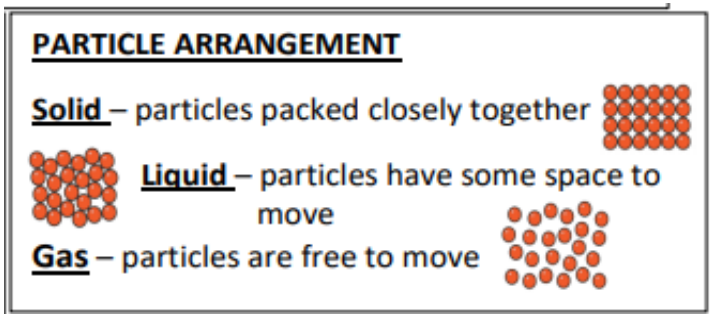
Upper Key Stage 2: Properties and changes of materials

Key Vocabulary

solid	Firm and stable in shape; not liquid or fluid. Particles are close together.
liquid	A substance that flows freely but is of constant volume, having a consistency like that of water or oil.
gas	A substance or matter in a state in which it will expand freely to fill the whole of a container, having no fixed shape (unlike a solid) and no fixed volume (unlike a liquid).
change of state	A change of state occurs whenever matter changes from one state to another. Common states of matter on Earth are solid, liquid, and gas.
mixture	A substance is made by mixing other substances together.
dissolve	To alter or modify something to make it suitable for a new use or purpose
solution	when something solid mixes with a liquid and becomes part of the liquid.
soluble	Able to be dissolved, especially in water.
insoluble	Not able to dissolve in an liquid.
filter	A porous device for removing impurities or solid particles from a liquid or gas passed through it.
sieve	a utensil consisting of a wire or plastic mesh held in a frame, used for straining solids from liquids, for separating coarser from finer particles.
reversible	when a process can be reversed so that the previous state or situation is restored.
non-reversible	when a process cannot be reversed so that the previous state or situation is restored.
new material	When an irreversible change takes place a new material is always created.

Solid, Liquid and Gas Particles



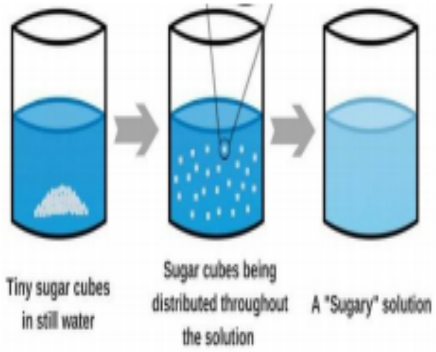
Did you know?

- There is a solvent called aqua regia which can dissolve the noble metals, these are rhenium, ruthenium, rhodium, palladium, silver, osmium, iridium, platinum, and gold.
- You can't see a beam of light when shining it through a true solution. This means fog is not a solution. It is a colloid.
- Solutions can be liquid, solid, or gas. An example of a solid solution is steel.
- Solids are generally more soluble at higher temperatures.
- Carbonated beverages are made by dissolving carbon dioxide gas into liquid at high pressure.

Dissolving and separating mixtures

DISSOLVING - Sometimes when a solid (solute) is mixed with a liquid (solvent) it will dissolve to form a solution e.g. dissolving sugar in hot tea.

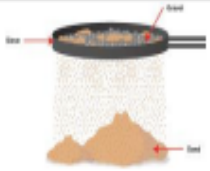
The solid seems to disappear in the solution but it is still there it has just become part of the liquid.



A soluble material can dissolve however an insoluble material cannot dissolve.

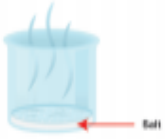
SEPARATING MIXTURES

SIEVING – a mixture of different sized solid particles can be separated with a sieve.



FILTERING – an insoluble solid can be separated from a liquid when passed through a filter. The liquid passes through the solid particles are trapped on the filter.

EVAPORATING – if a solution is boiled (heated) the water will evaporate into gas and the solid will be left behind.



Solution

A solution is made when a material dissolves in a liquid. Sugar and water are soluble materials. An insoluble material is one that doesn't dissolve in a liquid, such as sand. Materials in a solution can be separated by evaporation.

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