

# Beamont Collegiate Academy Curriculum Map



**Year: 11**

**Subject: Science**

Intent	Implementation	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Clarity around knowledge	Theme / topic	Genetics Rates and Equilibrium Waves	Electrochemistry Homeostasis and Response	Organic Chemistry Sustainability Electromagnetism	Momentum and Acceleration	GCSE Exam Season	GCSE Exam Season
	Key substantive knowledge	Evolution, inheritance and variation <ul style="list-style-type: none"> <li>the genome as the entire genetic material of an organism</li> <li>single gene inheritance and single gene crosses with dominant and recessive phenotypes</li> <li>sex determination in humans</li> <li>the process and evidence for evolution</li> <li>the uses of modern biotechnology and selective breeding</li> </ul> Rate and extent of chemical change: <ul style="list-style-type: none"> <li>factors that influence the rate of reaction: varying</li> </ul>	Chemical changes <ul style="list-style-type: none"> <li>electrolysis of molten ionic liquids and aqueous ionic solutions</li> <li>reduction and oxidation in terms of loss or gain of oxygen.</li> <li>balanced chemical equations, ionic equations and state symbols</li> <li>identification of common gases</li> </ul> Coordination and control <ul style="list-style-type: none"> <li>principles of hormonal coordination and control in humans</li> <li>hormones in human reproduction, hormonal and non-hormonal methods of contraception</li> </ul>	<ul style="list-style-type: none"> <li>carbon compounds, both as fuels and feedstock, and the competing demands for limited resources</li> <li>fractional distillation of crude oil and cracking to make more useful materials</li> <li>How materials cycle through abiotic and biotic components of ecosystems</li> <li>the role of microorganisms (decomposers) in the cycling of materials through an ecosystem</li> <li>organisms are interdependent</li> <li>magnetic effects of currents, how</li> </ul>	<ul style="list-style-type: none"> <li>estimating accelerations in everyday contexts</li> <li>interpreting quantitatively graphs of distance, time, and speed</li> <li>acceleration caused by forces</li> </ul>		

		<p>temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst</p> <ul style="list-style-type: none"> <li>• factors affecting reversible reactions.</li> </ul> <p>Wave motion:</p> <ul style="list-style-type: none"> <li>• amplitude, wavelength, frequency, relating velocity to frequency and wavelength</li> <li>• transverse and longitudinal waves</li> <li>• electromagnetic waves, velocity in vacuum; waves transferring energy; wavelengths and frequencies from radio to gamma-rays</li> </ul>	<ul style="list-style-type: none"> <li>• homeostasis.</li> </ul>	<p>solenoids enhance the effect</p> <ul style="list-style-type: none"> <li>• How transformers are used in the national grid and the reasons for their use.</li> </ul>			
	Disciplinary knowledge	<ul style="list-style-type: none"> <li>- The development of scientific thinking</li> <li>- Experimental skills and strategies</li> <li>- Analysis and evaluation</li> <li>- Vocabulary, units, symbols and nomenclature</li> </ul>	<ul style="list-style-type: none"> <li>- The development of scientific thinking</li> <li>- Experimental skills and strategies</li> <li>- Analysis and evaluation</li> <li>- Vocabulary, units, symbols and nomenclature</li> </ul>	<ul style="list-style-type: none"> <li>- The development of scientific thinking</li> <li>- Experimental skills and strategies</li> <li>- Analysis and evaluation</li> <li>- Vocabulary, units, symbols and nomenclature</li> </ul>	<ul style="list-style-type: none"> <li>- The development of scientific thinking</li> <li>- Experimental skills and strategies</li> <li>- Analysis and evaluation</li> <li>- Vocabulary, units, symbols and nomenclature</li> </ul>		
Clarity around sequencing	Main links across the curriculum	Y9 Inheritance and variation in.	Y11 Rates of reaction	Y10 acids and bases and Energy changes	Y10 Forces in action and Pressure in fluids and gases		

		<p>Y7 reproduction and growth.</p> <p>Y10 Acids &amp; bases, energy changes.</p> <p>Y9 Further chemical reactions.</p> <p>Y8 Physical changes &amp; chemical reactions</p> <p>Y7 Core chemistry</p> <p>Y10 Energy transfer, Radioactivity</p> <p>Y9 Waves (Light &amp; sound)</p>	<p>Y10 bonding and the structure of matter, acids and bases</p> <p>Y9 Fundamentals of chemistry</p> <p>Y10 Transport systems, The Nervous system</p> <p>Y7 Cell and organisation</p>	<p>Y9 Further chemical reactions</p> <p>Y8 Physical changes and chemical reactions</p> <p>Y7 Core chemistry</p> <p>Y10 Using resources</p> <p>Y9 Fundamentals of chemistry (chemistry of the atmosphere)</p> <p>Y8 Electricity generation and the atmosphere and the Earth's atmosphere</p>	<p>Y9 Forces &amp; motion and Fundamentals of physics (measuring motion)</p> <p>Y7 Fundamental Forces and Space Science</p>		
	Authentic cross curricular links	<p>Waves - Maths Equations:</p> <p>Calculation of wave speed (wave speed=frequency x wavelength)</p> <p>Period = 1 / frequency [T = 1/ f ]</p>	<p>Electrochemistry - Maths</p> <p>Balancing equations/half equations.</p>	Geography	<p>Maths- Quantitatively analysing graphs for speed, distance and time; Use of equations:</p> $a = \frac{v-u}{t}$ $F = ma$		
Vocabulary	Key words	<p>Selected examples:</p> <p>DNA, genotype, phenotype, haploid, diploid, inheritance, gamete, genome, variation.</p> <p>Catalyst, equilibrium, activation energy, collision theory,</p>	<p>Selected examples:</p> <p>cathode, anode, electrolysis, molten, aqueous, half equation.</p> <p>Homeostasis, automatic control, thermoregulatory centre, endocrine system, dialysis,</p>	<p>Selected examples:</p> <p>Hydrocarbon, saturated, fractional distillation, cracking; homologous series</p> <p>Biodiversity, community, photosynthesis</p>	<p>Selected examples:</p> <p>Resolving force, Newton's second law, velocity, inertial mass, conservation of momentum; acceleration</p>		

		<p>reversible reaction, rate of reaction.</p> <p>Transverse, longitudinal, frequency, time period, electromagnetic, oscillate, emission, wavelength, amplitude,</p>	<p>negative feedback, menstrual cycle, phototropism, gravitropism, auxins, synthetic hormones, horticulture</p>	<p>Electric current, electromagnet, induced magnetism, solenoid, Magnetic field</p>			
Assessment	Summative assessment	<p>Rates and Equilibrium Assessment</p> <p>BIOL1 PPE</p>	<p>CHEM1 PPE</p> <p>PHY1 PPE</p>	<p>Organic Chemistry Assessment</p> <p>CHEM2 PPE</p>	<p>BIOL2 PPE</p> <p>PHY2 PPE</p>	GCSE Exams	GCSE Exams
Links to the real world / careers / PD		<p>Genetics - geneticist, Fertility specialist/consultant, palaeontologist, biological engineer.</p> <p>Rates - Chemical industry.</p> <p>Waves - cancer treatment development, structural engineer.</p>	<p>Electrochemistry -</p> <p>Homeostasis and response: Drug developer, GP,</p>	<p>Organic chemistry- Forensic analyst, Environmental chemist, Food scientist</p> <p>Sustainability- Ecologist, meteorologist</p> <p>Electromagnetism- Robotics engineer (work for aerospace), sound engineer</p>	<p>Momentum and acceleration- automotive engineer,</p>		