

**Key Stage 4: Year 10**

Overall Curriculum Goals - developing the following Big Ideas:							
<ul style="list-style-type: none"> <li>Forces predict motion</li> <li>Structure determines properties</li> <li>Organisms interact in communities</li> <li>Forces act through fields</li> <li>Reactions rearrange matter</li> <li>Ecosystems cycle matter and energy</li> <li>Energy is conserved in transfers</li> <li>Earth systems interact</li> <li>Characteristics are inherited</li> <li>Electricity transfers energy</li> <li>Cells carry out life processes</li> <li>Species show variation</li> <li>Energy travels as radiation</li> <li>Bodies work as systems</li> </ul>							
WC 06/09 & 13/09		WC 20/09 & 27/09		WC 04/10 & 11/10		WC 18/10	
<ul style="list-style-type: none"> <li>Enzymes and nutrition</li> <li>Enzyme action and activity</li> </ul> <p><u>Core practical – pH and enzymes (variables, conclusion)</u></p>		<p>Assessment CB1b Close the gap</p> <ul style="list-style-type: none"> <li>Transporting substances</li> </ul>		<p><u>Core practical – osmosis (%change, conclusion, variables)</u></p> <p>Assessment CB1c</p> <ul style="list-style-type: none"> <li>Close the gap</li> </ul>		<p>Cells and Control CB2</p> <ul style="list-style-type: none"> <li>Mitosis</li> <li>Percentile Growth Charts</li> </ul>	
Review CC3 & 4		<p>Ionic bonding CC5, 6 &amp; 7</p> <ul style="list-style-type: none"> <li>Ionic bonds</li> <li>Ionic lattices</li> </ul>		<ul style="list-style-type: none"> <li>Ionic lattices</li> <li>Covalent bonds</li> </ul>		<ul style="list-style-type: none"> <li>Covalent bonds</li> <li>Molecular compounds</li> </ul>	
<p>Forces and motion CP2</p> <ul style="list-style-type: none"> <li>Newton's first law</li> <li>Weight and mass</li> <li>Newton's second law</li> <li>Core practical – Investigating acceleration (method, calculations, conclusion)</li> </ul>		<p>Newton's third law</p> <ul style="list-style-type: none"> <li>Momentum</li> <li>Stopping distances</li> <li>Crash hazards</li> </ul> <p>Assessment CP2 Close the gap</p>		<p>Conservation of energy CP3</p> <ul style="list-style-type: none"> <li>Energy stores and transfers</li> <li>Energy efficiency</li> <li>Sankey diagrams</li> </ul>		<ul style="list-style-type: none"> <li>Insulation</li> <li>Stored energies</li> </ul> <p>Assessment CP3 Close the gap</p>	
<b>Key Vocabulary/Concepts/ideas</b>							
<p><b>Half Term 1</b> enzyme, biological catalyst, active site, denature, substrate, polymer, monomer, temperature, pH, substrate concentration, collision, enzyme - substrate complex, diffusion, osmosis, active transport, gradient</p> <p>Bonds, ions, cations, anions, electrons, electrostatic forces, ionic compounds, lattice structure, properties, melting point, boiling, anode, cathode, covalent, molecular., valency, polymer, monomer, intermolecular, allotropes, fullerenes, graphene, delocalised, metallic, malleable, conduct</p> <p>Scalars, vectors, speed, velocity, resultant force, balance, unbalanced, centripetal force, mass, weight, gravitational field strength, inertial mass, equilibrium, collisions, momentum, stopping distance, reaction times, crumple zone, force, weight, energy, chemical, thermal, kinetic, elastic potential, gravitational potential, atomic, nuclear, conservation of energy, Sankey diagram, joules, conservation, dissipated, lubrication, insulation, conduction, thermal, convection, fluid, radiation, infrared, absorbed, emitted, thermal conductivity, kinetic, nuclear fuels, renewable</p>				<p><b>Half Term 2</b> meiosis, gametes, genome, gene, chromosome, DNA, complementary, bases, hydrogen bonds</p> <p>Bonding, ionic, simple molecular, giant covalent, metallic, empirical formula, molecular formula, relative formula mass, conservation of mass, Avogadro constant,</p> <p>Waves, transverse, sound, longitudinal, seismic, electromagnetic, frequency, hertz, period, wavelength, amplitude, velocity, refraction, interface,</p>			
WC 03/01 & 10/01		WC 17/01 & 24/01		WC 31/02 & 07/02 & 14/02		WC 28/02 & 07/03	
<p>Genetics CB3</p> <ul style="list-style-type: none"> <li>Mendel</li> <li>Alleles</li> <li>Inheritance</li> </ul>		<ul style="list-style-type: none"> <li>Genetic diagrams</li> <li>Variation</li> </ul>		<p>Human Genome Project</p> <p>Assessment CB3 Close the gap</p>		<p>Natural Selections and Genetic Modification CB4</p> <ul style="list-style-type: none"> <li>Classification</li> <li>Natural Selection and Evidence for Evolution</li> <li>Fossil Evidence</li> </ul>	
<p>Moles</p> <ul style="list-style-type: none"> <li>Stoichiometry</li> </ul>		<p>Assessment CC9</p> <p>Close the gap</p>		<p>Review CC3 &amp; 4</p>		<p>States of matter CC1&amp;2</p> <ul style="list-style-type: none"> <li>States of matter</li> <li>Mixtures</li> </ul>	
Review CP3 & 4		<p>Light and the EM Spectrum CP5</p> <ul style="list-style-type: none"> <li>Electromagnetic spectrum</li> <li><u>Core practical – Investigating refraction</u></li> </ul>		<ul style="list-style-type: none"> <li>The electromagnetic spectrum</li> <li>Uses of EM waves</li> </ul>		<ul style="list-style-type: none"> <li>Dangers of EM waves</li> </ul> <p>Assessment CP5</p> <ul style="list-style-type: none"> <li>Close the gap</li> </ul>	
<p>Filtration and crystallisation</p> <p>Paper chromatography</p>		<p>Distillation</p> <p><u>Core practical – investigating inks</u></p>		<p>Radioactivity CP6</p> <ul style="list-style-type: none"> <li>Atomic model</li> <li>Inside atoms</li> <li>Electrons and orbits</li> </ul>		<ul style="list-style-type: none"> <li>Background radiation</li> <li>Types of radiation</li> </ul>	
<b>Key Vocabulary/Concepts/ideas</b>							
<p><b>Half Term 3</b> alleles, homozygous, heterozygous, dominant, recessive, genotype, phenotype, Punnett squares, inheritance, mutation, variation, continuous, discontinuous</p> <p>Particle model, solid, liquid, gas, physical, chemical, melting, insoluble, filtration, crystallisation, solution, solute, solvent, filtrate, residue, risk assessment, hazard, chromatography, stationary phase, mobile phase, chromatogram</p> <p>Electromagnetic wave, frequencies, visible light, ultraviolet, transverse, vacuum, infrared, refraction, electromagnetic spectrum, visible spectrum, microwaves, radio waves, x-rays, gamma rays, fluorescence, gamma, radiotherapy, mutations, radiation</p>				<p><b>Half Term 4</b> evolution, fossils, binomial system, species, classification, <i>Ardipithecus ramidus</i>, <i>Australopithecus afarensis</i>, natural selection, competition, kingdom, genus, domain, eukaryote, archaea, bacteria, artificial selection, selective breeding, genetic engineering, recombinant DNA, restriction enzyme, plasmid, ligase, vector, sticky ends</p> <p>Distillation, mixture, evaporates, condensed, fractional distillation, precipitates, aquifers, sedimentation, chlorination,</p> <p>Particle theory, elements, atoms, subatomic particles, electrons, alpha particles, nucleus, nucleons, protons, neutrons, relative mass, mass number, isotopes, electronic configuration, emission spectrum, ionization, radioactivity, ionizing radiation, penetrating radiation</p>			
WC 25/04 & 02/05		WC 09/05 & 16/05		WC 23/05		WC 06/06 & 13/06	
WC 15/11 & 22/11		WC 29/11 & 06/12		WC 13/12		WC 20/06 & 27/06	
<p><u>Suggested practical – reaction times (variables, conclusion)</u></p> <p>Assessment CB2 Close the gap</p>		<p>Genetics CB3</p> <ul style="list-style-type: none"> <li>Meiosis</li> <li>Asexual and sexual reproduction</li> <li>DNA</li> </ul>		<ul style="list-style-type: none"> <li><u>Suggested practical -DNA Extraction (Method, safety)</u></li> </ul>		<p>Calculations involving masses CC9</p> <ul style="list-style-type: none"> <li>Calculating concentration</li> <li>Relative formula mass</li> </ul>	
<p>Assessment CC3 &amp; 4</p> <ul style="list-style-type: none"> <li>Close the gap</li> </ul>		<p>Review CP1 &amp; 2</p>		<ul style="list-style-type: none"> <li>Empirical formula</li> <li>Conservation of mass</li> </ul>		<p>Waves CP4</p> <ul style="list-style-type: none"> <li>Properties of waves</li> <li>Wave speeds</li> <li><u>Core Practical – Investigating waves</u></li> </ul>	
<b>Key Vocabulary/Concepts/ideas</b>							
WC 06/06 & 13/06		WC 20/06 & 27/06		04/07 & 11/07			

Term 3	Health, disease and the development of medicines CB5 • Health and disease • Non-communicable disease	• Pathogens • Spreading pathogens • Physical and chemical barriers	• The immune system • Antibiotics and drug development	• Cardiovascular disease Assessment CB5 Close the gap	Review Paper 1 CB 1,2 & 3	Review Paper 1 CB 1,4 & 5
	Drinking water Review Assessment CC1 & 2	Acids and Alkalis CC8 • Indicators • Acids	Bases and salts Core practical – preparing copper sulfate Alkalis and balancing equations	Core practical – investigating neutralisation • Alkalis and neutralisation	• Reactions of acids with metals and carbonates • Solubility	Assessment CC8 Close the gap Review CC 1, 2 & 9
	• Radioactive decay • Half life	• Dangers of radioactivity Assessment CP6 Close the gap	Review Paper 5 (CP1-6)	Review Paper 5 (CP1-6)	Forces and Energy CP7 & 8 • Work and power • Objects affecting each other	• Vector diagrams Assessment CP7 & 8 Close the gap
	<b>Key Vocabulary/Concepts/ideas</b>					
Half Term 5 health, pathogen, communicable, non-communicable, deficiency, cholera, tuberculosis, chalaria dieback, malaria, HIV, AIDs, bacteria, fungi, virus, protist, pathogen, lymphocyte, antibody, antigen, vaccination, barriers Aqueous solution, acidic, alkaline, neutral, pH scale, polyatomic ions, dissociate, neutralise,, state symbols, crystallization, Radioactive decay, nuclear equation, becquerels, half-life, mutation, contaminated, irradiated			Half Term 6 cardiovascular disease, heart attack, body mass index, waist:hip ratio, artery, stroke, antihypertensives, anticoagulants, stent Ions, neutralisation,,titration, burette, pipette, end-point, reactivity series, effervescence, ionic equation, carbonates, precipitation, precipitate, insoluble Energy, work done, power, watts, contact forces, non-contact forces, vectors, action-reaction forces, force field, gravitational field, magnetism, static electricity, magnet, electric field, resultant force,			
<b>CEIAG</b>						
<ul style="list-style-type: none"> <li>• Cultural capital sheets to introduce each unit.</li> <li>• Careers displays around the whole department</li> <li>• British Science week, BioBakes, BioArtAttack</li> <li>• Why Study? Talks</li> <li>• Medical Mavericks (PE &amp; Health&amp;Social)</li> </ul>						
<b>Personal Development</b>						
Throughout the year the rule of law is promoted during experimental work, students are required to follow lab rules in order to keep themselves and each other safe. This also allows us to focus upon tolerance and respect whilst collaborating with others. Individual liberty and choice is acknowledged when discussing vaccination, debates are conducted respectfully. The rule of law is addressed through the age of consent. Communicable diseases such as AIDs and chlamydia are taught in a scientific yet respectful way, again the rule of law is acknowledged with regards to testing of STIs, contraception and the responsibility to inform partners of infection. Healthy diets and the impact of certain lifestyles on the NHS and society is discussed, the role of individuals within society is debated. Further debates are carried out with regards to organ donation, drug development and testing, again all opinions are respected. In physics the rule of law is addressed during the teaching of speed limits and stopping distances. When discussing theories and development of ideas students are encouraged to respect the views of others. The uses of radioactive sources and their impact on individuals and the environment is also addressed in half term 4. Students are taught the importance of making informed choices when discussing types of energy and their effects.						

**Key Stage 4: Year 11**

Overall Curriculum Goals - developing the following Big Ideas:						
<ul style="list-style-type: none"> <li>Forces predict motion</li> <li>Structure determines properties</li> <li>Organisms interact in communities</li> <li>Forces act through fields</li> <li>Reactions rearrange matter</li> <li>Ecosystems cycle matter and energy</li> <li>Energy is conserved in transfers</li> <li>Earth systems interact</li> <li>Characteristics are inherited</li> <li>Electricity transfers energy</li> <li>Cells carry out life processes</li> <li>Species show variation</li> <li>Energy travels as radiation</li> <li>Bodies work as systems</li> </ul>						
WC 06/09 & 13/09		WC 20/09 & 27/09		WC 04/10 & 11/10 & 18/10		WC 29/11 & 06/12 & 13/12
Term 1	Exchange and transport in animals CB8	<ul style="list-style-type: none"> <li>The heart</li> <li>Suggested practical – heart dissection</li> <li>Cellular respiration</li> </ul>	<ul style="list-style-type: none"> <li>Core practical – respiration rates</li> </ul> Assessment CB8 <ul style="list-style-type: none"> <li>Close the gap</li> </ul>	Animal coordination, control and homeostasis CB7	<ul style="list-style-type: none"> <li>Menstrual cycle</li> <li>Hormones and the menstrual cycle</li> </ul>	<ul style="list-style-type: none"> <li>Control of blood glucose</li> <li>Type 2 diabetes</li> <li>Suggested practical – testing for glucose</li> </ul> Assessment CB7 Close the gap
	Electrolytic processes CC10, 11 & 12	<ul style="list-style-type: none"> <li>Products from electrolysis</li> <li>Reactivity</li> <li>Ores</li> </ul>	<ul style="list-style-type: none"> <li>Oxidation and reduction</li> <li>Life cycle assessment &amp; recycling</li> <li>Dynamic equilibria</li> </ul> Assessment CC10,11 & 12 Close the gap	Groups in the periodic table CC13,14 & 15	<ul style="list-style-type: none"> <li>Group 0</li> <li>Rates of reaction</li> <li>Factors affecting reaction rates</li> </ul>	<ul style="list-style-type: none"> <li>Core practical – investigating reaction rates</li> <li>Catalysts and activation energy</li> <li>Exothermic and endothermic reactions</li> </ul>
	Electricity and circuits CP9	<ul style="list-style-type: none"> <li>Energy and charge</li> <li>Resistance</li> <li>Core practical – investigating resistance</li> <li>Transferring energy</li> </ul>	<ul style="list-style-type: none"> <li>Power</li> <li>Transferring energy by electricity</li> <li>Electrical safety</li> <li>Assessment CP9</li> <li>Close the gap</li> </ul>	Review CP1, 2, 3 & 4	Magnetism CP10 & 11	<ul style="list-style-type: none"> <li>Magnets and magnetic fields</li> <li>Electromagnetism</li> </ul>
<b>Key Vocabulary/Concepts/ideas</b>						
Half Term 1 gas exchange, respiration, aerobic, anaerobic, alveoli, plasma, platelets, lymphocytes, erythrocytes, haemoglobin, antibodies, atria, ventricle, artery, capillary, vein, cardiac output, stroke volume  Electrolysis, electrolyte, electrodes, cations, anions, cathode, anode, oxidation, reduction, half equation, displacement, redox, native state, extraction, bioleaching, leachate, phytoextraction, corrosion, recycling  Atom, nucleus, protons, neutrons, electrons, shells, current, series, parallel, circuit, amperes, ammeter, potential difference, voltage, volts, charge, coulombs, resistance, ohms, diodes, energy transfer, power watts, national grid, mains electricity, direct voltage, alternating voltage,				Half Term 2 hormones, endocrine, pituitary, thyroid, adrenal, pacers, testes, ovaries, metabolic rate, thyroxine, adrenaline, menstrual cycle, FSH, oestrogen, LH, progesterone, ovulation, menstruation, diabetes, insulin, pancreas, glucose, glycogen, glucagon, homeostasis  Periodic table, alkali metals, reactivity, halogens, diatomic, salts, halide, displacement, redox, oxidation, reduction, noble gases, inert, rate of reaction, activation energy, exothermic, endothermic, catalysts, protein, active site, denature, neutralization, displacement  Safety, circuit breakers, magnet, magnetic fields, plotting compasses, electromagnet		
WC 03/01 & 10/01		WC 17/01 & 24/01		WC 31/01 & 07/02 & 14/02		WC 28/03 & 04/04
Term 2	Plant structures and their functions CB6	<ul style="list-style-type: none"> <li>Absorbing water and mineral ions</li> <li>Transpiration and translocation</li> </ul> Assessment CB6 Close the gap	Ecosystems and material cycles CB9	<ul style="list-style-type: none"> <li>Biotic factors and communities</li> <li>Parasitism and mutualism</li> <li>Biodiversity and humans</li> <li>Preserving biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>Water cycle</li> <li>Carbon cycle</li> </ul>	<ul style="list-style-type: none"> <li>Nitrogen cycle</li> </ul> Assessment CB9 Close the gap
	Energy changes in reactions	Fuels CC16 <ul style="list-style-type: none"> <li>Hydrocarbons in crude oil and natural gas</li> <li>Fractional distillation of crude oil</li> </ul> Assessment CC13, 14 & 15 Close the gap	<ul style="list-style-type: none"> <li>Alkane homologous series</li> <li>Complete and incomplete combustion</li> </ul>	<ul style="list-style-type: none"> <li>Combustible fuels and pollution</li> <li>Breaking down hydrocarbons</li> </ul>	Earth and atmospheric science CC17 <ul style="list-style-type: none"> <li>The early atmosphere</li> <li>The changing atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>Climate today</li> </ul> Assessment CC16 & 17 Close the gap
	Transformers and energy	Particle model & matter CP12 <ul style="list-style-type: none"> <li>States of matter</li> <li>Density</li> <li>Core practical – investigating densities</li> </ul> Assessment CP10&11 Close the gap	<ul style="list-style-type: none"> <li>Energy changes and changes of state</li> <li>Energy calculations</li> <li>Core practical – investigating water</li> </ul>	<ul style="list-style-type: none"> <li>Gas temperature and pressure</li> <li>Bending and stretching</li> <li>Core practical – investigating springs</li> </ul>	<ul style="list-style-type: none"> <li>Extension and energy transfers</li> <li>Assessment CP12</li> <li>Close the gap</li> </ul>	Review CP 6,7 8,9
<b>Key Vocabulary/Concepts/ideas</b>						

	<b>Half Term 3</b> photosynthesis, glucose, biomass, producer, chloroplast, endothermic, stomata, guard cell, limiting factors, inverse square law, root hair cell, diffusion, osmosis, active transport, xylem, phloem, transpiration, translocation  Crude oil, natural gas, hydrocarbons, fractional distillation, evaporate, condense, viscosity, ignite, alkanes, homologous, molecular formulae, structural formulae, combustion, complete, incomplete  Fleming's left hand rule, magnetic flux density, tesla, transformers, potential; difference, induction, alternating current					<b>Half Term 4</b> ecosystem, community, population, habitat, interdependent, abundance, quadrat, belt transect, biotic, abiotic, competition, predation, mutualism, parasitism, eutrophication, indigenous, non-indigenous, biodiversity, conservation, water cycle, desalination, potable, carbon cycle, nitrogen cycle, crop rotation  Impurities, pollutants, cracking, alkene, saturated, unsaturated, composition, atmosphere, volcanic activity, photosynthesis, infrared, emit, absorb, greenhouse effect, global warming,  Sublimation, states of matter, kinetic theory, compressed, density, thermal energy, specific heat capacity, specific latent heat, pascals, kelvin, elastic, inelastic, extension, linear relationship, directly proportional, spring constant, work done					
	WC 25/04	WC 02/05	WC 09/05	WC 16/05	WC 23/05	WC 06/06	WC 13/06	WC 20/06	WC 27/06	04/07	11/07
<b>Term 3</b>	<b>Revision GCSE Exams</b>										
	<b>Key Vocabulary/Concepts/ideas</b>										
	Half Term 5					Half Term 6					
<b>CEIAG</b>											
<ul style="list-style-type: none"> <li>• Cultural capital sheets to introduce each unit.</li> <li>• Careers displays around the whole department</li> <li>• British Science week, BioBakes, BioArtAttack</li> </ul>											
<b>Personal Development</b>											
Throughout the year the rule of law is promoted during experimental work, students are required to follow lab rules in order to keep themselves and each other safe. This also allows us to focus upon tolerance and respect whilst collaborating with others. Individual liberty and the freedom of choice is discussed during the teaching of contraception and assisted reproductive technology. Healthy diets and the impact of certain lifestyles on the NHS and society is discussed, the role of individuals within society is debated. In chemistry discussions are centered around climate change and the responsibility of individuals towards the planet. Reducing pollution and the development of renewable energy resources are debated.											