Curriculum Overview

Science Year 10

	HT1	HT2	HT3	HT4	HT5	HT6
Topic	Atomic structure and the periodic table Bonding structure and properties of matter	• Energy • Electricity	Cell Biology Organisation	Quantitative chemistry Chemical changes Energy changes	Particle Model of matter Atomic Structure Forces	Infection and response Bioenergetics
Knowledge	• A simple model of the atom, symbols, relative atomic mass, electronic charge and isotopes. • The periodic table.	• Energy changes in a system, and the ways energy is stored before and after such changes. • Work done • Energy transfers	• Cell structure: Difference between eukaryotes and prokaryotes. Detailed structure and function of animal and plant cells. • Cell specialisation: adaptations of cells in animals and plants.	• Reactivity of metals • Reactions of acids • Electrolysis • Exothermic and endothermic reactions	• Changes of state and the particle model Internal energy and energy transfers Particle model and pressure • Atoms and isotopes	• Communicable (infectious) diseases including diseases caused by bacteria, viruses, fungi and protists. • Human defence systems: immunity and vaccination.

	• Chemical bonds, ionic, covalent and metallic. • How bonding and structure are related to the properties of substances Structure and bonding of carbon • Chemical measurements, conservation of mass and the quantitative interpretation of chemical equations.	in a system • Emission and absorption of infrared radiation • Internal energy • Temperate changes in a system and specific heat capacity. • National and global energy resources. • Current, potential difference and resistance	• Microscopy: Theory of microscope use, and limitations with different types of microscope • Transport into and out of cells: Diffusion, Osmosis in animal and plant cells and active transport. • Cell differentiation: how cells develop from stem cells into specialised cells. • Chromosomes: structure of chromosomes • Mitosis and the cell cycle: events in the cell cycle		• Atoms and nuclear radiation • Forces and their interactions • Forces and motion	• Discovery and development of drugs including antibiotics. • The effect of lifestyle on some noncommunicable diseases including the effects of alcohol, smoking, exercise and diet. The causes and treatments of cancer are covered. • Photosynthesis, the process where the energy from the sun is transferred into chemical energy in a plant. Practical work looks at the rate of photosynthesis. • Aerobic and anaerobic

		• Series and parallel circuits. • Domestic uses and safety • Explain the purpose of fuses, earthing, circuit breakers, and plastic casings in electrical safety. • Describe the link between charge, potential difference, current, time, energy and power and do calculations involving those quantities	• Stem cells: Therapeutic cloning, the use of stem cells in medicine and ethical issues related to their use. • How organisms are organised. • The structure of the digestive system and principles of chemical digestion. • Transport within a human including the structure of the heart and blood vessels and composition of blood. • Coronary heart disease: a noncommunicable disease			respiration. Energy within chemical molecules is released in respiration. This is then linked to the body's response to exercise and the principles of metabolism.

			• Organisation of plant tissues and the transport and exchange in a plant			
Skills	• Write formulae and balanced chemical equations for the reactions in this specification. • Safe use of a range of equipment to separate chemical mixtures. • The historical context of atomic structure provides an opportunity for students to show an understanding of why and describe how scientific	• Explain processes in terms of energy stores. • Do more complex calculations involving gravitational potential energy, kinetic energy, elastic potential energy, work done, power and efficiency, and change the subject of equations.	• Recognise, draw and interpret images of cells. • Students should be able to carry out calculations involving magnification, real size and image size • Students should be able to express answers in standard form if appropriate. • Use prefixes centi, milli, micro and nano. • Evaluate the practical risks and benefits, as	• Use of appropriate apparatus and techniques for conducting chemical reactions, including appropriate reagents. • Safe use of a range of equipment to purify and/or separate chemical mixtures including evaporation, filtration, crystallisation.	• Calculate density and describe factors that affect it. • Explain why a gas exerts a pressure. Explain the relationship between pressure and volume, and volume and temperature. • Describe the Thomson, Rutherford and Bohr	• The principles of sampling as applied to scientific data, including epidemiological data. • Convert disease incidence information between graphical and numerical forms, construct and interpret frequency tables and diagrams, bar charts and histograms, and use a scatter diagram to identify a correlations • Understand the principles of sampling as

	methods and theories develop over time • Recognise expressions in standard form. • Use SI units and the prefix nano. • Students should be able to represent the electronic structures of the first twenty elements of the periodic table in both forms. • Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects.	• Apply what students know about power and efficiency. • Calculate specific heat capacity and apply knowledge of specific heat capacity to make predictions. • Apply what students know about thermal conductivity to buildings and other situations. • Analyse data in terms of specific	well as social and ethical issues, of the use of stem cells in medical research and treatments. • Develop an understanding of size and scale in relation to cells, tissues, organs and Systems. • Use simple compound measures such as rate and carry out rate calculations for blood flow.		models of the atom, the structure of the nucleus and evidence that led to the model changing. Describe what alpha, beta, and gamma radiation are, and their different properties and how to balance equations for nuclear decay. • Use ideas about halflife to solve problems. • Calculate resultant forces. Describe why some objects are stable and	applied to scientific data, including epidemiological data. • Solve simple algebraic Equations including the inverse square law. • Investigations into the effect of exercise on the body.

	• Recognise substances as small molecules, polymers or giant structures from diagrams showing their bonding.	heat capacity. • Explain why the temperature of the Earth is increasing. • Explain charging and discharging in terms of electron movement. Explain attraction and repulsion using the idea of electric fields. Apply knowledge of series and parallel circuits.			others topple. • Plot and interpret a distance-time graph. Make calculations of speed using a range of units. Plot and interpret a speed-time graph.	
Assessment Opportunities (F&S)	.Retrieval practice starter Self and peer assessment of knowledge.	Retrieval practice starter Self and peer assessment of knowledge.	Retrieval practice starter Self and peer assessment of knowledge.	Retrieval practice starter Self and peer assessment of knowledge.	Retrieval practice starter	Retrieval practice starter Self and peer assessment of knowledge.

	Mid term assessment: Atomic structure and the periodic table. **End of topic tests** Structures and bonding	**Mid term** assessment Energy **End of topic tests. -** Electricity	**Mid term** assessment Cell Biology **End of topic tests. -** Organisation	**Mid term** assessment Quantitative chemistry **End of topic tests. -** Chemical and energy changes	Self and peer assessment of knowledge. **Mid term** assessment Particle model of matter **End of topic tests. -** Atomic structure and Forces	**Mid term** assessment Infection and response **End of topic tests. -** Bioenergetics
CEIAG	Careers in medicine, engineering, education, manufacturing and many more.	Careers in medicine, engineering, education, manufacturing and many more.	Careers in medicine, engineering, education, manufacturing and many more.	Careers in medicine, engineering, education, manufacturing and many more.	Careers in medicine, engineering, education, manufacturing and many more.	Careers in medicine, engineering, education, manufacturing and many more.
Cultural Capital						Blackpool pleasure beach
Cross-Curricular Links	Maths skills	Maths skills	Maths skills	Maths skills	Maths skills	Maths skills