KS3 Science Curriculum Coverage: 2025-2026

Year 7

Sequenced	Practical Skills & Safety (Autumn term)	Particles and solutions (Autumn term)	Cells and reproduction (Autumn/Spring term)	Energy (Spring term)	Periodic table (Spring/Summer term)	Acids and alkalis (Summer term)
Key Knowledge	• Name common pieces of lab apparatus • Describe what different apparatus is used for • The names and meaning of common hazard symbols • The metric units for mass, volume, temperature, length and time • The meaning of the terms independent, dependent and control variables in science • How to present data in a table and graphically	• The properties of the different states of matter in terms of particle model. • Changes of state in terms of particle model • Conservation of material and mass for changes of state, including sublimation and dissolving • The differences in motion and closeness of particles explaining changes of state, density, the anomaly of ice-water transition • Changes with temperature in the motion and spacing of particles • Similarities and differences of states of matter including density differences • Brownian motion in gases • Gas pressure in terms of particles • Diffusion of fluids in terms of particles, driven by differences in concentration • Pure substances, mixtures and dissolving • Identifying pure substances • Filtration, evaporation, distillation and chromatography to separate mixtures	• The hierarchical organisation of multicellular organisms • Cells as the fundamental unit of living organisms • How to observe, interpret and record cell structure using a microscope • Functions of cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts • Similarities and differences between plant and animal cells • Role of diffusion in movement of materials between cells • Structural adaptations of some unicellular organisms • Reproduction in humans – structure of male/female reproductive system, menstrual cycle (no hormones), gametes, fertilisation, gestation and birth • Maternal lifestyle on foetus through placenta • Reproduction in plants – flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal including quantitative investigation of dispersal mechanisms	• Fuels and energy resources • Simple machines give bigger force at the expense for smaller movements and vice versa • Heating and thermal equilibrium – energy transfer from hotter to cooler one, through conduction, convection and radiation • Reducing temperature differences by using insulators • Other processes that involve energy transfer, including dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels • Energy as a quantity that can be calculated and conservation of energy • Comparing starting with final conditions of a system, describing changes in amount of energy associated with movements, temperatures, changes in positions of a field, elastic distortions and chemical compositions • Using physical processes, rather than energy, to explain intermediate steps that bring about these changes	• Simple (Dalton) atomic model • Differences between atoms, elements and compounds • Naming elements and simple compounds • Chemical symbols and formulae for elements and compounds • Principles for Mendeleev periodic table • Periodic table: groups and periods, metals and non-metals • Physical and chemical properties of different elements • Using periodic table to predict patterns in reactions • Properties of metals and non-metals • Atoms and molecules as particles	• Defining acids and alkalis in terms of neutralisation reactions. • Using pH scale for measuring acidity/alkalinity, and indicators • Reactions of acids with metals to produce salt and hydrogen • Reactions of acids with alkalis to produce salt and water • The chemical properties of metal and non-metal oxides with respect to acidity
Key Skills	• Draw scientific diagrams of lab apparatus • Identify different variables in everyday and science scenarios • To label axes, draw scales and plot data on a graph • Convert between different units using the prefixes milli and kilo • Measure temperature and read a thermometer • Set up and use a Bunsen burner safely	• Measure the temperature of a substance accurately • Draw and record data in an appropriate results table • Calculate density using mass and volume • Calculate the density of objects by measuring the mass and volume • Identify pure substances by melting or boiling points • Making solutions and using observations to classify substances as soluble or insoluble • Using filter paper and funnel to filter mixtures • Set up apparatus for evaporation and obtain a soluble substance • Set up and carry out chromatography of a felt tip pen	• Identify animal and plant cells based on the organelles present • To use a light microscope safely to observe and draw diagrams of cells • To prepare a slide for viewing using a light microscope • To calculate total magnification of an image • Convert between units for length (milli)	• Comparing energy values from labels of different foods (kJ) • Comparing power ratings of appliances (W) • Comparing amounts of energy transferred (J, kJ, kW, hour) • Comparing domestic fuel bills, fuel uses and cost • Converting between seconds, minutes and hours • Converting between kilojoules and joules	• Identify elements and compounds from particle diagrams • Identify elements names from their symbols and vice versa • Describe properties of elements • Describe physical and chemical properties of metals and non-metals • Predict properties of elements • Predict reactivity using the periodic table • Record observations	• Identifying hazards of acids and alkalis • Writing word equations of reactions of acids • Using indicators to measure pH • To identify acids/alkalis by using indicators • Use acids and alkalis safely in a lab

Prior knowledge / areas for recap **Links to future learning**	• Identifying variables at KS4 required practical's • Using appropriate apparatus for measuring different quantities / writing methods • Presenting data on graphs	• Temperature and how to measure it • Simple concept of energy • How to measure volumes and masses • Making observations and measuring quantities such as time Should know from KS2: • Use knowledge of solids, liquids and gases to describe how mixtures could be separated by either filtering, sieving and evaporating (Y5) • Some materials can dissolve and how to recover them from a solution (Y5) • Demonstrate that dissolving, mixing and changes of state are reversible (Y5) • Compare and group together everyday materials based on hardness, conductivity, solubility, transparency and response to magnets (Y5) • Physical vs chemical reactions at KS3 (Y8) • Particle model at KS4 • Using particle model to explain forces of attraction between particles • Using particle model to explain cooling/heating curves at KS4 • Explaining the difference between pure and impure substances at KS4 • Explaining how separation techniques can be used to separate different mixtures KS4	• Diffusion of particles in terms of concentration Should know from KS2: • Describe the life process of reproduction of some animals and plants (Y5) • Organelles linked to photosynthesis at KS3 (Y8) • Diffusion of substances into the blood at KS3 (Y8) • Digestive system and function of organs at KS3 (Y8) • Plants and the role of pollinators with links to food security in KS3 (Y8) • Genetics and variation at KS3 (Y9) • Plant, animal and bacterial cells at KS4 • Using a microscope KS4 • Calculating magnification at KS4 • Role of hormones in the menstrual cycle at KS4 • Fertilisation and reproduction at KS4	Should know from KS2: • Simple concept of energy • Energy stores and transfers at KS4 • Calculating energy at KS4 • Calculating efficiency at KS4 • Investigating insulation at KS4 • Describing conduction, convection, radiation at KS4	• Atoms as particles • Identify properties of substances (solids liquids gases in KS3 prior, same principal for elements in this topic). • Writing word equations (acids and alkalis Y7) • Chemical vs physical reactions at KS3 (Y8) • Rutherford and Bohr models at KS4 • Chadwick at KS4 • Mass and charge of subatomic particles at KS4 • Electron structure at KS4 • Explaining reactivity at KS4	• Metals and non-metals • Making simple compounds • Naming simple compounds • Using pH scale at KS4 • Identifying pH using universal indicator at KS4 • Writing word equations for different reactions of acids at KS4 • Carry out a chemical reaction and using separation techniques to prepare a dry, soluble salt at KS4
	Tier 3 key vocabulary	**Tier 3 key vocabulary**	**Tier 3 key vocabulary**	**Tier 3 key vocabulary**	**Tier 3 key vocabulary**	**Tier 3 key vocabulary**
Subject specific	Beaker, conical flask, thermometer, balance, Bunsen burner, flammable, corrosive, toxic, independent, dependent, control, line of best fit, scale, axis	Particle, solid, liquid, gas, melting, freezing, evaporation, condensation, pressure, diffusion, temperature, density, mass, volume, solvent, solute, solution, soluble, insoluble, dissolve, filtration, distillation, chromatography, pure substance, mixture	Cell, organelle, nucleus, cell membrane, cytoplasm, cell wall, chloroplast, vacuole, lens, magnify, stain, specialised, unicellular, adaptation, function, gamete, fertilisation, gestation, pollen, ovum, pollination, germination, seed dispersal	System, chemical, thermal, kinetic, gravitational potential, elastic potential, vibrational, efficiency, useful, output, convection, conduction, radiation, insulation, temperature, renewable, non-renewable, power, energy, fossil fuel, Joules	Atom, element, compound, nucleus, periodic table, trends, group, period, reactivity, alkali metals, halogens, noble gases, metals, non-metals, physical properties, chemical properties	Acid, alkali, pH, scale, acidity, neutral, neutralisation, indicator, metal oxide, metal hydroxide, metal, reaction, corrosive