

Rocks and Soils KS2

Activity: Grouping and Sorting Rocks

Ideally, you will find some examples of rocks in your local area. You might find gravestones or old buildings in cities, towns and villages, rocks and stone in parks, gardens or garden centres, or you might live in the countryside or by the sea and be able to see rocks in the natural environment. You do not need to collect these, but could examine them where they are and photograph them and then find ways to group them according to their physical properties.

You could group according to size, weight, colour, appearance, eg shiny/dull dark/light, rough/smooth.

If you can't find any rocks, you could use these pictures of different rocks to sort:



Image credit: Jo Montgomery

(You'll need your rock samples for a later activity too).

Create a table that looks something like this, depending on the properties you are using:

Shiny	Dull
Examples of rocks	Examples of rocks

Rough	Smooth
Examples of rocks	Examples of rocks

Hard	Soft
Examples of rocks	Examples of rocks

Light	Dark
Examples of rocks	Examples of rocks



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Activity: investigating soil

- A. Collect a small sample of soil to have a close look at. You should see that it's not just uniform brown grains. There are some stones or rocks, even tiny ones, and also bits of plant leaf or root and maybe even some minibeasts.



Image credit: CleanPNG

- B. Now, see if you can take a closer look by trying to separate the different parts in the soil.
- Take a small sample of soil – a couple of tablespoons should do (please ask permission before you do this, and wash your hands well afterwards)
 - Add some water (about 250ml should be enough, but you could experiment) to the soil in a see-through jug or large glass
 - Leave to settle
 - The organic matter (leaves etc) should float on top, and the stones sink to the bottom



Image credit: Jo Montgomery

Activity: Investigating the hardness of rocks

Are all rocks hard?

Can you think of a way to test how hard a rock is?

You could try scratching it with your fingernail or a pin.

Can you sort your rock samples into hard and not hard, or as a range from hardest to softest using the results of this investigation?



Image credit: Jo Montgomery

Activity: Investigating absorption

Do you think rocks are porous (have holes in that can absorb water)?

How could you find out?

Design an investigation to see if rocks can absorb water. How would you work out how much water they had absorbed?

You might use:

- A beaker of water
- A measuring cylinder or jug
- Weighing scales

Activity: Types of rock and the rock cycle (using chocolate!)

You could have a go at making the different types of rock in the rock cycle out of chocolate!

You will need:

- White chocolate
- Dark chocolate
- Milk chocolate
- Cheese grater (mind your fingers!)
- 3 bowls
- Clingfilm or plastic food bag
- A warm cup of water (be careful with hot water)

Grate the different types of chocolate into separate bowls (you could just use two types of chocolate if you prefer).

Sedimentary rock

- Layer up the white and milk chocolate shavings that you have grated onto a piece of clingfilm or inside a plastic food bag) to represent the layers of sediment falling to the bottom of the sea.
- Wrap up the clingfilm so it doesn't get too messy.
- Apply pressure by squashing the chocolate flat inside the clingfilm. The heat of your hands and pressure of squashing represents the effects as more layers of sediment squash down to form rock.
- Unwrap the clingfilm carefully to examine your chocolate sedimentary rock – it should be a bit crumbly, just like real sedimentary rocks like sandstone and limestone.

Metamorphic rock

Metamorphic means 'changed'. We are going to change the sedimentary rock into a different kind of rock.

- Add some grated dark chocolate to the sedimentary rock (made from the white and milk chocolate). Metamorphic rocks often have grains or crystals of other minerals in them. Metamorphic rocks are formed deep down inside the earth where it's hot and there's a lot of pressure
- Wrap up the clingfilm again
- Apply much more squashing pressure and warm with the heat from your hands to represent the hot, squashing effect on metamorphic rocks.
- Unwrap the clingfilm carefully to examine your chocolate metamorphic rock – it should have changed to be a lot less crumbly, more stuck together and you may also be able to see the different flecks of colour
- If you leave it to cool, it will be harder and less crumbly than the sedimentary chocolate rock

Igneous rock

Igneous rock gets its name from 'ignis' meaning fire. Igneous rocks are formed deep down inside the earth as molten magma. As the magma cools, it solidifies into rock. If it cools quickly, it will have small or no crystals and if it cools more slowly it will have larger crystals in the structure.

- Wrap up the clingfilm containing your chocolate rock again
- You are going to melt the chocolate now, just as the rocks melt inside the earth
- Hold the clingfilm parcel against the side of the mug containing warm water (or tea or coffee!) to melt the chocolate.
- You could even dunk the clingfilm parcel inside the warm water to melt
- Once it's warmed up, carefully unwrap the clingfilm to examine your chocolate igneous rock – it should have melted all into one piece
- Leave it to cool and it will be much less crumbly and harder than the other rocks.

You can eat the chocolate rocks if you're allowed!

This rock cycle doesn't only go in one direction – rocks can change from one type to another, for example, both igneous and metamorphic rocks could get worn away and then be deposited on the seabed to turn into sedimentary rocks, and sedimentary rocks can directly become igneous rocks through melting.

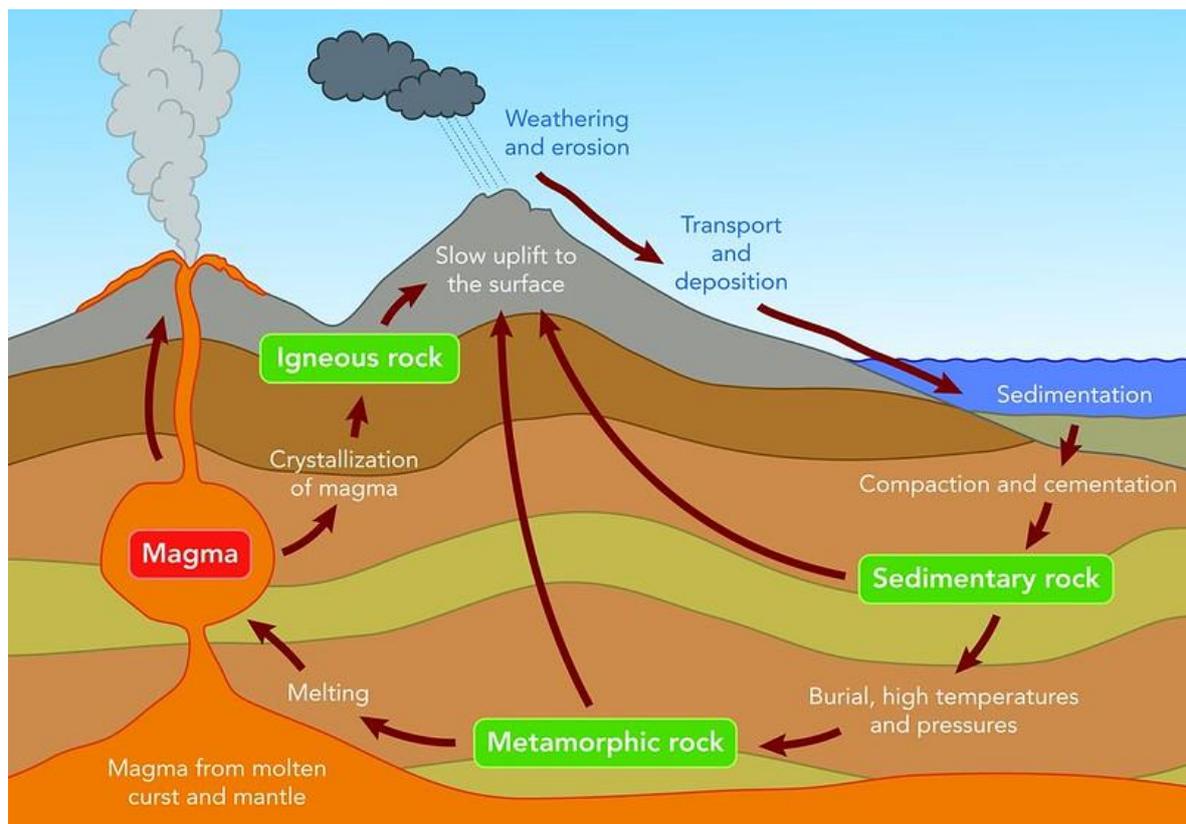


Image: www.flickr.com/photos/121935927@N06/13581730833/in/photostream/

Activity: Key vocabulary

Explain what these key words mean:

rock	stone	pebble	boulder	grain	crystal	Layers
hard	soft	texture	absorb	water	soil	fossil
marble	chalk	granite	sandstone	slate	peat	sandy/chalky/clay soil

Activity: Find out how fossils are made

Use secondary sources to find out about fossils. You could start with:

Fossils <https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3>

Mary Anning <https://www.pstt-cpd.org.uk/ext/cpd/dramatic-science/resources.html>

And then see the further investigation links at the end.

Activity: Discover more about how soils can retain water

Look at the resources from Practical Action Schools to find out more about how important soil is - ReGreen The Desert Home Learning Guide at:

<https://practicalaction.org/schools/regreen-the-desert/>

Other investigations and further research:

Rocks and fossils <https://www.stem.org.uk/resources/elibrary/resource/26719/rocks-rocks-and-fossils>

Rocks and their uses video clip

<https://www.stem.org.uk/resources/elibrary/resource/32188/teeth-springs-rocks-and-other-topics> (fast forward to 4 min 14 seconds (4:14-6:28))

Rocks, soils and fossils class clips <https://www.bbc.co.uk/bitesize/topics/z9bbkqt/resources/1>



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