The Programme of Study for Science is derived from the National Curriculum for Science in England, which provides a coherent and structured framework for the progression of scientific knowledge and skills from the Early Years Foundation Stage (EYFS) through to Key Stage 4 (KS4). It outlines a carefully sequenced body of knowledge and key concepts, ensuring continuity and progression across all key stages. Many of these concepts are revisited and developed in greater depth throughout the primary and secondary phases, supporting cumulative learning and mastery over time.

	SCIENCE – PROGRAMME OF STUDY – KS4		
Prior learning:	**Biology**	**Chemistry**	**Physics**
	At KS3, pupils should be taught about: **Structure & function of living organisms** • Cells & organisation • The skeletal & muscular systems • Nutrition & digestion • Gas exchange systems • Reproduction • Health - The effects of recreational drugs **Material cycles & energy** • Photosynthesis • Cellular respiration **Interactions & interdependencies** • Relationships in an ecosystem **Genetics & Evolution** • Inheritance, chromosomes, DNA & genes	At KS3, pupils should be taught about: • **The particulate state of matter** • **Atoms, elements & compounds** • **Pure & impure substances** • **Chemical reactions** • **Energetics** • **The Periodic Table** • **Materials** • **Earth & atmosphere**	At KS3, pupils should be taught about: **Energy** • Calculation of fuel uses & costs in the domestic context • Energy changes & transfers • Changes in systems **Motion & forces** • Describing motion • Forces • Pressure in fluids • Balanced forces • Forces & motion **Waves** • Observed waves • Sound waves • Energy & waves • Light waves **Electricity & electromagnetism** • Current electricity • Static electricity • Magnetism **Matter** • Physical changes • Particle model • Energy in matter **Space physics**

Taught content: Knowledge/Skills	Teaching Science in key stage 4 continues with the process of building upon and deepening scientific knowledge and the understanding of ideas developed in earlier key stages in the subject disciplines of biology, chemistry and physics.		
	Biology	**Chemistry**	**Physics**
	Cells • Typical cells • Organelles • Specialised cells • Microscopes and microscopy **Respiration** • Aerobic respiration • Anaerobic respiration • Comparing respirations • Fermentation • Photosynthesis • Diffusion • Osmosis • Active transport • Revision Techniques • Interpreting data and graphs **Human Biology** • Digestive Organs • Enzymes • Lungs and breathing • Exchange Surfaces • The Heart • Blood and Blood Vessels • The Nervous System • Reactions and reflexes • Endocrine Organs • Blood Glucose • The Menstrual Cycle **Health** • Non communicable disease	**States of matter** • Changing states • Mixtures and separating mixtures • Density • Gas pressure **Atoms and molecules** • Atoms, molecules and compounds • Structure of atoms • Electronic structure • Calculating RAM • RAM and RFM **Periodic Table** • Structure of the periodic table • Alkali metals • Halogens • Atoms and Ions **Structure and Bonding** • Ionic bonding • Giant ionic structures • Covalent bonding • Simple covalent bonding **Acids and alkalis** • pH and neutralisation • Exothermic and endothermic reactions **Rates of reaction**	**Forces and energy** • Identifying forces • Balanced forces • Force diagrams • Energy stores and transfers • Conservation and dissipation • EPE • GPE • KE and GPE • Stopping distances **Waves** • Types of wave • Measuring and calculating waves **The Electromagnetic spectrum** • The Electromagnetic spectrum (EMS) • Uses of low frequency EMS waves • Use and risks of high frequency EMS waves • Magnetic fields • Fields and current • The motor effect **Energy resources** • Energy resources • Evaluating energy resources **Circuits electricity** • Static electrical fields

	• Smoking and alcohol **Communicable disease** • Pathogen Cells • Bacterial and Protist diseases • Viral and Fungal diseases • The immune system • Vaccination **Genetics** • Mitosis • Meiosis • Types of reproduction • DNA and Genes • Genetic diagrams • Inherited disorders • Variation **Variation and Evolution** • Natural selection • Antibiotic resistance • Fossils and extinction • Selective breeding • Genetic engineering	• Measuring rates of reaction • Surface area • Temperature, concentration and pressure • Catalysts • Carbon emissions **Atmospheric science** • Global warming and climate change • Burning fossil fuels	• Current and charge • P.D. and resistance • Resistance and wire length • Component characteristics • Series circuits • Parallel circuits
	Working Scientifically Through the content outlined above, students should be taught so that they develop understanding and first-hand experience of: • **The development of scientific thinking** • **Experimental skills & strategies** • **Analysis & evaluation** • **Vocabulary, units, symbols & nomenclature**		
Subsequent learning:	Studying Science at Key Stage 4 provides the platform for more advanced studies at Post-16, establishing the basis for a wide range of careers. As a subject, it provides the foundations for understanding the natural world and will support students into adulthood as they live in an increasingly technological society.		