IFP Physics Vocabulary List

Term 1:

- Base unit – a fundamental unit.
- Derived unit – a unit which can be written as combination of base units.
- Current – charge passing a point per unit time.
- Amp – a base unit – can be expressed a number of coulombs of charge passing a point per second.
- Voltage – the work done per charge.
- Volt – joules per coulomb.
- Ohm's law – current is directly proportional to potential difference for a component with constant resistance at constant temperature.
- EMF – work done per charge into electrical energy.
- PD – work done per charge from electrical energy into other forms.
- Resistance – the ratio of potential difference across a component to the current through that component.
- Ohm – the resistance of a component at which 1 amp flows when 1V is applied.
- Power – the work done per unit time.
- Watt – when 1 joule of work is done in one second .
- Drift velocity – the average velocity of the large number of charge carriers in a wire.
- Resistivity $= \frac{resistance\ of\ a\ section\ of\ wire \times cross\ sectional\ area\ of\ the\ wire}{length\ of\ the\ wire}$.
- Light intensity – the power per unit area falling on a surface.
- Magnetic flux density. Magnetic flux density B is defined using the equation $B = \frac{F}{IL}$ where F is the force acting on a normally on a wire of length L carrying current I in a magnetic field with flux density B. It is proportional to the number of field lines acting normally per unit area.
- Magnetic flux – the magnetic flux is proportional to the number of field lines. $\phi = BA$.
- Magnetic flux linked – The flux linked is proportional to the number of field lines passing through a turn of a coil. If there are more turns then you must multiply by the number of turns. i.e. $N\phi$.
- Faraday's law – the amount of EMF induced is directly proportional to the rate of change of magnetic flux linked.
- Lenz's law – The EMF induced by a change of flux will always be in the direction to oppose that change.

Term 2:

- Vector – a quantity which contains a magnitude and a direction.
- Scalar – a quantity which only contains a magnitude.
- Displacement – distance from an original point in a specified direction.
- Speed – rate of change of distance with time.
- Velocity – rate of change of velocity with time.
- Acceleration – rate of change of velocity with time.
- Freefall – an object moving under the force of weight alone.
- Linear motion – motion with a constant acceleration.
- Force – a push or a pull.
- Newton – the amount of resultant force which will cause an object of mass 1kg to accelerate at $1ms^{-2}$.
- Newton's First Law – an object with zero resultant force will continue moving at a constant velocity or, if at rest, remain at rest
- Newton's Second Law – the acceleration of an object with constant mass is directly proportional to the applied resultant force.
- Newton's Third Law – if object A exerts a force on object B then object B exerts a force on object A with equal magnitude and opposite direction. The forces are of the same type and act in the same line and for the same time.
- Work done – $force \times distance\ moved\ in\ the\ direction\ of\ the\ force$.
- Joule – the amount of work done when an object is moved a distance of 1m with a force of 1N.
- Power – the work done per unit time.
- Watt – the amount of power when 1J is transferred in 1second.
- Efficiency - $\frac{useful\ energy\ (or\ power)\ out}{total\ energy\ (or\ power) in}$.
- Density $= \frac{mass}{volume}$.
- Pressure $= \frac{force}{surface\ area}$.
- Laminar – a type of flow where the flow lines do not cross and the fluid remains in layers.
- Turbulent – a type of flow where the flow lines cross and layers mix. Eddy currents may also be present.
- Eddy Current – where the flow of a fluid moves in a circle.
- Viscosity - the resistance of a liquid to flow. Can be measured using the coefficient of viscosity which is defined as $\eta = \frac{drag\ force}{6\pi \times radius\ of\ object \times speed\ of\ object}$.
- Terminal Velocity – the maximum velocity which an object can move given a constant driving force. Occurs when the driving force is balanced by a drag force.
- Stiffness – a measure of how much force is required to change the shape of a material. Measured by the spring constant which is the force per unit extension.
- Limit of proportionality – when a material stops obeying Hooke's law and beyond which the force is no longer directly proportional to extension.
- Elastic – a type of deformation which when the force is removed the material returns to its original shape.
- Plastic – a type of deformation which when the force is removed the material does not return to its original shape.

- Elastic limit – the point at which plastic deformation begins.
- Yield point – the point at which significant plastic deformation begins and the material continues to extend without any additional force being applied.
- Stress $= \frac{force}{cross\ sectional\ area}$.
- Strain $= \frac{extension}{original\ length}$.
- Youngs's Modulus $\frac{tensile\ stress}{tensile\ strain}$.
- Tensile – under tension (i.e. being stretched).
- Compressive – under compression (i.e. being squashed).
- Ductile – a material which shows significant plastic deformation under tension – i.e. it can easily be drawn into wires.
- Malleable – a material which shows significant plastic deformation under compression – i.e. it can easily be hammered into sheets.
- Strong – can withstand a large force or stress before breaking. Strength can be measured using the Ultimate Tensile Stress.
- Hard – not easy to scratch or dent.
- Tough – can absorb a large amount of energy before breaking.
- Stiff – requires a large force to change in shape. Stiff materials have a large youngs modulus.
- Brittle – will break before any plastic deformation.

Term 3:

- Radian – the angle subtended by an arc of a circle whose length is equal to the radius of the circle.
- Period – the time taken for an object to complete one revolution.
- Frequency – the number of revolutions per second.
- Angular velocity – this is defined as $\omega = \frac{angular\ displacement}{time} = \frac{\theta}{t}$ but here is a specific angle (2π) and time (the period, T) for one complete revolution and so this can also be written as $\omega = \frac{2\pi}{T}$.
- Angular frequency $\omega = 2\pi f$.
- Centripetal force – a resultant force acting towards a centre of the circle. It is always perpendicular to the velocity.
- Centripetal acceleration – the "centre seeking" acceleration of an object moving in a circle. It is always perpendicular to the velocity.
- Apparent weightlessness – when the normal reaction between the person and the surface is zero. This usually occurs in freefall.
- Gravitational field strength – force per unit mass acting at a point.
- Gravitational field line – a line showing the direction of the gravitational force which acts on a test mass.
- Newton's Law of Gravitation – the force between two masses is directly proportional to the product of the masses and inversely proportional to the square of the distance between them. $F = \frac{GMm}{r^2}$.
- Geostationary orbit – the orbit of a satellite that appears stationary when observed from the surface of the earth. Have a period of 24 hours and are directly above the equator.
- Polar orbit – an orbit that passes over the two poles of the earth.
- Low earth orbit – an orbit that is relatively close to the surface of the earth. These typically have a period of around 90minutes.
- Kepler's Third Law – the period of an orbit squared is directly proportional to the radius of the orbit cubed. $T^2 \propto r^3$.

Practical Skills:

- Independent variable – in an experiment the independent variable is the variable which you adjust.
- Dependent variable – in an experiment the dependent variable is the variable which you observe changing as you adjust the independent variable
- Control variable – in an experiment a control variable is kept constant but if it were to be changed then it would affect the relationship between the independent and dependent variables.
- Percentage difference $\frac{accepted\ value - measured\ value}{accepted\ value} \times 100$