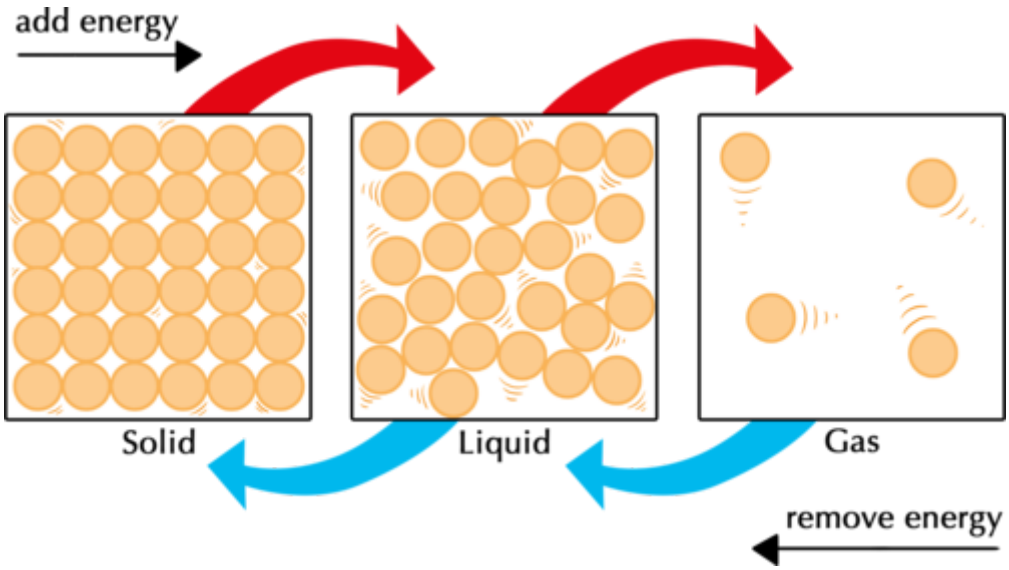
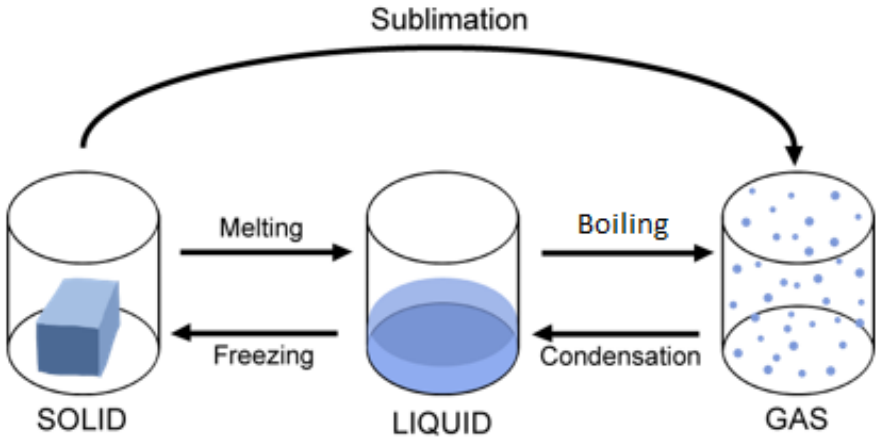
Summary Sheet Year 7 Particle Model:

Particle Arrangement in Solids, Liquids and Gases



State	**Solid**	**Liquid**	**Gas**
Organisation	Particles in regular rows	Particles randomly arranged	Particles randomly arranged
Spacing	Very close together, touching. Can't be squashed	Very close together, some touching. Can't be squashed	Very spaced out. Can be compressed or squashed together
Energy	Lowest energy		Highest energy
Movement	Vibrate in fixed positions	Can move or slip and slide over each other	Move quickly in all directions

Changing States

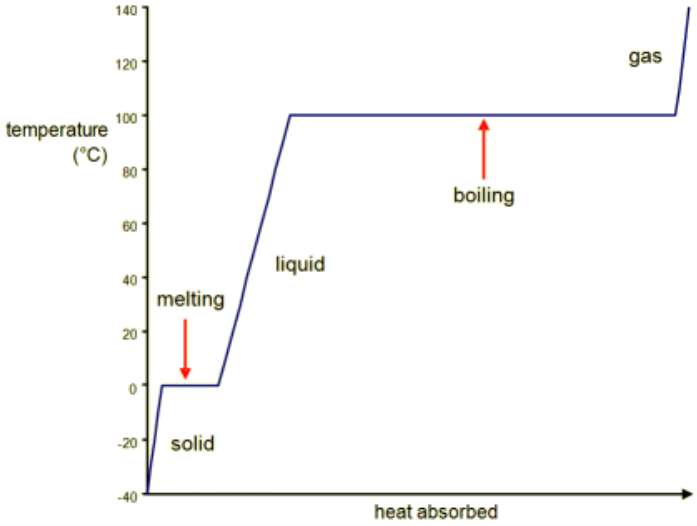


Evaporation is a change from liquid to gas, but can occur well below a liquid's usual boiling temperature

Some substances (carbon dioxide and iodine) can turn directly from a solid into a gas without melting. This is called **sublimation**

Summary Sheet Year 7 Particle Model:

Heating and Cooling Curves



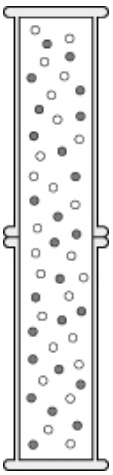
The graph shows a **heating curve**

Ice is heated and the temperature is taken at regular time intervals

The graph levels off (goes flat) where the substance is changing state

The heat energy is being used to separate the particles

Substance will remain at the same temperature until all of it has changed state



Diffusion

Diffusion is the way **particles in liquids or gases spread out** through random movement from where there are many particles to where there are fewer, or from **high to low concentration**

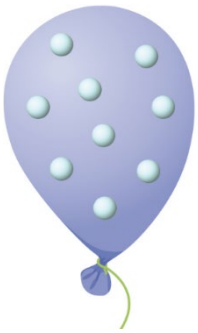
Diffusion is **fastest in gases** (as gas particles have higher energies so move faster), and slower in liquids. Diffusion **will not happen in solids** as the particles are held in fixed positions

Gas Pressure

Pressure is a force caused by gas particles hitting the walls of the container they are in

The **pressure may increase** because:

- container is squashed, making the **volume smaller** - particles hit the walls more often
- number of particles has been increased - **more particles** moving around to hit the walls
- the **temperature increases**, making the particles move faster and hit the walls more often



In a balloon which can stretch and expand, an increase in pressure inside the baloon can make the volume increase. If the pressure becomes too great, the balloon will burst

Air pressure is the pressure caused by air particles around us. If all the air is sucked out of a container, you get a **vacuum** - the container may be squashed

Density

Density is the **mass per unit volume**. Density can be found using the equation:

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

The unit for density is g/cm^3 (or kg/m^3).

Volume has increased from 40 → 70 cm^3 (increased by 30 cm^3)
Mass on a balance gone up from 72 → 105 g (increased by 33 g)

The density of the object = $\frac{\text{mass}}{\text{volume}} = \frac{33\text{ g}}{30\text{ cm}^3} = 1.1\text{ g/cm}^3$

(This answer is to **1 decimal place** or **2 significant figures**)