Science Knowledge Organiser - Year 5

Unit: What properties can materials have and how can they be changed?

Key Vocabulary:

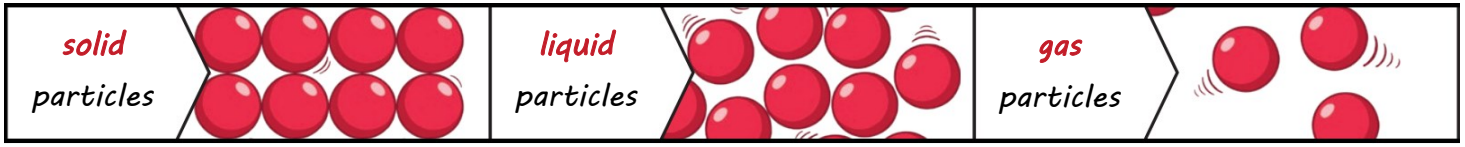
condensing	Condensing is when a gas, such as water vapour, cools and turns into a liquid.
conductor	A conductor is a material that heat or electricity can easily travel through.
evaporating	Evaporating is when a liquid turns into a gas or vapour.
freezing	Freezing is when a liquid cools and turns into a solid.
gases	Gas is one of the three states of matter.
insulator	An insulator is a material that does not let heat or electricity travel through it.
liquids	Liquid is the state of matter that can flow and take the shape of its container.
materials	The substance that something is made from is its material.
melting	Melting is the process of heating a solid until it changes into a liquid.
solids	Solid is the state of matter that holds its shape.
transparent	A transparent object lets light through so the object can be looked through.

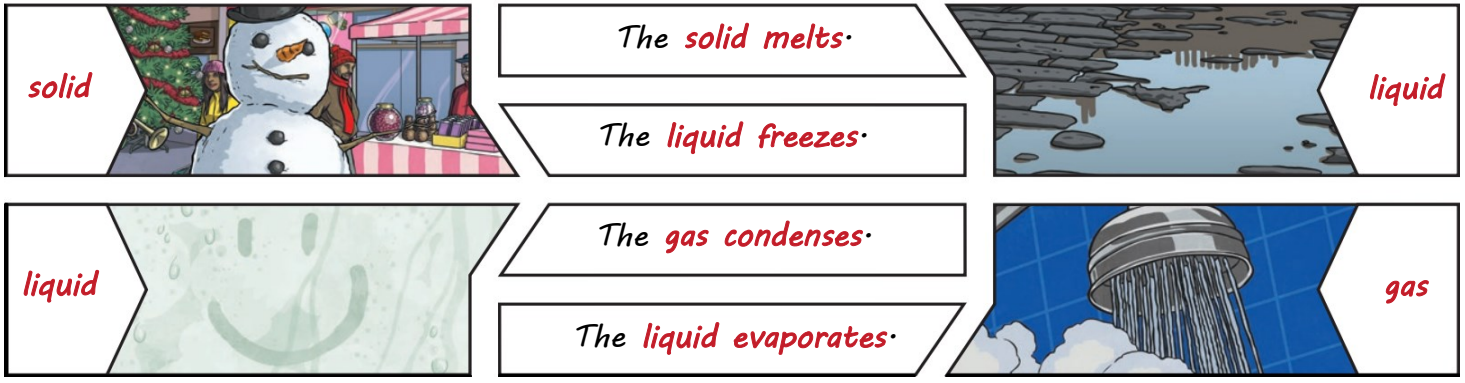
Science Skills:

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.
- Demonstrate that dissolving, mixing and changes of state are reversible changes.
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
- Use test results to make predictions to set up further comparative and fair tests.

Key Facts:

- Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulation, magnetism, solubility, thermal conductivity and transparency.
- Most metals are both thermal conductors and electrical conductors.
- Gas particles are further apart than solid or liquid particles and they are free to move around. Examples of gases are oxygen and helium.
- Liquid particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
- Solid particles are very close together so they hold their shape. Examples of solids include wood and glass.
- Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by sieving, filtering and evaporating.





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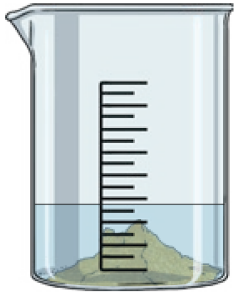


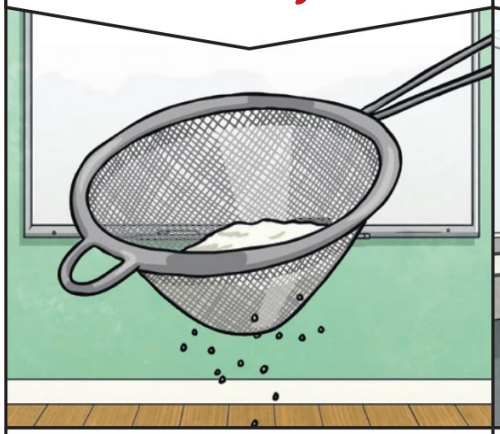
Sugar is a soluble **material**.

Sand is an insoluble **material**.

Dissolving

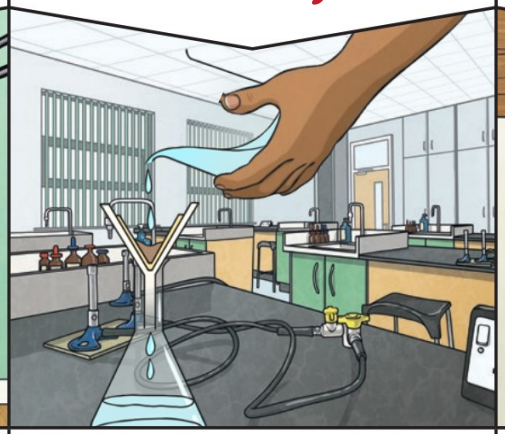
A solution is made when **solid** particles are mixed with **liquid** particles. **Materials** that will dissolve are known as soluble. **Materials** that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.

Sieving



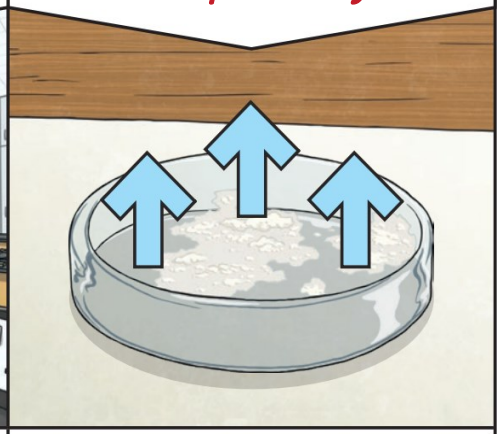
Smaller **materials** are able to fall through the holes in the sieve, separating them from larger particles.

Filtering

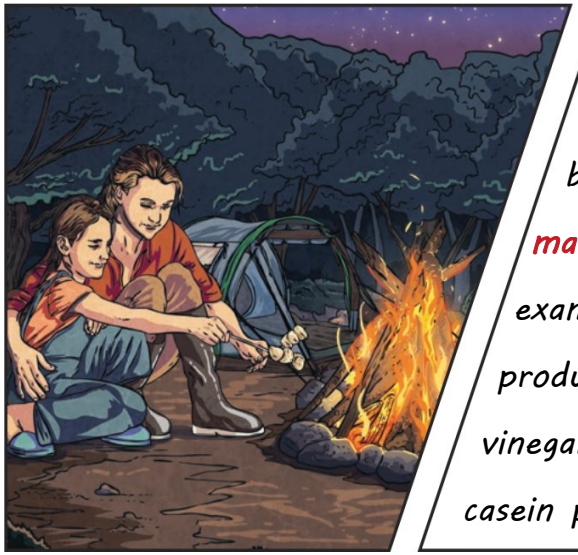


The **solid** particles will get caught in the filter paper but the liquid will be able to pass through.

Evaporating



The **liquid** changes into a gas, leaving the solid particles behind in the dish.



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.