Science Curriculum Map

THE BRUNTS ACADEMY

Key = matching colours denote links between topics either in content or skills across year groups and key stages.

BIOLOGY	CHEMISTRY	PHYSICS
ECOSYSTEMS	THE EARTH	FORCES
ORGANISMS	REACTIONS	ENERGY
GENES	MATTER	ELECTRICITY
		WAVES
SCIENTIFIC SKILLS	REVISION & EXAMS	

KEY STAGE 3	7	Investigation skills	Particle model	Movement	Specialised cells	Reproduction	Variation
		Cells	Speed and Gravity	Acids and Alkalis	Sound	Separating mixture	Cost & transfer
	8	Interdependence	Heathy diet	Respiration	Digestion	The rock cycle	Metals & non-metals
		Elements	Electricity	The periodic table	The universe	Forces, contact, and pressure	Photosynthesis
	9	Breathing	Evolution	Inheritance	Cells and specialised cells	Cell transport	Cell division and reproduction
		Chemical reactions and energy	Climate	The rock cycle	Atomic structure and states of matter	The periodic table	Chemical bonding
		Electromagnetism	Properties and effects of waves	Light	Energy	Electricity	Particle model

By the end of key stage 3, students will develop a deeper understanding of a range of scientific ideas in the biology, chemistry, and physics topics. Students will begin to see the connections between these areas and become aware of the big ideas underpinning scientific knowledge, such as the links between structure and function in living organisms, the particulate model, interactions of matter in all its forms, and the resources and means of transfer of energy. Students are encouraged to relate scientific explanations to phenomena in the world around them and start to use modelling and abstract ideas to develop and evaluate explanations. Students will understand that science is about working objectively and scientifically, using the correct vocabulary, mathematical units, and representations. Students will be taught investigation skills explicitly at the beginning of year 7 and then develop this through each topic at KS3, deciding on the appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be considered when collecting, recording, and processing data. They should evaluate their results and identify further questions.

KEY STAGE 4	10	Specialised cells and transport	Cell division	Organisation, plants, and animals	Infection and response	Infection and response	Bioenergetics (photosynthesis)
			Organisation and digestion				Chemical changes (reactions)
		Atomic structure and periodic table	Bonding, Structure, and properties of matter	Quantitative chemistry	Chemical changes	Chemical changes (electrolysis)	Energy changes
		Energy	Electricity	Electricity	Atomic structure	Revision and mock exams	Forces
		Particle model					
	11	Homeostasis and response	Homeostasis and response	Inheritance, variation, and evolution	Ecology	GCSE REVISION AND EXAMS	
		Rates of reactions	Organic chemistry	Chemical analysis	Chemistry of the atmosphere		
		Forces	Waves	Electromagnetism	Space Physics		

By the end of key stage 4, students will have developed scientific knowledge and understanding through the disciplines of biology, chemistry, and physics. Students will have obtained an understanding of the nature, process, and methods of science, through different scientific enquiries, that will help them to answer questions about the world around them. Moreover, students will have developed and learnt how to apply observation, practical, modelling, enquiry, and problem-solving skills, in the laboratory, the field, and in other learning environments. Students will also have furthered their ability to evaluate claims based on science through critical analysis of methodology, evidence, and conclusions, both quantitatively and qualitatively. Above all, students will have developed curiosity, insight, and appreciation of science and its relevance in their everyday life.

KEY STAGE 5								
	12	BIO	Biological molecules	Cells, structure, the cell cycle, and transport	Substance exchange, gas exchange, and digestion	Genetic information (including variation and biodiversity)		
		CHEM	Atomic structure and chemical bonding	Organic chemistry and amount of substances	Organic chemistry, kinetics, and energetics	Inorganic chemistry, chemical equilibria, and REDOX	Born-Haber cycles and optical isomers	
		PHYS	Motion, momentum, and energy	Fluids and solid material properties	Electrical quantities and circuits	Waves and the particle nature of light		
	13	BIO	Energy transfers	Organisms and the environment	Genetics and ecosystems	The control of gene expression	A LEVEL REVISION AND EXAMS	
		CHEM	Carbonyl chemistry and thermodynamics	Rate equations and benzene chemistry	Equilibrium constants and amine, amino acids, proteins, polymers, and DNA	Electrode potential, EC cells, and organic analysis	Inorganic chemistry, acids, and bases	
		PHYS	Momentum and circular motion	Nuclear and particle physics	Electric and magnetic fields	Space and gravitational fields	Thermodynamics heat and temperature	Oscillations (simple harmonic motion)	Nuclear radiation (radioactivity)

By the end of KS5, students will be able to expand on key theories to build an in-depth knowledge and comprehensive understanding of the key concepts that underpin each discipline. Students will be able to solve problems and apply scientific knowledge to practical contexts, applying scientific methods and practices, such as being able to comment on experimental design, and evaluate scientific methods. In physics, they will be able to apply key theories to real world applications, with links to degree level physics and engineering. In chemistry, they will apply key theories learnt to determine the mechanics and complexities of chemical reactions, to build a foundation for transfer to higher education chemistry and engineering. In biology, they will use their knowledge to understand real world applications of technology and genetics, to explain inheritance and the development of genetic engineering and modern medicine.