

SCHEME OF LEARNING – SCIENCE – YEAR 8

Year 8	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
National Curriculum Content	<p>BIOLOGY</p> <p>Nutrition and Digestion</p> <p>Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed.</p> <p>Calculations of energy requirements in a healthy daily diet.</p> <p>The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.</p> <p>The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)</p>	<p>Respiration continued</p> <p>The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume</p> <p>The impact of exercise, asthma and smoking on the human gas exchange system</p> <p>Plants</p> <p>Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.</p> <p>The role of leaf stomata in gas exchange in plants.</p> <p>Reproduction in plants, including flower structure, wind</p>	<p>CHEMISTRY</p> <p>Reactions</p> <p>Chemical reactions as the rearrangement of atoms</p> <p>Representing chemical reactions using formulae and using equations</p> <p>Combustion, thermal decomposition, oxidation and displacement reactions</p> <p>Defining acids and alkalis in terms of neutralisation reactions</p> <p>The pH scale for measuring acidity/alkalinity; and indicators</p> <p>Reactions of acids with metals to produce a salt plus hydrogen</p> <p>Reactions of acids with alkalis to produce a salt plus water</p> <p>What catalysts do.</p>	<p>Earth Science</p> <p>The composition of the Earth</p> <p>The structure of the Earth</p> <p>The rock cycle and the formation of igneous, sedimentary and metamorphic rocks</p> <p>Earth as a source of limited resources and the efficacy of recycling</p> <p>The carbon cycle</p> <p>The composition of the atmosphere</p> <p>The production of carbon dioxide by human activity and the impact on climate.</p>	<p>PHYSICS</p> <p>Motion and Pressure</p> <p>Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)</p> <p>The representation of a journey on a distance-time graph</p> <p>Relative motion: trains and cars passing one another</p> <p>Newton’s second law with forces producing accelerations (changes of velocity)</p> <p>Atmospheric pressure, decreases with increase of height as weight of air above decreases with height</p> <p>Pressure in liquids, increasing with depth; upthrust</p>	<p>Electricity</p> <p>electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge</p> <p>potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current</p> <p>differences in resistance between conducting and insulating components (quantitative).</p> <p>separation of positive or negative charges when objects are rubbed together: transfer</p>

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	<p>The importance of bacteria in the human digestive system.</p> <p>Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.</p> <p>Respiration Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life</p> <p>A word summary for aerobic respiration The process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for</p>	<p>and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.</p> <p>the reactants in, and products of, photosynthesis, and a word summary for photosynthesis</p> <p>the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere</p> <p>The adaptations of leaves for photosynthesis.</p>			<p>effects, floating and sinking</p> <p>Pressure measured by ratio of force over area – acting normal to any surface.</p> <p>Moments as the turning effect of a force. Forces associated with deforming objects; stretching and squashing – springs. Measurements of stretch or compression as force is changed. The force-extension linear relation; Hooke’s Law as a special case.</p>	<p>of electrons, forces between charged objects</p> <p>the idea of electric field, forces acting across the space between objects not in contact.</p>
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	anaerobic respiration The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism.					
Why?	These are key concepts and knowledge that are important to build on in further study of biological processes. (KC)	These are key concepts and knowledge that are important to build on in further study of biological processes. (KC)	These are key concepts and knowledge that are important to build on in further study of chemical processes. (KC)	These are key concepts and knowledge that are important to build on in further study of chemical processes. (KC)	These are key concepts and knowledge that are important to build on in further study of physical processes. (KC)	These are key concepts and knowledge that are important to build on in further study of physical processes. (KC)
Matrix reference	AO1 AO2 AO3 AO4	AO1 AO2 AO3 AO4	AO1 AO2 AO3 AO4	AO1 AO2 AO3 AO4	AO1 AO2 AO3 AO4	AO1 AO2 AO3 AO4
Assessments	Formative and summative assessments for each topic using the matrix	Formative and summative assessments for each using topic the matrix	Formative and summative assessments for each sport using the matrix Mid KS3Exam – summative exam	Formative and summative assessments for each topic using the matrix	Formative and summative assessments for each topic using the matrix	Formative and summative assessments for each topic using the matrix

Why? Codes linking to the National Curriculum:

KC - develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics

NPM -develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them

UI -are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and for the future.