CNCS

Year 8 Science: Curriculum Overview

Rationale: In Year 8, students will build on prior knowledge from Year 7 and develop their skills in key foundation concepts in Biology, Chemistry and Physics. Students will develop their knowledge about how to work safely in a lab and investigate scientific questions. Students will revisit and be introduced to a range of specific subject terminology, learning how to identify and discuss this appropriately. Furthermore, students will be given opportunities to develop their own responses to scientific problems and consider how to apply their knowledge to them.

A learner in Year 8 will know/ have studied:	**A learner in Year 8 will be able to:**
Key areas in all three sciences, this will build the foundation for further study and investigation. They will have worked in a lab and will know the key safety rules to follow. They will have carried out key investigations to help with their understanding of the areas taught. They will have prior knowledge review lessons before each topic to recap on Year 7 knowledge if it is needed. - ***Biology:*** B1.1 Cells, B1.2 Reproduction, B1.3 Interdependence - ***Chemistry:*** C1.1 Particles, C1.2 Atoms, elements, compounds, C1.3 Mixtures ***Physics:*** P1.1 Forces, P1.2 Space, P1.3 Energy, P1.4 Electrical circuits	Work safely in labs and carry out investigations. They will be able to question and will have begun to understand the world around them from the units studied.

Term	Outline	Assessment	Home Learning	Key Skills/ End Point
1	**B2.1 Tissues and organs** Students will explore the structure and function of the skeletal and muscular systems, investigating muscle strength and movement. They will study the respiratory system, the mechanism of breathing, and gas exchange, understanding how these processes support life. The topic also examines the effects of medicinal and recreational drugs on the body, highlighting their impact on health. Additionally, students will learn about organ donation, ethical considerations, and medical advancements. Through practical investigations and discussions, they will develop scientific reasoning and an appreciation for the importance of health, fitness, and medical science in everyday life. **B2.4 Nutrition** Students will explore the importance of diet and nutrition, understanding how different food groups contribute to a healthy body. They will conduct food tests and analyse food	**Formative Assessment:** **Pitstops: (Section 1 – Key knowledge, Section2 – Extended knowledge & Section 3- 4 to 6 marks) completed after every topic.** B2.1 Tissues and Organs B2.3 Nutrition C2.1 Changing substances P2.1 Movement and Pressure **Summative assessment:** **1.2 End of Term assessment (B2.1, B2.4, C2.1, P2.1)** **Skills Tested** AO1: Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures. AO2: Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures.	Set once per week via Educake.	Students are able to recall key knowledge and apply this knowledge to exam questions from different areas. Students will interpret and then describe and explain what graphs show with reference to the data collected for a range of contexts. Students are able to analyse information given to them, and apply their knowledge

	samples to identify key nutrients. The topic will cover the structure and function of the digestive system, with a focus on the small intestine and models of digestion. Students will investigate the role of enzymes, particularly digestive enzymes such as amylase, in breaking down food. Additionally, they will study plant nutrition, examining how plants obtain and use nutrients for growth. **C2.1 Changing substances** Students will develop an understanding of chemical changes and the principles governing reactions. They will explore the conservation of mass, learning how to apply this concept to balanced chemical equations. The topic will introduce oxidation and reduction, with practical investigations such as burning magnesium to observe these processes. Students will study the reactions of acids, and learn to test for gases produced during reactions. Through hands-on experiments and analytical thinking, students will enhance their problem-solving skills. **P2.1 Movement and Pressure** Students will develop mathematical and analytical skills by exploring mean, median, and mode in scientific data analysis. They will study speed and changing speed, using distance-time graphs to interpret motion and solve problems. The topic will cover the principles of pressure and its applications, demonstrating how forces act in different contexts. Students will also investigate moments, understanding how turning forces operate in real-world situations. Through hands-on experiments, graph interpretation, and problem-solving activities, students will enhance their understanding of motion, forces, and pressure.	AO3: Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.		gained through the course to evaluate data provided.
2	**B2.2 Respiration and Photosynthesis** Students will explore the impact of lifestyle and habits on health, assessing risks associated with different behaviours. They will study aerobic and anaerobic respiration, investigating how exercise affects respiration and muscle fatigue. The topic also examines the role of anaerobic	**Formative Assessment:** **Pitstops: (Section 1 – Key knowledge, Section2 – Extended knowledge & Section 3- 4 to 6 marks) completed after every topic.** B2.2 Respiration and Photosynthesis C2.2 Acids and alkalis	Set once per week via Educake.	Students are able to recall key knowledge and apply this knowledge to exam questions from different areas.

	respiration in various biological processes. In plant biology, students will learn about photosynthesis, conduct experiments to investigate its factors, and explore plant adaptations, including those of non-photosynthetic plants. Through practical investigations and critical analysis, students will develop a deeper understanding of human and plant physiology. **C2.2 Acids and alkalis** Students will develop an understanding of acidity and alkalinity through exploration of the pH scale and the use of indicators to classify substances. They will conduct practical investigations, including making natural indicators from red cabbage, to observe colour changes in different pH conditions. The topic will cover neutralisation reactions, with a focus on how acids react with bases and metal carbonates to form salts. Students will learn to write scientific methods for practical work and apply their knowledge to making salts through controlled reactions. Through hands-on experiments and critical thinking, students will strengthen their practical and analytical chemistry skills. **P2.2 Magnetism and resistance** Students will develop an understanding of magnetism and magnetic fields, exploring how magnets interact and influence their surroundings. They will study the properties of electromagnets, investigating how they can be strengthened. Through practical experiments, students will construct and analyse electromagnets, measuring their effectiveness under different conditions. The topic will emphasise scientific analysis, encouraging students to interpret data. Students will develop a comprehensive understanding of resistance and its role in electrical circuits. They will apply Ohm's Law to explore the relationship between voltage, current, and resistance, using mathematical techniques such as significant figures and proportionality to analyse data accurately. Practical investigations will focus on measuring resistance and	P2.2 Magnetism **Summative assessment:** **1.2 End of Term assessment (B2.2, C2.2, P2.2)** **Skills Tested** AO1: Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures. AO2: Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.		Students will interpret and then describe and explain what graphs show with reference to the data collected for a range of contexts. Students are able to analyse information given to them, and apply their knowledge gained through the course to evaluate data provided.

	examining how factors such as wire length and material affect resistance. Through hands-on experiments, data analysis, and problem-solving, students will develop essential scientific and mathematical skills for understanding and working with electrical circuits			
3	**B2.3 Life Diversity** Students will explore the principles of variation and inheritance, understanding how genetic traits are passed down through generations. They will examine artificial selection and natural selection, analysing how these processes influence species over time. The topic will also cover the theory of evolution, providing insight into the biodiversity. Additionally, students will investigate the impact of human activities on natural selection, considering the consequences for ecosystems and species survival. **C2.3 Earth systems** Students will explore the formation and characteristics of rocks, studying igneous, sedimentary, and metamorphic rocks and their roles in the rock cycle. They will examine the water cycle, understanding its importance in shaping landscapes and sustaining life. The topic will also cover the relationship between water and living organisms, emphasising the significance of clean water for ecosystems and human health. Additionally, students will investigate air pollution, its causes, and its environmental impact. **P2.4 Light**	**Formative Assessment:** **Pitstops: (Section 1 – Key knowledge, Section2 – Extended knowledge & Section 3- 4 to 6 marks) completed after every topic.** B2.3 Life Diversity C2.3 Earth systems P2.3 Resistance **Summative assessment:** **3.2 End of Term assessment (B2.3, C2.3, P2.3)** **Skills Tested** AO1: Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures. AO2: Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures. AO3: Analyse information and ideas to: interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.	Set once per week via Educake	Students are able to recall key knowledge and apply this knowledge to exam questions from different areas. Students will interpret and then describe and explain what graphs show with reference to the data collected for a range of contexts. Students are able to analyse information given to them, and apply their knowledge gained through the course to evaluate data provided.