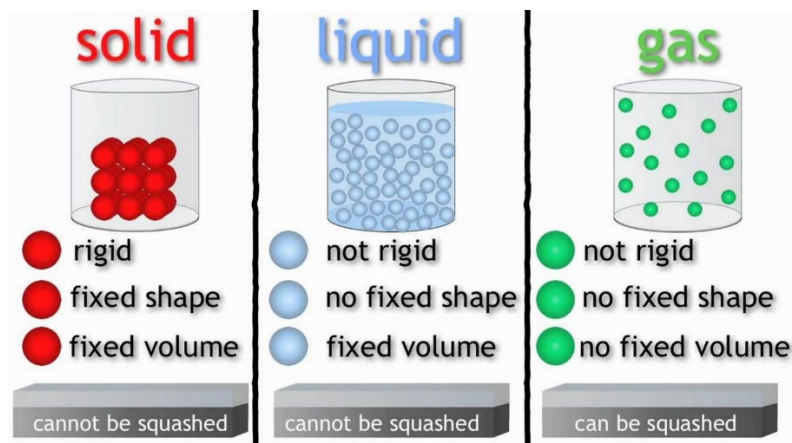


PARTICLE THEORY

Properties of solids, liquids and gases can be described in terms of particles in motion but with differences in the arrangement and movement of these same particles: closely spaced and vibrating (solid), in random motion but in contact (liquid), or in random motion and widely spaced (gas).



Observations where substances change temperature or state can be described in terms of particles gaining or losing energy.

A substance is a solid below its melting point, a liquid above it, and a gas above its boiling point.

Keywords

Particle: A very tiny object such as an atom or molecule, too small to be seen with a microscope.

Particle model: A way to think about how substances behave in terms of small, moving particles.

Diffusion: The process by which particles in liquids or gases spread out through random movement from a region where there are many particles to one where there are fewer.

Gas pressure: Caused by collisions of particles with the walls of a container.

Density: How much matter there is in a particular volume, or how close the particles are.

Evaporate: Change from liquid to gas at the surface of a liquid, at any temperature.

Boil: Change from liquid to a gas of all the liquid when the temperature reaches boiling point.

Condense: Change of state from gas to liquid when the temperature drops to the boiling point.

Melt: Change from solid to liquid when the temperature rises to the melting point.

Freeze: Change from liquid to a solid when the temperature drops to the melting point.

Sublime: Change from a solid directly into a gas.

SEPARATING MIXTURES

Keywords

Solvent: A substance, normally a liquid that dissolves another substance.

Solute: A substance that can dissolve in a liquid.

Dissolve: When a solute mixes completely with a solvent.

Solution: Mixture formed when a solvent dissolves a solute.

Soluble (insoluble): Property of a substance that will (will not) dissolve in a liquid.

Solubility: Maximum mass of solute that dissolves in a certain volume of solvent.

Pure substance: Single type of material with nothing mixed in.

Mixture: Two or more pure substances mixed together, whose properties are different to the individual substances. Air, fruit juice, sea water and milk are mixtures.

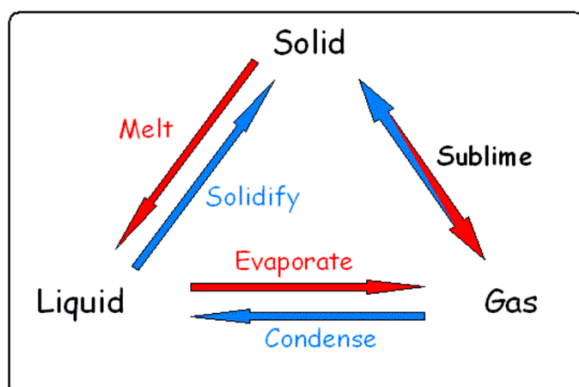
Filtration: Separating substances using a filter to produce a filtrate (solution) and residue.

Distillation: Separating substances by boiling and condensing liquids.

Evaporation: A way to separate a solid dissolved in a liquid by the liquid turning into a gas.

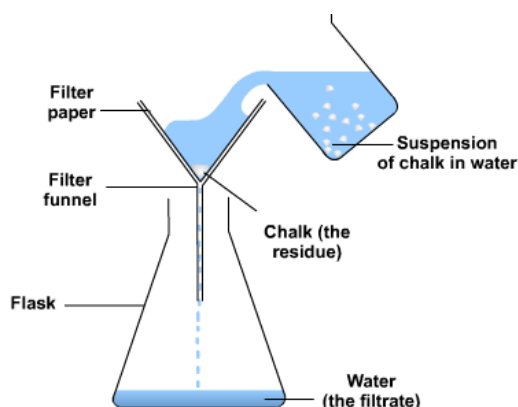
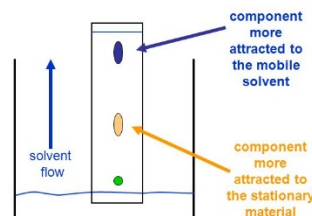
Chromatography: Used to separate different coloured substances.

A pure substance has only one type of element or compound and a fixed melting and boiling point. Mixtures are separated due to differences in their physical properties.

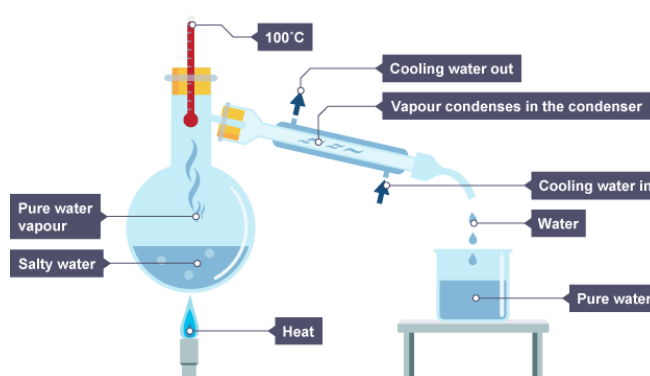


Methods of Separating Mixtures

- **Paper chromatography** is a separation method in which the components of a mixture are attracted differently to other substances not in the mixture.



Filtration



Distillation

The method chosen to separate a mixture depends on which physical properties of the individual substances are different.

Subject	Year 7 Matter
Are solids, liquids or gases rigid?	Solids.
Do solids, liquids or gases have no fixed shape?	Liquids and gases.
Do solids, liquids or gases have a fixed volume?	Solids and liquids.
Can solids, liquids or gases be squashed?	Gases.
Solid → Liquid.	Melt/Melting.
Liquid → Gas.	Evaporate/Evaporating.
Gas → Liquid.	Condense/Condensing.
Liquid → Solid.	Solidify/Solidifying/Freezing.
Solid → Gas.	Sublime/Subliming.
Key word - pure.	Made of one substance only.
Key word - mixture.	More than one substance - not joined together. Easily separated.
Key word - solvent.	Liquid that dissolves something e.g. water.
Key word - solute.	Substance being dissolved e.g. salt.
Key word - dissolve.	Solute mixed with solvent e.g. salty water (brine).
Name three methods of separating mixtures.	Magnet, filter, decant, evaporation, centrifuge, chromatography and distillation.
What does filter paper trap?	Undissolved solids.
Key word - liquid component of the mixture.	Filtrate.
The distillation equipment separates saltwater into what?	Salt and pure water.
Why does the condenser use cooling water?	To condense steam (gas) into water (liquid).

Subject	Year 7 Matter
Are solids, liquids or gases rigid?	
Do solids, liquids or gases have no fixed shape?	
Do solids, liquids or gases have a fixed volume?	
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Solid → Liquid.	
Liquid → Gas.	
Gas → Liquid.	
Liquid → Solid.	
Solid → Gas.	
Key word - pure.	
Key word - mixture.	
Key word - solvent.	
Key word - solute.	
Key word - dissolve.	
Name three methods of separating mixtures.	
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