**Physics Topic 3: Particle Model of Matter**

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| **Definitions** | | | **Equations to memorise** | | | |
| 1 | Specific Heat Capacity | The energy required to increase the temperature of 1 kg of a substance by 1°C | 1 |  | |  |
| 2 | Specific Latent Heat | The energy required to make a 1kg of a substance change state | **Equations given to you** | | | |
| 3 | melting | State change from solid to liquid | 1 | change in thermal energy = mass  × specific heat capacity × temperature change | |  |
| 4 | freezing | State change from liquid to solid | 2 | thermal energy for a change of state = mass × specific latent heat | | *E* = *m L* |
| 5 | evaporating | State change from liquid to gas without reaching boiling point | **Diagrams** | | | |
| 6 | sublimating | State change directly from solid to gas | **Cooling by evaporation**  Particles with enough kinetic energy can escape a liquid and become a gas. This reduced the average kinetic energy of the liquid. | | **Gas Pressure** is caused by the force exerted when particles collide with their container | |
| 7 | boiling | State change from liquid to gas at boiling point |
| 8 | condensing | State change from gas to liquid |
| 9 | Kinetic Energy | Movement energy in the particles in a substance (gases have the most because particles move fastest) |
| 10 | Potential Energy | Stored energy in the particles in a substance (gases have the most because particles are furthest away) |
| 11 | Internal energy | Total kinetic and potential energy in a substance |
| **Units** | | | **Temperature of a substance as state changes** | | **Changing volume and pressure**    Halving the volume of a container will double the pressure of the gas because the particles will hit the sides more often (if the temperature is constant).  Pressure x Volume = constant | |
| 1 | density | Kilograms per metre cubed (kg/m3) |
| 2 | mass | Kilograms (kg) |
| 3 | volume | Metres cubed (m3) |
| 4 | Thermal energy | Joules (J) |
| 5 | Temperature | Degrees Celcius (°C) |
| 6 | Specific heat capacity | Joules per kilogram per degree Celsius  (J/kg°C) |
| 7 | Specific latent heat | Joules per kilogram (J/kg) |