

# Ashtree Primary School and Nursery Medium Term Plan for Science

## Year 3 Autumn Term – Materials Unit – Rocks and Soils

### Prior Knowledge – Y2

**Step 1** - identify uses of some common materials

give a reason why a material is suitable for its job

**Step 2** - recognise that some materials will have more than one property which increases its suitability for its purpose (e.g. glass is **transparent, rigid and weatherproof**)

**Step 3** - suggest several reasons why a material may or may not be suitable for a particular purpose  
*explain why one material may be more suitable for a purpose than another by discussing properties*

**Step 4** - identify materials that can be easily changed with force  
identify materials that cannot be easily changed with force

**Step 5** - describe pushes and pulls needed to change a material as big or small

**Step 6** - describe changes in shapes because of the action of **pushes, pulls, bends and twists**

**Prior Skills – Y2** - uses simple observable features to compare up to 3 objects, materials, or living things, talks about their findings with increasing confidence, using everyday terms, text scaffolds or simple scientific language, **observes closely** (including changes over time), **using equipment, uses their observations and ideas to suggest answers to questions**, with help, records their findings in a range of ways, e.g. tables, diagrams, pictograms, sorting circles, bar charts and templates

**Key Vocabulary** Rock, soil, marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crystal, grains, crumbly, igneous, sedimentary, metamorphic, fossil,

### Key Knowledge

**Step 1** - understand that there are **rocks** under the Earth's surface

**Step 2** - observe the **characteristics** of a variety of rocks  
name and describe the characteristics of several rocks –  
**sedimentary, igneous and metamorphic rock**  
classify rocks from the evidence of investigations

**Step 3** - explain that different types of rock react differently to physical forces (e.g. water, rubbing)

explain that rocks are used for different purposes dependent on their physical properties – **permeable, impermeable, crumbly**

**Step 4** - identify **fossils** in rocks  
*explain why we do not see the soft parts of animals in fossils*

**Step 5** - recognise that soil is a mixture of different materials and living things

recognise that soil contains dead plants and animals

**Step 6** - recognise that there is rock under all surfaces and that soils come from rocks

### Key Skills

**Step 1** - beginning to make systematic and careful observation

**Step 2** - sets up simple practical enquiries, comparative and fair tests with support, asks relevant questions and uses, with support, different types of scientific enquiries to answer them

**Step 3** - with support, records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables

**Step 4** - reports on findings from enquiries, in simple scientific language, using oral and written explanations.

**Step 5** - Using model frames for support, gathers and records data in a variety of ways to help in answering questions

**Step 6** - beginning to make systematic and careful observation, begins to make decisions about what observations to make and how long to make them for, with help, looks for changes, patterns, and relationships in their data

### Curriculum Enhancements

- *describe how Mary Anning discovered fossils*



### Suggested Activities

S1 – ‘Rock’ hunt on the school grounds – How is rock used?  
Where can we find rock?

S2 - explain how a model (e.g. biscuits, chocolate bars) can be used to represent sedimentary, metamorphic and igneous rocks

S3 - explain why certain rocks are used for different purposes and why some rocks could be used for these jobs for example:

- Marble- kitchen worktops or statues
- Slate roof tiles
- Granite walls

S4 – Use clay to create own fossils.

S5 – Mix soil with water and leave to settle to then observe the different layers that soil is made up of.

S6 – Diagram to show how soils come from rocks and that rocks are under all surfaces.

### Possible Misconceptions

Some children may think:

- rocks are all hard in nature
- rock-like, man-made substances such as concrete or brick are rocks
- materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer ‘natural’
- certain found artefacts, like old bits of pottery or coins, are fossils
- a fossil is an actual piece of the extinct animal or plant
- soil and compost are the same thing.

### This will lead to . . . Y4 – States of Matter

Step 1 - name some **solids and liquids**, state that air is a **gas**

Step 2 - state some differences between **solids, liquids and gases**

Step 3 - recognise everyday substances as mixtures of **solids, liquids and/or gases**

Step 4 - recognise that **air** is a **material** and that it is one of a range of gases which have important uses, recognise that gases flow from place to place, know that **gases** can be easily **compressed**, recognise that for a substance to be detected by smell, some of it must be in the **gas state**

Step 5 - describe the differences between solids and liquids, compares simple solids and liquids (e.g. in terms of ease of squashing or pouring)

Step 6 - observe what happens to a variety of **materials** when they are **heated** (e.g. chocolate, ice cream, butter, water)

Step 7 - identify a wide range of contexts in which **changes of state** take place, describe a few examples where these changes occur

Step 8 - state that **ice, water and steam** are the same material, identify the processes of **melting, freezing, evaporation and condensation**,

Step 9 - describe what happens to water when it is heated and cooled, recognise that these **processes can be reversed**

Step 10 - describe how when ice melts it turns to liquid and how when water freezes it becomes ice, describe how these **processes can be reversed**

Step 11 - describe how **liquids evaporate** to form gases and how **gases condense** to form liquids

Step 12 - sequence the changes that happen in **the water cycle**, describe the water cycle in terms of these processes

Step 13 - explain the relationship between liquids and solids in terms of melting and freezing, explain the relationship between liquids and gases in terms of **evaporation and condensation**

Step 14 - know that **temperature** can affect the rate of evaporation or condensation, describe the effect of temperature on evaporation, explain how changing conditions affects processes such as evaporation and condensation, identify a range of contexts in which changes take place (e.g. evaporation of puddles in the school playground or from clothes on a washing line, condensation in the bathroom)