TOR VIEW

SCIENCE COMPOSITE KNOWLEDGE COVERAGE
KEY STAGE 4

Intent:
To explore the world around us, observe phenomena, develop scientific vocabulary, be curious and ask questions about what we see, answer scientific questions creatively and form conclusions from our evidence gathered.

		CYCLE A – 2026-2027	CYCLE B - 2025-2026	Running throughout each cycle
Autumn	**1**	**Chemistry – The Periodic Table** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • the varying physical and chemical properties of different elements • the principles underpinning the Mendeleev periodic table • the periodic table: periods and groups; metals and non-metals • how patterns in reactions can be predicted with reference to the periodic table • the properties of metals and non-metals • the chemical properties of metal and non-metal oxides with respect to acidity	**Physics** **Motion & Forces** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** **Describing motion** • speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time) • the representation of a journey on a distance-time graph • relative motion: trains and cars passing one another **Pressure in fluids** • atmospheric pressure, decreases with increase of height as weight of air above decreases with height • pressure in liquids, increasing with depth; up thrust effects, floating and sinking • pressure measured by ratio of force over area – acting normal to any surface	**Working scientifically** Through the content across all three disciplines and detailed in the implementation structure for weekly focus. **Pupils will be taught:** **Scientific attitudes** • pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility • understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review • evaluate risks **Experimental skills and investigations** • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • make predictions using scientific knowledge and understanding • select, plan and carry out the most appropriate types of scientific enquiries to test predictions,
	2	**Biology** **Structure & functions of living organisms –** Cells and Organisation ***National Curriculum coverage to be taught at differentiated Developmental steps.***	**Physics Matter** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** ***Energy in matter***	

		• cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope • the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts • the similarities and differences between plant and animal cells • the role of diffusion in the movement of materials in and between cells • the structural adaptations of some unicellular organisms • the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms	• changes with temperature in motion and spacing of particles • internal energy stored in materials ***Space physics*** • gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and sun (qualitative only) • our sun as a star, other stars in our galaxy, other galaxies • the seasons and the Earth's tilt, day length at different times of year, in different hemispheres • the light year as a unit of astronomical distance	including identifying independent, dependent and control variables • use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques **Measurement** • understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature • use and derive simple equations and carry out appropriate calculations • undertake basic data analysis including simple statistical techniques **Analysis and evaluation** • apply mathematical concepts and calculate results • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • present reasoned explanations, including explaining data in relation to predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arising from their results
Spring	**1**	**Physics** **Energy** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** **Calculation of fuel uses and costs in the domestic context** • comparing energy values of different foods (from labels) (kJ) • comparing power ratings of appliances in watts (W, kW) • comparing amounts of energy transferred (J, kJ, kW hour) • domestic fuel bills, fuel use and costs • fuels and energy resources **Changes in systems** • energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change • comparing the starting with the final conditions of a system and describing 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 using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes	**Chemistry** **Chemical Reactions** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • chemical reactions as the rearrangement of atoms • representing chemical reactions using formulae and using equations • combustion, thermal decomposition, oxidation and displacement reactions • defining acids and alkalis in terms of neutralisation reactions • the pH scale for measuring acidity/alkalinity; and indicators • reactions of acids with metals to produce a salt plus hydrogen • reactions of acids with alkalis to produce a salt plus water • what catalysts do	

	2	**Chemistry** **Pure and Impure Substances** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • the concept of a pure substance • mixtures, including dissolving • diffusion in terms of the particle model • simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography • the identification of pure substances	**Physics** **Electricity & Electromagnetism** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** **Current electricity** • electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge • potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current • differences in resistance between conducting and insulating components (quantitative) **Static electricity** • separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects • the idea of electric field, forces acting across the space between objects not in contact **Magnetism** • magnetic poles, attraction and repulsion • magnetic fields by plotting with compass, representation by field lines • Earth's magnetism, compass and navigation • the magnetic effect of a current, electromagnets, DC motors (principles only)	
Summer	1	**Biology** **Interactions & Interdependencies –** Relationships in an Ecosystem & Health ***National Curriculum coverage to be taught at differentiated Developmental steps.*** ***Relationships in an ecosystem***	**Biology –** **Structure & functions of living organisms –** Gas Exchange Systems ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope	

		• the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops • the importance of plant reproduction through insect pollination in human food security ***Health*** the effects of recreational drugs (including substance misuse) on behaviour, health and life processes	• the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts • the similarities and differences between plant and animal cells • the role of diffusion in the movement of materials in and between cells • the structural adaptations of some unicellular organisms the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms	
	2	**Chemistry** **Atoms, elements & Compounds** ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • a simple (Dalton) atomic model • differences between atoms, elements and compounds • chemical symbols and formulae for elements and compounds • conservation of mass changes of state and chemical reactions	**Biology** **Material Cycles & energy –** Cellular respiration ***National Curriculum coverage to be taught at differentiated Developmental steps.*** • aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life • a word summary for aerobic respiration • the process of anaerobic respiration in humans and micro-organisms, including fermentation, and a word summary for anaerobic respiration • the differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	