

INTENT-

- To develop knowledge and understanding of key scientific principles within Biology, Chemistry and Physics.
- Students to apply this knowledge and explain key ideas within Science, applying them to a range of typical and frequent assessment points.
- Students will be able to analyse scientific data and will be able to evaluate scientific discoveries in order to approach enquiry questions based on practical investigations

The bigger picture:

The BTEC Science curriculum revisits many of the core scientific concepts from KS3&4, and then builds upon this knowledge, overlapping with concepts taught in A Level Biology, Chemistry and Physics. The Applied Science Units delivered are a mixture of key scientific concepts and scientific skills assessed through a combination of written exams and assignments.

**Bilton School Planning for Progress over Time
Programme of Study 2024/25**

IMPLEMENTATION

	Term 1 Unit 3								Term 2 Unit 3					Term 3 Unit 1					Term 4 Unit 1					Term 5 Unit 1				Term 6 Unit 2 Preparation																
KS5	02/09/2024	09/09/2024	16/09/2024	23/09/2024	30/09/2024	07/10/2024	14/10/2024	21/10/2024	HOLIDAY: 1	04/11/2024	11/11/2024	18/11/2024	25/11/2024	02/12/2024	09/12/2024	16/12/2024	HOLIDAY: 2 WEEKS	06/01/2025	13/01/2025	20/01/2025	27/01/2025	03/02/2025	10/02/2025	HOLIDAY: 1 WEEK	24/02/2025	03/03/2025	10/03/2025	17/03/2025	24/03/2025	31/03/2025	07/04/2025	HOLIDAY: 2 WEEKS	28/04/2025	05/05/2025	12/05/2025	19/05/2025	HOLIDAY: 1 WEEK	02/06/2025	09/06/2025	16/06/2025	23/06/2025	30/06/2025	07/07/2025	14/07/2025
Year 12 Applied Science	Skills topics, A, B, C . Skills topics, A, B, C Skills topics, A, B, C Skills topics, A, B, C, Assessment. Topic D, Topic H, Topic E Topic D, Topic H, Topic E Topic D, Topic H, Topic E Topic D, Topic H, Topic E								Topic D, Topic H, Topic E Assessment. Topic F, Topic G PPEs PPEs Topic F, Topic G Topic F, Topic G Topic F, Topic G Assessment					Exam Revision Exam Revision Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics					PPEs PPEs Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics Unit 1 Chemistry, Biology, Physics					Unit 1 Chemistry Revision Unit 1 Biology Revision Unit 1 Physics Revision Unit 1 Revision				Unit 2 Assignment A Preparation Unit 2 Assignment A Preparation Unit 2 Assignment A Preparation Unit 2 Assignment B Preparation Unit 2 Assignment B Preparation Unit 2 Assignment C Preparation Unit 2 Assignment C Preparation																
Progress and assessment	End of topic assessments. Follow on questions to test previous knowledge through the Unit. Practical write ups.								End of topic assessments. Follow on questions to test previous knowledge through the Unit. Practical write ups.					End of topic assessments. Follow on questions to test previous knowledge through the Unit.					End of topic assessments. Follow on questions to test previous knowledge through the Unit.				End of topic assessments. Follow on questions to test previous knowledge through the Unit.																					
Required Practical (RP)	<ul style="list-style-type: none"> Diffusion demos and potassium permanganate in water Diffusion of acid in agar jelly Effect of substrate concentration on enzyme action using catalyse and hydrogen peroxide Effect of temperature on the digestion of milk Habitat sampling using quadrat and line transect Fermentation 								<ul style="list-style-type: none"> Burning fuels Energy in food Specific heat capacity of a metal Energy from candle wax Investigating resistance in a circuit with a fixed resistor 																																			
Homework <small>(ensure that this is NOT stand alone, but clearly advances or embeds knowledge and understanding)</small>	Practical write ups.								Practical write ups.					Exam style questions					Exam style questions				Exam style questions																					

<p>Key Vocabulary/literacy opportunities</p>	<p>Unit 3 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. Hypothesis, equipment procedures, techniques, risks, hazards, variables, data collection, analysis, quantitative, qualitative, observation, inference, trends, primary and secondary data, reliability, conclusions, evaluation, enzyme, catalyst, activation energy, mean standard deviation, percentage error, chi-squared, t-test, collision theory, enzyme substrate complex, diffusion, concentration gradient, dynamic equilibrium, inter and intra-specific competition, flammability, toxicity, impurities, specific heat capacity, circuit, component, current, voltage, resistance, power, energy transferred.</p>	<p>Unit 3 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. Hypothesis, equipment procedures, techniques, risks, hazards, variables, data collection, analysis, quantitative, qualitative, observation, inference, trends, primary and secondary data, reliability, conclusions, evaluation, enzyme, catalyst, activation energy, mean standard deviation, percentage error, chi-squared, t-test, collision theory, enzyme substrate complex, diffusion, concentration gradient, dynamic equilibrium, inter and intra-specific competition, flammability, toxicity, impurities, specific heat capacity, circuit, component, current, voltage, resistance, power, energy transferred.</p>	<p>Unit 1 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. electronic orbitals, Aufbau principle, Bohr theory, de-localised, van der Waals, dipole-dipole, notation, prokaryote cells (bacterial cell) – nucleoid, plasmids, 70S ribosomes, capsule, cell wall, eukaryotic cells (plant and animal cells) – plasma membrane, cytoplasm, nucleus, nucleolus, endoplasmic reticulum (smooth and rough), Golgi apparatus, vesicles, lysosomes, 80S ribosomes, mitochondria, centriole, eukaryotic cells (plant-cell specific) – cell wall, chloroplasts, vacuole, tonoplast, amyloplasts, plasmodesmata, pits, squamous, periodic time, wavelength, frequency, amplitude, oscillation, emission spectra, identifying gases.</p>	<p>Unit 1 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. electronic orbitals, Aufbau principle, Bohr theory, de-localised, van der Waals, dipole-dipole, notation, prokaryote cells (bacterial cell) – nucleoid, plasmids, 70S ribosomes, capsule, cell wall, eukaryotic cells (plant and animal cells) – plasma membrane, cytoplasm, nucleus, nucleolus, endoplasmic reticulum (smooth and rough), Golgi apparatus, vesicles, lysosomes, 80S ribosomes, mitochondria, centriole, eukaryotic cells (plant-cell specific) – cell wall, chloroplasts, vacuole, tonoplast, amyloplasts, plasmodesmata, pits, squamous, periodic time, wavelength, frequency, amplitude, oscillation, emission spectra, identifying gases.</p>	<p>Unit 1 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. electronic orbitals, Aufbau principle, Bohr theory, de-localised, van der Waals, dipole-dipole, notation, prokaryote cells (bacterial cell) – nucleoid, plasmids, 70S ribosomes, capsule, cell wall, eukaryotic cells (plant and animal cells) – plasma membrane, cytoplasm, nucleus, nucleolus, endoplasmic reticulum (smooth and rough), Golgi apparatus, vesicles, lysosomes, 80S ribosomes, mitochondria, centriole, eukaryotic cells (plant-cell specific) – cell wall, chloroplasts, vacuole, tonoplast, amyloplasts, plasmodesmata, pits, squamous, periodic time, wavelength, frequency, amplitude, oscillation, emission spectra, identifying gases.</p>	<p>Unit 2 - key terms that will be used consistently by Pearson in our assessments to ensure students are rewarded for demonstrating the necessary skills. Add/label, Assess, Calculate, Comment on, Compare, Complete, Convert, Deduce, Derive, Describe, Determine, Discuss, Draw, Estimate, Evaluate, Explain, Give/state/name, give a reason why, Identify, Plot, Predict, Record, show that, Sketch, State and justify/identify and justify, State what is meant by, Write. Electronic thermometers/temperature probes, liquid-filled thermometers, calibration, cooling from the gradient, tangent to the cooling curve, determination of melting point from the shape of a curve for a substance freezing, super cooling, intermolecular forces and the state (solid or liquid) of the substance, Chromatographic techniques, adsorption, mobile and stationary phases, solvent extraction, filtration, concentration by evaporation, amino acids, Polarity of molecules/intermolecular forces, Rf value.</p>
<p>Connected knowledge</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy, Fuels</p> <p>KS4 – Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity.</p> <p>KS5 – Chemistry, Biology, Physics.</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy, Fuels</p> <p>KS4 – Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity.</p> <p>KS5 – Chemistry, Biology, Physics.</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy, Fuels, Sound, Light</p> <p>KS4 – Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves</p> <p>KS5 – Chemistry, Biology, Physics.</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy, Fuels, Sound, Light</p> <p>KS4 – Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves</p> <p>KS5 – Chemistry, Biology, Physics.</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity.</p> <p>KS5 – Chemistry, Biology, Physics.</p>	<p>KS3 – Atoms and Elements, Compounds and Mixtures,</p> <p>KS4 – Structure, Bonding and the Properties of Matter,</p> <p>KS5 – Chemistry</p>
<p>Spiritual, Moral, Social and cultural.</p>	<p>Building students confidence to plan and undertake scientific investigations using a range of procedures and techniques.</p>	<p>Building students confidence to plan and undertake scientific investigations using a range of procedures and techniques.</p>	<p>Biology topic work explores the social and cultural impacts of physiological disorders and their treatments.</p>	<p>Biology topic work explores the social and cultural impacts of physiological disorders and their treatments.</p>	<p>Biology topic work explores the social and cultural impacts of physiological disorders and their treatments.</p>	

British Values	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.	Respect and tolerance, collaboration during experiments and group work. Following the laboratory rules when conducting practical work.
Cultural Capital	Science - Careers display on W side corridor.	Science - Careers display on W side corridor.	Science - Careers display on W side corridor. Uses and advances in technology used for communication, linked to the electromagnetic spectrum. History of scientific models of the atom.	Science - Careers display on W side corridor. Uses and advances in technology used for communication, linked to the electromagnetic spectrum.	Science - Careers display on W side corridor.	Science - Careers display on W side corridor. Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.