

# KS4 Physics Curriculum



Year 10: Physics				
	P1: Matter (Triple and Combined)	P2: Forces [Motion] (Triple and Combined)	P2: Forces [Energy] & P5: Energy (Combined) P7: Energy (Triple)	P2: Forces
	Autumn 1	Autumn 2	Spring 1 and Spring 2	Summer 1 and Summer 2
		These three modules are from two modules 'Forces' and 'Energy' that have been combined and split up to make three distinct sections: Motion, Energy and Forces.		
<b>Content:</b> What will students know	Students will start off their GCSE with understanding the history of the particle and how to use the particle model to explain how the world interacts around us. They will consolidate their learning of density, changes of state from previous years as well as being introduced to such concepts as specific heat capacity, specific latent heat as well as pressure. This module is P1 for both triple and combined but triple will learn about pressure in greater depth.	Students will look at motion in the world around us and what is meant by frequently used words acceleration, momentum and speed. Students will look at how graphs are another tool that scientists use to show a story. This module is a section of P2 for both triple and combined and is identical.	Students will learn some small sections of the 'forces' topic as well as the whole of the 'energy' topic intertwined. Students will learn that energy is an important concept in understanding the world around us. They will learn about the concept of energy stores and transfers and will take a greater look at several energy stores: kinetic, gravitational and thermal energy. This module is a section of P2 for both triple and combined and is the complete chapter of P5 for combined and P7 for triple.	Students will finish off the 'forces' topic and will learn how forces can help explain the world around us. They will look at Newton's Laws, as well as how forces interact on planets, in springs, on see-saws and parachutes. This is the remaining section of P2 for both triple and combined. However, triple will learn about force multipliers in greater depth.
<b>Skills:</b> What will students be able to do.	Students will learn how maths can be used to explain relationships between different properties. Students will also be introduced to exam technique: particularly when approaching maths-based questions and when answering describe and explain questions.	Students will be able to describe and calculate properties such as speed, acceleration and momentum and will be able to describe and analyse motion graphs.	Students will be able to describe what energy stores are in a system and how they change from one into another. They will be able to calculate different types of energy.	Students will be able to describe Newton's Laws and be able to use them to explain how forces interact with the world around us. They will look at real world applications of forces such as measuring the strength of an object, how stuff an object is, as



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				well as how we can use force multipliers to make tasks easier.
<b>Other:</b> Literacy/ Numeracy/ Ethos	<p><b>Literacy:</b> Students will learn definitions for a multitude of different scientific vocabulary such as melting, specific heat capacity, pressure and density. Students will also read a news article of their choice that shows how useful density is for a number of different careers.</p> <p><b>Numeracy:</b> Students will be introduced to equations that show how different properties affect one another. For example, density. Students will also consolidate their understanding of units in science and be introduced to unit analysis.</p> <p><b>Ethos:</b> This module is there to introduce the particle to students and showcase the importance of it as an explanatory tool.</p>	<p><b>Literacy:</b> Students will be able to define frequently used words such as speed, acceleration and momentum. Students will also read a chapter on the discrepancy between male and female car accident injuries and will use momentum to explain this,</p> <p><b>Numeracy:</b> Using equations to calculate properties such as speed and momentum. Students will also be taught unit analysis and unit conversion in greater depth.</p> <p><b>Ethos:</b> To understand how equations can be used to analyse how objects move in the world around us.</p>	<p><b>Literacy:</b> Students will be shown how certain words can be guessed by their etymology (such as kinetic) and also how certain words pop up in science frequently (such as the word potential).</p> <p><b>Numeracy:</b> Be able to calculate different types of energy as well as learning that there are shorthand ways to show units in science.</p> <p><b>Ethos:</b> Consolidate students' knowledge of the concept of energy from Year 7 and 8 and to show them that energy can be used to explain how the world works.</p>	<p><b>Literacy:</b> Learn definitions of different terms in science such as strength and stiffness. Students will also learn definitions for different forces.</p> <p><b>Numeracy:</b> Students will learn mathematical relationships and how different variables affect one another. For example, looking at how both extension and force affect stiffness.</p> <p><b>Ethos:</b> To give students another tool to explain how the world works around us.</p>
<b>Assessment</b>	End of topic assessment on Matter as well as several marked Educakes throughout the module.	End of topic assessment on Motion as well as several marked Educakes throughout the module.	This is usually not assessed as Year 10 Mocks will be carried out in this half term. Students will have several marked Educakes.	This is usually not assessed as Year 10 Mocks will be carried out in this half term. Students will have several marked Educakes.

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Year 11: Physics			
	Electricity and Magnetism (P3 for Combined and P3 & 4 for Triple)	Radioactivity and Waves (P4 for combined and P5 and 6 for Triple)	Global Challenges (P6 for Combined and P8 for Triple)
	Autumn	Spring	Summer 1
<b>Content:</b> What will students know	Students will learn about electricity and how charges act in the world around us. Students will build on their knowledge from Year 7 by building their own model of electricity and using mathematical relationships to describe how charges act and move. Students will then recap their magnetism learning from Year 8 and will take a greater look in depth at the link between magnetism and electricity.	<p>Students will learn what radioactivity is and how radioactive decay occurs. Students will get to see a radioactive demo and will understand the real-world applications of radioactivity: from nuclear medicine, smoke alarms and nuclear power.</p> <p>There will also be a number of lessons that look back at what students learn in Year 9 waves and summarise that year of learning in what they need to know. For triple, this consists of learning about sound waves and its applications, light waves and its interactions, as well as looking at wave interactions in the world around us. The Combined content will be around light waves and its interactions and a look at wave interactions but not to the same depth as Triple.</p>	<p>This module is distinctly different for Combined and Triple.</p> <p>Combined – The majority of this module has been spread across the previous two years. For example, road safety is taught in the ‘motion’ topic and ‘wiring in the home’ is taught in the ‘electricity’ topic. Therefore, this sequence of lessons is usually a small recap.</p> <p>Triple – A number of these lessons have already been taught in the prior two years. As such, the remaining lessons focus on space. Students will learn about our place in the immediate solar system and how the sun, planets and satellites interact. Students will learn about the future of space together with looking at spectra to prove the big bang and analysing stars.</p>
<b>Skills:</b> What will students be able to do.	Students will be able to build their own model for electricity and will be able to describe qualitatively what is happening in terms of potential difference, current and resistance. They will also have a quantitative look at circuits using Ohm’s Law and Kirchhoff’s Laws. Students will be able to build and analyse circuits in a number of	Students will be able to describe the composition of atoms and be able to describe the three different nuclear decays. Students will be able to explain how we can investigate the absorption and penetration abilities of the three decays as well as investigate radioactive half-life. Students will also be able to describe	Triple – Students will learn how to describe how the sun, planets and satellites interact with one another. Students will also be able to describe the lifecycle of a star and be able to explain it in terms of two competing forces. Students will also be able to describe the expansion of the universe and be able to analyse simple spectra to show both the



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	<p>experiments as well as having a closer look at uses of circuits utilising their new knowledge of circuit components.</p> <p>In magnetism, students will be able to investigate magnets and magnetic fields and will be able to describe the link between electricity and magnetism in greater detail.</p>	<p>different uses of radiation using their knowledge of penetration and absorption.</p> <p>Students will also recap Year 9 knowledge of waves and will be able to describe different waves, the properties of these waves and how these waves interact with the world around us.</p>	<p>composition of the stars and the expansion of the universe.</p>
<b>Other:</b> Literacy/ Numeracy/ Ethos	<p><b>Literacy:</b> Key definitions of potential difference, current and resistance.</p> <p><b>Numeracy:</b> Analysing circuits and problems utilising a number of different mathematical laws. Students will also have a greater look at using prefixes.</p> <p><b>Ethos:</b> To allow students to investigate electricity and magnetism and utilise their new found theoretical knowledge.</p>	<p><b>Literacy:</b> Students will read a news article on the discovery of radioactivity as well as knowing key definitions of words.</p> <p><b>Numeracy:</b> Students will learn how nuclear equations show radioactive decay and will understand how to draw and analyse half-life curves.</p> <p><b>Ethos:</b> To give students a greater understanding of one of the topics that students find the most interesting.</p>	<p><b>Literacy:</b> Students will learn how to compact a vast amount of information down. They will also learn key stages of a life cycle of a star as well as re-learn key words such as planets, stars and moons.</p> <p><b>Numeracy:</b> Students will learn about different units for distance.</p> <p><b>Ethos:</b> To stretch student's imagination of the universe and to show students what the cutting edge of science currently looks like.</p>
<b>Assessment</b>	<p>End of topic test on Electricity and Magnetism. Multiple marked Educake's throughout the module.</p>	<p>Potentially an end of topic test on radioactivity dependent on where the Year 11 mocks fall. Multiple marked Educake's throughout the module.</p>	<p>No assessment due to position in the Year and proximity with Year 11 final exams.</p>