

SJBC Curriculum Termly Plan: SJBC NEW APPLIED SCIENCE BTEC YEAR 12

Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
Autumn 1	<p>Biology A Structure and function of cells and tissues</p> <p>B: Structure and function of biological molecules</p>	<p>Biology</p> <ul style="list-style-type: none"> • Structure and function of cells and tissues • Structure and function of specialised cells in multicellular organisms • Structure and function of biological tissues <ul style="list-style-type: none"> • Structure and function of water • Structure and function of carbohydrates • Structure and function of proteins • Structure and function of nucleic acids • Structure and function of lipids 	<p>Biology: Cell membrane Nucleus Cytoplasm Mitochondria Ribosomes -Tissue -Organs - Specialised cells</p> <p>Biological molecules Monomer Polymer Monosaccharide Disaccharide Polysaccharide Glycosidic bond Amino acid Peptide bond Polypeptide Fatty acid Phospholipids Glycoproteins Channel proteins Glycolipids Cholesterol Channel proteins</p>	<p>End of topic test 45mins</p> <p>End of topic test 45mins</p>	<p>Core resources: Seneca UpLearn</p> <p>Enrichment and extension resources:</p> <p>Core resources: Seneca UpLearn</p> <p>Enrichment and extension resources:</p>

			<p>Glycerol Triglyceride Ester bond Hydrophobic Hydrophilic Nucleotide DNA (Deoxyribonucleic acid) RNA (Ribonucleic acid) Phosphodiester bond</p>		
Autumn 2	Cellular transport and enzyme activity	<ul style="list-style-type: none"> • Cell transport mechanisms • Enzymes as biological catalysts • Homeostasis 	<p>Cellular transport</p> <p>Diffusion Facilitated diffusion Osmosis Active transport Concentration gradient Semi-permeable membrane Carrier protein</p> <p>Enzyme activity</p> <p>Enzyme-substrate complex Catalyst Lock and key model Activation energy Temperature pH Substrate concentration Enzyme concentration Inhibitor Competitive inhibitor Non-competitive inhibitor Denaturation</p>	End of topic test 45mins	<p>Core resources: Seneca UpLearn</p> <p>Enrichment and extension resources:</p>

			Homeostasis Negative feedback Set point Effector Receptor Control centre <hr/>		
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SJBC Curriculum Termly Plan: Y13 BTEC Applied Science

Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
Autumn 1	<p>Enzymes in Action</p> <p>Subject Links: Biology Chemistry Maths Health & Social Care PE</p> <p>Diffusion of molecules</p> <p>Subject Links: Biology Chemistry Physics Geography Maths</p> <p>Plants and their environment</p> <p>Subject Links: Biology Geography Environmental Science</p>	<p>Enzymes in Action</p> <ul style="list-style-type: none"> • Structure and function of proteins (peptide bonds, active site) • Enzymes as biological catalysts: collision theory, enzyme-substrate complexes, specificity • Initial rate of reaction • Factors affecting enzyme activity (temperature, pH, substrate/enzyme concentration) • Application of variables, method writing, and planning investigations <p>Diffusion of Molecules</p> <ul style="list-style-type: none"> • Factors affecting diffusion: concentration gradient, molecule size, temperature, surface area, diffusion distance • Random movement of molecules in gases/liquids • Dynamic equilibrium • Application of qualitative/quantitative data collection and control of variables <p>Plants and Their Environment</p> <ul style="list-style-type: none"> • Abiotic factors affecting plant distribution: light, water, temperature, soil pH, human impact • Ecological sampling techniques: quadrats, transects, point frames • Importance of random sampling and choosing appropriate sample sizes 	<p>Enzymes in Action</p> <p>Active site Substrate Denaturation Collision theory Activation energy Rate of reaction Controlled variables Initial rate</p> <p>Diffusion of Molecules</p> <p>Diffusion Concentration gradient Dynamic equilibrium Surface area to volume ratio Random motion Qualitative/Quantitative</p> <p>Plants and Their Environment</p> <p>Abiotic Transect Quadrat Sampling technique Population density Validity</p>	<p>Practical Investigations</p> <p>Written method planning with focus on accuracy, precision, and control of variables</p> <p>Knowledge check quiz</p> <p>Learning aim D, E and F topic tests (50 mins)</p> <p>Project based homework</p>	<p>Level 3 BTEC National Extended Certificate in Applied Science Specification</p> <p>Seneca</p> <p>JSTOR</p> <p>Scientific articles</p> <p>Sample / Practice assessment papers</p> <p>Textbook: BTEC National Applied Science Student Book 1</p> <p>Pearson REVISE BTEC National Applied</p>

	Maths Health & Social Care	<ul style="list-style-type: none"> Data validity and reliability 	Reliability Random sampling		Science Revision Guide
Autumn 2	<p>Energy content of fuels</p> <p>Subject Links: Chemistry Physics Maths Geography Environmental Science</p> <p>Electrical Circuits</p> <p>Subject Links: Physics Maths Engineering/DT IT Environmental Science</p>	<p>Energy Content of Fuels</p> <ul style="list-style-type: none"> Types of fuels: alcohols, hydrocarbons, foods (carbohydrates, proteins, fats) Energy transfer: specific heat capacity and energy change calculations Units of energy: joules, kilojoules, calories Hazards of fuels: flammability, toxicity, pollutants Quantitative investigation of energy content using calorimetry <p>Electrical Circuits</p> <ul style="list-style-type: none"> Series and parallel circuits and the components used (ammeters, voltmeters, resistors, LDRs, LEDs, etc.) Use of equations: $P = IV$, $V = IR$, $E = VIt$, $E = P \times t$ Calculating energy transferred and domestic energy usage (kWh) Interpreting circuit diagrams and calculating current, voltage, resistance Fuse ratings and household safety implications 	<p>Energy Content of Fuels</p> <p>Fuel Calorimetry Combustion Specific heat capacity Exothermic reaction Incomplete combustion Energy transfer Joules (J) / Kilojoules (kJ) kJ mol^{-1} Pollution</p> <p>Electrical Circuits</p> <p>Circuit Current (Amperes) Voltage (Volts) Resistance (Ohms) Power (Watts) Energy transfer Series circuit Parallel circuit Kilowatt-hour (kWh) Fuse Thermistor Light-dependent resistor (LDR) Diode</p>	<p>Practical investigations</p> <p>Written method planning with focus on accuracy, precision, and control of variables</p> <p>Knowledge check quiz</p> <p>Learning aim G and F topic tests (50 mins)</p> <p>Project based homework</p>	<p>Level 3 BTEC National Extended Certificate in Applied Science Specification</p> <p>Seneca</p> <p>JSTOR</p> <p>Scientific articles</p> <p>Sample / Practice assessment papers</p> <p>Textbook: BTEC National Applied Science Student Book 1</p> <p>Pearson REVISE BTEC National Applied Science Revision Guide</p>

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