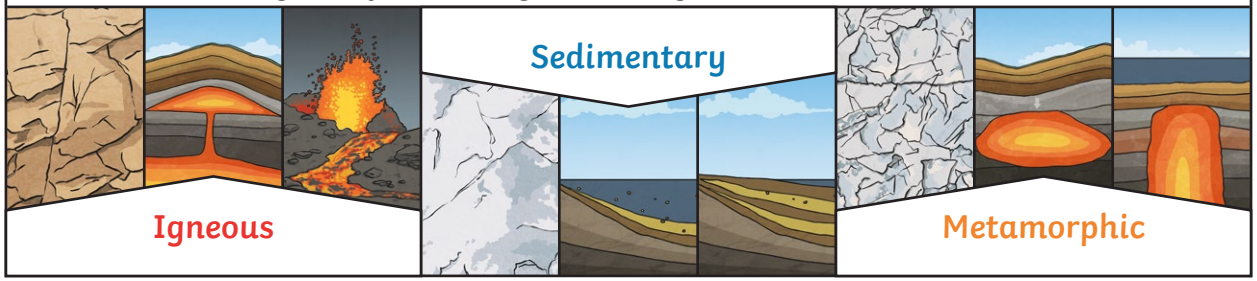
Key Vocabulary

igneous rock	Rock that has been formed from magma or lava.
sedimentary rock	Rock that has been formed by layers of sediment being pressed down hard and sticking together. You can see the layers of sediment in the rock.
metamorphic rock	Rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure.
magma	Molten rock that remains underground.
lava	Molten rock that comes out of the ground is called lava.
sediment	Natural solid material that is moved and dropped off in a new place by water or wind, e.g. sand.
permeable	Allows liquids to pass through it.
impermeable	Does not allow liquids to pass through it.

To look at all the planning resources linked to the Rocks unit, click here.

Key Knowledge

There are three types of naturally occurring rock.



Natural Rocks			Human-Made Rocks
Igneous	Sedimentary	Metamorphic	
Obsidian	Chalk	Marble	Brick
Granite	Sandstone	Quartzite	Concrete
Basalt	Limestone	Slate	Coade Stone

Some words you might use to discuss the properties of a rock:

hard, soft, **permeable**, **impermeable**, durable (meaning resistant to weathering), high density, low density. Density measures how 'bulky' the rock is (how tightly packed the molecules are).

Key Vocabulary

fossilisation	The process by which fossils are made.
palaeontology	The study of fossils.
erosion	When water, wind or ice wears away land.

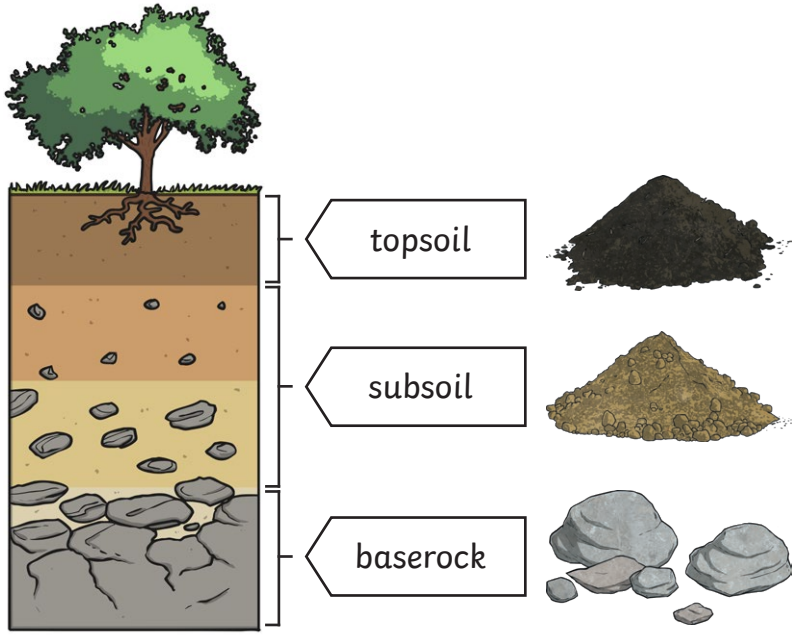
Caves are formed when water **permeates** through the base rock and **erodes** some of the rock away. Over thousands of years these caves can become very large.

Key Knowledge

Soil

Soil is the uppermost layer of the Earth. It is a mixture of different things:

- minerals (the minerals in soil come from finely broken-down rock);
- air;
- water;
- organic matter (including living and dead plants and animals).



Fossilisation

An animal dies. It gets covered with **sediments** which eventually become rock.	More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth.	Over thousands of years, **sediment** might enter the mould to make a **cast fossil**. Bones may change to mineral but will stay the same shape.	Changes in sea level take place over a long period.	As **erosion** and weathering take place, eventually the fossil becomes exposed.

Rocks: Types of Rocks

Aim: Compare different kinds of rocks based on their appearance in the context of understanding the difference between natural and human-made rocks. I can compare different types of rocks.	**Success Criteria:** I can name the three different types of rocks. I can explain the difference between natural and human-made rocks. I can use the appearance of rocks to group and compare them.	**Resources:** **Lesson Pack** A selection of igneous, sedimentary and metamorphic rocks You may wish to source video clips to show the formation of igneous, sedimentary and metamorphic rocks.
	Key/New Words: Rocks, igneous, sedimentary, metamorphic, form, formation, volcano, sea, seabed, changes, compare, types, natural, human-made, strata, anthropic.	**Preparation:** **Natural or Human-made Rocks Activity Sheet** - 1 per child **Natural or Human-made Rocks Picture Sheet** - as required

Prior Learning: It will be helpful if children are learning this unit alongside a geography unit which includes volcano formation.

Learning Sequence

	**Rocks:** Ask the children the following questions: What are rocks? Are rocks alive? How do you know? Why are there rocks everywhere? How do rocks form? **Spot the Rocks:** Show children pictures of different environments on the **Lesson Presentation** and ask them to spot the rocks. Children feedback to the whole class.	
	**Natural Rocks:** Introduce or recap the three different types of rock. You may wish to show video clips of the formation of igneous, sedimentary and metamorphic rocks. Read through the information about how the following rocks forms: **Igneous, Sedimentary** and **Metamorphic.** **Human-made Rocks:** Introduce children to human-made rocks like concrete and bricks.	
	**Natural or Human-made?** Place children in small ability groups. Groups will have a small selection of rocks with name labels and will group these before deciding whether the rock is natural or human-made. Alternatively, children can use **Natural or Human-made Rocks Picture Sheet** if physical rocks are unavailable. Children will record their answers on the differentiated **Natural or Human-made Rocks Activity Sheet.**  Children decide whether rocks are natural or human-made.  Children will group rocks further by the type of natural rock they are.	
	**Natural or Human-made:** *(If using a set of rocks then go through these with the children. If using the* **Natural or Human-made Rocks Picture Sheet** *then use the slide on the* **Lesson Presentation**.*)* Children mark and correct their own answers on the **Natural or Human-made Rocks Activity Sheet.**	
	**Fact or Fiction?** Check children's knowledge of the different types of rocks by reading out a statement. Children discuss with their talk partner and then vote for if it is fact or fiction. Check children have understood the three different types of rocks and the difference between human-made and natural rocks.	

Task*it*

***Wordsearch*it:** Children complete the **Rocks Wordsearch** to reinforce key vocabulary.

***Draw*it:** Children to make close drawings of the rocks and label them.

Natural or Human-Made Rocks

Brick

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Granite

Photo courtesy of James Bowe - granted under creative commons licence - attribution

Chalk

Photo courtesy of tsbl2000 (@flickr.com) - granted under creative commons licence - attribution

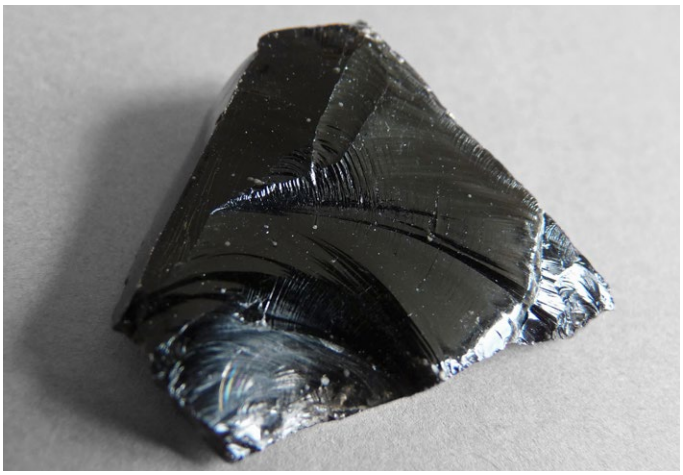
Marble

Photo courtesy of Luis Miguel Bugallo Sanchez (@commons.wikimedia.org) - granted under creative commons licence - attribution

Concrete

Photo courtesy of keriluamox (@flickr.com) - granted under creative commons licence - attribution

Obsidian



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Natural or Human-Made Rocks

Coade Stone

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Sandstone

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Quartzite

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Basalt

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Limestone

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Slate

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Natural or Human-Made Rocks

Natural Rocks	Human-Made Rocks

Natural or Human-Made Rocks

Natural Rocks	Uses	Human-Made Rocks	Uses

Natural or Human-Made Rocks

Natural Rocks

Human-Made Rocks

Igneous

Sedimentary

Metamorphic

Rocks: Grouping Rocks

Aim:	**Success Criteria:**	**Resources:**
Group together different kinds of rocks on the basis of their simple physical properties in the context of natural rocks. I can group rocks based on their properties. Making systematic and careful observations by examining different types of rocks. I can make systematic and careful observations.	I can name the different types of rocks. I can identify features of different rocks. I can group rocks by specific criteria. I can handle and examine rocks carefully. I can use systematic observations to identify the properties of rocks.	**Lesson Pack** A selection of igneous, sedimentary and metamorphic rocks A selection of books on rocks Computers / Laptops / Tablets Sandpaper Pipette A large container or plastic box
	Key/New Words: Igneous, sedimentary, metamorphic, rocks, group, properties, permeable, impermeable, hard, soft, durable, buoyancy, split.	**Preparation:** **Properties of Rocks Activity Sheet** - 1 per child **Grouping Rocks Activity Sheet** - 1 per child (A3 copies for HA)

Prior Learning: Children will have learnt the three different types of rocks in lesson 1.

Learning Sequence

Whole Class	**Types of Rocks:** What are the three types of rocks? Why causes them to be different? Children need to demonstrate they understand the difference occurs in the formation of the rocks. Show the types of rocks on the **Lesson Presentation** and use this to address any misconceptions or errors.	
	Describing Rocks: In talk partners, children discuss the adjectives they would use to describe rocks. Children feedback to class and ideas to be written on the IWB. Select one of the properties such as 'hard' – Are all rocks hard? What about clay? Discuss how different rocks have different properties.	
	Properties of Rocks: Introduce children to the scientific terms they will be using to describe the properties of rocks.	
	Carousel of Activities: Children record observations and make notes from each activity on the differentiated **Properties of Rocks Activity Sheets.** ***Permeability and Durability Group:*** This should be a teacher led activity. Using a selection of different rocks, children to make observation in relation to their permeability and durability. To test permeability add a few drops of water using the pipette onto the rock and ask the children to observe whether it is absorbed. Use a small square of sandpaper to test how durable the rocks are. Children record their observations. ***Books Group:*** Using a selection of age-appropriate books on rocks, children to make notes about the properties of rocks. ***Density Group:*** Children test the buoyancy of different rocks using a large container full of water to decide which rocks have higher and which have lower density and take notes. Conduct a mini-plenary to check and assess the children's understanding based on the activities they have completed. Address any misconceptions or errors.	
	Grouping Rocks: Children use their notes on the differentiated **Properties of Rocks Activity Sheets** to group rocks based on their properties on the differentiated **Grouping Rocks Activity Sheets.** ★ Children group rocks based on permeability and one other property of their choice. ★★ Children group rocks based on two properties of their choice and then answer questions. ★★★ Children group rocks based on all four properties. Children label the rocks by their type and then write a paragraph on the relationship between rock type and the various properties. If children have not already identified the type of rock allow them to do so using books or the Internet while grouping the rocks on their activity sheet.	

Task*it*	
***Poster*it:**	Children select a rock and create a poster adding factual information about the type of rock it is, its properties and its uses.
***Identify*it:**	Using the **Everyday Uses of Rocks Activity Sheet,** children to walk around the school or their local area finding the different types of rocks used in buildings and outdoors. Children name the rock, its type and the properties that make it suitable for that particular use.

Adult Guidance

Grouping Rocks

Hard or Soft?

Igneous and metamorphic rocks are hard compared to sedimentary rocks which are more likely to be soft, for example clay and chalk.

More or Less Durable?

This is obviously linked to being hard or soft in the first place. Rocks that are harder are more durable in comparison to rocks that are soft. Children should make links and connections between the two properties.

Permeable or Non-Permeable?

Igneous and metamorphic rocks are generally less likely to be permeable than sedimentary rocks. This is due to the way they are formed. The tight interlocking grain structures have few, if any, pores. An exception is when igneous or metamorphic rocks are fractured by tectonic plates, which increases the porosity, and therefore permeability, of the rocks. Basalt for example demonstrates a large range of variation in porosity depending on how it has formed and where.

High Density or Low Density?

Metamorphic and igneous rocks have more 'bulk' and therefore are higher in density. The density of sedimentary rocks varies and the lower down it is (the more compacted) the more dense it becomes. However, sedimentary rocks on upper layers (for example, pumice) have much lower density. Density is also related to porosity. Therefore, the children should see a pattern emerging and linking to permeability and density.

Overall, igneous and metamorphic rocks tend to exhibit similar properties and are different to sedimentary rocks.

Grouping Rocks

I can group rocks based on their properties.

Using your notes from the Properties of Rocks Activity Sheet, group the rocks based on whether they were permeable or impermeable.

Permeable	Impermeable

Now choose another category and group the rocks based on what you found. Label each box first and then add the rocks.
