

Progression Model – Year 12 Physics

Module Title:	Module Title:	Module Title:
Electricity and Waves	Forces and Particles	Forces, Materials and Quantum Phenomena
Learning Intent for this module: Students will build upon their GCSE knowledge by developing a deeper understanding of waves and current electricity. Throughout this module they will learn about the mathematical aspects of physics as well as the fundamentals of measurement and errors. These topics will provide an essential foundation to later study in A Level Physics. <u>Weeks 1-11</u> • Measurements and their errors • Waves • Optics • Electric Current • DC Circuits <u>Weeks 12-13</u> Consolidation and enrichment	Learning Intent for this module: In this module, students will build upon the mathematical foundation that they built in module one. Students will progress from GCSE Physics into a deeper understanding of Newtonian physics and the brave new world of particles physics. They will then look at the fundamentals of atom and how we break them down into the constituent parts. Students will start to develop their understanding of mechanics by applying Newton's laws of motion. <u>Weeks 1-11</u> • Forces in Equilibrium • Newton's Laws of Motion • Matter and Radiation • Quarks and Leptons <u>Weeks 12-13</u> Consolidation and enrichment	Learning Intent for this Module: In this module, students will move onto momentum, materials and quantum phenomena. The foundation they have developed over this first year will support them in study of the more abstract concepts of momentum and quantum phenomena. <u>Weeks 1-11</u> • Momentum • Work, energy and power • Materials • Quantum Phenomena <u>Weeks 12-13</u> Consolidation and enrichment

Key Content to be learned: Students will start this module by learning about the current potential difference and resistance alongside waves and vibrations and wave properties. They will then move onto learning about components and their characteristic, circuit rules and stationary and progressive waves. Students will learn about more about resistance together with using an oscilloscope. In the waves topic, students will develop their learning about optics and develop an understanding of diffraction, interference and diffraction grating. In the current electricity topic, students will apply their knowledge of electricity to concepts including the emf, internal resistance and potential dividers.	Key content to be learned: In this module students will learn about mechanics and particles includes looking at forces in equilibrium, motion in a straight line and matter and radiation. In particles topic, they will learn about stable and unstable nuclei, photons and matter and antimatter. In forces topic, students will learn about projectile motion, force and acceleration and vehicle safety. Finally students will learn about conservation rules for particle interactions to determine if an interaction will possibly occur and conditions for terminal velocity.	Key Content to be learned: In this final module, students will learn about momentum, impulse and the conservation of momentum as well as the photoelectric effect and collision of electrons with atoms. They will study elastic and inelastic collisions and explosions. Students will also learn about work, energy and efficiency. They will study the density of materials and the deformation of solids together with stress and strain. Students will develop ideas on energy levels in both the atom and spectra leading onto wave-particle duality.
Prior knowledge: • Types of waves • Wave properties • Electromagnetic spectrum and uses • Electric circuits and components • Current electricity • Resistance and Ohm's law	Prior knowledge: • Forces • Types of Forces • Effects of Forces • Atomic Structure • Models of the Atom	Prior knowledge: • Work done • Conservation of energy • Atomic structure • Waves properties
Key tasks for this module: • Measurements and their errors • Electric Current • DC Circuits • Waves • Optics • All topics	Key tasks for this module: • Forces in Equilibrium • Newton's Laws of Motion • Matter and Radiation • Quarks and Leptons • All topics	Key tasks for this module: • Momentum • Work, energy and power • Materials • Quantum Phenomena • Mock exams