

## Science – Rocks



**Year: 3**

**Term: Autumn**

### Prior knowledge

Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)  
Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)  
Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)  
Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)  
Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

### Key Knowledge

#### Fossilisation

A fossil is the preserved remains or traces of a dead organism. The process by which a fossil is formed is called fossilisation. It's very rare for living things to become fossilised. Usually after most animals die their bodies just rot away and nothing is left behind. However, under certain special conditions, a fossil can form. A fossil is formed when an animal dies and certain parts of its body is left behind. These are buried by rocks.

#### The fossil record

Fossils are the preserved remains or traces of a dead organism. They provide evidence for how living things and the environment have changed over time. Fossils have been found in rocks of all ages, stretching back billions of years. However, most of the species found in the fossil record have died out or become extinct. Fossils don't just show how living things have changed; they can also help us understand how the Earth has changed. Over millions of years the Earth's surface shifts and changes. For example, rocks that once formed the seafloor might be forced up to form a mountain range. This means that you can sometimes find the fossils of sea creatures at the peak of a mountain.

#### What is soil made of?

Soil is a mixture of tiny particles of rock, dead plants and animals, air and water. Different soils have different properties depending on their composition. Sandy soil is pale coloured and has large particles. These create lots of small air gaps. Water drains through them easily so it usually feels dry. Clay soil is usually sticky and has small particles. They contain very few air gaps and water does not drain through it easily. Chalky soil is a light brown soil. Water drains through it quickly. Peat does not contain any rock particles. It's made from very old decayed plants and is dark, crumbly and rich in nutrients.

#### Properties and uses

Different types of rocks have different properties. Some rocks are harder than others. For example, granite is a very hard rock. This makes it a good material for building as it doesn't wear away easily. Marble is another hard rock. It has an attractive texture and colour and it can be cut and polished. Because of this, it is used to make floor tiles and wall tiles. Some statues are made from marble too. Chalk is a soft rock and wears away easily. This makes it ideal for making chalk sticks to write on blackboards. Some rocks, such as sandstone or chalk, let water soak through them. They are called permeable rocks. Other rocks, such as slate, do not let water soak through them. They are called impermeable rocks. Slate also splits easily into thin sheets. This makes it ideal for making roof tiles.

### Key skills

- I use my results to draw a conclusion and make predictions for answering a different question.
- I can identify some simple differences or similarities when making comparisons.

- c. I support my answers by pointing out the scientific evidence.
- d. I can report my conclusion from the results of my experiment.
- e. I can gather the data I need to answer a scientific question and then present them in a table, grid or graph.
- f. I can record my findings in simple labelled diagrams, keys, bar charts or tables.
- g. I can set up a simple fair test experiment to answer a scientific question.
- h. I can make observations and record measurements (for example in mm or g).
- i. I can ask relevant scientific questions.

**Future Learning**

Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)  
 The composition of the Earth. (KS3)  
 The structure of the Earth. (KS3)  
 The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)

<b>Key Vocabulary</b>	
Working scientifically key vocabulary – properties, observe, test, object, record, equipment, prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis	
<b>Physical properties</b> - relating to things perceived through the senses e.g. feel, see, smell, hear and taste.	<b>Sedimentary</b> – rocks made by mineral or organic particles found on the floor of oceans or other bodies of water at the Earth's surface.
<b>Fossils</b> - the remains or impression of a prehistoric organism, sometimes as a mold or cast in rock.	<b>Permeable</b> - something that will allow water to pass through it
<b>Formation</b> - the action of forming or process of being made.	<b>Impermeable</b> – something that will not allow water to pass through it
<b>Soils</b> - Soil is a mixture of organic matter, minerals, gases, liquids, and organisms.	<b>Rotting</b> - decay or cause to decay by the action of bacteria and fungi.
<b>Organic matter</b> – soil consisting of plant and animal remains/ the breakdown of cells and tissues of soil organisms.	<b>Grains</b> - give a rough surface or texture to.
<b>Metamorphic</b> - rock that has undergone transformation by heat/ pressure.	<b>Crystals</b> - clear and transparent like crystal.
<b>Igneous</b> – a rock solidified from lava or magma.	
Additional vocabulary to discuss across the unit – Compare, group, appearance, grains, crystals, investigate, decay, material, extinction, palaeontologist	
<p><b><u>Deepening and broadening the knowledge and understanding for GDS learners:</u></b></p> <ul style="list-style-type: none"> <li>• compares and groups different kinds of rock based on appearance and properties using the correct scientific language to describe the properties, <i>e.g. permeable/ impermeable</i></li> <li>• compares and groups different kinds of rock based on their knowledge of how the rock was formed</li> <li>• compares and groups different kinds of rock based on their knowledge of the names of the different kinds of rock</li> <li>• describes in detail how a fossil is formed when a living thing is trapped in rock - including the chemical reactions that turn the sediment into rock and the bones into mineralised fossils</li> <li>• recognises that there is more than one way a fossil can be formed</li> </ul>	<p><b><u>Key Outcomes</u></b></p> <p><b>1. How can I classify rocks?</b>  <i>Children will investigate sorting and naming the three main types of rock, investigating formation, recording findings in diagrams and tables.</i></p> <p><b>2: What causes rocks to change over time?</b>  <i>Children will make observations of rock types that have changed over time, such as formation of caves, rocks at a quarry or of pictures of gravestones and understand why they have changed.</i></p> <p><b>3: What is a fossil?</b>  <i>Children will create scientific diagrams to explain the process of fossil formation and write an explanation</i></p> <p><b>4. Who was Mary Anning?</b></p>

- knows that only a very small proportion of things that have once been alive become fossils
- describes how soil is formed
- recognises that soil will be different according to the geographical area in which it is found
- knows that the nutrients contained within the remains of living things are slowly being released into the soil
- describes the difference between topsoil and subsoil

*Children will use secondary sources to research Mary Anning's life and the influence she had on fossil hunting. They will present their research in a report.*

**5: What can rocks be used for?**

*Children will predict and then observe whether different rocks can be scratched with a nail, are permeable, or can float in water and record results. Conclude what these properties mean for potential uses.*

**6: What is soil made from and which is the most permeable?**

*Children investigate what soils consist of by making observations and comparisons of differing soil samples and predict and investigate which is most and least permeable and why. Children will notice and discuss differences and similarities in each other's results e.g. soils from different places are not all made up of the same organic matter and record and make conclusions about them. They will learn that soil is different depending on its geographical location and make predictions about what this might mean for what can grow there, drawing on knowledge from the previous plants unit.*