

## Science KS3 Curriculum Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<b>Rationale</b>	<p>Year 7 starts with the scientific method and the techniques used in practical work throughout secondary science and beyond. The particles topic is introduced next, as particles and their behaviour are fundamental to understanding diffusion within the cells topic which follows. The energy stores topic includes the study of renewable resources, ahead of the ecology and ecosystems topic later in the year. The reproduction, chemical reactions and forces topics all build on concepts which have been studied at KS2 (e.g. seed dispersal and forces in Year 3), introducing further depth and calculation skills which will be required in KS4 for GCSE work.</p> <p>Year 8 builds further on the particles topic in Chemistry, introducing more sections of the periodic table and connecting those to the properties of materials in the Earth topic. In physics, light waves are linked to biological features in the eye and electricity is explored experimentally for the first time since KS2. The biology work stretches the KS2 work on “living things” with specific features of the biological systems of both plants and humans. Integrating revision work with practicals from each topic ahead of the end of year exam reinforces both scientific knowledge and a sound investigative approach.</p> <p>Year 9 spirals around to recap and then strengthen some topics already covered in Year 7 &amp; 8, with particle theory, biological systems and chemical reaction topics which include more detail and challenge than in previous years. The physics topics of forces and sound anticipate GCSE work and introduce more opportunities for calculation and equation practice. The end of KS3 topic allows for flexible use of the end-of-summer-term lessons, consolidating KS3 literacy and numeracy skills.</p>					
<b>Year 7</b>	<p><b>Working Scientifically Skills:</b></p> <ul style="list-style-type: none"> <li>- How to plan an experiment</li> <li>- Recording results</li> <li>- Drawing conclusions</li> <li>- Evaluating results</li> <li>- separation techniques</li> </ul> <p><b>Chemistry, Particles</b></p> <ul style="list-style-type: none"> <li>- Particles &amp; their behaviour</li> <li>- Atoms &amp; chemical reactions</li> <li>- State changes</li> </ul>	<p><b>Biology, Cells</b></p> <p>For both plants &amp; animals:</p> <ul style="list-style-type: none"> <li>- Cells, Tissues &amp; Organs</li> <li>- Reproduction &amp; variation</li> </ul> <p><b>Physics, Forces</b></p> <ul style="list-style-type: none"> <li>- Measuring and drawing forces</li> <li>- equations – weight, pressure and speed</li> <li>- Distance-time graphs</li> </ul>	<p><b>Revision – Mid-Year Exam</b></p> <p><b>Biology, Reproduction</b></p> <ul style="list-style-type: none"> <li>- Foetal development and puberty in humans</li> <li>- Sexual reproduction in humans and plants</li> <li>- Seed development and dispersal</li> </ul>	<p><b>Chemistry, Reactions</b></p> <ul style="list-style-type: none"> <li>- Chemical reactions</li> <li>- Chemical word equations</li> <li>- Acids &amp; alkalis</li> </ul>	<p><b>Physics, Energy</b></p> <ul style="list-style-type: none"> <li>- Energy stores &amp; transfers</li> <li>- Power, energy &amp; electricity</li> <li>- Fossil fuels &amp; renewable resources</li> </ul> <p><b>Revision – UL Exam</b></p>	<p><b>Biology, plants</b></p> <ul style="list-style-type: none"> <li>- Plants and photosynthesis</li> <li>- Structure of leaves</li> <li>- pollination &amp; food security</li> </ul> <p><b>Physics, Light</b></p> <ul style="list-style-type: none"> <li>- Properties of light</li> <li>- The structure of the eye and seeing colour</li> <li>- gravity &amp; the solar system</li> </ul>
<b>Year 8</b>	<p><b>Physics, Light</b></p> <ul style="list-style-type: none"> <li>- Properties of light</li> <li>- The structure of the eye and seeing colour</li> <li>- gravity &amp; the solar system</li> </ul>	<p><b>Chemistry, Elements</b></p> <ul style="list-style-type: none"> <li>- Atoms, elements &amp; compounds</li> <li>- Chemical formulae</li> <li>- Properties of metals &amp; non-metals</li> </ul> <p><b>Biology, Digestion</b></p> <ul style="list-style-type: none"> <li>- nutrition &amp; malnutrition</li> <li>- Food tests</li> <li>- enzymes and microbes</li> </ul>	<p><b>Revision – Mid-Year Exam</b></p> <p><b>Physics, Electromagnetism</b></p> <ul style="list-style-type: none"> <li>- Electricity, current and resistance</li> <li>- conductors and insulators</li> <li>- magnetic fields and electromagnets</li> </ul>	<p><b>Chemistry, Earth Science</b></p> <ul style="list-style-type: none"> <li>- Structure of the earth &amp; climate change</li> <li>- Rock cycle and carbon cycle</li> <li>- Recycling and materials science</li> </ul>	<p><b>Revision of Year 7 &amp; Year 8 content</b></p> <p><b>Working scientifically, practical skills</b></p>	<p><b>Revision, UL exam</b></p> <p><b>Biology, plants</b></p> <ul style="list-style-type: none"> <li>- Plants and photosynthesis</li> <li>- Structure of leaves</li> <li>- pollination &amp; food security</li> </ul> <p><b>Physics, Matter</b></p> <ul style="list-style-type: none"> <li>- Particle Model &amp; Density</li> <li>- Diffusion &amp; Brownian motion</li> <li>- Pressure &amp; upthrust</li> </ul>

<b>Year 9</b>	<p><b>Physics, Matter</b></p> <ul style="list-style-type: none"> <li>- Particle Model &amp; Density</li> <li>- Diffusion &amp; Brownian motion</li> <li>- Pressure &amp; upthrust</li> </ul> <p><b>Physics, Forces</b></p> <ul style="list-style-type: none"> <li>- Forces &amp; moments</li> <li>- Work done &amp; simple machines</li> <li>- Hooke's Law &amp; deformation</li> </ul>	<p><b>Chemistry, Reactions &amp; Energetics</b></p> <ul style="list-style-type: none"> <li>- Reactivity series &amp; displacement</li> <li>- Oxidation, combustion and thermal decomposition</li> <li>- Reactions of acids &amp; catalysts</li> </ul>	<p><b>Revision – Mid-Year Exam</b></p> <p><b>Physics, Sound</b></p> <ul style="list-style-type: none"> <li>- Properties of waves</li> <li>- Mechanical waves &amp; the electromagnetic spectrum</li> <li>- ultrasound, microphones &amp; speakers</li> </ul>	<p><b>Biology, The Body</b></p> <ul style="list-style-type: none"> <li>- Skeletons &amp; muscles</li> <li>- Respiration &amp; gas exchange</li> <li>- Inheritance &amp; DNA</li> </ul>	<p><b>Revision of KS3 content</b></p> <p><b>Working scientifically, practical skills</b></p>	<p><b>Revision, UL Exam</b></p> <p><b>GCSE Foundations: B1 Cell Biology</b></p> <ul style="list-style-type: none"> <li>• Cell structure</li> <li>• Cell division</li> <li>• Transport in cells</li> </ul> <p><b>C1 Atomic structure</b></p> <ul style="list-style-type: none"> <li>• Atoms, elements and compounds</li> <li>• The periodic table</li> </ul> <p><b>P3 Particles</b></p> <ul style="list-style-type: none"> <li>• Changes of state</li> <li>• The particle model</li> <li>• Internal energy and energy transfers</li> <li>• Particle model and pressure</li> </ul>
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#### Science KS4 Curriculum Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<b>Rationale</b>	<p>At GCSE our year 10s follow the AQA Trilogy specification and our year 11s follow AQA Synergy specification. Both specifications combine Biology, Chemistry and Physics, achieving them 2x GCSE grades. AQA Synergy content is very much based in the context of real life, linking together aspects of Science thematically into 'Life Science' (aspects of science that closely relate to us as living organisms) and 'Physical Science' (the aspects of science that explain how things work and interact). AQA Trilogy has been developed so that the biology, chemistry and physics content is presented clearly, in a logical teaching order and still allows students opportunities of progression to A level sciences.</p> <p>A smaller number of particularly interested and high aptitude scientists, will study the 3 sciences separately, following the AQA triple science specifications. These treat Biology, Chemistry and Physics as separate subjects, allowing students to go into more depth and cover a slightly greater breadth of each. This is ideal for students hoping to continue their study of science at KS5 and beyond!</p>					

<b>Year 10 Combined Science (TRILOGY)</b>	<p><b><u>B1 Cell Biology</u></b></p> <ul style="list-style-type: none"> <li>Cell structure</li> <li>Cell division</li> <li>Transport in cells</li> </ul> <p><b><u>C2 Structure and bonding</u></b></p> <ul style="list-style-type: none"> <li>Ionic, covalent and metallic bonding</li> <li>Properties of substances</li> <li>Structure and bonding of carbon</li> </ul> <p><b><u>P1 Energy</u></b></p> <ul style="list-style-type: none"> <li>Energy stores and systems</li> <li>Conservation and dissipation</li> <li>National and global energy resources</li> </ul>	<p><b><u>B2 Organisation</u></b></p> <ul style="list-style-type: none"> <li>Principles of organisation</li> <li>Animal tissues, organs and organ systems</li> </ul> <p><b><u>C3 Quantitative chemistry</u></b></p> <ul style="list-style-type: none"> <li>Chemical measurements</li> <li>Conservation of mass</li> <li>Chemical equations</li> <li>Moles, limiting reactants and concentration</li> </ul> <p><b><u>P2 Electricity</u></b></p> <ul style="list-style-type: none"> <li>Current, potential difference and resistance</li> <li>Series and parallel circuits</li> <li>Domestic uses and safety</li> <li>Energy transfers</li> </ul>	<p><b>Revision and MID YEAR EXAMS</b></p> <p><b><u>B2 Organisation (continued)</u></b></p> <ul style="list-style-type: none"> <li>Plant tissues, organs and systems</li> </ul> <p><b><u>C4 Chemical changes</u></b></p> <ul style="list-style-type: none"> <li>Reactivity of metals</li> <li>Reactions of acids</li> </ul> <p><b><u>P3 Particles</u></b></p> <ul style="list-style-type: none"> <li>Changes of state</li> <li>The particle model</li> </ul>	<p><b><u>B3 Infection and Response</u></b></p> <ul style="list-style-type: none"> <li>Communicable diseases</li> <li>Human defence systems</li> <li>Discovery and development of drugs</li> </ul> <p><b><u>C4 Chemical changes (continued)</u></b></p> <ul style="list-style-type: none"> <li>Electrolysis</li> </ul> <p><b><u>P3 Particles (continued)</u></b></p> <ul style="list-style-type: none"> <li>Internal energy and energy transfers</li> <li>Particle model and pressure</li> </ul>	<p><b><u>B4 Energetics</u></b></p> <ul style="list-style-type: none"> <li>Photosynthesis</li> <li>Respiration</li> </ul> <p><b><u>C5 Energy changes</u></b></p> <ul style="list-style-type: none"> <li>Exothermic and endothermic reactions</li> </ul> <p><b><u>P4 Atomic structure</u></b></p> <ul style="list-style-type: none"> <li>Atomic model</li> <li>Isotopes</li> <li>Half life and nuclear radiation</li> <li>Irradiation and contamination</li> </ul>	<p><b><u>B5 Homeostasis and Response</u></b></p> <ul style="list-style-type: none"> <li>Homeostasis</li> <li>The Human nervous system</li> <li>Hormonal coordination in humans</li> </ul> <p><b><u>C6 Rates</u></b></p> <ul style="list-style-type: none"> <li>Rate of reaction</li> <li>Reversible reactions and dynamic equilibrium</li> </ul> <p><b><u>P5 Forces</u></b></p> <ul style="list-style-type: none"> <li>Forces and their interactions</li> <li>Work done and energy transfer</li> <li>Forces and elasticity</li> <li>Forces and motion</li> <li>Momentum</li> </ul> <p><b>END OF YEAR EXAMS</b></p>
<b>Year 10 Biology</b>	<p><b><u>B1 Cell Biology</u></b></p> <ul style="list-style-type: none"> <li>Cell structure</li> <li>Cell division</li> <li>Transport in cells</li> </ul>	<p><b><u>B2 Organisation</u></b></p> <ul style="list-style-type: none"> <li>Principles of organisation</li> <li>Animal tissues, organs and organ systems</li> <li>Plant tissues, organs and systems</li> </ul>	<p><b>Revision and MID YEAR EXAMS</b></p> <p><b><u>B3 Infection and Response</u></b></p> <ul style="list-style-type: none"> <li>Communicable diseases</li> <li>Human defence systems</li> <li>Discovery and development of drugs</li> <li>Monoclonal antibodies</li> <li>Plant diseases</li> </ul>	<p><b><u>B4 Energetics</u></b></p> <ul style="list-style-type: none"> <li>Photosynthesis</li> <li>Respiration</li> </ul>	<p><b><u>B5 Homeostasis and Response</u></b></p> <ul style="list-style-type: none"> <li>Homeostasis</li> <li>The Human nervous system</li> <li>The Brain</li> <li>The Eye</li> </ul>	<p><b>REVISION AND END OF YEAR EXAMS</b></p> <p><b><u>B5 Homeostasis and Response</u></b></p> <ul style="list-style-type: none"> <li>Hormonal coordination in humans</li> <li>Maintaining water and nitrogen balance in the body</li> <li>Plant hormones</li> </ul>

Year 10 Chemistry	<p><b><u>C1 Atomic structure</u></b></p> <ul style="list-style-type: none"> <li>• Properties of transition metals</li> </ul> <p><b><u>C2 Structure and bonding</u></b></p> <ul style="list-style-type: none"> <li>• Ionic, covalent and metallic bonding</li> <li>• Properties of substances</li> <li>• Structure and bonding of carbon</li> </ul>	<p><b><u>C3 Quantitative chemistry</u></b></p> <ul style="list-style-type: none"> <li>• Chemical measurements</li> <li>• Conservation of mass</li> <li>• Chemical equations</li> <li>• Moles, limiting reactants and concentration</li> <li>• Yield and atom economy of chemical reactions</li> </ul>	<p>Revision and MID YEAR EXAMS</p> <p><b><u>C4 Chemical changes</u></b></p> <ul style="list-style-type: none"> <li>• Reactivity of metals</li> <li>• Oxidation and reduction</li> <li>• Reactions of acids</li> <li>• Titrations</li> <li>• Strong and weak acids</li> <li>• Electrolysis</li> </ul>	<p><b><u>C5 Energy changes</u></b></p> <ul style="list-style-type: none"> <li>• Exothermic and endothermic reactions</li> <li>• Chemical cells and fuel cells</li> </ul>	<p><b><u>C6 Rates</u></b></p> <ul style="list-style-type: none"> <li>• Rate of reaction</li> <li>• Reversible reactions and dynamic equilibrium</li> </ul>	<p>REVISION AND END OF YEAR EXAMS</p> <p><b><u>C7 Organic chemistry</u></b></p> <ul style="list-style-type: none"> <li>• Carbon compounds as fuels and feedstock</li> <li>• Reactions of alkenes and alcohols</li> <li>• Synthetic and naturally occurring polymers</li> <li>• Condensation polymerisation</li> <li>• Amino acids</li> <li>• DNA and other naturally occurring polymers</li> </ul>
Year 10 Physics	<p><b><u>P1 Energy</u></b></p> <ul style="list-style-type: none"> <li>• Energy stores and systems</li> <li>• Conservation and dissipation</li> <li>• National and global energy resources</li> </ul>	<p><b><u>P3 Particles</u></b></p> <ul style="list-style-type: none"> <li>• Internal energy and energy transfers</li> <li>• Particle model and pressure</li> </ul>	<p>Revision and MID YEAR EXAMS</p> <p><b><u>P2 Electricity</u></b></p> <ul style="list-style-type: none"> <li>• Current, potential difference and resistance</li> <li>• Series and parallel circuits</li> </ul>	<p><b><u>P2 Electricity</u></b></p> <ul style="list-style-type: none"> <li>• Domestic uses and safety</li> <li>• Energy transfers</li> <li>• Static electricity</li> </ul>	<p><b><u>P4 Atomic structure</u></b></p> <ul style="list-style-type: none"> <li>• Atomic model</li> <li>• Isotopes</li> <li>• Half life and nuclear radiation</li> <li>• Irradiation and contamination</li> <li>• Nuclear fission and fusion</li> </ul>	<p>REVISION AND END OF YEAR EXAMS</p> <p><b><u>P8 Space</u></b></p> <ul style="list-style-type: none"> <li>• Solar system</li> <li>• Stability of orbital motions</li> <li>• Satellites</li> <li>• Red-shift</li> </ul>
Year 11 Combined Science (SYNERGY)	<p><b><u>Unit 7c:</u></b></p> <ul style="list-style-type: none"> <li>• Acids, bases and pH</li> </ul> <p><b><u>Unit 7d</u></b></p> <ul style="list-style-type: none"> <li>• Energy changes in reactions</li> <li>• Reversible reactions</li> </ul> <p><b><u>Unit 3b:</u></b></p> <ul style="list-style-type: none"> <li>• Radiation</li> </ul>	<p>Revision and <b><u>MOCK EXAMS</u></b></p> <p><b><u>Unit 7e</u></b></p> <ul style="list-style-type: none"> <li>• Atoms into ions</li> <li>• Electrolysis</li> </ul> <p><b><u>Unit 4a:</u></b></p> <ul style="list-style-type: none"> <li>• Earth's atmosphere</li> <li>• Climate change</li> </ul>	<p><b><u>Unit 8</u></b></p> <ul style="list-style-type: none"> <li>• Carbon chemistry</li> <li>• Crude oil</li> <li>• Energy resources and efficiency</li> </ul> <p><b><u>Unit 4b:</u></b></p> <ul style="list-style-type: none"> <li>• Ecology</li> <li>• Biodiversity</li> </ul>	<p><b><u>MOCK EXAMS</u></b></p> <p><b><u>Unit 4c:</u></b></p> <ul style="list-style-type: none"> <li>• Inheritance</li> <li>• Natural selection</li> </ul> <p>Revision</p>	<p>Revision</p> <p><b>GCSE EXAMS START</b></p>	<p>GCSE EXAMS</p>

Year 11 Biology	<u><b>B6 Inheritance, variation and evolution</b></u> <ul style="list-style-type: none"> <li>• Reproduction</li> <li>• DNA structure</li> <li>• Variation and evolution</li> <li>• Cloning</li> <li>• Genetics and evolution</li> <li>• Speciation</li> <li>• Classification</li> </ul>	Revision and <u><b>MOCK EXAMS</b></u>  <u><b>B7 Ecology</b></u> <ul style="list-style-type: none"> <li>• Adaptations, interdependence and competition</li> <li>• Organisation of an ecosystem</li> <li>• Decomposition</li> </ul>	<u><b>B7 Ecology</b></u> <ul style="list-style-type: none"> <li>• Impact of environmental change</li> <li>• Biodiversity and the effect of human interaction on ecosystems</li> <li>• Trophic levels in an ecosystem</li> <li>• Food production</li> </ul>	<u><b>MOCK EXAMS</b></u>  Revision	Revision  GCSE EXAMS START	GCSE EXAMS
Year 11 Chemistry	<u><b>C8 Chemical analysis</b></u> <ul style="list-style-type: none"> <li>• Purity, formulations and chromatography</li> <li>• Identification of common gases</li> <li>• Identification of ions by chemical and spectroscopic means</li> </ul>	Revision and <u><b>MOCK EXAMS</b></u>  <u><b>C9 Chemistry of the atmosphere</b></u> <ul style="list-style-type: none"> <li>• The composition and evolution of the Earth's atmosphere</li> <li>• Carbon dioxide and methane as greenhouse gases</li> <li>• Common atmospheric pollutants and their sources</li> </ul>	<u><b>C10 using resources</b></u> <ul style="list-style-type: none"> <li>• Using the Earth's resources and obtaining potable water</li> <li>• Life cycle assessment and recycling</li> <li>• Using materials</li> <li>• The Haber process and the use of NPK fertilisers</li> </ul>	<u><b>MOCK EXAMS</b></u>  Revision	Revision  GCSE EXAMS START	GCSE EXAMS
Year 11 Physics	<u><b>P6 Waves</b></u> <ul style="list-style-type: none"> <li>• Waves in air, fluids and solids</li> <li>• Reflection of waves</li> <li>• Sound waves</li> <li>• Waves for detection and exploration</li> <li>• Electromagnetic waves</li> <li>• Lenses</li> <li>• Visible light</li> <li>• Black body radiation</li> </ul>	Revision and <u><b>MOCK EXAMS</b></u>  <u><b>P5 Forces</b></u> <ul style="list-style-type: none"> <li>• Forces and their interactions</li> <li>• Work done and energy transfer</li> <li>• Moments, levers and gears</li> <li>• Pressure in fluids</li> <li>• Forces and elasticity</li> <li>• Forces and motion</li> <li>• Momentum</li> <li>•</li> </ul>	<u><b>P7 Magnetism and electromagnetism</b></u> <ul style="list-style-type: none"> <li>• Permanent and induced magnetism, magnetic forces and fields</li> <li>• The motor effect</li> <li>• Induced potential, transformers and the National grid</li> </ul>	<u><b>MOCK EXAMS</b></u>  Revision	Revision  GCSE EXAMS START	GCSE EXAMS