

Physics Year 12	
Half term 1	<p><u>Maths Skills for Physics</u> Students develop knowledge and understanding of key skills paramount for the course. This includes algebra, graph skills, geometry and trigonometry. Practical skills are developed to include error analysis and uncertainty calculations.</p> <p><u>Mechanics</u> Students develop key stage 4 knowledge and understanding of forces and their interactions. This progresses to a deeper understanding of Newton's Laws of Motion, projectile motion, momentum and impulse. This is an in-depth and extended unit that seeks to develop a better understanding of how objects around us move.</p>
Half term 2	<p><u>Particle Theory</u> Students are introduced to the weird and wonderful world of the very small, from anti-particles and photons, to quarks and strange particles, exploring a world they were probably unaware even existed.</p> <p><u>Electromagnetic Radiation and Quantum Phenomena</u> Is it a particle or is it a wave? That is the question! Students gain a deeper understanding of energy and the subatomic insights we gained from relatively simple experiments, which had immense impact on the early development of quantum physics.</p>
Half term 3	<p><u>Electricity</u> Students further develop key skills and knowledge from GCSE in order to gain a deeper understanding of the relationships within electric circuits. Practical work allows the application of theory, reinforcing core scientific skills.</p>
Half term 4	<p><u>Waves</u> Following an outline introduction to the general properties of waves, students then take a deeper dive into their extraordinary behaviour, including the profound implications of Young's diffraction results.</p> <p><u>Electricity (cont.)</u> Further development of theory and practical skills, such as conservation of charge and energy, as well as the fundamental importance of such simple devices as the potential divider.</p>
Half term 5	<p><u>Materials</u> Building on the knowledge gained from studying forces, students now explore their effects on everyday materials, showing the importance which abstract ideas such as forces have in the real world.</p>
Half term 6	<p><u>Thermal Physics</u> Students now focus on the relationship between energy and the behaviour of gases, by exploring the relationship between volume, pressure and temperature and the resulting behaviour of the gas. This unit is of particular benefit to students who are also studying A-Level Chemistry.</p>
Independent study expectations	<p>During the course of the year students will be set extended and rigorous work in order to develop their knowledge, understanding and application skills. This will include questions to check foundation knowledge; exam questions to ascertain understanding; and extension material to develop application skills. In addition, students are expected to independently read around the subject.</p>
By the time you finish key stage 5 you'll be...	<p>.....in a position where you are able to pursue a career in Physics at university or associated areas such as engineering. You will be confident in the planning, execution and evaluation of practical work; a skill that is transferable into many industries.</p>

Physics Year 13	
Half term 1	<p><u>Nuclear Physics</u> Students develop their knowledge of how our understanding of the structure of the atom has changed. Students will now explore how the dimensions of the atom were discovered and calculated. They will then move on to investigate the properties of nuclear radiation and its decay; nuclear fission, fusion and reactors; 'missing' mass and what holds nuclei together.</p> <p><u>Further Mechanics</u> Students build on learning from Year 12. This year they study swinging objects and how objects move in circular orbits. This then links on to later work in respect of fields. Oscillations and free/forced vibrations are also examined.</p>
Half term 2	<p><u>Gravitational and Electric Fields</u> Students now enter the strange world of fields both on the large and the small scale. They will investigate the effect of masses on one another and their subsequent effect in terms of orbits, force and potential. Students will start to develop their application of knowledge and Math skills across disciplines.</p> <p><u>Magnetic Fields</u> Students will further extend their knowledge of fields and the inter-locking relationship between different types of field resulting in differing phenomena. The invisible world with very visible results!</p>
Half term 3	<p><u>Capacitors</u> Students develop knowledge from Year 12 Electricity to understand how charge can be stored and its subsequent applications from camera flashes to defibrillators.</p> <p><u>Turning Points</u> This topic is a fitting conclusion to the study of A-level Physics. The purpose of this unit is to explore more deeply key historical discoveries that have revolutionised our understanding of Physics and the world around us.</p>
Half term 4	<p>Some areas revisit previous learning in greater detail, others topics are new to the student. This option seeks to answer questions such as: how was the electron discovered without microscopes small enough to see them; how were their masses determined without suitable scales; are waves really particles and vice versa; what is special relativity?</p>
Half term 5	<p><u>Consolidation</u> We spend this time consolidating learning from the past 2 years. We will use this opportunity to fully develop exam technique and to refine skills relating to practical work analysis.</p>
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