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Module/Unit of Learning	Taught During	What will students learn?	How does this help to build a broad and strong foundation?	Links to other subjects
Chemical Reactions	September	**Chemical Reactions** develops students' understanding of what happens when substances react and establishes several of the fundamental ideas that underpin GCSE Chemistry. Students revisit and deepen their understanding of **atoms, elements, compounds and mixtures**, learn to represent reactions using **word and symbol equations**, and develop the principle of **conservation of mass**. They investigate **exothermic and endothermic reactions**, combustion, thermal decomposition, catalysts and reversible reactions, using practical investigations to observe and measure chemical change.	In **Year 9**, these ideas provide the foundation for more formal work on **atomic structure, bonding and chemical reactions**, allowing students to explain reactions in terms of particles and electrons rather than simply describing observations. In **Year 10**, students build on this in topics including **Quantitative Chemistry, Chemical Changes, Energy Changes and Bonding**, **Using Resources** and **Organic Chemistry** including balancing equations, calculating reacting masses and understanding energy transfers. In **Year 11**, the same foundations are essential for **Rates of Reaction** and **Chemical Analysis,** where students must apply their understanding of reactions to increasingly unfamiliar contexts. The Year 8 emphasis on practical observation, equations and conservation of mass therefore provides a crucial conceptual foundation for almost every part of the 5-year Science journey.	Maths Geography English
The Respiratory System	October	**The Respiratory System** develops students' understanding of how living organisms obtain and use energy, beginning with the organisation of cells and progressing to specialised tissues and organ systems. Students	In **Year 9**, students require a strong foundation of the respiratory system for the topics **Cell Biology, Organisation, Infection and Response and Bioenergetics**, particularly the relationships between cells, tissues, organs, gas exchange and respiration.	PE Life (PSHE) Sports Science English

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		consolidate their understanding of **animal cells and microscopy**, explore the distinction between unicellular and multicellular organisms, and investigate **diffusion** and the factors affecting its rate. They then apply these ideas to **gas exchange in the lungs**, before studying **aerobic and anaerobic respiration** and the effects of exercise on the body. Fermentation in yeast provides an important comparison with anaerobic respiration in humans.	They will apply this knowledge to the use of microscopes, culturing microorganisms and transport in multicellular organisms. They will also need to extend their understanding by linking the structure of the respiratory system to its role in the immune system. In **Year 10**, students develop these ideas further through respiration as an energy-releasing process and begin to make stronger links between respiration, metabolism and the body's energy requirements. Students will also be required to expand their knowledge by linking together the fundamental concepts of the respiratory and circulatory systems, to draw inferences about a range of activities and the impact on these systems. By **Year 11**, the knowledge is connected to wider Biology concepts including **homeostasis, exercise, disease, metabolism and ecological energy transfer**. The early distinction between diffusion and respiration is particularly important because it enables students to understand that oxygen must first reach cells before it can be used in aerobic respiration.	
Electricity	November	**Electricity** introduces students to the principles needed to understand electrical circuits and how electrical systems are controlled. Students investigate **static electricity**, then develop their understanding of **current and potential difference**, before constructing and	In **Year 9**, these fundamental concepts give students the conceptual and mathematical preparation needed to approach and develop their understanding of electricity. This will be applied when looking at concepts like specific heat capacity, power and work done, where a conceptual understanding of electricity will be built upon,	Design Technology Maths Engineering English

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		analysing **series and parallel circuits**. They investigate **resistance**, compare conductors and insulators and begin using the relationship between potential difference, current and resistance. Students then explore **light-dependent resistors (LDRs)** and **thermistors**, considering how changes in environmental conditions can affect resistance and how these components are used in real-world systems.	as well as links to their understanding of energy. In **Year 10**, students develop the complexity of their understanding of **electricity**, including the study of circuit calculations, resistance, electrical power and energy, domestic electricity and the national grid. Students will further develop their knowledge by making links between electricity and magnetism, explaining how electromagnets work and evaluating their uses. It will also be briefly utilised when students study Chemical and Energy changes. In particular, looking at the role electricity plays in the process of separating compounds using electrolysis. In **Year 11**, the knowledge is revisited and applied alongside **Energy, Forces, Waves and Magnetism and Electromagnetism**, allowing students to understand electricity as part of a wider physical model rather than an isolated topic, in preparation for physics Paper 1. The Year 8 emphasis on constructing circuits, making measurements, plotting graphs and identifying relationships is particularly valuable because Science requires students to apply mathematical and practical skills as well as recall electrical concepts.	
Metals and Reactions	November-December	**Metals and Reactions** develops students' understanding of chemical reactivity and the relationship between the properties of materials and their uses.	In **Year 9**, this knowledge supports the development of atomic structure and the explanation of why elements have different chemical properties. Students will study alkali metals and transition	Maths Geography Engineering English

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		Students compare the properties of **metals and non-metals**, use experimental evidence to construct a **reactivity series**, and investigate how metals can be extracted from their compounds through **reduction with carbon** and displacement reactions. They explore the reactions of metals and metal oxides with acids, reactions involving metal carbonates and the test for **carbon dioxide using limewater**. Students also consider the environmental impact of mining and metal extraction before investigating **ceramics, composites and polymers** as alternative materials.	metals, so require the fundamental understanding taught during this year 8 topic. They will also study chemical analysis, where they will recall and develop their skill of using the results of metals and reactions to infer different chemicals present in reactions, like flame tests. Students will also study the topic **Using Resources** in Year 9, where they will consider the extraction, recycling and environmental impact of materials. This involves a core, fundamental understanding of the conditions needed for certain reactions, and the skill of being able to write word and balanced symbol equations. In **Year 10**, students build on it through the topic **Chemical Changes**, particularly reactions of acids, metal extraction, electrolysis and redox ideas, while the topic **Bonding, Structure and the Properties of Matter** provides explanations for why different materials have different physical properties. In **Year 11**, students will study **Chemical Analysis**, where students expand and develop their knowledge by being able to use chemical reactions and observations to identify substances. The **Metals and Reactions** module therefore establishes an important connection between microscopic chemical behaviour, observable reactions, industrial processes and environmental consequences.	
The Earth	January-February	**The Earth** develops students' understanding of our planet as a	In **Year 9**, this provides important background for Chemistry and Biology topics	Maths Geography

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		dynamic system and introduces important ideas about the interaction between the geosphere, atmosphere, hydrosphere and biosphere. Students investigate the **structure of the Earth**, the formation of **igneous, sedimentary and metamorphic rocks**, and the role of **plate tectonics** in driving geological change. They then explore the composition and changing nature of the **atmosphere**, including the formation and use of fossil fuels, combustion and the increasing concentration of greenhouse gases. The module develops understanding of **global warming and climate change**, including the roles of combustion, deforestation and photosynthesis, before examining the **carbon cycle, water cycle and recycling of finite resources**.	involving particles, chemical reactions, energy and ecosystems. The concepts become increasingly aligned with **Chemistry of the Atmosphere and Using Resources** topics, particularly the composition and evolution of the atmosphere, greenhouse gases, global climate change, finite resources and recycling. The links to photosynthesis and the **carbon cycle** also support **Ecology and Bioenergetics**. In **Year 10**, students apply this knowledge when studying the **Ecology and Biodiversity** modules. They will build upon their knowledge by evaluating evidence for climate change, considering human impacts on the environment and analysing the advantages and disadvantages of different resource and energy strategies. In **Year 11**, students will use knowledge from this topic to underpin links made core concepts for both Biology Paper 2 and Chemistry Paper 1 and 2. The module is therefore particularly valuable for developing students' ability to connect scientific processes across disciplines and evaluate environmental issues using evidence rather than treating them as purely geographical or social topics.	Geology Engineering English
The Human Body and Plant Biology	February-March	**The Human Body** develops students' understanding of how different body systems work together to maintain life and enable movement. Students investigate **enzymes**, including how	In **Year 9**, this provides a foundation for **Cell Biology and Organisation**, particularly digestive enzymes, the digestive system and the relationship between cells, tissues, organs and organ systems. Students will expand their knowledge by	PE Life (PSHE) Maths English

		temperature and pH affect enzyme activity, before studying the **digestive system** and the role of enzymes in breaking large food molecules into smaller soluble molecules. They then explore how the **muscular and skeletal systems** are adapted for movement and investigate different types of joints. This builds directly on the Year 7 work on cells and the human body. **Plant Biology** develops students' understanding of how plants are structured and how they obtain and transport the materials required for growth. Students consolidate their knowledge of **plant cells and microscopy** before investigating **photosynthesis**, including factors affecting its rate and practical methods for demonstrating the process. They examine the structure of the **leaf**, the role of **stomata**, and the importance of chloroplasts in photosynthesis. Students investigate how plants use glucose, including the **starch test**, and study specialised structures such as **root hair cells, xylem, phloem and stomata**, linking structure to function. They also encounter **diffusion, osmosis, active transport, transpiration and translocation**, before exploring the role	applying the understanding of enzyme action to specific digestive contexts and explain how conditions within the digestive allow digestion to happen effectively. **Year 9** students will also build upon their understanding of plants by looking at their adaptations, interdependence within ecosystem and the role they play in maintaining biodiversity. They will also use their understanding of photosynthesis to look at the importance of plants in food security and the future. In **Year 10**, students will continue to build and develop their understanding of the human body through the topic **Homeostasis.** This involves using their knowledge to under and explain the functioning of the nervous system, hormones, blood glucose regulation and temperature control, while the concept of enzymes becomes increasingly important when explaining metabolic processes. **Year 10** learners will also build upon their skills when studying **Plant Biology and Ecology** by linking together ideas around structure and the importance of specialised structures for photosynthesis. They will also be required to make links between conservation and maintenance of biodiversity, and the important role plants (and photosynthesis) plays in the management of global warming. In **Year 11**, these topics will be holistically studied across both biology paper 1 and 2.	

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		of plant hormones in growth.		
Waves and Magnets	April-May	**Waves** introduces students to the two major types of waves and develops their ability to describe, represent and investigate wave behaviour. Students distinguish between **longitudinal and transverse waves**, investigate sound and calculate the **speed of sound**, and explore echoes and applications of sound waves. They then study light as a transverse wave, investigating **reflection and refraction**, before applying these ideas to the operation of the **eye and lenses** and explaining how we perceive colour. **Magnets** develop students' understanding of magnetic fields and introduces the important relationship between electricity and magnetism. Students investigate **permanent magnets**, represent magnetic fields using field lines and explore how a **compass** can be used to detect and navigate using magnetic fields. They then investigate **electromagnets**, considering how electrical current can produce a magnetic field and how electromagnets can be made stronger and applied in technology. Students are introduced to the **electromagnetic spectrum**, providing an	In **Year 9**, students will study energy, which will link back to the understanding of waves and how energy can be transferred from one store to another as a wave. They will also look at **Atomic Structure and Radiation**, which requires an understanding of how energy can be transferred as waves. In **Year 10,** students will be required to re-activate and expand their understanding of magnets, looking at the interaction of electricity and magnetism and using mathematical skills in relation to magnetic concepts. In **Year 11**, students will study **Waves.** They will continue to develop their understanding of waves by applying practical and mathematical skills to investigating the properties of waves. They will also revisit the electromagnetic spectrum, where they will explore the uses and dangers associated with the uses of electromagnetic radiation. This year 8 module is fundamental for exploring links between physics and biology, as well as developing fundamental practical skills that will be recalled and refined throughout their Science journey.	Geography Maths Music English

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		important connection between magnetism, waves and electromagnetic radiation.		
Variation and Evolution	May- June	**Variation and Evolution** develops students' understanding of why organisms within a species differ and how populations change over time. Students are introduced to **DNA and mutations**, before distinguishing between different types of variation and representing continuous and discontinuous variation using data. They investigate how organisms are **adapted to their environments**, using examples such as Arctic and desert organisms, before developing the mechanism of **evolution by natural selection**. Students then explore classification, evolutionary relationships and evolutionary trees, before considering **selective breeding** and the importance of **biodiversity**.	In **Year 9**, students will study an **Ecology** module, where they will be required to recall and expand their understanding of DNA, inheritance and evolution to explain an organism's adaptation to its environment. They will also look at developing their understanding biodiversity, to explain its importance in food security, biotechnology and sustainability. In **Year 10**, students develop these ideas further when they study **Inheritance, Variation and Evolution.** They will study concepts relating to inheritance, genetic crosses, sexual and asexual reproduction, mutations and the role of the environment in shaping phenotype. All of these require a fundamental understanding of DNA, genetics and inheritance to be built upon. In **Year 11**, these topics will be holistically studied across both Biology Paper 1 and 2. This year 8 module emphasises the importance of using evidence to explain evolutionary relationships and is particularly important because Science expects students to understand evolution as an evidence-based scientific explanation rather than simply a sequence of facts. Understanding DNA and genetics is also key for building upon throughout their 5 year journey, as well as the world around them.	History Geography Maths English

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Enrichment (Witchcraft and Wizardry)	July	**Witchcraft and Wizardry** provides an opportunity for students to apply science in imaginative and unfamiliar contexts while maintaining a strong emphasis on scientific evidence and explanation. Through themes such as potions, herbology, invisibility, charms and hidden worlds, students can revisit and connect ideas from **chemistry, biology and physics**, challenging misconceptions and distinguishing scientifically plausible explanations from fictional claims. The enrichment curriculum is particularly valuable because Science requires students not only to recall scientific knowledge but to **apply it to unfamiliar situations, analyse evidence, evaluate claims and communicate scientific explanations**.	This is valuable preparation for **Years 9–11**, where students increasingly need to apply knowledge across topics rather than simply recall individual facts. Science requires students to demonstrate knowledge, apply scientific ideas and **analyse and evaluate information, evidence, methods and conclusions**. The enrichment module therefore supports the development of scientific literacy, critical thinking, problem-solving and communication alongside subject knowledge. It also helps students develop the confidence to approach unfamiliar GCSE questions by identifying which scientific concepts they already know and applying them in a new context.	Maths English Geography History