



Key Stage 4 Curriculum Map Overview

Subject: Choose Subject						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	<p>Unit Name:</p> <ul style="list-style-type: none"> Cell Biology & Energetics Organisation Infection & Response Homeostasis & Response <p>Unit Description: Cells as the basic unit of life. Structural differences between cells enabling performance of specific functions. Mitosis, producing two new identical cells. Nature & development of stem cell technology. Diffusion, osmosis & active transport. Organisation of human digestive system, respiratory system & circulatory system. Including the impact that lifestyle can have. Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. In order to do this the body requires control systems that constantly monitor and adjust the composition of the blood and tissues. Control systems including receptors which sense changes and effectors that bring about changes. Particularly the nervous system and how it can bring about fast responses and the hormonal system which usually brings about much slower changes. Hormonal coordination controls the menstrual cycle, the role of hormones in reproduction and the</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> Inheritance, variation, evolution <p>Click or tap here to enter text. Unit Description: The halving and recombination of chromosomes to create genetic variation during sexual reproduction. The incidence of mutation and its possible consequences. Variation as the basis for natural selection; this is how species evolve. The classification of organisms according to these inherited characteristics. An understanding of these processes has allowed selective breeding Cloning of individuals to produce larger numbers of identical individuals all carrying the favourable characteristic. Genetic engineering and the controversy surrounding gene manipulation.</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> Ecology Plant organs, systems & energetics <p>Unit Description: The Sun as a source of energy for ecosystems. Carbon and water are continually recycled by the living world, released through respiration and taken up by plants in photosynthesis. Species live in ecosystems of complex communities dependent on each other and adapted to particular conditions. These ecosystems support human life and continued development. To continue to benefit humans need to engage with the environment in a sustainable way. Humans threaten biodiversity as well as the natural systems that support it. The essential contribution plants make to a stable ecosystem, examining the plant's detailed structures & energetics including transport systems dependent on environmental conditions to ensure that leaf cells are provided with the water and carbon dioxide that they need for photosynthesis.</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> Atomic structure and the periodic table Bonding, structure, and the properties of matter <p>Unit Description: The periodic table as a structured organisation of the known chemical elements from which sense can be made of their physical and chemical properties. The historical development of the periodic table and models of atomic structure as examples of how scientific ideas and explanations develop over time as new evidence emerges. 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. Structure and bonding to explain the physical and chemical properties of materials. Theories of bonding explain how atoms are held together in these structures. Use of this knowledge of structure and bonding to engineer new materials with desirable properties.</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> Quantitative chemistry Chemical changes Energy changes The rate and extent of chemical change <p>Unit Description: Quantitative analysis to determine the formulae of compounds and the equations for reactions. Determination of the purity of chemical samples and monitoring of the yield from chemical reactions. Chemical reactions can be classified in various ways. 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 equations provide a means of representing chemical reactions. Understanding chemical changes to predict new substances formed and use of this knowledge to develop a wide range of different materials and processes. The extraction of important resources from the earth The interaction of particles involving transfers of energy due to the breaking and formation of bonds. Exothermic & endothermic reactions & their everyday applications. Interactions between ions in an electrolyte result in the production of electricity. Cells and batteries use these chemical reactions to provide electricity. Electricity can also be used to decompose ionic substances and is</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> Organic chemistry Chemical analysis <p>Unit Description: The chemistry of carbon compounds forms a separate branch of chemistry. A great variety of carbon compounds is possible because carbon atoms can form chains and rings linked by C-C bonds. Its name comes from the main sources of organic compounds being living, or once-living materials. These 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 Analysts have developed 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. Forensic scientists and drug control scientists rely on such instrumental methods in their work.</p>

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	development of contraceptive drugs & fertility drugs.				a useful means of producing elements that are too expensive to extract any other way. Reactions occur at different rates. Variables can be manipulated to achieve this. Chemical reactions can be reversible. This is used in industry to maximise yield and thus increase profit.	
Year 11	<p>Unit Name:</p> <ul style="list-style-type: none"> • Chemistry of the atmosphere • Using resources <p>Unit Description: The Earth's atmosphere is dynamic. The causes of these changes are a mixture of man-made and natural cycles. Scientists use software to predict weather and climate change. The problems caused by increased levels of air pollutants require scientists and engineers to develop solutions that help to reduce the impact of human activity on the Earth and its atmosphere. Industries use the Earth's natural resources to manufacture useful products. To operate sustainably, chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of products. Chemists also try to develop ways of disposing of products at the end of their useful life in ways that ensure that materials and stored energy are utilised. Pollution, disposal of waste products and changing land use has a significant effect on the environment, and environmental chemists study how human activity has affected the Earth's natural cycles, and how damaging effects can be minimised.</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> • Energy • Electricity • Magnetism & Electromagnetism <p>Unit Description: The concept of energy emerged in the 19th century. It was used to explain the work output of steam engines and then later to understand other heat engines. It is also useful for understanding chemical reactions and biological systems. Limits to the use of fossil fuels and global warming are critical problems for this century. Physicists and engineers work hard to find ways to reduce our energy usage. Electric charge is a property of matter everywhere. Understanding the difference in the microstructure of conductors, semiconductors and insulators makes it possible to design components and build electric circuits. Many circuits are powered by mains electricity, but portable electrical devices must use batteries of some kind. The fundamentals of electromagnetism were worked out by scientists of the 19th century. Electromagnetic effects are used in a wide variety of devices. Engineers make use of the fact that a magnet moving in a coil can produce electric current and also that when current flows around a magnet it can produce movement. It means that systems that involve control or communications can take full advantage of this. Power stations, like all machines, have a limited lifetime. If we all</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> • Particle Model of Matter • Atomic Structure <p>Unit Description: The particle model is widely used to predict the behaviour of solids, liquids and gases. Engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft. Ionising radiation is hazardous but can be very useful. Although radioactivity was discovered over a century ago, it took many nuclear physicists several decades to understand the structure of atoms, nuclear forces and stability. Early researchers suffered from their exposure to ionising radiation. Rules for radiological protection were first introduced in the 1930s and subsequently improved. Today radioactive materials are widely used in medicine, industry, agriculture and electrical power generation.</p>	<p>Unit Name:</p> <ul style="list-style-type: none"> • Forces • Waves • Magnetism & Electromagnetism <p>Unit Description: Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic force microscopes. Anything mechanical can be analysed in this way. Recent developments in artificial limbs use the analysis of forces to make movement possible. Wave behaviour is common in both natural and man-made systems. Waves carry energy from one place to another and can also carry information. Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves.</p>	<p>Unit Name: Revision Techniques & Targeted Revision</p> <p>Unit Description: Exam focused recap of biology, chemistry and physics. Practising exam technique and exam preparation.</p>	<p>Unit Name: Summer Exam Series</p> <p>Unit Description: Click or tap here to enter text.</p>

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		continue to demand more electricity this means building new power stations in every generation – but which power stations can promise a sustainable future?				
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