

Year 10: Combined Physics

Curriculum Intent: Year 10 Physics tackles more complex ideas and concepts in the subject. It builds on the key knowledge from years 7,8 and 9 to link together all the areas of the subject. The key areas of Forces, Electricity, Energy and the impact of these ideas on the wider world are developed through more challenging topics such as series and parallel circuits, Newton's laws, energy and energy transfers and the National Grid. Knowledge of the important mathematical relationships is consolidated further, and application of these equations is developed throughout. Procedural knowledge and practical skills are developed further, building on experience working practically with forces, electricity and energy. The curriculum in year 10 aims to bring everything together so that students have a complete understanding of the Physics aspect of the Combined Science course.



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key ideas and sequence of learning	<p>Module P3 – electricity & magnetism</p> <ul style="list-style-type: none"> • Electric Current • Circuits and potential difference • Series and parallel circuits • Resistance • Circuit resistance • I-V graphs • LDR's and thermistors • Sensing circuits • Electrical power • Fields around a wire 	<p>Module P3 – electricity & magnetism</p> <ul style="list-style-type: none"> • Forces on a current carrying wire • Electric motors <p>Module P2 - forces</p> <ul style="list-style-type: none"> • Forces and Newton's 3rd law • Representing forces in diagrams • Newtons' 1st law • Newton's 2nd law • Everyday situations • Momentum (HT) • Hooke's law • Energy in springs and materials 	<p>Module P2 - forces</p> <ul style="list-style-type: none"> • Weight and gravitational energy <p>Module P5 - energy</p> <ul style="list-style-type: none"> • Energy changes when objects fall • Energy changes when work is done • Energy changes in stretched spring • Paying for electricity • Energy changes with an electric current • Heating 	<p>Module P5 - energy</p> <ul style="list-style-type: none"> • Walls and insulation • Efficiency <p>Module P6 – global challenges</p> <ul style="list-style-type: none"> • Measuring motion • Reaction time and thinking distance • Braking distance • Forces in collisions • Energy sources • Energy resources • The national grid • Mains electricity 	<p>Students sit their EoY exams.</p> <p>Students will complete practical investigations.</p> <p>Students will review their PPE exam papers.</p>	<p><u>Separate Science</u></p> <p>Module P5* - waves</p> <ul style="list-style-type: none"> • Sound • Medical imaging • EM waves & matter • Lenses • Colour <p>P2 – forces</p> <ul style="list-style-type: none"> • Moments • Gears • Hydraulics <p>*Module numbers for separate physics are different to the combined curriculum</p> <p><u>Combined Science</u></p> <p>Recap and reteach of Module P1 (matter) and Module P4 (waves and radiation)</p>

<p>Key questions</p>	<ul style="list-style-type: none"> • What happens in an electric circuit? • What affects a circuit's properties? • How are circuits used in our homes? • How are electricity and magnetism linked? 	<ul style="list-style-type: none"> • How do forces arise and what are their effects? • What properties do materials have when stretched? 	<ul style="list-style-type: none"> • How can we calculate energy changes, measure efficiency? 	<ul style="list-style-type: none"> • How do we reduce energy loss? • How do we apply physics to motion of a vehicle? 		<p>Separate Physics</p> <ul style="list-style-type: none"> • How do we hear and what happens when sound meets a boundary? • How do EM waves interact with matter? • How are waves used in medical imaging? • How does light behave as it travels through a lens? • How do we see colour? • How can the principle of moments help us calculate forces? • How do levers and gears transmit forces? • How can we determine the forces in a hydraulic system?
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Vocabulary

- Ammeter
- Voltmeter
- Current
- Potential difference
- Resistance
- Ohm, Amps. Volts. Watts
- LDR
- Thermistor

- Newton
- Force
- Drag, tension, upthrust, reaction, weight
- Accelerate
- Equilibrium
- Resultant
- Elastic
- Plastic
- Elastic, plastic

- Kinetic energy
- Work done
- Gravitational potential energy
- Heating
- Current
- Efficiency

- Reaction time
- Nuclear
- Solar
- Wind
- Tidal
- Fossil fuels
- Renewables
- Non- renewables
- Live, neutral, earth
- Double insulated

(see Year 9 Schemes Of Learning's for combined vocabulary)

- Moment
- Refraction
- Normal
- Ossicles
- Amplify
- Cochlea
- Ray diagrams
- Convex
- Concave
- Focal length
- Short sight
- Long sight
- Real image
- Virtual image
- Prism
- Dispersion
- Specular reflection
- Diffuse reflection
- Principle of moments
- Effort
- Load
- Mechanical advantage
- Hydraulic machine

Practical Skills	<ul style="list-style-type: none">• Building circuits, measuring current and potential difference	<ul style="list-style-type: none">• Hooke's law experiment	<ul style="list-style-type: none">• Measuring KE and GPE changes• Measuring energy changes by electric current	<ul style="list-style-type: none">• Measuring reaction time• Wiring a plug	<ul style="list-style-type: none">• Investigation planning	
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