Subject Overview
Year 7 Science

At Shireland CBSO Academy, we recognise that science is a vital part of our world; we need it to both understand and engage with the world around us. Our aim as a science department is to promote and develop an appreciation of science, to get students interested in the universe we live in and most importantly, to become inquisitive people who question everything around them. We want our students to leave secondary school with the fundamental skills necessary to deal with the real life issues facing their generations and the ones to come. Skills acquired during the science curriculum will include the ability to enquire, to hypothesize and explore different challenges that arise. With support from the L4L curriculum, students will develop a rich and powerful scientific knowledge, alongside different competencies to support the skills learnt in science lessons including investigation, analysis, problem-solving, and logical thought. As the students graduate into KS4, the GCSE curriculum will challenge students to question the world around us and independently develop their skills.

Science is taught hand in hand with L4L where science is taught in integrated in themes such as 'Journey to the Centre of the Earth', 'iRobot'. Students will also work in laboratories to improve their scientific working skills. The topics covered in KS3 revolve around the fundamental ideas such as – cells, atoms, compounds, energy, forces – that are integral to the three disciplines of Biology, Chemistry and Physics. These are important as the first steps for students to grasp the workings behind certain phenomenon. For example, understanding why a hot cup of tea is hot, understanding what organs are made of, understanding what happens when you put salt in a pan of boiling water. These fundamental ideas are crucial to the next step in their schooling and to allow them to get a well-rounded education. Using these ideas as the foundation for further scientific study, they will build on their knowledge as they move through school and into KS4.

Building on the knowledge and skills acquired in KS3, students will further develop and improve their investigative skills as well as developing a rich subject knowledge across the distinct but intertwined disciplines of Chemistry, Physics and Biology. Using the basic ideas of the three disciplines they will delve deeper into science and explore the wider application in the world. This will prepare them for their GCSE's and if they choose to, further education and follow them into a wide variety of career options. Topics covered in science include infection and response, where students gain a better understanding of their immune system and the issues humans face in terms of infections and diseases. This topic also includes infections suffered by plants which can give them the skills to understand why crops can fail. This knowledge can help them face and understand the issues society face in real life. In Chemistry we look at materials and resources, understanding non-renewable resources and how we extract different materials to use for everyday life. These topics can help them get an underlying understanding of topics that they can then use in careers that are not necessarily labelled as scientific. The analytical skills they gain can be transferred to any career they choose, the skills acquired in science will enable them to transfer those skills to other disciplines. For example, coming up with a hypothesis enables students to critically think about outcomes using knowledge they have acquired, analytical skills allows them the look at data and recognise patterns.

Discipline		Year 7
Biology	Structure and function of living organisms	Introduction to animal and plant cells - Looking at onion cells under a microscope, basic sub-cellular structures and their function. Intro to diffusion
	Material cycles and energy	Respiration in human cells
	Interactions and interdependencies	
	Genetics and evolution	
Chemistry	Structure, bonding and properties of matter	Particle model, states of matter, energy stores and energy transfers in changes of state
	Atoms, elements and compounds	Introduction to atoms and periodic table, elements, compounds and mixtures
	Chemical analysis	Simple techniques for separating mixtures, mixtures vs compounds

	Chemical changes	
	Energetics	
	Chemical and allied industries	Fractional distillation
	Earth and atmosphere	
Physics	Energy	Calculation of costs in domestic context, energy transfers, conservation of energy
	Motion and forces	Describing motion, forces and force diagrams, balanced forces
	Waves	Sound waves
	Electricity and magnetism	Forces between charged object
	Matter	Changes of state vs physical changes, density, motion of particles and temperature changes, internal energy
	Atomic structure	Atoms
	Space physics	

The science national curriculum links scientific principles to music, particularly through the study of sound. The structure of the ear is also covered by the national curriculum which explains how the anatomy can convert waves into sound. Chemistry plays a role in the materials used for instruments, affecting sound quality and durability. Biology also allows us to study muscle coordination, respiratory control, and the anatomy of the ear. Neuroscience shows that music activates brain regions, enhancing cognitive functions and emotional well-being. A fascinating side of science has allowed researchers to translate DNA into music which has allowed them to find patterns in sequences. This 'sonification' has even been applied to viruses or bacteria and have been made into songs! Finally, physics principles are fundamental in music, from the design of instruments to composing. Sound waves' frequency and amplitude determine pitch and volume. Instruments are designed based on physical principles, with string tension and air column length affecting notes. Acoustics studies help design concert halls for optimal sound quality. We need science to understand the technology involved in music, such as microphones, speakers, and amplifiers.