

Curriculum

The study of science stimulates an interest and sense of wonder in the world, as well as helping students to understand the world around them. At Cambourne we aim for science to be highly engaging, and for students to become capable and confident scientists. We offer a broad and balanced curriculum, aligned with the National Curriculum. Our curriculum is carefully sequenced, so that students can make excellent progress in their understanding of science and the scientific method.

	What pupils will learn	How it builds on learning
Year 7	Being a Scientist Pupils become accustomed to using scientific apparatus safely and practise the skills a scientist needs in carrying out an investigation from the planning stage to the evaluation.	Students complete this as their first unit to ensure that all students start the KS3 science in the same position with regards to disciplinary knowledge, which is then interwoven with the KS3 course
	Core Science Pupils cover the key ideas and vocabulary needed for KS3 Science, with four lessons each on Biology, Chemistry and Physics	Biology Takes students through the hierarchy of biological systems building on topics they have encountered at primary school and setting them up to study these further at secondary school. The unit looks at cells and the major organ systems of the body. Chemistry Builds on concepts of particles taught in KS2 and extends this to look at the idea of elements, compounds and mixtures, which are fundamental knowledge for the study of chemistry Physics Taught early as basic knowledge of forces is fundamental to most physics topics and is repeatedly returned to most units
	Reproduction Plant reproduction, fertilisation, puberty, human reproduction, pregnancy and birth	A fundamental unit taught in year 7 as this is also relevant to the student's current developmental stage.
	Living World Habitats, ecosystems, adaptations, variations and feeding relationships, the impact of food choices on the environment, the water cycle	Allows students to gain a deeper understanding of the natural world and our relationship with this. Exposes students to the concept of interdependence within the biological world.
	Atom and its History Structure of atom, history of the atom, electronic structure and reactivity, chemical formulae	Taught in year 7 to deepen students understanding of the nature of matter, which underpins all subsequent KS3 chemistry topics
	Simple Chemical Reactions Atoms, molecules and compounds. Signs of chemical reactions, oxidation and combustion, gas tests and decomposition reactions	Introduces students to the fundamental concept of chemical reactions and introduces students to writing and understanding equations.
	Space	Taught in year 7 as most of the concepts are simple, and it is a topic likely to engage students. Not revisited in

	Planets in our solar system and their motions, day and night, seasons, moon and its phases, mass and weight	KS3 as only triple science students need knowledge of Space at GCSE.
	Light Seeing things, reflection, refraction, colour, lenses, cameras and eyes	Taught in year 7 as most concepts are simple, and prepares students for more detailed study of waves in year 8.
	What pupils will learn	How it builds on learning
Year 8	Cell Biology: Cell structure, unicellular organisms, microscopy, diffusion, osmosis, anaerobic respiration and fermentation	The cellular basis of life is a fundamental biological concept, it is studied in more detail here so that students have a sound grounding ahead of their GCSE studies and year 9 units.
	Breathing and respiration Human respiratory system, aerobic and anaerobic respiration, circulatory system, smoking and asthma, non-communicable diseases	Builds on their KS2 and year 7 exposure to the unit and sets the groundwork for the GCSE Organisation unit. Students begin to develop a greater understanding of inter-related systems and the importance of energy for living things.
	Understanding Health The skeletal and muscular system. Fitness, health, communicable and non-communicable diseases. Immunity and drug development.	A closer look at some of the body systems introduced in the Core Biology unit. Explores important ideas about staying healthy and how scientists use the scientific process to develop new treatments.
	Periodic Table Understanding patterns in the periodic table, metals and non-metals, chemical symbols and balancing equations.	Builds on Atoms and Simple Chemical Reactions Units as students begin to study the patterns in reactions and the reasons behind them. The unit continues to develop the idea that science changes with evidence.
	Reactions of acids Word equations, acids and alkalis, reactions of acids and rates of reactions, gas tests	Builds on simple chemical reactions unit to further develop understanding of reactions (specifically in the context of acids and alkalis). Introduces key concept of acids and neutralisation.
	Separating mixtures Solutions and solubility, filtration, evaporation, simple and fractional distillation, chromatography, formulations.	Taught in year 8 as concepts are simple and builds on core chemistry topic taught in year 7.
	Waves Longitudinal and transverse waves, wave terminology, sound in solids liquids and gases, the human ear, music, ultrasound	Builds on Light topic by placing light in the context of other waves and comparing similarities and differences.
	Matter Heat transfer, conduction, radiation, convection, evaporation, heating and cooling curves, radioactivity,	Taught in Year 8 so students will have already studied Year 7 Core Chemistry, so will have studied solids, liquids and gases which this topic builds on.
Forces and motion Forces, friction, Hooke's law, speed, distance time graphs, velocity- time graphs	Builds on Year 7 Core Forces, further deepening their understanding of forces. Students should also have good experience of plotting graphs from BAS and from other experiments by this point.	

	What pupils will learn	How it builds on learning
Year 9	DNA Structure of DNA, inheritance, variation, evolution, natural selection, selective breeding	Follows on from the year 8 cells unit, taught here as it is more conceptually challenging. Concepts are revisited in year 11 and so this provides a solid grounding.
	Photosynthesis Parts of a flower, photosynthesis reaction, rate of photosynthesis, limiting factors, transport in plants, respiration in plants	Provides an understanding of the importance of plants to our existence and sets students up to understand these concepts at GCSE level.
	Food and digestion Food groups, deficiency diseases, energy in food, digestion and digestive system, enzymes	Follows on from the Core Biology unit and helps students to think about choices that can impact their own health as well as providing a grounding for their GCSE studies.
	Earth's Chemistry The composition of the Earth, the structure of the Earth. The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources and the efficacy of recycling. The carbon cycle, the composition of the atmosphere, the production of carbon dioxide by human activity and the impact on climate.	Follows on from KS2 ideas about the Earth. Introduces ideas of climate change - and impacts of carbon on the planet. Provides foundational knowledge to fully understand concepts that will be built on in KS4.
	Energy Changes in Chemical Reactions Word and symbol equations, thermal decomposition, catalysts, exothermic and endothermic reactions, changes of state	Builds on year 7 and 8 units, bringing a variety of concepts together including reactions, changes of state and the nature of matter. Introduces the idea of energy change in preparation for year 11.
	Materials Word and symbol equations, displacement reactions, reactivity series, polymers, composite materials	Builds on year 7 and 8 units - looking at specific materials and the reasons behind their properties. Also links to Earth chemistry and prepares students for year 10 using resources unit/year 11 organic chemistry unit.
	Pressure and moments Pressure in solids, liquids and gases, Hooke's Law, Machines and moments, Density	Students again return to the concept of forces, deepening their understanding. Taught in year 9 as it introduces some harder maths such as pressure calculations with different units for area/pressure, and balancing moment equations.
	Energy Types of energy, energy conversions, efficiency, fossil fuels, renewable energy, power	Taught in year 9 as it formalises concept of energy embedded in all topics in earlier years, and prepares students for year 10 unit on Energy. Also contains significant mathematical demand, introducing equations for power and efficiency.
	Electricity and Magnetism Static electricity, series and parallel circuits, potential difference, current, resistance, Ohm's law, plugs and	In Year 9 as ideas around current and voltage in series and parallel are conceptually challenging, as well as introducing Ohm's Law.

	electrical safety, magnets, electromagnets	
	<p>Introduction to GCSE Students study short units as an introduction to GCSE. In Biology students study proteins, epidemics, evolution and ecology. In Chemistry students focus on deepening their understanding of the atom and in Physics students study waves</p>	<p>Biology A series of four lessons which tackle fundamental biological ideas in an exciting way to both prepare students for their GCSE studies and get them excited about biology.</p> <p>Chemistry History of the atom is revisited in more detail, isotopes and RAM are introduced – building on ideas introduced in year 7 and preparing for year 10.</p> <p>Physics Students are taught 4 lessons of the GCSE waves topic, giving students the opportunity to return to this in year 11. It also allows students to practice unit conversions, a key maths skill, in a familiar context.</p>

Assessment

Students undertake formative assessments at the end of each topic. The aim of these is for students to be able to improve their understanding of the topic that they have just completed and to consolidate learning. Students also undertake summative tests. In year 7, these tests take place at the end of each term, while in years 8 and 9 students take two tests evenly spaced throughout the year. At the end of year 9 students undertake an end of Key Stage 3 test.

Supporting your child

What you can do at home:

Parents can support students in a number of ways, including:

- Asking students about what they have learnt in lessons and by trying to move them from thinking about what happens around them to why these things happen.
- Supporting students with revision for tests – revision resources for these are provided via SatchelOne and Teams, along with instructions. It can be really helpful if parents guide the students through using these resources.
- Reading about science – resources for this could include texts provided by the school library or BBC Science Focus magazine.

Equipment:

In addition to standard school equipment, students should bring a green pen and a calculator to lessons.

Extended learning

Homework policy:

Homework will usually be set every two weeks, although the exact frequency of this is at the discretion of the teacher. Homework should take approximately 30 minutes to complete. Extension homework may also be set as appropriate.

Clubs/ Enrichment opportunities:

STEM club will run once a week 3-4pm on a Wednesday. Enrichment activities also take place throughout the year.

Extended study suggestions and reading lists:

The library has a range of texts and study guides to support learning. The BBC Bitesize for KS3 Science website contains up-to-date subject content that can be used for revision.

Possible trips and visits:

All year 7 students go to Colchester Zoo at the end of the first half term. Year 8 and 9 students interested in science also can also opt for science-based activities during Activities Week. These currently include a trip to the National Space Centre in Leicester and a trip to Banham Zoo. In addition, a number of STEM based trips are offered over the course of the year.