Year 9 Physics Curriculum

Students follow the Ark Curriculum + Science Mastery Scheme which is a 5 year programme of study commencing in year 7 and aligns to the AQA Exam board for final assessment in year 11. 2024 is the first year that the course has been run, therefore some of the content for the Science Mastery topics has been covered previously. The content currently taught is identified in the sequence column. The switch to Science Mastery took place after the half term break in October, 2024.

Students either follow the combined science course or the separate 'triple' science course. Content that is separate science only is marked in bold as 'triple only'.

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
Force Fields and Electromagnets	This topic starts by revising previous work on magnetic and gravitational fields, then introduces static electricity and the idea of an electric field. Work on current electricity is revised, and then extended to look at resistance calculations and at some uses of electromagnets.	9Ja Mission to Mars 9Ja Force Fields 9Ja Cohesion in Writing 9Jb Static Electricity 9Jc Current Electricity 9Jd Resistance 9Jd Rounding Numbers 9Je Electromagnets 9Je Humans in Space	Starter questions Exam-type questions Hinge questions Use of web-based applications to assess knowledge in lesson (e.g. Isaac Physics, Active Learn etc.) There is a Working Scientifically opportunity looking at decimal places and significant figures. End-of-topic tests.	Literacy: 9Ja Cohesion in Writing Numeracy: 9Jd Rounding Numbers	Connection finding (linking) to use connections, to generalise the abstract concept of a field, ubiquitous in physics, and apply it to gravity, magnetism and charged objects. Analysing electromagnets where the link between seemingly disparate magnetic and electric phenomena is made plain.	Homework typically set via online platforms such as Tassomai, Isaac Physics, Active Learn. Exam preparation via exam papers, past paper questions…
Switch to Ark Curriculum+ Science Mastery Course. Pearsons Active Learn and Science Mastery course were cross referenced to ensure all curriculum content was covered.						

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
P3.1 Acceleration (from Forces Predict Motion)	In this unit, pupils will study the effect of forces on motion, focusing on Newton's First and Third Laws, balanced and unbalanced forces, and action-reaction pairs. They will learn the difference between scalar and vector quantities, particularly comparing speed/velocity and distance/displacement. Pupils will also learn to calculate resultant vectors from right-angled vectors and resolve diagonal vectors into horizontal and vertical components. Additionally, pupils will explore acceleration as the rate of change of velocity, calculate it, and investigate it by measuring initial and final velocity. They will use velocity-time graphs to describe and interpret motion and	Before this unit, pupils will have learned about contact and non-contact forces, calculating resultant force, and the effects of balanced and unbalanced forces on speed, direction, and shape. They will also understand speed, how to calculate it, and how to interpret distance-time graphs. This unit starts with a review of forces and motion, then introduces scalars and vectors, preparing pupils to understand acceleration as the rate of change of velocity. They will learn to calculate resultant vectors using Pythagoras's theorem, trigonometric ratios, and scale diagrams. Pupils will revisit Newton's First and Third Laws in more depth, with Newton's Second Law covered	Pre-knowledge quiz MCQ End of topic test Census point exams	Literacy: key words, definitions, summary notes. Numeracy: summary notes, equation practice, General maths skills (e.g. rearranging equations, graph plotting, standards form, SI prefixes) Equations students are required to recall and apply and which they are required to select from a list and apply	**Connection finding (linking)** to use connections, eg linking phenomena to conservation laws, The commonality of vectors manifest as forces, velocities or accelerations **Analysing** Determining which factors affect motion **Linking: abstract thinking Complex and multi-step problem solving** to break down a task to decide on a suitable approach, and then apply the knowledge.	Homework typically set via online platforms such as Tassomai, Isaac Physics, Active Learn. Exam preparation via exam papers, past paper questions…

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	identify the forces acting on an object based on its motion.	in P4.1 alongside stopping distances and force effects like deformation. Pupils will explore acceleration and its calculation, conduct a Newton's Second Law practical, and learn to draw and interpret velocity-time graphs. They will also compare velocity-time and distance-time graphs. Later, they will study momentum and its conservation, as well as real-life applications like stopping distances. Pupils will refine their practical skills in measuring time and acceleration, applying their knowledge to more complex calculations, including vertical and projectile motion. P3.1.1 PKR P3.1.2 Scalars & Vectors				

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		P3.1.3 Resultant Vectors (HT only) P3.1.4 Resolving Vectors (HT only) P3.1.5 Newton's 3rd Law P3.1.6 Newton's 1st Law P3.1.7 Acceleration P3.1.8 Investigating Acceleration P3.1.9 Velocity-Time graphs P3.1.10 Velocity-Time Graphs 2 P3.1.11 Acceleration Problems P3.1.12 Feedback Lesson				
P3.2 Heating (from Energy is Conserved)	In this unit pupil will learn about internal energy of substances and how these are affected by heating. They will learn about the different methods of energy transfer: conduction, convection and radiation and the	Pupils will build on their knowledge of energy stores, heating, particle behaviour in solids, liquids, and gases, and density. They will also understand thermal insulators and conductors, which will			Connection finding (linking) to use connections, eg linking phenomena to conservation laws, The commonality of vectors manifest as forces, velocities or accelerations	

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	similarities and differences between each process. They will learn about specific heat capacity and investigate the specific heat capacity of different materials, use the specific heat capacity equation and explain what these different values can tell us about materials. They will also learn about specific latent of heat, both of fusion and vaporisation, and calculate these for a number of different materials. They will also compare the ideas of specific heat capacity and specific latent heat in terms of energy changes.	be explored further in this unit with delocalised electrons. The unit begins with a review of prior knowledge: particle model, energy stores and transfers, pressure, and density. Pupils will then learn about internal energy, followed by methods of thermal transfer. This leads to an understanding of specific heat capacity and latent heat, using energy transfer concepts to explain experimental variations from theoretical values. Later, pupils will study kinetic and gravitational potential energy, power, work done, and efficiency in energy transfers. They will also compare appliance efficiencies. The key skill developed through the specific heat			Analysing Determining which factors affect motion Linking: abstract thinking Complex and multi-step problem solving to break down a task to decide on a suitable approach, and then apply the knowledge.	

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		capacity investigation is explaining experimental errors, a skill that will be applied in future investigations to improve methods. P3.2.1 Prior Knowledge Review Maths in Science Lesson 18: Rearranging Equations P3.2.2 Internal Energy P3.2.3 Thermal Transfers P3.2.4 Thermal Transfers 2 P3.2.5 Specific Heat Capacity P3.2.6 Specific Heat Capacity Investigation P3.2.7 Specific Latent Heat P3.2.10 Feedback Lesson				
P3.3 Sound and Waves (from Radiation Transfers Energy)	In this unit pupils will learn about the differences between transverse and longitudinal waves and	Pupils will build on previous knowledge of energy transfer through waves (P1.3), light travel (KS2, P2.4),	Pre-knowledge quiz MCQ End of topic test Census point exams	Literacy: key words, definitions, summary notes.	**Connection finding (linking)** to use connections, eg linking phenomena to conservation laws, The commonality of vectors	Homework typically set via online platforms such as Tassomai, Isaac Physics, Active Learn.

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
	examples of each. They will learn about the properties of waves and how to label the different parts of waves. They will also learn about the properties of sound waves, comparing waves in terms of pitch and volume. They will learn to calculate the velocity of waves using the wave equation, as well as investigating this themselves by measuring the velocity of a wave on a string and the velocity of waves in a ripple tank. Pupils will also learn more about the processes of reflection and refraction, including practice of drawing ray diagrams and understanding how refraction is related to velocity and wavelength.	and scalar/vector quantities (P3.1), as well as the Earth's structure (C2.3) for understanding seismic waves. This unit covers wave features, types, and calculations of velocity and frequency, applying them to refraction, reflection, and practical experiments with ripple tanks and waves on a string. Pupils will explore technological applications, including seismic waves and ultrasound. The unit prepares pupils for understanding the electromagnetic spectrum, visible light properties, and applications in biology, chemistry, and medicine. Later topics will include radiation and black body radiation.		Numeracy: summary notes, equation practice, General maths skills (e.g. rearranging equations, graph plotting, standards form, SI prefixes) Equations students are required to recall and apply and which they are required to select from a list and apply	manifest as forces, velocities or accelerations Analysing Determining which factors affect motion Linking: abstract thinking Complex and multi-step problem solving to break down a task to decide on a suitable approach, and then apply the knowledge.	Exam preparation via exam papers, past paper questions

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	Pupils will learn more about uses of waves, including ultrasound used in medical imaging and sonar technologies. They will also learn about how seismic waves have added to human understanding of the structure of the Earth, based on the differences in velocity, absorption and reflection of various types of wave.	Key skills include drawing ray diagrams for reflection/refraction and calculating velocity and acceleration in more complex scenarios. These skills will be expanded with more advanced ray diagrams for lenses. P3.3.1 Prior Knowledge Review P3.3.2 Types of Wave P3.3.3 Properties of Waves Maths in Science Lesson 20 Derived Quantities P3.3.4 Velocity of Waves P3.3.5 Reflection and Refraction P3.3.6 Investigating Reflection and Refraction P3.3.7 Investigating Waves P3.3.8 Using Waves P3.3.9 Feedback Lesson				

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
P3.4 Home Electricity (from Electricity Transfers Energy)	In this unit, pupils will study mains electricity and its transfer to where we need it. This includes learning about alternating and direct current, the different wires within circuits in the home, and the wiring and design of plugs in terms of function and safety. They will learn about how the cost of electricity is calculated, and how this links to the power of and energy transferred by appliances. They will learn how to calculate power and the meaning of power ratings, as well as the various ways to calculate energy transfers by appliances. From here, pupils will look at the generation of electricity and the various energy resources available to us. They will learn about the transport of that	In P1.3, pupils learned about energy stores and transfers, and in P1.4, they explored current, voltage, and circuit models. In P2.3, they covered resistance and Ohm's Law. P3.4 builds on this to explore electricity in the home, discussing how we power homes, organize circuits, and the role of energy transfers, voltage, and current. The unit begins with mains electricity, followed by appliance power and electricity costs. Pupils then study the National Grid and energy sources, connecting home circuits to electricity generation. They learn about power, including calculating power and understanding transformers. The unit concludes with static				

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	electricity to our homes via the National Grid, including the importance of step-up and step-down transformers. Finally, pupils are introduced to static electricity. This unit sits within the big idea of 'Electricity transfers Energy'.	electricity and safety measures to prevent electric shocks. This unit prepares pupils for the GCSE Electric Circuits and Energy unit, covering induced potential, transformers, and resistance. Pupils practice applying equations and identifying relevant quantities in questions and circuit diagrams, a skill they will build on in future units. P3.4.1 Prior Knowledge Review P3.4.2 Mains Electricity P3.4.3 Plugs P3.4.4 Power P3.4.5 Cost of Electricity P3.4.6 Power in Circuits P3.4.7 Power and Energy in Appliances P3.4.8 Energy Resources P3.4.9 The National Grid				

Unit:	Core knowledge/skill development:	Sequence:	Assessment:	Literacy, numeracy, PSHE, FBV, other links	Key areas of ACP and VAA development:	Home learning and enrichment
		P3.4.9 Static Electricity P3.4.10 Feedback Lesson				