Hurst Hill Primary School Knowledge Organiser

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Learning Together

Science	Rocks	Year 3	Summer 1	Chemistry

Knowledge

Can we group rocks according to their similarities and differences?

Can you use an identification key to find out the name of each ofthe rocks in your collection?

Comparative testing Identifying and classifying

There are three types of rocks that are formed naturally:

- Igneous rocks, such as granite and basalt, form when molten magma cools. The process takes place either under the Earth's surface or as lava flows out of an erupting volcano and mixes with other minerals on the surface. It is strong, hard-wearing and porous.
- Sedimentary rocks, such as limestone and chalk, form over millions of years. Little pieces of igneous rock are weathered away and sometimes find their way to the bottom of lakes, seas and rivers to create sediment. The sediment builds up in layers to eventually form the rock. It is porous and can be easily worn away.
- Metamorphic rocks, such as slate and marble, are formed when igneous and sedimentary rocks are put under intense heat and pressure. This makes them incredibly strong.

What changes occur when two rocks are rubbed together?

Observing Over Time

Rub two small samples of rock together and identify similarities and differences between each pair of samples: igneous/igneous; igneous/sedimentary; sedimentary/sedimentary; sedimentary/ metamorphic; metamorphic/metamorphic; metam[illegible] Would you expect man-made materials that are easily confused with rocks (e.g.: bricks/concrete) to react in similar ways?

How has the stone that local churches and gravestones are made out of changed over time? Why do you think that these changes have occurred?

Identifying and Classifying

Go on a walk around Priory Park and observe the ruins of St. James' Priory. Compare with images of other local churches, ranging in building materials (sandstone, brick, etc.), and of gravestones in local cemeteries/churchyards (granite, limestone, marble, etc.). Which of the three rock types are each made of (igneous/sedimentary/ metamorphic)? How can you tell from the changes that have taken place?

How are fossils formed? How can they be used to show changes in plants and animals over time?

Pattern Seeking

Fossils are the remains of prehistoric life that tell us about the Earth and about life that existed hundreds of thousands, and even millions, of years ago. They are usually formed when a living thing (plant or animal) dies and the body is covered up or buried by sediment over thousands of years. Some fossils are formed when bones and teeth in animals and the woody parts of plants are preserved, whilst others are made from sedimentary rock, such as footprints or imprints from shells.

How did Mary Anning's work help us to understand prehistoric life?

Ideas Over Time

Mary Anning (1799-1847) https://www.youtube.com/watch?v=qNOh-85_Dmc Fossil collector, dealer and palaeontologist.

Using a microscope, which rocks have crystals, grains or fossils in them?

Comparative Testing

Crystals are more likely to be found in igneous rocks, whilst grains and fossils are more likely to be found in sedimentary rocks. Why do you think this is? How could you prove or disprove this by answering the question? Discuss the variables involved in such an investigation (size and rock type of each sample) and the differences between crystals, grains and fossils. How would you make this a fair test? Does it need to be a fair test?

How are soils formed?

Research

Soils are made from pieces of rock, minerals, decaying plants and water. When rock is broken down into small grains, soil is formed.

There are different layers of soil: above the soil is leaf litter and recently decaying plants, and as the soil becomes deeper, the rock grains become larger until bedrock is reached.

Why might soil in different places be different colours? Do you think that water soaks in differently to each of these soils?

Ideas Over Time

The colour of soil is dependent upon the amount of drainage it has and the different types of minerals and decaying plants (also known as organic matter) that can be found within them. Typically, soil that has a lot of organic matter or a lot of water in it is darker than other soils. The amount of minerals can also affect the colour: red soils tend to have a lot of iron within them, whilst one of the reasons the Black Country was given its name was because of its black soil, which was caused by the thick layers of coal below the surface.

Vocabulary	
Absorb	Soak up or take in.
Bedrock	The solid **rock** in the ground which supports all the **soil** above it.
Decaying	Gradually being destroyed by a natural process.
Grain	A tiny, hard piece of a whole, such as sand or salt.
Igneous	**Rocks** that are formed by volcanic action or intense heat.
Imprint	A mark or outline made by the **pressure** of one object on another.
Leaf litter	**Decaying** leaves.
Magma	**Molten rock** that is formed in very hot conditions inside the earth.
Man-made	Things that are created by people.
Metamorphic	**Rocks** that have had their original structure changed by **pressure** and heat.
Mineral	Something that is formed naturally in **rocks** and in the earth.
Molten	Something that has been heated to a very high temperature and has become a hot, thick liquid.
Natural	Things that exist in nature and are not made by people.
Nutrients	Substances that help animals and plants to grow.
Palaeontology	The study of fossils as a guide to the history of life on Earth.
Permeable	A substance that some liquids and gases can pass through or soak into.
Porous	Something with many small holes in that allows some liquids and gases to pass through.
Prehistoric	The time in history before any information was written down.
Preserve	To protect from **decay**.
Pressure	The force produced by pressing hard on something.
Properties	The qualities or features that belong to something and make it recognisable.
Rock	A solid mass made up of **minerals**. Rock forms much of the Earth's outer layer, including cliffs and mountains.
Sediment	Solid material that settles at the bottom of a liquid, especially earth and pieces of **rock** that have been carried along and then left somewhere by water, ice or wind.
Soil	The substance on the **surface** of the Earth in which plants grow.
Surface	The flat, top part or the outside of something.
Surrounding	To be present all around.
Volcano	A mountain from which **molten rock**, gas, steam and ash from inside the Earth sometimes burst.
Weathered	Affected by the weather.

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Chemistry is the science that deals with the composition and properties of substances and various elementary forms of matter.

Statutory requirements

Pupils should be taught to:

- 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.