Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Rocks, fossils and soil	**Class 3**	**Year B Autumn Term**

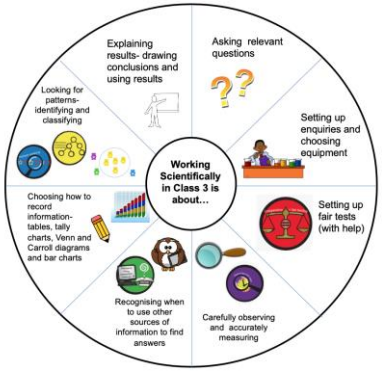
What should they already know?

From their 'Materials' unit in Class 2, children should be able to:

- identify some naturally occurring materials
- identify some properties of materials
- make observations and describe common objects/materials
- give a reason why a material is suitable for its job
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching)

Key vocabulary from Class 2:

hard, rigid, strong, smooth, absorbent, rock, insulate



Working Scientifically tasks that link to this unit:

Year 3 – Rocks – Testing soil	**How can we find out which soil is the most permeable?**

Key vocabulary

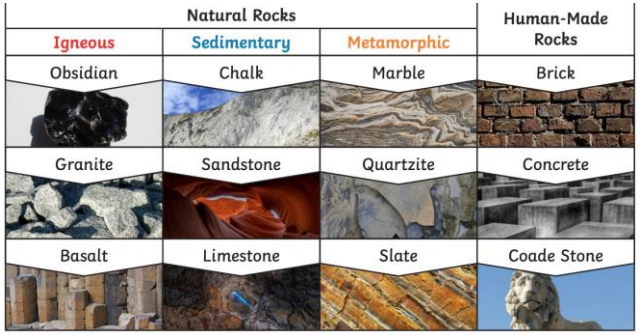
rock	A hard, solid material that is made of minerals and is found in nature. There are 3 types of naturally occurring rock (see below).
soil	The top layer of the ground, in which plants grow.
absorbent/ed	A material that soaks up liquid
permeable	Allows liquids to pass through it.
impermeable	Does not allow liquids to pass through it.
organic	Having to do with or coming from living organisms.
magma	Molten rock that remains underground.
lava	Molten rock that comes out from the ground is called lava.
igneous rock	Rock formed by the cooling and hardening of hot magma or lava. It is formed volcanoes. Examples: basalt, granite
sediment	Natural solid material that is moved and dropped off in a new place by water or wind (e.g. sand)
sedimentary rock	Rock formed when sediment is pressed together over time. It is formed over a long period of time. You can see the layers of sediment in the rock. Examples: shale, limestone, sandstone
metamorphic rock	They started out as igneous or sedimentary rock but changed by being exposed to extreme heat and pressure. Examples: marble, slate
fossil	The remains of a plant or animal that turned to stone over a long period of time. Mostly found in sedimentary rock.

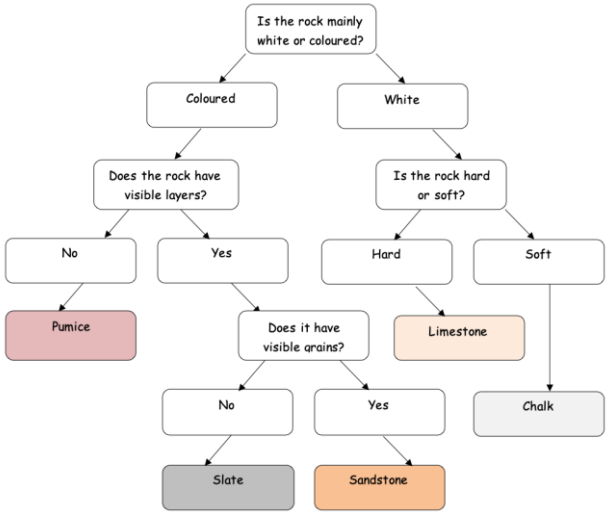
Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Rocks, fossils and soil	**Class 3**	**Year B Autumn Term**

HFL ARE statements explained

How do I classify rocks based on their characteristics?

Children can use identification keys to identify a variety of rocks, based on characteristics.





How do professionals decide which rocks to use for different purposes? (examples)

Sedimentary rocks
- Coal – used for fires as it can be easily burnt.
- Chalk – used for writing because it wears away easily.

Igneous rocks
- Granite – tiles for floors and counters as it is hard and resists wear/weathering
- Obsidian – can be referred to as 'natural glass'. It is so sharp it can be used by surgeons in surgical scalpels.

Metamorphic rocks
- Marble – kitchen worktops or statues
- Slate – roof tiles as it can split easily into thin sheets.

Do all rocks react the same to physical forces?

This links to finding out how professionals decide which rocks to use for different purposes, as different rocks react to the same forces differently. Children could carry out investigations to find this out. They could try a few different physical forces on different types of rock (like adding water or rubbing them).

Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Rocks, fossils and soil	**Class 3**	**Year B Autumn Term**

<table>
<tr><td>How are fossils formed?</td><td colspan="5">A fossil is the preserved remains or impressions of a living organism, such as a plant, animal or insect. Studying fossils hep scientist to learn about the past history of life on Earth. Fossils are found all over the world. Most are found in sedimentary rock such as shale, limestone and sandstone. It is 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. Things like footprints, burrows, eggs and even poo can be fossilised too!</td></tr>
<tr><td></td><td>1. An animal dies. It gets covered in sediments, which eventually become rock.</td><td>2. More layers of sediment cover it. Only hard parts of the creature remain (bones, shells, teeth). Soft parts of the body decay/decompose.</td><td>3. Over thousands of years, sediments around the skeleton begin to compact and turn to rock.</td><td>4. Movement – The bones start to be dissolved by water seeping through the rock. Minerals in the water replace the bone, leaving a rock replica of the original bone.</td><td>5. The rock rises to the surface and is worn away by erosion, exposing the fossil.</td></tr>
<tr><td>What are soils made of?

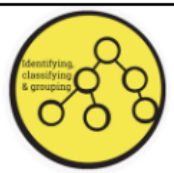
How can we find out which soil is the most permeable?</td><td colspan="3">Soil is a mixture of different materials and living things:
Minerals (small stone fragments like clay, silt or sand)
Organic matter (decaying plants and animals)
Water (which the nutrients in the minerals and the organic matter dissolve into)
Air (which fills the gaps between the mineral and organic matter parts.</td><td colspan="2">Example of different types of soil:
Sandy soil – pale in colour, lots of small air gaps, water drains through easily so quite dry.
Clay soil – orange/blue-ish and sticky, very few air gaps, water doesn’t drain through it easily, when it rains, puddles stay at the top of clay soil for a long time
Chalky soil – light brown, water drains through it quickly
Peat – dark colour, crumbly, doesn’t contain any rock particles; made from very old decaying plants</td></tr>
</table>

Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Rocks, fossils and soil	**Class 3**	**Year B Autumn Term**

How can a model be used to represent sedimentary, metamorphic and igneous rock? (GD statement)	Children could use biscuits and chocolate bars to make models of the different types of rock.		
	Sedimentary 	**Igneous** 	**Metamorphic** 

Famous people that relate to this unit:		**Writing ideas**
Mary Anning	Mary and her father noticed strange shaped rocks (fossils). She took them home and cleaned them. When Mary was alive, no one was sure what they were. Discovered a crocodile-like fossil (later named Ichthyosaur) by chipping away at rock. She went on to find many more fossils of different animals and kept detailed notes of everything she found.	Create your own tongue twister like the one inspired by Mary Anning on BPES

Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Rocks, fossils and soil	**Class 3**	**Year B Autumn Term**

Types of enquiry you could cover in this topic about rocks, fossils and soil	
	• Which soil absorbs the most water? • How does adding different amounts of sand to soil affect how quickly water drains through it? • Which soil drains fastest? (is the most permeable)
	• How does tumbling change a rock over time?
	• Is there a pattern in where we find volcanos on planet Earth?
	• Who was Mary Anning and what did she discover? • How did Mary Anning's work help us understand prehistoric life? • What were James Hutton's ideas about rocks were made and what was his evidence? • What is a fossil and how is it formed?
	• Can you use the identification key to find out the name of each of the rocks in your collection? • How can we group these different rocks?

Book/writing links
BOOKS • The Pebble in my Pocket • Stone Underpants • Pebble – the story of belonging
RECOUNT • A fossil explaining how they were made
NON-CHRONOLOGICAL • Uses of different types of rock e.g. chalk for drawing, granite for worktops and slate for roof tiles
INSTRUCTIONS • Instructions for making chocolate/ starburst rocks
EXPLANATIONS • How fossils are formed
PERSUASION • Persuade me to buy something silly made from rock e.g. a shoe. Children to note the relevant properties e.g. hardwearing, waterproof. They could relate to investigations they have done.