

Year 7 Science

The following topics will be covered by students throughout the year. In each of these units the following scientific skills will be developed:

Fundamental skills are developed in Year 7 such as identifying [appropriate](#) apparatus, practical skills, analytical skills, investigative skills, communication skills, teamwork skills and mathematical skills. Students gain a basic understanding [and practical experience](#) of principles to Science that will be covered in more depth throughout CHS.

Name of topic	Short description
I'm a Scientist	An introductory topic: Learners will become familiar with working safely in the labs, naming and safely using key equipment such as Bunsen burners. They will also develop their independent enquiry skills by designing and implementing their own experiments; recording data; processing and analysing data; and evaluating their own experimental processes.
Forensic (Simple Chemical reactions)	Through practical challenges based around forensic science, learners will lay foundational knowledge of physics, specifically particle theory, physical states, separation of mixtures and apply these concepts to real-world use of them to solve crimes. They will also build on their scientific processing from 'I'm a scientist', such as the importance of repeatability, how to evaluate reliability and validity of results.
Alien (Earth and beyond)	Space exploration and understanding the forces that influence the physical world around us is the focus for this topic. Through plenty of independent enquiry and investigations, learners will satisfy their curiosity about our solar system, daily and seasonal changes on Earth and effects of lunar cycles. Learners will begin to apply mathematical equations to scientific theories such as gravity, and how other forces govern motion on Earth and in Space, including rocket dynamics.
Electricity and magnetism	This topic investigates circuits, current, potential difference and resistance. Learners will find out about magnets and their magnetic fields and apply these concepts to our daily modern lives. The topic provides the perfect platform for students to practise and develop their problem solving and mental resilience through practical investigations.

Cook (Matter)	Reinforcing and furthering learners' understanding of particle physics and chemical reactions with a focus on changes due to heat energy underpins the learning in this topic. Learners use modelling and a variety of practical enquiries to uncover what goes on at a particle-level when we heat substances. They will explore the nature of heat energy itself, and how these discoveries have led to development of more efficient culinary equipment and techniques; including how to make the perfect pancakes and ice-cream.
A & E (The Human body)	The first in the series of Biology topics that our learners will experience. They will develop their technical vocabulary to help describe and explain how multicellular organisms, including humans, are structured. Journeying from sub-cellular chemical reactions, such as respiration, all the way through to organ system functions, with an impetus on how this knowledge is used in the medical world. Learners will begin to harness their handiness in using a microscope as well as discover their own fascinating development from just two simple, well-adapted and complementary cells, to their current selves.
Extinction (Climate change and adaptations)	An important topic for the modern-day scientist; learners will reveal what we know about the climate changes on pre-human Earth, from just soil, ice and fossil samples, and suggest what we do with the knowledge today. The topic covers some basic principles to understanding natural history, such as how we classify animals and how animals have evolved and adapted to environmental change. Learners will be tasked to develop creative ideas and solutions to the modern-day problems of human-influenced species endangerment and extinction. This topic is also used to develop graph and data interpretation aptitudes, including identifying and dealing with anomalies.

Year 8 Science

The following topics will be covered by students throughout the year. In each of these units the following scientific skills will be developed:

In Year 8 their scientific understanding and skills are developed further. They continue to expand their scientific vocabulary and broaden their experience of scientific concepts. Students are expected to plan, prepare and implement investigations, plus analyse and evaluate. The expectation of application of knowledge is increased to demonstrate a higher level of skill.

Name of topic	Short description
The periodic table	Learners build on ideas of particle models of chemical reactions, and develop an understanding of what the periodic table was developed for and how, and link this to how it is presently used by chemists. Pupils will work with a host of everyday and novel hazardous chemicals to harness their skills in precision measuring to make observations of reactions of different chemical groups. Their teacher will demonstrate explosive reactions where students will be tasked with applying their chemical knowledge to both predict and interpret products/results of chemical reactions. Learners will master naming compounds from their reactants for some widely used reactions, and some will make the leap from using chemical names to solving more complex chemical formula reactions.
Chemical reactions	A follow on to 'The periodic table', this topic provides the bridge between KS3 and GCSE chemistry. Learners explore more hazardous chemistry such as combustion reactions and acid-alkali reactions, whilst applying and bolstering their previous knowledge of chemical reactions to new scenarios. Learners will also gain potentially life-saving knowledge of identifying type of fire and how to safely extinguish each type of fire.
Light and Sound	This topic challenges learners' understanding of particle physics and applies it to a whole world of what we see/hear; explaining how we see and hear, but also enlightening them to the spectrums beyond our senses. The topic further exposes learners to practising of experimental design, collecting and interpreting good data, using equations, and identifying errors. Learners will discover the Electromagnetic spectrum, the visible light spectrum, infra- and ultrasound and how both the natural world and scientists take advantage of these. Practical investigations into the properties and behaviour of visible (coloured) light and sound provide opportunities for learners to learn by doing and explore their own ideas

	and theories. A tricky dissection of an eyeball will not only give learners an appreciation of how lenses work, but supply them with a test of their dexterity and education of safe working with sharp implements.
Microbes	This topic delves into the invisible living world around us, and how it plays a vital role in our day-to-day lives both in medicinal discoveries and providing us with vital and tasty nutrients such as bread. Learners will apply and practise scientific experimental design to product testing in order to evaluate effectiveness of deodorants and antibiotics. They will deepen their knowledge of the microbe world, including classification, transmission, prevention/cure of disease-causing microbes, as well as our body's natural responses to the micro-war we fight daily.
Energy and Resources	Starting with traditional methods of generating electricity then meandering through the various ways we now generate electricity from renewable sources, learners will develop their problem solving and evaluative thinking to answer questions such as "What's the best way to power the country/world?". Learning through secondary research, discussion and collaborating with others are key skills to being a successful scientist, and this topic provides a relevant and pertinent setting for learners to trial and improve these.
Alive and Kicking (Nutrition and the body)	Progress made in 'A&E' in year 7 will be revisited as a launch pad for learners to develop a deeper understanding of the respiratory and digestive system, making links between essential nutrients and cellular function. Learners will get hands on in dissection of lungs to understand how our organs are adapted to their functional efficiency, as well as how they are affected by smoking. Digestive enzymes are introduced and put into context in their industrial uses and their specific functions within our digestive system; knowledge required for their further study at GCSE.
Rocks and weathering	A topic that allows students to discover the changes that occur in the physical world around them. Students will learn about the structure of the Earth and how volcanoes and climate change the rocks around them. They will also explore how evidence in rocks can tell us stories about how life has changed on Earth. Students will investigate how different processes weather and transport rocks, and link different volcanic shapes to a lava viscosity through a practical investigation.

Energy in the environment	A topic set in the outdoors, learners will see plants in a whole new light and realise they are the key to life and energy flow on Earth and begin to piece together how photosynthesis makes life possible. They will develop an overview of how energy flows through the food web using practical models, and appreciate how ecologists estimate the numbers of organisms at each level of the food web. Getting their hands dirty is a necessity in this topic as learners will design an investigation to compare invertebrates in two different microhabitats and get creative and crafty with making and trialling their own insect traps.
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Year 9 Science

The following topics will be covered by students throughout the year. In each of these units the following scientific skills will be developed:

Year 9 begins to transition students to studying GCSE. They begin to study concepts that will be covered in more depth at GCSE. They are expected to make progress towards using language and practicing skills that are needed at GCSE level. Furthermore Year 9 bridges KS3 to KS4 by ensuring all fundamental concepts are covered and, in some topics, knowledge becomes more complex and specific.

Name of topic	Short description
Inheritance and selection	“Why do I look like this?” is the key question learners will be able to answer by the end of this topic, and they explore the world of genetic variation, selection and engineering. The topic bridges earlier knowledge of cells with reproduction, human gestation and development required at GCSE level. Learners will exercise their ability to evaluate ethics in science with debates about cloning of animals for research and farming and the morality of genetic engineering.
Particles	This topic builds on early understanding of particle physics from year 7 & 8 and give pupils more independence in planning and accurately executing their own investigations to gather evidence related to conduction of heat. Learners will be mathematically challenged with recalling and application of some key pressure equations and begin to master concepts of how pressure and heat affect substances in their different physical states. The EM spectrum is also revisited with a focus on infra-red radiation as a source of heat.
Speeding up	Forces and speed are tackled in this topic with a more rigorous focus on mathematical mechanics. Learners are required to recall and apply of formula to solve problems; providing a stepping-stone for learners to practise skills they will require in the GCSE Physics course. There is an emphasis on practical investigation, selecting appropriate variables, accurately recording results and linking their discoveries to real-life problems/observations.
Metals	A chemistry topic that recounts the basics of the periodic table, elements and compounds, reactions of metals, but steps up a gear; both in reactivity and using chemical symbols and formula to describe reactions. Learners get the opportunity to observe the surprising

	reactions of group one metals with water and acids, and develop their technical chemistry skills and competency in using apparatus.
Salts	'Salts' complements and builds on skills learnt in 'metals' topic, with a focus on predicting and naming products from reactions of acids with different metal compounds used in industry. Learners will be given and trusted with more hazardous substances which they will be required to be familiar with at GCSE, and start to appreciate the huge role chemistry has in everyday products and medical developments.
Using resources	Drawing on year 8 practical experience of fuels, this topic centres around environmental chemistry and sustainable use of products. Learners explore use, and consequences of using everyday items and resources they take for granted. They see how biology and chemistry complement each other in providing solutions to supplying clean water, recycling plastics, and decontaminating soils.
Electricity	This topic bolts on to investigating series and parallel circuits, current, potential difference and resistance, first visited in year 7, and provides learners with more autonomy and freedom to explore the nature of electricity. The focus is to provide a tangible link to energy as a whole and lay a strong foundation which they will build upon at KS4, by introducing some of the more challenging concepts and mathematics they will approach at GCSE.
Plants for food	This topic binds together plant biology with ecology and agriculture; it develops learners' understanding of innovative solutions humans have doctored in order to provide secure and reliable food resources for our growing population. They will also learn what it takes to successfully grow plants by applying their knowledge of plant biology.
Disease	A short Biology topic, which acts a prelude to the Infection and response topic covered in year 10. Learners will enhance their technical biology vocabulary, and conduct and present their very own research on diseases of their choice. Through this task they will learn how to gauge reliability of sources of information, and how to properly cite secondary research, as well practise presenting information in an engaging way to their peers.
Ecology	A precursor to the year 10 Ecology topic and a sequel to the year 7 'extinction' topic, this section provides a link between animal adaptations/evolution and the roles organisms play in nutrient cycling through an ecosystem. Learners will get hands on and familiar with using

	ecological equipment they will experience in required practical challenges at GCSE, as well as provide further opportunity to polish their experimental design and report writing skills.
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