

SCIENCE

Curriculum Map:



[KS3 Science Learning Journey](#)

[KS4 Combined Science Learning Journey](#)

[KS4 Chemistry Learning Journey](#)

[KS4 Biology Learning Journey](#)

[KS4 Physics Learning Journey](#)

Key Stage 3

Students follow a blended Science pathway at Key stage 3, covering key aspects of Biology, Physics and Chemistry, as well as building their core scientific and investigative skills.

Year 7:

Biology topics	Chemistry Topics	Physics Topics
Ecosystems Cells and movements, Digestion Gas exchange	Foundations of chemistry Earth Structure and rocks The periodic table and elements	Foundations of Physics Energy Light and sound

Year 8:

Biology topics	Chemistry Topics	Physics Topics
Genetics and evolution Reproduction Photosynthesis and respiration	Separating mixtures Metals and non-metals Climate and resources	Forces and motion Space Electricity and magnetism

Year 9:

Biology topics	Chemistry Topics	Physics Topics
Health Cell biology Ecosystems	Types of reactions Chemical energy Atomic structure	Heating and cooling Waves Forces and their effects

Key Stage 4

Subject	Combined Science		
Qualification	GCSE		
Exam Board	AQA		
Course Leader	Mr L Waterhouse		
Course summary	Students will study key aspects of Biology, Physics and Chemistry as a combined course and receive a double grade in Science.		
What will students learn?	Biology	Physics	Chemistry
	1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response	1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves	1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes

	6. Inheritance, variation and evolution 7. Ecology	7. Magnetism and electromagnetism	5. Energy changes 6. Chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources
	This also includes a number of practical experiments as part of the course, that allow students to develop key skills and gain a greater understanding of the scientific method.		
How will students be assessed?	Students will sit 6 papers (2 in each discipline) at the end of year 11..		

Subject	Triple Science								
Qualification	GCSE								
Exam Board	AQA								
Course Leader	Liam WaterHouse								
Course summary	<p>Students taking the Triple Science qualification will be entered in Biology, Physics and Chemistry exams. They will receive a GCSE in each.</p> <p>Successful Triple Science pupils at GCSE will be working at well above average level by the end of Year 9. This course is aimed at students who wish to study highly competitive, academic courses at university such as medicine, dentistry, and veterinary sciences; the work and pace of lessons reflects this.</p>								
What will students learn?	<p>Students will study Biology, Physics and Chemistry separately with a different teacher for each subject.</p> <table border="1"> <thead> <tr> <th>Biology</th> <th>Physics</th> <th>Chemistry</th> </tr> </thead> <tbody> <tr> <td>1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology</td> <td>1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves 7. Magnetism and electromagnetism 8. Space physics</td> <td>1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes 6. Chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources</td> </tr> </tbody> </table> <p>Each subject will include a number of practical experiments as part of the course, that allow students to develop key skills and gain a greater understanding of the scientific method.</p>			Biology	Physics	Chemistry	1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology	1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves 7. Magnetism and electromagnetism 8. Space physics	1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes 6. Chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources
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How will students be assessed?	Students will sit two exams in each subject at the end of Y11.
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Key Stage 5	
Subject	Biology
Qualification	A - Level
Exam Board	OCR A Specification
Course Leader	Mr P. Chapman
Course summary	We will learn how plants, animals and single-celled organisms survive, through a range of themed topics. Many of the topics will start with ideas you have covered before and then extend them to a higher level of detail. We will explore the links between the topics and investigate practically the themes in each unit.
What will students learn?	<p><u>Year 12</u></p> <ul style="list-style-type: none"> • How plants and animals gain the nutrients and gases they need for survival, and how these are transported around the organism. • About cells and the organelles they contain using microscopes, and test for biological molecules. • How and why organisms are classified and the importance of biodiversity • How organisms can spread diseases and how these diseases are fought. <p><u>Year 13</u></p> <ul style="list-style-type: none"> • How organisms obtain energy from the environment via photosynthesis and respiration, and get rid of waste. • How organisms communicate internally via nerves and hormones. • How and why organisms vary, and how this information can be manipulated using new technologies. • How ecosystems can be managed sustainably for future generations, and the impacts of humans on the environment.
How will students be assessed?	<p>At the end of the second year there will be 3 papers totalling 6 hours of questions covering all of the content from the two years.</p> <p>You will also keep a log book of all the practical work completed in the two years for the Practical Endorsement aspect of the qualification.</p>
Subject	Chemistry

Qualification	A - Level
Exam Board	Edexcel
Course Leader	Mr P. Kelsall
Course summary	The course is broken down into 3 strands – organic, inorganic and physical chemistry. Each section of the course begins with an overview, which puts the topic into a broader chemical context and encourages understanding of the place of each topic within the subject. The course is designed to inspire students, nurture their passion for chemistry and lay the foundations for further study and the workplace.
What will students learn?	<p><u>Year 12</u></p> <ul style="list-style-type: none"> • Atomic Structure • Amount of substance • Bonding • Kinetics • Energetics • Chemical equilibria , Le Chatelier's Principle and K_c • Organic Chemistry including alkanes, halogenoalkanes, alkenes, alcohols and organic analysis • Group 2 and Group 7 elements <p><u>Year 13</u></p> <ul style="list-style-type: none"> • Chemistry of Group 3 and their oxides • Transition metals • Further organic chemistry including aldehydes and ketones, carboxylic acids, amines, aromatic chemistry and further organic analysis. • Chromatography • Thermodynamics • Rate equations • Acids and bases
How will students be assessed?	<p>At the end of the second year there will be 3 papers covering all of the content from the two years.</p> <p>You will also keep a log book of all the practical work completed in the two years for the Practical Endorsement aspect of the qualification.</p>
Subject	Physics
Qualification	A - Level
Exam Board	Edexcel
Course Leader	Mr K. Betts-Masters

Course summary	<p>This course takes two approaches to the teaching of Physics. It covers the basic principles, the content, and then applies it to real uses of Physics. For example, the electricity content may be applied to satellite technology and material science is applied to the sweet industry. This course employs the use of practical investigations and the analysis of data.</p> <p>Students should have a 7 or above in GCSE Physics and a 6 or above in Maths.</p>
What will students learn?	<p>Year 12</p> <ul style="list-style-type: none"> • Mechanics (motion, forces and energy) • Material Science (the properties of materials, fluids and liquids) • Electricity (series and parallel circuits, resistance and components) • Waves (musical waves, transverse and longitudinal waves, how DVD's and Bluray's work) • Light (The photoelectric effect and energy levels within the atom) <p>Year 13</p> <ul style="list-style-type: none"> • Electricity and magnetism (Electromagnetic fields, capacitors, inducing electricity) • Further mechanics (circular motion, momentum and collisions) • Particle physics (fundamental particles, particle accelerators and detectors) • Oscillations (simple harmonic motion and resonance) • Radioactivity (radioactive materials, half-life and background radiation) • Astrophysics (the life cycle of a star and the history of the universe)
How will students be assessed?	<p>Pupils will be assessed through three exams at the end of Year 13. Two of these exams will count for 30% of the course, each 1 hour 45 long, and one will count for 40% which is 2 hours 30 mins in length.</p> <p>There is no longer a coursework element; however, pupils will need to complete at least 6 core practicals in each of the two years to count towards a practical skills qualification.</p>
Subject	Applied Science
Qualification	Level 3 Extended Certificate Applied Science
Exam Board	Edexcel
Course Leader	Mr P. Chapman
Course summary	<p>The level 3 BTEC in Applied Science uses a combination of assessment styles to enable students to gain the confidence and knowledge they need to succeed in their next steps either at higher education or in the workplace. The course has elements of Physics, Chemistry and Biology and has a blended approach to assessment with both coursework and exam components.</p>
What will students learn?	<p>Exam Content</p> <p>The structure of the atom</p>

	<ul style="list-style-type: none"> • The trends, patterns and properties in the periodic table • How the properties of elements link to their application and uses in industry • The Production of compounds, including making Aspirin • Cell specialisation • Nerve cells and tissues, linking their structure to their function • Heart disease, including the risk factors and treatment • Wave form • Waves in communication • Electromagnetic waves in communication <p><u>Coursework</u></p> <ul style="list-style-type: none"> • Preparing and using Standard solutions • Colourimetry • Chromatography • Calorimetry and cooling curves
How will students be assessed?	<p>Students will be required to complete a total of 4 units, 3 of which are mandatory and dictated by the exam board. • Principles and applications of science (Externally assessed by written exams) • Practical scientific techniques (Internally assessed by coursework) • Science investigation skills (Externally assessed by written exam with a practical component)</p>