

Topics are taught in rotation due to demands on equipment.

Year 7	Year 8	Year 9	Year 10	Year 11
Cells and organisation Describe, identify and explain the structure of animal and plant cells. Hierarchy of cells, tissues, organs and organ system. Roles of organ systems and focus on skeletal systems	Health, digestion and respiration Explain what digestion and describe process through human body. Describe breathing and respiration through the use of the human body. Describe and explain what a healthy diet is and consequences of poor diet. Understand the consequences of drinking and smoking on the human body.	Cell Biology Advanced cell structure and specialism, stem cells and cell differentiation. Microscopy. Mitosis and the cell cycle. Transport in cells via diffusion, osmosis or active transport#.	Organisation Organisation of cells into tissues, organs and organ system. Digestion and circulatory systems. How diseases and lifestyle can affect the human body with focus on cancer and heart disease. Plant tissues, organs and organ systems.	Homeostasis and response What can affect the functions of cells in the body. How the body constantly monitors and adjust the composition of the blood and tissues to achieve this. We will explore the structure and function of the nervous system and how it can bring about fast responses. We will also explore the hormonal system which usually brings about much slower changes.
Reproduction Sexual and asexual reproductions. Describe and explain organs in male and female organ systems. Fertilisation and development of baby in womb. Understand and describe role of puberty and menstruation.	Ecosystems and variation How animals and plants are adapted to their environment and how species interact within an ecosystem.	Infection and response Communicable diseases and how viruses, bacterial, fungal and protist diseases operate. How the human body defends against disease and how vaccinations, antibiotics and painkillers work. The discovery and development of drugs.	Bioenergetics Photosynthesis reaction and how to change the rate of photosynthesis. The uses of the products of photosynthesis. Respiration, the effect of exercise and metabolism.	Variation, inheritance and evolution How genetics produce unique offspring. How mutations can affect the functioning of the animal or plant which could be beneficial. Variation generated by mutations and sexual reproduction is the basis for natural selection and evolution. How organisms can be cloned and organisms are altered by genetic engineering
			Ecology	

How the Sun is a source of energy that passes through ecosystems. How carbon and water are continually recycled by the living world. How complex communities of animals and plants are dependent on each other and that are adapted to particular conditions, both abiotic and biotic. These ecosystems provide essential services that support human life and continued development.

Particles	Rocks and mixtures	Atomic structure and the periodic table	Bonding, structure and properties	Quantitative chemistry
How particles are arranged in the three states of matter and how we can use this to explain the behaviour of solids, liquids and gases.	We will describe and explain how different rocks are formed. How we can get useful materials from the Earth's crust and how to separate them from other substances.	How the periodic table developed and how we use it to make sense of their physical and chemical properties. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels.	How structure and bonding explain the physical and chemical properties of molecules and giant structures. How scientists use this knowledge of structure and bonding to engineer new materials with desirable properties. The properties of these materials may offer new applications in a range of different technologies.	How to determine the formulae of compounds and the equations for reactions. Which leads to how we determine the purity of chemical samples and to monitor the yield from chemical reactions. Identifying different types of chemical reaction allows chemists to make sense of how different chemicals react together, to establish patterns and to make predictions about the behaviour of other chemicals.
Chemical reactions	Metals	Earth and Atmosphere	Chemical changes	Hydrocarbons

The difference between chemical and physical changes. How we classify acids and bases as well as explain neutralisation. What is required for combustion to occur.	We will look at various reactions involving metals to form useful salts. The reactivity series and how this can be used to explain displacement reactions.	The Earth's atmosphere is dynamic and forever changing. We will look at how to predict weather and climate change. The problems caused by increased levels of air pollutants and the solutions that help to reduce the impact of human activity.	Understanding of chemical changes which can be used to understand the complex reactions that take place in living organisms. The extraction of important resources from the Earth makes use of the way that some elements and compounds react with each other and how easily they can be 'pulled apart'.	A great variety of carbon compounds is possible because carbon atoms can form chains and rings linked by C-C bonds. These sources include fossil fuels which are a major source of feedstock for the petrochemical industry. Chemists are able to take organic molecules and modify them in many ways to make new and useful materials such as polymers, pharmaceuticals, perfumes and flavourings, dyes and detergents.
			Energy changes	Chemical analysis
			How the interaction of particles often involves transfers of energy due to the breaking and formation of bonds. These interactions between particles can produce heating or cooling effects that are used in a range of everyday applications. Some interactions between ions in an electrolyte result in the production of electricity. Electricity can also be used to decompose ionic substances and is a useful means of producing elements that are too expensive to extract any other way.	Analysts have developed a range of qualitative tests to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate. Instrumental methods provide fast, sensitive and accurate means of analysing chemicals, and are particularly useful when the amount of chemical being analysed is small.
			Rates of reaction	

How the rate of a chemical reactions can vary. Chemical reactions may also be reversible and therefore the effect of different variables needs to be established in order to identify how to maximise the yield of desired production. In industry, chemists and chemical engineers determine the effect of different variables on reaction rate and yield of product. Whilst there may be compromises to be made, they carry out optimisation processes to ensure that enough product is produced within a sufficient time, and in an energy-efficient way

Forces and Space	Forces and energy	Forces and motion	Energy stores and pathways	Further forces
How to calculate speed. Describe common forces and motion of objects. Understand gravity and its affects on our solar system	I can describe energy stores and pathways. I can explain the effect of forces on surfaces and pivotted objects.	Using graphs to describe motion and calcalte acceleration. Understand Newton's laws and how materials behave.	How to calcualte energy transfers and how energy resources affect the Earth.	Forces and their affect on moving objects. Stopping distances of vehicles
Light and Sound	Electricity and magnetism	Kinetic theory and changes of state	Electricity	Waves
How to describe waves using light and sound as examples. How waves behave due to reflection and refraction.	How current and potential difference behave in simple circuits. Link between magnetism and electricity and electromagnets	Energy changes as materials change state and processes of how heat is transferred	How resistance, potential difference and current behave in components and circuits.	Behviour of lectromagnetic waves and sound and how they are used to aid modern life.
			Electromagnetism	Space Physics (Physics only)
			The links between electric current and magnetism. How an electric motor works.	Motion of celestial objects. The life cycle of stars and the big bang.
			Atomic structure	

How the model of the atom has changed and how. Properties and uses of ionising radiation