



The Bromfords School and Sixth Form College Science Department. Intent of Curriculum

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The Bromfords School– Science & Psychology Faculty

The intent of Science at Bromfords is the systematic study of the physical and natural world through observations and experimentation. Our intent is to make students scientifically literate in order to make sense of information and to communicate their ideas to contribute to a better and more advanced world.

Achieve:

Students are supported and challenged to think scientifically. To be inquisitive and pose genuine investigative questions. Through problem solving approaches they will use experimental observations to deepen their understanding.

Enrich:

To offer a blend of independent investigation and team working skills to explore and suggest solutions to real world problems. To help students be better members of society through a deeper understanding of how science works, and consequently help students make better life decisions. Enable students to acquire accurate information about the natural world and about society and culture.

Prepare:

To re-visit key skills in real world contexts. Allow students to reflect on the purpose of the topic in the bigger picture of how the world works and future career opportunities. Students are aware of implications of actions through application of real science.

(Links to the relevant specifications for Key Stage 4 can be found in the Programme of Study (implementation) documents)

Year 7 – Intent: Engage and enthuse students in the application of Science (including literacy and numeracy skills). To gain understanding of it in a physical and natural world.

<p>Scheme of Work: Year 7 Transition to Science (revised July 2022)</p> <p>Learning Intent: To capture prior knowledge of students and explore the purpose of Science through the development of practical skills.</p>	<p>Scheme of Work: B1 & B2 From cells to organ systems</p> <p>Learning Intent: To understand building blocks of life and how they work together to create functioning living systems</p>	<p>Scheme of Work: B3 Reproduction</p> <p>Learning Intent: To understand the scientific basics behind puberty, reproduction and contraception. (SMSC Opportunity)</p> <p>Home project – plant reproduction</p>	<p>Scheme of Work: C1 & C2 Particles Elements, atoms, compounds</p> <p>Learning Intent: Be able to explain materials and their properties by applying particle theory</p>	<p>Scheme of Work: C3 Reactions</p> <p>Learning Intent: Understand how chemical reactions take place and use particle theory to explain practical science.</p>
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			
	<p>Scheme of Work: C4 Acids and Alkalis</p> <p>Learning Intent: To use investigation skills to understand the reactions between acid and alkalis</p>	<p>Scheme of Work: P1 Forces</p> <p>Learning Intent: To understand forces, their interactions and their impact on the real world</p>	<p>Scheme of Work: P2 & P3 Sound and Light</p> <p>Learning Intent: To understand the properties of waves in order to compare and contrast light and sound</p>	<p>Scheme of Work: P4 Space</p> <p>Learning Intent: To understand the Solar System and its (and our) place in the universe</p>
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			

Year 8 – Intent: Engage and enthuse students in the application of Science (including literacy and numeracy skills). To gain understanding of it in a physical and natural world. Students have the opportunities to develop practical skills and to apply to real world problems.

<p>Scheme of Work: B1 Health</p> <p>Learning Intent: To understand what constitutes a healthy lifestyle and be aware of risk factors associated with unhealthy lifestyles.</p>	<p>Scheme of Work: B2 Ecosystems</p> <p>Learning Intent: To understand how organisms are interdependent and evaluate human impact on ecosystems.</p>	<p>Scheme of Work: B3 Adaptation</p> <p>Learning Intent: To understand the processes of inheritance and how they explain the variety of life on Earth. To develop maths in science skills.</p>	<p>Scheme of Work: C1 Periodic Table</p> <p>Learning Intent: To be able to carry out chemical reactions safely and predict the outcomes of reactions.</p>	<p>Scheme of Work: C2 Separation techniques</p> <p>Learning Intent: To be able to apply scientific techniques to the problem of separating mixtures.</p>
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			
<p>Scheme of Work: C3 Metals and Acids</p> <p>Learning Intent: To apply knowledge of the periodic table to predict outcomes and understand the chemical properties of materials around them.</p>	<p>Scheme of Work: P1 Electricity and magnetism</p> <p>Learning Intent: To demonstrate an understanding, both physically and conceptually, of key ideas within electricity, and how it is generated.</p>	<p>Scheme of Work: P2 Energy</p> <p>Learning Intent: To learn the true nature of energy and methods of energy transfer applying the particle theory.</p>	<p>Scheme of Work: P3 Motion and Pressure</p> <p>Learning Intent: To use mathematical skills to understand motion and pressure.</p>	
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			

Year 9 – Intent: Expose students to the developing nature of learning resources, including the implications of use. Building on prior knowledge to tackle more complex problems. Continue to use analytical skill and interpret data in readiness for Key Stage 4 Curriculum, which commences in Term 3.

<p>Scheme of Work: 9aa – Psychology of Science</p> <p>Learning Intent: introduce the psychology of learning Science and to explore the question ‘If our brains work in the same way, how are we so unique?’</p>	<p>Scheme of Work: 9ba - Biodiversity and human impact</p> <p>Learning Intent: To consider the facts and myths of human impact on our Earth and explore the question ‘Are humans reducing biodiversity?’</p>	<p>Scheme of Work: 9bb – Inheritance and survival</p> <p>Learning Intent: How do we inherit characteristics and adapt to change whilst exploring the question ‘How can inheritance impact survival?’</p>	<p>Scheme of Work: 9bc – Cells</p> <p>Learning Intent: Consider examples of the smallest units of life, whilst exploring the question ‘How do cells form more complicated systems?’</p>	<p>Scheme of Work: 9ca – Environmental chemistry</p> <p>Learning Intent: Evaluating evidence to support scientific theories and predicting future impact using models around the question ‘Have humans changed the atmosphere?’</p>
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			
<p>Scheme of Work: 9cb - Materials</p> <p>Learning Intent: Matching property to purpose and using data analysis to evaluate performance of materials for different circumstances whilst answering the question ‘Why do we build houses from bricks?’</p>	<p>Scheme of Work: 9cc – Chemical Reactions</p> <p>Learning Intent: Give students the opportunity to further develop safe use of a range of practical techniques whilst exploring the question ‘How does Chemistry influence our lives?’</p>	<p>Scheme of Work: 9pa – Energy and Electricity</p> <p>Learning Intent: Modelling and comparing of data on energy consumption over time and how it looks in the future whilst answering the question ‘How do we adapt our use of energy resources to cope with a modern world?’</p>	<p>Scheme of Work: 9pb – Forces and Speed</p> <p>Learning Intent: Identify how Maths and Physics overlap and enhance mathematical skills in preparation for KS4 studies, whilst focusing on physical interactions of objects near each other.</p>	<p>Scheme of Work: 9pc – Surviving in Space</p> <p>Learning Intent: Extending knowledge of Fundamental Physics concepts that help us explain motion and effects on our bodies in space whilst answering the question can humans travel to and colonise Mars?’</p>
<p><i>Measuring Impact though:</i></p>	<p>AFL and internal assessment practices. These include detailed and levelled end of topic tests and short individual topic based assessments where appropriate</p>			

Key Stage 4 Biology – Intent: To have a deeper understanding of various biological principles, such as cell, reproduction and essential reactions for life to be sustained on Earth.

Key Stage 4	<p>Scheme of Work: B1 Cell structure and division and Transport</p> <p>Learning Intent: How organisms in the natural world carry out the 7 life processes of life.</p>	<p>Scheme of Work: B2 Tissues, organs, organ systems. Health and disease and Enzymes and Digestion</p> <p>Learning Intent: How multicellular organisms are structured to thrive, and potential consequences of poor lifestyle</p>	<p>Scheme of Work: B3 – Infection and Response</p> <p>Learning Intent: The impact on modern medicine of understanding how infection occurs and how to support our natural immune system in destroying pathogens and preventing, (including the spreading of) disease</p>	<p>Scheme of Work: B4 – Bioenergetics</p> <p>Learning Intent: How living organisms source, store and transfer energy in order to sustain life. Explore how human behaviour impact on this.</p>
<i>Measuring Impact though:</i>	B1 internal test (50 Marks) and in Paper 1 of external exam in Year 11 In class AFL activities	B2 internal test (50 Marks) and in Paper 1 of external exam in Year 11 In class AFL activities	B3 internal test (50 Marks) and in Paper 1 of external exam in Year 11	B4 internal test (50 Marks) and in Paper 1 of external exam in Year 11
Key Stage 4	<p>Scheme of Work: B5 – The nervous and Endocrine system and Animal and Plant Hormones</p> <p>Learning Intent: How living organisms detect, process and respond to changes in the environment. How nervous and hormonal coordination manages systems such as human fertility and reflex actions.</p>	<p>Scheme of Work: B6 – DNA, Reproduction and Genetics. Evolution and Classification</p> <p>Learning Intent: To learn that processes such as meiosis and gene mutation effect new life and functioning of an animal or plant. Deeper understanding on how such processes allow scientists to weigh up potential benefits and risks, in addition to what technology students will learn that genetic modification is highly controversial.</p>	<p>Scheme of Work: B7i – Organisms, the Environment and human impact.</p> <p>Learning Intent: Realise humans must engage with the environment in a sustainable way. Explore how humans threaten biodiversity and the natural systems that support it. Actions are considered and discussed to ensure a healthy environment is secured.</p>	<p>Scheme of Work: B7ii Biomass, food and biotech (Bio only)</p> <p>Learning Intent: Explain the global impact of deforestation and global warming through the use of data and statistics, and how they have an immediate impact on biodiversity.</p>
<i>Measuring Impact though:</i>	B5 internal test (50 Marks) and in Paper 2 of external exam in Year 11	B6 internal test (50 Marks) and in Paper 2 of external exam in Year 11	B7i internal test (50 Marks) and in Paper 2 of external exam in Year 11	B7ii internal test (50 Marks) and in Paper 2 of external exam in Year 11

Key Stage 4 Chemistry – Intent:

To further enhance and develop mathematical skills learnt at KS3. Working scientifically and using apparatus and techniques, students will build on their basic concepts and principles, in areas such as atomic structure, bonding and structure and quantitative chemistry.

Key Stage 4	<p>Scheme of Work: C1 Atoms, elements, compounds and mixtures and The Periodic Table</p> <p>Learning Intent: Trends in behaviours of naturally occurring substances, and the use of the Periodic Table to predict outcomes of chemical reactions</p>	<p>Scheme of Work: C2 Bonding and Structure and Types of matter</p> <p>Learning Intent: How combining elements can give rise to a range of materials with varying properties and how these link to structure in order to understand their uses in modern technological applications.</p>	<p>Scheme of Work: C3 Amounts of substance. Concentrations. Atom economy and Yield.</p> <p>Learning Intent: Developing fluency in using formulae and equations to communicate chemical reactions. Assess purity and yield for industrial processes.</p>	<p>Scheme of Work: C4 Chemical Changes</p> <p>Learning Intent: Explore the way that chemicals react with each other in order to develop materials and processes to extract further resources and understand reactions that take place in living organisms.</p>	<p>Scheme of Work: C5 Energy changes</p> <p>Learning Intent: Recognise the transfer of energy due to the breaking and formation of bonds can lead to a heating or cooling effect and how it is used in everyday applications and the generation of electricity.</p>
<i>Measuring Impact though:</i>	<p>C1 internal test (50 Marks) and in Paper 1 of external exam in Year 11 In class AFL activities</p>	<p>C2 internal test (50 Marks) and in Paper 1 of external exam in Year 11 In class AFL activities</p>	<p>C3 internal test (50 Marks) and in Paper 1 of external exam in Year 11</p>	<p>C4 internal test (50 Marks) and in Paper 1 of external exam in Year 11</p>	<p>C5 internal test (50 Marks) and in Paper 1 of external exam in Year 11</p>
Key Stage 4	<p>Scheme of Work: C6 Rates of Reaction and Reversible reactions</p> <p>Learning Intent: Understand how changing conditions of chemical reactions to maximise yield and give better industrial output. To explore the human impact of this.</p>	<p>Scheme of Work: C7 Hydrocarbons, Crude Oil and Organic Compounds</p> <p>Learning Intent: To learn that the main sources of organic compounds are living, or were once living materials from plants and animals. Apply knowledge to describe how chemists can make organic molecules to make everyday products.</p>	<p>Scheme of Work: C8 Chemical Analysis</p> <p>Learning Intent: In the world of work, this unit allows links to be made to roles like forensic and drug control scientists. Students learn how a range of qualitative tests detect specific chemicals based on reactions that produce gas, with distinctive properties, in addition to instrumental methods.</p>	<p>Scheme of Work: C9 Chemistry of the Atmosphere</p> <p>Learning Intent: To understand causes of ever changing environment cycles. Learn that scientists use a range of equipment to help predict and solve these issues to reduce impact of human activity.</p>	<p>Scheme of Work: C10 Using resources</p> <p>Learning Intent: Learn how chemists aim to develop ways of disposing of products at the end of their useful lives. Apply knowledge to discuss how environmental chemists study how human activity effects Earth's natural cycles and how damaging impacts are minimised.</p>
<i>Measuring Impact though:</i>	<p>C6 internal test (50 Marks) and in Paper 2 of external exam in Year 11</p>	<p>C7 internal test (50 Marks) and in Paper 2 of external exam in Year 11</p>	<p>C8 internal test (50 Marks) and in Paper 2 of external exam in Year 11</p>	<p>C9 internal test (50 Marks) and in Paper 2 of external exam in Year 11</p>	<p>C10 internal test (50 Marks) and in Paper 2 of external exam in Year 11</p>

Key Stage 4 Physics – Intent: Enhance knowledge on matter, energy, and the interaction between them. Analyse results from fundamental questions and/or observe and experiment with scientific equipment to prove/disprove laws. Students will be able to demonstrate how the laws of Physics enhance our lifestyle and identify the advantages and disadvantages to certain technological advances through time. They will be able to apply this knowledge to further their studies in Physics or in employment. The future decisions on environmental impact of technology and industry are made based upon factual knowledge and learning.

Key Stage 4	<p>Scheme of Work: P1 Energy Transfers and Energy Resources</p> <p>Learning Intent: To scientifically evaluate the sources, stores and transfers of energy in the physical world.</p>	<p>Scheme of Work: P2 Circuits and Domestic Electricity</p> <p>Learning Intent: Understand how the generation and application of electricity contributes to the inner workings of every day modern appliances.</p>	<p>Scheme of Work: P3 Particle model of matter</p> <p>Learning Intent: Students will be able to give examples to show how scientific methods and theories have changed over time. They will be able to explain, with an example, why new data from experiments or observations led to changes in models or theories. They will then be able to decide whether given data supports a particular theory.</p>	<p>Scheme of Work: P4 Atomic structure</p> <p>Learning Intent: Students will be able to use models in explanations, or match features of a model to the data from experiments or observations that the model describes or explains. They will be able to make predictions or calculate quantities based on the model or show its limitations.</p>	<p>Scheme of Work: P5(a&b) Forces and Elasticity</p> <p>Learning Intent: Be able to analyse forces in the way that engineers do when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Apply the knowledge to real life context like recent developments in how artificial limbs use the analysis of forces to make movement possible.</p>
<i>Measuring Impact though:</i>	P1 internal test (50 Marks) and in Paper 1 of external exam in Year 11 In class AFL activities	P2 internal test (50 Marks) and in Paper 1 of external exam in Year 11. In class AFL activities	P3 internal test (50 Marks) and in Paper 1 of external exam in Year 11. In class AFL activities	P4 internal test (50 Marks) and in Paper 1 of external exam in Year 11. In class AFL activities	P5i internal test (50 Marks) and in Paper 2 of external exam in Year 11. In class AFL activities
Key Stage 4	<p>Scheme of Work: P5(c&d) Motion, Car safety and Momentum</p> <p>Learning Intent: Students will be able to link learning to the motion of vehicles and assess how factors affect the stopping distance through analysis of data. Students are more informed about safety systems in readiness for them to leave school and learn to drive, or even make choices about transport based on scientific reasoning.</p>	<p>Scheme of Work: P6 (a&b) Waves and the Electromagnetic Spectrum</p> <p>Learning Intent: Relate wave behaviour in both natural and man-made systems. Recognise that waves carry energy from one place to another and can also carry information. Explore how the design of comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves. Identify our dependency including risks on the use of EM Waves.</p>	<p>Scheme of Work: P6(c&d) Lenses and other waves (Physics only)</p> <p>Learning Intent: Identify how lenses are used in different context. Students will be able to predict the image based upon the structure and shape of a lens. Students will be able to calculate the magnification through measurement and data analysis. Students will be able to relate colour in transmission of wavelengths of energy, including the use of filtering.</p>	<p>Scheme of Work: P7 Magnetism and Electromagnetism</p> <p>Learning Intent: Identify the uses and how electromagnetic effects are used in a wide variety of devices. Understand that engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. Explain how systems that involve control or communications take full advantage of these phenomena.</p>	<p>Scheme of Work: P8 Space physics (Physics only)</p> <p>Learning Intent: To answer questions based upon evidence and data provided. Students will be able to explain how the evidence for our existence is based upon technological advances. Facts about evolution and structure of matter in the cosmos is explored and students get to apply the principles based upon data analysis.</p>
<i>Measuring Impact though:</i>	P5ii internal test (50 Marks) and in Paper 2 of external exam in Year 11 In class AFL activities	P6i internal test (50 Marks) and in Paper 2 of external exam in Year 11. In class AFL activities	P6ii internal test (50 Marks) and in Paper 2 of external exam in Year 11. In class AFL activities	P7 internal test (50 Marks) and in Paper 2 of external exam in Year 11. In class AFL activities	P8 internal test (50 Marks) and in Paper 2 of external exam in Year 11. In class AFL activities

Key Stage 5 Biology – Intent: A-Level Biology students will have a love for learning about the natural world. Students will cover a wide range of Biological processes over the course of two years, and will link these together to build up a broad understanding of the complex mechanisms within living organisms. Through a range of practical investigations students will develop skills to allow them to access Science courses at University. During the course students will identify where Biology links to careers and the wider world, developing a firm understanding of the scientific method.

Year 12	<p>Scheme of Work: Biological molecules</p> <p>Learning Intent:</p> <p>To understand how Biological molecules form the basis of our knowledge of Biology. Students will understand how Carbohydrates, Lipids, Proteins, water and nucleotides are formed and link their understanding to the roles of biological molecules within living organisms.</p> <p>Students will be introduced to the CPAC element of their course and practical techniques needed to be successful in Biology.</p>	<p>Scheme of Work: Cells</p> <p>Learning Intent:</p> <p>To secure an understanding of the cell theory and that it is a unifying concept in biology. Students will develop their knowledge of cells, cell division, and substance exchange, microscopes and immunity.</p> <p>Students will be introduced to the CPAC element of their course and practical techniques needed to be successful in Biology. Students will be able to explore ethical arguments surrounding vaccinations. This topic is the foundation and knowledge will be built on throughout the course to move on to University or other career options.</p>	<p>Scheme of Work: Exchange transport systems</p> <p>Learning Intent:</p> <p>To secure an understanding that the internal environment of a cell or organism is different from its external environment. Students will develop their understanding of gas exchange in different organisms and how substances are transported in plants and mammals.</p> <p>Students will Develop maths skills within biology, apply techniques to answer comprehension questions and develop dissection skills. This topic allows students to develop arguments around the ethical issues surrounding dissections of animals within Biology. This topic also allows students to discover a range of possible careers linked to the study of Biology</p>	<p>Scheme of Work: DNA and diversity</p> <p>Learning Intent:</p> <p>Students build on their knowledge of DNA as a biological molecule, and apply this to understand how genetic information is stored, copied and used in living organisms. Students will understand how mutations can lead to health issues and also contribute towards diversity and selection.</p> <p>Students will start to explore gene technologies and their role in classifying organisms.</p> <p>Students will explore ethical arguments with regards to gene technology, genetic diseases and selection. Students will discuss the different careers available to geneticists and other specialist brands of Biology.</p>	<p>Scheme of Work: Genetics and populations (A)</p> <p>Learning Intent:</p> <p>Students build on their basic understanding of inheritance of DNA to now be able to explain and predict the inheritance of characteristics. Students will apply a range of complex statistical analysis to these problems to make conclusions regarding inheritance.</p> <p>Students will also build on their understanding of natural selection to now include mechanisms behind changes in allele frequencies.</p> <p>This topic allows students to build on their understanding of ethical issues regarding genetic diseases and their treatment.</p>	<p>Scheme of Work: Coordination and control (A & B)</p> <p>Learning Intent:</p> <p>To secure an understanding of how the body responds to internal and external stimuli. Students will develop their knowledge of animal and plant responses, synaptic transmission, muscle structure and transmission. Students will develop practical skills by developing investigations from scratch.</p> <p>Students will be able to create links between chemistry and P.E and suggest how their knowledge of human and plant responses can link to different career opportunities.</p>
<i>Measuring Impact though:</i>	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment

Year 13	<p>Scheme of Work:</p> <p>Genetics and populations (B & C)</p> <p>Learning Intent:</p> <p>Students build on their basic understand of inheritance of DNA to now be able to explain and predict the inheritance of characteristics. Students will apply a range of complex statistical analysis to these problems to make conclusions regarding inheritance.</p> <p>Students will also build on their understanding of natural selection to now include mechanisms behind changes in allele frequencies.</p> <p>This topic allows students to build on their understanding of ethical issues regarding genetic diseases and their treatment.</p>	<p>Scheme of Work:</p> <p>Coordination and control (C)</p> <p>Learning Intent:</p> <p>To build on knowledge of coordination and control. Students will be able to explain how the body maintains a constant internal environment. Students will be able to analyse data to draw conclusions and apply maths skills to complex problems. Students will be able to understand common medical problems linked with diabetes and kidney disease.</p>	<p>Scheme of Work:</p> <p>Gene expression</p> <p>Learning Intent:</p> <p>Students will build on their knowledge of genes and genetics to understand how genes are expressed in living organisms. Students will understand the role of gene expression in cancer, and suggest how epigenetics can influence the expression of genes.</p> <p>Students will apply this to understand how humans manipulate genes and genes through gene technology to diagnose medical issues and</p>	<p>Scheme of Work:</p> <p>Gene Technologies</p> <p>Learning Intent:</p> <p>To build on student understanding of gene technologies and application to real life. Students will gain experience sequencing key processes within producing DNA fragments, comparing in vivo and in vitro gene cloning. Students will evaluate ethical issues surrounding gene therapy.</p> <p>Students will be able to look at real life application of gene therapy within medicine, plant and animal breeding and genetic fingerprinting</p>	<p>Scheme of Work:</p> <p>Photosynthesis</p> <p>Learning Intent:</p> <p>To build on student knowledge of photosynthesis and respiration to include the light dependent and light independent reaction. Students to describe mitochondrial reactions with respiration.</p> <p>Students develop CPAC skills and use complex practical techniques.</p>	<p>Scheme of Work:</p> <p>Energy, ecosystems and nutrient cycles</p> <p>Learning Intent:</p> <p>To secure an understanding of energy transfers through ecosystems and the importance of nutrient cycles in ecosystems. Students will research and evaluate the use of fertilisers and consider their impact on the environment.</p> <p>Students will make own decisions on whether organic or inorganic fertilisers should be used in farming and the impact of human interference of ecosystems.</p>
<i>Measuring Impact though:</i>	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment	AFL in lessons CPAC skills End of unit assessment

Key Stage 5 Chemistry – Intent:

To develop an appreciation of the scope of chemistry to influence our lives. Students will further their understanding and knowledge of physical, inorganic and organic chemistry. They will use practical sessions to deepen their grasp of chemical fundamentals and the scientific method. Students will learn to handle chemicals safely and understand the process of risk assessment. During the course students will be made aware of the large number of STEM careers that rely on an advanced qualification in chemistry.

Year 12	<p>Scheme of Work: Physical chemistry</p> <p>Learning Intent: Students will learn about the structure of the atom, why atoms bond and the usefulness of the periodic table. They will calculate chemical amounts in a variety of contexts. Energetics will be studied which will lead on to an appreciation of why chemical reactions proceed at different rates. Students will study why reactions reach an equilibrium and how redox explains how electrical energy can be obtained from chemical reactions</p>	<p>Scheme of Work: Inorganic Chemistry</p> <p>Learning Intent: Students will study the true nature of trends in the periodic table and relate these to their work in Physical Chemistry. Using a practical approach students will study the chemistry of group 2 and 7 elements and be able to write both symbolic and ionic equations.</p>	<p>Scheme of Work: Organic Chemistry</p> <p>Learning Intent: Students will further develop their understanding of carbon compounds, including the alkanes, alkenes, halogenoalkanes and alcohols. They will learn elementary reaction mechanisms and be able to predict the behaviour of unknown molecules. Students will learn the rudiments of chemical and spectroscopic analysis.</p>	<p>Scheme of Work: Practical Chemistry</p> <p>Learning Intent: Students will be taught how to handle chemicals and the importance of risk assessment. They will carry out at least 6 practical assessments as well as performing illustrative practicals to aid their understanding of theoretical chemistry.</p>
<i>Measuring Impact though:</i>	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	Use of CPAC criteria, effect on test scores and understanding. Assessment of enjoyment of the subject
Year 13	<p>Scheme of Work: Physical Chemistry</p> <p>Learning Intent: Students will deepen their knowledge of various types of equilibria (acid / Base, redox, and gas systems). They will continue to deepen their use of mathematics to solve problems and predict the outcome of chemical reactions.</p>	<p>Scheme of Work: Inorganic Chemistry</p> <p>Learning Intent: Students will study the chemistry of the transition metals and be able to describe chemical reactions using complex notation. They will use practical work to illustrate the usefulness of transition metal chemistry in our everyday lives. Also students will study the chemistry of aqueous ions and relate this to the properties of transition metals. The periodic properties of period 3 elements will be studied and linked to the study of atomic structure and the properties of matter.</p>	<p>Scheme of Work: Organic Chemistry</p> <p>Learning Intent: Students will study the behaviour of more complex homologous series, the carbonyls, amines, alcohols, arenes, polymers and amino acids. They will learn how to construct and interrogate reaction sequences and how NMR can be used to ascertain the structure of Organic molecules.</p>	<p>Scheme of Work: Practical Chemistry</p> <p>Learning Intent: Students carryout a further 6 practical assessments. They deepen their ability to use mathematical methods to assess precision, accuracy and error.</p>
<i>Measuring Impact though:</i>	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	Internal tests involving all types of question. Homeworks concentrating on opportunities to show flair and depth of understanding	

Key Stage 5 Physics – Intent:

To develop a deeper interest in Physics, enabling further study and/or careers associated with it. Students get to demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods. Their greater understanding will help them understand how society makes decisions about scientific issues based upon validated new knowledge and how the sciences contribute to the success of the economy and society. Students will be more able to recognise and help to contribute to a reduction in the risks of these applications through evaluating methodology, evidence and data, and resolving conflicting evidence. Carry out experimental and investigative activities, including appropriate risk management, in a range of contexts.

Year 12	<p>Scheme of Work: Particles and Radiation</p> <p>Learning Intent: Introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena. Students become aware of the way ideas develop and evolve in physics. Appreciate the importance of international collaboration in the development of new experiments and theories in this area of fundamental research.</p>	<p>Scheme of Work: Waves</p> <p>Learning Intent: GCSE studies of wave phenomena are extended through a development of knowledge of the characteristics, properties, and applications of travelling waves and stationary waves. Greater knowledge of refraction, diffraction, superposition and interference will increase understanding of applications in modern society.</p>	<p>Scheme of Work: Mechanics and Materials</p> <p>Learning Intent: Development of the knowledge and understanding of forces, energy and momentum. A study of materials considered in terms of their bulk properties and tensile strength. To provide a good starting point for students who are seeking careers in Engineering.</p>	<p>Scheme of Work: Electricity</p> <p>Learning Intent: Build on and develop earlier study of these phenomena from GCSE. Provide opportunities for the development of practical skills and lay the groundwork for later study of the many electrical applications that are important to society.</p>	<p>Scheme of Work: Measurements and their errors</p> <p>Learning Intent: (Content in this section is a continuing study for a student of physics throughout both years). Gain a working knowledge of the specified fundamental (base) units of measurement. Develop a greater skill in practical work based upon subject needs, which are underpinned by an awareness of the nature of measurement errors and of their numerical treatment.</p>
<i>Measuring Impact though:</i>	Internal assessments and Final Exam performance on Paper 1. CPAC skills will be assessed as an ongoing exercise				
Year 13	<p>Scheme of Work: Further Mechanics and Thermal Physics</p> <p>Learning Intent: Earlier study of mechanics is further advanced through a consideration of circular motion and simple harmonic motion (the harmonic oscillator). Thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth preparing learners for a career in Engineering or Physics.</p>	<p>Scheme of Work: Fields and their consequences</p> <p>Learning Intent: Explore the ideas of gravitation, electrostatics and magnetic field theory and emphasise this unification between each phenomena. Further develop ideas from earlier studying of Physics and in particular, mechanics and electricity. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. To identify how these topics have considerable impact on modern society.</p>	<p>Scheme of Work: Nuclear Physics</p> <p>Learning Intent: Build on the work of Particles and radiation to link the properties of the nucleus to the production of nuclear power through the characteristics of the nucleus, the properties of unstable nuclei, and the link between energy and mass. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society. Explore the advantages and disadvantages of Nuclear industry based upon scientific research.</p>	<p>Scheme of Work: Optional Unit</p> <p>Learning Intent: To extend knowledge on one of the following units (based upon the needs of the cohort): Astrophysics Medical Physics Engineering Physics Turning Points in Physics Electronics</p>	
<i>Measuring Impact though:</i>	Internal assessments and Final Exam performance on Paper 2. CPAC skills will be assessed as an ongoing exercise			Internal assessments and Final Exam performance on Paper 3 with a practical certificate of competence awarded to the successful candidates	

Key Stage 5 BTEC Level 3 National Extended Certificate in Applied Science – Intent: Develop the transferable and higher order skills, which are valued by higher education providers and employers through the development of cognitive and problem-solving skills, intra and interpersonal skills. Students will develop skills including how to plan investigations, collecting, analysing, and presenting data and communicating results which support some of the skills learners need to progress to higher education, employment, self-employment or training.

Year 12	<p>Scheme of Work: Unit 3: Science Investigation Skills</p> <p>Learning Intent: Develop investigative skills, including planning, recording and interpreting data. Analysis and evaluation of findings in order to test a hypothesis to inform further research and development.</p>	<p>Scheme of Work: Unit 8: Physiology of Human Body Systems</p> <p>Learning Intent: Consolidate and extend biological knowledge gained from Unit 1 and apply this knowledge to the physiological make up of three specified human body systems (musculoskeletal, lymphatic and digestive), including how the systems function and what occurs during dysfunction.</p>
<i>Measuring Impact though:</i>	Externally assessed and written paper (first sitting in June with resit option available in January/June of y13)	3 Internally assessed and externally moderated assignments in line with BTEC official assignment briefs.
Year 13	<p>Scheme of Work: Unit 2 – Practical Scientific Procedures and Techniques</p> <p>Learning Intent: An introduction to a higher level of laboratory techniques in order to develop practical competence, problem solving skills and application of Scientific method. Reflect on developing skills and evaluating own techniques.</p>	<p>Scheme of Work: Unit 1: Principles and Applications of Science I</p> <p>Learning Intent: To study key scientific concepts in biology, chemistry and physics. Topics included in this unit are; animal and plant cells and tissues; atomic structure and bonding; chemical and physical properties of substances related to their uses; waves and their application in communication.</p>
<i>Measuring Impact though:</i>	4 Internally assessed and externally moderated assignments in line with BTEC official assignment briefs.	3 Externally assessed written papers (first sitting in January with resit option available in June).

Key Stage 5 Psychology – Intent:

Psychology is an academic subject that enables our students to develop their knowledge of psychological issues, research studies, theories, and models in a range of topic areas. Psychology includes elements of many other disciplines including English Language, Mathematics, Computer Science, Biology, Business Studies, History and Geography. Students develop the higher-level skill of evaluation by looking at strengths, limitations, and other discussion points such as compare and contrast throughout the course. This allows them to understand the complexity of psychological issues and move away from simplistic answers towards more developed discussions. Students use their knowledge and evaluation skills to apply Psychology to real world examples of behaviour and need to be prepared to consider topics in the exams that are not on the specification, a wide range of examples are used in lessons to support them with this.

<p>Year 12</p>	<p>Scheme of Work: Research Methods (Unit 2) Learning Intent: Students will develop their critical analysis skills acquire the knowledge and skill to evaluate the validity and quality of research underpinning all subsequent topics/units.</p> <p>Students will demonstrate knowledge and understanding of a range of research methods, scientific processes and techniques of data handling and analysis, be familiar with their use and be aware of their strengths and limitations.</p> <p>Rationale: Research Methods equates to 30% of the whole A-level specification. Research Method questions are embedded in all other units and topics. Rather than overwhelming students with the whole of the research methods topic, teaching is delivered in two parts. The year one content will be followed up at the start of year two (year 13).</p>	<p>Scheme of Work: Approaches in Psychology (Unit 2) Learning Intent: Students develop a basic understanding of human development from various perspectives. They will refine their ability to think abstractly, from other points of view and apply this to everyday situations/human behaviour.</p> <p>Rationale: The first part of this unit covers the Origins of Psychology and students are provided with a very interesting overview of how psychology has developed as a science. This is critical as we do not offer GCSE Psychology and so it is likely that this is the first-time students will have studied this topic in any capacity.</p> <p>The rest of the Approaches topic covers the main six approaches in psychology. These underpin so many other topics and students are able to see links between the units each time we cover a topic.</p>	<p>Scheme of Work: Psychopathology (Unit 1) Learning Intent: Students gain knowledge of some of the most common mental health disorders, including anxiety and depression. Students will evaluate therapies and treatments including in terms of their appropriateness and effectiveness.</p> <p>Rationale: Psychopathology (unit one) is taught towards the end of the autumn term. Much of the learning is a progression and development from the approaches topic. This topic is easier to understand, if taught after students have gained an understanding of the biological, cognitive, and behavioural approaches.</p>	<p>Scheme of Work: Social Influence, Memory & Attachment (Unit 1) Learning Intent: Attachment – Develop the required understanding of why humans need attachments and the evolutionary benefits of them. Reflecting upon own attachments. Understanding future impacts of earlier attachments. Analysing impacts of disruption in early attachments.</p> <p>Memory – Utilise conceptual and abstract thinking to build upon the cognitive approach. Understand of how memory works through 2 different models. Students will focus on forgetting and issues with EWT.</p> <p>Social Influence – Students will be required to demonstrate an understanding of conformity, obedience and how this impacts society. Examines key examples throughout history (apartheid, The Suffragettes, MLK etc.). Emphasis placed on personality.</p> <p>Rationale: These remaining unit 1 topics allow students to exercise their application of various approaches in understanding these key features of human behaviour.</p>	<p>Scheme of Work: Biopsychology (Unit 2) Learning Intent: Built on from biological approach; getting students to understand the biological basis of human behaviour. This will potentially include a dissection of the brain and will draw links between the structure and function of the nervous system and the symptomatic effect of behaviour.</p> <p>Rationale: The final topic covered is Biopsychology. For some students this can be the most challenging and so it is actually quite motivating for students to know that this is the last topic covered. It is more straightforward than students first believe. Leaving Biopsychology to the end means that students must review their understanding of the Year 1 content.</p>
<p>Measuring Impact though:</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>

<p>Year 13</p>	<p>Scheme of Work: Issues & Debates in Psychology (Unit 3)</p> <p>Learning Intent: To understand significant issues & debates that are consistent across all areas of psychology. This will bring together AO3 elements from all topics. Debates are including but not limited to, Gender bias, Nature – Nurture, Freewill and determinism, research validity and ethical concerns in relation to research and its findings. In answering questions on Issues and Debates in Psychology students will be expected to illustrate their answers with knowledge and understanding of topics studied elsewhere in the specification as appropriate.</p> <p>Rationale: The Issues and Debates unit is covered first, reviewing the flipped learning carried out over the summer holidays. Issues and debates can be developed and explored in all other topic units. It is important to cover this early on in year 13. It is difficult for students to get an understanding of this topic before completing year 12. Hence why it is best taught at the start of year 13, when students already have a good understanding of other units.</p>	<p>Scheme of Work: Option 2 – Schizophrenia</p> <p>Learning Intent: Students will learn to understand schizophrenia the co-morbidity rates with other common mental illnesses. This includes symptoms, classifications, explanations and treatments. Students will build on knowledge from the cognitive, behavioural & biological approaches.</p> <p>Rationale: Schizophrenia was chosen due to the social sensitivity of the other options in this group (Eating disorders and stress), as Schizophrenia is generally a late onset disorder students were much less likely to have been personally effected by this.</p>	<p>Scheme of Work: Option 1 – Cognition & Development</p> <p>Learning Intent: Students will learn about the work of a number of critically influential Psychologists. In doing so they will be able to compare, using various perspectives, the explanations of thinking perception development and learning.</p> <p>Rationale: Cognition and Development was chosen because it has significantly less content for students to learn than the other options. This topic builds on what students have already learnt in attachment in year 1, it is also very useful for any students thinking of applied careers in which Psychology may not be a primary qualification.</p>	<p>Scheme of Work: Option 3 – Forensics – Possibly Addiction (Cohort dependent)</p> <p>Learning Intent: Forensic Psychology - Students will learn explanations for criminality and how it can be “treated” (e.g. token economy systems and restorative justice).</p> <p>Rationale: Forensic psychology is a popular choice with students and something, which does lend itself to wider discussion and research beyond the curriculum. Current affairs are regularly discussed when teaching this topic as there is always relevant crime in the news.</p>	<p>Scheme of Work: Biopsychology (Unit 2)</p> <p>Learning Intent: The final topic covered is Biopsychology. For some students this can be the most challenging and so it is actually quite motivating for students to know that this is the last topic covered. It is more straightforward than students first believe. Leaving Biopsychology to the end means that students must review their understanding of the Year 1 part learned in Year 12. This understanding is the basis for the Year 2 elements.</p>
<p>Measuring Impact though:</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>	<p>Internal tests involving all types of question. Homework concentrating on opportunities to show flair and depth of understanding</p>