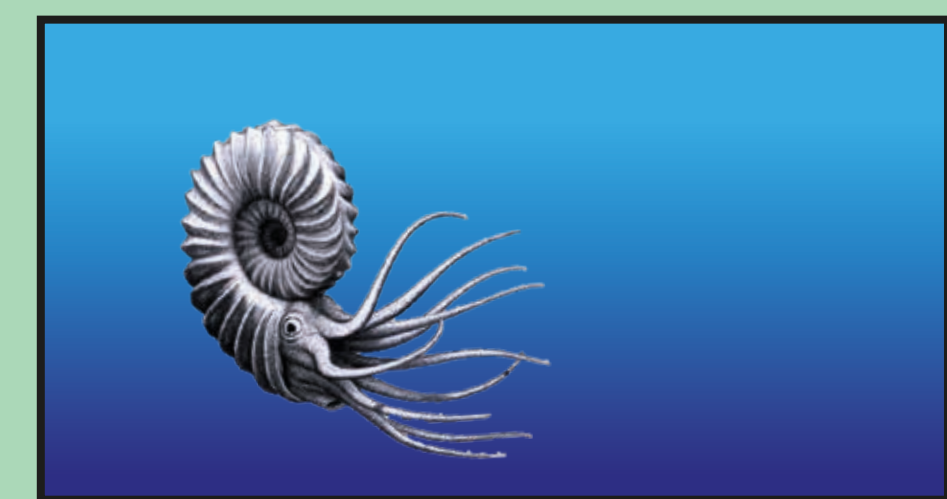
Reptile footprints of the 'Beast of Blackwaterfoot'

Find a Fossil Activity
Become a palaeontologist and discover what fossils are in our sand box! Use the brushes to carefully remove the sand until you discover a fossil. Try and work out what fossil you have uncovered!

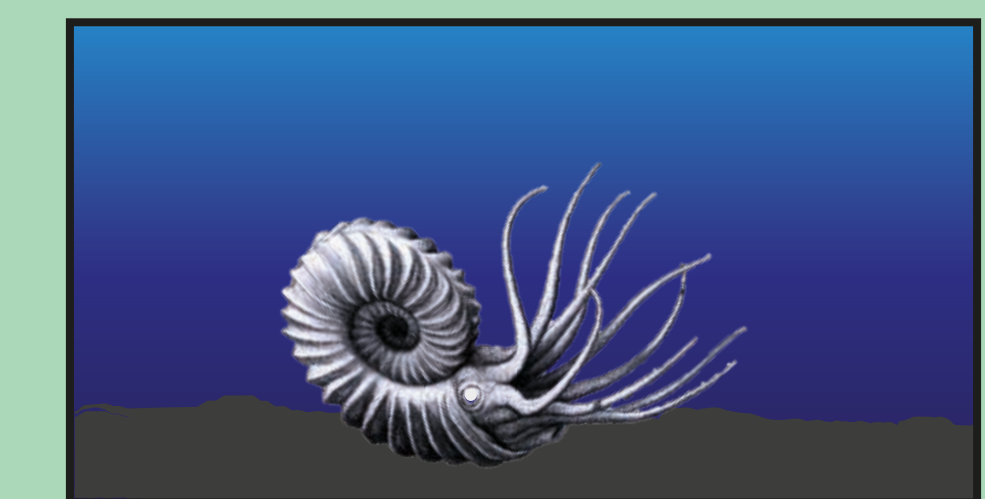
How is a fossil made?

Follow the story of how this ammonite began its life swimming in the sea 250 million years ago, to how it can be found as a fossil today.

Millions of years ago there was an ammonite swimming in the sea



The ammonite died and sank to the bottom of the sea bed



As it was buried by layers of sand and mud, the soft parts of the ammonite rotted away.



The sand and mud hardened into rock and the ammonite dissolved leaving a perfect mould of the ammonite shell.



The mould was filled by minerals making a cast exactly like the ammonite shell.



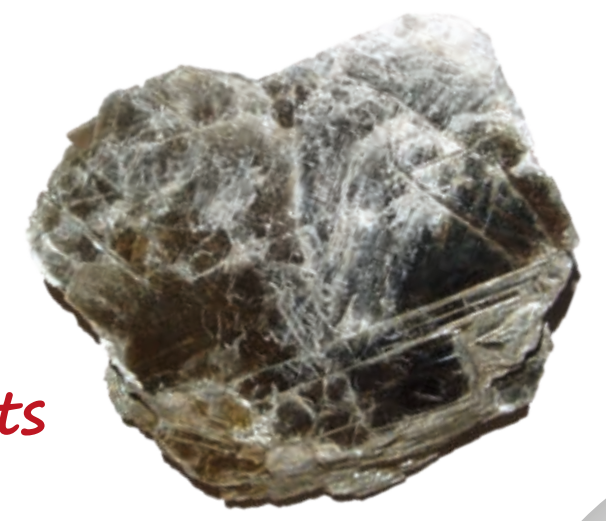
Over time the rock layers are eroded away, and both the mould and cast can be found as a fossil!



Cleavage or fracture

Many minerals have weaknesses in their structure. If you hit it, it will break along these planes of weaknesses creating shiny flat surfaces called cleavages. If a mineral has no weaknesses it will fracture when broken.

Muscovite has one good cleavage and will break into thin flaky sheets



Olivine is a beautiful olive-green and will form conchoidal fractures when broken producing concave surfaces.

Colour

Probable the most obvious property- although not the most useful! Many minerals can form in a variety of colours

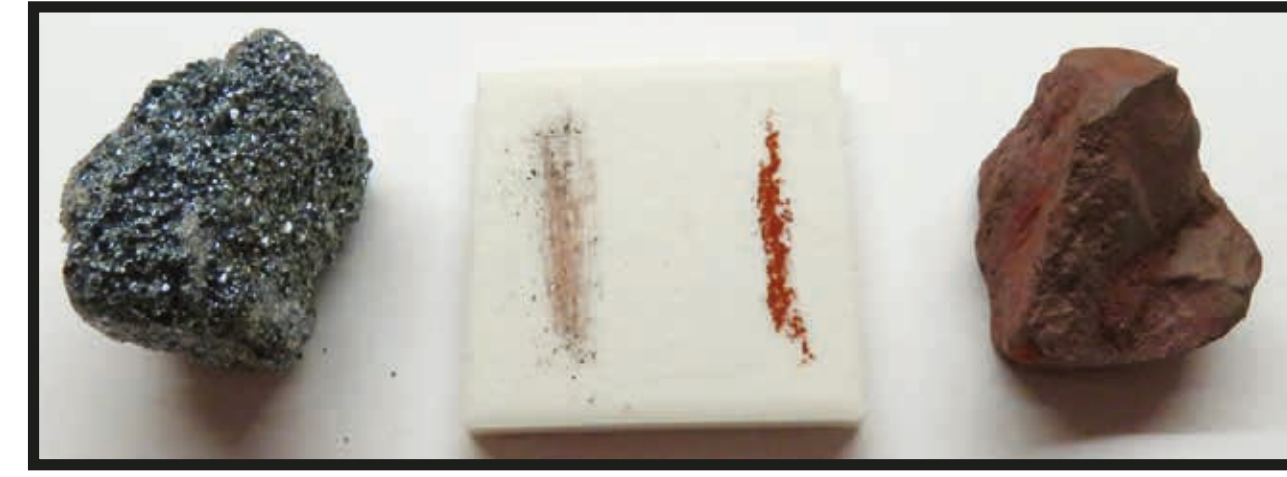
Sorted Minerals

What is a mineral?

A mineral is a naturally occurring inorganic solid with the same chemical structure throughout. They can be made from a single element (e.g. gold) or of a combination of elements.

How can we identify different minerals?

Minerals can be identified based on several different properties.



Haematite leaves a red-brown streak whether it has a metallic lustre (left) or an earthy lustre (right).

Streak

The streak is the colour of the mineral when it is a fine powder. You can test this by scraping the mineral over a white tile.



Calcite has a white streak and fizzes when acid is applied!

Hardness

The hardness of a mineral can be compared to a mineral or object with a known hardness using the The Mohs Hardness Scale.



Garnet can be various colours and has a dodecahedral crystal shape

Crystal Shape

A minerals shape is highly important, although it is only seen if it has had space to grow uninterpreted, e.g. in a cavity.

Galena has a metallic lustre and a cubic crystal shape



Lustre

Lustre is the way a mineral reflects light. The mineral quartz reflects light the way a glass does so has a vitreous (glassy) lustre.



Clear quartz (left) and purple quartz (amethyst) with a prismatic crystal shape.

Density

You can get an idea of how dense (or heavy) a mineral is by picking it up and comparing it with other minerals of the same size.

Magnetite has a high density and is magnetic!



Mohs Hardness Scale

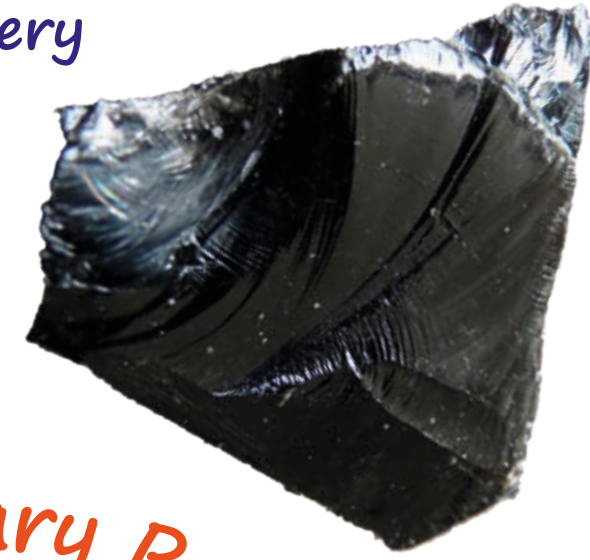
Talc	1 (softest)
Gypsum	2
Calcite	3 ← Fingernail 2.5
Fluorite	4 ← Copper coin 3.5
Apatite	5 ← Iron nail 4.5
Orthoclase	6 ← Steel 6.5
Quartz	7
Topaz	8
Corundum	9
Diamond	10 (hardest)

Sort these Minerals Activity

Have a go at identifying the minerals below using our YES/NO mineral guide!

The three Rock Groups

When lava cools very quickly no crystals can grow and it forms obsidian (volcanic glass).



Igneous Rocks

An igneous rock forms when molten rock cools and crystallises. If the molten rock is inside the Earth, it is called magma, and if it is on the Earth's surface it is called lava.



This granite cooled from a magma. It is made up of interlocking crystals of quartz, feldspar, and mica.

Sedimentary Rocks

A sedimentary rock is formed from fragments of other rocks or organic material. Over time this material accumulates to form layers and is 'glued' together. They are the only rock group that contain fossils

This limestone is made of lots of brachiopod shells 'glued' together with calcite.



The quartz grains in this sandstone are stained with haematite (iron), giving it a bright red colour.

Metamorphic Rocks

"meta"(change) and "morph"(form). A metamorphic rock is a rock that has been altered due to high temperatures and/or pressure. Any rock can be changed into a metamorphic rock!



This rock started its life as a shale. Under high heat and pressure the minerals within it have changed producing a schist.



Under even higher heat and pressures, light and dark minerals form distinctive bands in the rock to make a gneiss!

Rock Stories

What is a rock?

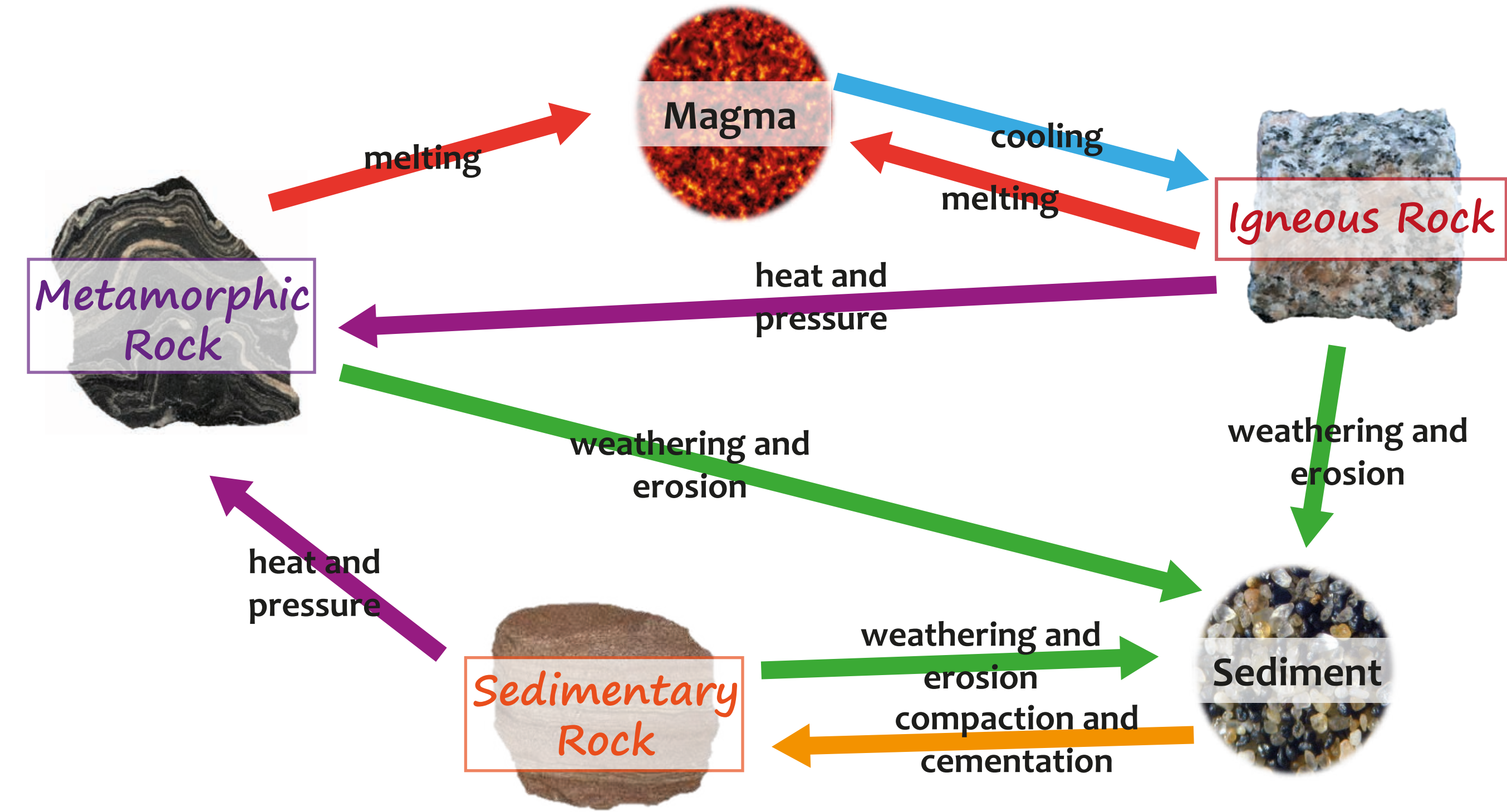
A rock is a naturally occurring solid which is made up of one or more minerals. A rock can also contain the organic remains from plants or animals.

How can we identify different rocks?

We can identify rocks by observing their colour, mineral content, mineral size and shape, and any other structures. Rocks can be split into three groups.

The Rock Cycle

The three different rock groups are linked in what is called the Rock Cycle. This cycle describes how a rock can change into another type of rock.



Rock Stories Activity

Try and identify the rock types below by reading the story cards and matching them up with the correct rock!