KS3 CURRICULUM: SCIENCE - YEAR 7 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 primary school including planning, taking measurements, recording data and identifying evidence.
Rationale of sequencing: The course begins with an introduction to science to ensure everybody is familiar with some of the key concepts and health and safety. We then work through biology, chemistry and physics in each term. 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	**Introduction to science** **B1 – Cells** **C1 – Particles and their behaviour**	Identify a range of scientific equipment. **B1** - Explain the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts. Identify similarities between animal and plant cells. Recognise the role of diffusion in the movement of materials in and between cells. Identify structural adaptations of unicellular organisms. **C1 -** Describe properties of the different states of matter in terms of the particle model including gas pressure. Use the particle model to explain changes of state.	Be able to select, plan and carry out scientific experiments to test predictions and identify independent, dependent and control variables. Make predictions using scientific knowledge and understanding. Make and record observations and measurements using a range of methods for different investigations and evaluate the reliability of methods suggesting possible improvements.	Two question led lessons to develop skills to answer 6 mark questions in science. Required practical 1 - observing cheek cells under a microscope. Required practical 2 - what is the best temperature to make tea? Required practical 3 - diffusion.
Autumn 2	**P1 – Forces** **B2 – Structure and function of body systems**	**P1 -** Recognise forces as pushes or pulls arising from an interaction between two objects. Show the relationship between force and extension using Hooke's Law. Identify forces as contact and non-contact. Associate forces with stretching and squashing objects. Apply force arrows and diagrams to explain balanced and unbalanced forces. **B2** - Outline the hierarchical organisation of multicellular organisms from cells to tissues to organs to systems to organisms. Describe the structure and function of the human skeleton including support, protection and movement.	Evaluate data, showing awareness of potential sources of random and systematic error. Present observations and data using appropriate methods, including tables and graphs. Use and derive simple equations and carry out appropriate calculations. Use appropriate techniques, apparatus and materials during	Autumn term assessment on B1 cells, C1 particles and their behaviour and P1 forces. Two question led lessons to develop skills to answer 6 mark questions in science.

		Describe the function of muscles and examples of antagonistic pairs of muscles. Identify the structure and function of the gas exchange system in humans including the mechanism of breathing.	laboratory work paying attention to health and safety.	
Spring 1	**C2 – Elements, atoms, and compounds** **P2 – Sound**	**C2 -** Describe a simple model of the atom. Identify differences between elements, atoms and compounds. Recognise and apply chemical symbols and formulae for elements and compounds. **P2** - Recognise that sound needs a medium through which to travel and identify the difference of the speed of sound in solids, liquids and gases. Explain frequency measured in hertz, echoes, reflection and ultrasound. Discover the auditory range of humans and animals and recognise the danger to the eardrum of loud sounds.	Select, plan and carry out scientific experiments to test predictions and identify independent, dependent and control variables. Make predictions using scientific knowledge and understanding.	Spring term assessment on B2 body systems, C2 elements, atoms, and compounds and P2, sound. Two question led lessons to develop skills to answer 6 mark questions in science.
Spring 2	**B3 – Reproduction** **C3 – Reactions**	**B3 -** Identify and describe the structure and function of the male and female reproductive systems, the menstrual cycle, gametes and fertilisation including the effect of maternal lifestyle of the foetus through the placenta. Describe reproduction in plants including the structure of a flower, types of pollination, fertilisation, seed and fruit formation and dispersal **C3** - Explain the law of conservation of mass. Explain chemical reactions as the rearrangement of atoms. Describe thermal decomposition and combustion. Explain the difference between exothermic and endothermic reactions.	Identify further questions arising from your results. Interpret observations and data, identifying patterns and using observations to draw conclusions. Understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas.	Two question led lessons to develop skills to answer 6 mark questions in science.
Summer 1	**P3 – Light** **C4 – Acids and Alkalis**	**P3** - Explain the similarities and differences between light and sound waves. Explain the transmission of light through materials including absorption and reflection. Describe the law of reflection. Explain how and why we see objects as different colours. **C4** - Identify reactions of acids with alkalis and metals including the products formed. Define acids and alkalis in terms of neutralisation reactions. Use the pH scale and indicators for measuring acidity and alkalinity.	Ask questions and develop a line of enquiry based on observations of the real world alongside prior knowledge and experience. Identify further questions arising from your results. Make predictions using scientific knowledge and understanding. Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility.	Summer term assessment on B3 reproduction, C3 reactions, P3 light. Required practical 4 - measuring changes in pH.

Summer 2	**P4 – Space** **Environment project**	**P4** - Identify our sun as a star and recognise that there are other stars in our galaxy and other galaxies. Explain the seasons in terms of the Earth's tilt. Explain how eclipses form and the stages of the moon. Project: "War on plastics". Identify ways to reduce our reliance on single use plastics. Develop research and presentation skills in order to display your findings.	Make predictions using scientific knowledge and understanding. Interpret observations and data, identifying patterns and using observations to draw conclusions. Identify further questions arising from your results.	**End of year assessment on all topics learned this year:** **B1 - Cells** **B2 - Body systems** **B3 - Reproduction** **C1 - Particles** **C2 - Elements, atoms, compounds** **C3 - Reactions** **C4 - Acids and alkalis** **P1 - Forces** **P2 - Sound** **P3 - Light** **P4 - Space**

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)