**Physics Topic 6: Waves**

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| **Definitions** | **Diagrams** |
| 1 | Wave | A vibration that transfers energy from one place to another without transferring matter. | **The Electromagnetic Spectrum** |
| 2 | Transverse | Vibrations are at right angles to the direction of travel e.g. water waves. |
| 3 | Longitudinal | Vibrations are parallel to the direction of travel e.g. sound waves. |
| 4 | Compression | Areas in a longitudinal wave where the particles are closer together (high pressure). |
| 5 | Rarefaction | Areas in a longitudinal wave where the particles are further apart (low pressure). | **Wave form diagram**Image result for wave diagram ks4 | **Refraction ray diagram**Image result for refraction ray diagram |
| 6 | Amplitude | The distance between the rest position and the peak (or trough) of a wave. |
| 7 | Wavelength | The distance from a point on one wave to the equivalent point on the next wave. |
| 8 | Frequency | The number of waves passing a point in one second. |
| 9 | Time period | The time taken for one complete wave. |
| **Uses of Electromagnetic Spectrum** |
| 1 | Radio waves | television and radio | **Higher Tier only** |
| 2 | microwaves | satellite communication and cooking | 1 | Radio wave production | Radio waves are produced by oscillations in electrical circuits |
| 3 | infra-red | infra-red cameras, cooking food, heaters |
| 4 | visible light | fibre optic communication | 2 | Radio wave absorption | When radio waves are absorbed they create an alternating current in the same frequency as the wave itself |
| 5 | ultraviolet | energy efficient lamps, sun beds |
| 6 | x-rays and gamma rays | medical imaging and treatments | 3 | Transmit | Allow radiation to pass through |
| 4 | Absorb | Stop radiation from passing through and take the energy in |
| Dangers of Electromagnetic spectrum | 5 | Reflect | Throw back radiation without absorbing it |
| 1 | ultraviolet | Sun burn, premature skin ageing and skin cancer | 6 | Refract | Make radiation change direction and speed when it enters at an angle |
| **Wave front diagram: Refraction**AirWave frontsWave fronts move slower in glassBoundaryThus their direction changesglass |
| 2 | x-rays and gamma rays | Ionising radiation. Can cause the mutation of genes and cancers |
| **Equations** |
| 1 | *v= f λ* | wave speed = frequency x wavelength |
| 2 | $$T=\frac{1}{f}$$ |  |