

What should I already know?

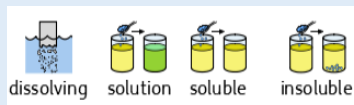
- A variety of everyday materials including wood, plastic, glass, metal, water and rock.
- The physical properties of a variety of everyday materials (including those that are transparent) and to compare and group materials on the basis of these properties.
- How materials are suitably used based on their properties.
- How magnets and electrical circuits work.
- Name some materials which are magnetic.
- How shapes of solid objects can be changed by squashing, bending, twisting and stretching.
- Materials that are solids, liquids and gases and their particle structure.
- Some materials change state when they are heated or cooled and the temperature at which this happens.
- The roles of melting, evaporation and condensation in the water cycle and the role temperature has on the rate of evaporation.
- Some rocks are permeable.

Can materials be separated after they have been mixed?

- Some **materials** can be **separated** after they have been mixed based on their **properties** - this is called a **reversible change**.
- Some methods of **separation** include the use of a magnet, a filter (for **insoluble** materials), a sieve (based on the size of the solids) and **evaporation**.
- When a mixture cannot be separated back into the original components, this is called an **irreversible change**.

What is dissolving?

- When the **particles** of a **solid** mix with the particles of a **liquid**, this is called **dissolving** and the result is a **solution**.
- Materials that dissolve are **soluble**.
- Materials that do not dissolve are **insoluble**.

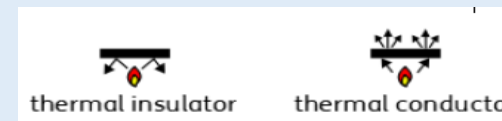


What will I know by the end of the unit?

How to group **materials** based on their **properties** using scientific vocabulary including:

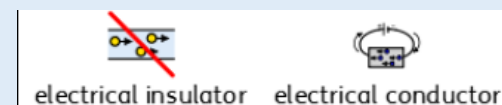


What are thermal insulators and conductors?



- Materials which are good thermal conductors allow heat to pass through them easily.
- Thermal conductors are used to make items that require heat to travel through them easily e.g. a saucepan which requires heat to travel through to cook food.
- Thermal insulators do not let heat travel through them easily. Examples of thermal insulators are woollen clothes and flasks for hot drinks.

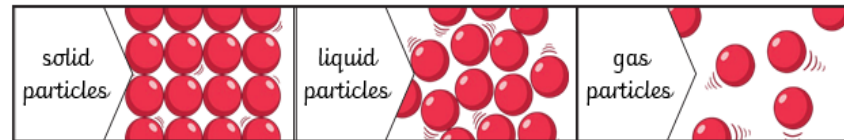
What are electrical insulators and conductors?



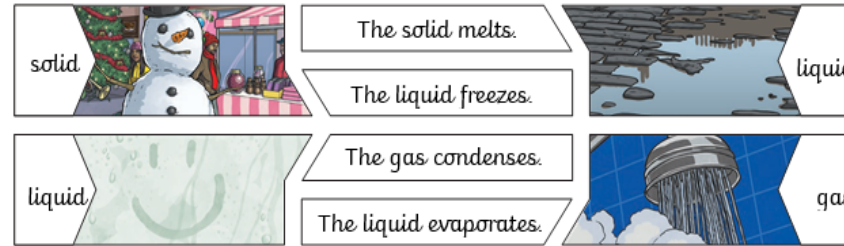
- Electrical conductors allow electricity to pass through them easily while electrical insulators do not.
- Electrical insulators have a high resistance which means that it is hard for electricity to pass through these objects.

Key Vocabulary

Word	Meaning
conductor	A substance that heat or electricity can pass through or along.
dissolves	When a substance is mixed with a liquid and the sub-
filtering	A device used to remove dirt or other solids from liquids or gases. A filter can be made from paper, charcoal, or other material with tiny holes in it.
insoluble	Impossible to dissolve especially in a given liquid.
insulator	A non-conductor of electricity or heat.
irreversible	Impossible to reverse, turn back, or change.
particles	Particles are tiny bits of matter that make up everything in the universe. They have different
permeable	Of a substance being such that gas or liquid can pass through
resistance	The opposing power of one force against another.
reversible	Able to turn or change back.
soluble	Able to be dissolved.
thermal	Relating to or caused by heat or by changes in temperature.



Changes of State



Key Knowledge

Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by:

Sieving	Filtering	Evaporating
Smaller materials are able to fall through the holes in the sieve, separating them from larger particles.	The solid particles will get caught in the filter paper but the liquid will be able to get through.	The liquid changes into a gas, leaving the solid particles behind.

Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.

Key Vocabulary

Word	Meaning
solids	One of the three states of matter. Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.
liquids	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
gases	One of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. Examples of gases are oxygen and helium.
melting	The process of heating a solid until it changes into a liquid.
freezing	When a liquid cools and turns into a solid.
evaporating	When a liquid turns into a gas or vapour.
condensing	When a gas, such as water vapour, cools and turns into a liquid.