

Progression Model – Year 13 Physics

Module Title: Further Mechanics and Fields	Module Title: Thermal Physics, Nuclear physics and Astrophysics	Module Title: Astrophysics and Exam Preparation
<p>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, electric and magnetic fields. Electromagnetic induction is studied after capacitance both developing their understanding of fields.</p> <p><u>Weeks 1-11</u></p> <ul style="list-style-type: none"> • Further mechanics • Gravitational fields • Electric fields • Magnetic fields • Capacitance • Electromagnetic induction <p><u>Weeks 12-13</u> Consolidation and enrichment</p>	<p>Learning Intent for this module: Students will develop their knowledge of thermal, nuclear physics and telescopes which builds on their prior knowledge of particles, kinetic theory and optics. They will go onto study thermal physics and gases, radioactivity and nuclear stability. Finally they will study the many types of telescopes we can use to observe the night skies.</p> <p><u>Weeks 1-11</u></p> <ul style="list-style-type: none"> • Thermal Physics • Radioactive Decay • Nuclear Stability • Telescopes <p><u>Weeks 12-13</u> Consolidation and enrichment</p>	<p>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.</p> <p><u>Weeks 1-4</u></p> <ul style="list-style-type: none"> • Surveying the skies • Cosmology <p><u>Weeks 5-13</u></p> <ul style="list-style-type: none"> • External examinations
<p>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 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.</p>	<p>Key content to be learned: In this module students will develop a deep understanding of thermodynamics and nuclear decay. 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. They will then move on to learning about of 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</p>	<p>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.</p>

	<p>final topic of the module they will start the astrophysics option topic.</p>	
Prior knowledge: <ul style="list-style-type: none"> • Year 12 Mechanics • Year 12 Electricity • KS\$ Static Electricity 	Prior knowledge: <ul style="list-style-type: none"> • KS4 Kinetic theory of gases • Atomic structure • Particle physics 	Prior knowledge: <ul style="list-style-type: none"> • Year 12 Optics • KS4 Space
Key tasks for this module: <ul style="list-style-type: none"> • Further Mechanics • Fields • Capacitance • FEM Induction • Mock exam (weeks 8/9) 	Key tasks for this module: <ul style="list-style-type: none"> • Radioactive Decay • Nuclear Stability • Thermal Physics • Practical write up – Gas laws • Mock exam 	Key tasks for this module: <ul style="list-style-type: none"> • Telescopes • Astrophysics • External examinations