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	**Biology** A Structure and function of cells and tissues B: Structure and function of biological molecules	**Biology** • Structure and function of cells and tissues • Structure and function of specialised cells in multicellular organisms • Structure and function of biological tissues • 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	**Biology:** Cell membrane Nucleus Cytoplasm Mitochondria Ribosomes -Tissue -Organs - Specialised cells **Biological molecules** **Monom**er Polymer Monosaccharide Disaccharide Polysaccharide Glycosidic bond Amino acid Peptide bond Polypeptide Fatty acid Phospholipids Glycoproteins Channel proteins Glycolipids Cholesterol Channel proteins	End of topic test 45mins End of topic test 45mins	Core resources: Seneca UpLearn Enrichment and extension resources: Core resources: Seneca UpLearn Enrichment and extension resources:

			Glycerol Triglyceride Ester bond Hydrophobic Hydrophilic Nucleotide DNA (Deoxyribonucleic acid) RNA (Ribonucleic acid) Phosphodiester bond		
Autumn 2	Cellular transport and enzyme activity	• Cell transport mechanisms • Enzymes as biological catalysts • Homeostasis	**Cellular transport** Diffusion Facilitated diffusion Osmosis Active transport Concentration gradient Semi-permeable membrane Carrier protein **Enzyme activity** Enzyme-substrate complex Catalyst Lock and key model Activation energy Temperature pH Substrate concentration Enzyme concentration Inhibitor Competitive inhibitor Non-competitive inhibitor Denaturation	End of topic test 45mins	Core resources: Seneca UpLearn Enrichment and extension resources:

			Homeostasis Negative feedback Set point Effector Receptor Control centre		

SJBC Curriculum Termly Plan: Y13 BTEC Applied Science

Term	Topic(s) and links to other subjects	Core Knowledge	Core Vocabulary	Assessment	Resources
Autumn 1	**Enzymes in Action** **Subject Links:** Biology Chemistry Maths Health & Social Care PE **Diffusion of molecules** **Subject Links:** Biology Chemistry Physics Geography Maths **Plants and their environment** **Subject Links:** Biology Geography Environmental Science	**Enzymes in Action** • 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 **Diffusion of Molecules** • 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 **Plants and Their Environment** • 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	**Enzymes in Action** Active site Substrate Denaturation Collision theory Activation energy Rate of reaction Controlled variables Initial rate **Diffusion of Molecules** Diffusion Concentration gradient Dynamic equilibrium Surface area to volume ratio Random motion Qualitative/Quantitative **Plants and Their Environment** Abiotic Transect Quadrat Sampling technique Population density Validity	Practical Investigations Written method planning with focus on accuracy, precision, and control of variables Knowledge check quiz Learning aim D, E and F topic tests (50 mins) Project based homework	Level 3 BTEC National Extended Certificate in Applied Science Specification Seneca JSTOR Scientific articles Sample / Practice assessment papers Textbook: BTEC National Applied Science Student Book 1 Pearson REVISE BTEC National Applied Science Revision Guide

	Maths Health & Social Care	• Data validity and reliability	Reliability Random sampling		
Autumn 2	**Energy content of fuels** **Subject Links:** Chemistry Physics Maths Geography Environmental Science **Electrical Circuits** **Subject Links:** Physics Maths Engineering/DT IT Environmental Science	**Energy Content of Fuels** • 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 **Electrical Circuits** • 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 × t • Calculating energy transferred and domestic energy usage (kWh) • Interpreting circuit diagrams and calculating current, voltage, resistance • Fuse ratings and household safety implications	**Energy Content of Fuels** Fuel Calorimetry Combustion Specific heat capacity Exothermic reaction Incomplete combustion Energy transfer Joules (J) / Kilojoules (kJ) kJ mol^{-1} Pollution **Electrical Circuits** 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	Practical investigations Written method planning with focus on accuracy, precision, and control of variables Knowledge check quiz Learning aim G and F topic tests (50 mins) Project based homework	Level 3 BTEC National Extended Certificate in Applied Science Specification Seneca JSTOR Scientific articles Sample / Practice assessment papers Textbook: BTEC National Applied Science Student Book 1 Pearson REVISE BTEC National Applied Science Revision Guide