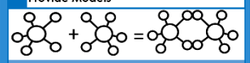
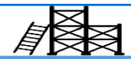
Swindon Academy Science Curriculum Map

Intent

The purpose of our science curriculum is to ensure that Swindon Academy pupils develop scientific knowledge and conceptual understanding through the disciplines of biology, chemistry and physics and deepen their understanding of the nature, process and methods of science through different types of scientific enquiries. All our curriculum routes aim to develop an appreciation of how experimentation and observation develop this knowledge, and an ability to think rationally and analytically when applying this knowledge in new. This makes students scientifically informed citizens with the option to pursue careers in science, or in careers that require some scientific understanding should they wish.

Implementation – Rosenshine principles of instruction

Daily Review	New Material in Small Steps	Ask Questions	Provide Models	Guide Student Practice	Check Student Understanding	Obtain High Success Rate	Scaffolds for Difficult Tasks	Independent Practice	Weekly and Monthly Review
 Daily review is an important component of instruction. It helps strengthen the connections of the material learned. Automatic recall frees working memory for problem solving and creativity.	 Our working memory is small, only handling a few bits of information at once. Avoid its overload—present new material in small steps and proceed only when first steps are mastered.	 The most successful teachers spend more than half the class time lecturing, demonstrating and asking questions. Questions allow the teacher to determine how well the material is learned.	 Students need cognitive support to help them learn how to solve problems. Modelling, worked examples and teacher thinking out loud, help to clarify the specific steps involved.	 Students need additional time to rephrase, elaborate and summarise new material in order to store it in their long-term memory. More successful teachers build in more time for this.	 Less successful teachers merely ask "Are there any questions?" no questions are taken to mean no problems. False. By contrast, more successful teachers check on all students.	 A success rate of around 80% has been found to be optimal, showing students are learning and also being challenged. Better teachers taught in small steps followed by practice.	 Scaffolds are temporary supports to assist learning. They can include modelling, teacher thinking aloud, cue cards and checklists. Scaffolds are part of cognitive apprenticeship.	 Independent practice produces 'overlearning" - a necessary process for new material to be recalled automatically. This ensures no overloading of students' working memory.	 The effort involved in recalling recently –learned material embeds it in long-term memory. And the more this happens, the easier it is to connect new material to such prior knowledge.
• Quizzing Do Now – based on previous content learnt • Exam question practice – based on previous lessons content	• New content delivered in small chunks with practice in between	• Cold call is used to check for understanding • Open and closed questioning • Right is right • No opt out	• Teacher models procedures using the visualiser • Teachers use WTM techniques during exam question practice • Visual aids used to illustrate abstract concepts	• Turn and talk opportunities provide students with the opportunity to rephrase and elaborate on their answers and understanding	• Pupil white boards are used to check for whole class understanding • Tracking not watching • Hot task used to feedforward content to be retaught.	• Content is delivered in small chunks followed by student practice including turn and talk, quizzing for understanding and application using exam questions • SLOP/Fluency • #AimHigh	• Use of MULES acronym for calculations • KS3 ladder differentiation used to scaffold tasks • WTM • SLAP • Textbook support	• Everybody writes tasks provide students with independent practice • SLOP/Fluency • KPI tasks • Doddle prep	• Quizzing Do Now – based on previous content learnt • Synoptic testing used in CEAT weeks so revision covers all content covered not just recently covered content • Doddle prep

Term	1	2		3		3	4	5	6		6
Year 7	**Booster Curriculum** Nutrition This module looks at nutrition in animals including the importance of teeth. There is a literacy focus in all lessons. Magnets and forces This module looks at magnets and the forces between them. There is a literacy focus in all lessons. Changing state This module looks at how substances change from solids to liquids to gases. Space This module introduces Space and focuses on the movement of the Sun, Earth and Moon.		Teacher Assessment	Electricity This module looks at conductors and insulators and basic series circuits. Living things and their habitats This module looks at the way living things are classified.		Assessment 1	Sound This module looks at how sounds are made and the different features of sound. Living things and life cycles This module looks at various life cycles including the human life cycle.	Light This module introduces the concept of light and looks at simple behaviours of light like reflection. Flowers This module looks at flowers and the other main plant organs and their importance in the plant's life cycle. Evolution This module looks at how living things change over time along with the way they are adapted to their environment. Bodies This module looks at the main organ systems in humans and other animals.		Assessment 2	Review and reteach
	Mainstream 7CP Particles In this module students learn the foundations chemistry and are introduced to the particle theory and use it identify pure and impure substances from particle diagrams and describe different separation techniques. 7BC Cells In this module students learn the foundations of biology and are introduced to cells. They will learn the main cell components and the functions and use microscopes to observe cells. 7PE Energy In this module students the foundations of physics and introduces the energy store model and the mechanisms of transfer between different energy stores			7BR Reproduction In this module learn the foundations of biology and are introduced to the topic of reproduction. Students learn the process of reproduction in mammals including humans.			7BR Reproduction (continued) The module continues and students learn the process of reproduction in flowering plants. This module also introduces the concept of variation with respect to biological differences between species and statistical differences in data type e.g. continuous and discontinuous variation.	7CR Chemical Reactions In this module students learn the foundations of chemistry and are introduced to simple chemical reactions. They also learn the basics of acids and alkalis and the pH scale. 7PF Forces In this module students learn the foundations of physics and are introduced to forces and force diagrams. They also learn to calculate speed and interpret distance-time graphs 8BE Ecological relationships In this module students review and build on their knowledge from the 7BR Reproduction module by learning about the causes of variation.			
	Vocabulary Instruction										
	Distillation, Separation, Conservation, Solute, Solution, Properties, Chromatography, Multicellular, , Unicellular Organism,	Nucleus, Magnification, Cell, Tissue, Organ, Membrane, Energy, Gravitational, Renewable, Mass,		Gamete, Fertilisation, menstrual, Reproduction			Variation, Pollination	Reactant, Product, Salt, Neutralisation, Compound	Pesticide, Herbivore, Biomass, Weight, Pressure		

	Geothermal, Potential, Elastic, Temperature					
Grammar **Biology** 7BC Cells In this module students learn the foundations of biology and are introduced to cells. They will learn the main cell components and the functions and use microscopes to observe cells. **Chemistry** 7CP Particles In this module students learn the foundations of chemistry and are introduced to the particle theory and use it to identify pure and impure substances from particle diagrams and describe different separation techniques. **Physics** 7PE Energy In this module students learn the foundations of physics and introduces the energy store model and the mechanisms of transfer between different energy stores.		7BR Reproduction In this module learn the foundations of biology and are introduced to the topic of reproduction. Students learn the process of reproduction in mammals including humans. 7CC Chemical Reactions In this module students learn the foundations of chemistry and are introduced to simple chemical reactions. 7PF Forces In this module students learn the foundations of physics and are introduced to forces and force diagrams.	7BR Reproduction (continued) The module continues and students learn the process of reproduction in flowering plants. This module also introduces the concept of variation with respect to biological differences between species and statistical differences in data type e.g. continuous and discontinuous variation. 7CC Chemical Reactions (continued) The module continues and students learn the basics of acids and alkalis and the pH scale. 7PF Forces (continued) They also learn to calculate speed and interpret distance-time graphs.	8BE Ecological relationships In this module students review and build on their knowledge from the 7BR Reproduction module by learning about the causes of variation. 8CM Materials and the Earth In this module students learn the foundations of chemistry and are introduced to the structure and composition of the Earth before moving onto to look at the carbon cycle and the effects of human activity on the environment. 8CP Periodic Table In this module students review and build on their knowledge from the 7CP Particles and 7CR Reactions modules and are introduced to the periodic table and how it links to the physical and chemical properties of elements and their compounds. 8PL Light and space In this module students learn the foundations of physics and learn about the properties and behaviour light. It then moves on to look at space and planets.	
Vocabulary Instruction						
Multicellular, Organism, Nucleus, Magnification, Cell, Tissue, Organ, Membrane, Unicellular Distillation, Separation, Conservation, Solute, Solution, Properties, Chromatography Energy, Gravitational, Renewable, Mass, Geothermal, Potential, Elastic, Temperature		Gamete, Fertilisation, menstrual, Reproduction, Reactant, Product, Compound	Pollination Variation Salt, Neutralisation Weight, Pressure	Pesticide, Herbivore, Biomass Material, Polymer, Reactivity, Atom, Physical, Chemical, Element Vacuum, Refraction, Absorption, Transmission, Wavelength, Reflection		
Year 8	**Booster Curriculum** 7CP Particles In this module students build on the changing state module from year 7 and are introduced to the concept of particles and the properties of solids, liquids and gases. There is a focus on literacy in all these lessons. 7BC Cells In this module students build on their knowledge from the year 7 living things and their environment module to learn about the seven life process. There is a focus on literacy in all lessons.		7PE Energy This module introduces the different stores of energy then moves on to looking at the movement of energy between different stores. There is a focus on literacy in all lessons.	7BR Reproduction In this module students build on their knowledge from the bodies and flowers modules in year 7 and learn about the process of reproduction in plants and animals. There is a focus on literacy in all lessons.	7CC Chemical Reactions In this module students learn the foundations of chemistry and are introduced to simple chemical reactions. There is a focus on literacy in all lessons. 7PF Forces This module builds on the knowledge from the year 7 alternative curriculum module magnets and forces by looking at to forces and force diagrams. They also learn to calculate speed and interpret distance-time graphs. There is a focus on literacy in all lessons	
Vocabulary Instruction						
Distillation, Separation, Conservation, Solute, Solution, Properties, Chromatography	Multicellular, Organism, Nucleus, Magnification, Cell, Tissue, Organ, Membrane, Unicellular	Energy, Gravitational, Renewable, Mass, Geothermal, Potential, Elastic, Temperature	Gamete, Fertilisation, menstrual, Reproduction, Pollination	Reactant, Product, Compound,	Weight, Pressure	
Mainstream 8PL Light and space In this module students learn the foundations of physics and learn about the		8BN Digestion and nutrition In this module students review and	8PE Electricity and magnetism (continued) The students then move on the study magnetism.	9BP Plants and photosynthesis In this module students review and build on their knowledge from the 7BC Cells module and introduces the process of photosynthesis.		

properties and behaviour light. It then move on to look at space and planets. 8CP Periodic Table In this module students review and build on their knowledge from the 7CP Particles and 7CR Reactions modules and are introduced to the periodic table and how it links to the physical and chemical properties of elements and their compounds.		build on their knowledge from the 7BC Cells and focuses on the digestive system and diet. It introduces the action of enzymes in digestion. 8PE Electricity and magnetism In this module students review and build on their knowledge from the 7PE Energy and 7PF Forces modules and are introduced to electricity.	8CM Materials and the Earth In this module students learn the foundations of chemistry and are introduced to the structure and composition of the Earth before moving onto to look at the carbon cycle and the effects of human activity on the environment.	9PM Matter In this module students review and build on their knowledge from 7CP Particles and 7PE energy and revisits the particle model and expands it to the concept of density. The students then move on to apply the particle model to the concept of pressure. 9PF Forces in action In this module students review and build on their knowledge from the 7PE energy and 7PF Forces modules. The students apply the energy store model to a pendulum before moving on to moment and Hooke's Law.	
Vocabulary Instruction					
Vacuum, Refraction, Absorption, Transmission, Wavelength, Reflection	Material, Polymer, Reactivity, Atom, Physical, Chemical, Element	Carbohydrate, Protein, Villi, Glucose, Amino acid Current, Component, Resistance	Field, Material, Polymer	Chloroplast, Xylem, Phloem, Photosynthesis, Density, Compression	Internal, Work, Equilibrium, Deformation, Moment
Grammar **Biology** 8BN Digestion and nutrition In this module students review and build on their knowledge from the 7BC Cells and focuses on the digestive system and diet. It introduces the action of enzymes in digestion. **Chemistry** 8CP Periodic Table In this module students review and build on their knowledge from the 7CP Particles and 7CR Reactions modules and are introduced to the periodic table and how it links to the physical and chemical properties of elements and their compounds. **Physics** 8PE Electricity and magnetism In this module students review and build on their knowledge from the 7PE Energy and 7PF Forces modules and are introduced to the concept of electricity and magnetism.		**Grammar** **Biology** 9BP Plants and photosynthesis In this module students review and build on their knowledge from the 7BC Cells module and introduces the process of photosynthesis. 9CR Reactivity module students review and build on their knowledge from the 7CR Reactions and 8CP Periodic table modules and learn about the properties of metals. 8PE Electricity and magnetism (continued) The students then move on the study magnetism	9BB Biological systems In module students build on their knowledge from the 7BC Cells and 8BN modules and introduces the gas exchange, circulatory and skeletal systems. 9CR Reactivity (continued) The students then move on to consider chemical reactions involving metals and introduces the idea of metal extraction. 9PM Matter In this module students review and build on their knowledge from 7CP Particles and 7PE energy and revisit the particle model before expanding it to the concept of density. The students then move on to then moves on to apply the particle model to the concept of pressure.	9BB Biological systems (continued) The students are introduced to respiration. 9CE Energetics In this module students review and build on their knowledge from the 7CC chemical reactions and 9CR reactivity and learn about oxidation, thermal decomposition and combustion reactions. Students use equations to represent chemical reactions before categorising reactions as endothermic or exothermic. 9PF Forces in action In this module students review and build on their knowledge from the 7PE energy and 7PF Forces modules. The students apply the energy store model to a pendulum before moving on to moments and Hooke's Law.	
Vocabulary Instruction					
Carbohydrate, Protein, Villi, Glucose, Amino acid, Material, Polymer, Reactivity, Atom, Physical, Chemical, Element Current, Component, Resistance, Field		Chloroplast, Xylem, Phloem, Photosynthesis Field	Chromosome, exchange, Cilia Density, Compression	Aerobic, Anaerobic, Respiration, Decomposition, Oxidation, Exothermic, Endothermic, Displacement Internal, Work, Equilibrium, Deformation, Moment	

Year 9

Booster Curriculum

7CC Chemical Reactions (continued) In this module students are introduced to simple neutralisation reactions.
8BE Ecological relationships In this module students review and build on their knowledge from the 7BR Reproduction module by learning about the causes of variation.
8BE Ecological relationships In this module students review and build on their knowledge from the 7BR Reproduction module by learning about the causes of variation.
8CP Periodic Table In this module students review and build on their knowledge from the 7CP Particles and 7CC Chemical Reactions modules and are introduced to the periodic table and how it links to the physical and chemical properties of elements and their compounds.

8PE Electricity and magnetism In this condensed module students review and build on their knowledge from the 7PE Energy and 7PF Forces modules and are introduced to electricity.

9BP Plants and photosynthesis In this module students review and build on their knowledge from the 7BC Cells module and introduces the process of photosynthesis.

9BP Plants and photosynthesis (continued) In this module students review and build on their knowledge from the 7BC Cells module and introduces the process of photosynthesis.

9PF Forces in action In this condensed module students review and build on their knowledge from the 7PE energy and 7PF forces modules. The students apply the energy store model to a pendulum before moving on to Hooke's Law.

9CE Energetics In this module students review and build on their knowledge from the 7CC chemical reactions and learn about oxidation, thermal decomposition and combustion reactions. Students use equations to represent chemical reactions before categorising reactions as endothermic or exothermic.

B1.1 Cells, structure and transport In this module students review and build on their knowledge from the 7BC cells and 7CP particles modules to included cell transport mechanisms, including diffusion, osmosis and active transport.

C1.1 Atomic structure In this module students build on their knowledge from the 7CP particles and 8CP periodic table modules by developing their understanding of atoms.

P1.1 Conservation and dissipation of energy In this module students review and build on their knowledge from the 7PE energy and 8PE Electricity and magnetism modules by describing processes, such as forces and electrical currents, through which energy can be transferred.

B1.2 Cell division In this module students review and build on their knowledge from the 7BC cells module to describe cell division, growth and differentiation.

Vocabulary Instruction

Salt, Neutralisation	Pesticide, Herbivore, Biomass, Material, Polymer, Reactivity, Atom, Physical, Chemical, Element	Current, Component, Resistance, Chloroplast, Xylem, Phloem,	Photosynthesis, Internal, Work, Equilibrium, Deformation, Decomposition, Exothermic, Endothermic, Displacement	Transport, Osmosis, Specialised, Mitochondria, Eukaryote, Prokaryote, Isotopes, Protons, Ionisation, Dissipate, Generation, Efficiency	Mitosis, Differentiate

Mainstream

9CE Energetics In this module students review and build on their knowledge from the 7CC chemical reactions and 9CR reactivity and learn about oxidation, thermal decomposition and combustion reactions. Students use equations to represent chemical reactions before categorising reactions as endothermic or exothermic.
9PS Sound In this module students review and build on their knowledge from the 8PL Sound and Light module and introduces sounds waves. The students then compare sound and light waves before moving onto uses of ultrasound.
9BB Biological systems In this module students review and build on their knowledge from the 7BC Cells and 8BN modules and introduces the gas exchange, circulatory and skeletal systems. Finally, students are introduced to respiration.

B1.1 Cells, structure and transport In this module students review and build on their knowledge from the 7BC cells and 7CP particles modules to included cell transport mechanisms, including diffusion, osmosis and active transport.

B1.2 Cell division In this module students review and build on their knowledge from the 7BC cells module to describe cell division, growth and differentiation.
C1.1 Atomic structure In this module students build on their knowledge from the 7CP particles and 8CP periodic table modules by developing their understanding of atoms.
C1.2 The periodic table In this module students review and build on their knowledge from the 7CP particles and 8CP periodic table modules by describing the development of the periodic table and the trends in the properties of elements across the periodic table.
P1.1 Conservation and dissipation of energy In this module students review and build on their knowledge from the 7PE energy and 8PE

B1.3 Organisation and the digestive system In this module students review and build on their knowledge from the 8BN digestion and nutrition by explaining how different factors affect enzyme activity and the role of bile in digestion.
B1.4 Organising plants and animals In this module students review and build on their knowledge from the 9BB biological systems and 9BP plants and photosynthesis describing the transport systems in mammals and plants.
B2.5 Communicable diseases In this module students are introduced to the causes of communicable diseases, how they are spread and describe the body's defences to pathogens.
C1.3 Structure and bonding In this module students review and build on their knowledge from the C1.1 atomic structure and C1.2 periodic table modules by describe different types of bonding and explaining the properties of ionic compounds, covalent compounds and metals. The concepts of nanoparticles is introduced.
P1.3 Energy resources In this module students build on their knowledge from the 7PE energy by evaluating different methods of meeting the nation's energy demands.

					Electricity and magnetism modules by describing processes, such as forces and electrical currents, through which energy can be transferred. P1.2 Energy transfer by heating In this module students review and build on their knowledge from the 7PE energy by looking at heat energy transfer and applying it heating and insulating of buildings and introduces the concept of specific heat capacity. This module then extends to look at infrared radiation.		
Vocabulary Instruction							
Decomposition, Oxidation, Exothermic, Endothermic, Displacement, Ultrasound, Frequency, Transverse,	Chromosome, exchange, Cilia, Aerobic, Anaerobic, Respiration		Transport, Osmosis, Specialised, Mitochondria, Eukaryote, Prokaryote, Mitosis, Differentiate, Isotope, Proton, Ionisation, Aqueous, Residue		Isotope, Proton, Ionisation, Aqueous, Residue, Halogen, Intermolecular, Dissipate, Generation, Efficiency, Specific,	Transpiration, Cardiovascular, Pulmonary, Coronary, Oxygenated, Pathogen, Antigen, Delocalised, Electrostatic, Ionic, Covalent	
Grammar **Biology** B1.1 Cells, structure and transport In this module students review and build on their knowledge from the 7BC cells and 7CP particles modules to included cell transport mechanisms, including diffusion, osmosis and active transport. B1.2 Cell division In this module students review and build on their knowledge from the 7BC cells module to describe cell division, growth and differentiation. **Chemistry** C1.1 Atomic structure In this module students review and build on their knowledge from the 7CP particles and 8CP periodic table modules by developing their understanding of atoms. C1.2 The periodic table In this module students review and build on their knowledge from the 7CP particles and 8CP periodic table modules by describing the development of the periodic table and the trends in the properties of elements across the periodic table. This module then extends to look at transition elements. **Physics** P1.1 Conservation and dissipation of In this module students review and build on their knowledge from the 7PE energy and 8PE Electricity and magnetism modules by describing processes, such as forces and			B1.3 Organisation and the digestive system In this module students review and build on their knowledge from the 8BN digestion and nutrition by explaining how different factors affect enzyme activity and the role of bile in digestion C1.3 Structure and bonding In this module students review and build on their knowledge from the C1.1 atomic structure and C1.2 periodic table modules by describe different types of bonding and explaining the properties of ionic compounds, covalent compounds and metals. The concepts of nanoparticles is introduced. P1.3 Energy resources In this module students build on their knowledge from the 7PE energy		B1.4 Organising plants and animals In this module students review and build on their knowledge from the 9BB biological systems and 9BP plants and photosynthesis describing the transport systems in mammals and plants. C1.4 Chemical calculations In this module students review and build on their knowledge from the C1.1 atomic structure and C1.2 periodic table modules by calculating atomic mass and relative formula mass, before going onto learn about moles. This module also reviews and builds on the 7CC chemical reactions module through titration experiments. P2.4 Electric circuits In this module students review and build on their knowledge from the 7PE energy and 8PE Electricity and magnetism	B2.5 Communicable diseases In this module students are introduced to the causes of communicable diseases, how they are spread and describe the body's defences to pathogens. This module then extends to look at the process of growing bacteria in the lab before introducing plant defence responses. B2.6 Preventing and treating disease In this module students evaluate the use of vaccinations, antibiotics and pain killers before describing how drugs are discovered and developed before use. C2.5 Chemical changes In this module students review and build on their knowledge from the 7CC chemical reactions, 9CR reactivity and 9CE energetics modules by explaining how the extraction of a metal from its ore depends on the reactivity of the metal and using ionic equations for neutralisation reactions P2.6 Molecules and matter In this module students review and build on their knowledge from the 9PM Matter module and introduces the concept of internal energy and specific latent heat alongside describing the relationships between gas pressure and temperature and gas pressure and volume.	

	electrical currents, through which energy can be transferred. P1.2 Energy transfer by heating In this module students build on their knowledge from the 7PE energy by looking at heat energy transfer and applying it heating and insulating of buildings and introduces the concept of specific heat capacity. .		by evaluating different methods of meeting the nation's energy demands			modules by describing static electricity before describing electrical fields and investigating the relationship between current, potential difference and resistance in different components. P2.5 Electricity in the home In this module students review and build on their knowledge from the 7PE energy and P2.4 electrical circuits by looking at electrical safety in the home and calculating electrical power and efficiency.	P2.7 Radioactivity In this module students are introduced to nuclear radiation by describing the different types of nuclear radiation, calculating half-life and explaining the processes of nuclear fission and fusion.		
	Vocabulary Instruction								
	Specialised, Mitochondria, Eukaryote, Prokaryote, Mitosis, Differentiate, Isotope, Proton, Ionisation, Aqueous, Residue, Halogen, Intermolecular, Dissipate, Generation, Efficiency, Specific,		Delocalised, Electrostatic, Ionic, Covalent			Transpiration, Cardiovascular, Pulmonary, Coronary, Oxygenated, Potential difference, Thermistor	Pathogen, Antigen, Clinical, Placebo Crystallisation Internal energy, Latent, Irradiation, Contamination, Radioactive		

Term	1	2	3	Assessment 1	3	4	5	6	Assessment 2	6
Year 10	**Mainstream** B2.6 Preventing and treating disease In this module students evaluate the use of vaccinations, antibiotics and pain killers before describing how drugs are discovered and developed before use. B2.7 Non-communicable diseases In this module students review and build on their knowledge from the 9BB biological systems module by learning the explaining risk factors associated with different non communicable diseases. C1.4 Chemical calculations In this module students review and build on their knowledge from the C1.1 atomic structure and C1.2 periodic table modules by calculating atomic mass and relative formula mass, before going onto learn about moles. This module also reviews and builds on the 7CC chemical reactions module through titration experiments. B2.8 Photosynthesis In this module students review and build on their knowledge from the 9BP plants and B1.4 Organising plants and animals' modules by describing how plants use glucose and explaining limiting factors for photosynthesis. B2.9 Respiration In this module students review and build on their knowledge from the 9BB biological systems and B1.4 organising plants and animals' modules by comparing aerobic and anaerobic respiration		P2.4 Electric circuits In this module students review and build on their knowledge from the 7PE energy and 8PE Electricity and magnetism modules by describing electrical fields and investigating the relationship between current, potential difference and resistance in different components. P2.5 Electricity in the home In this module students review and build on their knowledge from the 7PE energy and P2.4 electrical circuits by looking at electrical safety in the home and calculating electrical power and efficiency. C2.5 Chemical changes In this module students review and build on their knowledge from the 7CR chemical reactions, 9CR reactivity and 9CE Energetics modules by explaining how the extraction of a metal from its ore depends on the reactivity of the metal and using ionic equations for neutralisation reactions C2.6 Chemical changes In this module students review and build on their knowledge from the 9CR reactivity module and are introduced to electrolysis	Review and reteach		C2.7 Energy changes In this module students review and build on their knowledge from the 9CE energetics module and draw reaction profile diagrams and complete bond energy calculations P2.6 Molecules and matter In this module students review and build on their knowledge from the 9PM Matter module and introduces the concept of internal energy and specific latent heat alongside describing the relationships between gas pressure and temperature. P2.7 Radioactivity In this module students are introduced to nuclear radiation by describing the different types of nuclear radiation and calculating half-life. B3.10 The human nervous system In this module students are introduced to the principles of homeostasis and the nervous system. B3.11 Hormonal co-ordination In this module students build on their knowledge from B3.10 the nervous system by introducing the principles of hormonal control and its role in maintaining blood glucose levels and reproduction.	C3.8 Rates and equilibrium In this module students review and build on their knowledge from the 9CE energetics module by investigating and explaining how different factors affect the rate of chemical reactions. C3.9 Crude oils and fuels In this module students review and build on their knowledge from the 7PE energy, 7CP particles and 9CE energetics modules by describing hydrocarbon fuels and how they are obtained from crude oil. B4.13 Reproduction In this module students review and build on their knowledge from the 7BR reproduction and 8BE ecological relationships modules by comparing sexual and asexual reproduction. The module goes on to extend students' knowledge by introducing genetics B4.14 Variation and evolution In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the processes of evolution, selective breeding and genetic engineering. B4.15 Genetics and evolution In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the evidence to support evolution and the way organisms are classified.		Review and reteach
Vocabulary Instruction										
Clinical, Placebo, Metabolism	Mesophyll,	Potential difference, Thermistor, Crystallisation, Electrolysis, Electrolyte			Activation energy, Internal energy, Latent, Irradiation, Contamination, Radioactive, Reflex	Anhydrous, Meiosis, Phenotype, Genotype, Dominant, Recessive,	Evolution, Extinction, Antibiotic resistance, Fossil			
Grammar B2.7 Non-communicable diseases In this module students review and build on their knowledge from the 9BB biological		B2.9 Respiration In this module students			B3.11 Hormonal co-ordination In this module	B3.12 Homeostasis in action In this module students build on their knowledge from B3.10 the human nervous system and B3.11				

	systems module by learning the explaining risk factors associated with different non communicable diseases. B2.8 Photosynthesis In this module students review and build on their knowledge from the 9BP plants and B1.4 Organising plants and animals' modules by describing how plants use glucose and explaining limiting factors for photosynthesis. C2.6 Chemical changes In this module students review and build on their knowledge from the 9CR reactivity module and are introduced to electrolysis. C2.7 Energy changes In this module students review and build on their knowledge from the 9CE energetics module and draw reaction profile diagrams and complete bond energy calculations. This module then extends to look at fuel cells. C3.8 Rates and equilibrium In this module students review and build on their knowledge from the 9CE energetics module by investigating and explaining how different factors affect the rate of chemical reactions. P3.8 Forces in balance In this module students review and build on their knowledge from the 7PF forces and 9PF forces and motion modules by introducing vectors and resolving forces.	review and build on their knowledge from the 9BB biological systems and B1.4 organising plants and animals' modules by comparing aerobic and anaerobic respiration. B3.10 The human nervous system In this module students are introduced to the principles of homeostasis and the nervous system. This module then extends to study the brain and eye. C3.9 Crude oils and fuels In this module students review and build on their knowledge from the 7PE energy, 7CP particles and 9CE energetics modules by describing hydrocarbon fuels and how they are obtained from crude oil. C3.10 Organic reactions In this module students review and build on their knowledge from the C3.9 crude oils and fuels module by learning the foundations of organic chemistry. P3.9 Motion In this module students review and build on their knowledge from the 7PF forces and 9PF forces and motion modules by calculating velocity and acceleration and analysing motion graphs. P3.10 Forces in motion In this module students review and build on their knowledge from the 7PF forces, 9PF and P3.9 motion forces and motion by describing the effect of forces acting on a falling body, during braking and introducing the concept of		students build on their knowledge from B3.10 the nervous system module by introducing the principles of hormonal control and its role in maintaining blood glucose levels and reproduction. This module then extends to look at hormonal control in plants. C3.11 Polymers In this module In this module students review and build on their knowledge from the C3.9 crude oils and fuels module by describing polymerisation reactions. C4.12 Chemical analysis In this module students review and build on their knowledge from the 7CP module by describing methods used to analyse chemicals. P3.11 Force and pressure In this module students matter and module by explaining pressure on liquids and gases. P4.12 Wave Properties In this module students review and build on their knowledge from the 8PL Light and space and 9PS Sound modules by looking at the nature and behaviour of waves.	hormonal co-ordination by describing the processes of temperature control and waste removal in the human body. B4.13 Reproduction In this module students review and build on their knowledge from the 7BR reproduction and 8BE ecological relationships modules by comparing sexual and asexual reproduction. The module goes on to extend students' knowledge by introducing genetics. C4.13 The Earth's atmosphere In this module students review and build on their knowledge from the 8CM Materials and the Earth module by explaining the change so in the composition of the Earth's atmosphere. C4.14 The Earth's resources In this module students review and build on their knowledge from the 8CM Materials and the Earth module by describing the processing methods of different resources obtained from the Earth. P4.13 Electromagnetic waves In this module students review and build on their knowledge from the 8PL Light and space module by describing the electromagnetic spectrum and its uses. P4.14 Light In this module students review and build on their knowledge from the P4.12 wave properties module by describing the behaviour of light in more detail and applying it to the use of lenses.	

			momentum. This module then extends to study the conservation of momentum and car safety.							
	Vocabulary Instruction									
	Metabolism, , Electrolysis, Electrolyte, Activation energy,	Mesophyll Anhydrous Displacement, Velocity	Reflex, Momentum			Suspension	Formulation,	Meiosis, Phenotype, Genotype, Dominant, Recessive, Potable, Finite, Desalination, effluent, Sustainable, Generator		

Term	1		2		3	4	5
Year 11	**Mainstream** B5.16 Adaptations, interdependence and competition In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the factors that affect survival in a habitat. B5.17 Organising the ecosystem In this module students review and build on their knowledge from the 8BE ecological relationships module by describing feeding relationships and material cycling in ecosystems. B5.18 Biodiversity and ecosystems In this module students build on their knowledge from B5.17 by analysing the impact f humans on the environment. P3.10 Forces in motion In this module students review and build on their knowledge from the 7PF forces, 9PF and P3.9 motion forces and motion by describing the effect of forces acting on a falling body, during braking and introducing the concept of momentum.	*Mock 1*	C4.12 Chemical analysis In this module students review and build on their knowledge from the 7CP module by describing methods used to analyse chemicals. C4.13 The Earth's atmosphere In this module students review and build on their knowledge from the 8CM Materials and the Earth module by explaining the change so in the composition of the Earth's atmosphere. C4.14 The Earth's resources In this module students review and build on their knowledge from the 8CM Materials and the Earth module by describing the processing methods of different resources obtained from the Earth. P4.12 Wave Properties In this module students review and build on their knowledge from the 8PL Light and space and 9PS Sound modules by describing the nature and behaviour of waves. P4.13 Electromagnetic waves In this module students review and build on their knowledge from the 8PL Light and space module by describing the electromagnetic spectrum and its uses. P4.15 Electromagnetism In this module students review and build on their knowledge from the 8PE Electricity and magnetism module by describing the motor effect.	*Mock 2*	**Revision and past paper practice to embed knowledge and apply skills**	*Mock 3*	**Revision and past paper practice to embed knowledge and apply skills**
	Vocabulary Instruction						
	Quadrat, Colonisation, Abundance, Distribution, Transect, Displacement, Velocity, Momentum		Suspension, Formulation, Potable, Finite, Desalination, effluent, Sustainable, Generator				
	Grammar B4.14 Variation and evolution In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the processes of evolution, selective breeding, cloning and genetic engineering. B4.15 Genetics and evolution In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the evidence to support evolution and the process of speciation before moving on to the way organisms are classified. P4.15 Electromagnetism In this module students review and build on their knowledge from the 8PE Electricity and magnetism module by describing the motor effect. P4.16 Space In this module students review and build on their knowledge from the 8PL Light and space module by describing the origin and future of the universe and the evidence supporting it.		B5.16 Adaptations, interdependence and competition In this module students review and build on their knowledge from the 8BE ecological relationships module by describing the factors that affect survival in a habitat. B5.17 Organising the ecosystem In this module students review and build on their knowledge from the 8BE ecological relationships module by describing feeding relationships and material cycling and decomposition in ecosystems. B5.18 Biodiversity and ecosystems In this module students build on their knowledge from B5.17 by analysing the impact of humans on the environment and the impact of food security. C4.15 Using resources In this module students build on their knowledge from C4.14 The Earth's resources by describing the production of ammonia via the Haber cycle.				
	Vocabulary Instruction						
	Evolution, Extinction, Antibiotic resistance, Fossil, Generator		Quadrat, Colonisation, Abundance, Distribution, Transect				

Term	1	Assessment 1		2	Assessment 2	2	3	Assessment 3	3	4	Assessment 4	4	5	6	Assessment 5	6
Year 12	**Applied Science Cambridge Technical** Science Fundamentals		Review and reteach	Science Fundamentals		Review and reteach	Laboratory Techniques		Review and reteach	Laboratory Techniques		Review and reteach	Control of hazards in the laboratory			Review and reteach
	Biology A Level Biological molecules Cell structure PAG 1 Microscopy			Biological molecules continued PAG 6 Chromatography PAG 9 Tests for biological molecules Cell Membranes PAG 8 Membranes			Enzymes PAG 4 Enzymes Nucleic acids Exchange surfaces			Animal transport PAG 2 Dissection PAG 11 Exercise and pulse rate Cell division, diversity & organisation Biodiversity Plant transport PAG 5 Potometer			Biodiversity continued Communicable diseases Classification & evolution Communication & homeostasis Cellular control			
	Chemistry A Level Atomic structure Bonding Periodicity			Amount of substance Introduction to organic chemistry Alkanes			Redox reactions Haloalkanes Group 2 elements Group 7 elements Alkenes			Energetics Alcohols Organic analysis			Kinetics Equilibria Equilibria & *Kp* Rate equations Revision & practical skills			
	Physics A Level Measurements and errors Particles and radiation			Waves Required practical 1 Required practical 2 Required practical 3			Mechanics and materials Required practical 4			Electricity Required practical 5 Required practical 6			Further mechanics Required practical 7 Gases Required practical 8 Nuclear			

Term	1	Mock 1	2	Mock 2	3	Mock 3	4	Mock 4	5
	Applied Science Cambridge Technical Microbiology		Microbiology		Product Testing		Product Testing		
Year 13	**Biology A Level** Excretion Patterns of inheritance Nerves		Hormones Manipulating genomes Plant & animal responses Cloning & biotechnology PAG 7 Microbiology		Photosynthesis PAG 12 Photosynthesis Ecosystems Populations & sustainability		Respiration Revision		**Revision and past paper practice to embed knowledge and apply skills**
	Chemistry A Level Equilibrium constant *Kp* Aromatic chemistry Rate equations Amines Aldehydes and ketones Elements Isomerism		Acids and bases Carboxylic acids & derivatives Thermodynamics Polymers		Electrochemistry Amino acids, proteins & DNA Spectroscopy		Transition metals Chromatography Reactions of ions in aqueous solutions Organic synthesis		
	Physics A Level Nuclear Further mechanics Required practical 7		Fields Required practical 9 Required practical 10 Required practical 11		Astrophysics Revision		Revision		

Impact

Exam results show an increase in attainment over the past three years and consistent outstanding progress in science GCSE's. GCSE results also show that all groups of learner are making positive progress (All 1.0, Boys 0.9, Girls 1.0, Pupil premium 0.9, SEN 0.5, EAL 1.69, Low ability 1.1, Mid ability 1.2, High ability 0.8).Our curriculum regularly monitors and progress and addresses any misconceptions using pre (cold task) and post (hot ask) module testing. At KS3 students also show progress through a set of key performance indicators (KPI). Students are teacher assessed on these KPI tasks and given feedback to address any misconceptions. At KS4 students are given tasks to improve their knowledge of a module after the hot task, also teachers provide whole class feedback after a hot task and re-teach any class misconceptions.

All students continue with science from KS3 to KS4 and the number of students choosing to study at least one science subject at KS5 is increasing (20% to 27% from 2019-2021)