

Content listed in purple is for separate physics students only. Content listed in green indicates AQA Required Practical Work. Content listed in orange is HT only.

	Year 10	Year 11
<p>Autumn half term 1 Sequential knowledge and skills</p>	<p>P4 - Atomic structure Ionising radiation is hazardous but can be very useful. Although radioactivity was discovered over a century ago, it took many nuclear physicists several decades to understand the structure of atoms, nuclear forces and stability. Early researchers suffered from their exposure to ionising radiation. Rules for radiological protection were first introduced in the 1930s and subsequently improved. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation.</p> <p>Timeline of the atom and the significance of new evidence. Rutherford's alpha scattering experiment. Alpha, beta and gamma properties. Half-life and modelling half-life. Dangers of nuclear radiation. Irradiation and contamination.</p> <p><u>Separate Physics</u> Background radiation Different half-lives of radioactive isotopes Uses of nuclear radiation Nuclear fission Nuclear fusion</p>	<p>P5 - Forces Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in this way. Recent developments in artificial limbs use the analysis of forces to make movement possible.</p> <p>Resultant forces, $F=ma$ calculations, measuring forces, Hooke's law required practical. Elastic potential energy recap, weight mass and gravity. Moments and equilibrium, Newton's laws, inertia. Scalars and vectors, scale drawings.</p> <p><u>Required practical</u>- Force and extension</p> <p><u>Separate Physics</u> Moments, levers and gears</p> <p><u>HT Only</u> Pressure in a fluid 2</p>
<p>Assessment Content And Methods Used To Judge Learning</p>	<p>Y10 Autumn Summative Assessment <i>Atomic Structure</i></p> <ul style="list-style-type: none"> • End Of Topic Consolidation Tasks • Formative Assessment • Y10 Autumn Assessment • Homework – Exam Style Questions 	<p>Y11 Autumn Summative Assessment <i>Atomic Structure, Energy, Current Electricity, Particle Model + Forces</i></p> <ul style="list-style-type: none"> • End Of Topic Consolidation Tasks • Formative Assessment • Y10 Autumn Assessment • Homework – Exam Style Questions

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Autumn half term 2 Sequential knowledge and skills	<p><u>P1 - Energy</u> The concept of energy emerged in the 19th century. The idea was used to explain the work output of steam engines and then generalised to understand other heat engines. It also became a key tool for understanding chemical reactions and biological systems. Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers are working hard to identify ways to reduce our energy usage.</p> <p><u>Energy stores</u> Stores/types of energy. Calculations of kinetic energy, gravitational potential energy, work done, elastic potential energy, energy transferred through heating. Specific heat capacity required practical. Conduction, convection, radiation, evaporation heat transfers. Required practical - Thermal insulation Separates Physics</p> <p><u>Energy resources</u> Evaluating fossil fuels, biomass, geothermal, nuclear, hydroelectric, wave, wind, tidal and solar power stations.</p>	<p><u>Forces (motion & pressure)</u> Distance-time graphs, speed calculations, velocity-time graphs, acceleration calculations, momentum, car safety and stopping distances. Surface pressure, fluid pressure and atmospheric pressure. Required practical – Acceleration</p> <p><u>Separate Physics</u> Changes in momentum HT Only Momentum is a property of moving objects Conservation of momentum</p> <p><u>P6 - Waves</u> <u>Waves</u> Wave behaviour is common in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Definitions and examples of transverse and longitudinal waves, mechanical and non-mechanical waves. Reflection and refraction (theory and required practical). Wave front diagrams. Required practical – Waves</p> <p><u>Separate Physics</u> Reflection of waves Sound waves Waves for detection and exploration</p>
Assessment Content And Methods Used To Judge Learning	<p><i>Formative Assessment</i> <i>Atomic Structure, Energy</i></p> <ul style="list-style-type: none"> • <i>End Of Topic Consolidation Tasks</i> • <i>Homework – Exam Style Questions</i> • <i>Peer Marked End Of Topic Assessment</i> • <i>Required Practical Completion</i> 	<p><i>Formative Assessment</i> <i>Atomic Structure, Energy, Current Electricity, Particle Model, Forces + Waves</i></p> <ul style="list-style-type: none"> • <i>End Of Topic Consolidation Tasks</i> • <i>Homework – Exam Style Questions</i> • <i>Peer Marked End Of Topic Assessment</i> • <i>Required Practical Completion</i>

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<p>Spring half term 3 Sequential knowledge and skills</p>	<p>P2 – Electricity <u>Current electricity</u> Electric charge is a fundamental property of matter everywhere. Understanding the difference in the microstructure of conductors, semiconductors and insulators makes it possible to design components and build electric circuits. Many circuits are powered with mains electricity, but portable electrical devices must use batteries of some kind. Electrical power fills the modern world with artificial light and sound, information and entertainment, remote sensing and control. The fundamentals of electromagnetism were worked out by scientists of the 19th century.</p> <p>Current, potential difference, series and parallel circuits. Current-potential difference graphs and required practical. Resistors in series and parallel required practical.</p> <p>Required practical - Resistance</p>	<p><u>Waves</u> Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves. Defining frequency, amplitude, period. Wave speed calculation. Wave speed required practical for waves within a solid and within a liquid. The electromagnetic spectrum, uses and dangers of each of the electromagnetic spectrum.</p> <p>Required practical - Light Separate Physics Required practical - Radiation and absorption Separate Physics</p> <p><u>Separate Physics</u> Lenses Visible light Emission and absorption of infrared radiation Perfect black bodies and radiation</p>
<p>Assessment Content And Methods Used To Judge Learning</p>	<p>Y10 Spring Summative Assessment <i>Atomic Structure, Energy, Current Electricity</i></p> <ul style="list-style-type: none"> • <i>End Of Topic Consolidation Tasks</i> • <i>Formative Assessment</i> • <i>Required Practical Retrieval Tasks</i> • <i>Homework – Exam Style Questions</i> 	<p>Y11 Spring Summative Assessment <i>Atomic Structure, Energy, Current Electricity, Particle Model, Forces + Waves</i></p> <ul style="list-style-type: none"> • <i>End Of Topic Consolidation Tasks</i> • <i>Formative Assessment</i> • <i>Required Practical Retrieval Tasks</i> • <i>Homework – Exam Style Questions</i>

	Year 10	Year 11
<p>Spring half term 4 Sequential knowledge and skills</p>	<p><u>Mains electricity</u> However, power stations, like all machines, have a limited lifetime. If we all continue to demand more electricity this means building new power stations in every generation – but what mix of power stations can promise a sustainable future?</p> <p>Plugs and fuses, power calculations, mains supply, the national grid, supply and demand. Combining whole circuit knowledge to carry out circuit analysis and calculations.</p> <p>Required practical - V-I characteristics</p> <p><u>Separate Physics</u> Static charge Electric fields</p>	<p><u>P7 - Electromagnetism</u> Electromagnetic effects are used in a wide variety of devices. Engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. It means that systems that involve control or communications can take full advantage of this. Magnetic materials, magnetic fields, finding magnetic field lines around a permanent magnet, solenoid and electromagnet. Electromagnets and uses. The motor effect (FLHR).</p> <p><u>Separate Physics</u> Loudspeakers Induced potential Uses of the generator effect Microphones Transformers</p> <p><u>HT Only</u> Fleming's left-hand rule Electric motors</p> <p><u>P8 - Space</u> Questions about where we are, and where we came from, have been asked for thousands of years. In the past century, astronomers and astrophysicists have made remarkable progress in understanding the scale and structure of the universe, its evolution and ours. New questions have emerged recently. 'Dark matter', which bends light and holds galaxies together but does not emit electromagnetic radiation, is everywhere – what is it? And what is causing the universe to expand ever faster? Objects in the Universe, relationship between orbital speed and distance from the object. The Big Bang and evidence for it (redshift and CMBR)</p>

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Assessment Content And Methods Used To Judge Learning	<p>Formative Assessment Atomic Structure, Energy, Current Electricity, Mains Electricity</p> <ul style="list-style-type: none"> • End Of Topic Consolidation Tasks • Homework – Exam Style Questions • Peer Marked End Of Topic Assessment • Required Practical Completion 	<p>Y11 Spring Formative And Summative Assessments Atomic Structure, Energy, Current Electricity, Particle Model, Forces + Waves, Electromagnetism + Space</p>
Summer half term 5 Sequential knowledge and skills	<p>P3 - Particle model The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life. It helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft. It also explains why it is difficult to make a good cup of tea high up a mountain! States of matter. Density calculations, density required practical for determining the density of solids and liquids. Specific heat capacity (also covered in the energy topic so chance to revisit required practical), specific latent heat, kinetic and potential energies of particles. Changes of state. Heating and cooling curves.</p> <p>Required practical – Density Required practical - Specific heat capacity</p> <p>Separate Physics Pressure in gases Increasing the pressure of a gas</p>	<p>Revision End of topic consolidation tasks Peer marked end of topic assessment Leveled practical write up 10 Minute Tests Required Practical review Review of the specification checklist Retrieval Practice</p>
Assessment Content And Methods Used To Judge Learning	<p>Y10 Summer Summative Assessment Atomic Structure, Energy, Current Electricity, Particle Model</p> <ul style="list-style-type: none"> • End Of Topic Consolidation Tasks • Formative Assessment • Required Practical Retrieval Tasks • Homework – Exam Style Questions 	

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<p>Summer half term 6 Sequential knowledge and skills</p>	<p>P5 - Forces Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in this way. Recent developments in artificial limbs use the analysis of forces to make movement possible.</p> <p>Types of forces, resultant forces, the effects of forces.</p>	
<p>Assessment Content And Methods Used To Judge Learning Assessment</p>	<p>Formative Assessment <i>Atomic Structure, Energy, Current Electricity, Particle Model + Forces</i></p> <ul style="list-style-type: none"> • <i>End Of Topic Consolidation Tasks</i> • <i>Homework – Exam Style Questions</i> • <i>Peer Marked End Of Topic Assessment</i> • <i>Required Practical Completion.</i> 	