

Year 1	Knowledge and Skills	Vocabulary & Reading	Checking of understanding	Rationale
Autumn Term	<p>Electronic structure of atoms and bonding. Quantities used in chemical reactions. Chemical and physical properties of elements</p> <p>The ultrastructure and function of organelles. Cell specialisation in terms of structure and function. Structure and function of muscular tissue. The structure and function of nervous tissue.</p> <p>Features common to all waves. The industrial application of diffraction gratings. The concept and applications of stationary waves resonance.</p> <p>The use of electromagnetic waves in communication</p>	<p>Covalent Ionic Electronic configuration Periodicity Electronegativity Prokaryotic Eukaryotic Palisade mesophyll Endothelial and epithelial. COPD Action potential Wavelength Amplitude Frequency Oscillation Path difference Superposition</p>	2 mini written tests and 1 mock exam per scientific area.	<p>This first unit of the course covers the mandatory content for examination in year 12. The curriculum covers all of the sciences equally, with each area providing 1/3 of the assessment. Students learn the fundamentals of the 3 sciences in this first unit. Covering these fundamental principles allows the students to subsequently apply this acquired knowledge in different units. For example, generation and propagation of action potentials covered in unit 1 is then revisited in year 13 when the concept is applied to blood pressure homeostasis. This then feeds back into unit 1 by explaining how blood pressure irregularities can lead to atherosclerosis.</p> <p>Teaching all 3 sciences also allows cross curricular links to be made. For example, they need to apply their knowledge of electronegativity studied in chemistry unit 1 to their biology chlorophyll and amino acid chromatography coursework in unit 2. Contemporary issues in science will also be discussed. While studying COPD in the biological topic,</p>

				students assess the effects of smoking on alveolar epithelial cells and gas exchange. Here we also introduce the recent research on the effects of COVID 19 on lung structure and function too.
Spring Term and summer term.	<p>The chemistry focusses on making standard solutions and titration technique.</p> <p>The physics component uses calorimetry to investigate cooling curves.</p> <p>The biology aspect investigates chromatographical techniques applied to biological molecules that include amino acids and chlorophyll.</p> <p>Improving your own, and others, practical skills.</p>	<p>Adsorption</p> <p>Stationary phase</p> <p>Mobile phase</p> <p>Solvent front</p> <p>Colourimetry</p> <p>End point</p> <p>Concordant</p> <p>Calibration curve</p> <p>Gradient</p> <p>Tangent</p>	<p>Practical observations</p> <p>4 Assignment briefs with the opportunity for re-submissions to improve grades.</p>	<p>This is the mandatory coursework component of year 12. As mentioned, it allows previous knowledge from unit 1 to be applied, but also moves the students' knowledge into new areas. Through the practical tasks, students develop proficiency in the quantitative analytical techniques of titration and colorimetry, including learning to calculate the concentration of solutions; a basic skill required in industry. They will use measurement of temperature to study cooling curves and be introduced to paper and thin-layer chromatography. The discussion and analysis of group results allows the students to understand their progress in relation to that of their peers. The experience gained in unit 2 will be invaluable in a career such as biopharmaceutical, water treatment, and polymer creation. We are also lucky to have Mr Hebbs who has recently worked in industrial chemical</p>

				<p>laboratories and so our students can tap into his relevant experiences. Employers in these industries appreciate a student's ability to follow written scientific procedures to obtain accurate and repeatable results. Before students write their assignments, they are trained to reference sources accurately and create a wide-ranging bibliography.</p>
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Year 2	Knowledge and Skills	Vocabulary & Reading	Checking of understanding	Rationale
Autumn term	<p>Planning a scientific investigation, data collection, processing and analysis/interpretation, drawing conclusions and evaluation.</p> <p>This is done via the following practical's:</p> <p>Enzyme reaction rate.</p> <p>Diffusion</p> <p>Ecological sampling</p> <p>Calorimetry</p> <p>Electrical circuits</p>	<p>Hypothesis</p> <p>Variables</p> <p>Accurate</p> <p>Repeatable</p> <p>Reproducible</p> <p>Reliable</p> <p>Valid</p> <p>Resolution</p> <p>Precision</p> <p>Qualitative</p> <p>Quantitative</p> <p>Anomalous</p>	<p>5 mini tests based on each experimental area</p> <p>1 mock exam.</p>	<p>Unit 3 is the second mandatory externally assessed unit. Its aim is to develop the essential skills underpinning practical scientific investigations. As well as drawing on Unit 1 and Unit 2, these skills will be delivered through subject themes ranging from enzyme activity and diffusion to electrical circuits, ecological sampling and calorimetry. These practical areas provide different contexts for the development of the investigative skills. By the end of the unit the students should be able to plan, implement, analyse and evaluate any area of research. Science investigative skills will help students in many scientific courses in higher education, or prepare them for employment in a science-related industry.</p>
Spring term and summer term.	<p>The interrelationship and nervous control of the cardiovascular and respiratory systems.</p> <p>The homeostatic mechanisms used by the human body</p> <p>The role of hormones in the</p>	<p>Autonomic</p> <p>Sympathetic</p> <p>Parasympathetic</p> <p>Synapse</p> <p>Neurotransmitter</p> <p>Sino-atrial node</p> <p>Atrioventricular node</p>	<p>3 assignment briefs with the opportunity for re-submissions to improve grades.</p>	<p>Our final unit is our selective unit where we have chosen to study unit 9, Human Regulation and Reproduction. This allows Mrs Sunderland and Mr Barton to use their extensive experience in biology to deliver the detailed human anatomy and physiology content. It</p>

	<p>regulation and control of the reproductive system.</p>	<p>Action potential  Resting potential  Cardiac cycle  Cardiovascular control centre  Ventilation centre  Stimuli  Effector  Receptor</p>	<p>investigates the interrelationship between the nervous, cardiovascular and respiratory systems. Homeostatic mechanisms in the body and the hormonal control of the reproductive system are also discussed. This knowledge is an essential part of health and medical science-related occupations.</p> <p>It allows our students to understand how exercise affects our body in terms of heart rate, ventilation rate, but also thermoregulation. This would link directly to sports science related degrees. The detailed knowledge of reproduction allows our students to understand how contraception works, but also how fertility treatments can allow for successful conception. This could allow our students to enter into fields such as reproductive research.</p>
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