

Rocks

National curriculum objectives:

- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties
- describe in simple terms how fossils are formed when things that have lived are trapped within rock
- recognise that soils are made from rocks and organic matter.

Science in the news today

Largest and hottest volcano in the world discovered!

Until now, a different volcano held the title of largest volcano on earth. But, by studying the rocks in and around the Gardner Pinnacles and the rocks on the ocean floor, scientists have realised that actually the Pūhāhōnu is the largest volcano on Earth.

It is made up of two large rocks. The highest peak is 52m and the total area is 2,400 km², that's the size of 33,000 football pitches, or, half the size of Somerset!

A lot of the rock is underwater, which is why it doesn't look so big in the picture.

Here is a picture of the Gardner Pinnacles

It may not look like much, but this is the home of the largest volcano on Earth!



Rocks!

In this lesson we are going to look at the different types of rock. Some of them in our homes and local environment, and some types you may never have seen before, but a lot of the world is made up of rock!



Chalk, slate and marble

These are all different kinds of rock that you may have come across before.

Think about the differences between these three rocks. Can you name some differences in appearance, texture or function? What do people use these types of rock for?



Chalk, slate and marble

Chalk is crumbly and soft. Because it is easily worn down, it is good to use it to write on boards with.

Granite (or slate), doesn't let water pass through it. It also easily breaks into sheets. Both of these properties mean it is good for making roof tiles.

Marble is smooth and very hard, it is also nice to look at and can be smoothed down and polished. Because of these properties it is good for making statues, or ornaments. Some people also use it to cover surfaces in their home, for example the kitchen.



Volcanos!

Volcanoes are large masses of rock, usually mountains, that are connected to the *surface of the planet*. At the planet's core there is molten rock - rock that is so hot it becomes like a liquid - we call this magma.

When this rock travels from the planets surface and into the rock above and spills out over its surface we call it lava.

So, a volcano is a large mountain with a tunnel to the center of the earth where molten rock can escape!



Where does soil come from?

You have soil in your garden, at the park, you see it on the side of the road, it's really *everywhere*.

Soil actually contains lots of small rock mixed with organic matter. The rock in soil has been broken down over many, many years by the wind and the rain into tiny pieces. This is combined with decaying plant and animal matter to give us soil.



Way back in 17th century Bristol, rocks start forming into soil that we use today!

Because of this, it can take up to 400 years for just 2 cm of soil to form.



All of this soil is made up of tiny tiny rocks and decomposing plants.

Look closely at these pictures, and if you can, the soil in your garden - can you see the rock?

Fossils

Fossils are animals and plants that have been preserved in rock! They are usually thousands of years old (or older) and show us information about animals and plants from a long time ago.*



*See our week 5 lesson on evolution and fossils for more information about what they are and where they come from!

A test of rock hardness

This experiment will work better if you collect rocks that are very different from one another. Spend some time trying to find a wide variety of rocks from different places for the best results!

What do you need?

- A selection of different rocks (between 4 and 10)
- Pen and paper
- An adult to help you

Instructions:

1. Count how many rocks you collected. Give each rock a letter (a - j, depending on how many rocks you collected!)
2. Draw a table that has the same number of rows and column as the number of rocks you collected.
3. The heading of both the rows and columns should be the letters you gave to your rocks. (see the next slide if you're stuck!)
4. Now take rock a first and try and scratch each of the other rocks with it. Can it scratch the rock and leave a mark? Go down the **column of that rock and mark a tick for yes or a cross for no.**
5. **Repeat this for all the rocks, filling in each column as you go.**
6. **Now, count how many of the boxes in each column have ticks for each rock.**
7. **Compare how many ticks each rock got. And you can now put them in order of hardness!**

This method is similar to the one used to classify the hardness of all rocks - it's called the Mohs' scale of mineral hardness!



Example of a completed sheet:

A tick is put in the column if the rock at the column head scratches the other rock.

Which is the hardest rock? A comparison of different rock strengths.				
	A	B	C	D
A		X	X	X
B	✓		✓	✓
C	✓	X		X
D	✓	X	✓	
Totals:	3	0	2	1

A was harder than all the other rocks. B wasn't harder than any of the other rocks. C was harder than B and D. D was harder than B.

Order of hardness: A, C, D, B.

My pet rocks! Compare your rocks.

This experiment will work better if you collect rocks that are very different from one another. Spend some time trying to find a wide variety of rocks from different places for the best results! (you can use the same rocks as last time for this).

What do you need?

- A very small amount of vinegar (get an adult to help you if needed).
- A magnet
- A small bowl of water
- A metal file - if you don't have one a penny will do



Instructions:

1. First, make a chart like the one on the next page for each of your rocks
2. Next, go through each section of the chart for each rock:
 - a. Draw a picture of your rock - what does it look like? Is it smooth or bumpy? What colour is it?
 - b. The vinegar test - drop a very small amount of vinegar on your rock, does it fizz? If so, it contains something called carbonate!
 - c. Hold your rock close to your magnet, is it attracted to the magnet?
 - d. Scratch test - try and scratch your rock with the file, does the file scratch the rock?
 - e. Is the rock shiny or dull in appearance?
 - f. Lastly, carefully place the rock in the small bowl of water. Does it sink or float?
3. You have now completed a thorough investigation into the rocks you found. Hopefully you got some interesting results!

A drawing of your rock:

The vinegar test - does the rock fizz when you drop a **small** amount of vinegar on it?

Is the rock magnetic?



Scratch test. Can you scratch your rock with a metal file?

Is it shiny or dull?

Does the rock sink or float?

