

Intent:

The purpose of our Key Stage 3 scheme is to provide robust foundations to allow students to develop into analytical, methodical, and innately inquisitive scientists, students should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. The three disciplines are split into topics which are introduced in Year 7 and built upon in Year 8, covering the Big Ideas of Science (as outlined by ASE). Students are encouraged to examine the consequences of scientific discoveries, and develop opinions based upon fact, with the intent of developing self-confident, resilient and scientifically literate citizens of the world.

Teaching is focused on the scientific method and students are given opportunities within lessons to build the necessary skills to suggest a hypothesis, collate valid data and make logical conclusions, using knowledge shared with them. Students are assessed on their mastery of knowledge and the application of this knowledge in both 'real world' and investigative science.

The aim of Year 9 is to bridge the gap between Key Stage 3 and GCSE, further developing students' knowledge and investigative abilities. The chosen topics allow students to dive deeper into the 10 Big Ideas, first introduced in Key Stage 3. The sequence of topics allows students to connect knowledge from all three disciplines of science, whilst the time dedicated to independently led investigative approaches promotes curiosity and resilience when discovering answers to posed questions. Some content from year 7 and 8 has been reintroduced to cover concepts covered during the national lockdowns.

Good habits are reinforced at every possible opportunity: scientific language is used, maths skills are modelled, recall of key knowledge is reinforced and students are given opportunities to both ask and answer questions using experimental approaches.

Our Key Stage 4 students follow the AQA GCSE specification. Throughout Year 10, knowledge from previous years is built upon as new content is introduced in line with the Trilogy science specification.

Students undertaking the combined trilogy pathway spend Year 11 consolidating knowledge gained in earlier years, focusing on application of recall to different situations, and the development of analytical, mathematical and evaluative skills, allowing a deeper understanding of topics identified using data from mock assessments. Students also undertake 'Flashback' lessons with a focus on recall of information and development of different skills, thus allowing them to access the exam papers.

Science – Key Stage 3

Implementation:

Term	Year 7			Year 8			Year 9		
	Topic	Knowledge	Skills	Topic	Knowledge	Skills	Topic	Knowledge	Skills
Term 1	Introduction to science unit B1 – Cells and organ systems	Structure and function of cells, specialised cells, circulatory, digestive, skeletal and muscular organ systems	Estimating risks, drawing tables, calculating averages and planning variables	B4 – Organ systems	Detailed descriptions of organ systems (big focus on respiratory and digestive systems)	Identifying hypotheses, drawing graphs, evaluating data, construct explanations	B1 – Transport in cells	Cell structure, diffusion, osmosis and active transport	Use scientific theories and explanations to develop hypotheses, recall facts, identify variables, draw graphs, carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations
	P1 – Introduction to forces	Drawing and labelling forces, speed, acceleration, pressure, weight		C4 - The Periodic table	The periodic table - Group 1, 7 & 0 elements, Elements, mixtures & compounds		C1 –Rates of reaction	Measuring rate of reaction, how the rate of reaction is affected by factors like temperature, concentration, surface area and using a catalyst	
	C1 – Particle model	Particle model of matter and techniques for separating mixtures		P4 – Electricity and magnetism	Building simple circuits, resistance and magnetic fields		P1 – Energy Transfers	Heating, Conduction, convection, radiation and insulators	
Term 2	B2 – Interdependence	Food webs and chains, animal and plant adaptations	Writing scientifically, describing patterns in graphs, drawing graphs, identifying hypotheses	B5 – Photosynthesis and respiration	Photosynthesis, aerobic respiration, anaerobic respiration	Planning variables, discussing limitations of methods, examining consequences, analysing hypotheses	B2 – Digestion and enzymes	Roles of the organs of the digestive system, enzymes in digestion	Discuss limitations, make conclusions, recall facts, use scientific vocabulary, terminology and definitions, use a variety of models, plan experiments or devise procedures to make observations
	C2 - Simple chemical reactions	Simple chemical reactions including reactivity series, metal salts, acids and alkalis, pH scale, neutralisation		C5 – Complex chemical reactions	Combustion, corrosion, endothermic & exothermic reactions		C2 – The Periodic Table	The history of the periodic table Reactions of elements in groups found on the periodic table	
	P2 - Waves	Types of waves, introduction to sound and light		P5 – Waves 2	Electromagnetic spectrum, using sound, types of radiation, reflection, refraction & diffraction		P2 - Electricity	Current and potential difference in series and parallel, V-I characteristics, resistance in a wire	

Term	Year 7			Year 8			Year 9		
	Topic	Knowledge	Skills	Topic	Knowledge	Skills	Topic	Knowledge	Skills
Term 3	B3 – Variation and reproduction	Continuous & discontinuous variation, male & female reproductive systems, puberty	Justifying opinions, making conclusions, reviewing theories, analysing hypotheses	B6 – Variation and evolution	Variation, evolution, inheritance, cell division	Making conclusions, justifying opinions, recalling facts, interrogating sources	B3 – Healthy living	The heart and cardiovascular disease, respiration and exercise, effects of drugs on the body	Examine consequences, make conclusions, use scientific vocabulary, terminology and definitions, use a variety of models, plan experiments or devise procedures to make observations, use scientific vocabulary, terminology and definitions
	C3 – Chemistry of the Earth	Earth's atmosphere, global warming, structure of the Earth, types of rocks		C6 – Earth's resources and beyond	Earth's resources, the solar system, day/ night & Seasons, Stars		C3 – Quantitative Chemistry	Recognising mass is conserved in equations, using relative atomic and relative formula mass in calculations, balancing chemical equations	
	P3 – Energy	How we generate electricity, stores of energy, energy in food, energy efficiency		P6 - Forces and energy	Forces, pulleys/ levers, conduction, convection, radiation and insulation		P3 - Waves	How we see colour, ray diagrams, how the eye works, electromagnetic spectrum	

Science – Key Stage 4

Term	Year 10			Year 11		
	Topic	Knowledge	Skills	Topic	Knowledge	Skills
Term 1	Paper 2 – Biology	Homeostasis and response Inheritance, variation and evolution Ecology	Use a variety of models, make predictions, appreciate the power and limitations of science, consider ethical issues, describe and evaluate, with the help of data, use scientific theories and explanations to develop hypotheses, plan experiments	Paper 2 - Chemistry	Rates and equilibria, organic chemistry, chemical analysis, chemistry of the atmosphere and using resources	Use a variety of models, make predictions, appreciate the power and limitations of science, consider ethical issues, describe and evaluate, with the help of data, use scientific theories and explanations to develop hypotheses, plan experiments
	Paper 1 – Chemistry	Atomic structure, bonding and structure of properties and quantitative chemistry				
Term 2	Paper 1 – Chemistry (continued)	Chemical changes and energy changes	Use a variety of models, make predictions, appreciate the power and limitations of science, consider ethical issues, describe and evaluate, with the help of data, use scientific theories and explanations to develop hypotheses, plan experiments	Paper 2 - Physics	Forces, waves, magnetism and electromagnetism (spaces – separate sciences only)	Use a variety of models, make predictions, appreciate the power and limitations of science, consider ethical issues, describe and evaluate, with the help of data, use scientific theories and explanations to develop hypotheses, plan experiments
	Paper 1 – Physics	Energy, electricity and particle model of matter				
Term 3	Paper 1 – Physics (continued)	Atomic structure and radiation	Use a variety of models, make predictions, appreciate the power and limitations of science, consider ethical issues, describe and evaluate, with the help of data, use scientific theories and explanations to develop hypotheses, plan experiments	All units	General revision of key concepts for preparation for exams	Exam skills and preparation. Heavy focus on the command words
	Paper 1 – Biology	Cells, organisation, infection and response and bioenergetics				