Definitions and Concepts for WJEC (Wales) Physics GCSE

Topic 1.8: Kinetic Theory

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Absolute Zero: The lowest possible temperature. At this temperature the particles have no kinetic energy and so are completely stationary.

Change in Thermal Energy: The product of the mass, specific heat capacity and temperature change of a substance.

Chemical Changes: Changes to the chemical structure of a substance. The substance does not usually restore its original properties when the changes are reversed.

Condensation: **The changing from vapour state to a liquid state, when a substance is cooled.**

Evaporation: **The changing from liquid state to a vapour state, when a substance is heated.**

Freezing: **The changing from a liquid state to a solid state, when a substance is cooled.**

Gas Temperature: The temperature of a gas is directly proportional to the average kinetic energy of its molecules.

Gas: A state of matter in which the particles are spread apart and have high kinetic energies. Any intermolecular forces acting between the particles are very weak.

Kelvin: The SI unit of temperature, based on an absolute temperature scale. To convert from degrees Celsius to degrees Kelvin, subtract 273 degrees.

Latent Heat: The energy required for a substance to change state.

Liquid: A state of matter in which the particles are in contact, but can flow over each other. Intermolecular forces act between the particles.

Melting: **The changing from solid state to liquid state, when a substance is heated.**

Pascals: The unit of pressure, equal to a force of one Newton acting perpendicular to an area of one metre squared.

Physical Changes: Changes to the physical properties of a substance which can be reversed. Changes of state are physical changes since substances can restore their original properties when the changes are reversed.

Pressure of a Gas: The perpendicular force per unit area acting on the surfaces of a container as a result of the gas particles colliding with it.

Pressure: The force acting perpendicular to a surface, per unit area.

Pressure-Volume Relationship: **When at a constant temperature, the volume of a fixed quantity of gas is inversely proportional to its pressure.**

Pressure-Temperature Relationship: **When at a constant volume, the pressure of a fixed quantity of gas is directly proportional to its absolute temperature.**

Solid: A state of matter in which the particles are tightly packed together and can only vibrate about their fixed positions. Strong intermolecular forces act between the particles

Specific Heat Capacity: The amount of energy needed to increase the temperature of one kilogram of a given substance by one degree Celsius.

Specific Latent Heat of Fusion: The amount of energy needed to change the state of one kilogram of a substance from solid state to liquid state, whilst held at constant temperature.

Specific Latent Heat of Vaporisation: The amount of energy needed to change the state of one kilogram of a substance from liquid state to vapour state, whilst held at constant temperature.

Specific Latent Heat: The amount of energy needed to change the state of one kilogram of a substance, whilst held at constant temperature.

Temperature: A measure of the average kinetic energy of the particles in a substance. An increase in temperature will result in an increase in the particles' kinetic energies and velocities.

Volume-Temperature Relationship: **When at a constant pressure, the volume of a fixed quantity of gas is directly proportional to its absolute temperature.**