

Sequenced	Practical Skills & Safety (Autumn term)	Cells & Reproduction (Autumn term)	Particles (Spring term)	Energy (Spring term)	Separation techniques (Summer term)	Fast & Furious (Summer term)
Key Knowledge	To know: <ul style="list-style-type: none"> The names of common pieces of lab equipment used in science. The common hazard symbols used in science. The metric units of length, mass, volume, time and temperature. The meaning of independent, dependent and control variables within the context of everyday scenarios. 	To know: <ul style="list-style-type: none"> How organisms are made up... cells → tissues → organs → organ systems How to label an animal and plant cell. The functions of the different organelles limited to the nucleus, cell membrane, cytoplasm, cell wall, chloroplasts & vacuole. How to compare similarities and differences between animal and plant cells. That some cells are specialised and adapted in order to carry out their function in animals and plants. The structural adaptations of some unicellular organisms. The male and female gametes, where they are produced and how they are involved in fertilisation. How the menstrual cycle is (without details of hormones) linked to gestation and birth and how maternal lifestyle can impact foetal development. 	To know: <ul style="list-style-type: none"> The differences between atoms, elements and compounds. The properties of solids, liquids and gases in terms of the particle model. The changes of state - melting, freezing, evaporating, condensing and sublimation. The meaning of density and how to calculate it (rearrangement not compulsory). The differences in arrangements, in motion and in closeness of particles, explaining changes of state, shape and density including the anomaly if the ice-water transition. Changes with temperature in motion and spacing of particles linked to internal energy stored in materials. How particles move via diffusion. How the particle model is linked to gas pressure including the Brownian motion in gases. 	To know: <ul style="list-style-type: none"> The first six energy stores (thermal, kinetic, gravitational potential, elastic potential, chemical & vibrational). That chemical energy stored in food and fuels is released during combustion. How to calculate the efficiency of devices. The processes of conduction, convection and radiation and examples of where these occur. The difference between a thermal conductor and a thermal insulator. The work done by an object depends on the force applied and the distance moved. The different renewable and non-renewable energy resources, including advantages and disadvantages. 	To know: <ul style="list-style-type: none"> What a pure substance is and how they are identified. The terms dissolving, solute, solvent, solution, soluble and insoluble. The separation of mixtures including filtering, evaporation, distillation and chromatography and examples of what each process can be used to separate. Examples of acids, alkalis and neutral substances. An indicator can be used to identify the pH of a substance. The process of neutralisation - reacting acids and alkalis together to form salt plus water The 4 layers that make up the earth's structure. The three types of rocks and how they are formed. The problems with climate change. 	To know: <ul style="list-style-type: none"> How Mendeleev ordered the elements into the Periodic table. Where metals and non-metals are positioned on a periodic table and their chemical symbols. The columns and called groups and the rows are called periods on the periodic table. How Dalton's simple atomic model has changed over time. The sub-atomic particles that make up an atom and their relative mass and relative charge. Group 1 elements are known as the alkali metals and they get more reactive as you go down the group. Group 7 elements are known as the halogens and they get less reactive as you go down the group. Why the noble gases are unreactive. A more reactive metal can displace a less reactive metal. The chemical properties of metal and non-metal oxides with respect to acidity.
Key Skills	To be able to: <ul style="list-style-type: none"> Convert between different units. Identify the independent, dependent and control variables in everyday scenarios. Draw a line graph including the labelling and scaling of axes. Set up and use a Bunsen burner safely in order to earn a Bunsen burner license. 	To be able to: <ul style="list-style-type: none"> Identify animal and plant cells and unicellular organisms using knowledge of different organelles. Use a light microscope to observe and draw cells and identify organelles. Use a light microscope to calculate the total magnification of an image. Convert between measurements of length. 	To be able to: <ul style="list-style-type: none"> Measure the temperature of a substance using a thermometer at regular intervals. (stearic acid practical) Draw and enter data into a results table. Measure the density of an object by: measuring the mass of an object using a balance; and measuring the volume using either formula or displacement method. Explain zero error using a balance, and random error using a thermometer as well as the resolution of both pieces of equipment. 	To be able to: <ul style="list-style-type: none"> Describe the changes in energy stores of different scenarios. Identify the independent, dependent and control variables in energy investigations. Draw and complete a results table. Draw a bar chart including the labelling of both axes. Compare the advantages and disadvantages of renewable and non-renewable energy resources. Compare energy values of different foods. Compare power ratings of appliances Calculate energy costs = power (kW) x time (hrs) x price (per kWh). 	To be able to: <ul style="list-style-type: none"> Set up a funnel and filter a mixture (e.g. sand and water and rock salt) Produce and analyse a chromatogram to identify different colours within a dye. Identify the pH of chemicals using universal indicator and the pH scale. Compare different types of rocks and their formation. Analyse pie charts showing the composition of gases in the earth's early atmosphere and the earth today. 	To be able to: <ul style="list-style-type: none"> Identify the numbers of protons, neutrons and electrons in an atom given the atomic number and mass number of an element. Write word equations for displacement reactions using the reactivity series of metals. Identify non-metals and metals based on their physical and chemical properties. Predict reactivity using the Periodic table Record observations of a chemical reaction (e.g. fizzing, temperature change, colour change) Identify the independent, dependent and control variables of an investigation (rates of reaction)
	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.	Cell, organelle, nucleus, cell membrane, cytoplasm, cell wall, chloroplast, vacuole, specialised, unicellular, adaptation, function, gamete, fertilisation.	Atom, element, compound, particles, melting, freezing, evaporating, condensation, sublimation, pressure, diffusion, temperature, density, mass, volume, Brownian motion, anomaly.	System, chemical, thermal, kinetic, gravitational potential, elastic potential, vibrational, efficiency, useful output, wasted output, conduction, convection, radiation, insulation, temperature, equilibrium, renewable, non-renewable, fossil fuel, joules, watts, combustion.	Solute, solvent, solution, soluble, insoluble, dissolve, filtration, evaporation, distillation, chromatography, acid, alkali, neutral, neutralisation, indicator, pH, core, mantle, crust, sedimentary, igneous, metamorphic.	Element, atom, sub-atomic, nucleus, proton, neutron, electron, groups, periods, reactivity, alkali metals, halogens, noble gases, reactivity, displacement, fizzing, chemical properties, physical properties.

Current Year 7 Cohort 2023-2024

Topics to study in Year 8:

- Forces
- Keeping Healthy
- Electricity & Magnetism
- Chemical Reactions

Topics to study in Year 9:

- Energy from Food
- Ecology, Inheritance & Evolution
- Waves
- Cellular Biology
- Atomic Structure & Periodic Table
- Energy & resources