

## Progression Model - Year 8 Science

Module 1: The Periodic Table, Plants and Forces	Module 2: Light Waves, Genetics and Chemical Changes	Module 3: The Earth, Relationships and Pressure
<p><b>Learning Intent for this module:</b> Students will learn about the periodic table, the function of different plant organs and how plants make their own food in photosynthesis. They will also learn about forces, including magnetism.</p> <ol style="list-style-type: none"> <li>1. Periodic table and Materials</li> <li>2. Plant Systems and Photosynthesis</li> <li>3. Forces and motion</li> </ol>	<p><b>Learning Intent for this module:</b> Students will learn about physical changes and more examples of chemical reactions, they will also learn about light waves, genetics and evolution, skeleton and muscles and respiration.</p> <ol style="list-style-type: none"> <li>1. Chemical Reactions</li> <li>2. Genetics and evolution</li> <li>3. Light waves</li> </ol>	<p><b>Learning Intent for this Module:</b> Students will learn about pressure and moments, sound waves, the Earth and atmosphere as well as relationships in ecosystems.</p> <ol style="list-style-type: none"> <li>1a. Earth and atmosphere</li> <li>1b. Cellular Respiration</li> <li>2a. Relationships in ecosystems</li> <li>2b. Skeletons and Muscles</li> <li>3a. Sound waves</li> <li>3b. Pressure and moments</li> </ol>
<p><b>Key Content to be learned:</b></p> <p><b>Chemistry:</b> Students will learn that elements and materials have different chemical and physical properties. They will study how elements are grouped in the periodic table and how patterns in reactions can be predicted. They will learn the properties of metals and non-metals, the reactivity series and use of carbon to extract metals from their oxides.</p> <p><b>Biology:</b> Students will be reminded of the function of key plant organs and learn about the</p>	<p><b>Key content to be learned:</b></p> <p><b>Chemistry:</b> Students will compare physical and chemical changes and be introduced to the pH scale and indicators. They will become familiar with word and chemical equations by studying key chemical reactions. Ideas and principals of symbol equations and balancing equations will also be developed.</p> <p><b>Biology:</b> Students will learn about variation between and within species. They will investigate and learn how to represent discontinuous and continuous variation in graphs. Students will learn about the discovery</p>	<p><b>Key Content to be learned:</b></p> <p><b>Chemistry:</b> Students will learn about the structure and composition of the Earth and the rock cycle. They will learn about the importance of recycling as the Earth's materials are finite. Students will also study the carbon cycle, drawing of prior knowledge of photosynthesis, respiration, and combustion. They will learn about the composition of the atmosphere and the impact of human activities on the climate.</p> <p><b>Biology:</b> Students will learn about food chains and food webs and how organisms in ecosystems rely on each other. They will learn about toxin</p>

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<p>process of photosynthesis, summarising it as a word (and chemical) equation. They will learn about the importance of photosynthetic organisms and the adaptations of leaves to photosynthesis.</p> <p><b>Physics:</b> Students will learn about contact and non-contact forces and will study the effect of forces on objects. They will learn to use force arrows in diagrams and recognise balances and unbalanced forces. Students will also be able to calculate speed, distance, and time from suitable information, describe/ calculate relative motion and interpret distance-time graphs.</p>	<p>of DNA and the scientists involved; they will learn how DNA is transmitted from one generation to the next. Students will learn how variation within a species can lead to natural selection and evolution.</p> <p><b>Physics:</b> Students will learn the properties of longitudinal and transverse waves. They will then study the properties of light waves and how they behave when passed through materials. They will use ray boxes to investigate reflection and refraction and study focussing by convex lenses with a link to the function of the eye. Students will also investigate how filters and prisms can separate white light into different wavelengths/colours.</p>	<p>accumulation in food chains and the role of insects and plants in ensuring humans have food security. Students will also learn about the structure and function of muscles.</p> <p><b>Physics:</b> Students will learn that sound waves are vibrations that need a medium to travel through, they will learn about the speed of sound in solids, liquids and gases and relate this to the particle theory. Students will learn how sound waves can be reflected and how we can measure the speed of sound. Students will learn about how the ear works, auditory ranges and sound pollution.</p> <p>Students will also learn about pressure in liquids and gases allowing them to understand how hydraulic systems work. They will further develop their understanding of forces in the context of levers and moments.</p>
<p><b>Prior Knowledge</b> In year 7 students learnt what an element was and how chemical reactions are the rearrangement of atoms. They learned how to represent reactions as word equations. This knowledge will allow them to assimilate further information about reactions and trends in the periodic table.</p> <p>In Y3 students are introduced to the relationship between structure and function in the context of plant organs, here they will build on this</p>	<p><b>Prior Knowledge</b> In Y7 students are introduced to the idea that chemical changes are irreversible and can be represented by word equations. They also learn that physical changes (such as state changes) are reversible and involve changes in energy. The principle of conservation of mass and the role of diffusion in cells are also explored in Y7. This module will enable students to consolidate these important ideas and develop a more detailed understanding of chemical changes.</p>	<p><b>Prior Knowledge</b> In Y4 students investigate patterns between the pitch and volume of a sound and features of the object that produced it. Students will build on these ideas and the properties of longitudinal waves introduced in the last module to develop a deeper and consolidated understanding of sound waves.</p> <p>In Y5 students are taught that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect. Students</p>

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<p>knowledge and ideas about tissues and organs to build a much bigger schema about the role of plant organs including the adaptation of leaves for photosynthesises.</p> <p>In primary school students learn about the effects forces between moving objects (air resistance, water resistance and friction) and these ideas will be built on allowing students to draw force diagrams and calculate resultant forces.</p>	<p>In Y6 students are introduced to the idea that characteristics are passed from parents to their offspring. They also learn that variation in offspring over time can make animals more or less able to survive. In Y7 students are introduced to genetic material in the context of cells and the nucleus and they also learn about gametes in the context of reproduction. Students should therefore have the prior knowledge required to build a more detailed schema of generic inheritance and evolution.</p> <p>In Y6 the idea that light travels in straight lines from light sources to our eyes or from light sources to objects and then to our eyes is introduced. Students use these ideas to explain why shadows have the same shape as the objects that cast them. Here students will build on this knowledge to further investigate the behaviour of light.</p>	<p>will build on this knowledge develop a deeper understating of pressure, moments, levers, and hydraulics.</p> <p>In Y4 students learn to construct and interpret food chains, identifying producers, predators and prey. In Y7 they learn about sexual reproduction in plants including the importance of pollination. This prior knowledge will allow them to make links and assimilate new information into a schema about interdependence and ecosystems.</p>
<p><b>Key tasks for this module:</b>  Extended Writing Chemistry  Periodic table and Materials (Chemistry)  Photosynthesis (Biology)  Forces and motion (Physics)</p>	<p><b>Key tasks for this module:</b>  Chemical Changes (Chemistry)  Genetics and evolution (Biology)  Extended Writing (Biology)  Light waves (Physics)</p>	<p><b>Key tasks for this module:</b>  Earth and atmosphere (Chemistry)  Ecosystems (Biology)  Sound Waves (Physics)  Extended Writing Physics</p>

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