Knowledge Organiser – Year 3 Science – Rocks and Soil

What should I already know?

Rock aren't living things Plants grow in soil	Rocks are natural forms Fossils are made by old, dead animals

Cross- Curricular links

Art, Design and Technology – make fossils
Topic/Geography - undertake a local walk looking at the environment to study rocks

Scientists / Geologists

Mary Anning - (21 May 1799 – 9 March 1847) was an English fossil collector, dealer, and palaeontologist who became known around the world for finds she made in Jurassic marine fossil beds in the cliffs along the English Channel at Lyme Regis in the county of Dorset in Southwest England

Charles Darwin - 12 February 1809 – 19 April 1882) was an English naturalist, geologist and biologist, best known for his contributions to the science of evolution.

Investigations

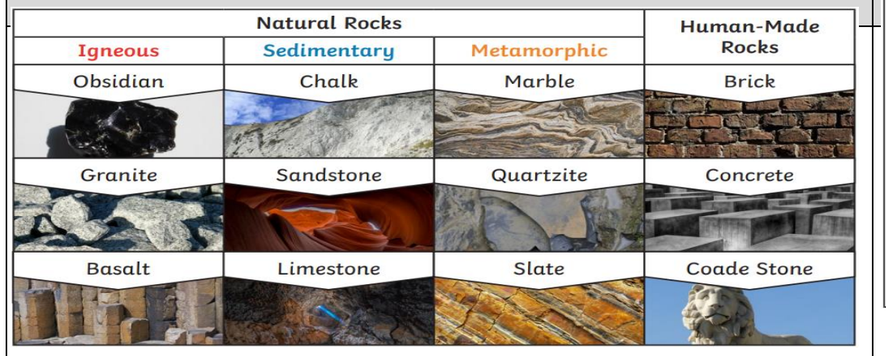
- Children to work scientifically by: observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time; using a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. Children to make 'chocolate rock' to show 3 types of rock.
- Children to research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed. Children to undertake jelly sweets and bread investigation to show how fossils are formed.
- Children to explore different soils and identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water. They raise and answer questions about the way soils are formed.

Key Vocabulary

Igneous	Rock that has been formed from magma or lava.
Sedimentary	Rock that has been formed by layers of sediment (tiny pieces of rock and animal skeletons) being pressed down hard and sticking together at the bottom of seas and rivers. You can see the layers of sediment in the rock (eg shale, limestone and sandstone).
Metamorphic	Rock that started out as igneous or sedimentary but changed due to being exposed to extreme heat or pressure (eg slate, marble or slate).
Igneous	Rock that is formed through the cooling and solidification of magma or lava (eg basalt or granite). Most Igneous rock is very hard.
Soil	The top layer of the Earth's crust
Clay	A type of fine grained natural soil material
Permeable	Allows water to pass through it
Mineral	A solid, naturally occurring inorganic substance
Fossil	A fossil is any preserved remains, impression, or trace of any once-living thing (plant, animal or insect) from a past geological age (at least 10,000 years ago). Most fossils are found in sedimentary rock such as shale, limestone and sandstone.

What I will know at the end of the topic

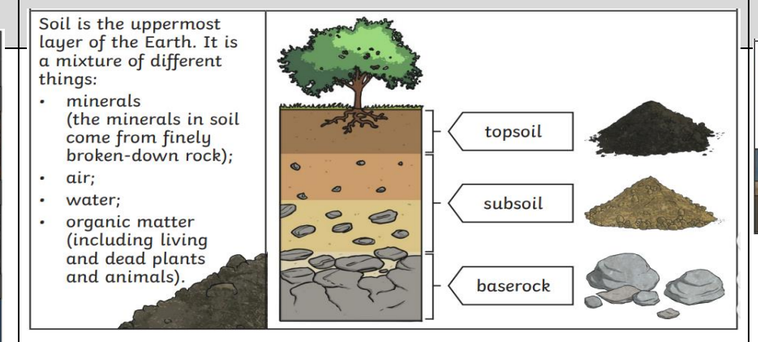
How can different kinds of rocks be compared and grouped on the basis of their appearance and simple physical properties?



What are the three types of rock and how was it formed?

Igneous – sometimes magma is forced into the ground and cools slowly eg granite. Faster cooling rock include basalt and pumice
Sedimentary – as pieces of rock are broken off into small particles usually softer and easier to cut, erodes easier by the action of weathering (eg freezing/thawing) they are transported by water and wind and deposited in the sea/river as sediment. Chemical changes may also take place eg when water from the ground seeps through sand eg creating sandstone
Metamorphic – affected by heat and pressure shale changes to slate, limestone (tiny animals) changes to marble, sandstone to quartzite and coal to coke.

What is soil made from?



What is soil and how can we classify it?

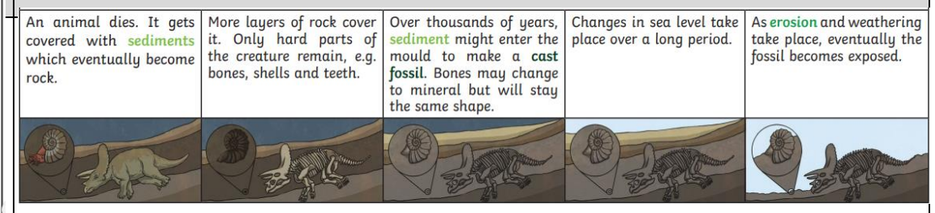
Soil is the thin layer of material covering the earth's surface and is formed from the weathering of rocks. There are three main types of soil which are classified according to the amount of sand and clay in them.

Clay – holds water, hold nutrients well

Sandy – contains a lot of sand

Loam – consists of sand, silt and clay

In simple terms, how are fossils are formed when things that have lived are trapped within rock?



How are fossils formed?

When would an animal not make a fossil?

Not all plants and animals turn into fossils. When a plant or animal dies, its remains either rot away to nothing or get eaten. Sometimes though, when the conditions are just right and the remains can be buried quickly, it may be fossilised.

How else are fossils formed?

Trace fossils – are geological records of biological activity. They are fossils, but not of the living things themselves. Trace fossils may be impressions made on the substrate by an organism. Burrows, borings, footprints, feeding marks, and root cavities are examples.

Amber fossils – when an insect gets 'stuck' in tree resin and becomes fossilized.

How else can we group the rocks based on their appearance and simple physical properties? **Hard or soft** Some rocks, like granite, are incredibly hard and can only be cut or split with specialist tools. On the other hand, clay is soft and can be easily moulded. Permeable or impermeable If a rock is permeable, for example pumice, this means it allows water to pass through it. Rocks that are impermeable do not allow water to pass through **Durability** Rocks that are durable are more resistant to weathering (being eroded – that is broken down – by rain and wind). More durable rocks, such as marble, have been chosen to create buildings and for outside use for this reason. **Density** Density measures how 'bulky' the rock is (how tightly packed the molecules are), not how heavy. Density can be checked by testing the buoyancy (whether they float in water) of rocks. High density rocks sink whereas low density rocks float **Examples of uses** : Building eg from houses to cathedrals/kitchen worksurfaces/flooring/walling/grave- stones/monuments		