Subject Overview
KS3 Science

At Shireland CBSO, science education is designed to spark curiosity, deepen understanding, and empower students to see the world through both analytical and creative lenses. Rooted in the belief that integrating the arts and sciences creates a rich, interdisciplinary learning environment, our approach encourages students to make meaningful connections across subjects—fostering both critical thinking and imaginative problem-solving.

Science lessons are not taught in isolation; they are woven into the broader fabric of our curriculum, where music, performance, and visual arts enhance scientific exploration. Whether investigating the physics of sound, the chemistry of materials in instrument design, or the biology of hearing, students experience science as a living, breathing discipline that intersects with their passions and the world around them. This philosophy is further supported by our *Literacy for Life* programme, which equips students with the communication skills needed to articulate scientific ideas, debate ethical implications, and collaborate effectively. By embedding literacy into science, we ensure that learners not only grasp complex concepts but also express them with clarity and confidence.

Through our key stages, science becomes more than a subject—it becomes a gateway to innovation, creativity, and a deeper appreciation of how knowledge shapes our lives and our future. Building on the strong foundation laid by Springboard Science at key stage 3, the AQA GCSE Science curriculum deepens students' understanding through more rigorous content, analytical thinking, and practical application. It revisits key concepts introduced earlier—such as forces, energy, chemical reactions, and biological systems—and expands them with greater complexity and precision. Students engage in structured investigations, develop data-handling skills, and apply scientific models to explain real-world phenomena. This progression ensures continuity in learning while preparing students for further study or careers in science-related fields, including those within the music industry. By linking prior knowledge to advanced topics, the AQA curriculum empowers learners to think critically, solve problems creatively, and appreciate the relevance of science in both academic and artistic contexts.

Term		Year 7	Year 8	Year 9
Autumn	Biology	**Cells** In this unit, students develop a foundational understanding of cells as the basic building blocks of life. They learn to identify and describe the structure and function of key cell components such as the nucleus, cytoplasm, and cell membrane, and distinguish between plant and animal cells. Through practical investigations and microscope work, learners explore how cells form tissues, organs, and systems, and begin to appreciate the complexity and	**Skeletal & Muscular systems** In this unit, students explore how the skeletal and muscular systems work together to support movement, protection, and structure in the human body. They learn to identify major bones and muscle groups, understand the role of joints and ligaments, and investigate how muscles contract to produce motion. Through hands-on activities and model-based learning, pupils develop a deeper appreciation of biomechanics and the interdependence of body systems. This unit builds foundational knowledge for future study in human biology, health, and physical performance.	**Skeletal & Muscular systems** In this unit, students explore how the skeletal and muscular systems work together to support movement, protection, and structure in the human body. They learn to identify major bones and muscle groups, understand the role of joints and ligaments, and investigate how muscles contract to produce motion. Through hands-on activities and model-based learning, pupils develop a deeper appreciation of biomechanics and the interdependence of body systems. This unit builds foundational knowledge for future study in human biology, health, and physical performance.

		organisation of living organisms. This unit lays the groundwork for future topics in biology, including reproduction, health, and genetics, while fostering curiosity and precision in scientific observation.		
		Skeletal & Muscular systems	**Nutrition & digestion**	**Nutrition & digestion**
		Through this scheme of learning, students explore how the skeletal and muscular systems work together to support movement, protection, and structure in the human body. They learn to identify major bones and muscle groups, understand the role of joints and ligaments, and investigate how muscles contract to produce motion. Through hands-on activities and model-based learning, pupils develop a deeper appreciation of biomechanics and the interdependence of body systems. This unit builds foundational knowledge for future study in human biology, health, and physical performance.	Through this scheme of work, students investigate how the human body obtains and processes nutrients to sustain life. They explore the components of a balanced diet, the roles of carbohydrates, proteins, fats, vitamins, and minerals, and the consequences of nutritional imbalance. Learners examine the structure and function of the digestive system, tracing the journey of food from ingestion to absorption. Through practical experiments and model-based learning, they develop a clear understanding of enzymatic action, organ function, and the interdependence of body systems. This unit builds essential knowledge for healthy living and prepares students for deeper study in biology and health sciences.	Through this scheme of work, students investigate how the human body obtains and processes nutrients to sustain life. They explore the components of a balanced diet, the roles of carbohydrates, proteins, fats, vitamins, and minerals, and the consequences of nutritional imbalance. Learners examine the structure and function of the digestive system, tracing the journey of food from ingestion to absorption. Through practical experiments and model-based learning, they develop a clear understanding of enzymatic action, organ function, and the interdependence of body systems. This unit builds essential knowledge for healthy living and prepares students for deeper study in biology and health sciences.
			Reproduction	**Photosynthesis**
			In this unit, students explore the biological processes of reproduction in both plants and animals. They learn to identify the key structures and functions involved in sexual and asexual reproduction, including the roles of gametes, fertilisation, and pollination. Through model-based learning and scientific enquiry, pupils investigate life cycles, gestation periods, and the development of offspring. This unit builds essential understanding of continuity in life, genetic inheritance, and variation, laying the	In this unit, students explore the process of photosynthesis as the foundation of life on Earth. They learn how plants convert light energy, carbon dioxide, and water into glucose and oxygen, and investigate the role of chlorophyll and chloroplasts in this transformation. Through experiments and model-based learning, pupils examine the factors that affect the rate of photosynthesis and understand its importance in food chains and ecosystems. This unit deepens their appreciation

			foundation for future study in genetics, evolution, and human biology.	of plant biology and introduces key concepts in energy flow, sustainability, and the carbon cycle.
				Ecosystems
				This scheme of work enables students to explore the dynamic interactions between living organisms and their environments. They investigate how ecosystems are structured through producers, consumers, and decomposers, and examine the flow of energy and cycling of nutrients within food chains and food webs. Learners develop an understanding of habitats, biodiversity, and the impact of environmental changes—both natural and human-induced—on ecosystem stability. Through fieldwork, modelling, and enquiry-based learning, pupils build essential ecological literacy and begin to appreciate the delicate balance that sustains life on Earth.
Spring	**Chemistry**	**Particle model**	**Chemical reactions**	**Energy changes**
		This unit will enable students to develop a foundational understanding of the particle model as a way to explain the properties and behaviour of matter. They learn how solids, liquids, and gases are composed of particles arranged and moving in distinct ways, and use this model to interpret changes of state, diffusion, and density. Through practical investigations and visual modelling, learners explore how temperature and energy affect particle movement, and how this underpins key concepts in chemistry. This unit equips students with the tools to explain everyday phenomena and prepares them for	In this scheme of work, students dive into the dynamic world of chemical reactions, uncovering how substances interact to form new products. Through engaging experiments and data analysis, learners will explore evidence of chemical change—such as colour shifts, gas production, temperature change, and precipitate formation. They'll learn to write and balance chemical equations, classify reaction types, and investigate the role of energy in endothermic and exothermic processes. By connecting theory to real-world phenomena, students will develop a deeper understanding of how chemical reactions drive everything from cooking and combustion to biological processes and industrial innovation.	In this unit, students investigate how energy is transferred and transformed during chemical reactions. They will explore the differences between exothermic and endothermic processes, analyse energy profiles, and interpret reaction graphs to understand activation energy and reaction pathways. Through practical experiments and data interpretation, learners will connect energy changes to real-world applications such as combustion, cooling packs, and industrial synthesis. By the end of the unit, students will be able to describe how energy affects reaction rates, product formation, and the sustainability of chemical processes.

		more advanced study in chemical reactions and material science.		
		Atoms, elements & Compounds	**Energy changes**	**Periodic table**
		In this unit, students build a foundational understanding of the structure of matter by exploring atoms, elements, and compounds. They learn that atoms are the smallest units of matter and that elements consist of only one type of atom, while compounds are formed when atoms of different elements chemically bond. Learners investigate the periodic table as a tool for organising elements, and use models to represent atomic structure and chemical combinations. Through practical experiments and symbolic representations, pupils develop the skills to distinguish between mixtures and compounds, and begin to understand how chemical reactions create new substances with different properties. This unit prepares students for deeper study in chemistry and supports scientific literacy across disciplines.	Through this unit, students investigate how energy is transferred and transformed during chemical reactions. They will explore the differences between exothermic and endothermic processes, analyse energy profiles, and interpret reaction graphs to understand activation energy and reaction pathways. Through practical experiments and data interpretation, learners will connect energy changes to real-world applications such as combustion, cooling packs, and industrial synthesis. By the end of the unit, students will be able to describe how energy affects reaction rates, product formation, and the sustainability of chemical processes.	In this unit, students explore the structure and organization of the periodic table as a powerful tool for understanding elements and their properties. They will investigate how elements are arranged by atomic number, grouped by similar chemical behaviour, and classified as metals, nonmetals, or metalloids. Through pattern recognition and guided inquiry, learners will uncover trends in reactivity, atomic size, and electronegativity across periods and groups. By the end of the unit, students will be able to use the periodic table to predict element behaviour, explain chemical families, and connect atomic structure to real-world applications in science and industry.
		Pure & impure substances		**Materials**
		During this unit, students explore the foundational concepts of chemistry by distinguishing between pure substances and mixtures. Through hands-on investigations and real-world applications, learners will identify the characteristics of elements and compounds,		In this unit, students explore the properties, uses, and classifications of materials, linking their structure to function in everyday applications. They investigate natural and synthetic substances, compare metals, polymers, ceramics, and composites, and analyse how materials respond to forces, temperature, and environmental conditions.

		understand the differences between homogeneous and heterogeneous mixtures, and analyse methods of separating mixtures such as filtration, distillation, and chromatography. By the end of the unit, students will be able to classify materials based on their composition and explain how purity affects the properties and uses of substances in everyday life.		Through practical experiments and case studies, learners examine how materials are selected for specific purposes—from construction and packaging to electronics and clothing. By the end of the unit, students will understand how science drives innovation in material design and how sustainability influences material choices in modern society.
				Earth & atmosphere
				Through this scheme of work, students explore the dynamic systems that shape our planet and its protective atmosphere. They investigate the composition and structure of the Earth, the layers of the atmosphere, and the processes that drive weather, climate, and geological change. Through data analysis and practical activities, learners examine the carbon cycle, the impact of human activity on atmospheric composition, and the science behind climate change. By the end of the unit, students will understand how Earth's systems interact, how atmospheric changes affect life on Earth, and how science informs sustainable solutions for global challenges.
Summer	**Physics**	**Energy**	**Sound**	**Sound**
		Through this scheme of work, students explore the concept of energy as a vital force that drives physical and chemical processes. They investigate different forms of energy—including kinetic, potential, thermal, and electrical—and learn how energy is transferred, transformed, and	In this unit, students explore the fascinating world of sound—how it's produced, how it travels, and how we perceive it. They investigate the properties of sound waves, including frequency, amplitude, wavelength, and speed, and learn how these relate to pitch and volume. Through hands-on experiments and real-life applications, learners examine how sound moves	In this unit, students explore the fascinating world of sound—how it's produced, how it travels, and how we perceive it. They investigate the properties of sound waves, including frequency, amplitude, wavelength, and speed, and learn how these relate to pitch and volume. Through hands-on experiments and real-life applications, learners examine how sound moves through different materials,

		conserved. Through experiments and real-world examples, learners examine energy efficiency, renewable and non-renewable resources, and the impact of energy use on the environment. By the end of the unit, students will be able to analyse energy changes in systems, apply the principle of conservation of energy, and evaluate sustainable energy solutions for the future.	through different materials, how echoes and resonance occur, and how technology like microphones and speakers manipulate sound. By the end of the unit, students will be able to describe sound as a wave, explain how it interacts with matter, and apply their understanding to everyday phenomena and devices.	how echoes and resonance occur, and how technology like microphones and speakers manipulate sound. By the end of the unit, students will be able to describe sound as a wave, explain how it interacts with matter, and apply their understanding to everyday phenomena and devices.
		Speed	**Light**	**Light**
		In this unit, students explore the concept of speed as a measure of how quickly objects move. They learn how to calculate speed using the relationship between distance and time, interpret motion graphs, and analyse real-world scenarios involving constant and changing speeds. Through practical investigations and data analysis, learners develop an understanding of average speed, instantaneous speed, and the factors that affect motion. By the end of the unit, students will be able to describe and compare different types of motion, apply formulas to solve problems, and explain how speed relates to everyday experiences—from walking and driving to sports and space travel.	In this unit, students explore the nature and behaviour of light, uncovering how it travels, interacts with materials, and enables us to see the world around us. They investigate key concepts such as reflection, refraction, absorption, and dispersion, and learn how light behaves as a wave. Through hands-on experiments and real-world applications, learners examine how lenses, mirrors, and prisms manipulate light, and how technologies like cameras and telescopes rely on optical principles. By the end of the unit, students will be able to explain how light travels, describe its effects on different surfaces, and apply their understanding to everyday phenomena and scientific tools.	In this unit, students explore the nature and behaviour of light, uncovering how it travels, interacts with materials, and enables us to see the world around us. They investigate key concepts such as reflection, refraction, absorption, and dispersion, and learn how light behaves as a wave. Through hands-on experiments and real-world applications, learners examine how lenses, mirrors, and prisms manipulate light, and how technologies like cameras and telescopes rely on optical principles. By the end of the unit, students will be able to explain how light travels, describe its effects on different surfaces, and apply their understanding to everyday phenomena and scientific tools.
		Forces		**Space**
		In this unit, students investigate the invisible pushes and pulls that govern motion and interaction in the physical world. They		During this unit, students journey beyond Earth to explore the vastness of space and our place within it. They investigate the structure of the solar system,

		explore different types of forces—including gravity, friction, air resistance, and applied force—and learn how these affect the movement and shape of objects. Through hands-on experiments, motion analysis, and real-world examples, learners develop an understanding of balanced and unbalanced forces, Newton's Laws of Motion, and how force is measured. By the end of the unit, students will be able to describe how forces influence everyday phenomena, predict motion outcomes, and apply scientific reasoning to solve practical problems.		the movement of celestial bodies, and the forces—like gravity—that govern planetary motion. Learners examine the phases of the Moon, eclipses, seasons, and the apparent motion of stars, deepening their understanding of how Earth's rotation and orbit shape our experience of time and light. Through models, observations, and data analysis, students also consider the scale of the universe, the life cycle of stars, and the technologies that enable space exploration. By the end of the unit, students will be able to explain key astronomical phenomena and appreciate the scientific methods used to study the cosmos.

Science is deeply woven into the fabric of music and the music industry—from the physics of sound waves and acoustics to the cutting-edge technology behind recording, mixing, and live performance. At Shireland CBSO, science teaching is designed to illuminate these connections, helping students understand how sound travels, how instruments produce different tones, and how materials and electronics shape the music we hear.

Through a curriculum that blends theory with hands-on experimentation, students explore topics like wave behaviour, frequency, resonance, and digital signal processing. They learn how microphones, speakers, and mixing desks work, and how scientific principles underpin innovations in music production, acoustics, and audio engineering. With access to industry-standard equipment and a unique partnership with the City of Birmingham Symphony Orchestra, learners gain insight into both the artistic and technical sides of music. By integrating science with creative expression, Shireland CBSO empowers students to become not only musicians but also informed innovators—ready to shape the future of the music industry with knowledge, curiosity, and confidence.