

# Allanson Street Primary School – Medium Term Plan



Year group:	<b>3</b>	Subject:	<b>Science</b>	Unit:	<b>Rocks and Soils</b>
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## National Curriculum Objectives

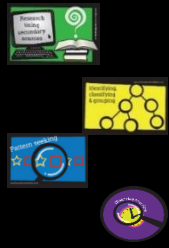
I will learn to:

- 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.

## Scientific Enquiries

1. Searching for patterns and grouping rocks based on their properties.
2. Looking for patterns in rock usage around school.
3. Researching the significance of Mary Anning.
4. Observing different types of soil over time to identify them.



## Key Learning - what chn need to know to be secure

Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.

## Common 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.


## Prior Learning

**Y1-2** Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) • Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) • Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)

## Future Learning

**Y4-KS3** Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance) • The composition of the Earth. (KS3) • The structure of the Earth. (KS3) • The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. (KS3)

Learning Objectives	Learning Sequence	Sticky knowledge / core skills & vocab.	End points & Assessment
<p>I know that rocks come in various sizes, such as boulders and pebbles.</p>	<p><b>Session 1 - Pre-learning Task and Rock pets</b></p> <p>Tell the children that we are starting a brand new topic today, all about rocks and soils! To help us through this topic, we will be making some rock pets with the rocks we brought in from home. But firstly, what do we know about rocks?</p> <p><b>Pre-learning task</b> - Look at the children's different rocks, which will later be turned into Rock Pets. Pass them around and talk about how some may feel different to others. Do the children think that there are different types of rocks? Can they name any? Talk about the fact that we often find rocks in the soil. What do the children think that soil actually is?</p> <p>Pre-learning assessment quiz</p> <p><b>Main</b> - chn use paints and sharpies to create their rock pets, in small groups. Whilst waiting their turn, children could design a character profile about their rock pet, including things like its name, where it likes to live, its hobbies etc.</p> <p>The finished rock pets could be kept in school for the duration of the unit, and brought out each science lesson.</p> <p><b>Reflection</b> - Read 'Rocks are Lively' book as an introduction to the topic. Focus on boulders and pebbles.</p>	<p>A boulder is a large rock, a pebble is a much smaller rock,</p> <p>Vocab: Rock, stone, pebble, boulder</p>	<p>I can state the difference between a pebble, stone and boulder</p>
<p>I know how igneous rocks are formed on Earth's surface</p>	<p><b>Session 2</b></p> <p><b>Prior learning</b> - Retrieve to achieve Networking activity (Slide 1)</p> <p><b>Main</b> - Follow the Developing Experts presentation:</p>	<p><i>Resources: Class packs of igneous rocks, magnifying glasses</i></p>	<p>Chn can explain what an Igneous rock is.</p>

<p>I know the difference between intrusive and extrusive igneous rock</p>  <p>I know how to ask scientific questions- Be able to ask a range of Yes/No questions to aid sorting</p>	<p><a href="https://www.developingexperts.com/s/missions/2907">https://www.developingexperts.com/s/missions/2907</a> (Lesson 1 - Igneous Rocks)</p> <p>Stop at the career film. Display key vocab page. Pass around examples of igneous rocks - can the children decide whether they are intrusive igneous or extrusive igneous? How can they tell the difference?</p> <p><b>Activity</b> - Display the Scientific Enquiry symbol for classifying and grouping. Tell the chn that we are going to be real scientists by grouping our igneous rocks! Give each table a class pack of igneous rocks (without the knowledge mat initially). Ask the chn to sort the rocks into two or more groups, however they wish. What questions could we ask to help us sort these rocks? (e.g. does it have crystals/ is it smooth etc)</p> <p>Bring back together and discuss how they have been sorted - guide chn towards sorting into intrusive igneous and extrusive igneous by looking at crystals/ air bubbles. Chn then check by looking at knowledge mats.</p> <p>In books, chn create a table of intrusive igneous rocks and extrusive igneous. They should then write a sentence to describe the differences between each type of igneous rock (how created, and what they look like).</p> <p><b>Reflection</b> - Concept cartoon</p>	<p>Rock is a naturally occurring material. There are different types of rock. Igneous is one type of rock but can be split into two sub groups: intrusive igneous (formed underneath the Earth's surface) or extrusive igneous (formed on top of the Earth's surface).</p> <p>Vocab: Igneous rock, extrusive igneous rock, intrusive igneous rock, magma, crystals</p>	<p>Chn identify the difference between an extrusive igneous rock, and an intrusive igneous rock.</p>
<p>I know how to compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p>	<p>Session 3 - Sedimentary rock and rock investigation</p> <p><b>Prior Learning</b> - Retrieve to achieve ppt - Slide 2</p> <p><b>Main</b> - Follow the Developing Experts presentation: <a href="https://www.developingexperts.com/s/missions/2908">https://www.developingexperts.com/s/missions/2908</a> (Lesson 2 - Sedimentary and Metamorphic Rocks)</p> <p>Stop at the career film.</p>	<p><i>Resources: Sandpaper, nails, toothpicks, pipettes, bowls for water</i></p> <p>Rock is a naturally occurring material. There are 3 main categories: Igneous,</p>	<p>Chn can explain what a sedimentary rock is.</p> <p>Chn can explain how they have grouped different rocks.</p>



Presenting results  
- Group objects  
using venn  
diagrams

Drawing  
conclusions - Draw  
simple conclusions  
about uses of  
rocks

Before skipping to the Mission Assignment to explain the activity today, display the comparing and classifying logo and show the children our selection of rocks.

If we were scientists, and we wanted to find out what these rocks are best used for how would we do that? What would we be looking for?

Discuss then being waterproof (permeability), hardness/ durability. Create some questions that we would like to answer before we can suggest how these rocks could be used in everyday life.

#### **Activity 1:** Searching for patterns and grouping rocks

Share the Mission Assignment.

The children will carry out some tests on a selection of rocks to investigate their durability, permeability and density. They will also use a microscope to see if the rocks contain crystals.

Durability? - The children will test how hard or soft the rocks are by scratching them with different items (for example, sandpaper, a nail and a wooden spoon) to see if the rock starts to crumble off.

Permeability? - The children will test whether water will soak into the rocks by dropping a small amount of water onto the rocks.

Density? - The children will test how dense their rocks are by seeing if they float or sink.

Crystals? - Using a microscope or magnifying glass, can the children see any crystals embedded in the rocks?

Children sort rocks into the most durable, least permeable and most dense.

**Activity 2** - Sort, grouping and classifying, focusing on creating Carroll diagrams. For example, children may create a Venn diagram for hardness and permeable.

Can the children suggest any uses for these rocks based on what they have discovered?

**Reflection** - Set up a rock museum - launch on Dojo - link to homework

sedimentary and metamorphic. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water.

Vocab: Sedimentary rock, metamorphic rock, durability, permeability, dense.

I know how to look for patterns in where rocks are used in my local area.

I can identify some common rocks around the local area.



Observing closely- make observations linked to answering questions

#### Session 4 - Rock hunt around the local area (morning out)

Tell the children that today, they are going to be rock detectives, and take their pet rock on a walk around the local area to find other types of rock!

Share ppt with the children.

**Prior learning Activity 1** - Networking activity to remind chn of key vocab from last week, which will be useful for today's task

**Activity 2** - Rock hunt! Look at all the rocks chn might see on a walk to St. Peter's Church graveyard. At the graveyard, explain to the children how we will see some new gravestones, and some much older ones. Can they compare to see how the rock has changed over time? Chn respectfully look in small groups with adult supervision. Bring attention to moss/ lichen growth and the gravestones being eroded (worn away) by the weather over time. Note the different rocks used - pay particular attention to crystals, grains etc.

**Take photos of the different things chn spot on the walk to print off back in class.**

**Activity 3:** Afternoon session, back in classroom (print wallet size photos over lunchtime for chn to use):

Looking at the photos on the board, recap the rocks that the chn found that morning. Why have these rocks been used? Pay particular attention to what we noticed in the graveyard. Vocabulary to use: soft, hard, durable, , rigid, permeable ... etc.

Chn choose pictures from the morning walk to stick in their books, identify what they saw and anything they noticed about the rocks.

(e.g. pic of old gravestone - it had been worn away by the weather, there was moss growing on them.)

Key vocab: durable, hard, soft, permeable, rigid, crystals, weathering



**Common misconceptions to address:** rock-like, man-made substances such as concrete or brick are rock. Materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'

Chn can identify common rocks used around school.

Chn can spot patterns in usage.

	<p><b>Reflection</b> - Introduce rock hunt homework task. Discuss where chn may find rocks, based on what we have seen today.</p>		
<p><b>I know how fossils are formed when things that have lived are trapped within rock and can describe this in simple terms.</b></p>	<p><b>Session 5 - fossils</b></p> <p><b>Prior learning</b> - Concept cartoon - types of rock</p> <p><b>Main - Use Dev Experts - Lesson 5 (fossils)</b></p> <p>Use the presentation to teach the children about fossils. The slides will show the children how fossils are the imprints of living things that have died. Layers and layers of sediment have turned to rock, preserving the imprint and forming the fossil.</p> <p>Follow this with BBC clip to consolidate:  <a href="https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3">https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3</a></p> <p>Activity 1 (in small group with HC) - Children can make their own fossils by mixing together 200g salt, 150g flour and 150g coffee grounds. Mix in 100ml of cold coffee or water. If the mixture is too runny, add more flour; if it is too wet, add more water. Turn out the mixture onto a flat surface and knead it for 3-4 minutes. The 'dough' will be ready once it no longer sticks to your hands. At this point, the children can make their own imprints by pressing their objects into the dough. Peel off the object gently and leave the imprint to dry. It should dry in around 1 to 2 days (or sooner if left in a warm place). Take group photos for photo sheet.</p> <p>Activity 2 - Describe how a fossil is formed.</p> <p><b>Reflection</b> - How is a fossil formed? Focus on common misconception.</p>	<p><i>Resources: salt, flour, coffee grounds, objects to imprint (such as shells)</i></p> <p>Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water.</p> <p>Vocab: Sediment, fossil, embed, decompose, erode</p> <p><b>Common misconception to address:</b> a fossil is an actual piece of the extinct animal or plant</p>	<p>I can create a fossil from dough and describe how this is like the formation of a real fossil.</p> <p>I can describe the fossilisation process using key vocabulary.</p>
<p><b>I know and can explain the</b></p>	<p><b>Session 6 - Mary Anning</b></p> <p><b>Prior learning</b> - retrieve to achieve activity</p>	<p>Mary Anning was a fossil hunter who collected many</p>	<p>I can ask and use research to answer questions about the</p>



<p><b>significance of Mary Anning</b></p>  <p>Interpret results - I can answer scientific questions using simple scientific language</p> <p>Evaluate an enquiry - I can suggest limitations to this investigation</p>	<p><b>Main</b> - Tell the children that people did not really know much about fossils, until the time of Mary Anning, a very important palaeontologist and fossil collector. Read the Little People, Big Dreams book about Mary and watch parts of the clip below about her life:  <a href="https://www.bbc.co.uk/teach/class-clips-video/ks1-ks2-mary-anning/zn7qd6f">https://www.bbc.co.uk/teach/class-clips-video/ks1-ks2-mary-anning/zn7qd6f</a></p> <p>Show the children the following website and talk about the interesting facts together. Tell the children that they are being real scientists today! They are conducting a scientific enquiry, <u>researching</u> Mary Anning, a very famous and influential person in the world of science.  <a href="https://www.natgeokids.com/uk/discover/history/general-history/mary-anning-facts/">https://www.natgeokids.com/uk/discover/history/general-history/mary-anning-facts/</a></p> <p>Then give children their own copies of this text. Using this, along with what they have learned from the video, the children note down in their science books interesting and RELEVANT facts about Mary Anning.</p> <p><b>Reflection</b> - Evaluating the enquiry. Why was this enquiry limited? (only used two sources of information). How could we improve this?</p>	<p>'curiosities' in her lifetime. She became known around the world for important finds she made in Jurassic fossil beds in Dorset.</p> <p>Vocab: Sediment, fossil,</p> <p><b>Common misconception to address:</b> certain found artefacts, like old bits of pottery or coins, are fossils</p>	<p>life and work of Mary Anning.</p> <p>I can suggest why this investigation was limited.</p>
<p><b>I can name some different types of soil and describe the properties of them.</b></p> 	<p><b>Session 7 - soil</b>  <b>Prior learning</b> - Retrieve to achieve slide 3</p> <p><b>Main</b> - Use Dev Experts (lesson 6 - soil)</p> <p>The presentation will teach the children about different types of soil. They will learn that certain types of flowers and vegetables will grow better in different types of soil. They will also learn how it is important for farmers to understand this so they can grow crops more effectively.</p> <p>Share the Mission Assignment.</p>	<p><i>Resources - Soil samples, funnels, filter papers, small ml measuring cylinders, 5ml measuring spoons.</i></p> <p>Sticky knowledge:  Soils are made up of pieces of ground down rock which may be mixed with plant and</p>	<p>I can name some of the common types of soil.</p> <p>I can make observations based on smell, texture and water retention.</p>

<p>Observe closely - make a range of relevant observations</p> <p>Take measurements - measure using standard units</p>	<p>Ask the children to carry out an investigation to test 4 different samples of soil. Give the children a selection of soil, such as peat soil, clay soil, sandy soil, silt soil, loam soil or chalky soil.</p> <p>First of all, ask the children to smell and observe the soil using a magnifying glass. Ask them to note down the soil's texture and appearance.</p> <p>Next, ask the children to wet a sample of the soil to see how it acts</p> <p>Once the children have done this, they should place some filter paper over a funnel and put the funnel over a measuring cylinder. Put a teaspoon of soil into the filter. Slowly add 15ml of water (3 teaspoons) and then wait for 2 minutes.</p> <p>Once 2 minutes is over, ask the children to measure how much water the soil sample has held. Repeat this experiment for the other three samples, making sure it is a fair test each time. Ask the children to use the handout to compare their observations with the soil descriptions to identify their samples.</p> <p><b>Reflection</b> - How are the soils different? Similar? Are they the same as compost? Focus on common misconception.</p> <p>For teacher knowledge - Soil is the earthy material in your garden. It is made up of minerals such as sand or silt, as well as decaying matter. Compost is an organic material that has decayed enough that it can be added into your soil to improve soil structure and fertility. Compost does not significantly alter the soil texture – if you add compost to a sandy soil you'll still have a sandy soil. Gardeners use compost to improve the quality of their soil.</p>	<p>animal material (organic matter).</p> <p>Key vocab: Decompose, fragments, organic matter, clay soil, sandy soil, chalky soil</p> <p><b>Common misconception to address:</b> soil and compost are the same thing</p>	<p>I can measure to the nearest ml.</p>
	<p><b>Session 8</b></p> <p>Post-learning task</p>		



