

## KS4 – Subject Intent Outline Plan – Science

<p><b>KS4</b></p>	<p>Key stage 4 is taught over Years 9, 10 and 11. We have carefully chosen the topics studied in year 9 to enable progression from the KS3 onto the KS4 curriculum. All assessments in Year 9 are adapted to support students in the transition to GCSE. All students continue to follow the AQA scheme of learning. Approximately one third of the cohort will complete the ‘Triple Science’ route and sit three separate GCSEs in Biology, Chemistry and Physics. Our triple science classes are fully inclusive and we welcome any students who shows a keen interest and enthusiasm for Science. Students are selected based on consistently excellent attitude to learning scores. All other students follow the AQA Combined Science (Trilogy) GCSE and will gain two GCSEs at the end of the course. Topics are taught on rotation throughout the year, with topics being interleaved so that previous learning can be revisited and linked to the learning of new topics. Students are assessed at the end of each unit and through trial exams, teachers use the data to assess progress and identify misconceptions. Common misconceptions are addressed through collaboratively planned lessons after each exam.</p>	
	<p>All topics taught on rotation.</p>	
<p><b>Year 9:</b></p>	<p><b>Biology unit 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Cell biology:</b> Differences in cell structure, cell division and stem cells.</li> <li>• <b>Organisation:</b> Digestive system, heart and circulatory system, coronary heart disease and plant transport systems.</li> <li>• <b>Infection and response:</b> Pathogens, immunity, vaccination, antibiotics and antibiotic resistance.</li> <li>• <b>Bioenergetics:</b> Aerobic and anaerobic respiration, photosynthesis.</li> <li>•</li> </ul>	<p><b>Chemistry unit 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Atomic structure and the Periodic Table:</b> The structure of the atom, patterns in the Periodic Table, the development of the Periodic Table.</li> <li>• <b>Bonding, structure and the properties of matter:</b> Types of bonding, giant and simple molecules.</li> </ul> <p><b>Physics unit 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Atomic structure:</b> The development of the model of the atom, nuclear radiation.</li> <li>• <b>Particle model of matter:</b> Solids, liquids and gases, changes of state, density.</li> </ul>
<p><b>Year 10</b></p>	<p><b>Term 1:</b> GCSE topics from Year 9 are consolidated and applied to support progression into Year 10 and 11 content.</p>	

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	<p><b>Chemistry Unit 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Quantitative chemistry:</b> Conservation of mass, formula mass, mole calculations, yield.</li> <li>• <b>Chemical changes:</b> The reactions of metals, predicting pattern</li> <li>• <b>Energy changes:</b> Exothermic and endothermic reactions.</li> </ul>	<p><b>Physics Unit 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Energy:</b> Energy stores and transfers, energy resources, calculations.</li> <li>• <b>Electricity:</b> Current, voltage and resistance, electrical components and the National Grid.</li> </ul>	<p><b>Biology Unit 2:</b></p> <ul style="list-style-type: none"> <li>• <b>Homeostasis and response:</b> Controlling internal conditions, the nervous system.</li> <li>• <b>Inheritance:</b> Genetics, reproduction, selective breeding, cloning.</li> <li>• <b>Variation and evolution:</b> Natural selection and evolution.</li> <li>• <b>Ecology:</b> Ecosystems and biodiversity.</li> </ul>
<p><b>Year 11</b></p>	<p><b>Chemistry Unit 2:</b></p> <ul style="list-style-type: none"> <li>• <b>The rate and extent of chemical change:</b> Rates of reaction, yield, reversible reactions.</li> <li>• <b>Organic chemistry:</b> Crude oil and its uses, products from crude oil, polymers.</li> <li>• <b>Chemical analysis:</b> Chromatography, formulations and identification of gases.</li> <li>• <b>Chemistry of the atmosphere:</b> Earth's atmosphere, greenhouse gases, atmospheric pollutants.</li> <li>• <b>Using resources:</b> The Earth's finite resources, potable water, recycling.</li> </ul>	<p><b>Physics Unit 2:</b></p> <ul style="list-style-type: none"> <li>• <b>Forces:</b> Work done, energy transfers, elasticity, motion and momentum.</li> <li>• <b>Waves:</b> Waves in fluids and solids, Electromagnetic spectrum.</li> <li>• <b>Magnetism and electromagnetism:</b> Permanent and induced magnets, magnetic forces and fields, the motor effect.</li> <li>• <b>Space:</b> Solar system, orbital motions, satellites, red shift. (triple science only)</li> </ul>	<p><b>Year 11 structured revision programme:</b></p> <p>Students undertake an 8 week revision scheme of work where they consolidate and apply key learning from all units including core skills for working scientifically.</p>