KS3 CURRICULUM: SCIENCE - YEAR 8 2024-2025

Curriculum Aim: In science we aim to develop a deeper understanding of a range of scientific ideas in biology, chemistry and physics. Pupils will be able to connect the three disciplines and become aware of the big ideas underpinning scientific knowledge and understanding.
Link to prior learning: The subject builds on key skills learned in year 7 including planning, taking measurements, recording data and identifying evidence.
Rationale of sequencing: The course begins with biology, chemistry and physics in the autumn term and this theme continues in the spring and summer terms. By grouping the topics together as such, it allows students to develop their use of scientific vocabulary throughout, building on knowledge acquired in all three disciplines.

	Focus / Topic	Knowledge	Skills	Assessment
Autumn 1	**B1 - Health and lifestyle** **C1 - The periodic table**	**B1** - Describe the components of a healthy human diet including carbohydrates, lipids, proteins, vitamins, minerals, fibre and water. Identify the consequences of imbalances in the diet including obesity, starvation and deficiency diseases. Describe the tissues and organs of the human digestive system explaining how each part is adapted to do its role. Identify enzymes as biological catalysts. Explain the importance of bacteria in the human digestive system. Explain the effects of recreational drugs on behaviour, health and life processes. **C1** - Describe the physical and chemical properties of different elements. Describe the differences in properties between metals and non-metals. Explain how patterns in reaction can be predicted with reference to the periodic table incorporating groups and periods.	Make predictions using scientific knowledge and understanding. Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas. Make predictions using scientific knowledge and understanding.	Two question led lessons to develop skills to answer 6 mark questions in science.
Autumn 2	**P1 - Electricity and magnetism** **B2 - Ecosystem processes**	**P1** - Explain electric current, measured in amps, in series and parallel circuits. Explain potential difference, measured in volts, in series and parallel circuits. Describe and explain resistance, measured in ohms. Explain static electricity in terms of positive and negative charges. Use plotting compasses to identify a magnetic field around a magnet. Describe the magnetic effect of a current. **B2** - Recall the reactants, products, and word equations for photosynthesis, aerobic respiration and anaerobic respiration. Describe adaptations of leaves for photosynthesis. Explain the process of aerobic respiration in terms of enabling chemical processes necessary for life.	Interpret observations and data, identifying patterns and using observations to draw conclusions. Identify further questions arising from your results. Make and record observations and measurements using a range of methods for different investigations and evaluate the reliability of methods suggesting possible improvements.	Autumn term assessment on B1 health and lifestyle, C1 the periodic table and P1 electricity and magnetism. Two question led lessons to develop skills to answer 6 mark questions in science.

		Explain the process of anaerobic respiration in humans and microorganisms, including fermentation. Describe the interdependence of organisms in an ecosystem including food webs.		
Spring 1	**C2 - Separation techniques** **P2 - Energy**	**C2 -** Explain the concept of a pure substance. Explain mixtures, including dissolving. Apply simple techniques for separating mixtures including filtration, evaporation, distillation and chromatography. **P2** -Compare energy values of different foods in kJ. Compare power ratings of appliances in kW. Compare amounts of energy transferred. Use ideas about energy to explain domestic fuel bills, fuel use and costs. Describe heating and thermal equilibrium in terms of conduction, convection and radiation.	Evaluate risks. Make and record observations and measurements using a range of methods. Make and record observations and measurements using a range of methods. Use and derive simple equations and carry out appropriate calculations.	Spring term assessment on B2 ecosystem processes, C2 separation techniques and P2, energy. Two question led lessons to develop skills to answer 6 mark questions in science.
Spring 2	**B3 - Adaptation and inheritance** **C3 - Metals and acids**	**B3 -** Identify variation as the differences between species. Describe the variation between individuals of a species as continuous and discontinuous using measurements and graphical representations. Describe variation in terms of organisms being able to compete more successfully therefore driving natural selection. Explain how changes in an environment may leave individuals within a species less adapted to compete, survive, and reproduce which in turn may lead to extinction. Explain the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. **C3** - Predict the products of displacement reactions. Predict the products of reactions with metals and acids. Identify the order of metals in the reactivity series. Explain the use of carbon in obtaining metals from metal ores. Describe the properties of ceramics, polymers and composites.	Present observations and data using appropriate methods, including tables and graphs. Evaluate risks. Make and record observations and measurements using a range of methods. Make predictions using scientific knowledge and understanding. Evaluate data, showing awareness of potential sources of random and systematic error.	Two question led lessons to develop skills to answer 6 mark questions in science.
Summer 1	**P3 - Motion and pressure**	**P3** - Describe speed and the quantitative relationship between average speed, distance and time. Explain the representation of a journey on a distance-time graph. Explain atmospheric pressure in terms of weight of air above. Explain pressure in gases and liquids.	Ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience.	Summer term assessment on B3 adaptation and inheritance, C3 metals and acids,

		Describe pressure measured by ratio of force over area. Describe a moment as the turning effect of a force.		P3 motion and pressure.
Summer 2	**C4 –The Earth** **Project here?**	**C4** - Describe and explain the composition and structure of the Earth. Use the rock cycle to explain the formation of igneous, sedimentary and metamorphic rocks. Describe the composition of the Earth's atmosphere. Explain the production of carbon dioxide by human activity and its impact on climate change. Describe the Earth as a source of limited resources and the efficacy of recycling.	Make predictions using scientific knowledge and understanding.	**End of year assessment on all topics learned this year:** **B1 - Health and lifestyle** **B2 - Ecosystem processes** **B3 - Adaptation and inheritance** **C1 - The periodic table** **C2 - Separation techniques** **C3 - Metals and acids** **C4 - The Earth** **P1 - Electricity and magnetism** **P2 - Energy** **P3 - Motion and pressure**

Further Information

Seneca: https://www.senecalearning.com/

BBC Bitesize: https://www.bbc.com/bitesize/subjects/zng4d2p

Kerboodle: https://www.kerboodle.com/ (Regular assessment tasks will be set and expected to be completed on Kerboodle)