

Sithney C.P. School Knowledge Organisers

Science. Materials: Rocks, Soils and Changing State

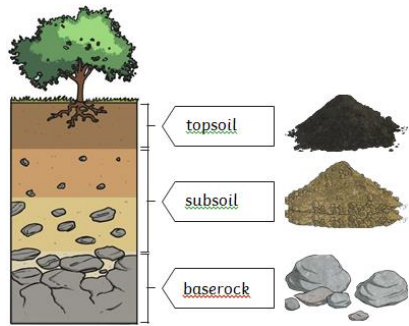


What you should already know:

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses. (Y2)

Rocks and Soils key learning:

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.



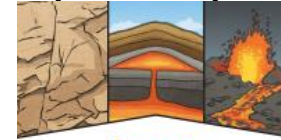
Soil is the uppermost layer of the Earth. It is a mixture of different things:

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

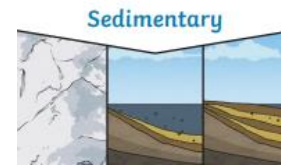
Fossilisation: The process by which fossils are made.

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.

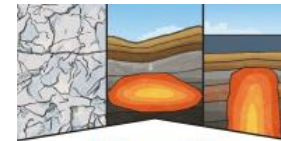
Key Vocabulary:



Igneous



Sedimentary



Metamorphic

Igneous rock: Rock that has been formed from **magma** or **lava**.

magma Molten rock that remains underground.

lava Molten rock that comes out of the ground is called 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.

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

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.

erosion When water, wind or ice wears away land.

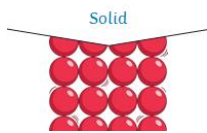
What you should already know:

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2)

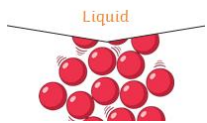
Changing State key learning:

A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped. Each individual grain demonstrates the properties of a solid. Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing point of water is 0°C. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100°C. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling. Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.

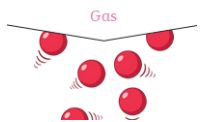
States of Matter: there are three states of matter.



Particles in a **solid** are close together and cannot move. They can only vibrate.

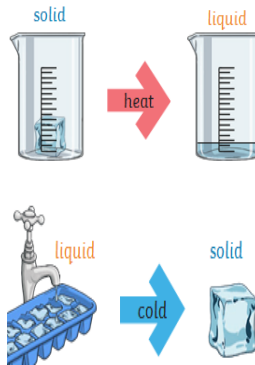


Particles in a **liquid** are close together but can move around each other easily.



Particles in a **gas** are spread out and can move around very quickly in all directions.

When water and other **liquids** reach a certain temperature, they change state into a **solid** or a **gas**. The temperatures that these changes happen at are called the boiling, **melting** or **freezing** point.



If a **solid** is heated to its **melting** point, it **melts** and changes to a **liquid**. This is because the particles start to move faster and faster until they are able to move over and around each other.

When **freezing** occurs, the particles in the **liquid** begin to slow down as they get colder and colder. They can then only move gently on the spot, giving them a **solid** structure.

Melt - this is when a solid changes to a liquid.

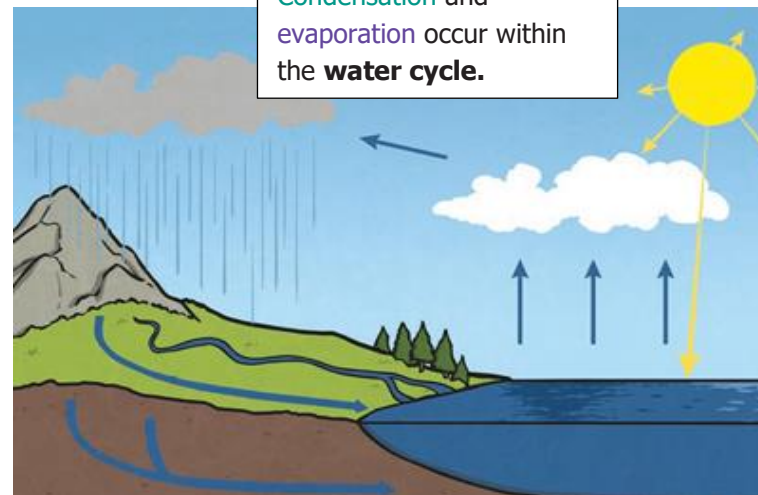
Freeze - liquid turns to a solid during the freezing process.

Evaporate - turn a liquid into a gas.

Condense - turn a gas into a liquid.

Precipitation - liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.

Condensation and **evaporation** occur within the **water cycle**.



Key Vocabulary:

States of matter - materials can be one of three states: solids, liquids or gases. Some materials can change from one state to another and back again.

Solids - these are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy. Solids take up the same amount of space no matter what has happened to them.

Liquids - liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.

Gases - gases can spread out to completely fill the container or room they are in. They do not have any fixed shape but they do have a mass.

Water vapour - this is water that takes the form of a gas. When water is boiled, it evaporates into a water vapour.

1. Water from lakes, puddles, rivers and seas is **evaporated** by the sun's heat, turning it into **water vapour**.
2. This **water vapour** rises, then cools down to form water droplets in clouds (**condensation**).
3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (**precipitation**).