


Department	SCIENCE (Applied Science)	
Key Stage	KEY STAGE 5	
Course Level	Level 3 BTEC Extended certificate	
Exam Board	Pearson Edexcel	

Dates Delivered	Unit Title	End Points	Substantive Knowledge What will they learn about in this topic?	Disciplinary Knowledge What subject concepts will be developed through this topic?	Assessment Method	Key Course Guides & Reading
Year 12 Autumn term	Unit 1 Principles and applications of Science I	<p>In Biology, pupils will be able to describe the structure and function of organelles in eukaryotic and prokaryotic cells. They will then be able to apply this knowledge and explain how cells and tissues may be specialised for their function.</p> <p>Students will be able to describe and explain how action potentials arise in neurones and how electrical impulses and transmitted along neurones and across synapses.</p>	Biology topic 1 : Cell structure and specialisation	<p>Graph and data analysis</p> <p>Application of knowledge</p> <p>Unit conversion</p> <p>Linking topics</p> <p>Rearranging of equations</p>	<p>End of topic tests at the end of topic (identified in substantive knowledge)</p> <p>Full mock papers done at end of Biology, end of Chemistry and end of Physics</p> <p>External assessment in January</p>	<p>Edexcel link for specification</p> <p>https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html</p>
			Biology topic 2: Tissues			
			Biology topic 3: Nervous system			
			Chemistry topic 1: Atomic structure and bonding			

In Chemistry, students will be able to use the Aufbau principle to describe atomic structure. They will be able to describe ionic, covalent and metallic bonding and use this knowledge to explain trends in properties of ionic, metallic and covalent substances. Students will be able to define first ionisation energy and electronegativity. They will be able to discuss trends in first ionisation energy, melting points, atomic radius and electronegativity across periods and groups in the periodic table. They will also be able to calculate expected mass, percentage mass, concentration and RFM.

In Physics, pupils will be able to define and label waves with the following characteristics; amplitude, wavelength and frequency. They will be able to calculate wave speed and periodic time.

Chemistry topic 2: Trends in the periodic table

		<p>Students will be able to describe and explain wave behaviours including reflection, refraction, resonance and diffraction. They will be able to relate these wave behaviours to practical applications such as endoscopes. Students will be able to describe uses, properties and dangers of electromagnetic waves</p>				
			Physics topic 1: Wave behaviours			
			Physics topic 2: Electromagnetic waves			

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Year 12 Spring /summer term	Unit 2 Practical scientific procedures and techniques	<p>Students will carry out a range of practical work, including</p> <ul style="list-style-type: none"> • Making a standard solution • Carrying out titrations using a pH meter or indicator • Colorimetry • Paper chromatography • Thin layer chromatography <p>They will be able to calibrate equipment, analyse results and evaluate method based on their experimental results</p>	Learning Aim A: Students will use a range of methods to calculate an unknown concentration	Using scientific equipment to measure volumes accurately	Internally assessed	Edexcel link for specification https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html	
			Learning Aim B: Students will investigate the freezing point of a known chemical and make a judgement of its purity				Calculating concentration
			Learning Aim C: Students will analyse pigments in plants and amino acids using paper and thin layer chromatography				Calculating Rf values
			Learning Aim D: Pupils will assess the progress of their practical skills and evaluate their next steps.				Drawing and analysing graphs
				Evaluation of methods and justification of improvements			

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Year 13 Autumn term	Unit 3 Science investigation skills	<p>Pupils will carry out a range of experiments including:</p> <ul style="list-style-type: none"> - The effect of concentration and temperature on enzyme action - The effect of temperature and concentration on diffusion - The impact of abiotic factors on plant distribution - Combustion in fuels - Current, potential difference and resistance in circuits <p>Pupils will be able to identify independent, dependent and control variables. They will be able to collect and analyse data to make conclusions. Pupils will be able to evaluate methods and justify improvements</p>	<p>A -> Planning a scientific investigation</p> <p>B -> Data collection, processing and analysis/interpretation</p> <p>C -> Drawing Conclusions</p> <p>D -> Enzymes in Action</p> <p>E -> Diffusion of molecules</p> <p>F -> Plants and their environment</p>	<p>Drawing results tables</p> <p>Drawing and analysing graphs</p> <p>Evaluation of methods and justification of improvements</p> <p>Linking topics</p> <p>Application of knowledge</p> <p>Calculations using graphs</p>	<p>Assessed in year 13 mocks at end of topic</p> <p>Externally assessed in January</p>	<p>Edexcel link for specification</p> <p>https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html</p>
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G -> Energy content off fuels	
H -> Electrical Circuits	

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Year 13 Spring/ summer term	Unit 9 Human regulation and reproduction	Pupils will be able to describe and explain the structure and function of the nervous system, reproductive system and kidney. They will be able to describe why homeostasis is important and explain how heart rate, blood glucose level and blood water potential are controlled. They will be able to describe and explain symptoms of conditions that arise from heart	Learning Aim A: Pupils will be able to describe and explain how the cardiac cycle is controlled with reference to the nervous system	Research and referencing Application of knowledge Linking topics	Internally assessed	Edexcel link for specification https://qualifications.pearson.com/en/qualifications/btec-nationals/applied-science-2016.html
			Learning Aim B : Pupils will be able to explain how blood glucose and water levels are controlled and the impact of a lack of regulation			
			Learning Aim C: Pupils will be able to processes of spermatogenesis, oogenesis and fertilisation. They will be able to describe and explain factors that lead to infertility and explain how treatments for infertility work			

rate, blood glucose level and blood water potential not being regulated.
Pupils will be able to describe the processes of spermatogenesis, oogenesis and fertilisation. They will be able to describe and explain factors that lead to infertility and explain how treatments for infertility work

