

Year Group: Year 3 & Year 4

Term: Summer 2 (Cycle A)

Topic: Rocks and Soils

National Curriculum Links Pupils in Key Stage Two should be taught 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.

Working Scientifically

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units and a range of equipment
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings.

Prior Learning

- 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

- 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)**

Global Goals

This global goal would be perfect to fit with this unit of learning:

Knowledge and Skills Objectives	Activity	Differentiation
<p>Lesson One I know what rocks are and how I can group them.</p> <p>Working Scientifically I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can make systematic and careful observations.</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes.</p>	<p>Prior Assessment Task: Give every child a small rock sample to examine. Explain that these are a clue to our next exciting science project.</p> <p>Ask;</p> <ul style="list-style-type: none"> • What are they? Are they all the same? • Do you know the names of any rocks? • Where did they come from? • How were they made? What are they made of? • What is made out of rock, and why? • Is rock natural or man-made? <p>Record children’s ideas on flip chart paper, Notability or other. Refer to this when preparing and planning weekly lessons, and amend.</p> <p>Hook: A selection of rocks, magnifying glasses, books about rocks</p> <p>Big Questions: <i>What is a geologist? What do they do? Why is their job important? TYP</i> Explain that geologists are scientists who study what the earth is made from. They will be particularly concentrating on rocks.</p> <p><i>What is a rock? TYP</i> Explain to the children that rocks are made of minerals. To help them understand, ask them to imagine a cake. The cake is made of flour, butter, sugar and eggs. The cake is like a rock, and the flour, butter, sugar and eggs are the minerals. – Rocks are made of minerals – Minerals are not made of rocks.</p>	<p>SEN - children to read questions and circle the correct answer to the following questions; What is a rock? Where would you find rock? Why is brick not a rock? Children to have pictures of three different types of rocks they observed. Match key vocabulary/phrases to each picture e.g. it can be scratched.</p> <p>Main Activity Children to journal the answer to these questions; What is a rock? Where would you find rock? Why is brick not a rock?</p> <p>Describe three different types of rock you have observed today using the word bank for support.</p> <p>WAGOLL A rock is made up of lots of different minerals that have been forced together. Rocks are found on the surface of the Earth, known as the Earth crust. All rocks are natural. Some materials behave like a rock such as brick and cement. However, these are not rocks as</p>

Introduction:

Give each group a model of the Earth made of playdough, and ask them to cut the earth in half. Children to discuss what they see. What do they think the different colours represent?

Introduce the Earth crust (the outer layer). Discuss with the children that the Earth crust is made of rock and rock is all across the surface of the Earth, even under the water!

Next, introduce the mantle (the layer underneath the crust). Discuss with the children that the mantle is mostly molten rock – put a picture of molten rock on the IWB to support understanding.

There isn't a need to teach about the other layers. These are not important in the creation of rocks, and this knowledge and understanding will be taught in more detail in the Y4 topic Earthquakes and Volcanoes.

Use cocktail sticks and strips of paper, children to label the model of the Earth (crust & mantle).



Activity 1:

Ask;

Are all rocks the same?

Which of these are rocks?

Which are not rocks? What are they? How do you know?

Give the groups a selection of different rocks (about 3) with a number stuck on them. Ideally, each number should be the same for each table i.e. all number 3s are sandstone.

Children to explore and discuss the rocks characteristics e.g. appearance and texture. Children to share their initial observations.

Activity 2:

Provide children with a wider selection of different rocks including man-made substances which are like rock (e.g. brick and cement) and magnifying glasses. Invite them to study the rocks further and discuss them.

these are man-made.

There are lots of different types of rocks. Here are three examples of rocks:



This is a white rock. It is very light. When I scratched it, white powder appeared on my fingers. Therefore, this rock is soft and can be easily crumble. When the rock was placed in water, I saw bubbles come from tiny holes in the rock known as pores.

Challenge:

Read about the three different types of rock; sedimentary, igneous and metamorphic.

TYPES OF ROCKS
Did you know there are different types of rocks?

Sedimentary Rock
This type of rock is made out of sand, shells, pebbles and other materials. Together, these particles are "sediment". Slowly the sediment gathers up in layers. Over time it turns into rock! Fossils are usually found in this type of rock.
Can you think of a place where this type of rock can be found?

Metamorphic Rock
This type of rock is made beneath the surface of the earth. It has ribbon-like layers, caused by the heat. Some of these rocks have shiny crystals on them.
Can you think of a place where this type of rock can be found?

Igneous Rock
This type of rock is made from the lava of a volcano. Deep inside the earth, rocks are melted and become magma. When magma comes out of the volcano, it is called lava. If the lava cools quickly, it will make a smooth and shiny rock. If the lava cools slowly, it will form a rock with tiny holes and gas bubbles in it.
Can you think of a place where this type of rock can be found?

Can the children identify which type of rock their chosen rocks above are?

Resources

Selection of rocks
Magnifying glasses
Books about rocks
Playdough Earths
Numbered cards
Reading material on the three different types of rocks

Give the children key question stems to guide their discussions encouraging new vocabulary;

- What colour is the rock?
- Does the colour of the rock change when you put water on it?
- Are there any shapes or patterns on the rock?
- What does your rock feel like?
- What does your rock look like it is made out of?
- Can you scratch your rock?
- Is the rock lighter or heavier than other rocks of a similar size?
- Can you see crystals in the rock?
- Does your rock have holes in it?

Children to share their observations, and support them to extract the new vocabulary. Some children might know the term, 'permeable'. This will be taught in another lesson, however, if it is raised, do discuss this with them.

Activity 3:

Invite the children to sort the rocks into groups. Discuss the reasons for the sorting e.g. these are all shiny, these have sparkly bits in them, these have layers etc.

Ask the children if all the rocks in one group belong to the same type (family of rock).

How many types of rocks do they think there are?

Explain there are three types of rock: sedimentary, igneous and metamorphic

Each type of rock is formed in a different way. Watch together the following video.

<https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/zsgkdmn> or/and

<https://www.youtube.com/watch?v=2LwUV4VL1eY>

Children to look at the rocks on their table, and identify which rocks are sedimentary, igneous and metamorphic.

Activity 4:

Ask; *What words would you use to describe rocks?*

Allow children to use talk partners, and feed back to the rest of the class. Create a word bank.

Model looking at a rock, and using children's vocabulary suggestions to write description next to sample number.

Ensure the children know that all rocks are natural, and the other things are man-made – they may share some characteristics of rocks, but they are not rocks. Discuss which samples were natural and which were man-made.

Plenary

Consolidate that different types of rocks have different properties.

Use Explorify – Zoom in and Zoom Out activity (notes how to use it on website) <https://explorify.uk/en/activities/zoom-in-zoom-out/mysterious-material>

Start by asking everyone:

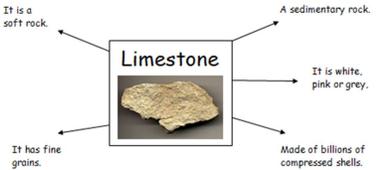
What do they think the image is and why?

What does the image remind them of and why?

Every time you zoom out, ask the class: Can they describe the colours, shapes and textures?

What do they think the image is now – have they changed their minds?

*Add all new vocabulary to working wall with images.

Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Two</u> I know the properties of different rocks and how they can be used.</p> <p><u>Working Scientifically:</u> I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can make systematic and careful observations.</p> <p>I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>I can use straightforward scientific evidence to answer questions or to support their</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p><u>Prior Learning Task:</u> Give each group a selection of rocks, and invite the children to sort them into the three different types of rocks; sedimentary, metamorphic and igneous and their properties. Listen carefully to the discussion – are they using the correct terminology and are they using reasoning?</p> </div> <p><u>Hook:</u> a selection of rocks and name cards</p> <p><u>Big Question:</u> <i>Can you name any rocks?</i> TYP Gather ideas from the children, and encourage them to justify their thinking e.g. I think this rock is chalk as I can write with it, and it is light and soft. Children might mention silver, gold or diamonds – these are rocks!</p> <p><u>Introduction:</u> Explain that some rocks are harder than others. Show the children granite. Explain that granite is a very hard rock. This makes it a good material for building as it doesn't wear away easily. Show the children marble. Explain that marble is another hard rock. It has an attractive texture and colour and it can be cut and polished. Because of this, it is used to make floor tiles and wall tiles. Some statues are made from marble too. Show the children chalk. Explain that chalk is a soft rock that wears away easily. This makes it ideal for making chalk sticks to write on blackboards. With the chalk, show the children sandstone. Explain that both these materials let water soak through them. They are called permeable rocks. Show the children slate. Explain that slate does not let water soak through them. They are called impermeable rocks. Slate also splits easily into thin sheets. This makes it ideal for making roof tiles.</p> <p>*if there are more rocks that you feel important to introduce, do so.</p>	<p><u>SEN:</u> Stick an image of a rock into their books. Using a word bank, write three facts about the rock;</p> <ol style="list-style-type: none"> 1) Name of rock 2) 1 or 2 characteristics e.g. porous 3) A use e.g. graves <p><u>Main Activity:</u> Children to include several facts describing its appearance, texture, properties and use of each rock.</p> <p><u>WAGOLL</u></p> <div style="text-align: center;">  </div> <p><u>Challenge:</u> Children to research other uses of rocks on chrome books or ipads. Feedback to class.</p>

findings.

Activity 1:

Place the following rocks (marble, chalk, sandstone, granite, slate) on the table along with name cards and a description of their properties; invite the children in groups to match the rocks to their names. Discuss the children's reasons for the matching.

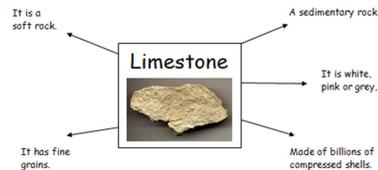
Activity 2:

Explain that we use rocks for lots of different things every day and you probably don't even realise! We use rocks in lots of different ways. They are useful building materials, and are often used in the construction of roads and buildings.

Give children examples of the everyday things rocks are used for. Children to identify the object made from rock and what it is used for. Children to discuss why that rock has been selected for that purpose.

Activity 3:

Children to create a mind map about each rock. Mind map to include the properties and uses of the rock, and why type of rock it is.



Resources

Selection of rocks
Name cards of the 3 different types of rocks
Fact cards
Uses of cards

Plenary

Unscramble the rock names; provide children with the names or rocks all scrambled up. Children to work together to unscramble them.

Children to reflect on one thing they have learnt today.

Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Three</u> I know the properties of different rocks and how they can be used.</p> <p><u>Working Scientifically:</u> I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can make systematic and careful observations.</p> <p>I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>I can use straightforward scientific evidence to answer questions or to support their</p>	<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p>Prior Learning Task: Use Explorify – Odd One Out https://explorify.uk/en/activities/odd-one-out/building-with-rocks (notes to accompany activity is on the website.)</p> <p>Show the three images above and ask everyone to come up with as many similarities and differences as they can. If they get stuck, prompt them to think about: appearance, what they do, where they might be found</p> </div> <p>Hook: a selection of permeable and impermeable rocks, large containers, water</p> <p>Big Question: Ask the children; <i>Can rocks allow water and air in to them?</i> TTYP Consolidate the term, permeable and impermeable, if discussed in previous lessons.</p> <p>Introduction: Explain they will be investigating rocks and water in a bit more detail. You will have two clear containers of water, like the children will.</p> <p>Model putting one permeable rock (e.g. sandstone) and one impermeable rock (e.g. granite) each into the containers of water, and look closely at the bubbles which form. Describe both the bubbles, and where they come from on both samples.</p> <p>Activity 1: Children to set up their own investigate, observe and describe what they have seen. Discuss what the children have found, and why they think this is. Why do you think some rocks have more bubbles than others? What do you think this means?</p> <p>Explain to the children that some rocks have holes between the grains, and this lets air or water into them. When you put these rocks into the water, the air is less dense than</p>	<p><u>All children in mixed ability groups:</u> Go outside and children collect 10 rocks. Put their rocks into a container with a water-tight lid. Fill the container with water and put lid on tightly. Take it in turns to shake the container whilst counting up to 100. When they have finished, they should sieve the contents of the container into a second container – so the rocks will be in the sieve, and the water will be in another container.</p> <p>Discuss any changes they notice to the rocks, and to the water.</p> <p>Children to record what is weathering and erosion in their books.</p> <p><u>WAGOLL</u> Weathering is the breaking down or dissolving of rocks on the surface of the Earth, wearing it away over time.</p> <p>Erosion is the transportation of natural materials following weathering. This usually happens by wind or water.</p> <p>Children could draw images to show this.</p> <p><u>SEN:</u></p>

findings.

the water, so it rises up as a bubble. This is called a permeable rock. Other rocks do not have spaces between the grains, so their bubbles might be air that was in a crack on the surface. These are impermeable rocks.

Encourage the groups to order their rocks from most bubbly to least bubbly – sorting them by permeability.

Record their findings in their books.

Activity 2:

Hold up a rock and ask the question;

Do you think this rock will change today? This week? This year? By the time you are a grandma or grandpa? TTYP

Discuss the children's answers. Explain that even though it looks like rocks don't change to us, actually, over hundreds and thousands of years, rocks do change.

Resources

Large containers
Permeable and impermeable rocks
Post-it notes & hairdryer or wood and sandpaper,
Water tight containers
Water
Poster for reading

Ask the question;

Can you think how a rock might change? What could happen to it? TTYP

Compile a class list of ways a rock could be made to change.

Show weathering and erosion clip, pausing at specific points to discuss.

<https://www.youtube.com/watch?v=exS9gFXgib0>

Consolidate that through weathering – wind, water, plants and chemical – the rock is eroded, and fragments break off and are carried away. This could also be demonstrated either;

- a) putting post-it notes on a child, and using a hair-dryer or fan to blow them off – so the so the post-its represent rock fragments, and the fan is the wind.
- b) using a piece of wood and sandpaper.

Consolidate that some rocks are more durable than others (hard wearing).

Watch the following short video.

<https://www.bbc.co.uk/bitesize/clips/zt3ygk7>

Create a simple poster e.g W is for weathering. It breaks down rocks
E is for erosion. It takes rocks away.

Challenge:

What is deposition? Give the children a poster about weathering, erosion and deposition to find out more about them.

Create a poster.

Earth and Space Sciences
Weathering, Erosion and Deposition
Remember WED!



Plenary

Ask;

What do you think happens to the fragments of rock following the process of weathering, erosion and deposition? Show compacting and cementing clip <https://www.youtube.com/watch?v=mSZu3SG69LY>

Discuss what compacting and cementing is, and how many rocks especially sedimentary rocks have been formed this way.

Knowledge and Skills Objectives	Activity	Differentiation
<p>Lesson Four I can explain the process of fossilisation.</p> <p>Working Scientifically I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes</p> <p>I can use straightforward scientific evidence to answer questions or to support their findings.</p>	<div style="border: 1px solid black; padding: 5px;"> <p>Prior Learning Task: Use Explorify – Big Question, ‘Do rocks stays the same forever’ (notes to accompany this are on the website) https://explorify.uk/en/activities/the-big-question/do-rocks-stay-the-same-forever Listen to the children’s responses. Are they using the words, weathering, erosion, deposition, cementing and compacting. *Year 4 perhaps bring in the rock cycle if you feel they will understand it.</p> </div> <p>Hook: fossils, magnifying glass</p> <p>Big Question: Ask the question; <i>What are fossils? What kind of fossils are there?</i> Children are likely to know about dinosaur fossils, but may not be aware that other living things can become fossils too. Discuss the children’s answers.</p> <p>Introduction: Explain to the children that fossils are the preserved remains of plants or animals however most animals and plants do not become fossils when they die. Most fossils only occur in sedimentary rocks. Some have been found in other natural materials, such as, amber. Fossils help us to find out about the organisms that lived a long time ago. A palaeontologist searches for and investigates fossils, of which, Mary Annings is known as one of the early fossil hunters. The depth a fossil is found within rock can help us to work out how long ago it died</p> <p>Show this video: http://www.youtube.com/watch?v=3rkGuOBItKM or https://www.youtube.com/watch?v=z58igGHuX2I pausing at key points to discuss.</p>	<p><u>All children working together in pairs,</u> Make fossils</p> <ol style="list-style-type: none"> Put flattened clay in bottom of cups. Make an impression using a plastic creature. Fill with plaster of Paris and mix carefully. Leave to set for 24 hours. Peel off the cup, and the clay, and you are left with a pretend fossil which the children can then paint. <p>WAGOLL When an animal dies, its skeleton settles on the sea floor. It then gets buried by sediment or dirt, and over time the sediment surrounding the skeleton thickens and begins to turn into sedimentary rock. The flesh of the animal rots, and eventually the skeleton dissolves and a mould or cavity is formed. A cavity is like a hole or a space where once the animal was. Water finds away into the cavity, depositing minerals that eventually solidify and create a cast. Due to weathering and erosion, the Earth’s surface becomes exposed and so do the remains.</p> <p>Or complete this activity</p>

Activity 1:

Explain to the children that they are going to make a cast fossil.
Model how to create it using the correct terms such as cavity, decay, casting.

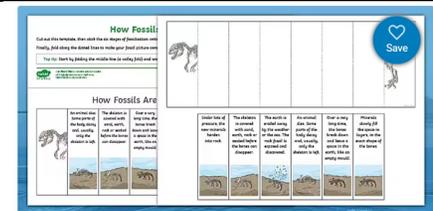
Children in pairs to have a go at creating their own cast model of either an animal or a plant.

Activity 2:

Children to either order the fossilisation process or produce a written explanation on how fossils are formed.

Resources

- Animal figures
- Plants
- Plastercine/playdough/clay
- Bowls
- Plaster of Paris
- Ordering of the fossilisation process sheets



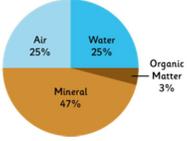
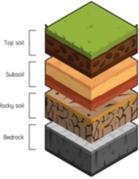
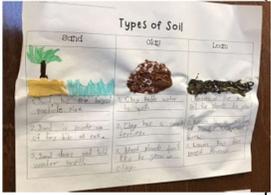
Challenge:

Find out about Mary Anning and her discoveries.

Plenary

Consolidate how fossils are formed.
<https://www.bbc.co.uk/bitesize/topics/z9bbkqt/articles/z2ym2p3>

Discuss with the children that there are other types of fossils.
Discuss the differences between some of these, and the impact fossils have had on the understanding of animals and plants.

Knowledge and Skills Objectives	Activity	Differentiation
<p>Lesson Five I know what soil is and can identify different soil types.</p> <p>Working Scientifically I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>I can use straightforward scientific evidence to answer questions or to support their findings.</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>Prior Learning Task: Use Explorify – Odd One Out, Frozen in Time (notes to accompany activity are on the website). https://explorify.uk/en/activities/odd-one-out/frozen-in-time</p> </div> <p>Hook: What am I questions leading to the answer – soil!</p> <p>Big Question Ask the children ; <i>What is soil?</i> TTYP</p>  <p>Introduction: Explain soil is the uppermost layer of the Earth. It is a mixture of different things; tiny particles of rock, organic matter (like rotten apple cores), air and water.</p> <p>There are lots of different types of soils. Different soils have different properties, and lots happen within the ground to make soil. Show the children the layers of soil model. Discuss the different layers (refer back to the playdough Earth from the first lesson)</p> <p>Watch the following video: https://www.bbc.co.uk/bitesize/topics/zjty4wx/articles/ztvbk2p</p> <p>Activity 1: Explain to the children that they are going to make a model of the different layers of soil. Use the following recipe for dirt pudding to guide the children.</p>  	<p>All children Follow instructions to make a model of the layer of soil.</p> <p>Main Activity Children to record what is in soil and record the difference and similarities between soil types.</p> <p>SEN: Children could simple record what they have learn like the following examples.</p>   <p>WAGOLL Soil is found in the uppermost layer of the Earth. Soil is made up of five layers; organic materials (humus), top soil, subsoil, rocky soil and bedrock. Soil is made up of a mixture of things. In soil there is;</p> <p style="text-align: center;">Draw and label images</p> <p>There are lots of different soil types. Sand – has large particles and it does not hold water well. Plants cannot grow</p>

Dirt Pudding

We can make a dirt pudding to model the different layers of the Earth to help you remember them. We will make it in a clear plastic cup so the layers can be seen easily. Each ingredient will represent a different layer.

1. At the bottom of the cup a squirt of red ice cream sauce or golden syrup to represent the **mantle, inner and outer core**.
2. Next, the earth's crust: Add a biscuit on top (which fits the bottom of the cup) to represent the **earth's crust**.
3. Bedrock: Add some layers of wafer thin chocolates or slices of fruit such as apple to represent the **bedrock**.
4. Subsoil: Add some instant chocolate dessert to represent the **subsoil** (*it is lighter in colour as it contains fewer nutrients than the top soil and is densely packed and clay like*).
5. Topsoil: Crush some biscuits such as Oreos to make the nutrient rich **top soil**. This can be sprinkled on top.

Activity 2:

Explain to the children that we are going to explore the soils in our school grounds, and to show the difference between the different types of soil.

Give the children in groups a selection of different soils and ask them to look through the soil to see what it is made up of. Can the children especially identify water?

Discuss how water is absorbed but is there.

Children to observe the appearance and texture of the soils. Discuss their observations and explore further;

Colour:

Black or Dark Brown - This soil can usually grow plants easily and is fertile.

Plain Brown or Yellow - This soil has a low level of nutrients and organic matter making it more difficult to grow plants. It is not very fertile and mulch or compost would need to be added to make it more fertile.

Red - the red colour is because oxygen reacts with the minerals, such as iron, which can make the soil look a reddish, 'rusty' colour. This soil has been exposed to the weather for a long time and will drain water well. To help plants grow, this soil must have nutrients and organic matter added to it.

Texture:

Soil texture means how coarse or fine a soil is. This means finding out how much sand, silt and clay it contains You can find out soil texture by using the ribboning technique.

Explain what this technique is, and investigate the different textures of soil.

well in this type of soil.

Clay – Clay has a smooth texture and can hold water, although it holds it too well. Plants cannot grow well in clay.

Loam – Loam has a mixture of clay, silt, sand and humus. It can hold water well and therefore, plants thrive in this soil.

Challenge:

Devise a quiz all about soil.

Provide children with example question types.

Resources

Lots of soil samples
Plastic gloves
Water
Dirt pudding ingredients,

Ribbon Technique Method

1. Get soil samples from different parts of the school grounds.
2. Remove any sticks, stones and leaves.
3. Slow add water to the soil. If it gets too wet, add more soil.
4. Roll the soil into a ball. Feel the ball with your fingers to find out if it is gritty (sand), silky (silt) or plastic/sticky (clay). If it starts to fall apart and you cannot make a ball, the soil is very sandy.
5. Next, roll the ball between your hands to start making a ribbon.
6. If the ribbon starts to fall apart, you have sandy loam.
7. If you can create a short ribbon before it starts falling apart, then the soil is another type of loam.
8. If you can make a long ribbon, then there is definitely clay in the soil.

Following the investigation, discuss the best soil texture for growing plants is loam, which is a mixture of clay, silt and sand. Did we find examples of loam in our school ground? If so where was it?

Activity 3:

Watch this video to consolidate all the learning from today.
<https://www.youtube.com/watch?v=if29mjcd5bc>

Plenary

Children who completed the challenge could present their questions to the class or lead a quiz on the different soils – invent one or use
<https://quizizz.com/admin/quiz/6015a5993a0790001b06ef87/soil-grade-3>

Knowledge and Skills Objectives	Activity	Differentiation
<p><u>Lesson Five</u> I know why soil is important.</p> <p><u>Working Scientifically</u> I can ask relevant questions and using different types of scientific enquiries to answer them</p> <p>I can set up simple practical enquiries, comparative and fair tests</p> <p>I can make systematic and careful observations and, where appropriate</p> <p>I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</p> <p>I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <p>I can identify differences, similarities or changes related to simple scientific ideas and processes</p>	<div style="border: 1px solid black; padding: 10px; margin-bottom: 10px;"> <p>Prior Learning Task: What are the ingredients of soil? Children to make a shopping list for soil.</p> <p>Discuss the list the children have created. Which do they think is the most important and why?</p> </div> <p>Hook: Compost bin</p> <p>Big Question: <i>Why is soil important?</i> TYP Link back to the previous lesson on the fact that without soil, there would be no life (links nicely to food chains)</p> <p>Introduction: Explain to the children that protecting and restoring our soil can play a crucial role in tackling climate change. Soil is very good at absorbing carbon dioxide from the atmosphere and storing it away as carbon. Recap what the children learn about carbon dioxide in the Food and Farming topic, and why this isn't good for the future of the Earth.</p> <p>Soil can hold 3 times the amount of carbon as the atmosphere. There are 10 billion tonnes of carbon stored in UK soils. A type of wet, boggy soil called peat is especially good at this. This type of soil is found in natural areas called peatlands, bogs or moors. Peatlands can lock up five times more carbon than forests.</p> <p>Activity 1: What can we do to help? Explain that leaving leaves and dead plants for longer is best. By doing so, we will be providing homes for insects which will help to increase the biodiversity in your green</p>	<p>All children to work in pairs or groups; Make a composter.</p> <p>Follow instructions to make their composter. Observe each week, and then at the end of the school year, add to the soil (if decomposed).</p> <p>Main Activity: Children to journal what they have learnt about the importance of soil.</p> <p>WAGOLL Soil is very important for life. Without soil, plants will not be able to grow and animals will have no plants to feed from.</p> <p>Soil also absorbs carbon dioxide from the atmosphere which will help our fight against climate change.</p> <p>Therefore it is crucial we protect and restore our soil, so that life can be sustained and our planet's climate doesn't get any hotter.</p> <p>One way in which we can help is by using composters. The animals and bacteria inside a composter break down dead plants and leaves, and foods into a rich, nutritious soil. We can spread compost onto our gardens to feed the</p>

I can use straightforward scientific evidence to answer questions or to support their findings.

space.

Each class will corner off a part of the field/soil area. In this area, the children will put leaves and dead plants on it. They can observe over time what happens to the leaves and dead plants.

Activity 2:

What can we do to help?

Explain that we can help by feeding soil with compost made up from old bits of dead plants and fallen leaves, or food that has decayed which we call organic matter.

Each class to go and have a look at the compost bins in the school garden, and explain the purpose of using them. Discuss how we can use them to help support the restoring of soil.

Activity 3:

Make our own compost. Watch the following video

https://www.google.com/search?q=make+your+own+compost+bin+kids&rlz=1C1GCEV-en-GBGB980GB984&ei=-6piYv_zJ5TrgAbEiYmYAg&ved=0ahUKEwi_3fnr4Kf3AhWUNcAKHcREAI MQ4dUDCA8&uact=5&oq=make+your+own+compost+bin+kids&gs_lcp=Cgdnd3Mtd2l6EAM6BwgAEcQsAM6BwgAELADEEM6BAgAEAO6BggAEBYQHkoECEEYAEoECEYYAFD2AViuCGC3CmgBcAF4AIABvASIAZYNkgEJMiOxLjEuMS4xmAEAoAEByAEKwAEB&sclient=gws-wiz#kpvalbx=_AKtiYrioAtDUgQai-4HYDw15

Children in groups or pairs to make their own compost bin. You could even add some worms to it!

Revisit it every week.

At the end of the school academic year, observe the changes that have happened, and if decomposed, spread onto soil.

soil, and to restore it so it can continue to do its amazing thing!

Challenge

Children to create a poster about composting.

Resources

Plastic bottles
Pins
Soil
Dead leaves
Food scraps,
Scissors
Garden canes
String
Worms

Plenary

Play the great composting quiz from BBC bitesize.

<https://www.bbc.co.uk/bitesize/articles/zj27wnb>

Consolidate all learning on rocks, soils and fossils.

Children to take an end of term test.

Applied Write Opportunities:

Instructional texts on how to make a compost bin or the process of fossilisation
An explanation text on fossilisation.

Enrichment Opportunities:

Invite a gardener into school to discuss the importance of composting.

Assessment Opportunities

- Can name some types of rock and give physical features of each
- Can explain how a fossil is formed
- Can explain that soils are made from rocks and also contain living/dead matter
- Can classify rocks in a range of different ways, using appropriate vocabulary
- Can devise tests to explore the properties of rocks and use data to rank the rocks
- Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily
- Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc.
- Can identify plant/animal matter and rocks in samples of soil

Key Vocabulary

Tier Two: natural, man-made, rock, stone, pebble, boulder, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, compost, Earth's crust, pores, holes, dense, top soil, bedrock, decay

Tier Three: crystals, grain, geologist, palaeontologist, igneous, sedimentary, metaphoric, weathering, erosion, mantle, permeable, impermeable, porous, cementing, compacting, humus, organic material, biodiversity,