P11 Wave Properties Knowledge Organiser (H)

Mechanical wave	•A wave made up of vibrations travelling through a medium •E.g. Water, sound waves, waves on springs •Must have a medium to travel through
Electromagnetic wave	•An electrical and magnetic disturbance that transfers energy from a source to an absorber •All EM waves travel at 3 x 10^8 m/s (the speed of light!) •E.g. Visible light, X-rays, Infrared
Transverse wave	•A wave that oscillates perpendicular (90^o) to the direction of energy transfer •All EM waves are transverse.
Longitudinal wave	•A wave that oscillates parallel to the direction of energy transfer. •Sound waves are longitudinal
Peak/crest	•The maximum height above the zero line for a wave (maximum positive displacement)
Trough	•The maximum depth below the zero line for a wave (maximum negative displacement)
Amplitude	•The maximum positive or negative displacement of a point on a wave from the rest position •To measure, measure from the zero line to the highest part of a peak or lowest part of a trough
Wavelength, λ	•The distance from a point on one wave to the same point on the next wave, i.e. Peak to peak •Measured in m
Frequency, f	•The number of waves passing a particular point per second •Measured in Hertz, Hz •1 Hz = 1 wave per second
Period , T	•The time taken for one complete oscillation •Period T = 1 ÷ f •Measured in s

Wave speed , v	•The speed at which a wave moves through a medium •This can be calculated if we know the frequency and wavelength of a wave • v = f x λ •Measured in m/s •All EM waves travel at the speed of light, 3 x10^8 m/s
Incident wave	•The wave that comes from a source and interacts with a boundary/medium
Reflection	•Angle of incidence, i = angle of reflection, r
Refraction	•When waves move from one medium to another at a non-zero angle to the boundary between the two substances, the wavefronts change direction. •Caused because wavefronts travel at different velocities (and therefore wavelengths) in the different media. •Because part of the wavefront changes direction before the rest of it, it slows down first and is refracted towards the normal.
Transmission	•When waves aren't absorbed by the medium they travel through and pass through it. •This depends on the wavelength of the waves
Absorption	•When some of the energy from the waves travelling through a medium is transferred to the medium. •This depends on the wavelength of the waves.
Investigating waves	•To measure the speed of sound in air, time how long a sound wave takes to reach a wall and echo back. Use the formula s = 2d ÷ t to calculate the speed •A ripple tank can be used to measure wave speed of water waves.

Key Equations To Learn	
Wave Speed, v	Wave speed = frequency x wavelength v = f x λ