The Ellesmere Port C of E College

Science

Part of the Frank Field Education Trust

KS3 Curriculum Plan 2025-2026

		LP1	LP2	LP3	LP4	LP5
Year 7	TOPIC	***Atomic structure, particles and states of matter***	***Periodic table Energy, particles and sound***	***Animal cells and body system***	***Body systems, diet and nutrition***	***Elements, compounds and mixtures, separation techniques and chemical reactions***
	Knowledge	Particles, States of matter, Solid, liquid, gas, arrangement of particles, changes of state, diffusion, dissolving, conservation of mass, atomic structure including protons, neutrons and electrons, electronic structure of the first 20 elements	Elements, Metals and non-metals, history of the periodic table, groups and periods, Group 1 reactivity and properties, Group 7 reactivity and properties. Energy stores, energy transfers, Sankey diagrams, kinetic theory, density, conduction, convection, sound waves and vibrations, frequency, wavelength, echoes, human hearing	Animal and plant cells, microscopy, specialised cells, movement in cells, unicellular organisms, vaccinations, puberty, human reproductive systems, menstrual cycle, development of a baby, composition of blood, the heart, the respiratory system	The skeletal system, muscles, balanced diet, health, effects of drugs on health, food tests, the digestive system, enzymes	Elements and compounds, mixtures, soluble and insoluble substances, filtration and evaporation, separating rock salt, distillation, chromatography, pure and impure substances, reactants and products, chemical equations, reversible and irreversible reactions
	Skills	Drawing particle diagrams Calculating change in mass (MS) Investigating if mass changes (Practical skills) Drawing diagrams of atomic structure and electron arrangement Investigation into group 1 and group 7 reactions (Practical skill/observation skills) Reading a periodic table correctly Drawing Sankey diagrams Calculating energy stores (MS) Drawing wave diagrams Drawing and labelling animal and plant cells Using a microscope to observe cells (practical skills) Testing the nutrients found in different food types (Practical skills) Separating different mixtures using different separating techniques (Practical skills) Constructing word equations for reactions Observing changes occurring during a chemical reaction (practical skills)				
	Key Vocab	Variable, state of matter, change of state, element, compound, mixture, periodic table.	Periodic table, reactivity, sound, audible range, echo, cells, microscopes.	Puberty, Menstrual Cycle, Foetus, Organs, Respiratory System, Circulatory System, Nutrient	Foetus, organs, respiratory system, circulatory system, nutrient, enzyme, drug.	Word equation, combustion, thermal decomposition, reactivity, metal extraction, corrosion, polymer.

		LP1	LP2	LP3	LP4	LP5

Year 8

TOPIC	*Plant tissues, respiration and photosynthesis*	*Reactivity, exothermic and endothermic reactions, acids and alkalis. Earth and climate change.*	*Space and ecosystems*	*Inheritance, genetics and evolution*	*Waves and light*
Knowledge	The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts and the similarities and differences between plant and animal cells. The role of diffusion in the movement of materials in and between cells. The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. The reactants in, and products of, photosynthesis, and a word summary for photosynthesis. 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. The adaptations of leaves for photosynthesis. 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.	The order of metals and carbon in the reactivity series and the use of carbon in obtaining metals from metal oxides. Combustion, thermal decomposition, oxidation and displacement reactions. Defining acids and alkalis in terms of neutralisation reactions and using 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. The composition and structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources and the efficacy of recycling. The composition of the atmosphere and the production of carbon dioxide by human activity and the impact on climate. Properties of ceramics, polymers and composites (qualitative). Energy changes on changes of state (qualitative). Exothermic and endothermic chemical reactions (qualitative).	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. 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. How organisms affect, and are affected by, their environment, including the accumulation of toxic materials.	Heredity as the process by which genetic information is transmitted from one generation to the next. A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. Differences between species and the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation. The variation between species and between individuals of the same species meaning some organisms compete more successfully, which can drive natural selection. Changes in the environment which may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.	Sound and energy transfer Wave traces as well as interpreting amplitude and frequency Observing waves through the use of the cathode ray oscilloscope Light including how it travels and the speed of light Reflection including the law of reflection and different mirrors Refraction including the law and different scenarios Dispersion, the colours of the spectrum and how we see colour Colour filters- how these work and how these effect the colours of different objects The eye, the parts of the eye and the function of eye
Skills	Labelling parts of a plant. Writing chemical equations. Comparing and contrasting scientific processes.□ Various safety and practical skills. Use of data and bar/pie charts (MS) Observing changes occurring during a chemical reaction (practical skills)□ Using chemical formulae to complete calculations and conversion of units. (MS) Observing changes occurring during a chemical reaction (practical skills)□ Measurement and graphical representation of variation. (MS) Comparing and analysing the limitations of scientific models and how ideas are developed.□ Graph skills (MS). Observing light in different scenarios (WS)				
Key Vocab	Variable, photosynthesis, stomata, aerobic respiration, acid, alkali (base).	Exothermic, displacement, revise, weathering, metamorphic rock, igneous rock, atmosphere, global warming.	Energy, renewable, conduction, radiation, eclipse, gravity, revision, ecosystem.	Ecosystem, adaptation, sampling, inheritance, biodiversity, evolution, wave.	Amplitude, longitudinal, frequency, reflection, refraction, absorption, spectrum.

TOPIC	LP1 *Electricity and magnetism*	LP2 *Atomic structure and the periodic table*	LP3 *Cells and cell processes*	LP4 *Newtonian forces*	LP5
Knowledge	Circuit symbols, circuit diagrams, constructing circuits, electrical charge and current, current and potential difference in series circuit, current and potential difference in parallel circuits, Mains electricity and energy transfer. Electrical safety devices, Appliances and the national grid, Resistance in a wire, Magnets, Magnetic fields, electromagnets, uses of electromagnets	Atomic structure Atoms to ions Electronic structure Isotopes Group 1 trends Group 7 trends Explaining trends in reactivity using electronic structure. History of the periodic table Mendeleev's periodic table Newlands periodic table	Eukaryotic and prokaryotic cells Microscopes Specialisation in animal cells Specialisation in plant cells Diffusion in cells Osmosis Osmosis in plants Active transport Exchanging materials Cell division STEM cells STEM cell dilemmas	Forces Newtons laws Weight and Newtons second law Forces and braking Forces and elasticity Hooke's Law	Speed Distance-time graphs Velocity Velocity-time graphs Acceleration

Year 9						
	Skills	Identifying circuit components using symbols building electrical circuits, measuring values in electrical circuits Drawing magnetic fields Building simple electromagnets□ Calculating the charge of an ion Explaining chemical properties using electronic structure□ Microscope practical skills Using a microscope. Calculating magnification, image size and actual size. Scientific drawings of cells seen under a microscope. Experimental technique. Graph drawing skills and analysis of data. Discussion of precision, accuracy and reliability. Identification of anomalies. Calculating and comparing surface area to volume ratios. Making ethical, social and economic judgements.□ Calculating weight Measuring the extension of a spring Practical skill Graph drawing and analysis of data Using data to prove/disprove a scien-tific hypothesis□ Calculating speed Drawing distance-time graphs from data Analysis of graphs Using data from to calculate speed Drawing velocity time graphs Using data from velocity-time graphs to calculate distance Calculating acceleration				
	Key Vocab	Variable, circuit, current, charge, electrostatic, electromagnet, energy.	Molecule, sub-atomic particle, periodic table, alkali metals, reactivity, electronic structure, transition metals, atomic mass.	Transition metals, atomic mass, microscope, differentiation, stem cell, meristem.	Newtons, forces, friction, weight, lever, density.	Scalar, speed, acceleration, terminal velocity, stopping distance, car safety.