

Year 11 Physics Curriculum Overview - Term 1

Unit 5: Forces. Key topics include:

- **Types of Forces:** Understanding contact and non-contact forces, including gravity, friction, air resistance, tension, and normal contact force.
- **Newton's Laws of Motion:** A deep dive into Newton's First, Second, and Third Laws, which describe how forces affect the motion of objects.
- **Force Calculations:** Using equations such as $F=ma$ (force = mass \times acceleration) to calculate resultant forces and predict the motion of objects.
- **Work Done and Energy Transfer:** Understanding how forces do work and transfer energy, using the equation $W=Fd$ (work = force \times distance).
- **Elasticity and Hooke's Law:** Investigating how materials stretch and compress, focusing on elastic and inelastic deformation, and the relationship between force and extension.
- **Momentum:** An introduction to the concept of momentum, how it is calculated, and how it applies to collisions and explosions.
- **Motion in Fluids:** Exploring terminal velocity and factors that influence how objects move through liquids and gases. Students will also conduct practical investigations, including measuring the extension of a spring and analysing motion using trolleys and ramps.

Unit 6: Waves. Key topics include:

- **Types of Waves:** Differentiating between transverse and longitudinal waves, understanding their properties, and how they propagate.
- **Wave Calculations:** Using the wave equation $v=f\lambda$ (wave speed = frequency \times wavelength) to calculate properties of waves.
- **Reflection, Refraction, and Diffraction:** Understanding how waves change direction when they encounter different materials or obstacles.
- **The Electromagnetic Spectrum:** Exploring the properties of different types of electromagnetic radiation, from radio waves to gamma rays, and understanding their applications in communication, medicine, and technology.
- **Sound Waves:** Investigating how sound travels through different mediums and the factors that affect its speed and intensity.
- **Seismic Waves:** A look at how waves are used to study the Earth's structure, focusing on how seismic waves help us understand earthquakes and the Earth's layers. Practical work will involve measuring wave properties in water and on a string, investigating the reflection of light, and exploring the refraction of waves through different mediums.