

Science - Physics



Year 11 Curriculum Map




Year 11 – Autumn Term

Physics

P5 – Forces and P6 - Waves

Prior Learning	<p>P5 – Forces At key stage 3, pupils should have learnt what forces are and the effects of balanced and unbalanced forces. How to calculate average speed, distance and time, and how to represent a journey on a distance-time graph. Pupils should be able to explain what a resultant force is and explain why gravity as a non-contact force. Pupils should be able to describe the ways in which energy is stored and transferred.</p> <p>P6 – Waves At key stage 3, pupils should have learnt about light waves and sound waves, and how they can be described. They should be able to explain how sound waves are produced and how they are detected by our ears. Pupils should be able to provide some uses of sound waves. Pupils should also be able to explain how light can be absorbed, scatter and reflected, and explain the different colours of light.</p>
What will I learn?	<p>P5 – Forces</p> <ul style="list-style-type: none"> • The difference between vector and scalar quantities • How to calculate speed and acceleration • How to represent journeys on distance/time and velocity/time graphs • How to use graphs to calculate speed, acceleration and distance travelled • About Newton’s Laws of Motion • How to calculate the weight of an object from its mass • About the factors that affect the stopping distance of a vehicle • How to use ideas about energy transfers to calculate braking distances • About the dangers or large decelerations • How to calculate momentum, and apply ideas about momentum to collisions (higher only) <p>P6 – Waves</p> <ul style="list-style-type: none"> • That waves transfer energy and information • How to describe the characteristics of waves • How the speed of a wave is related to its frequency and wavelength, and to the time it takes to travel a certain distance • How waves are refracted at boundaries between different materials • What happens when waves are reflected, refracted, transmitted or absorbed by different materials • More about how our ears work • About the uses of ultrasound and infrasound
How will I be assessed?	<p>Formative – Recall 5, Cold calling, skills such as graphs in books, retrieval homework task, mid topic assessment.</p> <p>Summative – End of topic assessment.</p>
Next Steps	<p>P5 – Forces This subject content is not revisited on other units. It will be covered in targeted revision sessions but also should form part of a detailed revision plan at home using the provided revision guides.</p> <p>P6 – Waves This subject content is not revisited on other units. It will be covered in targeted revision sessions but also should form part of a detailed revision plan at home using the provided revision guides.</p>
Opportunities for	<p>Focus eLearning by Focus Educational Software Ltd. Seneca Combined Science Physics (Foundation) or (Higher)</p>

Independent Learning	<p>Forces - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize https://www.bbc.co.uk/bitesize/topics/zt4gfcw BBC Bitesize https://www.youtube.com/watch?v=wl-VkxEelxw&list=PL-OdZdEk-XsJqjLFQ8CxDYorh6qYABg1&index=5 – CORE PRACTICAL https://www.youtube.com/watch?v=PKsMxaPbaWE – CORE PRACTICAL https://www.youtube.com/watch?v=UNmv6H-f180&list=PL-OdZdEk-XsJqjLFQ8CxDYorh6qYABg1&index=7 – CORE PRACTICAL https://www.youtube.com/watch?v=OY0IXHPo_nM&list=PLAd0MSIZBSsGNWkHdHJdQYIndKl3HZUrS_B&index=7 – CORE PRACTICAL</p>
Personal Development and CEIAG	<p>P5 – Forces This unit of work will provide an insight and understanding into the risks of dangerous driving and the importance of the laws surrounding the misuse of alcohol and other illegal substance. Possible careers in this area could engineering and mechanics.</p> <p>P6 – Waves Application of knowledge about refraction can be helpful for anyone who takes part in leisure activities such as fishing and deep-sea diving. Possible careers in this area could radiography, communication and film making.</p>
Enrichment Opportunities (Cultural Capital)	<p>P5 – Forces “Top Gear, BBC” - https://www.youtube.com/watch?v=LO0PgyPWE3o “Force and Motion, PBS” - https://www.pbs.org/video/science-trek-force-and-motion/ “The secret life of Isaac Newton” - https://www.youtube.com/watch?v=Y2s2fyMoCCU BBC Timeline - https://www.bbc.co.uk/teach/isaac-newton-the-man-who-discovered-gravity/zh8792p</p> <p>P6 – Waves Why do we see colours differently? - https://www.bbc.co.uk/teach/ks3-gcse-physics-colours/zvdgt39 - “The incredible science of surfing and waves” - http://www.bbc.com/earth/story/20170622-the-incredible-science-of-surfing-and-waves National geographic - Documentary Disaster Wars Earthquake vs Tsunami - https://www.youtube.com/watch?v=K31V-bOKLJw</p>

	<h2>Year 11 – Spring Term</h2> <h3>Physics</h3> <h3>P7 – Magnetism and Electromagnetism</h3>
Prior Learning	<p>P7 – Magnetism and Electromagnetism At key stage 3, pupils should have studied the structure of the and should be able to plot the shape of a magnetic field and explain that the Earth has a magnetic field. Pupils should be able to explain that electric currents cause magnetic fields, including in electromagnets and motors.</p>
What will I learn?	<p>P7 – Magnetism and Electromagnetism Pupils will learn about permanent and induced magnets Pupils will able to represent a magnetic field, explain a magnetic field around a current in a wire and how the factors that affect it. Pupils will be able to explain how the fields from the individual coils in a solenoid interact. They will be able to use the power equation for transformers and explain how transformers are used in the national grid. Higher tier pupils will also need to be able to use the turns ratio equation for transformers, explain how a current can be induced in a wire and the factors that affect it and can work out the size direction of the force on a wire carrying a current in a magnetic field.</p>

How will I be assessed?	Formative – Recall 5, Cold calling, skills such as graphs in books, retrieval homework task, mid topic assessment. Summative – End of topic assessment.
Next Steps	This subject content is not revisited on other units. It will be covered in targeted revision sessions but should also form part of a detailed revision plan at home using the provided revision guides. Once pupils have completed their learning for paper 2 - they will start revision for their summer GCSE's .
Opportunities for Independent Learning	P7 – Magnetism and Electromagnetism Focus on Physics: Fields - Focus eLearning by Focus Educational Software Ltd. Seneca Combined Science Physics (Foundation) or (Higher) Magnetism and electromagnetism - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize BBC Bitesize
Personal Development and CEIAG	P7 – Magnetism and Electromagnetism This unit of work provides pupils with an insight into how everyday electrical appliances work and will also develop their understanding of how electricity is generated and distributed around the country. This unit will also provide an introduction to potential career opportunities for example electrical engineer.
Enrichment Opportunities (Cultural Capital)	P7 – Magnetism and Electromagnetism What is the National Grid - https://www.bbc.co.uk/news/uk-scotland-scotland-politics-29509021 - Fully Charged – National Grid https://www.youtube.com/watch?v=vXOG9F42puY