Year 8 Science Curriculum – 2025-2026

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	Periodic Table Health and Lifestyle	Energy Separating techniques	Adaptations and inheritance Acids and Metals	Electricity and magnetism/ Motion and Pressure	Electricity and magnetism/ Motion and Pressure	Ecosystem Processes The Earth
Knowledge & Understanding (National Curriculum) *Skills are across the whole year.*	In biology students will know and understand: • The effects of recreational drugs (including substance misuse) on behaviour, health and life processes. • Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. • Calculations of energy requirements in a healthy daily diet. • The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. • The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts). • The importance of bacteria in the human digestive system. • Plants make carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots. • 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 microorganisms, 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 interdependence of organisms in an ecosystem, including food webs and insect pollinated crops. • How organisms affect, and are affected by, their environment, including the accumulation of toxic materials. • 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.				

	• 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 means some organisms compete more successfully, which can drive natural selection. • Changes in the environment 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. In chemistry students will know and understand: • The concept of a pure substance. • Mixtures, including dissolving. • Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography. • The identification of pure substances. • Reactions of acids with metals to produce a salt plus hydrogen. • Reactions of acids with alkalis produce salt plus water. • The order of metals and carbon in the reactivity series. • The use of carbon in obtaining metals from metal oxides. • Properties of ceramics, polymers and composites. • The principles underpinning the Mendeleev Periodic Table. • How patterns in reactions can be predicted with reference to the Periodic Table. • 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 carbon cycle. • The composition of the atmosphere. • The production of carbon dioxide by human activity and the impact on climate. In physics students will know and understand: • 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). • Fuels and energy resources, fuel cost and domestic fuel use. • Simple machines give bigger force but at the expense of smaller movement (and vice versa): product of force and displacement unchanged. • Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tend to reduce the temperature difference: use of insulators. • Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.

	• 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. • 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. • Moment as the turning effect of a force. • Work done and energy changes on deformation. • Atmospheric pressure decreases with increase of height as weight of air above decreases with height. • Pressure in liquids, increasing with depth; upthrust effects, floating and sinking. • Pressure measured by ratio of force over area – acting normal to any surface. • 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. • 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. • Magnetic fields, magnetic poles, attraction and repulsion. • The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition.	
Skills	**R** *Develop* **RESILIENCE**	★ *Always striving to improve answers by including key vocabulary and backing up thoughts with scientific explanations.* ★ *Working through challenging situations , reflecting as to why a practical might not produce the expected results and adapting their technique to collect accurate results.*
	A *Possess* **AMBITION**	★ *Seeking to answer scientific questions through analysis of experimental results.* ★ *Devising models and analogies for tricky and abstract scientific concepts.* ★ *Write effectively and coherently using Standard English appropriately.*

		★ *Using assessment to make progress – designated improvement and reflection time (Green for Growth) is built in following class assessments, summative assessments and any other teacher marked work.*
	I *Demonstrate* **INTEGRITY**	★ *Completing practical work sensibly baring in mind the safety of themselves and others.* ★ *Taking responsibility for their studies and individual revision* ★ *Using problem solving skills to work through scientific models.*
	S *Embed* **Self-Discovery**	★ *Sharing their own ideas of scientific questions during class discussions.* ★ *Asking scientific questions, carrying out investigations to find out the answers to scientific questions.* ★ *Students must reflect upon real world advancements and consequences of science such as climate change and renewable energy.*
	E *Display* **EMPATHY**	★ *Respecting the laboratory and others during practical experiments by helping to get equipment for others, compare experimental techniques and keeping the laboratory tidy.* ★ *Showing respect for the class teacher and other students by listening to and contributing to class discussions.* ★ *Respecting other people's opinions and ideas.*

Curriculum Links	**Periodic Table** At KS2, students will have been taught: - Common elements such as carbon, oxygen and some metals. **Health and Lifestyle** At KS2, students will have been taught: - Factors which affect the functioning of the body including diet, exercise, drugs, and lifestyle.	**Energy** At KS2, students will have been taught: - The idea that humans get energy from food and that simple machines are used to do work and they will have measured temperature. **Separating techniques**	.**Adaptations and inheritance** At KS2, students will have been taught: - To investigate variation with the idea that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. This leads to the idea of identifying how animals and plants	**Electricity and magnetism** At KS2, students will have been taught: - To construct simple series circuits and try different components. For example, bulbs, buzzers, and motors, and including switches, and use their circuits to create simple devices. In year 6, they will have begun to use recognised symbols when	**Electricity and magnetism** At KS2, students will have been taught: - To construct simple series circuits and try different components. For example, bulbs, buzzers, and motors, and including switches, and use their circuits to create simple devices. In year 6, they will have begun to use recognised symbols when	**Ecosystem Processes** At KS2, students will have been taught: - The idea of food chains and looking at components of ecosystems. - Classification keys to group and identify living things. Students will have used classification keys to group and identify living things. - The idea that plants produce their own 'food' (glucose) through photosynthesis. The students will

	- Basic components of diets and the functioning of the parts of the digestive system.	At KS2, students will have been taught:	are adapted to suit their environment in different ways. - The idea that fossils provide evidence about living things that inhabited the Earth millions of years ago. This leads to the idea of identifying how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. In the previous topic on adaptations and variation they have gained the introductory knowledge required for this topic. **Acids and Metals** At KS2, students will have been taught: - Basic knowledge of metals and properties of metals, most of the background knowledge for this topic will come from the acids and alkalis topic studied in year 7.	representing a simple circuit in a diagram. - The idea of magnetic forces. In year 3 they studied magnetic forces and should be able to describe magnets as having two poles and to predict whether two magnets will attract or repel each other, depending on which poles are facing. **Motion and Pressure** At KS2, students will have been taught: - To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate and recording data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs.	representing a simple circuit in a diagram. - The idea of magnetic forces. In year 3 they studied magnetic forces and should be able to describe magnets as having two poles and to predict whether two magnets will attract or repel each other, depending on which poles are facing. **Motion and Pressure** At KS2, students will have been taught: - To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate and recording data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs.	have already covered overlapping content on the features of the plant kingdom, including the photosynthesis reaction and features of plants and plant cells in year 7. - The importance of plants to our ecosystems and that they absorb energy from the sun to make food. **The Earth** At KS2, students will have been taught: - That air is a mixture of gases including oxygen.
Assessment	Checkpoint 1	Checkpoint 2	Checkpoint 3	Checkpoint 4	Checkpoint 5	Checkpoint 6

Aspirations & Careers	All year 8 students are invited to complete a chemistry “Christmas card” competition, to design a Christmas card used by the RSC. The 2023 entry was a winner! Newcastle university outreach team visits Boldon school’s science department regularly to deliver workshops to students in a range of topics such as pharmacy or brain anatomy. External visits for year 8 include visits to the great north museum in Newcastle. During British Science week and throughout the year, careers in STEM are promoted to all year 8 students.