Physics AS - Unit 2 - Mechanics, Materials and Waves - Definitions

- **Moment –** Force multiplied by perpendicular distance between force and the pivot
- **Principle of moments –** States that for an object to be in equilibrium the sun of the anticlockwise moments equals the sum of the anticlockwise moments (no turning moment)
- **An Object is in equilibrium if:**
    - Sum of anticlockwise moments = sum of clockwise moments
    - All vertical forces cancel and all horizontal forces cancel
- **A Couple –** A pair of opposite and equal forces separated by distance d, acting about point p, the turning effect at point p is equal to one of Forces multiplies by the perpendicular distance between the forces
- **Centre of mass –** Where all of an objects mass appears to act about and moments cancel
- **A Newton –** Force required to accelerate 1kg by $1ms^{-2}$
- **A Joule –** Work done 1N through a distance of 1m in direction of force
- **Law of conservation of energy –** energy is never created or destroyed just converted between different types
- **Hooke's Law –** The extension of a spring is proportional to the force applied to it as long as the limit of proportionality is not exceeded
- **Stress –** Force per unit area
- **Strain –** Ratio of extension to original length
- **Young's Modulus –** Stiffness constant of a material
- **A longitudinal Wave –** a propagating wave with oscillations in the same direction as propagation/energy transfer
- **A transverse wave –** A propagating wave with oscillations perpendicular to the direction of propagation
- **Transverse waves can be polarized but longitudinal waves cannot**
- **Stationary wave –** Formed when 2 waves of similar frequency travelling in opposite directions interfere and the resultant wave is the vector sum of each waves displacements at that point by the principle of superposition
- **Diffraction –** Spreading out of a wave when passed through a slit of around an obstacle
- **Coherent Sources –** Same frequency and constant phase relationship
- **Constructive Interference occurs –** 2 waves intersect and interfere through principle of superposition and the resultant displacement I the vector sum of the 2 waves displacement at that point and the phase difference between the 2 waves at that point is a whole number of wavelengths (destructive when 180 degrees phase difference – half number of wavelengths)
- **Differences between single and double slit diffraction –**
    - Single – Wide central maxima 2x width of others and reduction in intensity going away
    - Double – Same intensity same width going out