Year 1

Science

Everyday Materials

What?	
What does material mean?	All objects have a name like 'a table'. Material is the 'stuff' an object is made from.

Properties of materials	
Hard	Firm, may not be easily broken or bent
Soft	Easy to cut, fold or change shape
Stretchy	Can be made longer or wider without breaking
Brittle	Breaks or snaps easily
Rigid	Doesn't change shape easily
Shiny	Reflects light easily
Dull	Not very bright or shiny
Rough	Has an uneven surface
Smooth	An even surface with no lumps or bumps
Flexible	Can be bent easily
Waterproof	Keeps out water
Absorbent	Soaks up liquid easily
Transparent	Lets all of the light through – see through
Translucent	Lets some of the light through
Opaque	Does not let light through – not see through

Names of materials
wood
plastic
glass
metal
water
rock

Key Vocabulary	
Properties	A way to describe something
Material	The 'stuff' an object is made out of
Liquid	Liquids can **flow or be poured easily**
Surface	An outside part or layer of something
Object	A thing that can be seen and touched.

Materials and their properties

wood
hard, strong, rigid

metal
shiny, waterproof

plastic
bendy, waterproof

glass
transparent, smooth

water
runny, wet, clear

rock
hard, strong

Year 2

Science

Uses of Everyday Materials

Uses of materials	
Wood can be used for:	doors, tables
Plastic can be used for:	pens, rulers
Glass can be used for:	windows, glasses
Metal can be used for:	cars, coins
Rock can be used for:	garden walls, old buildings
Rubber can be used for:	tyres,
Brick can be used for:	houses, walls
Paper can be used for:	books, wrapping paper
Card can be used for:	folders, birthday cards
Fabric can be used for:	clothes, towels

Different materials for the same object	
Some objects can be made from various materials	For example, a fork can be made from: plastic, wood or metal.

Inventors	
John Dunlop	He was born in 1840. He was an expert in rubber. He invented the first inflatable tyre.
Charles Macintosh	He was born in 1766. He Invented the first waterproof fabric. The 'mac' raincoat is named after him.

Names of materials
wood, plastic, glass, metal, water, rock, rubber, brick, paper, card, fabric

Key Vocabulary and Phrases	
Various	Lots of different kinds
Inflatable	Can be filled with air
Rubber	A tough material that can be shaped
Fabric	Cloth produced by weaving or knitting

Changing the shape of materials

squashing

bending

twisting

stretching

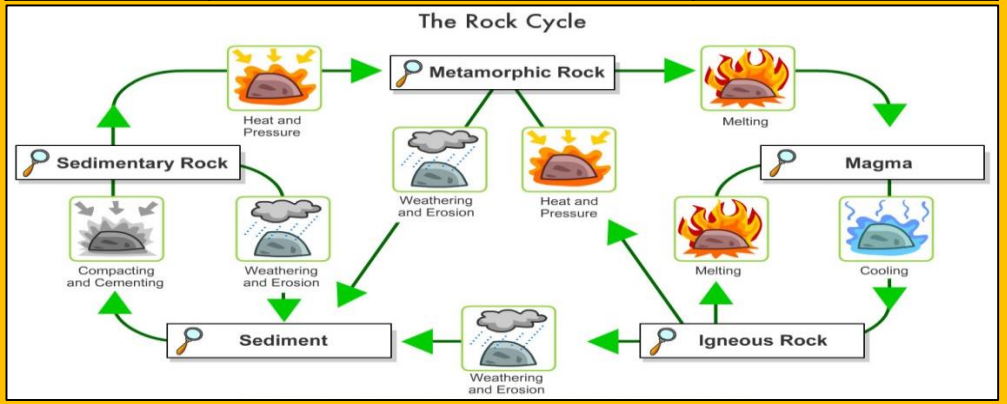
Year 3

Science

Rocks

Key Knowledge

Type	How are they formed?	Features
Sedimentary 	Sedimentary rocks are formed from particles of sand, shells, pebbles, and other fragments of material. Together, all these particles are called sediment. Gradually, the sediment accumulates into layers and over a long period of time hardens into rock.	Usually crumbly and allow water through them Made of layers and stuck together with mineral crystals They can contain fossils within their layers
Metamorphic 	Metamorphic rocks are formed under the surface of the earth from the metamorphosis (change) that occurs due to intense heat and pressure (squeezing).	Usually hard May contain tiny crystals or fossils
Igneous 	Igneous rock is formed when magma cools and solidifies, it may do this above or below the Earth's surface.	Very hard Contain crystals



Key Vocabulary and Phrases

Erosion	The gradual wearing away of something.
Magma	Hot fluid below or within the earth's crust from which lava and other igneous rock is formed on cooling.
Tectonic plates	A layer under the ground made up of large, moving pieces called plates. All of Earth's land and water sit on these plates.
Solidify	To become solid or hard.
Dissolve	To become part of a liquid

How are fossils formed?

An animal dies, its skeleton settles on the sea floor and is buried by sediment.
The sediment surrounding the skeleton thickens and begins to turn to stone.
The skeleton dissolves and a mould is formed. Minerals crystallise inside the mould and a cast is formed.
The fossil is exposed on the Earth's surface.

What is soil made from?

Minerals (small stone fragments: clay, silt or sand)
Organic Matter (decaying plants and animals)
Water (which the nutrients in the minerals and the organic matter dissolve into)
Air (which fills the gaps between the mineral and organic matter parts).

Types of soil

Sandy soil is pale in colour with lots of small air gaps. Water drains through sandy soil easily so it usually feels quite dry.
Clay soil is an orange or blue-ish sticky soil with very few air gaps. Water does not drain through it easily. When it rains, puddles stay on top of clay soil for a long time.
Chalky soil is a light brown soil. Water drains through it quickly.
Peat is different from other soils because it does not contain any rock particles. It is made from very old decayed plants and is dark, crumbly and rich in nutrients (chemicals plants need to grow).

Year 4

Science

States of Matter

Key Knowledge

Materials are in four main categories: solids, liquids, gases and plasma

Solids

- Solids stay in one place and can be held.
- Most solids keep their shape. They do not flow like liquids. Some solids like sand or salt can be poured.
- Solids always take up the same amount of space. They do not spread out like gases.

Liquids

- Liquids can **flow** or be **poured** easily. They are not easy to hold.
- Liquids change their shape depending on the container they are in.

Gases

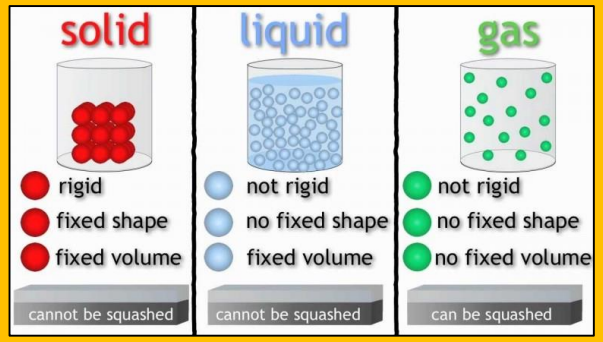
- Gases are often invisible.
- Gases do not keep their shape. They spread out and change their shape and volume to fill up whatever container they are in.

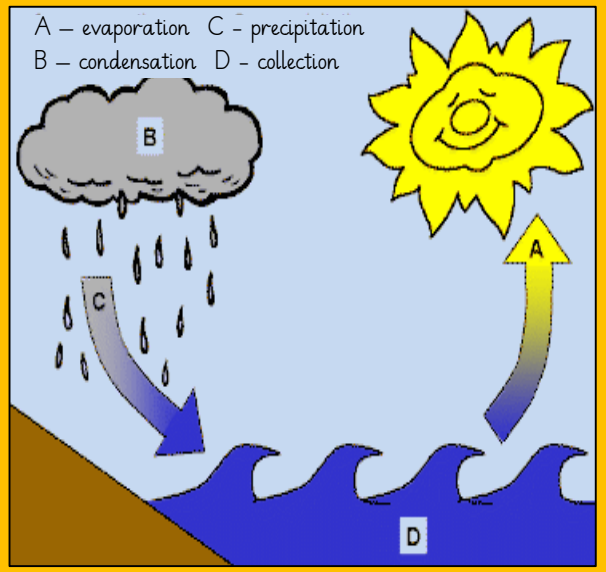
What does **changes of state** mean?
It is when a material changes from one material type to another.

What	Explanation	Name of process	Example
Solid to Liquid	When a solid **melts** it changes to a liquid.	Melting	When an ice cube melts.
Liquid to Gas	A liquid **evaporates** into a gas when it is heated	Evaporation	When water on a fence is warmed up and turns to steam.
Gas to Liquid	When a gas it cooled it **condenses** into a liquid.	Condensation	When steam from the shower cools on the mirror it turns to water.
Liquid to Solid	When a liquid **freezes** it turns into a solid.	Freezing	When the water in a pond freezes, it turns to ice.

Key Vocabulary and Phrases

Temperature	The measure of warmth or coldness of an object.
Celsius	The common scale in the UK for measuring temperature.
Boils	To become so hot (100°C) that water bubbles and then turns into a gas.
Container	Something which holds things inside, like a box, jar or tub.





Temperatures

Boiling	Water boils at exactly 100°C (A hot bath is about 40°C)
Melting	Different solids melt at different temperatures: Ice melts at 0 degrees Celcius (0°C). (Chocolate melts at about 35°C)
Freezing	Water freezes at 0 degrees Celcius (0°C).
Evaporation and Condensation	Water can evaporate and condense at any temperature. But, the warmer it is the faster the evaporation takes place.

Year 5

Science

Properties and Changes of Materials

Key Knowledge

Comparing and Grouping Materials

Materials can be grouped by their properties (is it hard or soft?) or by more than one of their properties (is it hard and magnetic?).

Properties of materials we can compare

Hard Difficult to scratch, like a metal spoon.	**Soft** Malleable (easily shaped), like play-doh.
Soluble Can be dissolved, like sugar granules.	**Insoluble** Cannot be dissolved, like gravel.
Transparent Lets all light through, like glass.	**Opaque** Does not let any light through, like a brick wall.
Electrical conductor Lets electricity pass through easily, like copper wire.	**Electrical insulator** Does not let electricity flow through easily, like plastic or rubber.
Thermal conductor Lets heat pass through easily, like a metal saucepan.	**Thermal insulator** Does not let heat pass through easily, like a wood pan handle.
Magnetic Is attracted to a magnet, like a steel paperclip. Not all metals attract to magnets.	**Not magnetic** Is not attracted to a magnet, like a wooden ruler.

Reversible and Irreversible Changes

A reversible change is a change that doesn't last forever. For example, water can turn to ice when frozen, but can be turned back to water by heating it.	An irreversible change lasts forever And is usually caused by heat. Example: eggs, flour, butter and sugar heated to make a cake. The original ingredients can't go back to how they started.

Key Vocabulary and Phrases

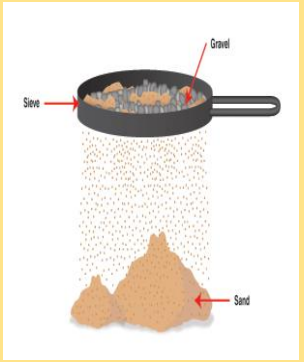
Dissolved	To become incorporated into a liquid so as to form a solution.
Separating	The action of moving things apart.
Evaporation	When a liquid turns to a gas due to an increase in temperature.
Properties	A specific quality of something.

Mixtures and Solutions

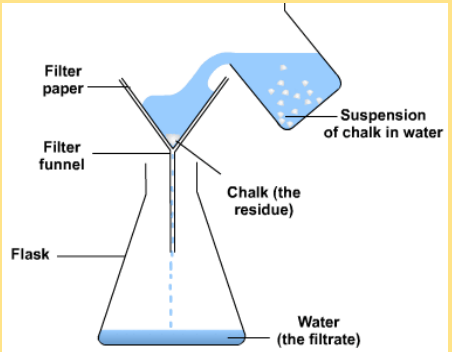
A mixture Where substances are mixed together, but dissolving hasn't taken place. For example, mixing, banana slices, grapes and orange segments to make a fruit salad.	**A solution** Some substances dissolve in a liquid. When this happens the liquid is called a solution. For example, when coffee granules dissolve in water this makes a solution.
We can separate a mixture by sieving and/or filtering **Sieving** – sorting out the big bits from the small bits, e.g. stones from soil. **Filtering** – separating solid bits from a liquid, e.g. sand from sand and water.	We can separate a solution by evaporation Because the soluble substance is too mixed into the water, it can't be removed by sieving or filtering. **Evaporation** – A liquid **evaporates** into a gas when it is heated. This removes the liquid.

Separation

Sieving



Filtering



Evaporation