

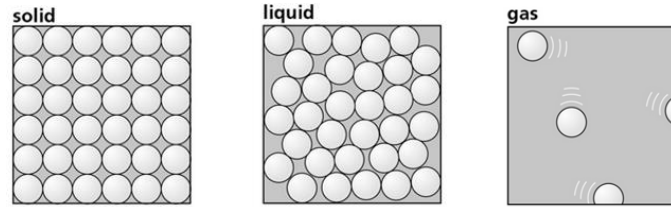
KNOWLEDGE ORGANISER

BIG IDEA: MATTER

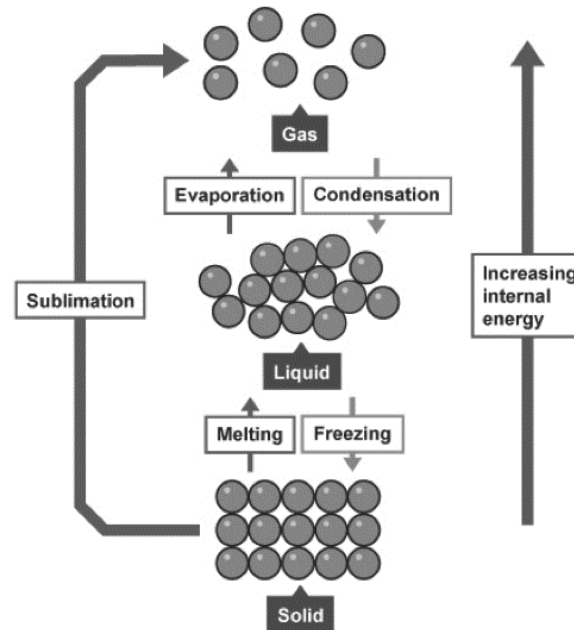
TOPIC: PARTICLE MODEL

| Key Word | Definition |
|--|---|
| 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 |
| density | How much matter there is in a particular volume, or how close the particles are |
| evaporate (evaporating) (evaporation) | Change from liquid to gas at the surface of a liquid, at any temperature |
| boil (boiling) | Change from liquid to a gas of all the liquid when the temperature reaches boiling point |
| condense (condensing) (condensation) | Change of state from gas to liquid when the temperature drops to the boiling point |
| melt (melting) | Change from solid to liquid when the temperature rises to the melting point |
| freeze (freezing) | Change from liquid to a solid when the temperature drops to the melting point |
| sublime (sublimation) | Change from a solid directly into a gas |

There are three states of matter: solid, liquid and gas. 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). This is known as the **particle model** and can be represented by these simple diagrams.

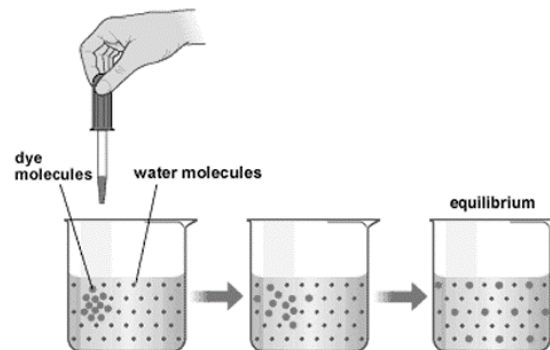
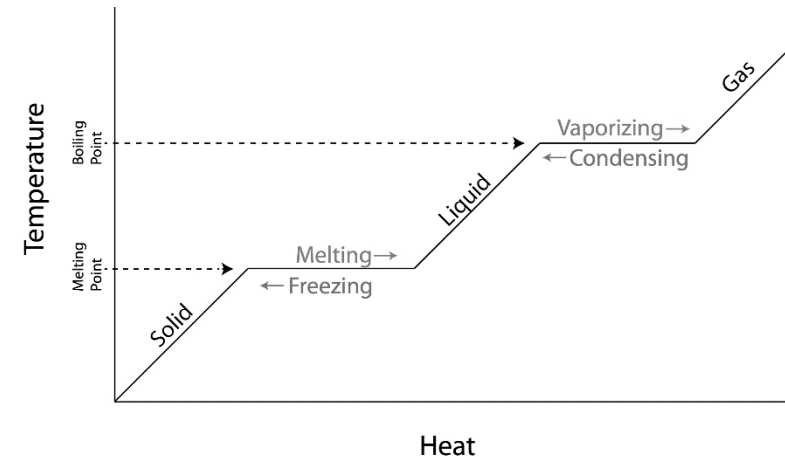


Solids usually have a higher **density** than liquids or gases because they contain more **particles** in a certain volume, the **particles** are therefore closer together. Gases can be compressed (squashed) because there is space between the **particles**.



When substances change state this is because they gain or lose energy. **Melting** and **evaporation** are caused by the **particles** gaining energy from their surroundings. **Condensation** and **freezing** are caused by the **particles** losing energy to their surroundings.

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



Diffusion is where gas or liquid **particles** spread out. They move from an area where there are many particles to an area where there are few particles. The rate (speed) of **diffusion** can be affected by: temperature, particles size and the states of the diffusing substance.