

		Year 10	Year 11
Autumn 1	Content (Why)	This unit develops students' understanding of fundamental ideas across chemistry and physics , showing how scientific models and theories are used to explain the behaviour of matter and energy. Students explore how the development of the periodic table and atomic model demonstrates that scientific understanding changes as new evidence emerges. Knowledge of structure and bonding allows students to explain the properties and uses of materials, while energy and electricity demonstrate how scientific principles underpin modern technology and society. Students also consider the challenges of energy demand, fossil fuel use, global warming and sustainable energy production .	This unit develops students' understanding of how scientific principles can be used to explain, predict and control change across chemistry, physics and biology. Rates of reaction develops understanding of the factors that influence chemical reactions and how conditions can be controlled to improve the yield of useful products. Waves allows students to understand how energy and information are transferred , linking scientific principles to communication, imaging and engineering. Homeostasis develops understanding of how the nervous and hormonal systems coordinate the body , including their important roles in maintaining stable conditions and controlling reproduction.
	Content (What)	Students investigate atomic structure and the periodic table , including how elements are organised and how the modern periodic table developed. They explore different types of chemical bonding and structure and use these to explain the physical and chemical properties of materials. Students investigate energy stores, transfers and efficiency, including energy resources and the environmental consequences of energy production. They also develop their understanding of electric charge, current, potential difference, resistance, electrical power and circuits , considering how electricity is generated and supplied.	Students investigate rates of chemical reaction , including the effects of temperature, concentration, pressure, surface area and catalysts, alongside reversible reactions and factors affecting yield. In physics, students explore the properties and behaviour of mechanical and electromagnetic waves , including how waves transfer energy and information and their applications in modern technologies. In biology, students investigate the nervous and endocrine systems , including reflex responses, hormones, the menstrual cycle, contraception and fertility treatments.
	Acquire (Knowledge)	- Understand atomic structure and the organisation of the periodic table, including how scientific models have developed as new evidence has emerged. - Understand how bonding and structure determine the properties of substances and materials, and how these properties influence their uses. - Understand the principles of energy transfer and electricity, including circuits, electrical power, energy resources and the environmental implications of different methods of energy generation.	- Understand the factors affecting rates of reaction, how collision theory explains these changes, and how conditions can influence reversible reactions and the yield of products. - Understand the properties and behaviour of waves, including how mechanical and electromagnetic waves transfer energy and information and their uses within technology. - Understand how the nervous and hormonal systems coordinate and control the body, including reflexes, the menstrual cycle, contraception and fertility.

	Apply (Skills)	Students apply their knowledge through scientific enquiry, practical investigation, calculations and data analysis . They use atomic models and the periodic table to predict and explain chemical behaviour and relate bonding and structure to material properties. Students construct and investigate electrical circuits, take measurements and use appropriate equations to calculate quantities such as energy, power, current, potential difference and resistance. They interpret graphs and experimental data, evaluate methods and evidence, and use scientific understanding to compare energy resources and make evidence-based conclusions about sustainable energy production .	Students apply their knowledge through practical investigation, calculations, modelling and data analysis . They investigate factors affecting reaction rates, control variables, calculate rates and interpret graphs to identify relationships. Students use wave equations and diagrams to analyse wave behaviour and evaluate the uses of different electromagnetic waves. In biology, they interpret information about nervous and hormonal responses and apply their understanding to unfamiliar contexts involving reproduction and homeostasis. Throughout the unit, students develop their ability to analyse data, evaluate experimental methods, apply scientific equations and construct evidence-based explanations and conclusions .
Autumn 2	Content (Why)	This unit develops students' understanding of how biological systems and chemical reactions are organised and explained through scientific principles. Students build on prior knowledge of cells, organs, particles and chemical reactions to explore how the digestive, respiratory and circulatory systems work together to maintain life. In chemistry, students develop their understanding of how substances change during reactions and how energy is transferred. This provides important foundations for later learning about health, bioenergetics, reactivity, electrolysis and rates of reaction .	This unit provides students with the opportunity to demonstrate and consolidate their understanding of Paper 1 content across Biology, Chemistry and Physics through formal assessment. The outcomes allow students and teachers to identify strengths, gaps in knowledge and misconceptions that require further development. Students then develop their understanding of organic chemistry , exploring the importance of carbon compounds and how naturally occurring resources, particularly fossil fuels, provide the raw materials used to manufacture a wide range of useful products.
	Content (What)	Students investigate the human digestive, respiratory and circulatory systems , including how nutrients, oxygen and carbon dioxide are transported around the body in the blood. They explore how organs and tissues are adapted to perform their functions and how different organ systems work together. In chemistry, students investigate chemical changes , including electrolysis, oxidation and reduction, before exploring exothermic and endothermic reactions and the transfer of energy during chemical reactions.	Students complete Paper 1 examinations in Biology, Chemistry and Physics , applying knowledge and scientific skills developed across the curriculum. In organic chemistry, students investigate carbon compounds, crude oil and hydrocarbons , including their properties and uses. They explore how crude oil is separated into useful fractions and how hydrocarbons can be processed to produce fuels and feedstocks for the petrochemical industry. Students consider how organic chemistry is used to manufacture products including polymers, pharmaceuticals, detergents, dyes, perfumes and flavourings .
	Acquire (Knowledge)	- Understand the structure and function of the digestive, respiratory and circulatory systems and how they work together to transport essential substances around the body. - Understand chemical changes, including oxidation, reduction	- Secure and retrieve essential Paper 1 Biology, Chemistry and Physics knowledge, including key concepts, equations, terminology and practical understanding. - Understand that crude oil is a finite resource containing

		and electrolysis, and how these processes can be represented and explained scientifically. Understand the difference between exothermic and endothermic reactions and how energy is transferred between a chemical reaction and its surroundings.	hydrocarbons and know how these compounds can be separated and processed to produce useful fuels and chemical feedstocks. Understand how organic compounds can be modified to manufacture useful materials and products, and recognise the importance of organic chemistry within modern industry and everyday life.
	Apply (Skills)	Students apply their knowledge through practical investigation, scientific diagrams, data analysis and extended scientific explanations. They explain relationships between the digestive, respiratory and circulatory systems and interpret information about how substances are transported around the body. Students investigate chemical and energy changes experimentally, make observations, record and analyse results and use evidence to identify patterns. They develop their ability to use scientific terminology, equations, models and data to explain chemical reactions and evaluate experimental methods and conclusions.	Students apply their scientific knowledge through formal examination questions, calculations, data interpretation, practical-based questions and extended scientific explanations. Assessment information is used to identify misconceptions and priority areas for improvement. In organic chemistry, students interpret molecular structures, formulae and chemical equations, analyse patterns in the properties of hydrocarbons and apply their knowledge to industrial processes. Students continue to develop their ability to analyse evidence, apply scientific knowledge to unfamiliar contexts, evaluate information and communicate scientifically accurate conclusions.
Spring 1	Content (Why)	This unit develops students' understanding of key concepts across physics, chemistry and biology, while making explicit connections between previously taught scientific ideas. The particle model builds on learning from Years 7 and 9 and allows students to connect concepts such as diffusion, pressure, temperature and rates of reaction across the sciences. Energy changes are placed into real-life contexts through endothermic and exothermic reactions. Students also develop their understanding of the life cycle of stars and the universe, while infection and response builds on previous learning about microbes and disease by exploring the immune system, vaccination, antibiotics and antibiotic resistance in greater depth.	This unit develops students' understanding of key concepts across biology, chemistry and physics, while building on scientific knowledge developed earlier in the curriculum. In biology, students extend their previous learning about genetics to explore inheritance, variation and evolution, including the ethical implications of modern genetic technologies. Chemistry develops understanding of how society uses the Earth's finite resources and the importance of sustainable manufacturing and environmental protection. Physics builds on previous work on forces and motion, developing students' ability to explain and calculate how forces affect objects in everyday and engineering contexts.
	Content (What)	Students use the particle model to explain the properties and behaviour of solids, liquids and gases and make links to diffusion, pressure, temperature and rates of reaction. They investigate endothermic and exothermic reactions, including applications such as hand warmers and	Students investigate meiosis, genes, chromosomes, dominant and recessive inheritance, mutation, variation, natural selection and evolution. They explore selective breeding, cloning and genetic engineering and consider the potential benefits, risks and ethical issues

		sports injury packs. In physics, students explore space and the life cycle of stars , including gravity, fusion and the forces acting within stars. In biology, students study pathogens, transmission of disease and the body's defence systems, including phagocytes, lymphocytes, antibodies and vaccination , alongside the use of antibiotics and the increasing challenge of antibiotic resistance.	associated with these technologies. In chemistry, students investigate the use of finite and renewable resources, sustainability, pollution, waste, water treatment and life-cycle assessments , making connections to the carbon and water cycles. In physics, students study scalar and vector quantities, forces, work, elasticity and motion , including relationships between distance, time, speed and velocity.
	Acquire (Knowledge)	- Understand how the particle model explains the behaviour of matter, diffusion, pressure and temperature, and how energy is transferred during endothermic and exothermic reactions. - Understand the life cycle of stars, including how gravity forms stars from dust and gas, how nuclear fusion releases energy and how forces within a star can reach equilibrium. - Understand how pathogens cause and spread infectious diseases, how the body's immune system responds through phagocytes and lymphocytes, and the roles of vaccination, antibiotics and antibiotic resistance.	- Understand how genes, chromosomes, meiosis, mutation and sexual reproduction create inheritance and variation, and how natural selection can lead to evolution. - Understand how the use of the Earth's natural resources affects the environment and how sustainable practices, recycling, waste reduction and life-cycle assessment can reduce environmental impacts. - Understand the difference between scalar and vector quantities and know how forces, work, elasticity, speed and velocity can be used to describe and explain the behaviour and motion of objects.
	Apply (Skills)	Students apply their knowledge through practical investigation, scientific modelling, calculations and data analysis . They use particle diagrams and models to explain observations and make connections between biological, chemical and physical processes. Students investigate energy changes experimentally and interpret temperature data to identify endothermic and exothermic reactions. They use models and scientific evidence to explain the formation and life cycle of stars and analyse information about the spread and prevention of infectious disease. Throughout the unit, students develop their ability to interpret graphs and data, evaluate experimental methods, identify patterns and construct detailed scientific explanations using appropriate terminology and evidence .	Students apply their knowledge through genetic diagrams, calculations, practical investigation, data analysis and evaluation . They predict inheritance using genetic crosses and use scientific evidence to explain variation, natural selection and evolution, while evaluating the ethical and social considerations surrounding cloning and genetic engineering. Students analyse environmental data and life-cycle information to compare the sustainability of products and processes. In physics, they represent forces using vectors, analyse motion and force data and apply appropriate equations to solve problems involving work, force, distance, speed, velocity and elasticity . Throughout the unit, students develop their ability to analyse evidence, evaluate scientific claims and communicate evidence-based conclusions .
Spring 2	Content (Why)	This unit develops students' understanding of key concepts across biology and chemistry , combining practical investigation with increasingly quantitative scientific thinking. Photosynthesis builds on	This unit provides students with dedicated time to retrieve, consolidate and apply their knowledge of AQA Paper 2 content across Biology, Chemistry and Physics . Structured revision allows students to identify

		prior learning about plant cells and ecosystems by exploring how plants produce glucose and how environmental factors affect the rate of this process. Quantitative chemistry develops students' ability to use mathematical relationships to understand chemical reactions, moving from qualitative descriptions towards precise calculations involving formulae, equations, moles, concentration and yield .	and address gaps in understanding before completing formal mock examinations. The assessments provide teachers with evidence of students' strengths and areas for development, which can be used to inform subsequent teaching and targeted intervention.
	Content (What)	Students investigate photosynthesis , including how light intensity, carbon dioxide concentration and temperature affect its rate. Practical work using green plants allows students to investigate the effect of changing light intensity and consider variables, reliability and accuracy. Students also explore how plants interact with animals and microorganisms within ecosystems. In chemistry, students use quantitative methods to determine chemical formulae, balance equations and calculate relative formula mass, moles, concentrations and percentage yield .	Students revisit key Paper 2 Biology, Chemistry and Physics content, including essential scientific concepts, equations, terminology and practical knowledge. Revision includes retrieval of previously taught material alongside opportunities to apply knowledge to examination-style questions. Students then complete formal AQA Paper 2 mock examinations in Biology, Chemistry and Physics.
	Acquire (Knowledge)	- Understand the process of photosynthesis and how light intensity, carbon dioxide concentration and temperature can act as limiting factors affecting its rate. - Understand the importance of plants within ecosystems and the relationships between plants, animals and microorganisms. - Understand how chemical formulae, balanced equations, moles, concentration and yield can be used to describe and quantify chemical reactions.	- Retrieve and consolidate essential Paper 2 knowledge across Biology, Chemistry and Physics. - Secure understanding and recall of key scientific terminology, processes, equations and required practicals. - Identify and address gaps in knowledge and misconceptions through focused revision and feedback.
	Apply (Skills)	Students apply their knowledge through practical investigation, mathematical calculations and analysis of scientific data . They plan and carry out investigations into the rate of photosynthesis, identify independent, dependent and control variables, record results and use graphs to identify relationships and limiting factors. In chemistry, students use balanced equations and quantitative relationships to calculate moles, masses, concentrations and yields. Throughout the unit, students develop their ability to analyse data, evaluate experimental methods, use mathematical reasoning and draw evidence-based	Students apply their knowledge through examination-style questions, scientific calculations, practical-based questions, data and graph interpretation and extended scientific explanations . They develop confidence in selecting and applying knowledge to familiar and unfamiliar contexts and interpreting command words accurately. Mock examination outcomes and question-level analysis (QLA) are used to identify priority areas for subsequent re-teaching, supporting further development of students' scientific knowledge, application and examination technique.

		scientific conclusions.	
Summer 1	Content (Why)	This unit develops students' understanding of forces and motion and how these can be represented mathematically and graphically. Students build on prior learning about forces by distinguishing between scalar and vector quantities and exploring how forces affect the motion and shape of objects. Practical investigation of springs develops understanding of force and extension, while Newton's Laws allow students to explain why objects accelerate, remain stationary or move at constant velocity. These concepts provide important foundations for understanding mechanics and the behaviour of objects in everyday situations.	Examination preparation.
	Content (What)	Students distinguish between scalar and vector quantities , including distance, displacement, speed, velocity, mass, weight and force. They investigate the relationship between force and extension in a spring , including Hooke's Law and the limit of proportionality. Students analyse velocity-time and displacement-time graphs to describe and calculate aspects of motion. They study Newton's Laws and apply them to explain how resultant forces affect the movement and acceleration of objects.	Examination preparation.
	Acquire (Knowledge)	- Understand the difference between scalar and vector quantities and know appropriate examples of each, including the distinction between distance and displacement and speed and velocity. - Understand the relationship between force and extension in a spring, including Hooke's Law, proportionality and the limit of proportionality. - Know Newton's Laws of motion and understand how displacement-time and velocity-time graphs can be used to represent and interpret the motion of objects.	Examination preparation.
	Apply (Skills)	Students apply their knowledge through practical investigation, calculations and graphical analysis . They investigate how changing the force applied to a spring affects its extension, identify variables, collect	Examination preparation.

		measurements and plot and interpret force-extension graphs. Students use displacement-time and velocity-time graphs to calculate and interpret speed, velocity and acceleration and apply Newton's Laws to explain changes in motion. Throughout the unit, students develop their ability to analyse data, interpret graphs, apply equations, evaluate practical methods and construct evidence-based scientific explanations.	
Summer 2	Content (Why)	This unit provides students with the opportunity to consolidate and retrieve key scientific knowledge from across the year before completing their end-of-year examinations. Assessment outcomes are then used to identify gaps in knowledge and misconceptions, allowing teachers to respond to the specific needs of their classes. Targeted re-teaching ensures that important concepts are secure before students progress to the next stage of the science curriculum.	
	Content (What)	Students revisit key content from across biology, chemistry and physics , focusing on important concepts, scientific vocabulary, equations and practical knowledge. Students complete end-of-year assessments covering the curriculum taught during the year. Following assessment, teachers use performance and question-level analysis to identify priority areas for re-teaching, consolidation and further practice.	
	Acquire (Knowledge)	- Retrieve and consolidate essential knowledge from across biology, chemistry and physics studied throughout the year. - Secure understanding of key scientific terminology, processes, equations and required practical knowledge. - Address specific gaps in knowledge and misconceptions identified through end-of-year assessment.	
	Apply (Skills)	Students apply their knowledge through retrieval practice, scientific calculations, data and graph interpretation, practical-based questions and extended scientific explanations. Following assessment, students revisit identified areas for development and use feedback to correct misconceptions and improve their responses. Targeted re-teaching	

		develops students' ability to apply knowledge to unfamiliar contexts, analyse scientific evidence, evaluate methods and communicate conclusions accurately.	
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