

KEYSTAGE 3 PHYSICS	INTENT	IMPLEMENTATION	IMPACT
	<p>The aim of the KS3 curriculum is for students to master the key skills and apply their knowledge to challenging and unfamiliar contexts.</p> <p>We have planned and implemented a rigorous curriculum, which builds on the prior learning and skills acquired at KS2.</p> <p>The content studied and skills acquired during Year 7, are revisited and extended on in Year 8. We have the same high ambitions for all of our learners, including those with SEND or EAL. Students are taught predominantly in their tutor groups (mixed ability) in Year 7, and are not ability set until Year 8.</p> <p>The KS3 Curriculum provides a solid foundation for the rigour of the content at GCSE. Due to all students studying the three separate Sciences at GCSE, the KS3 curriculum is delivered across two years and GCSE courses commence in Year 9. This maximises the opportunity to revisit the foundation topics of each specialism, and for students to make greater connections between content across the topics.</p> <p>The OPA KS3 Science curriculum focuses around practical learning opportunities. It is broad and provides our students access to the full National Curriculum for Science. We also incorporate many opportunities for cross-curricular learning, links to CEIAG and supports the Core British Values.</p>	<p>Typical curriculum allocation: 3hrs per week.</p> <p>In KS3, the curriculum is broken down into topics from each of the three specialisms; Biology, Chemistry and Physics.</p> <p>All three specialisms are taught across KS3, a topic at a time. Students focus on one specific topic from one of the specialisms before moving on to the next. This enables students to link the learning from one specialism to another and build up a solid understanding of how the three interweave.</p> <p>We use the Activate schemes of learning and lesson plans in KS3, which have been designed to link to the AQA GCSE 1-9 specifications, and provides a solid foundation for the KS4 curriculum.</p> <p>The detailed lesson plans and supporting resources provide support for non-specialists, RQTs, NQTs and ITTs.</p> <p>Our sequence of topics and lessons is followed by all to ensure all students are delivered same coherent curriculum, with content delivered in the same order, as selected and planned by the subject leads.</p> <p>After each topic, students complete an assessment, which assesses the students' understanding of 50:50 of previous learning: current topic.</p>	<p>Prescriptive, week by week, schemes of learning, ensure for consistency for all students. Our shared lesson resources, which have been designed and produced by the subject specialists in the department, link to the Biology, Chemistry and Physics GCSE specifications.</p> <p>Joint planning, marking and moderation supports the newer, less experienced members of the department, to ensure good quality teaching and learning for all classes, no matter the teacher's level of experience.</p> <p>Practical activities help to instil in our students a passion for Science that is built on in KS4.</p> <p>Students have a good understanding of the foundations of Biology, Chemistry and Physics, to be revisited, built and extended on at GCSE.</p> <p>Students cover the full content of the National Curriculum for Science at KS3. They also begin to develop their mathematical and working scientifically skills.</p> <p>Students have a good understanding of how Science applies to their everyday lives.</p>

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YEAR 7	<p>The Year 7 Physics Curriculum is designed to review and extend the students' knowledge from primary school (KS2).</p> <p>In Year 7, students' understanding of working scientifically and lab safety, are likely to vary due to variation in Science provision between primary schools and therefore initial lessons are spent reinforcing expectations for safety in the laboratory and planning investigations.</p> <p>The curriculum has been designed to engage learners through practicals and demonstrations, and help them develop their skills for Working Scientifically, while acquiring new knowledge across four distinct topics.</p> <p>Lessons are designed to support <i>all</i> learners, providing support and challenge.</p> <p>The structure of the lessons provides opportunity to assess prior learning and current level of understanding (from KS2) and then build on this. The practical element of the topics, enables students to gain the skills for working scientifically, as well as question what they know or think they know about the world around them.</p>	<ul style="list-style-type: none"> • Forces 1 Balanced forces, Speed, Gravity • Electricity 1 P.D. Resistance, Series & Parallel circuits, Current, Charge • Energy 1 Fuels, Resources, Power, Conservation, Dissipation • Waves 1 Sound, Amplitude, Frequency, The ear, Light, Reflection, Refraction, The eye, Colour 	<p>Students can know more, remember more and do more as a result of the science they have been taught.</p> <p>This is assessed at regular low stakes retrieval practice at the beginning of each lesson which allows pupils to review their own learning, while improving their recall of information that can be applied in context, as well as link across subjects.</p> <p>Throughout the year there are regular checkpoints from investigations or mathematical skills in science. Students will obtain targets from these tasks that are individualised to develop any areas of improvement.</p> <p>Students will have developed detailed scientific knowledge and skills to allow them to smoothly transition in to year 8 and future learning and employment.</p>

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YEAR 8	<p>The Year 8 Curriculum builds on the knowledge and skills gained in Year 7. It covers the remainder of the KS3 Science National Curriculum.</p> <p>Students continue to develop their skills and acquire new knowledge, in addition to revisiting and building on the content covered in Year 7.</p> <p>Topics still focus around practical teaching and learning, with further emphasis on Working Scientifically.</p> <p>Content taught in Year 7, is now pursued in a greater detail, introducing more scientific terminology.</p> <p>Lessons are designed to support all learners, providing support and challenge.</p> <p>The structure of the lessons provides opportunity to assess prior learning and current level of understanding (from KS2 and Year 7) and then build on this. The practical element of the topics, enables students to gain the skills for working scientifically, as well as question what they know or think they know about the world around them.</p>	<ul style="list-style-type: none"> • Forces 2 Friction, Stretching/Squashing, Moments, Pressure • Magnetism Magnets, Electromagnets • Energy 2 Work, Machines, Heat/Temperature, Energy Transfer • Waves 2 Sound & Water waves, Radiation, Modelling waves 	<p>Students can know more, remember more and do more as a result of the science they have been taught.</p> <p>This is assessed at regular low stakes retrieval practice at the beginning of each lesson which allows pupils to review their own learning, while improving their recall of information that can be applied in context, as well as link across subjects.</p> <p>Throughout the year there are regular checkpoints from investigations or mathematical skills in science. Students will obtain targets from these tasks that are individualised to develop any areas of improvement.</p> <p>Students will have developed detailed scientific knowledge and skills to allow them to smoothly transition in to year 9 and future learning and employment.</p>

OPA Physics 11-16 Curriculum Plan

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KEYSTAGE 4 PHYSICS	INTENT	IMPLEMENTATION	IMPACT
	<p>The aim of the curriculum delivered during KS4 is to build up on the understanding, and refine the skills, that were developed in KS3.</p> <p>All students follow the Separate Science Pathway at GCSE. This exposes students to the full breath of KS4 National Curriculum for Chemistry.</p> <p>Our curriculum interweaves the subject specific content with the Working Scientifically aspects of the National Curriculum.</p> <p>Each topic is taught so that the key skills are mastered. The Working Scientifically skills developed during KS3 are now utilised in planning, completing and evaluating the Required Practicals.</p> <p>Lessons are designed so that they address the objectives as outlined by the AQA specification.</p> <p>The curriculum draws on real world contexts, modelling and analogies where possible, so that students find concepts more relevant and interesting.</p> <p>Our WISE events have provided opportunities for our female students to meet positive female STEM role models. Hosting these events has also allowed us to develop positive relationships with parents and carers, as well as raising the aspirations of our female students.</p>	<p>Throughout the GCSE course, schemes of learning and full lesson plans are available to provide support to all staff within the department. They can be easily utilised for cover lessons when required.</p> <p>All schemes of learning and lesson plans are planned, developed and reviewed by the subject leads to ensure all students are delivered the content in the same coherent sequence across the three years of delivery.</p> <p>Shared lesson resources, which have been designed and produced by the subject specialists in the department, link to the AQA Biology, Chemistry and Physics GCSE specifications. This continues to provide consistency, and ensure quality is delivered across all classes and year groups.</p> <p>We have a joint lesson planning, marking and moderation system to support less experienced members of the department with differentiation and assessment, and tailoring the lesson plans to their individual classes.</p> <p>Pupils begin to read more widely and independently, so as to widen their scientific vocabulary and are gradually introduced to the range of exercises similar to those that they will face in the eventual examinations. Students extend their knowledge of working scientifically to planning, analysing data, and evaluating Required Practicals.</p>	<p>3 YEAR IMPACT: Students are fully prepared for the formal GCSE assessments.</p> <p>Regular exam assessments are also completed to encourage students to frequently review the content taught. At the end of each topic, an end of topic assessment takes place which comprises of 50% prior learning: 50% most recent content taught. This allows teachers to assess students' understanding of key concepts in a range of questions and applying to a variety of contexts. This emphasises the need to continually revisit prior learning, enhancing long term memory stores.</p> <p>Students become familiar with the different types of questions featuring in the GCSE exams for AQA. They also gain an understanding of how exams are marked and the emphasis to use scientific terminology.</p> <p>LONG TERM IMPACT: Students leave the academy equipped with the scientific knowledge base and skills to keep them well informed within an increasingly science-based society. Students have acquired and developed the knowledge to appreciate the relevance of science in their everyday lives. They have developed a range of planning, problem solving and evaluating skills that can be applied to different everyday contexts.</p> <p>Students are well prepared for studying science further at KS5, and those choosing to study A levels have solid foundations to build on.</p>

<p>Year 9</p>	<p>The aim of Year 9 Curriculum is to build on the key constructs of the KS3 Curriculum.</p> <p>The content taught early on is revisited again throughout KS4, creating opportunities for students to make connections within and across their learning.</p> <p>There is also an increased focus on the skills required to be successful at GCSE (for example planning valid investigations, collecting, analysing and evaluating data).</p> <p>In Year 9, students commence the GCSE separate science courses. As the students still receive three lessons for science a week, topics for the three specialisms are taught one at a time, rather than alongside each other.</p> <p>Careful consideration has been made around which foundation topics are the most suitable for the students to study in their first year taking into account; the skills required, prior knowledge from KS3 and the length of each of the topics. For this reason, there is a greater emphasis on Physics and Biology in Year 9, with only two of the Chemistry topics taught.</p>	<p>Term 1 – Conservation & Dissipation of Energy Energy Stores Conservation of Energy Work GPE, KE & EP Dissipation Efficiency Power</p> <p>Term 2 – Energy Transfer by Heating/Energy Resources/Electrical Circuits Conduction, Convection, Radiation, SHC, Insulation, Renewable & Non-Renewable resources, Energy Issues & The Environment Electrical Charge & Fields, Current, P.D. Resistance, Series & Parallel Circuits</p> <p>Term 3 – Electricity in the Home/Molecules & Matter A.C. & D.C. Cables & Plugs, Electrical Power & Energy, Appliances & Efficiency Density, States of Matter, Internal Energy, SLH, Gas Pressure</p>	<p>Students complete Year 9 having a good understanding of the foundation topics for Physics, to continue to build on in Years 10 and 11.</p> <p>They have learned how to apply their working scientifically skills to planning, analysing and evaluation of required practicals.</p>
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<p>Year 10</p>	<p>In Years 10 and 11, students receive six lessons per week for science. This is delivered as two lessons per week for each specialism, enabling topics for Biology, Chemistry and Physics to be taught distinctly alongside each other.</p> <p>This allows each specialism to be taught by a specialist teacher for that subject, who is able to talk more around the subject and provide more enthusiasm and engagement.</p> <p>The structure of topics and lessons facilitates revisiting previous content, building on and extending the learning from KS3 and the GCSE topics taught in Year 9.</p> <p>Time is allowed for students to develop as independent learners, to refine and improve their learning. Longer tasks are incorporated into lessons to help build resilience to work for longer periods, building towards the 1hr 45 exams.</p> <p>Learning tasks utilise modelling, analogies, practical work and theory for all abilities, and students continue to apply their working scientifically skills.</p> <p>Tests continue to assess the understanding of 50% prior knowledge and 50% newly acquired learning. There is greater focus on exam technique, and more time is spent going through assessments with students.</p>	<p>Term 1 – Radioactivity/Forces In Balance Atoms & radiation, Changes in the nucleus, alpha, beta, gamma, half-life, Radiation in medicine, fission, fusion Vectors & Scalars, Resultant Forces, Moments, Levers & Gears, Centre of Mass, Equilibrium, Resolution of forces</p> <p>Term 2 – Motion/Force & Motion/Force & Pressure s/t & v/t graphs, Acceleration Terminal Velocity, Braking, Momentum, Impact Forces, Safety, Elasticity Pressure & Surfaces, Pressure in a liquid, Atmospheric Pressure, Upthrust & Floatation</p> <p>Term 3 – Wave Properties /Electromagnetic Waves Nature & Properties of Waves, Reflection & Refraction, Ultrasound, Seismic Waves EMS, Communications, X-rays in Medicine</p>	<p>Students have been taught all of the paper 1 content by the end of Year 10.</p> <p>They have been taught by three specialist teachers and have been able to draw on their knowledge and understanding from learning in KS3 and Year 9.</p> <p>Students can use their working scientifically skills to confidently plan valid required practicals in different contexts, collect, analyse and evaluate the data.</p> <p>Students have been reassessed on prior learning from Years 9 & 10, and have increased their long-term memory stores.</p> <p>Students have greater resilience for completing longer tasks and attempting 6 mark exam questions.</p>
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<p>Year 11</p>	<p>The Curriculum for Chemistry in Year 11 has been designed to allow the students to have sufficient time to revise.</p> <p>Students still receive six lessons each week for science, and therefore are taught two lessons per week in each specialism. Topics for the three specialisms are taught alongside each other. Students have a subject specialist teacher for Biology, Chemistry and Physics.</p> <p>Tests continue to assess the understanding of 50% prior knowledge and 50% newly acquired learning and more time is spent going through assessments with students.</p> <p>Students are more confident in their pace and exam technique.</p> <p>Teachers use this time to personalise lessons ensuring students have mastered all skills required for the GCSE examinations.</p>	<p>Term 1 – Light/Electromagnetism Reflection & Refraction, Colour, Lenses Magnetic Fields, Electromagnets in Devices, Motor Effect, Generator Effect, A.C. Generators, Transformers</p> <p>Term 2 – Space The Solar System, Life-cycle of a star, Planets, Satellites & Orbits, Expanding Universe, Beginning & Future of the Universe</p> <p>Term 3 - Revision</p>	<p>Students have been taught all of the paper 1 and paper 2 content before the end of Term 2.</p> <p>They have been taught by three specialist teachers and have been able to draw on their knowledge and understanding from learning in KS3, Year 9 and Year 10.</p> <p>Students can use their working scientifically skills to confidently plan valid required practicals in different contexts, collect, analyse and evaluate the data. Students are able to critique methods and data analysis by others, and can recommend improvements.</p> <p>Students have been reassessed on their prior learning across KS4, and have increased their long-term memory stores.</p> <p>Students have greater resilience for completing longer tasks and attempting 6 mark exam questions.</p> <p>Students are well prepared for continuing with Physics at KS5, should they choose to.</p> <p>Students leave school equipped with the scientific knowledge base and skills to support them in an increasingly science-based society.</p>
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