

Science GSA KS5 Curriculum Map 2023-24

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 (HT1)	Autumn 2 (HT2)	Spring 1 (HT3)	Spring 2 (HT4)	Summer 1 (HT5)	Summer 2 (HT6)
Year 12						
Biology (Edexcel SNAB)						
Topic Covered	Topic 1 - Lifestyle, health and risk Topic 2 - Genes and Health	Topic 1 - Lifestyle, health and risk Topic 2 - Genes and Health	Topic 3 -Voice of the genome Topic 4 - Biodiversity and resources	Topic 3 -Voice of the genome Topic 4 - Biodiversity and resources	Topic 3 -Voice of the genome Topic 4 - Biodiversity and resources Revision and PPE prep	PPE paper 1 and 2 Topic 5 - On the Wild side (Global Warming Project)
Knowledge Deepened	Topic 1: The Heart - Cardiovascular system and disease - The role of blood clotting - Preventing CVD - Biological molecules Topic 2: Cell structure - Transport in cells - Proteins and their synthesis - DNA - Mutations - Cystic fibrosis	Topic 1: The Heart - Cardiovascular system and disease - The role of blood clotting - Preventing CVD - Biological molecules Topic 2: Cell structure - Transport in cells - Proteins and their synthesis - DNA - Mutations - Cystic fibrosis	Topic 3: Cell organelles and functions - Mitosis and Meiosis - Fertilisation - Sex-linkage - Inheritance - Stem cells - Epigenetics - cloning Topic 4: Biodiversity - Natural selection - Classification - Conservation - Plant structures and transport	Topic 3: Cell organelles and functions - Mitosis and Meiosis - Fertilisation - Sex-linkage - Inheritance - Stem cells - Epigenetics - cloning Topic 4: Biodiversity - Natural selection - Classification - Conservation - Plant structures and transport	Topic 3: Cell organelles and functions - Mitosis and Meiosis - Fertilisation - Sex-linkage - Inheritance - Stem cells - Epigenetics - cloning Topic 4: Biodiversity - Natural selection - Classification - Conservation - Plant structures and transport	Global warming - Climate change - Evidence for global warming - Predicting future models Retrieval of prior knowledge

			- Drug trials - Sustainability	- Drug trials - Sustainability	- Drug trials - Sustainability	
Skills developed	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 A1, A3, A4 maths skills (Geometry and trigonometry, graphs, handling data)	Practical CPACs A2 Maths skills (algebra) Synoptic links
Links to Specification (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
Flagship Link	Biology and PE: Cardiovascular System and Respiration				Biology and Maths - Statistic/Standard Deviation	
Cross Curriculum Connections		Core Maths (correlation and causation) - Y12 HT4	Psychology (Y12 term 1+2) Genotype, phenotype and the genetic basis of behaviour + evolution Geography Y12 Term 1 - Regenerating Places	Psychology - Y12 HT4 Application to human behaviour	Core Maths (stats) Y12 HT1	Geography (Y12 term 1) Plant succession, sand dunes and salt marshes
Resources to support learning	Edexcel Resources / PAMT					
Chemistry (AQA)						
Topic Covered	3.1.2 Amount of substance 3.1.1 Atomic Structure 3.3.1 Intro to Organic Chemistry 3.3.2 Alkanes	3.1.3 Bonding 3.3.3 Haloalkanes 3.3.4 Alkenes	3.1.4 Energetics 3.1.5 Kinetics 3.3.5 Alcohols 3.3.8 Aldehydes and Ketones	3.2.1 Periodicity 3.2.2 Group 2 3.1.7 Oxidation and Reduction 3.2.3 Group 7 3.3.7 Optical Isomerism 3.3.9 Carboxylic	3.1.6 Chemical Equilibria 3.3.6 Organic Analysis 3.3.10 Aromatic Chemistry 3.3.12 Polymers	PPE preparation Directed improvement of Lab Skills

				acids and Derivatives		
Knowledge Deepened	Chemical amount Behaviour of the electron Organic Principles, including nomenclature and isomerism. Fractional distillation and Cracking	Material properties in relation to internal forces Reactivity of organic substances in relation to environmental chemistry Reaction Mechanisms	Measurement of heat movement and reaction speed by indirect and practical methods Fuels and their use Relationships between organic families	Periodic trends in physical properties. Trends in group 2 and 7 chemical properties. Redox Enantiomers and their properties Organic acids and their reactions	Expressing the balance of reversible processes. Identifying organic molecules. Evidence for and chemistry of organic ring structures. Polymerisation and the behaviour of polymers	Atomic and macroscopic chemical behaviours. Energy movement Reaction speed Chemical Balance Group 2,7 and Carbon Chemistry Redox Analytical Chemistry Retrieval of prior knowledge
Skills developed	Practical Competencies Required practical 1 Maths skills Units/ratios/standard form/equations/uncertainty	Required Practical 4 (part 2) Maths skills 2D and 3D geometry	Practical Competencies Required Practical 2 Required Practical 3 Required Practical 5 Maths skills Ratios/uncertainty	Practical Competencies Required Practical 4 Maths skills Equations	Practical Competencies Required Practical 6 Maths skills Translate data	Exam technique. CPAC Skills, including Analysis and interpretation of Scientific data. Using ICT to analyse situations and process data.
Links to Specification (AQA spec)	Specification references 3.1.1 3.1.2 3.3.1 3.3.2 Req pracs section 7.3 PS 1.1. 1.2 2.2. 3.3 MS 0.0 0.1 0.2 MS 1.1 1.2 1.3 MS 2.2 2.3 2.4 MS 4.1 4.2 4.3	Specification references 3.1.3 3.3.3. 3.3.4 Req pracs section 7.3 PS 1.2 MS 0.2 MS 4.2 4.3	Specification references 3 3.1.4 3.1.5 3.3.5 3.3.8 Req pracs section 7.3 PS 2.1 2.2 3.1 3.2 3.3 MS 0.0 0.1 0.2 MS 1.1 1.2 1.3 MS 2.2 2.3 2.4	Specification references 3.2.1 3.2.2 3.1.7 .3.2.3 3.3.7 3.3.9 Req pracs section 7.3 PS 1.2 2.1 3.2 MS 0.0 MS 2.1 2.2 2.3 2.4	Specificati on references 3.1.6 3.3.6 3.3.10 3.3.12 Req pracs section 7.3 PS 1.1 1.2 2.2 MS 3.1	Review of all topics so far.
Flagship Link						
Cross Curriculum Connections	Amount of substance. Multi Step calculations and application of quantitative science → link to physics.		Chemistry and Physics Energy		Chemical Equilibria. Processing equations	
Resources to support learning	www.Chemguide.co.uk https://www.scisheets.co.uk/ https://www.physicsandmathstutor.com/chemistry-revision/a-level-aqa/					

Physics (Edexcel Concept Led)

Topic Covered	Topic 2 Mechanics Topic 4 Materials	Topic 2 Mechanics Topic 4 Materials Topic 5 Waves and the Nature of Light	Topic 3 DC Electricity Topic 5 Waves and the Nature of Light	Topic 3 DC Electricity Topic 5 Waves and the Nature of Light	Topic 7 Elec + Mag Fields (parts 1&3) Topic 6 Further Mechanics	PPEs and review Topic 7 Elec + Mag Fields (parts 1&3) Topic 6 Further Mechanics
Knowledge Deepened	Force and motion - including SUVAT, Newton's laws and Density and upthrust Fluid flow Terminal velocity and Stoke's law derivation	Projectiles Energy Momentum Hooke's law Stress, Strain and Young's Modulus Wave basics Superposition of waves	Electrical quantities (current, potential difference, resistance, resistivity) Conduction and semiconductors Wave properties: (Diffraction, Interference, Refraction, Polarisation) Lenses	Potential dividers EMF and internal resistance Wave-Particle duality Photoelectric effect Atomic energies and line spectra	Further momentum, impulse and 2d collisions. Electric fields, forces and potential. Magnetic fields and forces.	Circular motion, centripetal force and acceleration (including derivation). Generating electricity. Faraday's and Lenz's laws. Retrieval of prior knowledge
Skills developed	Working in standard form. Estimation. Practical measurement methods. Non-routine problem solving. 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) Health and safety. CPAC 1. CPAC 4: Makes and records observations	Multi-stage calculations. Circuit building, troubleshooting and analysis. Linear analysis. Working with errors and uncertainties CPAC2, CPAC 3: Safely uses a range of practical equipment and materials and CPAC 4	Longer response skills. Communication and team-approach to success. CPAC 1, 2, 3, 4 and CPAC 5: Researches, references and reports	Limits to measurement. Complex algebraic derivations. Frontiers in physics.	Exam technique. Analysis and interpretation of Scientific data. Using ICT to analyse situations and process data. CPAC 2, and 5

Links to Specification (Edexcel spec)	Topic 1 - Spec points 1 - 8. Topic 2 - Spec points 9 - 30. Topic 4 - Spec points 49 - 58.	Topic 2 - Spec points 9 - 30. Topic 4 - Spec points 49 - 58. Topic 5 - Spec points 59 - 96	Topic 3 - Spec points 31 - 48. Topic 5 - Spec points 59 - 96.	Topic 3 - Spec points 31 - 48. Topic 5 - Spec points 59 - 96.	Topic 6 - Spec points - 97 - 107 Topic 7- Spec points - 108 - 115 and 121 - 129.	Review of all topics so far. Topic 6 - Spec points - 97 - 107 Topic 7- Spec points - 108 - 115 and 121 - 129.
Flagship Link						
Cross Curriculum Connections			Computer Science: Y12 HT4 Fundamentals of computer science			
Resources to support learning	Edexcel Resources / PAMT					

Year 13

Biology (Edexcel SNAB)

Topic Covered	Topic 5 - On the Wild side Topic 6 - Immunity, Infection and Forensics	Topic 5 - On the Wild side Topic 6 - Immunity, Infection and Forensics	Topic 7 - Run for your Life Topic 8 - Grey Matter	Topic 7 - Run for your Life Topic 8 - Grey Matter	PPE paper 2 and 3 Synoptic Article & Revision	EXAMS
Knowledge Deepened	Topic 5: Ecological succession - Energy systems - Photosynthesis - Speciation - Controlling carbon Topic 6: Crime scene investigative techniques - Entomology - Immunity (specific and non-specific) - Bacterial diseases - Viral diseases - Vaccination and Antibiotics	Topic 5: Ecological succession - Energy systems - Photosynthesis - Speciation - Controlling carbon Topic 6: Crime scene investigative techniques - Entomology - Immunity (specific and non-specific) - Bacterial diseases - Viral diseases - Vaccination and Antibiotics	Topic 7: Joints - Muscles and contractions - Respiration - Homeostasis - Sporting injuries and their treatments - Performance enhancing and transcription factors Topic 8: The nervous system - IAA and plant growth - The eye - The brain - Visual development - Learning and memory - Problems with synapses - Genetic modification and ethics	Topic 7: Joints - Muscles and contractions - Respiration - Homeostasis - Sporting injuries and their treatments - Performance enhancing and transcription factors Topic 8: The nervous system - IAA and plant growth - The eye - The brain - Visual development - Learning and memory - Problems with synapses - Genetic modification and ethics	Retrieval of prior knowledge	
Skills developed	Practical CPACs Practical 10, 11, 12, 13, 14 A2 Maths skills (algebra) Synoptic links	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	
Links to Specification (Edexcel SNAB Bio A)	5.1 - 5.11 6.1 - 6.5 / 6.15	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	

spec)						
Flagship Link			Biology and Psychology (Y12 Term 2) Nervous system, neurons and synapses, endocrine system, brain structure, brain scanning and injury. Biology & Geography - Statistical Tests			
Cross Curriculum Connections			PE Y12 HT1 - Psychological Factors	P.E (muscles and respiratory system and Energy systems) Y12 HT 1		
Resources to support learning	Edexcel Resources / PAMT					
Chemistry (AQA)						
Topic Covered	3.1.8 Thermodynamics 3.1.10 Equilibrium Constant, K _p , for homogeneous systems. 3.1.9. Rate Equations 3.1.12 Acids and Bases	3.2.5. Transition metals 3.2.4 Properties of Period 3 elements and their oxides	3.2.6 Reactions of Ions in aqueous solution 3.3.11 Amines 3.3.15 NMR	3.1.11 Electrode potentials and electrochemical cells 3.3.13 Amino acids, proteins and DNA 3.3.14 Organic synthesis 3.3.16 Chromatography	Revision and exam preparation	EXAMS
Knowledge Deepened	Entropy and Gibbs free energy Balance in gaseous systems Reaction speed and the importance of order. The acid/base balance including buffers.	Chemical principles and properties of transition series. Period trends in the chemical properties of elements and their compounds	Identification of aqueous Metal ions. Quantitation of aqueous salts by redox titration Chemistry of Organic Nitrogen compounds. Chemical analysis by Magnetic resonance spectroscopy	Chemical cells, in Principle and practice. Biochemistry of Proteins and DNA. The principles of Multistep organic synthesis, including purification. Chemical analysis by chromatography	Retrieval of prior knowledge	

Skills developed	Required Practical 7 Required 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 Skills - PS4.1,3.2,1.1 Maths Skills - Handling Data 1.1 Synoptic Links	Required Practical 8 Required Practical 11 Synoptic Skills Application and Evaluative skills	Required Practical 10 Required 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	
Links to Specification (AQA spec)	Specification references 3.3.12 3.1.8 3.1.10 3.1.9 3.1.12	Specification references 3.2.4. 3.2.5	Specification references 3.2.5 3.2.6. 3.3.11 3.3.15	Specification references 3.1.11 3.3.13 3.3.14 3.3.16		
Flagship Link						
Cross Curriculum Connections						
Resources to support learning	<p style="text-align: center;"> www.Chemguide.co.uk https://www.scisheets.co.uk/ https://www.physicsandmathstutor.com/chemistry-revision/a-level-aqa/ </p>					
Physics (Edexcel Concept Led)						
Topic Covered	Topic 7 Elec + Mag Fields (part 2) Topic 8 Nuc + Particle Phys	Topic 8 Nuc + Particle Phys Topic 9 Thermodynamics Topic 10 Nuclear Radiation	Topic 11 Space Topic 12 Gravitational Fields Topic 13 - Oscillations	Synoptic Elements	Revision and exam preparation	EXAMS
Knowledge Deepened	Capacitor behaviour in circuits.	Heat and temperature and heat transfer.	Stellar classification.		Retrieval of prior knowledge	

	<p>Capacitor discharge and exponential relationships.</p> <p>The nuclear model.</p> <p>The standard model, and particle interactions Particle accelerators, detectors.</p>	<p>Ideal gas behaviour and kinetic theory (including derivation).</p> <p>Nuclear radiation, half life and radioactive decay.</p> <p>Nuclear fusion and fission.</p>	<p>Measuring astronomical distances.</p> <p>Start life cycle.</p> <p>Gravitational forces and fields.</p> <p>Simple harmonic motion. Resonance and damping.</p>	<p>Consolidation - examination technique.</p>		
Skills developed	<p>Investigating capacitor discharge.</p> <p>Inverse - Square relationships.</p> <p>CPAC 2, 3, and 5</p>	<p>Non-linear relationships.</p> <p>Indicative content extended writing practice.</p> <p>Critical thinking.</p> <p>Making judgments.</p> <p>CPAC 2, 3, 4 and 5</p>	<p>Scientific modelling of stochastic processes.</p> <p>Linkage to previous learning.</p> <p>Collaborative problem solving.</p> <p>Health and safety.</p> <p>CPAC 2,3 and 5</p>	<p>Application of calculus to scientific analysis.</p> <p>Synoptic view of the universe (linkage to previous learning).</p> <p>Working as an Experimental Physicist - quantifying error, thinking critically.</p> <p>Linkage and synopsis.</p> <p>CPAC 2, 4</p>	<p>Linkage and synopsis.</p> <p>Adaptability and coping with pressure.</p> <p>Examination technique.</p> <p>Self-management and self-development.</p>	
Links to Specification (Edexcel spec)	<p>Topic 7 - Spec points - 116 - 120.</p> <p>Topic 8 - Spec points 139 - 142.</p>	<p>Topic 8 - Spec points 139 - 142.</p> <p>Topic 9 - Spec points 144 - 155.</p> <p>Topic 10 - Spec points 156 - 163.</p>	<p>Topic 11 - Spec points 164 - 173.</p> <p>Topic 12 - Spec points 174 - 180.</p> <p>Topic 13 - Spec points 181 - 191.</p>	<p>All topics.</p>	<p>All topics.</p>	
Flagship Link						
Cross Curriculum Connections						

**Resources to
support learning**

[Edexcel Resources](#) / [PAMT](#)