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.

 <u>A learner in Year 8 will know/ have studied:</u> 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. <i>Biology:</i> B1: Cell Biology, B2: Organisation, B3: Infection and Response, B4: Bioenergetics; <i>Chemistry:</i> C1: Atomic Structure & the Periodic table, C2: Bonding, C4: Chemical Changes, C5 Energy Changes; <i>Physics:</i> P1: Energy, P2: Electricity, P3: Particle Model of Matter They will know the required practical (RP) activities for each unit and how to carry them out. 		A learner in Year 8 will be able to: 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	1	Home Learning	Key Skills/ End Point
1	B5 Homeostasis and Response Students will be able to describe the process of homeostasis. They will be able to describe hormonal coordination in humans. They will be able to simply describe reproduction in humans and plants. They will be able to describe the process of the menstrual cycle, fertilisation, gestation and birth. C7 Organic Chemistry Students will be able to describe what crude oil is and where it comes from. They will be able to describe the process of fractional distillation and some uses of fuels produced in this process. They	1.1 & 1.2 Pit Stops B5 Homeostasis (LA & HA)C7 Organic Chemistry (LA & HA)P6.1 Waves (LA & HA)P6.2 Waves (LA & HA)B6 Inheritance, Variation and Evolution (LA & HA) 1.2 End of Term Assessment (LA & HA) B5 Homeostasis and ResponseC7 Organic Chemistry		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.

	will be able to describe complete and incomplete combustion and write word equations to show this.	P6 Waves B6 Inheritance, Variation and Evolution <u>Skills Tested</u>		
	P6 Waves Students will be able to describe transverse and longitudinal waves and identify properties of waves. They will conduct experiments to investigate how light waves travel. They will describe the structure of the eye and investigate how white light is formed. They will describe the different types of electromagnetic waves and their uses. B6 Inheritance, Variation and Evolution	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 be able to describe the structure and importance of DNA. They will be able to identify the roles of Watson, Crick, Wilkins and Franklin in its discovery. They will be able to describe continuous and discontinuous variation with regards to natural selection. They will be able to describe the process of selective breeding and explain how changes in the environment can lead to extinction.			
2	<u>C8 Chemical Analysis</u> Students will be able to describe the difference between pure substances and mixtures. They will be able to identify a formulation and state some common examples. They will conduct an experiment to investigate the process of chromatography. They will be able to calculate Rf values and analyse chromatograms. They will be able to carry out tests for common gases.	2.1 & 2.2 Pit Stops C8 Chemical Analysis (LA & HA) P5.1 Forces (LA & HA) P5.2 Forces (LA & HA) P5.3 Forces (LA & HA) B7 Ecology (LA & HA)	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.

	P5 Forces	2.2 End of Term Assessment (LA & HA)		Students are able to analyse information given
	Students will be able to identify scalar and vector	C8 Chemical Analysis		to them, and apply their knowledge gained
	quantities and contact and non-contact forces.	C10 Using Resources		through the course to evaluate data provided.
	They will be able to calculate weight, work done	P5 Forces		
	and resultant force. They will conduct an	B7 Ecology		
	experiment investigating force and extension.			
	They will be able to calculate moments, pressure	Skills Tested		
	and speed. They will be able to interpret distance-	AO1: Demonstrate knowledge and		
	time graphs.	understanding of: scientific ideas; scientific		
		techniques and procedures.		
	B7 Ecology	AO2: Apply knowledge and understanding		
	Students will be able to describe interdependence	of: scientific ideas; scientific enquiry,		
	and identify the effect of biotic and abiotic	techniques and procedures.		
	factors. They will be able to describe how animals	AO3: Analyse information and ideas to:		
	are adapted to their environment. They will be	interpret and evaluate; make judgements		
	able to draw and interpret pyramids of number	and draw conclusions; develop and improve		
	and biomass. They will be able to explain the	experimental procedures.		
	importance of plant reproduction in food security,			
	how organisms are affected by the environment.			
	They will be able to explain the importance of			
	biodiversity and suggest methods to maintain and			
	improve it.			
	<u>C6 The Rate and Extent of Chemical Change</u>			
	Students will be able to define and calculate rate			
	of reaction. They will be able to describe and			
	conduct investigations into the factors affecting			
	rate of reaction: temperature, concentration,			
	surface area, catalysts.			
2				
5		3.1 & 3.2 Pit Stops	Set once per	Students are able to recall key knowledge and
			week via	apply this knowledge to exam questions from
	P8 Space Physics	P8 Space Physics (LA & HA)	Educake	different areas.

Students will be able to describe the structure of		
the universe. They will be able to explain how we	C9 Chemistry of the Atmosphere (LA & HA)	Students will interpret and then describe and
have day and night and seasons and years on		explain what graphs show with reference to
Earth. They will be able to recall and apply the	P7 Magnetism and Electromagnets (LA &	the data collected for a range of contexts.
equation linking weight, mass and gravitational	HA)	
field strength.		Students are able to analyse information given
	3.2 End of Term Assessment (LA & HA)	to them, and apply their knowledge gained
<u>C9 Chemistry of the Atmosphere</u>	P8 Space Physics	through the course to evaluate data provided.
Students will be able to describe the composition	C9 Chemistry of the Atmosphere	
and structure of the Earth. They will be able to	P7 Magnetism and Electromagnets	
describe the rock cycle and the carbon cycle.		
	Skills Tested	
P7 Magnetism and Electromagnets	AO1: Demonstrate knowledge and	
Students will be able to describe how a magnet	understanding of: scientific ideas; scientific	
works. They will be able to describe the difference	techniques and procedures.	
between permanent and induced magnets. They	AO2: Apply knowledge and understanding	
will be able to use a compass to draw a magnetic	of: scientific ideas; scientific enquiry,	
field. They will be able to make an electromagnet	techniques and procedures.	
and describe some uses for electromagnets.	AO3: Analyse information and ideas to:	
	interpret and evaluate; make judgements	
	and draw conclusions; develop and improve	
	experimental procedures.	