

NATIONAL CURRICULUM OBJECTIVES:

- **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**
- **RECOGNIZE THAT SOILS ARE MADE FROM ROCKS AND ORGANIC MATTER.**

WORKING SCIENTIFICALLY:

PUPILS IN LOWER KEY STAGE 2 SHOULD BE TAUGHT TO USE THE FOLLOWING PRACTICAL

SCIENTIFIC METHODS, PROCESSES AND SKILLS:

- **ASKING RELEVANT QUESTIONS AND USING DIFFERENT TYPES OF SCIENTIFIC ENQUIRIES TO ANSWER THEM**
- **SETTING UP SIMPLE PRACTICAL ENQUIRIES, COMPARATIVE AND FAIR TESTS**
- **MAKING SYSTEMATIC AND CAREFUL OBSERVATIONS AND, WHERE APPROPRIATE, TAKING ACCURATE MEASUREMENTS USING STANDARD UNITS, USING A RANGE OF EQUIPMENT, INCLUDING THERMOMETERS AND DATA LOGGERS**
- **RECORDING FINDINGS USING SIMPLE SCIENTIFIC LANGUAGE, DRAWINGS, LABELLED DIAGRAMS, KEYS, BAR CHARTS, AND TABLES**
- **REPORTING ON FINDINGS FROM ENQUIRIES, INCLUDING ORAL AND WRITTEN EXPLANATIONS, DISPLAYS**
- **OR PRESENTATIONS OF RESULTS AND CONCLUSIONS**

KEY VOCABULARY:

1. **ROCK** A SOLID MATERIAL THAT MAKES UP THE SURFACE OF THE EARTH
2. **SOIL** A BLACK OR DARK BROWN MATERIAL ON THE UPPER LAYER OF THE EARTH WHERE PLANTS GROW
3. **FOSSIL** THE REMAINS OF A PREHISTORIC ANIMAL EMBEDDED IN ROCK
4. **APPEARANCE** WHAT SOMETHING LOOKS LIKE PHYSICAL PROPERTIES
5. **IGNEOUS ROCK** ROCK FORMED THROUGH THE COOLING AND SOLIDIFICATION OF MAGMA OR LAVA
6. **SEDIMENTARY ROCK** ROCK FORMED FROM SEDIMENTS THAT HAVE SETTLED AT THE BOTTOM OF A LAKE, SEA OR OCEAN AND HAVE BEEN COMPRESSED TOGETHER OVER MILLIONS OF YEARS
7. **METAMORPHIC ROCK** ROCK FORMED FROM OTHER ROCKS THAT ARE CHANGED BECAUSE OF HEAT OR PRESSURE

CONTEXT

THE PRIMARY LOCATION WHERE HAMLET IS SET IS ELSINORE CASTLE IN DENMARK. FROM THE SIXTEENTH TO THE EIGHTEENTH CENTURIES, KRONBORG CASTLE PLAYED A KEY ROLE IN THE HISTORY OF NORTHERN EUROPE.



THE SOUND IS THE GATEWAY TO THE BALTIC SEA AND FROM 1429 TO 1857, DENMARK CONTROLLED THIS PASSAGE THANKS TO KRONBORG CASTLE, POSITIONED AT THE NARROWEST PART OF THE SOUND, WHICH IS ONLY FOUR KILOMETERS WIDE. AROUND 1.8 MILLION SHIPS PASSED THROUGH THE SOUND DURING THIS PERIOD AND ALL OF THEM HAD TO PAY A TOLL AT KRONBORG CASTLE. FOR THIS REASON, KRONBORG CASTLE AND ITS FORTRESS BECAME A SYMBOL OF DENMARK'S POWER. THE SOUND TOLL WAS NOT JUST A SOURCE OF INCOME; IT WAS ALSO A POLITICAL INSTRUMENT. BY FAVORING THE SHIPPING TRADE OF SELECTED NATIONS OR BY ALLOWING THEIR NAVIES FREE PASSAGE, DENMARK WAS IN A POSITION TO CREATE IMPORTANT ALLIANCES. THE CONTROL OF THE SOUND WAS ESSENTIAL AND IT BECAME AN IMPORTANT ISSUE IN THE MOTIVES AND COURSES OF SEVERAL WARS. FOR THIS REASON, KRONBORG CASTLE WAS OF GREAT SIGNIFICANCE, NOT JUST FOR DENMARK, BUT FOR ALL MAJOR SEAFARING NATIONS.

THE CASTLE ITSELF IS A RENAISSANCE BUILDING WITH FOUR WINGS SURROUNDING A SPACIOUS COURTYARD. THE BRIGHT SANDSTONE FACADES ARE CHARACTERIZED BY HORIZONTAL BANDS AND THE FRONT WALLS ARE BALANCED BY TOWERS AND SPIRES. THE CASTLE IS EXTENSIVELY AND RICHLY DECORATED WITH SANDSTONE ORNAMENTS IN UNIQUE AND IMAGINATIVE DESIGNS.

WHAT ROCKS WERE FOUND IN THE SURROUNDING AREAS?

MOSTLY MARINE SEDIMENTS LIKE LIMESTONE, MARLS, AND SANDSTONES, BUT ALSO TERRESTRIAL SANDSTONES AND EVEN EVAPORITES LIKE SALT AND GYPSUM AT THE BOTTOM. THE UPPERMOST SEDIMENTARY ROCKS ARE CHALK FROM THE CRETACEOUS AND DANIAN LIMESTONE.

LESSON 1 TO EXPLORE DIFFERENT KINDS OF ROCKS AND THEIR PROPERTIES.

- **CHN TO WRITE/DRAW WHAT THEY ALREADY KNOW ABOUT ROCKS ACTIVITY 1 . PUT THESE THREE KEY PROMPTS ON THE BOARD.**

TYPES OF ROCKS

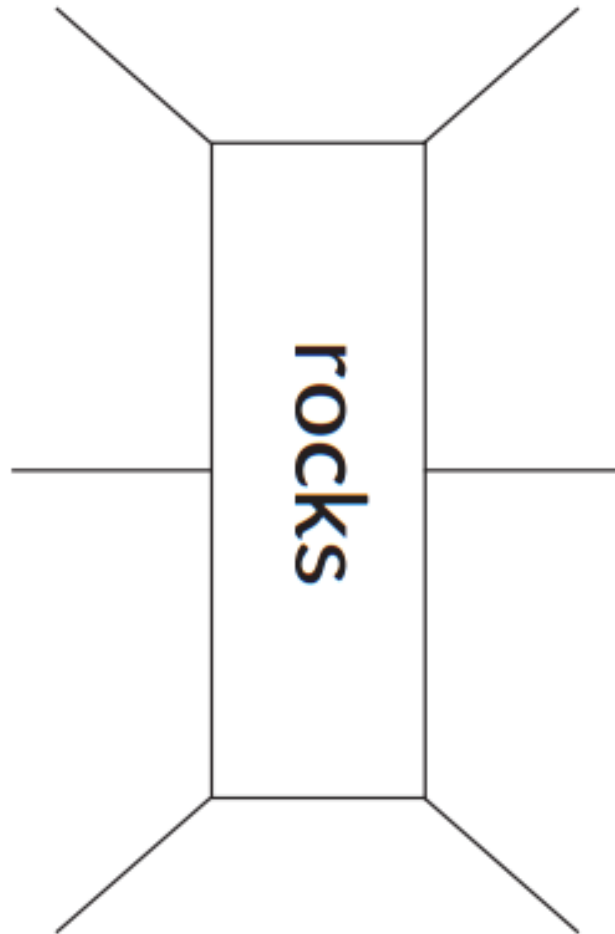
WHAT ROCKS ARE USED FOR

HOW ROCKS WERE MADE

- **CHN TO WRITE QUESTIONS THEY WANT TO FIND OUT ABOUT ROCKS GIVE POST IT NOTES .**
- **WATCH VIDEO AND ADD ADDITIONAL INFORMATION TO ACTIVITY 1 IN A DIFFERENT COLOUR PEN/PENCIL.**
<https://www.bbc.co.uk/bitesize/topics/zsgncxs/articles/zgJ9R2PGRUNGEAAWAFSTYZYCNN90>
- **ACTIVITY 2 GROUP THE ROCKS ACCORDING TO THEIR APPEARANCE. PUT THE HANDOUT ON THE TABLE AND READ TOGETHER AS A CLASS. THINK ABOUT WAYS YOU COULD GROUP THE ROCKS. HARD PERMEABLE/SOFT IMPERMEABLE/SHINY/ROUGH ETC. . USE HANDOUT 1 ADJECTIVES TO DESCRIBE ROCKS.**

PLENARY SHARE HOW YOU HAVE GROUPED THE ROCKS ACCORDING TO THEIR APPEARANCE. GO BACK TO ACTIVITY 1 AND WRITE ANY ADDITIONAL INFORMATION YOU HAVE LEARNT.

ACTIVITY 1



ACTIVITY 2

You have a number of **different rocks** on your table. Look at them carefully. You can **use magnifying glasses** to look at them closer.

Can you group them into different groups based on their **appearance?**

Write the name of your two groups at the top of each column in your table and then place the **rocks** (or photos of rocks) in the correct column.

Sort the rocks into two different groups.

Handout 1

If you dig down anywhere on **Earth** you will find **rock**.



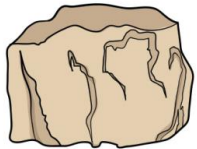
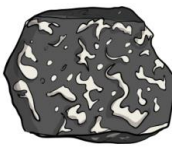

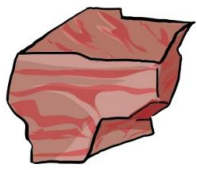



Rocks can be **hard, soft, permeable or impermeable**, depending on what type of **rock** it is.

Slate, marble, chalk and granite are all different types of rock and all have different uses.

New Word Alert!

permeable – allows liquids or gases to pass through
impermeable – Can you predict what this means?



 marble	 granite	 sandstone
 basalt	 slate	 clay
 chalk	 pumice	 limestone

Adjectives to describe rocks

hard

soft

permeable

impermeable

shiny

rough

chalky

crumbly

smooth

sharp

flat

dense

heavy

polished

brittle

dull

layered

rounded

fossilized

weathered

fragile

LESSON 2 TO CATEGORIES ROCKS ACCORDING TO THEIR CHARACTERISTICS FOCUS ON ROCKS FOUND SURROUNDING THE CASTLE.

- 1. DISCUSS WHAT ROCKS CAN BE FOUND IN DENMARK NEAR KRONBORG CASTLE. MOSTLY MARINE SEDIMENTS LIKE LIMESTONE, MARLS, AND SANDSTONES. THE UPPERMOST SEDIMENTARY ROCKS ARE CHALK FROM THE CRETACEOUS AND DANIAN LIMESTONE.**

RECAP LAST LESSON. CAN YOU REMEMBER THE NAMES OF ANY ROCKS WE LEARNT ABOUT LAST LESSON? DISCUSS THE ROCKS MENTIONED ABOVE. WHAT DID THEY NOTICE ABOUT THEM?

STARTER:

GIVE THE ROCK CLASSIFICATION SHEETS OUT AGAIN AND ASK CHILDREN IF THEY CAN THINK OF ANY ADJECTIVES THAT WE USED LAST LESSON TO DESCRIBE ANY OF THE ROCKS GIVE OUT HANDOUT 1 . PLAY 'GUESS MY ROCK'. CHOOSE A ROCK AND TELL CHILDREN CLUES TO DESCRIBE THE ROCK YOU ARE THINKING ABOUT.

A ROCK IS ANY NATURALLY OCCURRING SOLID MINERAL MATERIAL SO STONES, PEBBLES AND BOULDERS ARE ALL CLASSED AS ROCKS. PLAY THE BBC VIDEO AGAIN: <https://www.bbc.co.uk/bitesize/topics/zsgncxs/articles/zg9r2pgruneszycnn90>

LOOK AT DIFFERENT TYPES OF ROCK AND DISCUSS SOME OF THEIR USES. CAN CHILDREN THINK OF ANY OTHER USES FOR DIFFERENT ROCKS?

ACTIVITY 1 INDEPENDENT ACTIVITY. TODAY YOU ARE GOING TO BE GEOLOGISTS AND CARRY OUT INVESTIGATIONS TO COMPARE AND GROUP DIFFERENT ROCKS. THERE ARE FOUR DIFFERENT INVESTIGATIONS WHERE YOU WILL NEED TO FIND THE BEST ROCK FOR EACH JOB DESCRIBED.

CHILDREN WILL BE GIVEN A SELECTION OF INVESTIGATIONS THAT THEY CAN DO. YOU MAY WANT TO COMPLETE THIS AS A CAROUSEL SO EACH CHILD HAS THE OPPORTUNITY TO COMPLETE EACH INVESTIGATION, OR YOU MAY WANT DIFFERENT GROUPS TO DO THE DIFFERENT INVESTIGATIONS AND THEN FEEDBACK THEIR FINDINGS TO THE WHOLE CLASS.

INVESTIGATION 1 IS TO TEST HOW HARD WEARING THE ROCKS ARE. CHILDREN TO SCRATCH WITH A PIN AND GIVE THEM A RATING.

INVESTIGATION 2 IS TO SEE HOW DURABLE THE ROCKS ARE. CHILDREN TO RUB THE ROCKS GENTLY WITH SANDPAPER TO SEE HOW MUCH 'DUST' IS CREATED.

INVESTIGATION 3 IS TO SEE HOW WATERPROOF THE ROCKS ARE. CHILDREN WILL DRIP WATER ONTO THE ROCKS.

INVESTIGATION 4 IS TO SEE IF THE ROCKS WILL BE DAMAGED BY ACID. CHILDREN WILL DRIP VINEGAR ON THE ROCKS

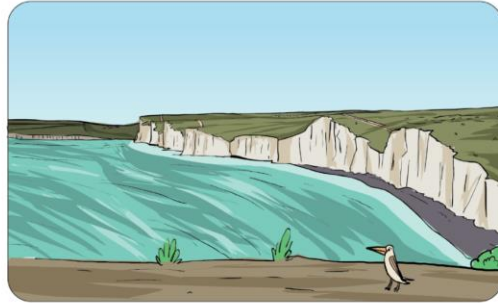
PLENARY. TALK TO YOUR PARTNER ABOUT THESE QUESTIONS. WHAT DID YOU MOST ENJOY ABOUT THIS LESSON? TELL ME ONE THING YOU HAVE LEARNT. DID YOU FIND ANYTHING DIFFICULT? WHAT WERE YOUR FINDINGS?

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**.

If you have ever been to **Dover**, you may have seen the '**White Cliffs**'.

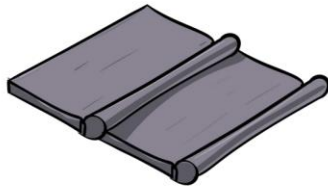
They are white because they are made up **mainly of chalk**.

We have learnt that **chalk** is a **type of rock**.



Marble is often used as a worktop in kitchens.

Lots of roofs are made from tiles of **slate**.



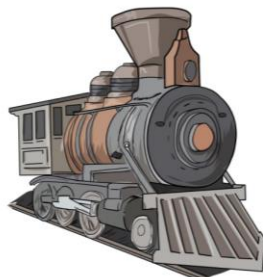
Some people use **pumice** to exfoliate and remove dead, hard skin from their feet.

Some gravestones are made from **granite**.



Basalt is used on railways to help support the rails and hold everything in place.

Limestone is sometimes used as a building material instead of bricks.



YEAR 3 HAMLET ROCKS



Observation	Results
<p>Are rocks hard?</p> <p>*Scratch with pin</p> <p>Give a rating 1-10</p>	<p>Name of rock:</p> <p>Rating:</p>
	<p>Name of rock:</p> <p>Rating:</p>
	<p>Name of rock:</p> <p>Rating:</p>
<p>How durable?</p> <p>Rub with sandpaper. How much dust?</p>	<p>Name of rock:</p> <p>Dust:</p>
	<p>Name of rock:</p> <p>Dust:</p>
	<p>Name of rock:</p> <p>Dust:</p>
<p>Waterproof or not?</p> <p>Children will drip water onto the rocks.</p>	<p>Name of rock:</p> <p>Waterproof:</p>
	<p>Name of rock:</p> <p>Waterproof:</p>

YEAR 3 HAMLET ROCKS



	Name of rock: Waterproof:			
Can it be damaged by acid? Children will drip vinegar on the rocks	<table border="1"><tr><td data-bbox="810 386 1523 579">Name of rock: Damage out of 10:</td></tr><tr><td data-bbox="810 579 1523 772">Name of rock: Damage out of 10:</td></tr><tr><td data-bbox="810 772 1523 968">Name of rock: Damage out of 10:</td></tr></table>	Name of rock: Damage out of 10:	Name of rock: Damage out of 10:	Name of rock: Damage out of 10:
Name of rock: Damage out of 10:				
Name of rock: Damage out of 10:				
Name of rock: Damage out of 10:				
Findings:				

LESSON 3: I CAN EXPLAIN HOW SOME ROCKS ARE FORMED.

RECAP THE LAST LESSON. CAN YOU REMEMBER THE NAMES OF ANY ROCKS WE LEARNED IN THE LAST LESSON? GIVE THE ROCK CLASSIFICATION SHEETS OUT AGAIN AND ASK THE CHILDREN IF THEY CAN THINK OF ANY ADJECTIVES, WE USED IN THE LAST LESSON TO DESCRIBE ANY OF THE ROCKS. PLAY 'GUESS MY ROCK'. CHOOSE A ROCK AND TELL CHILDREN CLUES TO DESCRIBE THE ROCK YOU ARE THINKING ABOUT.

THERE ARE THREE MAIN TYPES OF ROCK THAT EACH FORM IN DIFFERENT WAYS. THE THREE ROCKS ARE IGNEOUS, SEDIMENTARY AND METAMORPHIC. WATCH THE VIDEO

[HTTPS://WWW.BBC.CO.UK/BITESIZE/ARTICLES/ZDJHTRO3G4047V4](https://www.bbc.co.uk/bitesize/articles/zdjhtro3g4047v4) AND CHN TO WRITE DOWN NOTES ON ACTIVITY 1.

ACTIVITY 2: CHN TO CREATE A POSTER ON ONE SPECIFIC ROCK OR THE THREE TYPES OF ROCKS. CHN CAN CREATE THEIR POSTER IN PAIRS OR INDIVIDUALLY. EXAMPLES OF POSTERS BELOW.

CHN TO USE THE FOLLOWING WEBSITES TO HELP THEM:

[HTTPS://WWW.BBC.CO.UK/BITESIZE/ARTICLES/ZDJHTRO3G4047V4](https://www.bbc.co.uk/bitesize/articles/zdjhtro3g4047v4)

[HTTPS://WWW.THESCHOOLRUN.COM/WHAT ARE IGNEOUS SEDIMENTARY AND METAMORPHIC ROCKS](https://www.theschoolrun.com/what-are-igneous-sedimentary-and-metamorphic-rocks)

[HTTPS://WWW.GEOBUS LONDON.ORG.UK/TYPES OF ROCK](https://www.geobuslondon.org.uk/types-of-rock)

[HTTPS://WWW.GEOLSOC.ORG.UK/KS3/GSL/EDUCATION/RESOURCES/ROCKCYCLE/PAGE3445.HTML](https://www.geolsoc.org.uk/ks3/gsl/education/resources/rockcycle/page3445.html)

PLENARY

CHN TO PRESENT THEIR POSTERS.

TALK TO YOUR PARTNER ABOUT THESE QUESTIONS. WHAT DID YOU MOST ENJOY ABOUT THIS LESSON? TELL ME ONE THING YOU HAVE LEARNT. DID YOU FIND ANYTHING DIFFICULT?

ACTIVITY 1

Igneous rock

Metamorphic rock

Sedimentary rock


Igneous rock

Metamorphic rock

Sedimentary rock

LET'S ROCK!

Types of Rocks



I'M IGNEOUS!

I am made when hot magma cools quickly, like from a volcano!



I'M SEDIMENTARY!

I am formed by layers of sediment being squished together, like under the ocean!



I'M METAMORPHIC!

I have been changed into a new rock over time by pressure or heat!

Types of Rocks

Igneous

Formed by solidified molten rock.

Extrusive (volcanic)
Formed when molten rock reaches the Earth's surface and cools.

Basalt
Pumice

Intrusive (plutonic)
Formed when crystallized magma, cooled over time, is solidified deep in the Earth.

Serpentinite
Granite
Gabbro
Obsidian

Minerals

Rocks are made of minerals.

Calcite
Quartz
Feldspar
Hornblende
Biotite

Metamorphic

Formed when other rocks are changed by heat, pressure, and chemical action.

Schist
Marble
Slate
Gneiss
Phyllite

Sedimentary

Formed when combinations of rock fragments, seashells, and chemicals are compressed in layers and hardened.

Dolomite
Shale
Limestone
Conglomerate
Sandstone

Igneous

- Rocks buried deep underground melt because of high pressure and temperature. It's called magma.
- The magma can cool very slowly below ground and become intrusive igneous rocks, like granite.
- The magma can be pushed above ground through volcanic eruptions. It then cools quickly and forms extrusive igneous rocks, like pumice.
- There are many different kinds of igneous rocks.

Sedimentary

- Rocks get broken down by weathering. The particles of rocks are called sediments.
- The sediments are carried away by rivers and wind and they are deposited on the bottom of lakes and oceans by a process called erosion.
- Over time the particles layer on top of each other and the pressure of the water on top pushes it all together. Compacting is very slowly until eventually forming solid rock. The process is called compaction and cementation.
- There are many kinds of sedimentary rocks and you can see the layers in mountainsides, along roads and high walls, in forests, and in canyons.

Metamorphic

- Rocks are formed by extreme heat and pressure.
- Igneous and sedimentary rocks, deeply buried within the earth's crust are under intense heat and pressure (squeezing). The rocks do not melt, but they are changed into different kinds of rocks. The process is called metamorphosis.
- There are many kinds of metamorphic rocks.
- One example of a metamorphic rock is marble, formed from limestone.

The Rock Cycle

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graph TD
    Magma -- Cooling --> Igneous_Rock[Igneous Rock]
    Igneous_Rock -- Weathering + erosion --> Sediment
    Sediment -- Compaction + Cementation --> Sedimentary_Rock[Sedimentary Rock]
    Sedimentary_Rock -- Heat + Pressure --> Metamorphic_Rock[Metamorphic Rock]
    Metamorphic_Rock -- Melting --> Magma
    Igneous_Rock -- Melting --> Magma
    
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LESSON 4 I CAN EXPLAIN HOW THE EARTH IS MADE UP OF DIFFERENT LAYERS OF ROCKS AND SOILS.

RECAP LAST LESSON. CAN YOU REMEMBER THE NAMES OF ANY ROCKS WE LEARNT ABOUT LAST LESSON? GIVE THE ROCK CLASSIFICATION SHEETS OUT AGAIN AND ASK CHILDREN IF THEY CAN THINK OF ANY ADJECTIVES THAT WE USED LAST LESSON TO DESCRIBE ANY OF THE ROCKS. CAN CHILDREN NAME THE THREE DIFFERENT ROCK TYPES AND GIVE EXAMPLES FROM THE SHEET? PLAY 'GUESS MY ROCK'. CHOOSE A ROCK AND TELL CHILDREN CLUES TO DESCRIBE THE ROCK YOU ARE THINKING ABOUT.

DESCRIBE THE DIFFERENT TYPES OF SOIL AND SOME OF THEIR USES. ON WHITEBOARDS OR IN THEIR EXERCISE BOOKS CHN TO NOTE TAKE.

[HTTPS://WWW.BBC.CO.UK/BITESIZE/ARTICLES/ZGOKCMN-GROUNDS-2MNOOFR](https://www.bbc.co.uk/bitesize/articles/zgokcmn-grounds-2mnoofr)

READ THROUGH THE INFORMATION AND DISCUSS AS A CLASS HANDOUT . DID YOU KNOW THAT SOIL COULD DO ALL OF THESE THINGS?

INTRODUCE THE WORD PERMEABLE. PERMEABLE MEANS THAT LIQUIDS CAN PASS THROUGH IT. TODAY WE WILL BE CONDUCTING AN INVESTIGATION TO SEE WHICH SOIL IS THE MOST/LEAST PERMEABLE. MODEL ACTIVITY 1 AND CHN TO COMPLETE IN PAIRS.

ACTIVITY 2 WE ARE NOW GOING TO INVESTIGATE THREE DIFFERENT TYPES OF SOIL TO SEE HOW PERMEABLE THEY ARE. *YOU WILL NEED A BEAKER, A FUNNEL, FILTER PAPER AND A TIMER FOR EACH INVESTIGATION.* CHILDREN NEED TO SET UP THE EXPERIMENT AS SHOWN AND POUR SOIL INTO THE FILTER PAPER AND THEN POUR WATER ONTO IT.

MAKE SURE YOU POUR THE SAME AMOUNT OF WATER EACH TIME. YOU WILL NEED TO TIME IT TO SEE HOW LONG IT TAKES FOR ALL THE WATER TO COLLECT IN THE BEAKER. **THE LESS TIME IT TAKES, THE MORE PERMEABLE THE SOIL IS.**

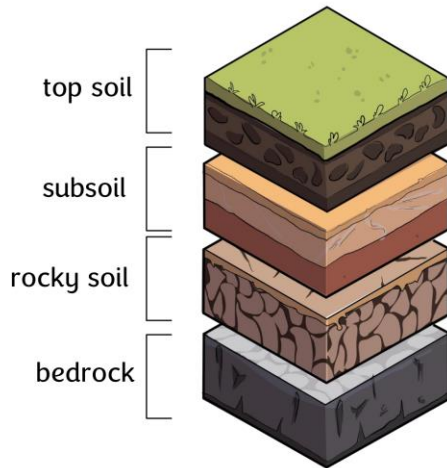
PLENARY. WHICH SOIL WAS THE MOST PERMEABLE? WHY DO YOU THINK THAT WAS? WHICH SOIL WAS THE LEAST PERMEABLE?

ACTIVITY 1

Which soil is the most permeable?

We will need (equipment)	
What we will do (method)	
We will keep these things the same (fair test)	
We will measure	
What we think will happen (prediction)	
What we found out (results)	

HANDOUT 1



Soil is used to help plants grow **healthy**, make art, pottery, to build houses and make bricks or it can just be **decorative in a garden**. Some other uses are:

- helping all kinds of **plants grow**.
- helping 'clean' the atmosphere by emitting and absorbing **gases and dust**.
- providing a **habitat** for animals that live in the soil
- absorbing, holding and **purifying water**
- processing **recycled nutrients**, including carbon, so that living things can use them over and over again.
- being used for **construction** of foundations, roadbeds, dams and buildings
- preserving or **destroying artefacts**
- acting as a living filter to **clean water**.

Soil is a **mixture** of tiny particles of **rock, humus, air and water**.

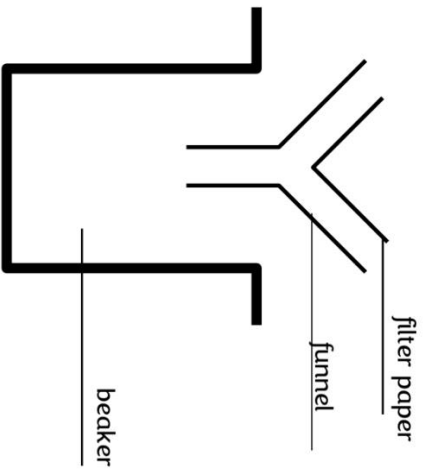
There are lots of different types of soils. Different soils have **different properties**.

New Word Alert

humus – decaying plants and animals

- **Sandy soil** is pale coloured and has large particles. These create lots of small air gaps. Water drains through them easily, so it usually feels dry.
- **Clay soil** is usually sticky and has small particles. They contain very few air gaps and water does not drain through it easily.
- **Chalky soil** is a light brown soil. Water drains through it quickly.
- **Peat** does not contain any rock particles. It's made from very old decayed plants and is dark, crumbly and rich in nutrients.

We are now going to investigate three different types of soil to see how permeable they are. You will need a **beaker**, a **funnel**, **filter paper** and a **timer** for each **investigation**. Set up each investigation as shown in the **diagram below**.



You will put the **soil** in the **filter paper** and pour water onto it. You will need to time it to see how long it takes for all the **water** to collect in the **beaker**.

The less time it takes, the more **permeable** the soil is.

Word Reminder

permeable – lets water and gas through.

ACTIVITY 2

Rock Types

The Rock Cycle

Rocks do not stay the same forever. They do not stay in one place forever. They move about. The rock cycle is the entire journey a rock make as it changes. This takes millions of years.



Igneous

Igneous rocks are formed when magma from volcanoes cools and solidifies. It may do this above or below the Earth's surface. Igneous rocks were once sedimentary or metamorphic rocks. Examples: granite, pumice and basalt.

Metamorphic

Metamorphic rocks form when existing rocks are exposed to heat and pressure deep within the Earth's surface. These rocks were once igneous or sedimentary rocks.

Examples: marble, slate and quartzite.



Sedimentary

Eroded rocks (sediments) are transported by streams and rivers to the ocean. The sediments compact together in layers, which creates sedimentary rock. In this way, igneous rock can become sedimentary rock.

Examples: chalk, limestone and sandstone.

LESSON 5 I CAN DESCRIBE HOW FOSSILS ARE FORMED WHEN THINGS THAT HAVE LIVED ARE TRAPPED WITHIN ROCK.

RECAP LAST LESSON. CAN YOU REMEMBER THE NAMES OF ANY ROCKS OR SOILS WE LEARNT ABOUT IN PREVIOUS LESSONS? GIVE THE ROCK CLASSIFICATION SHEETS OUT AGAIN AND ASK CHILDREN IF THEY CAN THINK OF ANY ADJECTIVES THAT WE USED TO DESCRIBE ANY OF THE ROCKS. CAN CHILDREN NAME THE THREE DIFFERENT ROCK TYPES AND GIVE EXAMPLES FROM THE SHEET? PLAY 'GUESS MY ROCK'. CHOOSE A ROCK AND TELL CHILDREN CLUES TO DESCRIBE THE ROCK YOU ARE THINKING ABOUT.

THINKING TIME. WE HAVE LEARNT ABOUT THE THREE DIFFERENT ROCK TYPES. CAN YOU REMEMBER HOW ROCKS ARE FORMED? ALLOW TIME TO DISCUSS WITH PARTNERS AFTER EACH CLUE BEFORE SHARING IDEAS AS A CLASS. CHN TO LOOK AT THEIR POSTERS THEY HAVE CREATED.

RECAP THE THREE DIFFERENT ROCK TYPES AND HOW THEY ARE FORMED.

THINKING TIME. DOES ANYONE KNOW WHAT A FOSSIL IS? ALLOW TIME TO DISCUSS WITH PARTNERS AFTER EACH CLUE BEFORE SHARING IDEAS AS A CLASS. RECORD ANY OF THE CHILDREN'S IDEAS ON PAPER TO DISPLAY ON THE SCIENCE DISPLAY.

A FOSSIL IS THE PRESERVED REMAINS OR TRACES OF A DEAD ORGANISM. THE PROCESS BY WHICH A FOSSIL IS FORMED IS CALLED FOSSILIZATION. IT'S VERY RARE FOR LIVING THINGS TO BECOME FOSSILIZED. USUALLY AFTER MOST ANIMALS DIE THEIR BODIES JUST ROT AWAY AND NOTHING IS LEFT BEHIND. HOWEVER, UNDER CERTAIN SPECIAL CONDITIONS, A FOSSIL CAN FORM. FOSSILS CAN GIVE US INFORMATION ABOUT ANIMALS THAT LIVED A LONG TIME AGO SUCH AS HOW LARGE THE ANIMAL WAS, WHEN IT LIVED AND WHAT IT ATE. HANDOUT 1

WATCH THE VIDEO [HTTPS://WWW.BBC.CO.UK/BITESIZE/TOPICS/Z98BKOT/ARTICLES/Z2YM2P3](https://www.bbc.co.uk/bitesize/topics/z98bkot/articles/z2ym2p3)

PARTNER ACTIVITY. CHILDREN TO FOLLOW THE INSTRUCTIONS TO CREATE THEIR OWN FOSSIL.

THERE ARE THREE DIFFERENT WAYS TO CREATE A FOSSIL. YOU MAY WANT TO GIVE A CHOICE OR YOU MIGHT WANT TO JUST GIVE ONE SET OF INSTRUCTIONS DEPENDING ON THE RESOURCES YOU HAVE AVAILABLE.

INDEPENDENT ACTIVITY. CHILDREN TO DRAW A COMIC STRIP/STEP BY STEP TO SHOW HOW FOSSILS ARE FORMED.

PLENARY. CHN TO SHOW THEIR FOSSILS.

A **fossil** is the preserved remains or traces of a **dead organism**. The process by which a fossil is formed is **called fossilisation**.

It's 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.

Fossils can give us information about **animals that lived** a long time ago such as **how large** the animal was, when it lived and **what it ate**.

New Word Alert

organism – a living thing (plant/animal/creature)

After an animal **dies**, the soft parts of its body **decompose** leaving the hard parts, like the **skeleton**, behind. This becomes buried by small particles of rock called **sediment**.

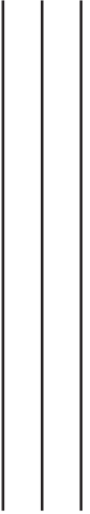

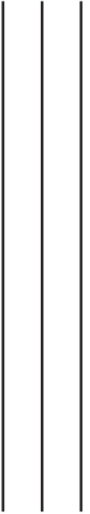

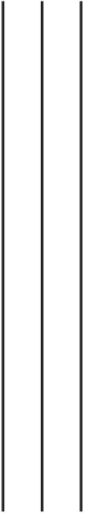

As more layers of **sediment** build up on top, the sediment around the **skeleton** begins to compact and turn **to rock**.

The bones then 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 called a **fossil**.

Did you know?

It's not just **animal** and **plant** remains that can be **fossilised**. Things like **footprints, eggs and even poo** can be fossilised too.

Write sentences and draw pictures to show how fossils are formed.



How to make a mould fossil

A **mould** is created when an **organism** sinks to the sea floor and is pressed into the layers of **sediment**. As the layers build up, the **sediment turns into rock** (sedimentary rock). The organism rots away and **leaves** in imprint of its original shape.

You will need:

- 1 cup of flour
- $\frac{1}{4}$ cup of coffee granules
- $\frac{1}{2}$ cup of salt
- $\frac{1}{2}$ cup of water
- a large bowl
- natural object (e.g. bone, shell, feather, leaf, flower, claw, tooth)

Method

- Mix the flour, coffee granules, salt and water together in the large bowl to make a dough.
- Take some of the dough and flatten it out with your hand.
- Take your natural object and press it into the dough.
- Carefully, remove the object. It should have left a mould behind.
- Let your imprinted fossil dry out.

How to make an amber fossil

An amber fossil is made when tiny **creatures** become trapped in **sticky tree** resin. Over many years, this becomes hard and creates a stone **called amber**. You may find the preserved remains of an organism in some **pieces of amber**.

You will need:

- an old cheese grater
- a yellow or orange candle
- a strong sandwich bag
- a jug of hot water ***adult assistance required***
- a small plastic creature/insect

Method

- Use the cheese grater to slice your candle into small pieces of coloured wax.
- Put the wax into the sandwich bag and seal it.
- Place the bag into the hot water. ***adult assistance required!***
- When the wax has turned into a liquid, take it out of the water.
- Carefully open the bag and drop in the plastic creature.
- The wax will turn back into a solid as it cools, trapping the creature inside and preserving it as though it is a fossil.

How to make a cast fossil

A cast fossil is made when **minerals** and **sediment fill** in the spaces left behind when an organism buried in the rock has rotted away and **disappeared**. This makes an exact replica (or cast) of the original **organism**.

You will need:

- a paper cup
- scissors
- clay
- a natural object (e.g. bone, shell, feather, leaf, flower, claw, tooth)
- thick mixture of plaster of Paris and water

Method

- Cut off the top of the paper cup so it is about 5cm tall.
- Fill your cup about $\frac{3}{4}$ full with clay. Make sure you press it firmly to the sides and the bottom.
- Take your natural object and press it into the clay carefully.
- Remove the object and check that the imprint is clear.
- Take the plaster of Paris mixture and pour this on top of the imprint.
- Let the plaster set.
- Rip off the paper cup and carefully separate your clay mould from the plaster cast.