

Progression Model – Year 13 Physics

Module Title:	Module Title:	Module Title:
Further Mechanics, Fields and Thermal Physics	Fields, Nuclear physics and Astrophysics	Astrophysics and Exam Preparation
Learning Intent for this module: Students will begin year 13 by learning about periodic motion which builds on their prior knowledge of forces. Students will go onto to apply these principles to gravitational and electric fields. Students will develop their knowledge of thermal which builds on their prior knowledge of matter and kinetic theory. <u>Weeks 1-11</u> • Further mechanics • Gravitational fields • Electric fields • Thermal Physics <u>Weeks 12-13</u> Consolidation and enrichment	Learning Intent for this module: Students will develop their knowledge of magnetic fields, nuclear physics and telescopes which builds on their prior knowledge of particles, kinetic theory and optics. They will go onto study magnetic fields and gases, radioactivity and nuclear stability. Electromagnetic induction is studied after capacitance both developing their understanding of fields. Finally they will study the many types of telescopes we can use to observe the night skies. <u>Weeks 1-11</u> • Magnetic fields • Capacitance • Electromagnetic induction • Radioactive Decay • Nuclear Stability • Telescopes <u>Weeks 12-13</u> Consolidation and enrichment	Learning Intent for this Module: In this module, students will build on their previous telescope topic by completing the astrophysics option topic. They will also study surveying skies and cosmology allowing them to understand their place in the universe. <u>Weeks 1-4</u> • Surveying the skies • Cosmology <u>Weeks 5-13</u> • External examinations

Key Content to be learned: In this module, students will learn about motion in a circle in which concepts such as centripetal forces and acceleration. Applying these ideas to simple harmonic motion. Students learn about electric and gravitational fields including potentials, potential differences and potential energy. They also will develop a deep understanding of thermodynamics. They will begin by looking at internal energy and temperature then change of state. After this they will apply kinetic theory to the ideal gases laws and then investigate the experimental gas laws.	Key content to be learned: In this module students will study magnetism and apply this to electromagnetic induction. Likewise they will apply electric fields to capacitance studying energy in a capacitors and the charging and discharging of the capacitors. They will then move on to learning about decay and the uses of radioactive isotopes. To complete nuclear physics students will study energy and mass and binding energy and their application in nuclear power. In the final topic of the module they will start the astrophysics option topic.	Key Content to be learned: Finally, the students get to make star measurements, classify and understand how a star evolves. They will then develop their astrophysics knowledge further by studying red shift, galaxies, quasars and the expansion of the universe.
Prior knowledge: • Year 12 Mechanics • Year 12 Electricity • KS4 Static Electricity • KS4 Kinetic theory of gases •	Prior knowledge: • Atomic structure • Particle physics	Prior knowledge: • Year 12 Optics • KS4 Space
Key tasks for this module: • Further Mechanics • Measurements and their Errors • Fields • Thermal Physics • Mock exam (weeks 8/9)	Key tasks for this module: • Radioactive Decay • Nuclear Stability • Capacitance • EM Induction • Mock exam	Key tasks for this module: • Telescopes • Astrophysics • External examinations