

**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**

**IMPLEMENTATION**

	Term 1 Unit 1, 2, 3								Term 2 Unit 1, 2, 3								Term 3 Unit 1, 2, 3					Term 4 Unit 1					Term 5 Unit 1, 2, 3 Revision						Term 6 Unit 4						
KS5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
<b>Year 12 Applied Science</b>	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: Biology, Unit 2 Chemistry, Unit 3 Physics content	Unit 1: help finish remaining content	Unit 1: help finish remaining content	Unit 1: help finish remaining content	Exam Revision Unit 1, 2 & 3	Exam Revision Unit 1, 2 & 3	Exam Revision Unit 1, 2 & 3	Exam Revision Unit 1, 2 & 3	Exam Revision Unit 1, 2 & 3	Exam Revision Unit 1, 2 & 3	Unit 4 Part A Preparation	Unit 4 Part A Preparation	Unit 4 Part A Preparation	Unit 4 Part A Preparation	Unit 4 Part A Preparation	Unit 4 Part A Preparation	Unit 4 Part A Preparation	
<b>Progress and assessment</b>	Assignment completion. End of topic tests.								Assignment completion. End of topic tests.								Assignment completion. End of topic tests.					Assignment completion. End of topic tests.					Assignment completion												
<b>Required Practical (RP)</b>	Rates of Reaction, Functional Groups testing, Reactions of Period 3. Microscopy, Food Tests. Diffraction Gratings, Refractive Index, Acceleration, Electrical Circuit Building, Specific Heat Capacity.								Rates of Reaction, Functional Groups testing, Reactions of Period 3. Microscopy, Food Tests. Diffraction Gratings, Refractive Index, Acceleration, Electrical Circuit Building, Specific Heat Capacity.								Rates of Reaction, Functional Groups testing, Reactions of Period 3. Microscopy, Food Tests. Diffraction Gratings, Refractive Index, Acceleration, Electrical Circuit Building, Specific Heat Capacity.					Rates of Reaction, Functional Groups testing, Reactions of Period 3. Microscopy, Food Tests. Diffraction Gratings, Refractive Index, Acceleration, Electrical Circuit Building, Specific Heat Capacity.					Exam preparation and revision						Making standard solutions and titrations, Colorimetry, Chromatography.						
<b>Numeracy Skills</b>	Chemistry: Calculation of Molar Mass, Moles, Concentrations, Gas Volume, Stoichiometric Ratio, converting units, Empirical Formula, Percentage Mass and Yield, Hess' Cycle Calculations, Percentage Yield Graph Skills. Biology: Calculation of Magnification, Actual and Image Size. converting units, graphing skills. Physics: Calculation and formula manipulation for Wave Equation, Critical Angle, Refractive Index, Inverse Square Law, Speed, Acceleration. Momentum, Velocity-Time Graph skills, Coefficient of Dynamic and Static Friction, Electricity and Energy calculations, SI units and converting units.								Chemistry: Calculation of Molar Mass, Moles, Concentrations, Gas Volume, Stoichiometric Ratio, converting units, Empirical Formula, Percentage Mass and Yield, Hess' Cycle Calculations, Percentage Yield Graph Skills. Biology: Calculation of Magnification, Actual and Image Size. converting units, graphing skills. Physics: Calculation and formula manipulation for Wave Equation, Critical Angle, Refractive Index, Inverse Square Law, Speed, Acceleration. Momentum, Velocity-Time Graph skills, Coefficient of Dynamic and Static Friction, Electricity and Energy calculations, SI units and converting units.								Chemistry: Calculation of Molar Mass, Moles, Concentrations, Gas Volume, Stoichiometric Ratio, converting units, Empirical Formula, Percentage Mass and Yield, Hess' Cycle Calculations, Percentage Yield Graph Skills. Biology: Calculation of Magnification, Actual and Image Size. converting units, graphing skills. Physics: Calculation and formula manipulation for Wave Equation, Critical Angle, Refractive Index, Inverse Square Law, Speed, Acceleration. Momentum, Velocity-Time Graph skills, Coefficient of Dynamic and Static Friction, Electricity and Energy calculations, SI units and converting units.					Chemistry: Calculation of Molar Mass, Moles, Concentrations, Gas Volume, Stoichiometric Ratio, converting units, Empirical Formula, Percentage Mass and Yield, Hess' Cycle Calculations, Percentage Yield Graph Skills. Biology: Calculation of Magnification, Actual and Image Size. converting units, graphing skills. Physics: Calculation and formula manipulation for Wave Equation, Critical Angle, Refractive Index, Inverse Square Law, Speed, Acceleration. Momentum, Velocity-Time Graph skills, Coefficient of Dynamic and Static Friction, Electricity and Energy calculations, SI units and converting units.					Calculations and manipulation of equations for: concentrations and making standard solutions; uncertainty, percentage errors, finding stoichiometric ratios, Rf value in chromatography, means. Graph drawing.												
<b>Homework</b> <i>(ensure that this is NOT stand alone, but clearly advances or embeds knowledge and understanding)</i>	Research and homework assignments based around content								Research and homework assignments based around content.								Research and homework assignments based around content.					Research and homework assignments based around content					Research and homework assignments based around content												

<p><b>Key Vocabulary/literacy opportunities</b></p>	<p><u>Unit 1</u> – 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.</p> <p>Cells, tissues, organs organ systems, specialised cells, multicellular organisms, biological, water, carbohydrates, proteins, nucleic acids, lipids, transport mechanisms, biological catalysts, homeostasis, active transport, diffusion, osmosis, concentration gradient, stem cells, microscope, organelles, permeability, phospholipids, glycoproteins, cholesterol, colorimeter,</p>	<p><u>Unit 2</u> - 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.</p> <p>Periodic table, atomic structure, subatomic, groups, periods, isotopes, relative atomic mass, electronic configuration, ionisation energy, ionic, metallic, covalent bonding, dot-cross diagram, conductivity, polarity, electronegativity, shape, dipoles, intermolecular forces, periodicity, oxidation, moles, stoichiometric, molar volume, Maxwell-Boltzmann distribution curve, enthalpy, Hess, yield, equilibrium, organic, functional group.</p>	<p><u>Unit 3</u>- 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.</p> <p>Waves, amplitude, frequency, speed, transverse, longitudinal, propagation, oscillation, spectra, diffraction grating, refractive index, critical angle, optical fibres, electromagnetic spectrum, velocity, acceleration, kinetic, momentum, series, parallel, resistance, specific heat capacity, latent heat,</p>			<p><u>Unit 4</u>- 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, State what is meant by, Write a 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><b>Connected knowledge</b></p>	<p>KS3 - Digestion, Enzymes, Movement, Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Organisation, Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves.</p> <p>KS5 – Biology, Chemistry, Physics</p>	<p>KS3 - Digestion, Enzymes, Movement, Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Organisation, Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves.</p> <p>KS5 – Biology, Chemistry, Physics</p>	<p>KS3 - Digestion, Enzymes, Movement, Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Organisation, Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves.</p> <p>KS5 – Biology, Chemistry, Physics</p>	<p>KS3 - Digestion, Enzymes, Movement, Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Organisation, Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves.</p> <p>KS5 – Biology, Chemistry, Physics</p>	<p>KS3 - Digestion, Enzymes, Movement, Atoms and Elements, Compounds and Mixtures, Enzymes, Electricity, Energy</p> <p>KS4 – Organisation, Structure, Bonding and the Properties of Matter, Organisation, Energy, Electricity, Waves.</p> <p>KS5 – Biology, Chemistry, Physics</p>	
<p><b>Spiritual, Moral, Social and cultural.</b></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>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>Building students confidence to plan and undertake scientific investigations using a range of procedures and techniques</p>	
<p><b>British Values</b></p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	<p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>	
<p><b>Cultural Capital</b></p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p> <p>Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.</p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p> <p>Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.</p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p> <p>Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.</p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p> <p>Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.</p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p> <p>Through assignments skills are linked to vocational contexts to show the importance of these processes in everyday life.</p>	<p>Science - Careers display on W side corridor. Careers links made throughout the units.</p>