



Rocks

Discussion Questions:

- 1) What are the three main type of rocks?
- 2) How do rocks form?
- 3) What are some examples of the three types of rocks?
- 4) How long do rocks take to form?
- 5) What type of rocks contain fossils?
- 6) How does 'Moh's Scale of Hardness' for rocks work?

There are three main classes of rocks:

Igneous

Rocks that are formed when molten magma or lava from a volcano cools and solidifies.

Sedimentary

Rocks that are formed when layers of sediment (sand, pebbles) are compacted.

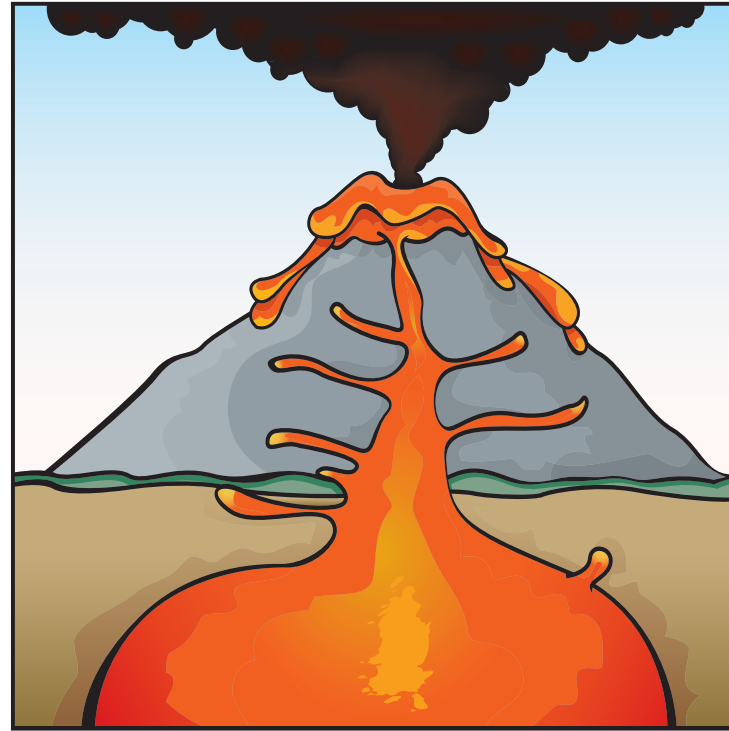
Metamorphic

Rocks that are formed when rock layers are subjected to heat and pressure that causes a change in the structure of the rock (formation of crystals).

Igneous rocks form:

a) When lava flows or blasts out of a volcano, cools and solidifies.

b) When magma collects under the ground and cools slowly.



Examples of Igneous Rocks



scoria

Fast cooling lava can produce light rocks with air pockets. Examples include pumice, and scoria.



pumice



obsidian

Fast cooling lava can also produce densely packed rock with little evidence of crystals. Examples include basalt and obsidian.



basalt



granite

Slower cooling lava can produce rocks with greater crystal content. Examples include granite, gabbro and diorite. The colour and texture of the rock depends on the mineral content and the speed of cooling.



granite samples, different colours

Sedimentary rocks form:

When loose sediments (including sand, pieces of shell, pebbles) are deposited by moving wind, water and ice and compacted over thousands of years, cementing into rock. Layers of deposits can sometimes be seen in sedimentary rock faces.



Examples of Sedimentary Rocks



sandstone



limestone



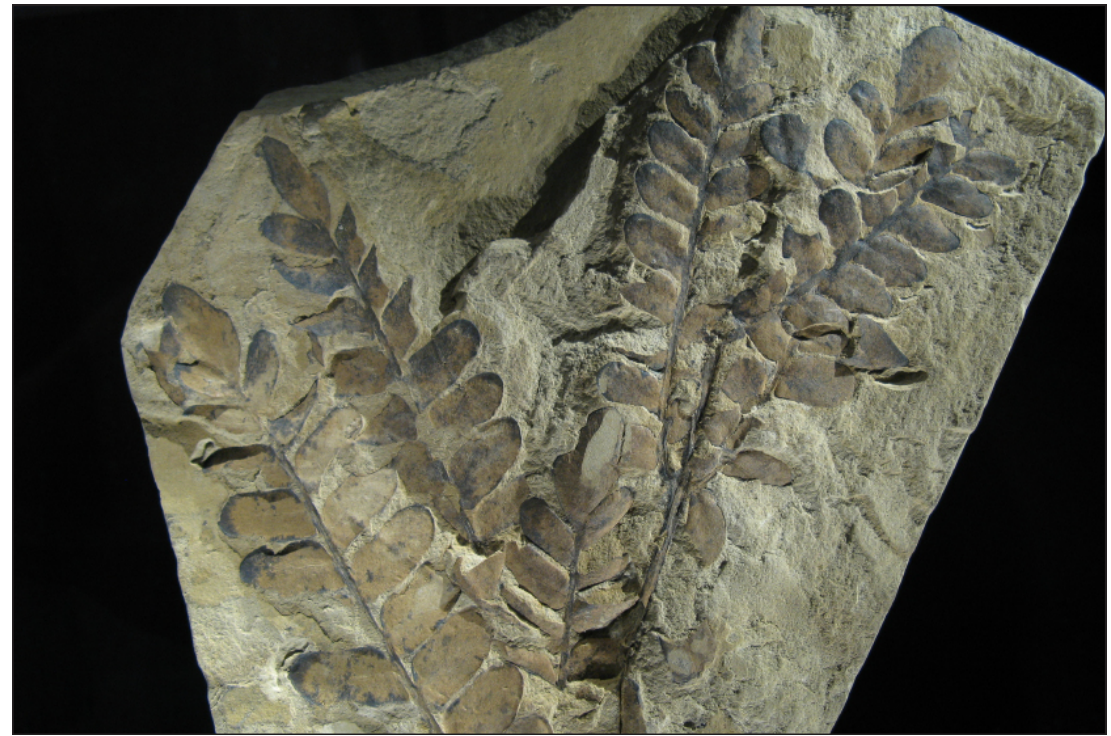
conglomerate



shale

Fossils

Fossils are found in sedimentary rocks. This is because animals and plants from millions of years ago were covered in sediments when they died. These sediments eventually compacted to form rock. Decomposed bodies and bones eventually fossilized, forming part of the rock surrounding them.



Coal

Coal is the remains of ancient plants that were covered in sediments and compacted over millions of years.

Coal formed on the Earth about 300 million years ago when the environment was wet and swampy. The vegetation sank into the swamps, building up over time to form peat. When the peat was covered in layers of sediments from volcanic activity, the peat was compressed, eventually causing the peat to petrify.



Coal takes billions of years to form.



Peat can take thousands of years to form. It can still be found in boggy parts of the world. When peat is dried out it can be used to fuel fires.

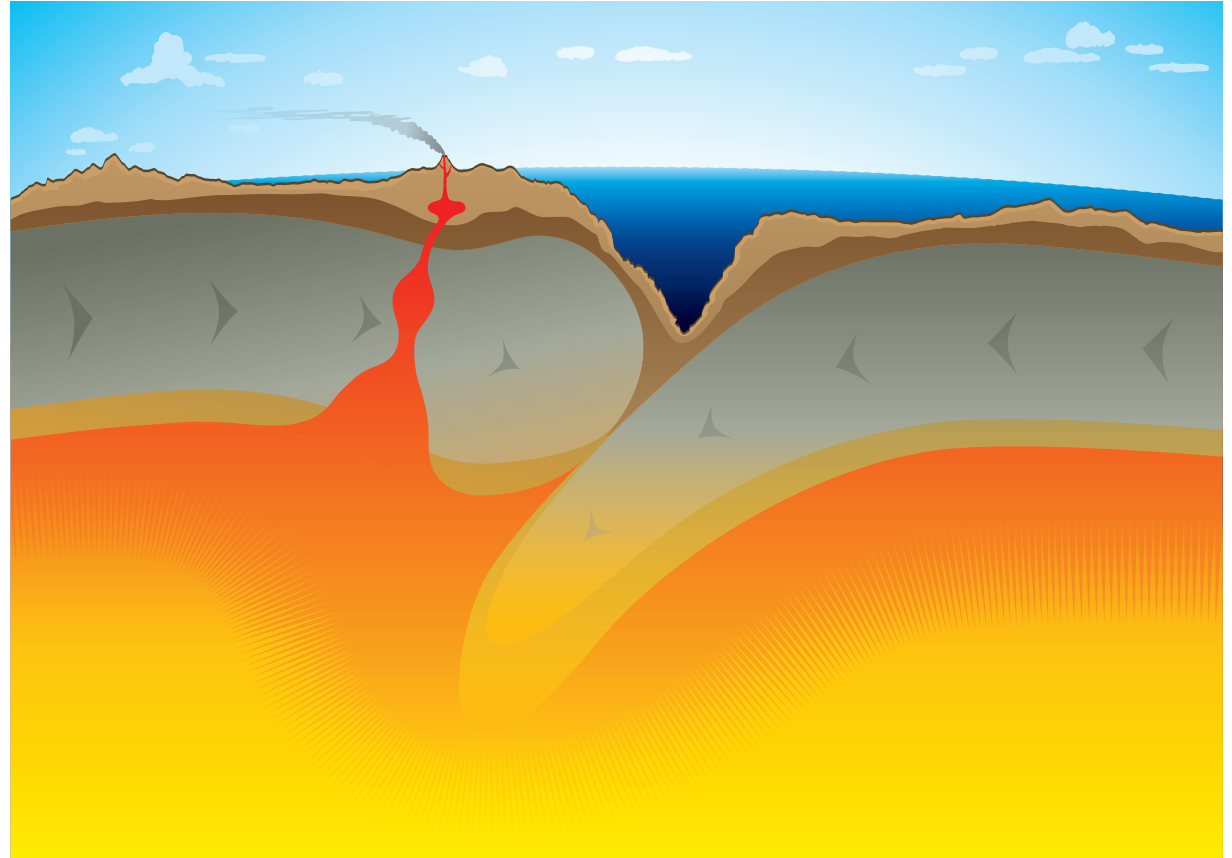


Metamorphic rocks form:

When igneous or sedimentary rocks are changed in texture or mineral composition by heat, pressure and/or the chemical action of fluids and gases.

This can occur when rock layers are compacted deep under the surface of the earth. There is intense pressure from the layers above. It often occurs in subduction zones, where continental plates are pushing against each other and one layer is forced down under the other.

Metamorphic rocks are eventually exposed on the surface by changes in the earth's crust due to earthquake action and erosion.



Metamorphosis means to have a change in form, structure or appearance. Sedimentary rocks and igneous rocks can go through a metamorphosis when they are under intense pressure and heat. However, the rocks do not heat up enough to become molten as then they would be classed as igneous.



marble

Examples include quartz and marble. These rocks are the result of the metamorphic changes to the sedimentary rock limestone. Some minerals in the limestone crystallise when under pressure.



quartz



gneiss

Sometimes the intense pressure forces similar particles to line up, producing layers of texture. The result is the streaky layers of colour that can be seen in examples such as gneiss and slate.



slate



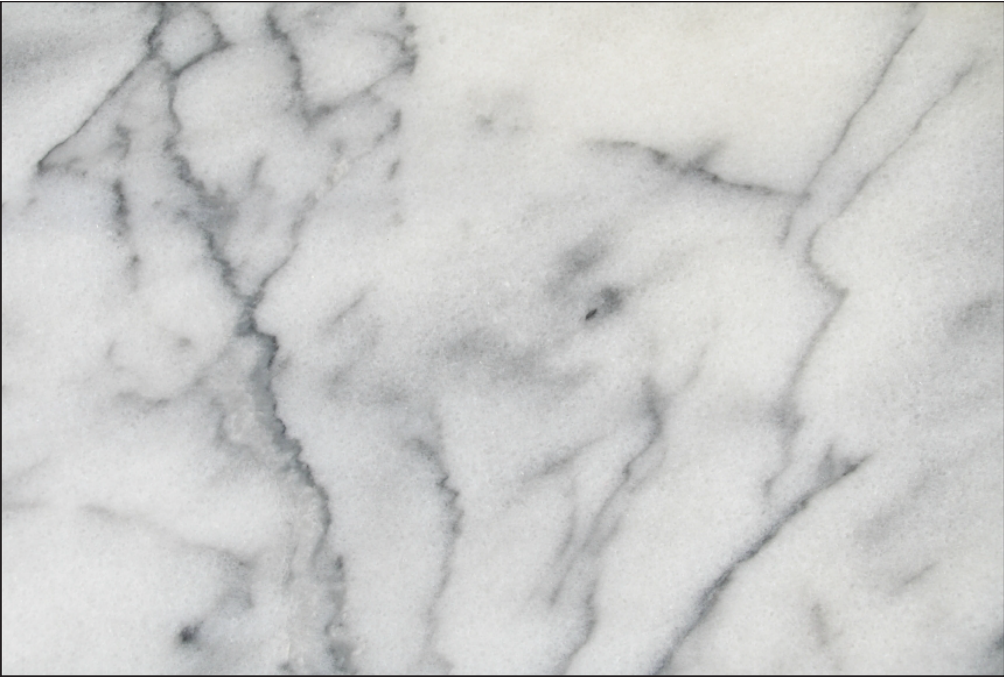
chert

The chemical changes that occur in metamorphic rocks can produce a glassy texture that is very beautiful when cut and polished.



jasper

Large blocks of marble are cut out of the bedrock at a quarry. These blocks are then sliced into useable pieces with stone cutting saws. Marble is commonly used in the building industry, for decorative flooring and kitchen bench tops.



Mohs Scale of Mineral Hardness

Minerals can be scaled according to their ability to visibly scratch another mineral. The German geologist Friedrich Mohs created a scale that orders minerals according to their hardness. A score of 1 is the softest material and 10 is the hardest.

1 talc



6 orthoclase



2 gypsum



7 quartz



3 calcite



8 topaz



4 fluorite



9 corundum
(ruby & sapphire)



5 apatite



10 diamond

