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 • Electrochemistry •Electricity in the Home	•Homeostasis and Response • Rates of Reaction •Waves •Electromagnetism	•Sustainability •Acceleration	•Advanced Ecology • Organic Chemistry	GCSE Exam Season	GCSE Exam Season
predators	Key substantive knowledge	**Genetics** • The genome as the entire genetic material of an organism. • Single gene inheritance and single gene crosses with dominant and recessive phenotypes. • Sex determination in humans. • The process and evidence for evolution. • The uses of modern biotechnology and selective breeding. **Electrochemistry** • Electrolysis of molten ionic liquids	**Homeostasis and Response** •Coordination and control. • Principles of hormonal coordination and control in humans. • Hormones in human reproduction, hormonal and non-hormonal methods of contraception. • Homeostasis **Rates and Equilibrium** • Factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid	**Sustainability** •How materials are cycled. •Biodiversity. •Waste management / land use. • Global Warming. **Acceleration** • Estimating accelerations in everyday contexts. •Interpreting quantitatively graphs of distance, time, and speed. • Acceleration caused by forces.	**Advanced Ecology** •How materials cycle through abiotic and biotic components of ecosystems. •The role of microorganisms (decomposers) in the cycling of materials through an ecosystem. • Organisms are interdependent. **Organic Chemistry** • Carbon compounds, both as fuels and feedstock, and the competing demands for limited resources. •Fractional distillation of crude		

		and aqueous ionic solutions. • Reduction and oxidation in terms of loss or gain of oxygen. • Balanced chemical equations, ionic equations and state symbols. • Identification of common gases. **Electricity in the home** • Direct and alternating potential difference. •Main's electricity. •Power. •Efficiency.	reactant or by adding a catalyst. • Factors affecting reversible reactions. **Waves** • Amplitude, wavelength, frequency, relating velocity to frequency and wavelength. • Transverse and longitudinal waves. • Electromagnetic waves, velocity in vacuum; waves transferring energy; wavelengths and frequencies from radio to gamma-rays. **Electromagnetism** •Magnetic effects of currents, how solenoids enhance the effect. •How transformers are used in the national grid and the reasons for their use.		oil and cracking to make more useful materials.		
	Disciplinary knowledge	• The development of scientific thinking •Experimental skills and strategies	•The development of scientific thinking •Experimental skills and strategies	• The development of scientific thinking •Experimental skills and strategies	•The development of scientific thinking •Experimental skills and strategies		

		•Analysis and evaluation •Vocabulary, units, symbols and nomenclature	•Analysis and evaluation •Vocabulary, units, symbols and nomenclature	•Analysis and evaluation •Vocabulary, units, symbols and nomenclature	•Analysis and evaluation •Vocabulary, units, symbols and nomenclature		
Clarity around sequencing	Main links across the curriculum	**Genetics:** •Y7 Reproduction •Y8 Plant Biology •Y9 Inheritance and variation in. **Electrochemistry:** •Y8 Physical changes and chemical reactions. •Y9 Further chemical reactions •Y10 Bonding, structure and property of matter •Y11 Rates of reaction. **Electricity in the home**: •Y8 Electricity and Electromagnets. •Y10 Electrical Circuits.	**Homeostasis & Response:** •Y7 Cells and Organisation. •Y10 Transport Systems. •Y10 The Nervous System. **Rates and Equilibrium** •Y7 Core Chemistry •Y8 Physical changes & Chemical reactions. •Y9 Further chemical reactions •Y10 Acids & Bases •Y10 Energy Changes. •Y11 Electrochemistry **Waves** •Y8 Waves (light & Sound) •Y10 Energy Transfer •Radioactivity. **Electromagnetism**	**Sustainability** •Y7 Ecology •Y8 Classification and Biomechanics •Y10 Bioenergetics. **Acceleration** •Y7 Forces. •Y9 Forces and Motion •Y10 Forces in Action	**Advanced Ecology** •Y7 Ecology •Y8 classification and Biomechanics. •Y10 Bioenergetics. **Organic Chemistry** •Y7 Core Chemistry •Y8 Physical Changes and Chemical reactions. •Y9 Further Chemical Reactions •Y10 Acids and Bases.		

			•Y8 Electricity and Electromagnets. •Y10 Electrical Circuits. •Y11 Electricity in the home.				
	Authentic cross curricular links	**Electrochemistry** Maths **Electricity in the home** Maths	**Waves** Maths	**Sustainability** Geography **Acceleration** Maths	**Advanced Ecology** Geography		
Vocabulary	Key words	**Genetics:** DNA, genotype, phenotype, haploid, diploid, inheritance, gamete, genome, variation. **Electrochemistry** Cathode, anode, electrolysis, molten, aqueous, half equation. **Electricity in the home** Direct current, alternating current, transformer, power, efficiency.	**Homeostasis and Response** Homeostasis, automatic control, thermoregulatory centre, endocrine system, dialysis, negative feedback, menstrual cycle, phototropism, gravitropism, auxins, synthetic hormones, horticulture. **Rates and equilibrium** Catalyst, equilibrium, activation energy, collision theory,	**Sustainability** Biodiversity, community, photosynthesis **Acceleration** Resolving force, Newton's second law, velocity, inertial mass, conservation of momentum; acceleration	**Advanced Ecology** Ecosystem, interdependence, community, abiotic, biotic, environment, adaptations, structural, behavioural, photosynthetic organism **Organic Chemistry** Hydrocarbon, saturated, fractional distillation, cracking; homologous series		

			reversible reaction, rate of reaction. **<u>Waves</u>** Transverse, longitudinal, frequency, time period, electromagnetic, oscillate, emission, wavelength, amplitude, **<u>Electromagnetism</u>** Electric current, electromagnet, induced magnetism, solenoid, Magnetic field				
Assessment	Summative assessment	KP1 CHEM1 KP1 PHY1 **PPE – BIOL1**	**PPE – CHEM1** **PPE – PHY1**	KP2 BiOL KP2 CHEM KP2 PHY	**PPE – BIOL** **PPE- PHY2** **PPE- CHEM2**	GCSE Exams	GCSE Exams
Links to the real world / careers / PD		**<u>Genetics</u>** •Geneticist • Fertility specialist/consultant •Palaeontologist •Biological engineer **<u>Electrochemistry</u>** • Electrochemist •Battery engineer **<u>Electricity in the home</u>** •Electrician	**<u>Homeostasis and response</u>** •Drug developer • GP **<u>Rates and equilibrium</u>** •Chemical industry. **<u>Waves</u>** •Cancer treatment development •Structural engineer	**<u>Sustainability</u>** •Ecologist •Meteorologist **<u>Acceleration</u>** •Automotive engineer	**<u>Advanced Ecology</u>** •Environmental Data Manger •Conservationist. •Environmental Consultant. **<u>Organic chemistry</u>** •Forensic analyst •Environmental chemist, •Food scientist		

		•Engineer	**<u>Electromagnetism</u>** •Robotics engineer (work for aerospace) •Sound engineer				