

Science - Biology/Chemistry/Physics

Programme of Study	Year 8 Milestones
	Biology
Plants	<p>Identify the dependence of almost all life on Earth on the transfer of solar energy to plants and algae in photosynthesis</p> <p>Recognise the relationship between the structures and functions of leaves, including chloroplasts and stomata</p> <p>Identify the reactants in and products of photosynthesis and the word equation for photosynthesis</p> <p>Recognise the mineral nutrition in plants to explain the role of nitrates</p> <p>Identify chemosynthesis in bacteria and other organisms</p> <p>Recognise that plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots</p>
Ecosystems	<p>Identify the interdependence of organisms, including food webs and the accumulation of toxic materials</p> <p>Explain how organisms affect, and are affected by, their environment</p> <p>Recognise niches and the role of variation in enabling closely-related living things to survive in the same ecosystem.</p>
Nutrition and Digestion	<p>Explain the content in a healthy human diet: carbohydrates, fats, proteins, vitamins, minerals, dietary fibre and water, and why each is needed</p> <p>Identify simple food tests for starch, simple (reducing) sugars, protein, fat</p> <p>Explain calculations of energy requirements in a healthy daily diet</p> <p>Identify the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases</p> <p>Identify the tissues and organs of the digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)</p> <p>Recognise how the digestive system digests food (enzymes simply as biological catalysts)</p> <p>Explain the importance of bacteria in the digestive system</p>
Respiration and Breathing Systems	<p>Recognise the impact of exercise, asthma and smoking on the breathing system</p> <p>Explain the structure and functions of the gas exchange system in humans, including adaptations to function</p> <p>Identify 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>
	Chemistry
Atoms, Elements and Compounds	<p>Explain atoms and molecules as particles.</p> <p>Explain a simple (Dalton) atomic number and the nature of atoms, elements and compounds</p> <p>Identify chemical symbols and formulae for elements and compounds</p> <p>Recognise conservation of mass in chemical and physical change</p>
Chemical Reactions	<p>Identify chemical reactions as the rearrangement of atoms</p> <p>Represent chemical reactions using formulae and using equations, including state symbols</p> <p>Explain combustion, thermal decomposition, oxidation and displacement reactions</p> <p>recognise the order of metals and carbon in the reactivity series</p> <p>the use of carbon in obtaining metals from metal oxides</p>
The Periodic Table and Materials	<p>Identify the principles underpinning the Mendeleev Periodic Table</p> <p>Recognise the Periodic Table: periods and groups; metals and non-metals</p> <p>Recognise how patterns in reactions can be explained and predicted with reference to the Periodic Table</p> <p>Identify the varying physical and chemical properties of different elements</p> <p>State the chemical properties of metals and non-metals and metal and non-metal oxides with respect to acidity</p> <p>explain metal and non-metal oxides with respect to acidity</p>

Physics	
Magnetism	Explain magnetic poles, attraction and repulsion
	Identify magnetic fields by plotting with compass, representation by field lines
	Explain Earth's magnetism, compass and navigation
	Recognise the magnetic effect of a current, electromagnets, D.C. motors (principles only).
Sound Waves and Energy Waves	Identify frequencies of sound waves, measured in hertz (Hz)
	Explain echoes, reflection and absorption of sound
	Recognise that sound needs a medium to travel, the speed of sound in air, in water and solids
	Identify that sound is produced by vibrations of objects for example in loud speakers
	Identify that sound is detected by their effects on microphone diaphragm and the ear drum and that sound waves are longitudinal
	Recognise the auditory range of humans and animals.
	Recognise that pressure waves, transferring energy are used for cleaning and physiotherapy by ultra - sound
	Identify that waves transferring information are used for conversion to electrical signals by microphone.
Electricity	Explain electric current, measured in amperes, in circuits, series and parallel circuits,
	Explain that currents add where branches meet and current as flow of charge
	Identify potential difference, measured in volts plus battery and bulb ratings
	Recognise resistance, measured in ohms, as the ratio of potential difference (p.d.) to current differences in resistance between conducting and insulating components.
Energy Transfers	Explain energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change
	Compare the starting point with the final conditions of a system
	Describe increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions
	Use physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes.