


Physics Topic 3: Particle model

1. Density

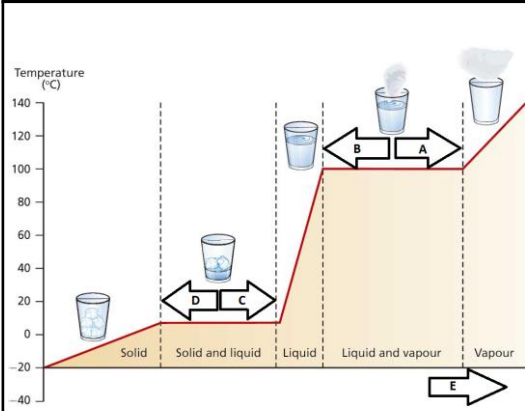
$$\rho = \frac{m}{V}$$

Symbol	Meaning	Unit
ρ	density	kg/m ³
m	mass	kg
V	volume	m ³

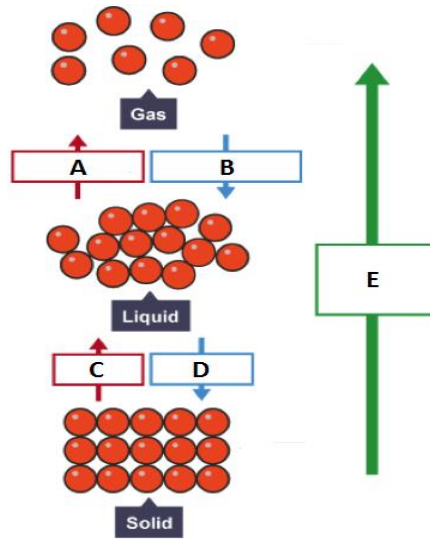
5. Gas properties

Diagram	
Arrangement of particles	Randomly arranged Far apart
Movement of particles	Brownian motion
Energy of particles	Very high energy
Density of substance	Very low density

2. Changes of state



- A. Evaporation/ Vaporisation
- B. Condensation
- C. Melting/ Fusion
- D. Freezing
- E. Increasing internal energy



3. The specific heat capacity

$$\text{Energy transferred, } \Delta E \text{ (joules, J)} = \text{mass, } m \text{ (kilograms, kg)} \times \text{Specific heat capacity, } c \text{ (joule per kilogram per degree Celsius, J/kg}^\circ\text{C)} \times \text{Temperature change, } \Delta\theta \text{ (degree Celsius, }^\circ\text{C)}$$

To find the specific heat capacity of a substance the equation can be rearranged to: $c = \frac{\Delta E}{m\Delta\theta}$

4. The specific latent heat

$$\text{Energy transferred, } \Delta E \text{ (joules, J)} = \text{mass, } m \text{ (kilograms, kg)} \times \text{Latent heat, } L \text{ (joule per kilogram J/kg)}$$

To find the specific latent heat of a substance the equation can be rearranged to: $L = \frac{\Delta E}{m}$

6. Pressure in gases (TRIPLE ONLY)

Change	Effect	Reason
Increase Pressure	Increase volume	More particles so more collisions Increase the force stretching the balloon until the forces balance
Decrease pressure	Decrease volume	Less particles so less collision. Decrease the force causing the balloon to contract until the forces balance
Formula	pV=constant	IF fixed mass and constant temperature