

Subject: Science

Subject Leader

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National Curriculum

The bespoke KS3 Science Syllabus is an approach to teaching the current National Curriculum KS3 Programme of Study. It has been designed to equip students for success at GCSE using big ideas with an approach that promotes understanding that prepares students for following the AQA Co-Taught ELC/ GCSE and AQA 9–1 GCSE Combined Trilogy specification at KS4.

We believe that the KS3 science units has something to offer every student.

KS3 science units have been designed to support each student along their education journey through secondary science at every level regardless of secondary school qualification whether that be AQA Entry level Certificate (ELC) or the GCSE Combined Trilogy in Science.

By putting students at the heart of everything we do, our aim is to help teachers shape successful lessons in science for every student.

Entry Level Certificates (ELCs) are nationally recognised qualifications which give students the opportunity to achieve a certificated award. As all the science qualifications taught at Kingsmead, we use straightforward language in our lessons to allow students to focus and achieve the ELC/GCSE results they deserve.

The Co-Taught ELC/ GCSE Combined Trilogy provides flexibility, but on a clear progression pathway.

It equips students with skills and knowledge transferable to both educational and career settings, and provides a worthwhile course for our Y10 and Y11 students coming to us from a range of diverse backgrounds.

All our science qualifications provide opportunities for progression. Entry Level Certificate provides the foundation for studying science at the GCSE level. The Co-Taught ELC/ Combined Science Trilogy gives students the opportunity to progress onto further education or apprenticeships.

Curriculum Intent

Science at The Kingsmead School is driven by one goal: to provide a fascinating, challenging and exciting exploration of science to support pupils understanding of the world around them through the specific disciplines of biology, chemistry and physics. All students work towards the highest science qualification that reflects their progress during their time with us – progress that develops their understanding of the impact and importance of science in their lives and ever-increasing relevance in tackling the challenges of the world around them.

The Science curriculum, across both Key Stages, is designed in a way to enable our pupils to grown into confident, resilient learners through a learning approach that develops practical, theoretical, mathematical and literacy skills. In an ever increasingly scientific world, with challenges such as the global pandemic and climate change, this approach aims to equip all pupils with the appropriate knowledge and understanding that supports them in become confident citizens who appreciate the impact and importance of science on their lives.

Teachers are passionate and enthusiastic about the importance of pupils being able to engage and grapple with the concepts we deliver. Motivated by the acknowledgement of how science is changing all our lives and is vital to the world's future, we endeavour to inspire all students and to promote high levels of engagement, aspiration and progression that will hopefully take them beyond Key Stage 4 or careers made possible by their science outcomes.

Students in years 7, 8 and 9 follow the National Curriculum over a three year SOW that is designed to consolidate learning from Key Stage 2 and develop a deeper understanding of the range of scientific ideas in the subject disciplines of biology, chemistry and physics.

The KS3 science scheme of work has something to offer every student studying at Kingsmead and is taught using a bespoke KS3 Science Syllabus. Our KS3 pathway has recently been developed in an attempt to further enhance the teaching and learning of our students and we continue to resource/update this SOW through our education journey. The intension of the department is to have a bespoke, continuously developing, exciting and well-resourced approach to teaching the science curriculum, delivered through individual units from Year 7 upwards. This approach in Key Stage 3 provides the foundations for future learning and the demands of Key Stage Four study

Year 10 and 11 students follow the Combined Trilogy GCSE scheme of work. The Combined Trilogy pathway allows each KS4 student to gain a double award qualification in science. The GCSE Combined Science Trilogy offers practical activities as an integral part of teaching and learning. It offers a series of required practical's that are clearly delivered by each subject teacher so that our KS4 students will have a clear understanding of what is required.

All students at both KS3 and 4 will complete practical tasks identified within the curriculum as part of the scientific enquiry. The expectation is that during Key Stage 3, students show progress in their scientific ability to predict, plan and carry out the most appropriate types of scientific enquiries. The ability to choose the most appropriate techniques, apparatus, whilst paying attention to health and safety in order to record observations and measurements using a range of methods for a variety of different investigations. Once in KS4 students will develop skills allowing them to further evaluate the reliability of methods and suggest possible improvements to practical activities.

In all lessons, students are encouraged to understand processes and methods of science through enquiry that help them to answer scientific questions about the environment around them and to develop a sense of excitement and curiosity about natural phenomena of the world we live in.

Our aim is to dispel misconceptions, to develop key specialist science vocabulary, and to equip them with the scientific knowledge required to understand the uses and implications of science not only today but for the future.

Teaching and learning approaches are differentiated and considered, according to the needs of different groups of pupils. With this approach to teaching we aim to encourage students to question the scientific method and nurture their interest - at a level that is appropriate, challenging but never overwhelming - should they wish to pursue a deeper understanding of the scientific world around them.

Curriculum Implementation

		Term	Content/Topics	Assessment
Year 7	Autumn Term 1	1	<p>(Y7 safety lab lessons)</p> <ul style="list-style-type: none"> • Students should know that when conducting certain practicals in the classroom/laboratory they will come into contact with a range of different chemicals. • Chemicals such as acids can cause burns, damage to tissues and organs • Act responsibly in the science classroom / laboratory. • Follow all written and verbal instructions to minimise risk • Do not touch equipment or chemicals in the classroom/laboratory until your teacher gives instructions. • Refrain from eating, drinking in the science classroom / laboratory. <p>Physics unit _Forces and their effects</p> <ul style="list-style-type: none"> • Look at the use of forces used to cause an object to start or stop moving, or to change their direction of motion. • Know that one effect of a force is to change an object’s form, causing it to be stretched or compressed • Describe the effects of air resistance and other forces on falling or accelerating objects as they move. • Describe factors which affect the size of frictional and drag forces, plus why materials behave as they do when they’ve been stretched or squashed. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

	Autumn Term 2	<p>2</p> <p>Biology unit _Cells</p> <ul style="list-style-type: none"> • Explain why multi-cellular organisms need organ systems to keep their cells alive. • Explain how to use a microscope to identify and compare different types of cells. • Students will investigate cell structures with the aid of a light microscope. Students will apply this knowledge to the hierarchical organisation of multicellular organisms • Suggest what kind of tissue or organism a cell is part of, based on its features. • Introduction to cellular organelles. <p>Biology unit _Reproduction</p> <ul style="list-style-type: none"> • Students will look at mammalian reproduction, content not covered at KS2 Science. There will be a larger focus on the structure and function of the male and female reproductive systems. • Explain whether substances are passed from the mother to the foetus or not. • Use a diagram to show stages in development of a foetus from the production of sex cells to birth. • Describe causes of low fertility in male and female reproductive systems. • Early learning of this topic describes the importance of plant life and the necessity of plant life for animal survival • Describe the main steps that take place when a plant reproduces successfully. • Identify parts of the flower and link their structure to their function. • Suggest how a plant carried out seed dispersal based on the features of its fruit or seed. • Explain why seed dispersal is important to survival of the parent plant and its offspring. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
	Spring Term 1	<p>3</p> <p>Physics unit _Energy resource</p> <ul style="list-style-type: none"> • An introduction to energy through the idea of foods and fuels as energy resources. • Students compare the advantages and limitations of a range of energy resources and give examples of how to use fuel economically; describe energy transfer links between the Sun, wind plus other energy resources. <p>Chemistry unit _Acids and alkalis</p> <ul style="list-style-type: none"> • Defining acids and alkalis in terms of neutralisation reactions • The pH scale for measuring acidity/alkalinity; and indicators • Reactions of acids with metals to produce a salt plus hydrogen • Reactions of acids with alkalis to produce a salt plus water 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

	Spring Term 2	4	<p>Biology unit _Environment and feeding relationships</p> <ul style="list-style-type: none"> covering topics such as Habitats, Interdependence and adaptation. Students look at how habitats vary in relation to how plants and animals have adapted to live in a particular habitat. Students look at how plants and animals interact with their environment and with each other, including feeding relationships. <p>Biology unit _Variation and classification</p> <ul style="list-style-type: none"> Students identify how variation has influenced natural selection. Examine similarities and differences in organisms of the same species and begin to attribute these to environmental or inherited factors. Describe the importance of classifying living things. Students discuss the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
	Summer Term1	5	<p>Physics unit _Electrical circuits</p> <ul style="list-style-type: none"> Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms Differences in resistance between conducting and insulating components (quantitative). Students investigate electrical circuits identifying the relationship between current, potential difference and resistance in both series and parallel circuits. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
	Summer Term 2	6	<p>Physics unit _Gravity, space and beyond</p> <ul style="list-style-type: none"> Students identify gravity as a universal force of attraction between objects and that this force is governed by mass and distance. Students understand how weight of an object can be different on different planets. Gravity as being a force which acts throughout the solar system. Gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) Sun as a star, other stars in our galaxy, other galaxies Seasons and the Earth's tilt, day length at different times of year, in different hemispheres 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
	Term		Content/Topics	Assessment
Year 8	Autumn Term 1	1	<p>Biology unit _Food and digestion</p> <ul style="list-style-type: none"> The body requires a balanced diet to provide cellular energy for healthy growth and maintenance. Investigate specific nutrients within different food groups and present observations using appropriate methods. Students study different organs of the digestive system and adaptation to break large food molecules into smaller soluble food molecules to be absorbed into the circulatory system. Nutrients in cells are used for life processes. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

		<p>Biology unit _Microbes and disease</p> <ul style="list-style-type: none"> Identify the many uses of microorganisms in industry Recognise that there are different types of micro-organism and that many micro-organisms are useful, eg fungi are a source of antibiotics and are used in food production. Microbes that cause infection and disease are known as pathogens. Identify ways in which infection and disease can be transmitted 	
	Autumn term 2	<p>2</p> <p>Chemistry unit _Atoms elements and the periodic table</p> <ul style="list-style-type: none"> Varying physical and chemical properties of different elements Principles underpinning the Mendeleev Periodic Table Periodic Table: periods and groups; metals and non-metals Patterns in reactions can be predicted with reference to the Periodic Table Properties of metals and non-metals The chemical properties of metal and non-metal oxides with respect to acidity Demonstrate a simple (Dalton) atomic model Differences between atoms, elements and compounds Chemical symbols and formulae for elements and compounds Conservation of mass changes of state and chemical reactions. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
Spring Term 1	3	<p>Physics unit _Speed</p> <ul style="list-style-type: none"> Look at the concept of speed and consider the relationship between forces on an object, and its movement. Study the effects of water and air resistance (particles) on speed, and how streamlining reduces these effects. Look at balanced and unbalanced forces to explain the movement of falling objects. <p>Physics unit _Energy and electricity</p> <ul style="list-style-type: none"> Builds on learning from electrical circuits focusing on how transfers and/or transformations of energy by electricity are important in everyday life. The unit covers the ideas of dissipation or 'wasted' energy and the conservation of energy. Look at energy and electrical production and simply looks at some of the consequences and impact of the electricity supply industry. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
Spring term 2	4	<p>Biology unit _Ecological relationships</p> <ul style="list-style-type: none"> Identify organisms in a food web (decomposers, producers and consumers) depend on each other for nutrients. See that a simple change in one population leads to changes in others. Describe differences between vertebrates and invertebrates. Recognise that plants are subdivided into groups based on characteristics such as tissue and seed or spore reproduction 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

		<p>Biology unit _Breathing and respiration</p> <ul style="list-style-type: none"> • Students will learn about the main organs of the respiratory system and how these organs work together to maximise gas exchange involved on the process of respiration in plants and animals. • Compare the difference between aerobic and anaerobic respiration during this topic with the use of investigative skills. • Describe respiration as a series of chemical reactions, in cells resulting in energy production. 	
Summer Term 1	5	<p>Chemistry unit _Compounds and mixtures</p> <ul style="list-style-type: none"> • Identify the difference between an element and compound. • Investigate different reactions and distinguish between physical and chemical reactions. • Use simple techniques for separating mixtures including: filtration, evaporation, distillation and chromatography. • Science investigative skills developed through practical activities by using simple techniques. <p>Chemistry unit _Rock cycle and weathering</p> <ul style="list-style-type: none"> • Rock cycle and the formation of igneous, sedimentary and metamorphic rocks • The composition of the Earth • How rocks are converted over millions of years through weathering, erosion, heat, pressure, melting and cooling • Earth as a source of limited resources and the efficacy of recycling • Production of carbon dioxide by human activity and the impact on climate • There are connections with work on fossil fuels in unit Energy resources. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
Summer term 2	6	<p>Physics unit _Light and sound</p> <ul style="list-style-type: none"> • The similarities and differences between light waves and waves in matter • Light waves travelling through a vacuum; speed of light • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface <ul style="list-style-type: none"> • Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound • Sound needs a medium to travel, the speed of sound in air, in water, in solids • Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone Diaphragm and the ear drum; sound waves are longitudinal • Auditory range of humans and animals. 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

	Term	Content/Topics	Assessment
Year 9	Autumn Term 1	<p>1</p> <p>Chemistry unit _Environmental chemistry</p> <ul style="list-style-type: none"> • Students get the opportunity to look at our environment as a whole from pollution of the soil to increased levels of carbon dioxide in the environment. • Discuss the science evidence to dismiss the idea that global warming as a myth. • Explain how scientists have evidence that global warming is caused by human activity leading to changes in climate. • Learn why technology is being developed to stop the increasing levels of carbon dioxide that are linked to climate change. • Development of practical skills investigation <p>Chemistry unit _Reaction of metals and metal compounds</p> <ul style="list-style-type: none"> • Compare the reactions of metals and dilute acids • Compare reactions of different metals and oxygen • Compare reactions of different metals with water • Use the reactivity series to identify metals that can be extracted from there metal ores • Describe how metals react with acids and how acids react with metal carbonates, metal oxides and alkalis; identify • Describe factors which indicate that a chemical reaction has taken place • Represent reactions by word equations, identify patterns in these and name a variety of salts • Describe the test for hydrogen 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
	Autumn term 2	<p>2</p> <p>Biology unit _ Inheritance and selection</p> <ul style="list-style-type: none"> • Heredity as the process by which genetic information is transmitted from one generation to the next • Simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model • Differences between species • Variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation • Variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction • Importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. • Compare sexual and asexual reproduction 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

		<p>Biology unit _Fit and healthy</p> <ul style="list-style-type: none"> • Look at factors that affect health such as diet, exercise, smoking and drugs. • Students learn how the human respiratory, digestive and circulatory systems interact to maintain activity plus how life style choices of diet, exercise, smoking and drugs affect our fitness and health • How the body uses food for energy and nutrition and energy storage • Direct links with topics covered in PSHE <p>• Development of practical skills investigation</p>	
Spring Term 1	3	<p>Physics unit _Heating and cooling</p> <ul style="list-style-type: none"> • Investigate the idea that energy transfer results from a difference in temperature. • Energy transfer results from a difference in temperature • Distinguish heat (energy) from temperature. • Thermal energy of an object depends upon its mass and temperature and material <p>• Development of practical skills investigation</p>	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
Spring term 2	4	<p>Chemistry unit _Patterns of reactivity</p> <ul style="list-style-type: none"> • Developing further chemical understanding. • Identifying the reactivity series of metals found on the periodic table. • Students describe how metals react with acids identifying products produced during each reaction. • Students will represent reactions with the use of chemical equations, identifying trends and patterns representing data in graphical form • Ability to describe an oxidation, displacement, or metal-acid reaction with a word and symbol equations. <p>• Development of practical skills investigation</p>	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>
Summer Term 1	5	<p>Physics unit _Magnets and electromagnets</p> <ul style="list-style-type: none"> • Study magnets, magnetic fields and electromagnets that are used in everyday electrical devices • Develop practical skills from investigating magnetic fields of current and electromagnets. • Create magnetic fields which can be described by drawing field lines to show the strength and direction. • Know that an electromagnet uses the principle that a current through a wire causes a magnetic field. • Strength of the electromagnet depends on flow of the current, the core material and number of coils <p>• Development of practical skills investigation</p>	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

Summer term 2	6	<p>Biology unit _Plants for food</p> <ul style="list-style-type: none"> Identify humans as part of a complex food web and the factors that can affect plant growth. Students gain an understanding around the management of food production and the potential implications for other animal and plant populations in the environment Food production has many implications for other animal and plant populations in the environment and how this could impact on the sustainable development of the countryside <p>Biology unit _Plants and photosynthesis</p> <ul style="list-style-type: none"> Identify the products and reactants of photosynthesis. Explain why other organisms are dependent on photosynthesis for survival. Learn word and symbol equations for this reaction Identify as an endothermic (Absorbs heat energy) chemical reaction <ul style="list-style-type: none"> Development of practical skills investigation 	<p>Use of Kerboodle paper tests to support teacher assessments used at the end of each unit to determine a Kingsmead academic level.</p> <p>Teacher assessed task included in every KS3 unit to support the science assessment process.</p>

		Term	Content/Topics	Assessment (including formal exam options)
Current Year 10 (Across all bases)	Autumn Term	1	<p>GCSE 4.1 Cells,</p> <ul style="list-style-type: none"> Recap plant and animal cell structure from KS3 Describe how substances can move into and out of cells across membranes by diffusion. Oxygen, carbon dioxide and urea passes through cell membranes by diffusion. Explain osmosis as the movement of water from a dilute solution to a more concentrated solution through a partially permeable membrane Describe how active transport is the movement of substances against the concentration gradient Chromosomes are found in the nucleus. They are made of DNA. Each chromosome carries a large number of genes. Specialised cells which acquire different organelles to enable them to carry out specific functions Stem cells are unspecialised/Differentiation to produce many cells including specialised cells Describe simply how and why body cells divide by mitosis Describe how mitosis makes copies of the genetic material separate then divides the cell to form two genetically identical cells. Mitosis occurs during growth or to produce replacement cells. Classify them as eukaryotic or prokaryotic cells Describe the differences in magnification and resolution of light and electron microscopes Calculate the magnification of a light microscope using the formula <p>ELC 1-Biology :The human body (Completed TDA +ESA)</p> <p>GCSE 4.2 Organisation</p> <ul style="list-style-type: none"> Recap KS3 work on organisation Describe the functions of the organs in the system Describe the functions of the heart and circulatory system Explain the adaptation of certain organs for a specific role e.g. Small intestines large surface area for the absorption of small soluble food molecules. Describe the properties of enzymes 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ End of unit assessments</p> <p>End of unit GCSE structured exams</p> <p>GCSE Combined Trilogy exams</p>

		<ul style="list-style-type: none"> • Explain lock and key and collision theory to explain enzyme action • Explain that enzymes are specific and are denatured by high temperatures and extremes of pH. • Health issues and Effect of lifestyle on non-communicable • Explain how diet, stress and life situations can affect physical and mental health • Describe some causes of cancer, eg viruses, smoking, alcohol, carcinogens and ionising radiation. 	
	2	<p>GCSE 6.1 Energy</p> <ul style="list-style-type: none"> • Energy can be transferred usefully, stored or dissipated, but cannot be created or destroyed. • Describe, for common situations, the changes involved in the way energy is stored when a system changes • Calculations to include work done by forces and when a current flows. • Identify that power is defined as the rate at which energy is transferred or the rate at which work is done. • Calculate the kinetic energy of a moving object, stored by a stretched spring and an object raised above ground level for gravitational potential energy. • Calculate the speed of an object, just before impact, when dropped from a given height • Explain the effect on the kinetic energy of an object when the speed and mass increases. • Explain the effect of increasing the spring constant of a spring • Describe energy efficiency and how to increase efficiency. Use equations to calculate the energy efficiency of an item • Describe renewable and non-renewable energy resources • Distinguish between energy resources that are renewable and energy resources that are non-renewable. Compare the ways that different energy resources are used. <p>GCSE 6.2 Electricity</p> <ul style="list-style-type: none"> • Define an electric current • Identify that for electrical charge to flow through a closed circuit the circuit must include a source of potential difference. Electric currents are the flow of charge. • Explain that the current through a component depends on both the resistance of the component and the potential difference across the component. • Describe and explain how increasing the resistance in a circuit will affect the current through the circuit. • Explain the design and use of a circuit to measure the resistance of a component by measuring the current through, and potential difference across, the component. • Explain Ohm's law and the conditions needed for it to apply. • Explain how the resistance of electrical components change with external conditions. • Describe the properties of series and parallel circuits. • Explain qualitatively why adding resistors in series increases the total resistance, while adding resistors in parallel decreases the total resistance. • The potential difference across cells and batteries is always in the same direction. • Most electrical appliances are connected to the mains using three-core cable. Insulation covering each wire is colour coded for easy identification. • Describe how different domestic appliances transfer energy from batteries or a.c. mains to the kinetic energy of electric motors or the energy of heating devices. 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ End of unit assessments</p> <p>End of unit GCSE structured exams</p> <p>GCSE Combined Trilogy exams</p>

		<ul style="list-style-type: none"> Describe how electrical power is transferred from power stations to consumers using the National Grid. Step-up transformers are used to increase the potential difference from the power station to the transmission cables then step-down transformers are used to decrease, to a much lower value, the potential difference for domestic use. Explain why step-up transformers are used to transfer electrical power at high voltage (but low current) through the National Grid. 	
Spring Term	3	<p>GCSE 5.1 Atomic structure</p> <ul style="list-style-type: none"> Define an atom and element. Write word equations for reactions from practical activities stated in the specification. Develop skills to communicate through use of symbolic equations. Describe, explain and give examples of the specified processes of separation. Mixtures can be separated by physical processes such as filtration, crystallisation, simple distillation, fractional distillation and chromatography. These physical processes do not involve chemical reactions and no new substances are made. Use the periodic table to identify number of protons, neutron and electrons in different elements. Describe the relationship between number of positive and negative charges. Apply this relationship to explain why there is no overall charge. Atoms of the same element can have different numbers of neutrons; these atoms are called isotopes of that element. Describe how many electrons there can be in the first, second and third energy shells. Explain how the position of an element in the periodic table is related to the arrangement of electrons in its atoms and hence to its atomic number. Explain how the reactions of elements are related to the arrangement of electrons in their atoms and hence to their atomic number. Describe the trends in properties in Group 0, 1 and 7. Explain how properties of the elements in Group 0, 1 and 7 depend on the outer shell of electrons of the atoms. Describe the differences between the early Periodic tables and our current Periodic table. Explain the differences between metals and non-metals on the basis of their characteristic physical and chemical properties. <p>GCSE 5.2 Bonding, structure, and the properties of matter</p> <ul style="list-style-type: none"> Identify that three types of strong chemical bonds: ionic, covalent and metallic. Ionic bonding the particles are oppositely charged ions. Ionic bonding occurs in compounds formed from metals combined with non-metals. Covalent bonding the particles are atoms which share pairs of electrons. Covalent bonding occurs in non-metallic elements and in compounds of non-metals. Metallic bonding the particles are atoms which share delocalised electrons. Metallic bonding occurs in metallic elements and alloys. Describe/draw the structure of common atoms and suggest how they could bond to obtain a full outer level of electrons. Describe the difference between simple covalent substances and giant covalent substances. 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ End of unit assessments</p> <p>End of unit GCSE structured exams</p> <p>GCSE Combined Trilogy exams</p>

- Deduce the molecular formula of a substance from a given model or diagram in these forms showing the atoms and bonds in the molecule.
- Identify substances as giant metallic structures from diagrams showing their bonding
- Display knowledge of the structures of specific ionic compounds
- Describe melting points and boiling points of covalent, ionic and metallic substances.
- Explain the properties of graphite and diamond in terms of its structure and bonding
- Explain fullerenes as molecules of carbon atoms with hollow shapes.
- Explain that a fullerene is based on hexagonal rings of carbon atoms but they may also contain rings with five or seven carbon atoms.

ELC 3-Chemistry :Elements, Mixtures and compounds (Completed TDA+ESA)

GCSE 5.3 Quantitative chemistry

- The law of conservation of mass states that no atoms are lost or made during a chemical reaction so the mass of the products equals the mass of the reactants.
- Use relative atomic masses in the calculations specified in the subject content.
- Be able to calculate the relative formula mass (M_r) of a compound from its formula, given the relative atomic masses.
- Explain any observed changes in mass in non-enclosed systems during a chemical reaction given the balanced symbol equation for the reaction and explain these changes in terms of the particle model.
- Represent the distribution of results and make estimations of uncertainty.
- Understand that the measurement of amounts in moles can apply to atoms, molecules, ions, electrons, formulae and equations
- Calculate the masses of substances shown in a balanced symbol equation.
- Calculate the masses of reactants and products from the balanced symbol equation and the mass of a given reactant or product.
- Change the subject of a mathematical equation.
- Explain the effect of a limiting quantity of a reactant on the amount of products it is possible to obtain in terms of amounts in moles or masses in grams.
- Calculate the mass of solute in a given volume of solution of known concentration in terms of mass per given volume of solution.

4 GCSE 4.3 Infectious disease

- Communicable diseases are infectious diseases caused by pathogens.
- Define the term pathogen
- Pathogens may be viruses, bacteria, protists or fungi.
- Explain how pathogens can be spread to plants or animals and cause infection.
- Explain how the spread of disease can be reduced or prevented using simple hygiene measures
- Describe the symptoms, mode of transmission, prevention and treatment for viral, fungal and bacterial diseases
- Explain how microbes make us feel ill and how viruses damage cells
- Describe what white blood cells do and how antibodies are specific for one pathogen/ surface

Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ End of unit assessments
End of unit GCSE structured exams
GCSE Combined Trilogy exams

		<p>antigen</p> <ul style="list-style-type: none"> • Explain the difficulty in developing drugs that kill viruses without damaging body tissues. • Describe what a vaccine contains and how vaccines prevent disease • Describe the problems associated with antibiotic treatment • Describe the main steps in the development and testing of a new drug. <p>GCSE 4.4 Bioenergetics</p> <ul style="list-style-type: none"> • Recap on topic covering photosynthesis from KS3 • State factors that can limit the rate of photosynthesis • Relate limiting factors to the cost effectiveness of adding heat, light or carbon dioxide to greenhouses • Describe what organisms need energy for • State that all animals and plants produce carbon dioxide and water all the time as a by-product of aerobic respiration. • State the site of aerobic respiration and be able to give examples of cells that contain a lot of mitochondria (links in with the GCSE Cells Unit) • Explain the difference between anaerobic and aerobic plus why anaerobic respiration is less efficient than aerobic respiration • Define the term 'metabolism' and identify factors that affect the rate of metabolism <p>ELC 1-Biology :The human body (Completed TDA +ESA)</p>	
Summer Term	5	<p>GCSE: 5.4 Chemical changes</p> <ul style="list-style-type: none"> • Explain reduction and oxidation in terms of loss or gain of oxygen • When metals react with other substances the metal atoms form positive ions. The reactivity of a metal is related to its tendency to form positive ions. Metals can be arranged in order of their reactivity in a reactivity series. • A more reactive metal can displace a less reactive metal from a compound • Interpret or evaluate specific metal extraction processes when given appropriate information • Metals less reactive than carbon can be extracted from their oxides by reduction with carbon. • Identify in a given reaction, symbol equation or half equation which species are oxidised and which are reduced. • Describe how to make pure, dry samples of named soluble salts • Describe the use of universal indicator or a wide range indicator to measure the approximate pH of a solution. • Describe neutrality and relative acidity in terms of the effect on hydrogen ion concentration and the numerical value of pH • Describe neutrality in terms on hydrogen ion concentration. • Identify then when an ionic compound is melted or dissolved in water, the ions are free to move about within the liquid or solution. These liquids and solutions are able to conduct electricity and are called electrolytes. This is the process of electrolysis. • Explain what happens to positive and negative ions during electrolysis and how elements form from their ions. • Ability to predict the products of the electrolysis of aqueous solutions containing a single ionic compound 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ End of unit assessments End of unit GCSE structured exams GCSE Combined Trilogy exams</p>

GCSE: 5.5 Energy changes

- Distinguish between exothermic and endothermic reactions on the basis of the temperature change of the surroundings.
- Evaluate uses and applications of exothermic and endothermic reactions given appropriate information.
- Chemical reactions can occur only when reacting particles collide with each other with sufficient energy. The minimum amount of energy that particles must have to react is called the activation energy.
- Reaction profiles can be used to show the relative energies of reactants and products, the activation energy and the overall energy change of a reaction.
- Understand that energy is needed to break bonds and the energy released when bonds are formed can be calculated from bond energies.
- Identifying that in an exothermic reaction, the energy released from forming new bonds is greater than the energy needed to break existing bonds.
- In an endothermic reaction, the energy needed to break existing bonds is greater than the energy released from forming new bonds.

GCSE 5.6 Rate and extent of chemical change

- Calculate the mean rate of a reaction from given information about the quantity of a reactant used or the quantity of a product formed and the time taken.
- Draw and interpret graphs showing the quantity of product formed or quantity of reactant used up against time.
- Predict and explain using collision theory the effects of changing conditions of concentration, pressure and temperature on the rate of a reaction.
- Predict and explain the effects of changes in the size of pieces of a reacting solid in terms of surface area to volume ratio.
- Identify catalysts in reactions from their effect on the rate of reaction and because they are not included in the chemical equation for the reaction.
- Understand that products of the reaction can react to produce the original reactants. Such reactions are called reversible reactions
- Describe that If a reversible reaction is exothermic in one direction, it is endothermic in the opposite direction
- Be able to make qualitative predictions about the effect of changes on systems at equilibrium when given appropriate information
- Be able to interpret appropriate given data to predict the effect of a change in concentration and temperature of a reactant or product on given reactions at equilibrium.
- Be able to interpret appropriate given data to predict the effect of pressure changes on given reactions at equilibrium.

6 **GCSE 6.3 Particle model of matter**

- Describe how the density of regular and irregular shapes can be found by experiment.
- Describe and explain the different particle arrangements in solids, liquids and gases due to the bonds between the atoms.
- Describe the motion of particles in solids, liquids and gases
- Describe the changes of state in terms of solids, liquids and gases.
- Explain how, when a substance changes state, the mass of the substance is unchanged as there is still the same number of atoms in the substance and it is just their arrangement that has altered.
- Describe the difference between a chemical and a physical change and provide examples for both types.
- Describe and explain how increasing the temperature of a substance affects the internal energy of a substance.
- Explain how the strength of the bonds between the particles will affect how much energy is needed to change the state of the substance.
- The energy needed for a substance to change state is called latent heat.
- Describe the factors that affect how quickly the temperature of a substance increases, eg why does a half-full kettle heat up faster than a full kettle of water
- Describe specific heat capacity of a substance is the amount of energy required to change the temperature of one kilogram of the substance by one degree Celsius.
- Describe and explain how the motion of molecules in a gas changes as the gas is heated
- Changing the temperature of a gas, held at constant volume, changes the pressure exerted by the gas (known as the Pressure law).

GCSE 6.4 Atomic structure,

- Describe/recap on the basic structure of an atom is a positively charged nucleus composed of both protons and neutrons surrounded by negatively charged electrons.
- Describe that some elements have isotopes
- Calculate the size of an atom given the size of the nucleus and the scale of the nucleus compared to the atom.
- Explain why atoms have no overall electrical charge, as the number of protons and electrons is equal.
- Describe the discovery of the electron led to the 'plum-pudding model' of the atom. The 'plum-pudding model' suggested that the atom was a ball of positive charge with negative electrons embedded in it.
- Describe the alpha scattering experiment
- The alpha scattering experiment led to the 'plum-pudding model' being replaced by the nuclear model.
- Describe the difference between the 'plum-pudding model' of the atom and the nuclear model of the atom.
- Some atomic nuclei are unstable. The nucleus gives out ionising radiation as it changes to become more stable. This is a random process called radioactive decay.
- Describe the composition of each type of radiation and where relevant, give the particle that the type of radiation is identical to.
- Explain the properties of each type of radioactive particle

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		<ul style="list-style-type: none"> • Explain nuclear decay equations by describing what happens to an atom when it undergoes alpha, beta and gamma emission. • Calculate the half-life of a radioactive source from a decay • Describe how radioactive contamination can occur • Describe and explain how radioactive sources are used safely within a science lab <p>(Start GCSE 6.5 Forces)</p> <ul style="list-style-type: none"> • Describe the difference between scalar and vector quantities and give examples. • Draw vector diagrams for vectors where the size and direction of the arrow represents the size and direction of the vector. • Describe the effects of forces in terms of changing the shape and/or motion of objects. • Describe examples of non-contact forces and state how the force is produced, eg gravitational force caused by two objects with mass exerting an attractive force on each other. • Describe and explain what weight is and why objects on Earth have weight. • State the units used to measure weight • Draw force diagrams to represent forces acting parallel to each other, both in the same direction or in opposite directions. • A number of forces acting on an object may be replaced by a single force that has the same effect as all the original forces acting together. This single force is called the resultant force. • Calculate the resultant of a number of forces acting parallel to each other. • Draw free body diagrams to represent the magnitude and direction of a number of forces acting on an object. • When a force causes an object to move through a distance, work is done on the object. • Describe the energy transfer involved when work is done on an object, eg the work done in lifting an object causes an increase in the gravitational potential energy store of that object. • Explain why the stretching of a material can only occur if more than one force is acting on the object • Elastic deformation occurs when an object returns to its original shape and size after the forces are removed. An object that does not return to its original shape after the forces have been removed has been inelastically deformed. • Calculate the force acting on a spring when given the spring constant and the extension of the spring. 	
	Term	Content/Topics	Assessment (including formal exam options)
11 (Across all	Autumn Term	1 (Complete GCSE 6.5 Forces) <ul style="list-style-type: none"> • Explain the difference between distance and displacement • Define speed and calculate it by using speed = distance/time • Draw and interpret distance – time graphs • Calculate the speed of an object that is accelerating from a distance – time graph by 	Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/Analysis and intervention GCSE Combined Trilogy exams

- finding the tangent to the curve at a given point then finding the gradient of the tangent.
- Describe and explain the factors that affect how quickly a person can walk or run.
 - Define velocity. Explain why velocity is a vector quantity rather than a scalar quantity.
 - Calculate the acceleration of a vehicle when given the initial and final speed and the time taken for the change in speed to occur. Rearrange the equation to find other unknown quantities.
 - Explain what deceleration means
 - Describe how the forces acting on skydiver change throughout a sky dive – from jumping out of the plane to landing on the ground.
 - State Newton's First Law. Describe the effect of having a zero resultant force on (1) a stationary object (2) an object moving at a constant velocity.
 - Define Newton's Second Law. Calculate the resultant force acting on an object.
 - The acceleration of an object is proportional to the resultant force acting on the object, and inversely proportional to the mass of the object.
 - Define inertial mass.
 - Explain why it is difficult to get a heavy moving object to change speed and/or direction but not a light one.
 - Define Newton's Third Law. Describe that whenever two objects interact, the forces they exert on each other are equal and opposite.
 - State that the overall stopping distance of a vehicle is made up of the thinking distance plus the braking distance.
 - Describe and explain how the speed of a vehicle affects the stopping distance, for a given braking force.
 - Explain how the braking distance of a vehicle can be affected by adverse road and weather conditions and poor condition of the vehicle.
 - Describe and explain how using a mobile phone when driving will affect a driver's reaction time and therefore their thinking distance.
 - Describe and explain how drugs will affect a driver's reaction time and thinking distance.
 - Calculate the momentum of an object given its mass, speed and direction of movement.

GCSE 6.6 Waves

- Describe that waves may be either transverse or longitudinal
- Transverse wave the oscillations are perpendicular to the direction of energy transfer
- Longitudinal wave the oscillations are parallel to the direction of energy transfer showing areas of compression and rarefaction.
- Describe waves by their amplitude, wavelength, frequency and period.
- Describe the frequency of a wave is the number of waves passing a point each second.
Calculate the frequency of a wave given the number of waves
- Describe methods to measure the speed of sound waves in air, and the speed of ripples on

		<p>a water surface.</p> <ul style="list-style-type: none"> • Describe the properties common to all electromagnetic waves • The waves that form the electromagnetic spectrum are grouped in terms of their wavelength and their frequency. Going from long to short wavelength • Describe how electromagnetic waves are generated • Describe how electromagnetic waves have many practical, domestic and medical applications <p>ELC 5-Physics: Energy, Forces and Structure of matter (Completed TDA +ESA)</p> <p>GCSE 6.7 Magnetism and electromagnetism</p> <ul style="list-style-type: none"> • Explain what is meant by a permanent magnet and give examples of materials that can become magnetised. • The region around a magnet where a force acts on another magnet or on a magnetic material is called the magnetic field. • An induced magnet is a material that becomes a magnet when it is placed in a magnetic field. Induced magnetism always causes a force of attraction. When removed from the magnetic field • Explain how the behaviour of a magnetic compass is related to evidence that the core of the Earth must be magnetic. • Describe that when a current flows through a conducting wire a magnetic field is produced around the wire • The strength of the magnetic field depends on the current through the wire and the distance from the wire. • Describe ways of increasing the magnetic field strength of a solenoid. • Explain how an electromagnet can be made from a solenoid. • Adding an iron core increases the magnetic field strength of a solenoid. An electromagnet is a solenoid with an iron core. 	
	2	<p>GCSE 5.7 Organic chemistry</p> <ul style="list-style-type: none"> • Crude oil is a mixture of a very large number of compounds. Most of the compounds in crude oil are hydrocarbons, which are molecules made up of hydrogen and carbon atoms only. • Most of the hydrocarbons in crude oil are hydrocarbons called alkanes. • Be able to recognise substances as alkanes given their formulae in these forms. • Explain how fractional distillation works in terms of evaporation and condensation • Many hydrocarbons in crude oil may be separated into fractions, each of which contains molecules with a similar number of carbon atoms, by fractional distillation. • Describe how fractions can be processed to produce fuels and feedstock for the petrochemical industry. • Hydrocarbons depend on the size of their molecules, including boiling point, viscosity and flammability. These properties influence how hydrocarbons are used as fuels. 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ Mock Exams /Analysis and intervention</p> <p>GCSE Combined Trilogy exams</p>

		<ul style="list-style-type: none"> • Write balanced symbol equations for the combustion of hydrocarbon fuels • Describe in general terms the conditions used for catalytic cracking and steam cracking. • Describe how alkenes are more reactive than alkanes and react with bromine water, which is used as a test for alkenes. <p>GCSE 5.8 Chemical analysis</p> <ul style="list-style-type: none"> • Pure elements and compounds melt and boil at specific temperatures. Melting point and boiling point data can be used to distinguish pure substances from mixtures. • Identify formulations given appropriate information. • Explain how paper chromatography separates mixtures • Chromatography can be used to separate mixtures and can give information to help identify substances. Chromatography involves a stationary phase and a mobile phase. Separation depends on the distribution of substances between the phases. • Interpret chromatograms and determine R_f values from chromatograms. • The test for hydrogen uses a burning splint held at the open end of a test tube of the gas. • The test for oxygen uses a glowing splint inserted into a test tube of the gas • The test for carbon dioxide uses an aqueous solution of calcium hydroxide (lime water) • The test for chlorine uses litmus paper 	
Spring Term	3	<p>GCSE 5.9 Chemistry of the atmosphere</p> <ul style="list-style-type: none"> • Theories about what was in the Earth's early atmosphere and how the atmosphere was formed have changed and developed over time. Evidence for the early atmosphere is limited because of the time scale of 4.6 billion years. • Given appropriate information, interpret evidence and evaluate different theories about the Earth's early atmosphere. • Explain the theory that suggests that during the first billion years of the Earth's existence there was intense volcanic activity that released gases that formed the early atmosphere and water vapour that condensed to form the oceans • Described how algae and plants produced the oxygen that is now in the atmosphere by photosynthesis • Describe the main changes in the atmosphere over time and some of the likely causes of these changes. • Describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter. • Evaluate the quality of evidence in a report about global climate change given appropriate information • Describe briefly four potential effects of global climate change • Discuss the scale, risk and environmental implications of global climate change. • Describe how emissions can be reduced. Suggest the consequences of the reductions on the Earth, atmosphere and everyday life. 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/ Analysis and intervention GCSE Combined Trilogy exams</p>

		<ul style="list-style-type: none"> • Predict the products of combustion of a fuel given appropriate information about the composition of the fuel and the conditions in which it is used. <p>ELC 4- Chemistry: Chemistry in our world (Completed TDA)</p> <p>GCSE 5.10 Using resources</p> <ul style="list-style-type: none"> • Distinguish between finite and renewable resources given appropriate information. • Extract and interpret information about resources from charts, graphs and tables. • Explain sustainable development, which is development that meets the needs of current generations without compromising the ability of future generations to meet their own needs. • Distinguish between potable water and pure water. • Describe the differences in treatment of ground water and salty water • Describe how desalination can be done by distillation or by processes that use membranes such as reverse osmosis. • Evaluate alternative biological methods of metal extraction, given appropriate information. • Describe how the process of phytomining uses plants to absorb metal compounds. The plants are then harvested for the extraction of the metal compounds • Describe how the procedure of bioleaching uses bacteria to produce leachate solutions that contain metal compounds. • Explain how Life Cycle Assessments (LCAs) are carried out to assess the environmental impact of products in each of these stages • Evaluate ways of reducing the use of limited resources, given appropriate information e.g. Recycling of metals 	
4		<p>GCSE 4.5 Homeostasis and response</p> <ul style="list-style-type: none"> • Introduction to homeostasis • Explain what homeostasis is and why it is important • Describe the roles of the nervous system and the endocrine system in homeostasis. • Explain the importance of being able to respond to environmental changes and coordinate behaviour. • Describe the functions of the main structures in the nervous system and how its adapted for its functions • Describe the differences between voluntary and reflex actions. • Describe the endocrine system and define the term hormone • Explain why the pituitary gland is often called the master gland • Describe the effects of adrenaline on the body. • Describe where thyroxine is produced and its effects on the body • Compare the actions of the nervous and endocrine systems. 	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/Analysis and intervention GCSE Combined Trilogy exams</p>

- Describe how blood glucose concentration is monitored and controlled
- Compare the causes, and treatments of Type 1 and Type 2 diabetes.
- Describe the menstrual cycle and fertility including the role of hormones.
- Describe hormonal and non-hormonal methods of contraception and explain how hormonal and non-hormonal contraceptives work.
- Describe the use of fertility drugs and treatment in women

GCSE 4.6 Inheritance, variation and evolution

- Recap of reproduction taught at KS3
- Explain the term gametes and describe their genetic material.
- Explain how cells in reproductive organs divide by meiosis to form gametes.
- Explain why sexual reproduction produces variation in the offspring, but asexual reproduction does not.
- Asexual reproduction involves only one parent and no fusion of gametes
- Asexual reproduction results in no mixing of genetic information leading to genetically identical offspring (clones). Only mitosis is involved
- Explain using a Punnett square and genetic diagram how sex is determined in humans.
- DNA is a polymer made up of two strands forming a double helix.
- A gene is a small section of DNA located on a chromosome. Each gene codes for a sequence of amino acids to form a particular protein
- Give examples of characteristics controlled by a single gene.
- Define and use the terms: gametes, genotype, phenotype, dominant recessive, homozygous and heterozygous.
- Interpret the results of a genetic diagram and use direct proportion and simple ratios to express the outcomes.
- Describe the process of genetic engineering and its advantages.
- Explain advantages and disadvantages of genetic engineering and GM crops
- Describe selective breeding as a type of sexual reproduction.
- Explain the benefits and risks of selective breeding in plants and animals.
- Describe Darwin's theory of evolution by natural selection.
- Describe how fossils are used as evidence for the theory of evolution by natural selection.
- Fossils are the 'remains' of organisms from many years ago, which are found in rocks.
- Explain that individuals with characteristics most suited to the environment are more likely to survive to breed successfully
- Explain why mutation may lead to more rapid change in a species.
- Mutations produce new strains. Resistant strains of bacteria are not killed by antibiotics, so they survive and reproduce.
- Define the term extinction. Explain that organisms become extinct because something changes and the species cannot adapt quickly enough to the new circumstances.

		<p>GCSE 4.7 Ecology</p> <ul style="list-style-type: none"> • Classify organisms based on their similarities. • Explain how modern technologies have affected how organisms are classified today. • Carl Linnaeus studied the similarities and differences between organisms to classify them. He developed the binomial system to name organisms by genus and species. • Carl Woese developed the three domain system to classify organisms as <ol style="list-style-type: none"> (1) Archaea (primitive bacteria) (2) Bacteria (true bacteria) (3) Eukaryota (protists, fungi, plants and animals). <p>ELC 2-Biology: Environment, evolution and inheritance (Completed TDA +ESA)</p>	
Summer Term	5	<p>GCSE 4.7 Ecology</p> <p>Describe factors that affect the survival of organisms in their habitat. Plants compete for light, space, water and mineral ions. Animals compete for food, mates and territory. Describe a stable community as one where all the species and environmental factors are in balance, so population sizes remain fairly constant. Give an example of a stable community. Describe biotic factors as living factors that can affect a community. Describe and explain how structural, behavioural and functional adaptations, in a range of organisms, help them to survive in their habitat Explain that photosynthetic organisms are the producers of biomass for life on Earth Describe how to carry out random sampling of organisms using a quadrat Describe examples of how a reduction in biodiversity can affect climate, food supplies for humans, useful chemical for the future etc. Explain how deforestation increases the amount of carbon dioxide in the atmosphere and leads to a reduction in biodiversity. Explain why levels of carbon dioxide and methane in the atmosphere are increasing and contribute to 'global warming'. Describe how water can be polluted with sewage, fertiliser or toxic chemicals Explain the role of microorganisms in cycling materials through an ecosystem. Describe how acid rain is formed and the effects of acid rain on living organisms</p> <p>ELC intervention/ Revision and past paper GCSE questions</p>	<p>Teacher Designed Assessments (TDA)/ Externally Set Assessments (ESA)/Mock Exams/Analysis and intervention GCSE Combined Trilogy exams</p>
	6	<p>ELC intervention/Revision and past paper GCSE questions</p> <p>GCSE Exams</p>	<p>GCSE Combined Trilogy exams</p>