

Mission Statement: Students will develop an enquiring mind to master the physical laws that govern the world around them and the wider Universe.

We will cover the KS3 specification in Years 7 and 8, allowing separate science GCSEs to be taken in Year 11.

Year 7 will be taught general science with blocks of biology, chemistry and physics taught in sequence. Each full block will last three weeks.

Key areas of development in year 7 include: practical skills, the importance of accurate scientific terminology, and developing confidence with numbers and formulae.

As the new general science approach provides an opportunity to rearrange course content, a small amount of material previously taught in Year 8 has been moved into Year 7 e.g. the Space topic. Other material that has been moved out of Year 7 will appear in next year's outline for Year 8.

Year 7 science also offers a chance for an increased emphasis on the scientific method and the importance of experimental data. Students at the end of Year 7 should be confident in how to obtain worthwhile experimental evidence by thoughtful practical design, and be able to review their experimental data critically to form robust conclusions.

KS3	Block 1: Forces	Block 2: Energy	Block 3: Motion	Block 4 (short): Space
7	<p>Topic: Forces and materials</p> <p>Exam: End of Year 7 exam and ultimately GCSE Paper 2</p> <p>Subject Content:</p> <p>Force types and sizes; mass v. weight; force diagrams; forces involved in changing shape; Hooke's law and its limitations; turning forces (moments)</p> <p>Learner Skills:</p> <p>Practical work and experimental design; fair tests; sources of error and solutions; graph plotting; technical vocabulary; numbers and equations</p> <p>Rationale:</p> <p>A good hands-on topic that is easily accessible. Plenty of scope for simple practical work but also to consider experimental design. Some simple mathematical and graph work</p>	<p>Topic: Energy types and transfers</p> <p>Exam: End of Year 7 exam and ultimately GCSE Paper 1</p> <p>Subject Content:</p> <p>Energy stores and energy transfers; energy conservation; work; power; heating and temperature; fuels</p> <p>Learner Skills:</p> <p>Technical vocabulary; practical skills and experimental design; numbers and equations; more complex use of numbers where equations interlink</p> <p>Rationale:</p> <p>A vital concept underpinning all physics - a little more abstract and harder to measure than forces, which is why we don't start with this! Lots of applications to everyday activities. A good chance to review forces using 'work' as the link between the two topics.</p>	<p>Topic: Motion</p> <p>Exam: End of Year 7 exam and ultimately GCSE Paper 2</p> <p>Subject Content:</p> <p>Speed formula; distance-time graphs; Newton's third law of motion; resultant forces and motion; air resistance; friction; experimental design</p> <p>Learner Skills:</p> <p>Formula use; technical vocabulary; practical skills; practical design; analysis of data</p> <p>Rationale:</p> <p>More simple numerical work and a chance to review and then extend ideas about forces. Students will plan a friction experiment from scratch, using ideas from previous blocks to design their own method and to ensure they obtain good data.</p>	<p>Topic: Space</p> <p>Exam: End of Year 7 exam and ultimately GCSE Paper 2</p> <p>Subject Content:</p> <p>The Earth and seasons; the solar system; the Universe</p> <p>Learner Skills:</p> <p>Technical vocabulary</p> <p>Rationale:</p> <p>A great way to end the year with some real 'wow' moments and a chance to stretch pupils' understanding of different distance scales.</p>

Year 8 will continue to be taught biology, chemistry and physics as separate subjects.

We will review this arrangement for September 2024, learning from our experience with teaching combined science classes to Year 7. Key areas of development in year 8 include: practical skills; the importance of accurate scientific terminology; confidence with numbers and formulae

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
8	Topic: Electricity Exam: Reported Assessment Subject Content: Circuits; current; series and parallel circuits; PD and voltage; resistance; $V = IR$; static electricity Learner Skills: Technical vocabulary; mathematical skills; practical skills (hopefully)	Topic: Magnets Exam: End of Year 8 exam and ultimately GCSE Paper 2 Subject Content: Permanent magnets and navigation; Learner Skills: Technical vocabulary	Topic: Waves Exam: End of Year 8 exam Subject Content: Waves, refraction and reflection, sound waves Learner Skills: Practical skills, mathematical skills, technical vocabulary	Topic: Electromagnets; Waves and superposition Exam: End of Year 8 exam Subject Content: Electromagnets; wave superposition Learner Skills: Technical vocabulary; practical skills (hopefully) Continuation of Spring 2 topic.		Topic: Pressure Exam: End of year 8 exam Subject Content: Pressure in solids, pressure in gases and Brownian motion, Pressure in liquids and floating Learner skills: Logic skills, making sense of the world around them
	Rationale: An important topic at GCSE that deserves significant time. Useful practical work and a necessary precursor for electromagnets.	Rationale: Some good practical work and interesting content in the run up to Christmas. Permanent magnets are a necessary precursor to electromagnets.	Rationale: A vital part of understanding how the world works, pupils will have some fun exploring different demonstrations and practicals.	Rationale: 'Electromagnets' topic ties together magnetism and electricity. 'Superposition' reviews some wave ideas from Year 7.		Rationale: Brownian motion is not taught again so is a vital part of the KS3 curriculum.

Note that we start the GCSE course in Year 9. This allows all students to take separate science GCSEs (aka Triple Science) at the end of Year 11.

Students enter Year 9 with a wide variety of background experience from different schools. We will often need to start any topic with a review of basic material and starting GCSE in Year 9 gives us time to do so.

The content we cover in Year 9 has a large overlap with KS3 content and is the easier material in the GCSE course. The small number of students joining us in Year 10 rarely face problems when catching up on the work that we cover in Year 9 and their GCSE results do not show that they are significantly disadvantaged.

A key theme in Years 9 and 10 is proficiency with formulae as the new style of GCSE exam is more challenging mathematically than older GCSE papers.

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	Topic: Forces and energy Exam: primarily GCSE Paper 1		Topic: Materials Exam: GCSE Paper 1 and 2	Topic: Waves and their applications Exam: GCSE Paper 2		

	Subject Content: Energy stores and transfers; efficiency; forces; work, GPE and power formulae; energy resources and electricity generation.	Subject Content: Springs; density; the particle model	Subject Content: Wave types and measurements; frequency and wave speed formulae; reflection and refraction; sound and ultrasound; seismic waves; colour; EM spectrum
	Learner Skills: practical work; technical vocabulary; data handling and formula use	Learner Skills: Practical work; technical vocabulary; data handling and formula use	Learner Skills: Practical work; technical vocabulary; data handling and formula use
	Rationale: Energy and forces underpin the GCSE course and it is unusual that even a foreign student hasn't got some background to draw on. Leads to energy formulae allowing us to develop that aspect of physics.	Rationale: A block of work on materials that links to both forces and energy. More formula practise.	Rationale: Waves is reasonably straightforward but full of key vocabulary and detail. It is well suited to Year 9 and there is a chance to practice simple formulae to develop skills and confidence. A significant number of students join us in Year 10. The Year 9 material has been chosen as it's less conceptually challenging and most students have some good basics from their previous schools. Students can more easily catch up with this material than with the rest of the course.

GCSE Subject AOS	AO1	AO2	AO3	AO4
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KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10	Topic: Electricity, magnetism and electromagnetism Exam: GCSE Paper 1 and 2 Subject Content: Electric circuits; mains electricity; magnetism; electromagnets and motors Learner Skills: Practical work; technical vocabulary; data handling and patterns; formula use	Topic: Radioactivity and particles Exam: GCSE Paper 1 Subject Content: Atomic structure; radioactive decay; particle model and internal energy. Learner Skills: Technical vocabulary; data handling; formula use for internal energy	Topic: Motion, forces and kinetic energy Exam: GCSE Paper 2 Subject Content: Distance, speed and velocity; forces as vectors and equilibrium; acceleration; Newton's laws of motion; falling motion and terminal velocity; KE; braking and car safety Learner Skills: Practical work; technical vocabulary; data handling and patterns; formula use			
	Rationale:	Rationale:	Rationale:			
						The last part of the Combined Science (Trilogy) material!

The work with electric circuits naturally links to electromagnets. Plenty of practical work. Lots of formulae that start to interleave usefully but are individually not too demanding. Material can be extended to give examples of level 8 and 9 questions for the more able.	A bit of a break from formulae for those still developing maths skills but returning to formulae at the end of the topic. Material links with topics studied in chemistry by this stage in Year 10.	This topic is quite mathematical and is deliberately left until last to allow students to cover topics such as trigonometry and graph gradients in maths. Allows plentiful extension work for those aiming at level 8 and 9, and provides further opportunities to practise multiple-step calculations (a feature of the new GCSE)
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All Year 11 will study separate (triple award) science GCSEs.

Students who struggles significantly with the challenge of separate sciences can sit foundation tier in physics (or other sciences) as necessary, reducing the content to be learnt as well as avoiding the most demanding material.

All classes will sit a Paper 1 mock in November. All classes will sit a Paper 2 mock in March. After this, we will give further mock papers in class (using CGP papers as needed) in order to refine exam skills.

Decisions about foundation tier or double award (to make it easier for any students who are clearly struggling) will be made after the March mock.

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
11 Triple award physics	<p>Topic: Finish paper 1 content</p> <p>Exam: GCSE Paper 1</p> <p>Subject Content:</p> <p>Particles and heat; pressure; fission and fusion; static electricity</p> <p>Learner Skills:</p> <p>Technical vocabulary; data handling and patterns; some formula use and practical work</p>	<p>Topic: Mock paper 1 and start paper 2 content</p> <p>Exam: GCSE Paper 2</p> <p>Subject Content:</p> <p>Space physics; moments and gears</p> <p>Learner Skills:</p> <p>Formula use and practical work; technical vocabulary</p>	<p>Topic: Finish paper 2 content</p> <p>Exam: GCSE Paper 2</p> <p>Subject Content:</p> <p>Lenses; electromagnetic induction; IR</p> <p>Learner Skills:</p> <p>Technical vocabulary; ray diagrams; some formula use and practical work</p>	<p>Topic: Mock paper 2</p> <p>Exam: GCSE Paper 2</p> <p>Subject Content:</p> <p>Consolidation and mocks</p> <p>Learner Skills:</p> <p>Revision and exam skills</p>	<p>Topic: Further P1 and P2 mocks</p> <p>Exam: GCSE Paper 1 and 2</p> <p>Subject Content:</p> <p>Consolidation and mocks</p> <p>Learner Skills:</p> <p>Revision and exam skills</p>	GCSE Exams
	<p>Rationale:</p> <p>Finish the triple award paper 1 material before half-term to allow revision for the mock.</p>	<p>Rationale:</p> <p>A return to practical work with moments and levers. Space science works well as a topic that can be taught in and around the mock exam and paper review.</p>	<p>Rationale:</p> <p>Finish the paper 2 content in time for half-term to allow revision for the second mock.</p>	<p>Rationale:</p> <p>There should be time to do some revision in class before Easter – use the mock papers to see what topics or skills need addressing (e.g. multiple step calculations)</p>	<p>Rationale:</p> <p>Students need more exam practice. Focus on exam technique – reading questions, structuring answers, making use of information.</p>	

A Level Subject AOS	AO1 Knowledge	AO2 Application	AO3 Analysis	AO4 Evaluation
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The new A level course content is very similar to the old A level course and so the old modules serve as useful past papers for practice questions. The course content is in the order of the old modules to make it easier for students to find practice papers. It also divides topics usefully in time for the Year 12 exams near Christmas and various Year 13 exams.

I've omitted 'Learner skills' from this document as it will be the same throughout: technical vocabulary; writing good extended explanations; increasing proficiency with formulae and numerical problems; development of practical skills (necessary for both the exam papers and the Practical Assessment at the end of Year 13).

The Year 13 course is considerably more challenging than the Year 12 course as almost none of the content has been met at GCSE. There is also a significant jump in the level of demand in exam questions and the mathematical difficulty of numerical questions (almost all of which involve multiple-step calculations).

calculations).							
KS5	Autumn 1		Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
12	Topic: old 'Unit 2' = Mechanics and waves		Topic: old 'Unit 1' = Electricity and quantum physics		Topic: Revision and mocks and a little bit of 'Unit 4'		Topic: UCAS mocks and start old 'Unit 4'
	Exam: AS exam and A2 Paper 1		Exam: AS exam and A2 Paper 1		Exam: AS exams		Exam: A2 paper 1
	Subject Content:		Subject Content:		Subject Content:		Subject Content:
	Vectors; moments; linear motion; energy; materials; wave properties; refraction; interference and diffraction		Electrical circuits, potential dividers and internal resistance; photons and energy levels, wave-particle duality; quarks and particle physics		Circular motion for 'Unit 4'		SHM and resonance. Logarithms.
	Rationale:		Rationale:		Rationale:		Rationale:
	We start the course with some of the heavier Year 12 maths content. Some of our students are less mathematically able and this allows them to quickly find out if they are suited to A level physics and can make an early change if the mathematical demands are beyond them.		Start this unit with 'electricity' as this topic is hard for students to visualise and they will need lots of practice. The particle physics material is more straightforward but hasn't been met at GCSE and so needs taking at a measured pace. We aim to finish by Easter and ideally by the March mock so that we can use a proper AS paper to get students used to the new-style exam and the questions on required practicals.		We would expect to be finished by Easter and can spend this term working on exam technique while starting the Year 13 content to prevent students getting bored and stale.		SHM and resonance follow usefully from circular motion and completes the content for A2 paper 1.
	The Christmas exam will be an old 'Unit 2' module paper.						Exponentials and the use of logarithms are required for A2 paper content and Year 13 required practicals.

KS5	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
13	<p>Topic: old 'Unit 4' = gravitational, electric and magnetic fields, electromagnetic induction</p>	<p>Topic: old 'unit 5A' = nuclear physics, heat and gases</p>	<p>Topic: Option topic</p> <p>Exam: A2 paper 3A</p>		<p>Topic: Revision and mocks</p> <p>Exam: all papers</p>	<p>A2 Exams</p>

	Exam: A2 papers 1 and 2 Subject Content: Gravitational fields and potential, electric fields and potential, capacitors, magnetic fields, induction.	Exam: A2 paper 2 Subject Content: The nuclear atom, radioactivity, SHC and latent heat, ideal gases	Subject Content: A free choice of option from medical physics; astrophysics; engineering physics; turning points in physics. We will not offer the electronics option.	Subject Content: As needed by students – this will change every year according to their experience.	
	Rationale: The toughest parts of the A2 course and those that will need most revisiting by students. A considerable jump in mathematical demand occurs which will raise awareness of the standards needed for the A2 exams and allow useful practice at this level.	Rationale: The final bit of the compulsory content. This should easily be finished in time for the March mock.	Rationale: A free choice of option as our teaching approach should mean that students are now good independent learners and can study with little assistance. Electronics was not on the old course and there are too few past papers for students to practise.	Rationale: Exam technique is needed, particularly reading questions properly and how to handle complex numerical questions. Sustained revision.	

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