

Progression Model – Year 12 Applied Science

Module Title: Module 1	Module Title: Module 2	Module Title: Module 3
<p>Learning Intent for this module:</p> <p>In Unit 1, students will revisit and build upon key aspects of GCSE chemistry knowledge. They will start the module by developing their understanding of chemical bonding and learn in detail about intermolecular forces. A number of quantitative aspects of chemistry will be developed in this module, including the calculation of formula mass, oxidation state and reacting masses. Finally, students will use their knowledge of bonding to learn about the production and uses of substances in relation to properties.</p> <p>Unit 1: Learning Aim A (Periodicity and properties of elements)</p> <p>Unit 2: Learning Aim A (Titrations)</p>	<p>Learning Intent for this module:</p> <p>In Unit 1, students will complete their understanding of the periodicity and the properties of elements. They will then develop their biological knowledge by revisiting and expanding on GCSE biology topics. They will learn about the structure and function of cells and tissues and, cell specialisation. In this module, students will learn about and undertake two chemical experiments, calorimetry and chromatography.</p> <p>Unit 1: Learning Aim A (Periodicity and properties of elements)</p> <p>Unit 1: Learning Aim B (Structure and functions of cells and tissues)</p> <p>Unit 2: Learning Aim B (Calorimetry)</p> <p>Unit 2: Learning Aim C (Chromatography)</p>	<p>Learning Intent for this Module:</p> <p>In this module, students are able to further develop their physics knowledge by learning about waves in Unit 1. Students will learn about working with waves which incorporates topics such as wave motion and emission spectra. They will also learn about how waves can be used in communication in applications such as fibre optics and analogue and digital signals. In Unit 2, students will review their experiences of titrations, calorimetry and chromatography. Students will then move onto Unit 3 and further deepen their understanding of planning experiments and collecting and interpreting data.</p> <p>Unit 1: Learning Aim C (Waves in communication)</p> <p>Unit 2: Learning Aim D (Review)</p> <p>Unit 3: Learning Aim A (Planning a scientific investigation)</p> <p>Unit 3: Learning Aim B (Data collection, processing and analysis and interpretation)</p> <p>Unit 3: Learning Aim C: Drawing conclusions and evaluations</p>

<p>Key Content to be learned:</p> <p><u>Unit 1</u> Students will learn about chemistry topics, including structure and bonding and properties and uses of substances. Bonding will be explained in detail and intermolecular forces will be investigated. Students will learn quantitative skills that link to chemical mass. Students will learn how physical properties and trends of elements are affected by factors such as atomic radius and electronegativity. They will also learn about the chemical properties of substances and various reactions.</p> <p><u>Unit 2</u> Students will develop practical skills by completing experiments and coursework on titrations.</p>	<p>Key content to be learned:</p> <p><u>Unit 1</u> After completing the chemistry component of Learning Aim A students will move on to the biology aspect of Unit 1, students will learn about cell structure and function which incorporates cell theory, microscopy and ultrastructure. Student will learn about cell specialisation and tissue structure and function.</p> <p><u>Unit 2</u> Students will develop their knowledge and practical skills by completing practical work and coursework on calorimetry (B) and chromatography (C).</p>	<p>Key Content to be learned:</p> <p><u>Unit 1</u> Students will complete the physics aspect of Unit 1 by learning about working with waves. This topic includes concepts such as wave motion and speed, types of waves, diffraction gratings and emission spectra. They will also learn about harmonics in musical instruments. Students will then move on to waves in communication and learn about the principles and application of fibre optics. Finally, students will learn about how electromagnetic waves are used in communication.</p> <p><u>Unit 2</u> Students will complete their final piece of coursework which entails a review of the previous learning and practical skills in this unit.</p> <p><u>Unit 3</u> Students learn about planning experiments (A), data collection and processing (B). They will complete this module by evaluating experiments and learning how to draw valid and reliable conclusions.</p>
<p>Prior knowledge:</p> <ul style="list-style-type: none"> • Atomic structure and the Periodic Table • Structure, bonding and the properties of matter • Chemical changes • Energy changes in chemistry • Rate and extent of chemical change • Chemical analysis • Working scientifically <ul style="list-style-type: none"> ○ The development of scientific thinking ○ Analysis and evaluation ○ Experimental skills and strategies ○ Vocabulary, units, symbols and nomenclature 	<p>Prior knowledge:</p> <ul style="list-style-type: none"> • Cell biology • Transport systems • Health, disease and the development of medicines • Coordination and control • Photosynthesis • Ecosystems • Evolution, inheritance and variation • Chemical changes • Chemical analysis • Working scientifically <ul style="list-style-type: none"> ○ The development of scientific thinking ○ Analysis and evaluation ○ Experimental skills and strategies 	<p>Prior knowledge:</p> <ul style="list-style-type: none"> • Energy • Forces • Forces and motion • Wave motion • Electricity • Magnetism and electromagnetism • The structure of matter • Atomic structure • Working scientifically <ul style="list-style-type: none"> ○ The development of scientific thinking ○ Analysis and evaluation ○ Experimental skills and strategies ○ Vocabulary, units, symbols and nomenclature

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Key tasks for this module: <ul style="list-style-type: none"> • Formative assessment (Titrations) • Practical skills assessment • Assessed coursework (Unit 2: Learning Aim A) • Formative assessment on bonding • Assesses coursework (Unit 2: Learning Aim A) 	Key tasks for this module: <ul style="list-style-type: none"> • Practical skills assessment • Assessed coursework (Unit 2: Learning Aim B) • Assessed coursework (Unit 2: Learning Aim C) • Formative assessment on periodicity • Formative assessment on cell structure and function 	Key tasks for this module: <ul style="list-style-type: none"> • Practical skills assessment • Assessed coursework (Unit 2: Learning Aim D) • External examination (Unit 1: Learning Aim A) • External examination (Unit 1: Learning Aim B) • External examination (Unit 1: Learning Aim C)