

Curriculum intent statement for Science

We aim to develop all students into scientists who:

- have opportunities to indulge their natural curiosity for science leading to a lifelong passion
- are scientifically confident and skilled learners with potential for embarking upon STEM-based careers
- have a broad and deep knowledge of the sciences through immersion in our five-year spiral curriculum

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 (2020 intake)						
Biology		B1 - Cells	B2 - Tissues and Organs			B3 - Digestion
Chemistry	C1 - Particles			C2 - Elements, compounds & mixtures		
Physics	P1 - Forces	P2 - Pressure			P3 - Electricity P4 - Magnets	
Projects	Introduction to Science		STEM Project 1			
Skills	- Using models to represent particles and changes of state - Chromatography of liquids - select, plan and carry out the most appropriate types of scientific enquiries to test predictions, - use and derive simple equations and carry out appropriate calculations	- Using an equation - Working scientifically: drawing conclusions, identifying and classifying, observing	- Working scientifically: drawing conclusions, identifying and classifying, observing	- Using models to represent particles and changes of state	- present observations and data using appropriate methods, including tables and graphs	- make and record observations and measurements
Links	NC: Working Scientifically NC: The particulate nature of matter NC: Atoms, elements and compounds NC: Pure and impure substances NC: Describing motion NC: Forces NC: Pressure in fluids NC: Balanced forces NC: Forces and Motion	NC: Pressure in fluids NC: Cells and organisation	NC: Working Scientifically NC: Cells and organisation NC: The skeletal and muscular systems NC: Gas exchange systems NC: Working Scientifically	NC: The particulate nature of matter NC: Atoms, elements and compounds NC: Working Scientifically	NC: Current Electricity NC: Static Electricity NC: Magnetism NC: Working Scientifically	NC - Nutrition and digestion NC - Health NC: Working Scientifically

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 8 (2019 intake)						
Biology		B3 - Digestion	B5 - Ecosystems	B6 - Energy in Ecosystems		B7 - Health & Lifestyle
Chemistry		C3 - Reactions	C4 - Periodic Table			
Physics	P3 - Electricity P4 - Magnets				P6 - Light and Sound	
Projects						STEM Project 2
Skills	- present observations and data using appropriate methods, including tables and graphs	- make and record observations and measurements - ask questions and develop a line of enquiry based on observations of the real world	- interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions - present observations and data using appropriate methods, including tables and graphs - apply sampling techniques.	- interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	- interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions	- make and record observations and measurements - Working scientifically: drawing conclusions, identifying and classifying, observing
Links	NC: Current Electricity NC: Static Electricity NC: Magnetism NC: Working Scientifically	NC - Nutrition and digestion NC - Health NC: Working Scientifically NC Chemical Reactions NC Energetics	NC: Photosynthesis NC The Periodic Table NC: Working Scientifically	NC: Photosynthesis NC: Cellular Respiration NC: Working Scientifically	NC: Observed Waves NC: Sound Waves NC: Energy and Waves NC: Light Waves NC: Working Scientifically	NC Chemical Reactions NC Energetics NC - Nutrition and digestion NC - Health NC: Working Scientifically

	Autumn 1	Autumn 2	Spring 1		Spring 2	Summer 1	Summer 2
Year 9 (2018 intake)							
Biology	Ecosystems				AQA GCSE Biology 1 + 2		
Chemistry	Metals, Acids and Alkalis				AQA GCSE Chemistry 1 + 2		
Physics	Light & Sound				AQA GCSE Physics 1 + 3		
Projects					Fundamental Skills for GCSE Sciences		
Skills	<ul style="list-style-type: none"> - interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions - present observations and data using appropriate methods, including tables and graphs - apply sampling techniques. 	<ul style="list-style-type: none"> - Development of scientific thinking - Experimental skills + strategies - Analysis and Evaluation - Scientific vocabulary, quantities, units, symbols + nomenclature 	<ul style="list-style-type: none"> - Development of scientific thinking - Experimental skills + strategies - Analysis and Evaluation - Scientific vocabulary, quantities, units, symbols + nomenclature 	G C S E	<ul style="list-style-type: none"> Microscopy Rearranging and applying formula Predicting, measuring, recording and drawing conclusions Evaluating 	The structure, history and development of the atom and periodic table.	<ul style="list-style-type: none"> -Inputting numbers into calculations -Rearranging equations -Using correct SI units - Scientific literacy (quality long answer questions) - Global environmental issues awareness. - Evaluation of Energy generation methods
Links	<ul style="list-style-type: none"> NC: relationships in an Ecosystem NC: Photosynthesis NC: Working Scientifically NC Chemical Reactions NC: Observed Waves NC: Sound Waves NC:Energy and Waves NC: Light Waves NC: Photosynthesis NC: Working Scientifically 	NC / AQA SC working scientifically	NC / AQA SC working scientifically		<ul style="list-style-type: none"> NC - Cell biology AQA specification points: 4.1.1.1- eukaryotes and prokaryotes, 4.1.1.2 - animal and plant cells 4.1.1.3 - cell specialisation 4.1.1.4 - cell differentiation 4.1.1.5 - microscopy 1.1.3.1 - diffusion 4.1.3.2 - osmosis 4.1.3.3 - active transport 4.1.2 - cell division 	AQA spec 4.1 Atomic structure and the periodic table	<ul style="list-style-type: none"> (AQA SC) 4.1.1.1 - Energy stores and systems 4.1.1.2 - changes in energy 4.1.1.4 - power 4.1.2.2 - Efficiency (AQA SC) 4.1.3 - National and global energy resources

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- are scientifically confident and skilled learners with potential for embarking upon STEM-based careers
- have a broad and deep knowledge of the sciences through immersion in our five-year spiral curriculum

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10 Combined Science / Trilogy (2017 intake)						
Biology	Organisation B3 Organisation B4	Infection and Response B5	Infection and Response B6 B7	Bioenergetics B8 B9	Homeostasis and Response B10 B11	Ecology B16
Skills	Making observations Drawing conclusions Dissection skills	Aseptic technique Calculating bacterial populations Evaluating scientific theories	Interpretation of data History of drug development	Calculating rate-straight line equations Calculating percentage change Investigate the effect of exercise on heart rate Investigating limiting factors rate of photosynthesis	Testing reflex actions Measuring reaction times Investigating newly germinated shoots Interpretation of graphical data	Investigation- Field work
Links	NC - cell biology AQA specification points: 4.2.1 - principles of organisation 4.2.2.1 - human digestive system NC - transport systems AQA specification points: 4.2.2.2 - the heart and blood vessels 4.2.2.3 - blood 4.2.3.1 - Plant tissues 4.2.3.2 - Plant organ systems	NC Health, disease and the development of medicines AQA GCSE Biology 4.3 Cross-curricular: History Y10 Autumn 2, development of the smallpox vaccination.	NC Health, disease and the development of medicines AQA GCSE Biology 4.3	NC Cell biology and Photosynthesis AQA GCSE Biology 4.4	NC Coordination and control AQA GCSE Biology 4.5	NC Ecosystems AQA GCSE Biology 4.7
Chemistry	Bonding, Structure and Properties of Matter C3	Bonding, Structure and Properties of Matter C4	Chemical Changes C5	Chemical Changes C6 C7		Chemical Analysis C12
Skills	The theories, properties, and technology about structures and materials.	Mathematical skills in Chemistry.	Formation of new substances in chemical reactions and using acid and alkalis to make salts.	Practically separating ions using electricity. How energy is gained and		Practical analysis of metals and gases in Chemistry.

				lost in reactions.		
Links	AQA 4.2 Bonding, Structure and the Properties of Matter.	AQA 4.3 Quantitative Chemistry	AQA 4.4 Chemical Changes	AQA 4.4 Chemical Changes AQA 4.5 Energy Changes		AQA 4.8 Chemical Analysis
Physics	Energy P3	Particle Model of Matter P6	Atomic Structure P7		Electricity P4 P5	
Skills	- Planning a practical (specific heat capacity) - Obtaining data - Plotting line graphs + determining the gradient of the line of best fit	Development of scientific ideas Extended writing Building simple circuits Recall and use of equations Required practicals resistance and I-V characteristics, Density	Complete electric circuits Using equations		Describing particle model and atomic structure Application of knowledge	
Links	(AQA SC) 4.1.1.3 - Energy changes in systems	4.1.2.1 Energy transfers in a system	Interpreting data Manipulation and application of equations		Atomic Structure NC: Structure of matter. Atomic Structure	

Year 10 Separate Science (2017 intake)

Biology	Organisation B3 B4	Infection and Response B5	Infection and Response B6 B7	Bioenergetics B8 B9 B10	Homeostasis and Response B11	Homeostasis and response B12
Skills	Making observations Drawing conclusions Dissection skills	Aseptic technique Calculating bacterial populations Evaluating scientific theories	Interpretation of data History of drug development	Calculating rate-straight line equations Calculating percentage change Investigate the effect of exercise on heart rate Investigating limiting factors rate of photosynthesis Testing reflex actions Measuring reaction times	Comparing and contrasting nervous to hormonal control	Investigating newly germinated shoots Interpretation of graphical data
Links	NC - cell biology AQA specification points: 4.2.1 - principles of organisation 4.2.2.1 - human digestive system NC - transport systems AQA specification points: 4.2.2.2 - the heart and blood vessels 4.2.2.3 - blood	NC Health, disease and the development of medicines AQA GCSE Biology 4.3	NC Health, disease and the development of medicines AQA GCSE Biology 4.3	NC Cell biology and Photosynthesis AQA GCSE Biology 4.4 NC Coordination and control AQA GCSE Biology 4.5	NC Coordination and control AQA GCSE Biology 4.5	NC Coordination and control AQA GCSE Biology 4.5

	4.2.3.1 - Plant tissues 4.2.3.2 - Plant organ systems					
Chemistry	Bonding, structure and properties of matter C3 C4	Chemical Changes C5	Chemical Changes C6 C7	The rate and extent of chemical change C8	Using Resources C14 C15 GCSE Chemistry only	Chemical Analysis C12
Skills	The theories, properties, and technology about structures and materials. Mathematical skills in Chemistry.	Formation of new substances in chemical reactions and using acid and alkalis to make salts.	Practically separating ions using electricity. How energy is gained and lost in reactions.	Factors affecting the rate of chemical reactions.	The history, structure and development of the Earth's atmosphere. Extraction and use of the Earth's natural resources.	Practical analysis of metals and gases in Chemistry.
Links	AQA 4.2 Bonding, Structure and the Properties of Matter. AQA 4.3 Quantitative Chemistry	AQA 4.4 Chemical Changes	AQA 4.4 Chemical Changes AQA 4.5 Energy Changes	AQA 4.6 The Rate and Extent of Chemical Change	AQA 4.9 Chemistry of the Atmosphere 4.10 Using Resources	AQA 4.8 Chemical Analysis
Physics	Energy P3 Particle Model of Matter P6	Atomic Structure P7	Electricity P4	Electricity P5	Forces P8 P9	Forces P10
Skills	- Planning a practical (specific heat capacity) - Obtaining data - Plotting line graphs + determining the gradient of the line of best fit Development of scientific ideas Extended writing Building simple circuits Recall and use of equations Required practicals resistance and I-V characteristics, Density	Complete electric circuits Using equations	Describing particle model and atomic structure	Describing particle model and atomic structure Application of knowledge	Forces	Forces
Links	(AQA SC) 4.1.1.3 - Energy changes in systems 4.1.2.1 Energy transfers in a system	Interpreting data Manipulation and application of equations	Atomic Structure NC: Structure of matter. Atomic Structure	Atomic Structure NC: Structure of matter. Atomic Structure Radioactive decay	Extended writing Application and rearrangement of equations Drawing and interpreting graphs Required practicals force and extension and acceleration	Extended writing Application and rearrangement of equations Drawing and interpreting graphs Required practicals force and extension and acceleration
Year 11 Combined Science / Trilogy (2016 intake)						
Biology	Homeostasis and Response B10 B11	Inheritance variation and evolution B13	Inheritance, variation and evolution B15	Revision	Revision	

		B14			
Skills	Testing reflex actions Measuring reaction times Investigating newly germinated shoots Interpretation of graphical data	Modelling natural selection Use of qualitative data Evaluating use of GM Ethics of cloning	Discussing viewpoints Weighing evidence	How Science Works	How Science Works
Links	NC Coordination and control AQA GCSE Biology 4.5	NC Evolution, Inheritance and variation AQA GCSE Biology 4.6	NC Evolution, Inheritance and variation		
Chemistry			The rate and extent of chemical change C8 C9 C12 C14	Revision	Revision
Skills			Factors affecting the rate of chemical reactions. The process of extracting oil and its uses. Practical analysis of metals and gases in Chemistry. The history, structure and development of the Earth's atmosphere.	How Science Works	How Science Works
Links			AQA 4.6 The Rate and Extent of Chemical Change Alkenes, Alcohols and other organic compounds. AQA 4.9 Chemistry of the Atmosphere		
Physics	Waves P12 Electricity and Magnetism P15			Revision	Revision
Skills	Extended writing linkage of ideas and concepts Application and manipulation of mathematical equations Required practicals radiation and absorption, [thermal insulation and light (Physics only)]			How Science Works	How Science Works

Links	AQA SC: Topic 6 Waves Topic 7 Magnetism NC: Wave motion, Magnetism				
Year 11 Separate Science (2016 intake)					
Biology	Homeostasis and Response B10 B11	Homeostasis and Response B12	Inheritance, variation and evolution B13 B14	Inheritance, variation and evolution B15 Ecology B16	Revision
Skills	Testing reflex actions Measuring reaction times Investigating newly germinated shoots Interpretation of graphical data	Investigating newly germinated shoots Interpretation of graphical data	Modelling natural selection Use of qualitative data Evaluating use of GM Ethics of cloning	Discussing viewpoints Weighing evidence Investigation- Field work	How Science Works
Links	NC Coordination and control AQA GCSE Biology 4.5	NC Coordination and control AQA GCSE Biology 4.5	NC Evolution, Inheritance and variation AQA GCSE Biology 4.6	NC Evolution, Inheritance and variation NC Ecosystems AQA GCSE Biology 4.7	
Chemistry	The rate and extent of chemical change C8 Organic Chemistry C9	Organic Chemistry C10 GCSE only C11 GCSE Chemistry only	Chemistry of the atmosphere C13 Using Resources C14	Revision	Revision
Skills	Factors affecting the rate of chemical reactions. The process of extracting oil and its uses.	Alkenes, Alcohols and other organic compounds. Production, uses and disposal of polymers.	The history, structure and development of the Earth's atmosphere. Extraction and use of the Earth's natural resources.	How Science Works	How Science Works
Links	AQA 4.6 The Rate and Extent of Chemical Change Alkenes, Alcohols and other organic compounds.	AQA 4.7 Organic Chemistry	AQA 4.9 Chemistry of the Atmosphere 4.10 Using Resources		
Physics	Waves P12 P13 P14	Magnetism P15 Space P16 (GCSE Physics only)	Revision	Revision	Revision
Skills	Extended writing linkage of ideas and concepts	Development of models and ideas of our universe	How Science Works	How Science Works	How Science Works

	Application and manipulation of mathematical equations Required practicals radiation and absorption, [thermal insulation and light (Physics only)]	throughout history A sense of scale and use of significant figures The importance of peer review when analysing and interpreting data				
Links	AQA SC: Topic 6 Waves Topic 7 Magnetism and Electromagnetism NC: Wave motion, Magnetism and electromagnetism	AQA SC: Topic 7 Magnetism and Electromagnetism Topic 8 Space (Physics only) NC: Magnetism and electromagnetism and Space Physics				

Curriculum intent statement for KS5 Science

We aim to develop all students into scientists who:

- are scientifically confident and highly skilled learners who are fully prepared for STEM-based careers
- have a broad and deep knowledge of the subject
- Take enjoyment from, and thrive in, the practical approaches to learning science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 12 (2015 intake)						
Biology (Edexcel SNAB)	Topic 1 Topic 2	Topic 1 Topic 2	Topic 3 Topic 4	Topic 3 Topic 4	Statistics & Developing longer response	Topic 5 Topic 6
Biology Skills	Practical CPACs Practical 1, 3 Command words for examination questions A4 Maths skills (Geometry and trigonometry)	Practical CPACs Practical 4 A3 Maths skills (graphs and data interpretation)	Practical CPACs Practical 2	Practical CPACs Practical 5, 6, 7, 8, 9 Longer response questions A1 Maths skills (Handling data)	Practical CPACs Practical 10 A1, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data)	Practical CPACs Practical 11, 12, 13, 14 A2 Maths skills (algebra) Synoptic links
Biology Links (Edexcel SNAB Bio A spec)	1.1 - 1.7 2.1 - 2.4	1.8 - 1.13 2.5 - 2.11	1.14 - 1.18 2.12 - 2.16 3.1 - 3.5 4.1 - 4.6	3.6 - 3.15 4.7 - 4.16	5.1 - 5.3 (Practical 10)	5.1 - 5.11 6.1 - 6.5 / 6.15
Chemistry	3.11 3.12 3.13	3.1.7 3.2.1 3.2.2 3.2.3 3.3.1	3.1.4 3.3.2	3.1.5 3.1.6 3.3.3 3.3.4	3.3.5 3.3.6 3.3.8 3.3.10	Lab books / Exam prep
Chemistry Skills	Practical Competencies Required practical 1 Required Practical 4 (part 1) Maths skills Units/ratios/standard form/equations/ uncertainty	Practical Competencies Required Practical 4 (part 2) Maths skills 2D and 3D geometry	Practical Competencies Required Practical 2 Maths skills Ratios/uncertainty	Practical Competencies Required Practical 3 Required Practical 5 Maths skills Equations	Practical Competencies Required Practical 6 Maths skills Translate data	Exam technique. Analysis and interpretation of Scientific data. Using ICT to analyse situations and process data.
Chemistry Links	Specification references 3.1.1 3.1.2 3.1.3 3.2.1. 3.2.3 Req pracs section 7.3 PS 1.1. 1.2 2.2. 3.3 MS 0.0 0.1 0.2	Specification references 3.1.7 3.2.2 3.3.1 Req pracs section 7.3 PS 1.2 MS 0.2	Specification references 3.1.4 3.3.2 3.3.3 Req pracs section 7.3 PS 2.1 2.2 3.1 3.2 3.3 MS 0.0 0.1 0.2	Specification references 3.1.5 3.1.6 3.3.4 3.3.5 Req pracs section 7.3 PS 1.2 2.1 3.2 MS 0.0	Specification references 3.3.6 Req pracs section 7.3 PS 1.1 1.2 2.2 MS 3.1	Review of all topics so far.

	MS 1.1 1.2 1.3 MS 2.2 2.3 2.4 MS 4.1 4.2 4.3	MS 4.2 4.3	MS 1.1 1.2 1.3 MS 2.2 2.3 2.4	MS 2.1 2.2 2.3 2.4		
Physics (Edexcel Concept Led)	Topic 2 Topic 5	Topic 2 Topic 5	Topic 3 Topic 4	Topic 3 Topic 4	Topic 8 Topic 6	CERN / Revision
Physics Skills	Working in standard form. Estimation. Practical measurement methods. Health and safety. CPAC 1: Follows written procedures CPAC 2: Applies investigative approaches and methods when using instruments and equipment	Dimensional analysis. Base and Derived unit. Linkage to learning in Maths (cross-curricular) Non-routine problem solving. CPAC 1. CPAC 4: Makes and records observations	Multi-stage calculations. Circuit building, troubleshooting and analysis. Linear analysis. CPAC2, CPAC 3: Safely uses a range of practical equipment and materials and CPAC 4	Longer response skills. Complex algebraic derivations. Communication and team-approach to success. CPAC 1, 2, 3 and 4 and CPAC 5: Researches, references and reports	Limits to measurement. Frontiers in physics.	Exam technique. Analysis and interpretation of Scientific data. Using ICT to analyse situations and process data. CPAC 2, and 5
Physics Links	Topic 1 - Spec points 1 - 8. Topic 5 - Spec points 59 - 96.	Topic 1 - Spec points 1 - 8. Topic 2 - Spec points 9 - 30.	Topic 1 - Spec points 1 - 8. Topic 3 - Spec points 31 - 48.	Topic 1 - Spec points 1 - 8. Topic 4 - Spec points 49 - 58.	Topic 8 - Spec points 139 - 142.	Topic 9 - Spec points 97 - 107. Review of all topics so far.

Year 13 (2014 intake)						
Biology (Edexcel SNAB)	Topic 5 Topic 6	Topic 7 Topic 8	Topic 7 Topic 8	Lab books & Revision	Synoptic Article & Revision	
Biology Skills	Practical CPACs Practical 11, 12, 13, 14 A2 Maths skills (algebra) Synoptic links	Practical CPACs Practical 15 A1, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data) Synoptic links	Practical CPACs Practical 16, 17 A1, A2, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data, algebra) Synoptic links	Practical CPACs Practical 18 A1, A2, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data, algebra) Synoptic links	A1, A2, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data, algebra) Synoptic links Pre-release - reading for meaning	Synoptic links Pre-release - reading for meaning
Biology Links (Edexcel SNAB Bio A spec)	5.1 - 5.11 6.1 - 6.5 / 6.15	5.12 - 5.22 6.6 / 6.11 - 6.15	7.1 - 7.10 8.1 - 8.7	7.11 - 7.16 8.8 - 8.19		

Chemistry	3.1.8 3.1.9 3.1.12 3.3.7	3.1.10 3.2.5 3.3.9 3.3.12	3.2.4 3.2.6 3.1.11 3.3.11	3.3.13 3.3.15 3.3.16	3.3.14 Revision	
Chemistry Skills	Practical 7 Practical 9 Practical Skills - PS3.2,3.1,3.2.4.1,2.4 Maths Skills (Numerical computation)- 0.1, 0.0,0.3,0.4 Maths Skill (handling Data) - 1.1 Algebra -2.2,2.4,2.5 Graphs 3.1,3.2,3.3 Synoptic Links	Practical 11 Practical 10 Practical Skills - PS4.1,3.2,1.1 Maths Skills - Handling Data 1.1 Synoptic Links	Synoptic Skills Application and Evaluative skills	Practical 12 Practical Skills- 1.2,3.2,4.1 Maths Skills Ratio Rf calc in Chromatography) Synoptic Skills	Mathematical Skills focus on data handling and evaluative skills Practical skills and techniques linked to extended questions	Exam Technique. Analysis, application an evaluative skills
Chemistry Links	3.1.9 3.3.8 3.3.7 3.1.10 3.1.8 3.1.12 3.2.5	3.2.6 3.3.9 3.1.11	3.3.11 3.2.4 3.3.12 3.3.10 3.3.13	3.3.14 3.3.15 3.3.16		
Physics	Topic 7 Topic 9	Topic 10	Topic 11 Topic 12 Topic 13	Lab books Revision	Revision	
Physics Skills	Building capacitors using household items. Inverse - Square relationships. CPAC 2, 3, and 5	Non-linear relationships. Indicative content extended writing practice. CPAC 2, 3, 4 and 5	Scientific modelling of stochastic processes. Linkage to previous learning. Collaborative problem solving. Health and safety. CPAC 2,3 and 5	Application of calculus to scientific analysis. Synoptic view of the universe (linkage to previous learning). CPAC 2, 4	Linkage and synopsis. Adaptability and coping with pressure.	Examination technique. Self-management and self-development.
Physics Links	Topic 7- Spec points - 108 - 129. Topic 8 - Spec points - 130 - 138.	Topic 7- Spec points - 108 - 129. Topic 9 - Spec points 144 - 155.	Topic 12 - Spec points 174 - 180. Topic 11 - Spec points 164 - 173.	Topic 10 - Spec points 156 - 163. Topic 13 - Spec points 181 - 191.	All topics.	All topics.