

Subject	Science		
Year	Term 1	Term 2	Term 3
9	<p>Students will describe and explain the concepts of:  <b>Organisms and Their Environment (Biology)</b></p> <ul style="list-style-type: none"> <li>• levels of organisation within an ecosystem</li> <li>• some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community</li> <li>• how materials cycle through abiotic and biotic components of ecosystems</li> <li>• the role of microorganisms (decomposers) in the cycling of materials through an ecosystem</li> <li>• organisms are interdependent and are adapted to their environment</li> <li>• the importance of biodiversity</li> <li>• methods of identifying species and measuring distribution, frequency and abundance of species within a habitat</li> <li>• positive and negative human interactions with ecosystems</li> </ul> <p><b>Fundamental Chemistry</b></p> <ul style="list-style-type: none"> <li>• The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their properties.</li> <li>• The historical development of the periodic table and models of atomic structure.</li> <li>• The arrangement of elements in the modern periodic table can be explained in terms of atomic structure.</li> </ul> <p><b>Forces</b></p> <ul style="list-style-type: none"> <li>• forces and fields: electrostatic, magnetic, gravity</li> <li>• forces as vectors</li> <li>• calculating work done as force x distance; elastic and inelastic stretching</li> <li>• speed of sound, estimating speeds and accelerations in everyday contexts</li> <li>• interpreting quantitatively graphs of distance, time, and speed</li> <li>• acceleration caused by forces; Newton's First Law</li> <li>• weight and gravitational field strength</li> <li>• decelerations and braking distances involved on roads, safety.</li> </ul>	<p>Students will describe and explain the concepts of:</p> <p><b>The Cellular Basis for life (Biology)</b></p> <ul style="list-style-type: none"> <li>• cells as the basic structural unit of all organisms; adaptations of cells related to their functions; the main sub-cellular structures of eukaryotic and prokaryotic cells</li> <li>• stem cells in animals and meristems in plants</li> <li>• the need for transport systems in multicellular organisms, including plants</li> </ul> <p><b>C6 The rate and extent of chemical change (Chemistry)</b></p> <ul style="list-style-type: none"> <li>• factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst</li> <li>• factors affecting reversible reactions</li> </ul> <p><b>Heating and cooling</b></p> <ul style="list-style-type: none"> <li>• Temperature what does it really mean</li> <li>• Heating and cooling with thermal conduction</li> <li>• Thermal energy store</li> </ul> <p><b>P6 Waves</b></p> <ul style="list-style-type: none"> <li>• amplitude, wavelength, frequency, relating velocity to frequency and wavelength</li> <li>• transverse and longitudinal waves</li> <li>• electromagnetic waves, velocity in vacuum; waves transferring energy; wavelengths and frequencies from radio to gamma-rays</li> <li>• uses in the radio, microwave, infra-red, visible, ultra-violet, X-ray and gamma ray regions, hazardous effects on bodily tissues.</li> </ul>	<p>Students will describe and explain the concepts of:</p> <p><b>B2 Organisation</b></p> <ul style="list-style-type: none"> <li>• carbohydrates, proteins and lipids as key biological molecules</li> <li>• enzymes</li> <li>• factors affecting the rate of enzymatic reactions</li> <li>• the relationship between the structure and functions of the human circulatory system</li> </ul> <p><b>C7 Organic chemistry</b></p> <ul style="list-style-type: none"> <li>• carbon compounds, both as fuels and feedstock, and the competing demands for limited resources</li> <li>• fractional distillation of crude oil and cracking to make more useful materials</li> </ul> <p><b>P1 Energy</b></p> <ul style="list-style-type: none"> <li>• energy changes in a system involving heating, doing work using forces, or doing work using an electric current: calculating the stored energies and energy changes involved</li> <li>• conservation of energy in a closed system, dissipation</li> <li>• power as the rate of transfer of energy</li> <li>• calculating energy efficiency for any energy transfers</li> <li>• renewable and non-renewable energy sources used on Earth, changes in how these are used.</li> </ul>

