

Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: Science Year: Y3 - Rocks

NC/PoS:

- 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

Prior Learning (what pupils already know and can do)

Know the difference between an object and a material. Can classify materials based on their properties and explain why they have been grouped that way. Know rock is a natural material. Know the properties hard/soft and permeable/impermeable.

End Goals (what pupils MUST know and remember)

- Know there are three main types of rocks and give an example – sedimentary (chalk, limestone, shale, sandstone), metamorphic (slate, marble, quartzite, anthracite) and igneous (basalt, granite, pumice, obsidian)
- Know that rocks can be group based on physical properties and can give examples – hard/soft, permeable/impermeable or durability
- Know that fossils are formed by a plant or animal dies in a watery environment, the plant or animal is buried in mud and silt, soft tissues quickly decompose leaving the hard bones or shells behind, over time sediment builds over the top and hardens into rock.
- Know that soil is made from rocks and organic matter – clay, sandy, loamy, peaty, chalky, silty
- Know that soil can help plants grow

Key Vocabulary: metamorphic, igneous, sedimentary, basalt, granite, pumice, obsidian, minerals, fine-grained, chalk, limestone, shale, sandstone, crystalline, slate, marble, quartzite, anthracite, texture, colour, hard, soft, durable, permeability, permeable, impermeable, dense, density, fossil, formation, silt, decompose, organic matter, rock particles, silty, loamy, clay, sandy, gravelly

Session 1: Recap: what a material is. Properties of materials (hard/soft, permeable/impermeable)

Rocks are natural materials that have never been alive. Children learn there are three types of rock. Sedimentary rocks are formed from the broken remains of other rocks that become joined together. Metamorphic rocks are formed from other rocks that are changed because of heat or pressure. Igneous rocks are formed from molten rock that has cooled and solidified.

Suggested activities:

<https://www.youtube.com/watch?v=xsHPA2GNF9Q> how rocks are formed

Research formation of rocks

Vocabulary: metamorphic, igneous, sedimentary

Session 2: Recap: How are rocks formed?

Children learn examples of igneous rocks are basalt, granite, pumice, obsidian, and they all contain minerals, can be fine-grained or close-grained and often have a glassy texture. Examples of sedimentary rocks are chalk, limestone, shale, sandstone and are not crystalline but grainy. Examples of metamorphic rocks are slate, marble, quartzite, anthracite and are crystalline.

Suggested activities:

- <https://www.youtube.com/watch?v=iDnkliPVK5o>
- <https://www.youtube.com/watch?v=drYhfxv6inE> properties of rocks (1.37-4.12)
- sort a collection of rocks into igneous, sedimentary, and metamorphic
- record observations of different types of rock

Vocabulary: basalt, granite, pumice, obsidian, minerals, fine-grained, chalk, limestone, shale, sandstone, crystalline, slate, marble, quartzite, anthracite, texture, colour

Session 3: Recap: name rocks which are igneous, metamorphic, or sedimentary

Children learn some rocks are harder so are difficult to scratch or break up (granite, flint, marble) and some rocks are softer so can be easily scratched (chalk). Some properties of rocks are hard/soft and durability.

Suggested activities:

investigate how difficult it is to scratch rocks using: their fingernail, a 2p coin and a steel nail

N.B. Some rocks need to be cut or split with tools because they are so hard (e.g. granite) but others are soft and can be moulded (e.g. clay). Rocks which are resistant to erosion last longer and are more durable. Buildings are often made with these (e.g. limestone)

Vocabulary: hard, soft, durable

Session 4: Recap: name properties of rocks. Which rocks are hard? Which are soft?

Children learn that some rocks are impermeable, so they don't allow water to soak through (marble, slate) and others are permeable allowing water to pass through (chalk, sandstone, pumice) Properties of rocks are permeable/impermeable and density.

Suggested activities:

- Use a pipette to place just a few drops on each of the rocks and use hand lenses/microscopes to look carefully at which rocks allows the water in.
- Devise an investigation to find out how much water each of the rocks would absorb in a given time.
- Predict which rocks have a high or low density and test in a tank of water

N.B. density – if the particles in the rock are tightly packed then it has a high density. These rocks would sink in water (e.g. basalt).

Vocabulary: permeability, permeable, impermeable, dense, density

Session 5: Recap: Meaning of permeable, impermeable, density. Name rocks with these properties

Children learn that some rocks contain fossils (more common in types of sedimentary rocks) Fossils are the remains of living things from millions of years ago. The stages of fossil formation (plant or animal dies in watery environment, is buried in mud and silt, soft tissues quickly decompose leaving hard bones or shells behind, over time sediment builds over the top and hardens into rock)

Suggested activities:

- <https://www.youtube.com/watch?v=tyOjxjFHW-c>
- Observe different fossils in rocks
- Draw flow diagrams to show the stages

Vocabulary: fossil, formation, silt, decompose

Session 6: Recap: How are fossils formed?

Children learn that soil is made from worn down rock, organic matter, water and air and that there are different types of soil (gravelly, sandy, clay, silt, loamy)

Suggested activities:

- <https://www.youtube.com/watch?v=5b9o7yM7YGE> where does soil come from? (Up to 4.51)
- Collect soil samples from the local environment and use magnifying glasses/ microscopes to analyse
- Separate different parts that make up soil: shake soil samples in a jar of water and allow the different sized pieces of rock to settle. Put about 5 cm of soil into the jar. Fill the jar until $\frac{3}{4}$ full of water, replace the lid and shake vigorously. The larger fragments of rock material will settle quickly whilst finer particles will remain in suspension for some time. The different sized rock particles will form well-defined layers. Much of the organic matter will float.
- Classify soils collected by moistening the soils with a little bit of water and then test if they are sticky and can roll them into balls: Loamy = It is not sticky but it can roll into a ball; Sandy = It is not sticky and cannot roll into a ball; Silty = It is sticky, it can roll into a ball and it can break easily; Clay = It is sticky, it can roll into a ball and it won't break easily.

Vocabulary: organic matter, rock particles, silty, loamy, clay, sandy, gravelly

Link to career: palaeontologist

geologist <https://www.youtube.com/watch?v=1RL-MJPJtP4> (read to children)

Scientists who have helped develop understanding in this field: Mary Anning

<https://www.youtube.com/watch?v=Of5sK8p2rZY>