Beamont Collegiate Academy Curriculum Map

Year: 9

Subject: Science

Intent	Implementation	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Clarity around knowledge	**Theme / topic**	Electricity Generation Advanced Diet and Digestion (Continues into HT2)	Advanced Diet and Digestion Further Chemical Reactions	Forces and Motion Inheritance and Variation (Continues into HT4)	Inheritance and Variation Magnetism	Atoms, Elements and Compounds Microscopy (Continues into HT6)	Microscopy Energy and Energy Resources
	Key substantive knowledge	**Biology:** **Nutrition and Digestion** Content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed. Calculations of energy requirements in a healthy daily diet. The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.	**Biology:** **See HT1**	**Biology:** **Genetics and evolution** Inheritance, chromosomes, DNA and genes. Heredity as the process by which genetic information is transmitted from one generation to the next. A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. Differences between species.	**Biology:** **See HT3**	**Biology:** **Structure and Function of Living Things** **Cells and Organisation** Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope. The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts.	**Biology:** **See HT5**

		The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts). The importance of bacteria in the human digestive system.		The variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation. The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. The importance of maintaining biodiversity and the use of gene banks to		The similarities and differences between plant and animal cells. The structural adaptations of some unicellular organisms. The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. Including stem cells.	

				preserve hereditary material.			
		Chemistry: **Chemical reactions** Representing chemical reactions using formulae and using equations. Combustion, thermal decomposition, oxidation and displacement reactions. **Earth and Atmosphere** The carbon cycle. The composition of the atmosphere. The production of carbon dioxide by human activity and the impact on climate.	**Chemistry:** **Atoms, elements and compounds.** Chemical symbols and formulae for elements and compounds. Conservation of mass changes of state and chemical reactions. **Chemical Reactions** Chemical reactions as the rearrangement of atoms. Representing chemical reactions using formulae and using equations. Combustion, thermal decomposition, oxidation and displacement reactions. Reactions of acids with metals to	**Chemistry:** **N/A**	**Chemistry:** **N/A**	**Chemistry:** **Atoms, elements and compounds** A simple (Dalton) atomic model. Differences between atoms, elements and compounds. Chemical symbols and formulae for elements and compounds. Conservation of mass changes of state and chemical reactions. Chemical Reactions Chemical reactions as the rearrangement of atoms. Representing chemical reactions using formulae and using equations. **The Periodic Table**	**Chemistry:** **N/A**

			produce a salt plus hydrogen. Reactions of acids with alkalis to produce a salt plus water. **Energetics** Exothermic and endothermic chemical reactions (qualitative).			The varying physical and chemical properties of different elements. The principles underpinning the Mendeleev Periodic Table. The Periodic Table: periods and groups; metals and non-metals. How patterns in reactions can be predicted with reference to the Periodic Table.	
		Physics: **Energy** Comparing power ratings of appliances in watts (W, kW). Comparing amounts of energy transferred (J, kJ, kW hour). Fuels and energy resources.	**Physics:** **See HT1**	**Physics:** **Motion and Forces** **Describing motion** Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time).	**Physics:** **Magnetism** Magnetic poles, attraction and repulsion. Magnetic fields by plotting with compass, representation by field lines.	**Physics:** **N/A**	**Physics:** **Energy and Energy Transfers** Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such

		Energy Changes and Transfers Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels.		The representation of a journey on a distance-time graph. Relative motion: trains and cars passing one another. **Forces** Moment as the turning effect of a force. Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. Forces measured in newtons, measurements of stretch or compression as force is changed. Force-extension linear relation; Hooke's Law as a special case. **Pressure in fluids**	Earth's magnetism, compass and navigation. The magnetic effect of a current, electromagnets, D.C. motors (principles only).		transfers tending to reduce the temperature difference: use of insulators. Other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels. **Changes in Systems** Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change. Comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic

				Pressure in liquids, increasing with depth. Pressure measured by ratio of force over area – acting normal to any surface. **Forces and motion** Forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only). Change depending on direction of force and its size.			distortions and in chemical compositions. **Energy** Fuels and energy resources.
	Disciplinary knowledge	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement	Scientific attitudes Experimental skills and investigations Analysis and evaluation Measurement
Clarity around sequencing	**Main links across the curriculum**	Electricity Generation builds on the Energy Stores and Transfers unit (Y8) and the Electricity Unit (Y8).	Further chemical Reactions builds on the Core Chemistry unit (Y7) and the Chemical Reactions unit (Y8).	Forces and Motion builds on the Fundamental Forces unit (Y7). Inheritance and Selection builds on the Cells and	Magnetism builds on the Fundamental Forces unit (Y7) the Electricity unit (Y8).	Atoms, Elements and Compounds builds on the Core Chemistry unit (Y7), the Chemical Reactions unit (Y8) and Further	Energy Stores and Transfers builds on The Particle Model (Y7) Energy Stores and Transfers (Y8) and Forces in Motion (Y9).

		Advanced Diet and Digestion builds on the Diet and Digestion unit (Y8).		Organisation unit (Y7) and the Reproduction unit (Y7).		Chemical Reactions (Y9). It underpins the GCSE course that will begin at the start of Year 10. Microscopy builds on Cells and Organisation (Y7) and The Particle Model (Y7). It underpins the GCSE course that will begin at the start of Year 10.	It underpins the GCSE course that will begin at the start of Year 10.
	Authentic cross curricular links	Design Technology: Nutrition and healthy eating PSHE: Healthy Lifestyles	N/A	Maths: Speed calculations, graphs	Maths: graphs and charts Geography: the Earth and its atmosphere	Maths: graphs and charts Geography: the Earth and its atmosphere	Maths: data, graph analysis, calculations
Vocabulary	**Key words**	Transverse, longitudinal, amplitude, frequency, Carbohydrate, Protein, lipid, reagent	Carbohydrate, Protein, lipid, reagent, Concentration, precipitate, carbonate, Decomposition	Displacement, momentum, velocity, extension, pressure, speed	Gene, chromosome, DNA, inheritance, organism, reproduction	Prokaryotic, eukaryotic, mitochondria, cytoplasm, proton neutron, electron, configuration	Proton neutron, electron, configuration, Gravitational, kinetic, evaporation, condensation
Assessment	**Summative assessment**	End of Unit Summative Test Formative Assessment Throughout	End of Unit Summative Test Formative Assessment Throughout	End of Unit Summative Test Formative Assessment Throughout	End of Unit Summative Test Formative Assessment Throughout	End of Unit Summative Test Formative Assessment Throughout	End of Unit Summative Test Formative Assessment Throughout
Links to the real world / careers / PD		NHS Careers Nutritionist (Link in SOW)	NHS Careers Nutritionist (Link in SOW)	Land speed record (Bloodhound and Thrust SSC) Mars rover landing	NHS Careers IVF Industrial chemist Chemical engineer Meteorologist	NHS Careers Cell Biologist, Zoologist, Vet Lab technician	BNFL Wind Farm Design Green Energy Environment Agency Lab technician

				Royal Navy submarines	Atmospheric Scientist		