RIVERSACADEMY
West London An Aspirations Academy

(SCIENCE) - Curriculum Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7 curriculum overview - for 26/27 year 7 cohort see new plan.	Investigative Skills Biology - B1- Cells and organisation Chemistry - C1- Particle model Physics - P1- Energy 1	Biology -B2- Digestion and Nutrition Chemistry - C2- Elements Physics -P2- Forces	Biology -B3- Circulation and Breathing Chemistry - C3- Periodic Table Physics - P3- Waves	Biology -B4- Movement Chemistry -C4- Metal and other materials Physics - P4- Light	Biology -B5- Reproduction Biology -B6 - No Limits Project - Fitness Chemistry-C5- Acids and Alkalis Physics P5- Electricity	Intervention with RPA(required Practical Assessment) focus: B1-6 C1-5 P1-5
Key knowledge outcomes (students should know)	**Investigative Skills** Identify independent, dependent and control variables in scientific investigations. Select appropriate equipment and methods to collect accurate data. Present data using tables, charts and graphs.	**Biology B2 - Digestion and Nutrition** Describe the components of a balanced diet and their functions. Explain the structure and function of the digestive system. Describe the role of enzymes in digestion. Explain how nutrients	**Biology B3 - Circulation and Breathing** Describe the structure and function of the heart and circulatory system. Explain the role of blood vessels and blood components. Describe the structure and	**Biology B4 - Movement** Describe the functions of the skeleton. Explain how muscles and bones work together to produce movement. Identify major bones and joints in the human body.	**Biology B5 - Reproduction** Describe the structures and functions of the male and female reproductive systems. Explain the physical and emotional changes that occur during puberty. Describe the	**Revision Science week** The key scientific knowledge and vocabulary from topics studied throughout the year. How to apply scientific knowledge to explain observations and solve unfamiliar problems.

	Analyse results and draw evidence-based conclusions. **Biology B1 - Cells and Organisation** Describe the structure and function of plant and animal cells. Explain the roles of specialised cells and how they are adapted for their functions. Describe the organisation of cells, tissues, organs and organ systems. Use microscopes safely to observe and compare cells. **Chemistry C1 - Particle Model** Describe the arrangement and movement of particles in solids, liquids and	are absorbed into the bloodstream. **Chemistry C2 - Elements** Distinguish between elements, compounds and mixtures. Identify elements using symbols and names. Describe the basic structure of atoms. Explain how elements combine to form compounds. **Physics P2 - Forces** Identify contact and non-contact forces. Explain the effects of balanced and unbalanced forces. Measure forces using appropriate	function of the respiratory system. Explain how oxygen and carbon dioxide are exchanged in the lungs. **Chemistry C3 - Periodic Table** Describe how elements are arranged in the periodic table. Explain the difference between metals and non-metals. Identify patterns within groups and periods. Describe the contribution of scientists to the development of the periodic table. **Physics P3 - Waves**	Explain the importance of exercise for maintaining a healthy musculoskeletal system. **Chemistry C4 - Metals and Other Materials** Describe the physical properties of metals and non-metals. Explain the uses of common metals based on their properties. Describe the differences between pure metals and alloys. Relate material properties to their everyday applications. **Physics P4 - Light** Describe how light travels in straight	processes of fertilisation and pregnancy. Explain how traits are passed from parents to offspring. **Biology B6 - No Limits Project: Fitness** Explain the effects of exercise on the body systems. Describe components of fitness including strength, stamina and flexibility. Interpret fitness data and identify areas for improvement. Evaluate lifestyle choices that contribute to health and wellbeing.	How to interpret data, identify patterns and draw evidence-based conclusions. How scientific ideas are developed, tested and applied to real-world contexts. How scientists use enquiry, collaboration and communication to investigate questions and share findings. The importance of science in addressing local and global challenges and shaping future technologies.

	gases. Explain changes of state using the particle model. Compare the properties of solids, liquids and gases. Interpret simple particle diagrams to explain observations. **Physics P1 - Energy 1** Identify different energy stores and pathways for energy transfer. Explain that energy cannot be created or destroyed. Distinguish between useful and wasted energy transfers. Describe ways of reducing energy waste in everyday situations.	equipment and units. Describe the effects of friction and air resistance.	Explain how waves transfer energy. Distinguish between transverse and longitudinal waves. Describe how sound waves travel through different media. Explain how wave frequency and amplitude affect observations.	lines. Explain reflection and refraction of light. Describe how images are formed in mirrors. Explain how colour is produced and observed.	**Chemistry C5 - Acids and Alkalis** Identify acids and alkalis using indicators and the pH scale. Explain neutralisation reactions and their products. Describe common uses of acids and alkalis in everyday life. Carry out practical investigations involving acids and alkalis safely. **Physics P5 - Electricity** Describe how electric current flows in simple circuits. Interpret and draw	

					circuit diagrams using standard symbols. Explain the difference between current and voltage. Investigate factors that affect the brightness of bulbs and operation of circuits.	
Key skills (students should be able to)	Observing Communicating Classifying Predicting Practical procedures	Communicating Classifying Inferring Measuring	Observing Communicating Classifying Measuring Predicting	Communicating Classifying Inferring Measuring Predicting	Observing Classifying Inferring Predicting	Observing Communicating Classifying Measuring
Year 8 curriculum overview	Biology -B7- Respiration Chemistry - C6- Metals and Non-metals Physics - P6- Forces II	Biology -B8- Microorganisms Chemistry - C7- Energetics Physics -P7- Force multipliers	Biology - B9- DNA and Genes Chemistry -C8- Global Challenges Physics - P8- Electromagnets	Biology -B10- Adaptation Chemistry -C9- Earth's Resources Physics -P9- Energy II	Maths Skills in Science KS3M1 Chemistry-C10- Separating Techniques Physics-P10- Physics in medicine.	Intervention: RPA(required Practical Assessment) focus: Analysis and Exam Practice B7-10 C6-10 P6-10
Key knowledge outcomes (students should know)	**Biology B7 - Respiration**	**Biology B8 - Microorganisms**	**Biology B9 - DNA and Genes**	**Biology B10 - Adaptation**	**Maths Skills in Science (KS3M1)**	**Revision Science week**

	Describe the process of aerobic respiration and its importance in releasing energy from food. Compare aerobic and anaerobic respiration in humans and other organisms. Explain the relationship between respiration, exercise and energy requirements. Describe the effects of exercise on breathing rate and heart rate. **Chemistry C6 - Metals and Non-metals** Compare the physical and chemical properties of metals and non-metals. Explain how metals react with oxygen,	Identify different types of microorganisms, including bacteria, fungi and viruses. Explain how microorganisms can be beneficial and harmful. Describe how pathogens spread and cause disease. Explain methods used to prevent and control infections. **Chemistry C7 - Energetics** Describe energy changes that occur during chemical reactions. Distinguish between exothermic and endothermic reactions.	Describe the structure and function of DNA, genes and chromosomes. Explain how inherited characteristics are passed from parents to offspring. Distinguish between inherited and environmental variation. Describe how genetic information contributes to individual differences. **Chemistry C8 - Global Challenges** Explain the causes and effects of climate change and global warming. Describe the	Describe how organisms are adapted to survive in different environments. Explain structural, behavioural and functional adaptations. Describe how competition affects the survival of organisms. Explain how environmental changes can affect populations. **Chemistry C9 - Earth's Resources** Describe the Earth's resources and explain why some are finite. Explain the importance of sustainable	Use standard units and convert between common units of measurement. Calculate averages, percentages and ratios in scientific contexts. Present and interpret data using tables, graphs and charts. Analyse patterns in data and use evidence to support conclusions. **Chemistry C10 - Separating Techniques** Describe methods used to separate mixtures, including filtration, evaporation, distillation and	The key scientific knowledge and vocabulary from topics studied throughout the year. How to apply scientific knowledge to explain observations and solve unfamiliar problems. How to interpret data, identify patterns and draw evidence-based conclusions. How scientific ideas are developed, tested and applied to real-world contexts. How scientists use enquiry, collaboration and communication to

	water and acids. Describe patterns of reactivity and the concept of a reactivity series. Relate the properties of metals and non-metals to their everyday uses. **Physics P6 - Forces II** Explain the relationship between force, mass and weight. Describe the effects of gravity on objects on Earth and in space. Interpret force diagrams and calculate resultant forces. Explain how forces affect the motion of objects.	Explain how energy is transferred to and from the surroundings. Apply ideas about energy changes to everyday examples and practical investigations. **Physics P7 - Force Multipliers** Describe how simple machines make work easier. Explain the operation of levers, pulleys and gears. Calculate and compare mechanical advantages in simple systems. Evaluate the uses of force multipliers in everyday life.	environmental impacts of human activities. Explain the role of greenhouse gases in Earth's atmosphere. Evaluate strategies for reducing environmental damage and promoting sustainability. **Physics P8 - Electromagnets** Describe how magnetic fields are produced by electric currents. Explain how electromagnets are constructed and how their strength can be increased. Compare permanent magnets and electromagnets.	development. Describe methods used to obtain useful materials from natural resources. Evaluate strategies such as recycling and reuse to conserve resources. **Physics P9 - Energy II** Calculate energy transfers using appropriate equations. Explain efficiency and identify ways to reduce energy wastage. Describe energy transfers in domestic and industrial systems. Evaluate methods used to improve energy efficiency.	chromatography. Select appropriate separation techniques for different substances. Interpret chromatograms and identify dissolved substances. Evaluate the effectiveness of different separation methods. **Physics P10 - Physics in Medicine** Describe how waves and radiation are used in medical diagnosis and treatment. Explain the uses of ultrasound, X-rays and other imaging technologies. Evaluate the benefits and risks	investigate questions and share findings. The importance of science in addressing local and global challenges and shaping future technologies.

			Describe practical applications of electromagnets in everyday devices.		associated with medical technologies. Describe how scientific developments have improved healthcare and patient outcomes.	
Key skills (students should be able to)	Observing Communicating Classifying Predicting	Communicating Classifying Inferring Measuring Analysing	Observing Communicating Classifying Measuring Predicting Analysing	Communicating Classifying Inferring Measuring Predicting	Observing Classifying Inferring Predicting	Observing Communicating Classifying Calculating Recall
Year 9 curriculum overview	Biology -B1 - Cells and Organisation Chemistry -C10- Chemical analysis Chemistry -C11 Earth's atmosphere Physics -P3 - Energy resources	Biology -B2 - Cell Division Biology -B7 - Non-communicable diseases Chemistry -C12 - Earth's resources Physics -P1 - Energy	Biology -B3 - Organisation and the digestive system Chemistry -C7 - Energy Changes Physics-P2 - Energy and heating	Biology-B4 - Organisation in Animals and Plants Chemistry-C5 - Chemical changes Physics-P4 - Electrical Circuits	Biology -B5- Communicable diseases, Biology -B6- Preventing and Treating Diseases Physics-P5- Electricity at Home	Intervention; RPA focus(required Practical Assessment) Analysis and Exam Practice B1-4, B7 C10,C12,C7,C5 P1-4
Key knowledge outcomes (students should know)	**Biology - B1: Cells and Organisation** Describe the structure	**Biology - B2: Cell Division** Describe the stages of	**Biology - B3: Organisation and the Digestive System**	**Biology - B4: Organisation in Animals and Plants**	**Biology - B5: Communicable Diseases**	The key scientific concepts, vocabulary and processes from

	and function of animal, plant and specialised cells, including adaptations for their roles. Explain how substances move into and out of cells by diffusion, osmosis and active transport. Understand the organisation of multicellular organisms, including tissues, organs and organ systems. **Chemistry - C10: Chemical Analysis** Use methods such as chromatography to separate substances and identify unknown compounds. Interpret tests for gases and analyse the purity of substances using melting and	the cell cycle and the process of mitosis. Explain the importance of cell division for growth, repair and asexual reproduction. Compare mitosis and meiosis and understand the role of stem cells. **Biology - B7: Non-communicable Diseases** Describe the causes and effects of major non-communicable diseases. Explain how lifestyle factors can increase disease risk. Interpret data linking risk factors to health outcomes. **Chemistry - C12: Earth's Resources**	Describe the organisation of the digestive system and the functions of its organs. Explain the role of enzymes in digestion and factors affecting enzyme activity. Understand how substances are absorbed and transported around the body. **Chemistry - C7: Energy Changes** Describe exothermic and endothermic reactions and their energy transfers. Interpret reaction profiles and activation energy diagrams. Explain the use of energy changes in	Describe the structure and function of the heart, blood vessels and blood. Explain the processes of transport in plants, including transpiration and translocation. Understand how exchange surfaces are adapted for efficient substance transfer. **Chemistry - C5: Chemical Changes** Explain reactivity and displacement reactions involving metals. Describe electrolysis and its use in extracting and purifying substances. Interpret the reactions of acids with metals, bases	Describe how pathogens cause communicable diseases and how they are transmitted. Explain the differences between bacterial, viral, fungal and protist diseases. Understand methods used to reduce the spread of infection. **Biology - B6: Preventing and Treating Diseases** Explain how the body defends itself against pathogens. Describe the development and use of vaccines, antibiotics and medicines.	GCSE Biology topics B1–B4 and B7, including applying knowledge to unfamiliar contexts. The key scientific concepts, vocabulary and processes from GCSE Chemistry topics C5, C7, C10 and C12, including chemical calculations, reactions and explaining patterns. The key scientific concepts, vocabulary and processes from GCSE Physics topics P1–P4, including energy, electricity, particle models and forces.

	boiling points. Explain how instrumental methods can be used to identify elements and compounds. **Chemistry - C11: Earth's Atmosphere** Describe the composition and evolution of Earth's atmosphere over time. Explain how human activities affect atmospheric composition, including greenhouse gas emissions. Evaluate evidence for climate change and methods to reduce environmental impacts. **Physics - P3: Energy Resources** Compare renewable	Explain the finite nature of Earth's resources and the need for sustainable development. Describe methods used to obtain potable water and treat waste water. Evaluate recycling, life-cycle assessments and resource conservation strategies. **Physics - P1: Energy** Describe energy stores and energy transfers in a range of systems. Calculate energy changes and efficiency using appropriate equations. Explain ways to reduce unwanted energy transfers.	everyday applications such as batteries and fuels. **Physics - P2: Energy and Heating** Explain how heating affects the internal energy of a system. Describe energy transfer by conduction, convection and radiation. Evaluate methods used to improve thermal efficiency and reduce energy loss.	and carbonates. **Physics - P4: Electrical Circuits** Describe the components and behaviour of series and parallel circuits. Calculate current, potential difference and resistance using circuit equations. Explain factors that affect resistance in electrical components.	Evaluate the benefits and limitations of different disease prevention strategies. **Physics - P5: Electricity at Home** Describe how mains electricity is supplied and used safely in homes. Explain the functions of plugs, fuses, circuit breakers and earthing. Calculate electrical power, energy transfer and the cost of electricity use.	How to plan, carry out, analyse and evaluate required practical investigations, including identifying variables, processing data and drawing valid conclusions. How to approach GCSE exam questions effectively by applying knowledge, interpreting information, using equations and evaluating scientific evidence.

	and non-renewable energy resources, including their advantages and disadvantages. Explain how different energy resources are used to generate electricity. Evaluate energy resource choices based on environmental, economic and reliability factors.					
Key skills (students should be able to)	Communicating Classifying Inferring Measuring Analysing	Communicating Classifying Inferring Measuring	Observing Communicating Classifying Measuring Predicting	Communicating Classifying Inferring Measuring Predicting	Observing Classifying Inferring Predicting	Observing Communicating Classifying Measuring
Year 10 curriculum overview	Biology-B8 - Photosynthesis Biology -B9- Respiration Chemistry -C8 - Rates and Equilibrium	Biology - B10 - Human Nervous System Chemistry -C9 - Crude oils Physics -P7 - Radioactivity	Biology - B11 - Hormonal Coordination Chemistry - C1- Atoms and Elements	Biology -B12 - Reproduction Chemistry -C2 - The periodic table Physics -P9 - Speed and	Biology -B13- Variation and Evolution Chemistry -C3- Structure and Bonding. Physics	Intervention and RPA focus for: B6-9: Preventing and Treating Diseases,

	Physics -P6 - Density Intervention: B1 Cells and Transport, C10 Chemical Analysis, C11 Earth's atmosphere, P1 Changes in Energy	Intervention: B2 Stem Cells, C12 Earth's resources, P2 Energy Transfers by Heat	Physics -P8 - Forces in Balance Intervention: B3 Organisation and the Digestive System, C7 Energy changes, P3 Energy Resources	Velocity Intervention: B4 Organisation in Animals and Plants, C5 Chemical Changes, P4 Electricity at Home	-P10- Forces and Motion. Intervention: B5 Communicable Diseases; C5 Chemical Changes	Non-communicable diseases, Photosynthesis, Respiration Chemistry-C8-Rates and Equilibrium Chemistry -C9-Crude Oils Physics P6-9 Molecules and Matter; Radioactivity, Forces in Balance, Motion Revision for End of Year Test
Key knowledge outcomes (students should know)	**Biology - B8: Photosynthesis** Describe the process of photosynthesis and the factors that affect its rate. Explain how plants use glucose for energy, growth and storage. Interpret data from investigations into	**Biology - B10: Human Nervous System** Describe the structure and function of the nervous system. Explain reflex actions and the pathway of nerve impulses. Investigate factors affecting human reaction time.	**Biology - B11: Hormonal Coordination** Describe the role of hormones in maintaining body conditions. Explain how hormones regulate blood glucose and reproductive processes.	**Biology - B12: Reproduction** Describe sexual and asexual reproduction and their advantages. Explain the structure and function of the male and female reproductive systems. Understand the stages of the menstrual cycle and	**Biology - B13: Variation and Evolution** Explain genetic and environmental causes of variation. Describe natural selection and the process of evolution. Understand evidence supporting	**Biology - B6–B9** Review disease prevention, treatments, non-communicable diseases, photosynthesis and respiration. Analyse and evaluate results from required practical activities.

	photosynthesis. **Biology - B9: Respiration** Explain the differences between aerobic and anaerobic respiration. Describe how respiration releases energy for cellular processes. ● Investigate factors that affect the rate of respiration. **Chemistry - C8: Rates and Equilibrium** Explain factors that affect the rate of chemical reactions. Describe collision theory and its role in reaction rates. Explain dynamic equilibrium and how changing conditions	**Chemistry - C9: Crude Oil** Explain the formation and composition of crude oil. Describe fractional distillation and the production of useful fractions. Compare hydrocarbons and evaluate the use of fuels. **Physics - P7: Radioactivity** Describe the structure of atoms and the nature of nuclear radiation. Compare alpha, beta and gamma radiation in terms of properties and uses. Explain radioactive decay and half-life.	Compare hormonal and nervous coordination. **Chemistry - C1: Atoms and Elements** Describe the structure of atoms, including protons, neutrons and electrons. Explain atomic number, mass number and isotopes. Represent elements and compounds using symbols and formulae. **Physics - P8: Forces in Balance** Explain balanced and unbalanced forces and their effects on motion. Describe resultant force and its	human development. **Chemistry - C2: The Periodic Table** Explain how elements are arranged in the periodic table. Describe trends and properties within groups and periods. Compare the characteristics of metals, non-metals and noble gases. **Physics - P9: Speed and Velocity** Calculate speed and velocity using distance and displacement data. Interpret distance-time and velocity-time graphs. Explain the relationship between motion, speed and	evolutionary theory. **Chemistry - C3: Structure and Bonding** Describe ionic, covalent and metallic bonding. Explain how bonding affects the properties of substances. Use bonding models to explain structure and behaviour of materials. **Physics - P10: Forces and Motion** Explain the relationship between force, mass and acceleration. Calculate acceleration and analyse motion using graphs.	Apply biological knowledge to unfamiliar exam contexts. **Chemistry - C8–C9** Review reaction rates, equilibrium and crude oil processing. Analyse practical investigations and evaluate experimental methods. Apply chemistry concepts to industrial and environmental contexts. **Physics - P6–P9** Review particle model, density, radioactivity, forces and motion. Interpret practical

	affects equilibrium position. **Physics - P6: Density** Describe the particle model of matter and changes of state. Calculate density using mass and volume measurements. Explain differences in density between solids, liquids and gases. **Intervention: B1, C10, C11, P1** Consolidate understanding of cell structure, transport processes and organisation. Review chemical analysis techniques and Earth's atmosphere. Apply energy stores,	**Intervention: B2, C12, P2** Review cell division, mitosis and stem cells. Consolidate understanding of sustainable resource use. Apply knowledge of heating and energy transfer processes.	relationship to acceleration. Interpret force diagrams and motion data. **Intervention: B3, C7, P3** Review digestion, enzymes and organisation in living organisms. Consolidate understanding of energy changes in reactions. Apply knowledge of renewable and non-renewable energy resources.	acceleration. **Intervention: B4, C5, P4** Review transport systems in animals and plants. Consolidate understanding of chemical changes and electrolysis. Apply electrical circuit concepts and calculations.	Describe stopping distance and factors affecting vehicle motion. **Intervention: B5, C5** Review communicable diseases, pathogen transmission and prevention. Consolidate understanding of reactivity, acids and electrolysis.	data and complete calculations accurately. Consolidate knowledge through exam-style questions and revision activities. **End of Year Test Preparation** Recall and apply key scientific knowledge from Biology, Chemistry and Physics. Develop analytical, mathematical and practical science skills. Improve examination technique through structured retrieval and assessment

	transfers and efficiency calculations to exam-style questions.					practice.
Key skills (students should be able to)	Observing Communicating Classifying Predicting	Communicating Classifying Inferring Measuring Analysing	Observing Communicating Classifying Measuring Predicting Analysing	Communicating Classifying Inferring Measuring Predicting	Observing Classifying Inferring Predicting	Observing Communicating Classifying Calculating Recall
Year 11 curriculum overview	Biology -B14- (Combined) Genetics and Evolution; Chemistry-C12- (Combined) Earth Resources; Physics-P11- P12 -Waves, Physics-P12- Electromagnetic Spectrum (Combined) Intervention; B1-4 Cells and Transport, Cell Division, Organisation and Digestive System, Transport in Animals and Plants. (Combined) C1-4 Atoms, Bonding and	Biology -B15- (Combined) - Adaptations, Interdependence Biology-B16- Competition, Organising and Ecosystem (Combined), Biology -B17-Biodiversity and Ecosystem Chemistry -C6- Electrolysis Physics-P13- Electro-magnets Intervention: B5-9 Communicable diseases, Preventing and treating diseases, Non-communicable diseases,	Biology- Revision Yr.9/10 topics B3 Organisation and digestive system, B10 Nervous system, B11 Hormonal System Re Chemistry- Revision Yr.9/10 C8 Rates Equilibrium C9 Crude oils C10 Chemical analysis Physics- Revision Yr.9/10 P3 Energy resources P8 Forces in Balance P9 Speed and velocity P10 Forces and motion Intervention: B10-11 The nervous	Biology -Revision Yr.9/10/11 B4 Organisation in animals and plants B12 Reproduction B13 Evolution B14 Genetics B15 Adaptation B16 Competition B17 Ecosystems Chemistry Revision C11 Earth's Atmosphere C12 Earth's Resources Physics Revision P4 Electricity P11 Waves P12 Electromagnetic spectrum P13 Electro Magnets Exam Practice for all 3	Paper 1 Exam Practice Required Practical Assessment Applied Questions B1-B9 C1-7 P1-7 Half Term Intervention	Exams

	Moles, Periodic Table, Structure and Bonding, Chemical Calculations (Combined) P1-3 Changes in Energy Stores, Energy Transfers by Heat, Energy Resources (Combined)	Photosynthesis, Respiration; C5-7 Chemical Changes, Electrolysis, Energy Changes, P4-7 Electrical Circuits, Electricity in the Home, Molecules and Matter, Radioactivity	system, Hormonal Coordination, C8-9 Rates and Equilibrium, Crude Oil, P8-10 Forces in Balance, Motion, Forces in Motion	subjects Intervention: B12-17 Reproduction, Variation and Evolution, Genetic Evolution, Adaptations, Inheritance and Competition, Organising an Ecosystem, Biodiversity in the Ecosystem; C10-12 Chemical Analysis, The Earth's Atmosphere, The Earth's Resources; P11-13 Wave Properties; Electromagnetic Waves, Electromagnetism - Exam practice		
Key knowledge outcomes (students should know)	**Biology B14 - Genetics and Evolution** Explain how genetic variation arises through sexual reproduction and	**Biology B16 - Organising an Ecosystem** Describe the movement of biomass and energy through food chains and food	The key scientific concepts, vocabulary and processes across the GCSE Combined Science specification and how they link between different topics. How to apply	The key scientific concepts, vocabulary and processes across the GCSE Combined Science specification and how they link between different topics. How to apply	The key scientific concepts, vocabulary and processes across the GCSE Combined Science specification and how they link between different topics.	

	mutation. Describe the structure of DNA, genes and chromosomes and their role in inheritance. Explain the process of natural selection and how it leads to evolution. Evaluate evidence for evolution, including fossils, selective breeding and antibiotic resistance. **Chemistry C12 - Earth Resources** Describe the Earth's resources and explain why some resources are finite and others are renewable. Explain the principles of sustainable development and life cycle assessments.	webs. Explain how materials are recycled through the carbon and water cycles. Interpret pyramids of biomass and explain energy losses between trophic levels. Evaluate factors that affect the efficiency of food production systems. **Biology B17 Biodiversity and Ecosystems** Explain the importance of biodiversity for maintaining stable ecosystems. Describe human activities that reduce biodiversity and their environmental impacts.	scientific knowledge to a range of exam questions, including unfamiliar contexts, calculations and extended written responses. How to use past papers, mark schemes and examiner feedback to identify gaps in knowledge, improve exam technique and develop accurate scientific explanations. How to complete and evaluate required practical investigations, including writing methods, identifying variables, analysing results, drawing conclusions and suggesting improvements. How to construct	scientific knowledge to a range of exam questions, including unfamiliar contexts, calculations and extended written responses. How to use past papers, mark schemes and examiner feedback to identify gaps in knowledge, improve exam technique and develop accurate scientific explanations. How to complete and evaluate required practical investigations, including writing methods, identifying variables, analysing results, drawing conclusions and suggesting improvements. How to construct	How to apply scientific knowledge to a range of exam questions, including unfamiliar contexts, calculations and extended written responses. How to use past papers, mark schemes and examiner feedback to identify gaps in knowledge, improve exam technique and develop accurate scientific explanations. How to complete and evaluate required practical investigations, including writing methods, identifying variables, analysing results, drawing conclusions and suggesting improvements.	

	Compare methods used to obtain potable water and treat waste water. Evaluate strategies for reducing resource use, including recycling, reuse and metal extraction alternatives. **Physics P11 - Waves** Describe the properties of transverse and longitudinal waves and how they transfer energy. Calculate wave speed using the wave equation and interpret wave characteristics. Explain reflection, refraction and absorption of waves in different media. Describe the uses and limitations of seismic waves and their role in	Evaluate conservation strategies used to protect species and habitats. Explain how monitoring and maintaining biodiversity supports ecosystem sustainability. **Chemistry C6 Electrolysis** Describe electrolysis as the decomposition of ionic compounds using electricity. Predict the products formed at the electrodes during electrolysis of molten and aqueous solutions. Explain the extraction of reactive metals using electrolysis. Apply half-equations and ionic principles to	high-quality extended responses, including six-mark answers, by selecting relevant knowledge, using scientific terminology and developing clear explanations supported by evidence.	high-quality extended responses, including six-mark answers, by selecting relevant knowledge, using scientific terminology and developing clear explanations supported by evidence.	How to construct high-quality extended responses, including six-mark answers, by selecting relevant knowledge, using scientific terminology and developing clear explanations supported by evidence.	

	understanding Earth's structure. **Physics P12 - Electromagnetic Spectrum** Describe the order of the electromagnetic spectrum and the properties of each type of radiation. Explain how electromagnetic waves are generated and transmitted. Compare the uses of different electromagnetic waves in communication, medicine and industry. Evaluate the risks and benefits associated with exposure to electromagnetic radiation. **Biology B15 - Adaptations,**	electrolysis processes. **Physics P13 Electromagnets** Explain how magnetic fields are produced by electric currents. Describe factors affecting the strength of an electromagnet. Explain the motor effect and its applications in electrical devices. Describe the operation and uses of loudspeakers, relays and electric motors.				

	Interdependence and Competition Explain how organisms are adapted to survive in particular environmental conditions. Describe the interdependence of organisms within ecosystems and food webs. Explain how competition occurs between organisms for limited resources. Predict the effects of environmental changes on populations and communities.					
Key skills (students should be able to)	Communicating Classifying Inferring Measuring Predicting	Observing Classifying Inferring Predicting	Communicating Classifying Inferring Measuring Analysing	Observing Communicating Classifying Measuring Predicting	Observing Communicating Classifying Measuring Predicting	Observing Communicating Classifying Measuring Predicting

				Analysing	Analysing	Analysing