

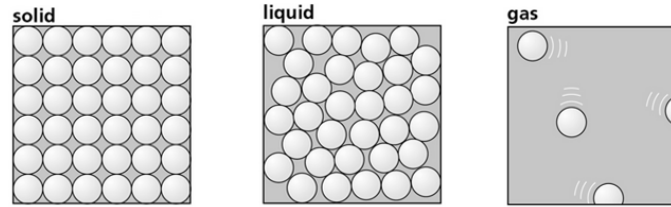
KNOWLEDGE ORGANISER

BIG IDEA: MATTER

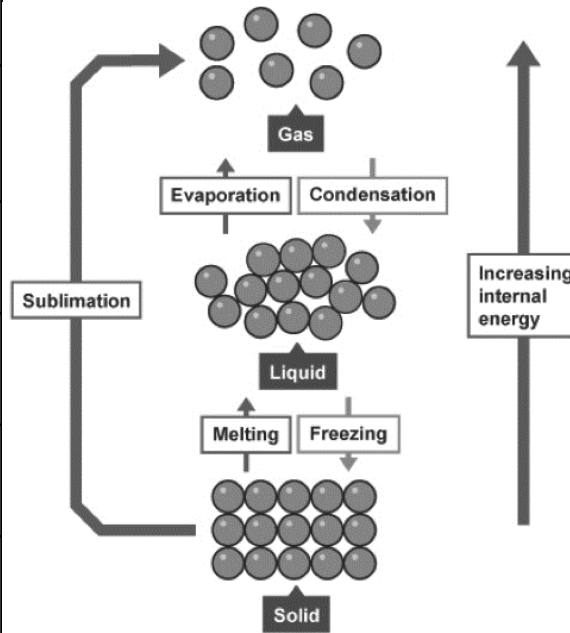
TOPIC: PARTICLE MODEL

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 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
state	Whether a substance is a solid, liquid or 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.

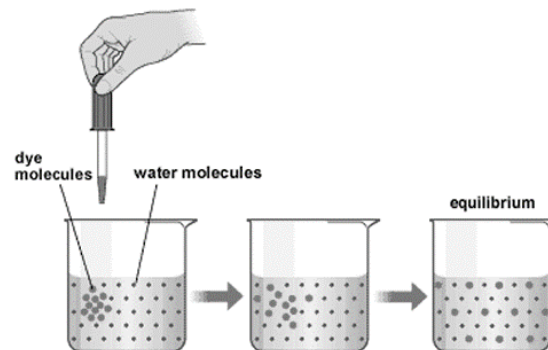
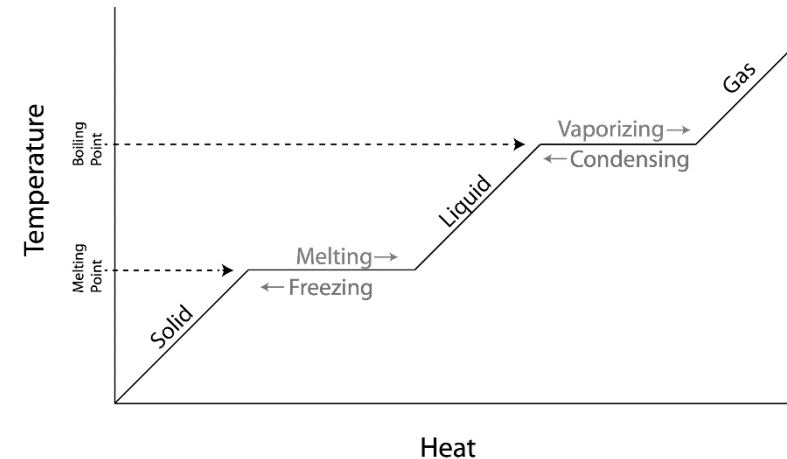


Solids usually have a higher **density** than liquids or gases because they contain more **particles** in a certain volume, the **particles** are therefore closer together. Gases can be compressed (squashed) because there is space between the **particles**.



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.