

Statement of Intent

Science is the study of how the world works - it covers the biological world of plants and animals, the particulate level of how chemical reactions take place and the “unseen” physics that underpins every process occurring. Students will study all aspects of science and develop the practical skills and critical thinking that will allow them to solve problems and evaluate unknown scenarios. Our curriculum is designed to engage students in the cutting edge of science and develop vital life skills and understanding.

Key Stage 3 Curriculum

At KS3 students have four lessons of science a week. The year is split into topics that cover all three sciences, Biology, Chemistry and Physics. Each topic will cover the fundamental theory and key language as well as practical investigations that are an essential element to all science. Homework is set once a week and the expected completion time is 30 minutes.

Key Stage 4 Curriculum

AQA Trilogy Combined Science

At KS4, the majority of students study the AQA Trilogy Combined Science course. Students have four lessons of science a week. The year is split into topics that cover all three sciences, Biology, Chemistry and Physics. Each topic will cover the fundamental theory and key language as well as practical investigations that are an essential element of the GCSE. Homework is set twice a week and the expected completion time is 60 minutes. The AQA Trilogy Combined Science course is assessed at the end of year 11 in 6 x 1 hour 15 minute exams that cover all content and practical work studied. These exams are evenly weighted in generating the two GCSE grades students are awarded.

AQA Biology, Chemistry and Physics

At KS4, the top scientists can opt to complete the AQA Biology, Chemistry and Physics courses. Students have seven lessons of science a week which are split into individual sciences. Each science will cover the fundamental theory and key language as well as practical investigations that are an essential element of the GCSE. Homework is set three times a week and the expected completion time is 90 minutes. The AQA Biology, Chemistry and Physics courses are assessed at the end of year 11 in 6 x 1 hour 45 minute exams that cover all content and practical work studied. These exams are evenly weighted in generating the three GCSE grades students are awarded.

Key Stage 5 Curriculum

AQA Biology

Students will complete the AQA Biology A Level which covers human, animal and plant biology in depth. During the course students have five lessons a week that will allow the teaching of the fundamental theory and key language as well as practical investigations that are an essential element of the A Level. Homework, with an expected completion time of five hours, is set throughout the week. Students are assessed at the end of year 13 in 3 x 2 hour exams. Topics are assessed through a mixture of short and long answer questions as well as both a comprehension task and an assessed essay.

AQA Chemistry

Students will complete the AQA Chemistry A Level which covers physical, inorganic and organic chemistry in depth. During the course students have five lessons a week that will allow the teaching of the fundamental theory and key language as well as practical investigations that are an essential element of the A Level. Homework, with an expected completion time of five hours, is set throughout the week. Students are assessed at the end of year 13 in 3 x 2 hour exams. Topics are assessed through a mixture of short and long answer questions as well as a multiple choice section in paper 3.

AQA Physics

Students will complete the AQA Physics A Level which covers the fundamentals of physics and astrophysics in depth. During the course students have five lessons a week that will allow the teaching of theory and key language as well as practical investigations that are an essential element of the A Level. Homework, with an expected completion time of five hours, is set throughout the week. Students are assessed at the end of year 13 in 3 x 2 hour exams. Topics are assessed through a mixture of short and long answer questions as well as multiple choice sections in both paper 1 and 2.

AQA Psychology

Students will complete the AQA Psychology A Level which covers psychological concepts, research and ethical issues. During the course students have five lessons a week that will allow the teaching of the fundamental theory and key language. Homework, with an expected completion time of five hours, is set throughout the week. Students are assessed at the end of year 13 in 3 x 2 hour exams. These papers are evenly weighted and include both multiple choice questions and essay extended writing work.

Edexcel Applied Science BTEC

Students will complete the Edexcel Applied Science BTEC which covers fundamental theory across all three sciences and practical investigation work. During the course students have five lessons a week that will allow the teaching of the exam theory and the practical work required for assignments. Homework, with an expected completion time of five hours, is set throughout the week. Students are assessed throughout year 12 and 13 with two exams and two coursework assignments.

Extended Learning

What we offer to extend the learning of our students

We have a range of exciting extra-curricular options for students. Currently we offer a Science club that works with KS3 students completing practical work that does not normally fit into the classroom. STEM projects throughout the year have involved construction of aircraft (in partnership with BECSLink and the Smallpeice Trust) and project work in STEM week on the sustainable planet.

What parents can do to support extended learning in this subject

To support extended learning, parents could encourage their children to ask questions about how and why everyday processes happen. Additionally, they could visit science exhibitions and encourage students to watch scientific discovery programmes.

KS3 Curriculum Map

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 7	Transition Content Introduction to Science skills <ul style="list-style-type: none"> • Planning • Analysing • Identifying variables • Graph work 	Matter <ul style="list-style-type: none"> • Physical and chemical properties • Chemical changes Organisms <ul style="list-style-type: none"> • Structures of the human body Reactions <ul style="list-style-type: none"> • Reactions between metal, acid, oxygen and water. 	Forces <ul style="list-style-type: none"> • Balanced and unbalanced forces • Speed Genes <ul style="list-style-type: none"> • Inherited and environmental variation Electromagnets <ul style="list-style-type: none"> • Electricity 	Energy <ul style="list-style-type: none"> • Energy changes between various stores • Renewable and non-renewable energy resources Earth <ul style="list-style-type: none"> • Structure of the earth • The rock cycle • The solar system 	Waves <ul style="list-style-type: none"> • Properties of waves • Reflection and refraction Ecosystems <ul style="list-style-type: none"> • Food chains • Competition for survival. 	Revision for end of year exams and Practical Skills
Year 8	Science Skills Review <ul style="list-style-type: none"> • Provide evidence • Carrying scientific investigations Matter <ul style="list-style-type: none"> • Atomic structure • The periodic table 	Organisms <ul style="list-style-type: none"> • Respiratory and digestive systems Electromagnets <ul style="list-style-type: none"> • Magnetism Reactions <ul style="list-style-type: none"> • Conservation of mass • Energy changes 	Forces <ul style="list-style-type: none"> • Friction and drag • Pressure in gases and liquids Genes <ul style="list-style-type: none"> • Charles Darwin and natural selection • Biodiversity 	Energy <ul style="list-style-type: none"> • Transfer of energy as work • Conduction, convection and radiation Earth <ul style="list-style-type: none"> • Earth's atmosphere • Climate change. 	Waves <ul style="list-style-type: none"> • Radiation • Electromagnetic spectrum Ecosystems <ul style="list-style-type: none"> • Aerobic and anaerobic respiration • Photosynthesis 	Revision for end of year exams and Practical Skills
Year 9	Cell structure <ul style="list-style-type: none"> • Structure and function of cells Atomic structure <ul style="list-style-type: none"> • Particle model Conservation of energy <ul style="list-style-type: none"> • Stores of energy 	Transport between cells <ul style="list-style-type: none"> • Transport methods The periodic table <ul style="list-style-type: none"> • Groups 1, 7 and 0 Dissipation of energy <ul style="list-style-type: none"> • Energy in devices 	Cell division <ul style="list-style-type: none"> • Mitosis and meiosis • Stem cell technology Structure and bonding <ul style="list-style-type: none"> • Ionic, covalent and metallic substances Energy transfer by heating <ul style="list-style-type: none"> • Insulating materials 	Organisation and the digestive system <ul style="list-style-type: none"> • Factors affecting enzyme rates of reactions Chemical calculations <ul style="list-style-type: none"> • Relative masses and molar calculations Energy resources <ul style="list-style-type: none"> • Generating electricity 	Organising animals and plants <ul style="list-style-type: none"> • Structure and function of the heart and lungs The Earth's resources <ul style="list-style-type: none"> • Finite and renewable resources Molecules and Matter <ul style="list-style-type: none"> • States of matter and changes of state 	Revision for end of year exams and Practical Skills

KS4 Curriculum Map

AQA GCSE Science Trilogy and Triple Science

		Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 10	Biology	Communicable diseases and non-communicable diseases <ul style="list-style-type: none"> Specific diseases and symptoms 	Preventing and treating disease <ul style="list-style-type: none"> Development of drugs and vaccines 	Photosynthesis and respiration <ul style="list-style-type: none"> Factors that photosynthesis and respiration. 	Adaptations, interdependence and competition <ul style="list-style-type: none"> Interaction of species and communities 	Organising an ecosystem and biodiversity <ul style="list-style-type: none"> Food chains and webs Carbon and water cycles 	Revision for end of year exams and Practical Skills
	Chemistry	Chemical changes 1 <ul style="list-style-type: none"> The reactivity series Displacement reactions 	Chemical changes 2 <ul style="list-style-type: none"> Neutralisation reactions 	Electrolysis <ul style="list-style-type: none"> Electrolysis and its applications 	Energy changes <ul style="list-style-type: none"> Exothermic and endothermic reactions 	Rates and equilibrium <ul style="list-style-type: none"> Collision theory Dynamic equilibrium 	
	Physics	Forces in balance <ul style="list-style-type: none"> Equilibrium and non-equilibrium of forces 	Motion <ul style="list-style-type: none"> Distance Speed Acceleration 	Forces and motion <ul style="list-style-type: none"> Force Momentum 	Electric circuits <ul style="list-style-type: none"> Electric charge, current, potential difference and resistance 	Electricity in the home <ul style="list-style-type: none"> Using and measuring electricity in appliances 	
Year 11	Biology	The human nervous system and hormonal control <ul style="list-style-type: none"> Response to different stimuli 	Reproduction <ul style="list-style-type: none"> Reproduction Genetic screening 	Variation, genetics and evolution <ul style="list-style-type: none"> Natural selection and evolution 	Revision	GCSE Exams	
	Chemistry	Crude oil and fuels <ul style="list-style-type: none"> Hydrocarbons 	Chemical analysis <ul style="list-style-type: none"> Chromatography 	The Earth's atmosphere <ul style="list-style-type: none"> Evolution of the atmosphere Pollution 			
	Physics	Wave properties <ul style="list-style-type: none"> Wave behaviour 	Electromagnetic waves and electromagnetism <ul style="list-style-type: none"> Electromagnetic spectrum Magnetic fields 	Radioactivity <ul style="list-style-type: none"> Nuclear radiation 			

KS5 Curriculum Map

AQA A Level Biology

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12	<p>Biological molecules</p> <ul style="list-style-type: none"> Structure and function of biological molecules <p>Cell structure</p> <ul style="list-style-type: none"> Study of cells to understand their structure and function 	<p>Transport across cell membranes</p> <ul style="list-style-type: none"> Diffusion, osmosis, co-transport and active transport <p>Cell recognition</p> <ul style="list-style-type: none"> The body's response to pathogens 	<p>Exchange</p> <ul style="list-style-type: none"> The exchange of substances in fish, insects, mammals and unicellular organisms <p>DNA</p> <ul style="list-style-type: none"> Structure, function and replication of DNA/RNA 	<p>Mass transport</p> <ul style="list-style-type: none"> The transport of oxygen around the cardiovascular system <p>Genetic diversity</p> <ul style="list-style-type: none"> The role of mutations and meiosis in generating variation 	<p>Biodiversity</p> <ul style="list-style-type: none"> Species, taxonomy and investigations into factors affecting diversity 	<p>Revision for end of year exams</p>
Year 13	<p>Photosynthesis</p> <ul style="list-style-type: none"> The light dependent and independent stages of photosynthesis <p>Response to stimuli</p> <ul style="list-style-type: none"> Role of receptors and subsequent responses to changes in stimuli 	<p>Respiration</p> <ul style="list-style-type: none"> Glycolysis, the krebs cycle and oxidative phosphorylation <p>Energy and Ecosystems</p> <ul style="list-style-type: none"> Food chains and the environmental impacts of farming <p>Nervous co-ordination</p> <ul style="list-style-type: none"> The response of the nervous system 	<p>Homeostasis</p> <ul style="list-style-type: none"> The principles of homeostasis to control internal conditions <p>Inherited change</p> <ul style="list-style-type: none"> Studying inheritance and genetic crosses. <p>Populations</p> <ul style="list-style-type: none"> Changes in variation from natural selection, speciation and the impacts of competition 	<p>Gene Expression</p> <ul style="list-style-type: none"> The control of gene expressions and cancer through the regulation of transcription and translation <p>Recombinant DNA</p> <ul style="list-style-type: none"> The use of DNA technology for cloning, genetic finger printing and genetic counselling 	<p>Revision</p>	

KS5 Curriculum Map

AQA A Level Chemistry

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12	Atomic Structure <ul style="list-style-type: none"> Subatomic particles Mass spectrometry Bonding <ul style="list-style-type: none"> Types of bonding Intermolecular forces 	Amount of Substance <ul style="list-style-type: none"> Molar calculations Kinetics 1 <ul style="list-style-type: none"> Rates of reaction Energetics <ul style="list-style-type: none"> Energy changes 	Organic Chemistry 1 <ul style="list-style-type: none"> Alkanes Chemical Equilibria <ul style="list-style-type: none"> Application of Le Chatlier's principle Organic Analysis 1 <ul style="list-style-type: none"> IR spectroscopy 	Organic Chemistry 1 <ul style="list-style-type: none"> Alkenes Alcohols Redox Chemistry <ul style="list-style-type: none"> Reduction and oxidation 	Organic Chemistry 1 <ul style="list-style-type: none"> Haloalkanes Group 2 and 7 <ul style="list-style-type: none"> Trends in properties Periodicity <ul style="list-style-type: none"> Trends in period 3 	Revision for end of year exams
Year 13	Organic Chemistry 2 <ul style="list-style-type: none"> Carboxylic acid derivatives Thermodynamics <ul style="list-style-type: none"> Enthalpy changes Born-Haber cycles Kinetics 2 <ul style="list-style-type: none"> Initial rates theory Arrhenius equation 	Organic Chemistry 2 <ul style="list-style-type: none"> Aromatic chemistry Electrode Potentials <ul style="list-style-type: none"> Functionality of electrochemical cells 	Organic Chemistry 2 <ul style="list-style-type: none"> Amine chemistry Acids and Bases <ul style="list-style-type: none"> Calculations relating to acid strength Organic Analysis 2 <ul style="list-style-type: none"> NMR Chromatography 	Organic Chemistry 2 <ul style="list-style-type: none"> Organic synthesis Transition Metals <ul style="list-style-type: none"> Reactions of transition metals Oxidation states 	Revision and A level exams	

KS5 Curriculum Map

AQA A Level Physics

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12	<ul style="list-style-type: none"> Experimental Skills Matter and Radiation Quarks and Leptons Quantum phenomena 	<ul style="list-style-type: none"> Waves – core practical work and theory Optics – core practical work and theory 	<ul style="list-style-type: none"> Forces in Equilibrium Dynamics – core practical work and theory Newton’s Laws of Motion 	<ul style="list-style-type: none"> Force and Momentum Work, energy and Power Materials – core practical work and theory 	<ul style="list-style-type: none"> Electric Current – core practical work and theory DC Circuits – core practical work and theory 	<ul style="list-style-type: none"> Exams Motion in a Circle
Year 13	<ul style="list-style-type: none"> Simple Harmonic Motion – core practical work and theory Thermal Physics Gases – core practical work and theory 	<ul style="list-style-type: none"> Gravitational Fields Electric Fields Capacitors – core practical work and theory Magnetic Fields 	<ul style="list-style-type: none"> Electromagnetic Induction – core practical work and theory Radioactivity – core practical work and theory 	<ul style="list-style-type: none"> Nuclear Energy Astrophysics 	Revision and A level exams	

KS5 Curriculum Map

AQA A Level Psychology

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12	<p>Topic 1 Social Influence</p> <ul style="list-style-type: none"> Types of conformity Explanations for obedience Minority influence Social change <p>Topic 6 Biopsychology</p> <ul style="list-style-type: none"> The divisions of the nervous system 	<p>Topic 6 Biopsychology</p> <ul style="list-style-type: none"> The structure and function of sensory, relay and motor neurons The function of the endocrine system <p>Topic 7 Research Methods</p> <ul style="list-style-type: none"> Self-report techniques Correlations Content analysis Case studies 	<p>Topic 4 Psychopathology</p> <ul style="list-style-type: none"> Definitions of abnormality The behavioural approach The cognitive approach The biological approach 	<p>Topic 5 Approaches</p> <ul style="list-style-type: none"> Origins of Psychology The cognitive approach The biological approach <p>Topic 2 Memory</p> <ul style="list-style-type: none"> Types of memory Working memory model Explanations for forgetting 	<p>Topic 3 Attachment</p> <ul style="list-style-type: none"> Animal studies Explanations of attachment Ainsworth's 'Strange Situation' Bowlby's theory of maternal deprivation The influence of early attachment on childhood 	<p>Topic 8 Issues and debates</p> <ul style="list-style-type: none"> Gender and culture Free will and determinism <p>Topic 7 Research Methods</p> <ul style="list-style-type: none"> Scientific processes Descriptive statistics
Year 13	<p>Topic 8 Issues and debates</p> <ul style="list-style-type: none"> Ethical implications of research studies <p>Option 2 Schizophrenia</p> <ul style="list-style-type: none"> Classification of schizophrenia Reliability and validity in diagnosis and classification of schizophrenia 	<p>Option 2 Schizophrenia</p> <ul style="list-style-type: none"> Biological explanations Psychological explanations Drug therapy Cognitive behaviour therapy and family therapy The interactionist approach 	<p>Option 3 Aggression</p> <ul style="list-style-type: none"> Neural and hormonal mechanisms The ethological explanation Evolutionary explanations Social psychological explanations Institutional aggression Media influences on aggression 	<p>Option 1 Relationships</p> <ul style="list-style-type: none"> The evolutionary explanations Factors affecting attraction Theories of romantic relationships Duck's phase model Virtual relationships Parasocial relationships 	<p>Revision</p>	

KS5 Curriculum Map

Edexcel BTEC Applied Science

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 12	Unit 1: Principles and Applications of Science <ul style="list-style-type: none"> • Topic A: Periodicity and properties of elements • Topic B: Structure and function of cells and tissues • Topic C: Waves and communication Unit 1 external exam (January)			Unit 2: Practical Scientific Procedures and Techniques <ul style="list-style-type: none"> • Learning aim A: Undertake titration and colorimetry to determine the concentration of solutions • Learning aim B: Undertake calorimetry to study cooling curves • Learning aim C: Undertake chromatographic techniques to identify components in mixtures • Learning aim D: Review personal development of scientific skills for laboratory work 		Final deadline and resubmissions of Unit 2 written assignments.
Year 13	Unit 3: Science Investigation Skills <ul style="list-style-type: none"> • Topic D: Enzymes in action • Topic E: Diffusion of molecules • Topic F: Plants and their environment • Topic G: Energy content of fuels • Topic H: Electrical circuits Unit 3 external exam (January)			Unit 8: Physiology of Human Body Systems <ul style="list-style-type: none"> • Learning aim A: Musculoskeletal disorders • Learning aim B: Impact of lymphatic disorder and associated treatments. • Learning aim C: Explore the physiology of the digestive system and the use of corrective treatments for dietary related diseases. 		Final deadline and resubmissions of Unit 8 written assignments