

Year 7

Half term 1		Half term 2		Half term 3	Half term 4	Half term 5	Half term 6	
Introduction to science	Particle Model and separating techniques	Energy transfers (including work done, heating cooling)		Organisms cells and movement (bones, muscles etc)	Speed, gravity and space	Matter (Atomic structure, Periodic Table, metals and non-metals)	Ecosystems and interdependence	Year 7 Science fair
Observing and recording chemical reactions. Evaluating risks, health and safety in the science laboratory	Plan and carry out scientific enquiries. Accuracy and precision. Measuring, reading a scale. Developing graph skills, plotting a heating curve.	Making predictions. Presenting and recording data. Developing graph skills, applying mathematical techniques, calculating results. Identify further questions from results.		Accuracy and precision. Using a scale, using microscopes, converting units Understanding how scientific models develop over time	Asking questions based upon understanding of the world. Testing predictions. Applying calculations, showing working. Identifying variables. Presenting and recording data in tables and graphs identifying patterns in data and drawing conclusions. Using equations and SI units.	Organising tables. Making predictions based on understanding. Health and safety, evaluating risks. Understanding how scientific theories develop over time.	Using new techniques. Testing predictions. Applying sampling techniques, calculating averages, analysing data and suggesting improvements. Undertaking data analysis	Posing scientific questions. Selecting the most appropriate techniques to plan and carrying out a scientific enquiry. Identifying questions based on results.
			December assessment				End of year assessment	
	The particulate nature of matter <ul style="list-style-type: none">The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure changes of state in terms of the particle model.Changes of state in terms of particle model. Pure and impure substances <ul style="list-style-type: none">the concept of a pure substance	Calculation of fuel uses and costs in the domestic context <ul style="list-style-type: none">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 costsfuels and energy resources.		Cells and organisation <ul style="list-style-type: none">cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscopethe functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplaststhe similarities and differences between plant and animal cellsthe role of diffusion in the movement of materials in and between cells	Describing motion <ul style="list-style-type: none">speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)the representation of a journey on a distance-time graphrelative motion: trains and cars passing one another. Forces <ul style="list-style-type: none">forces as pushes or pulls, arising from the interaction between two objects	Atoms, elements and compounds <ul style="list-style-type: none">a simple (Dalton) atomic modeldifferences between atoms, elements and compoundschemical symbols and formulae for elements and compounds The periodic Table <ul style="list-style-type: none">the varying physical and chemical properties of different elementsthe principles underpinning the Mendelev Periodic Table	Interactions and interdependencies Relationships in an ecosystem <ul style="list-style-type: none">the interdependence of organisms in an ecosystem, including food webs and insect pollinated cropsthe importance of plant reproduction through insect pollination in human food securityhow organisms affect, and are	

	<ul style="list-style-type: none"> • 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. • energy changes on changes of state (qualitative) <p>Physical changes (Physics)</p> <ul style="list-style-type: none"> • Conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving • Similarities and differences, including density differences, between solids, liquids and gases • Brownian motion in gases • Diffusion in liquids and gases driven by differences in concentration. 	<p>Calculation of fuel uses and costs in the domestic context</p> <ul style="list-style-type: none"> • 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. <p>Changes in systems</p> <ul style="list-style-type: none"> • 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, temperature, changes in elastic distortions. • using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes. <p>Energy in matter</p> <ul style="list-style-type: none"> • changes with temperature in motion and spacing of particles • internal energy stored in materials. 	<ul style="list-style-type: none"> • the structural adaptations of some unicellular organisms • the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. <p>The skeletal and muscular systems</p> <ul style="list-style-type: none"> • the structure and functions of the human skeleton, to include support, protection, movement and making blood cells • biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles • the function of muscles and examples of antagonistic muscles. 	<ul style="list-style-type: none"> • using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces • forces measured in newtons, <p>Forces and motion</p> <ul style="list-style-type: none"> • forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) • change depending on direction of force and its size. <p>Space physics</p> <ul style="list-style-type: none"> • gravity force, weight = mass x gravitational field strength (g), on Earth $g=10\text{ N/kg}$, 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. 	<ul style="list-style-type: none"> • 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 • chemical reactions as the rearrangement of atoms • representing chemical reactions using formulae and using equations <p>Materials</p> <ul style="list-style-type: none"> • properties of ceramics, polymers and composites (qualitative). <p>Matter (physics)</p> <ul style="list-style-type: none"> • the difference between chemical and physical changes. 	<p>affected by, their environment, including the accumulation of toxic materials.</p>	
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