Year 10 Entry Level Certificate Science Curriculum End Points and Key Vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Unit of Work	1. Component 1: Biology - The Human Body 2. Component 3: Chemistry - Elements, Mixtures and Compounds 3. Component 5: Physics - Energy, Forces and the Structure of Matter	1. Component 1: The Human Body 2. Component 3: Completion of Elements, Mixtures and Compounds 3. Component 5: Forces and Motion	1. Component 1: The Human Body 2. Component 2: Environment, Evolution and Inheritance 3. Component 5: Forces and Motion	1. Component 2: Environment, Evolution and Inheritance 2. Component 6: Electricity, Magnetism and Waves	1. Component 2: Environment, Evolution and Inheritance 2. Component 4: Chemistry in our World 3. Component 6: Electricity, Magnetism and Waves	1. Component 2: Environment, Evolution and Inheritance 2. Component 4: Chemistry in our World 3. Component 6: Electricity, Magnetism and Waves
Ethos links	**STEM** – Understanding how microscopes are used in medicine and scientific research. **STEM** – Understanding how cells act as the building blocks of life and how specialised cells support body functions. **STEM** – Understanding materials, energy transfer and forces in everyday products and transport.	**STEM**: Understanding digestion, circulation and respiration and their role in human health. **Personal Development:** Making informed lifestyle choices relating to diet, exercise and wellbeing. **STEM**: Investigating material properties and their uses in society. **Sustainability**: Recycling metals and reducing waste.	**STEM:** Understanding disease prevention, medicines and vaccination. **Sustainability:** Understanding ecosystems and environmental interactions. **STEM:** Evaluating the uses and risks of radioactive materials.	**STEM**: Understanding electrical technologies used in homes and industry. **Sustainability**: Understanding biodiversity and environmental change.	**Sustainability** – Understanding the impact of pollution and climate change on the environment. **STEM** – Understanding how chemical reactions are used in industry and everyday life. **STEM** – Understanding how electrical and magnetic systems are used in modern technology. **Personal Development** – Developing environmental	**Sustainability** – Evaluating climate change, carbon footprints and environmental responsibility. **STEM** – Understanding communication technologies through waves and the electromagnetic spectrum. **STEM** – Evaluating the benefits and risks of genetic engineering and biotechnology. **Careers** – Environmental science, communications technology, engineering, agriculture and biotechnology.

					awareness and responsible decision making.	
Learning End Points By the end of this unit students will know and understand:	**Component 1: The Human Body** - Identify the different parts of a microscope and describe their functions. - Describe how to use a microscope correctly. - Calculate magnification using the magnification formula. - Describe the main parts of plant and animal cells. - Explain how organelles are adapted to their function. - Describe examples of specialised cells. - Explain how specialised cells are adapted for specific functions. - Define diffusion and osmosis. - Describe how water moves into and out of cells. - Explain how different concentrations affect plant tissue. - Describe the difference between cells, tissues and organs. - Explain the functions of major organ systems. - Component 3: Elements, Mixtures and Compounds	**Component 1: The Human Body** - Label the main organs in the circulatory system. - Describe the components of blood. - Explain the function of the circulatory system. - Label the digestive system. - Describe the route of food through the digestive system. - Explain the role of enzymes in digestion. - Identify factors affecting enzyme activity. - Describe the difference between breathing and respiration. - Identify the nutrients required in a balanced diet. - Explain effects of an unbalanced diet. - Describe lifestyle factors that affect health. **Component 3: Elements, Mixtures and Compounds** - Describe the difference between mixtures and pure substances. - Explain how mixtures can be separated. - Define formulations and identify examples. - Describe how chromatography separates substances. - Explain how chromatography can identify pure and impure substances.	**Component 1: The Human Body** - Identify the difference between communicable and non-communicable diseases. - Describe what pathogens are and how they spread. - Explain how white blood cells defend the body. - Explain how vaccinations create immunity. - Describe how antibiotics work. - Explain antibiotic resistance. - Describe reflex actions. - Explain the role of hormones. - Describe contraception and fertility treatments. **Component 2: Environment, Evolution and Inheritance** - Describe the process of photosynthesis. - Explain how leaves are adapted for photosynthesis. - Describe adaptations in plants and animals. - Explain food chains and food webs. - Describe processes involved in decay. - Explain material recycling	**Component 2: Environment, Evolution and Inheritance** - Describe competition between organisms. - Describe biotic and abiotic factors. - Explain how environmental factors affect communities. - Describe different forms of pollution. - Explain how pollution affects ecosystems. **Component 6: Electricity, Magnetism and Waves** - Recall circuit components and symbols. - Describe electrical current and voltage. - Explain how resistance affects current. - Compare series and parallel circuits. - Describe the difference between AC and DC current. - Explain electrical safety features including plugs, earth wires and fuses.	**Component 2: Environment, Evolution and Inheritance** - Describe the difference between DNA, genes and chromosomes. - Explain how characteristics are inherited. - Explain the difference between the genetic material of male and female organisms. - Describe sexual reproduction. - Describe asexual reproduction. - Compare the advantages and disadvantages of sexual and asexual reproduction. - Describe what is meant by variation. - Explain genetic and environmental causes of variation. **Component 4: Chemistry in our World** - State why hazard symbols are useful.	**Component 2: Environment, Evolution and Inheritance** - Explain how characteristics may be linked. - Describe what is meant by evolution. - Explain how fossils provide evidence for evolution. - Explain how evolution occurs through natural selection. - Describe selective breeding and its applications. - Explain how genetic engineering is carried out. - Compare the advantages and disadvantages of genetic engineering. **Component 4: Chemistry in our World** - Describe the composition of the atmosphere today. - Explain how Earth's atmosphere has changed over time. - Describe what crude oil is. - Explain how crude oil is separated by fractional distillation. - Explain the relationship between the properties of crude oil fractions and their uses. - Describe complete and incomplete combustion. - Explain the environmental and health impacts of combustion products.

	- Recall that all substances are made of atoms. - Describe the difference between atoms and elements. - Explain that atoms are made of subatomic particles. - Describe Mendeleev's contribution to the development of the periodic table. - Describe the properties of Group 1 and Group 7 elements. - Explain patterns in reactivity within Groups 1 and 7. - Describe what a compound is. - Explain chemical reactions in terms of elements and compounds. - Calculate relative formula mass (Mr). - Identify the three states of matter. - Describe particle arrangements in solids, liquids and gases. - Explain processes involved in changing state. - Interpret melting point data. Component 5: Energy, Forces and the Structure of Matter - Describe the different ways energy can be stored.	- Describe the structure of diamond and graphite. - Explain how structure affects properties. - Describe the properties of polymers. - Explain environmental issues associated with polymers. - Describe physical properties of metals. - Explain how recycling reduces environmental impacts. - Calculate density. - Describe what an alloy is and explain why alloys are useful. - Identify gases using standard gas tests. **Component 5: Energy, Forces and the Structure of Matter** - Identify different types of forces. - Describe balanced and unbalanced forces. - Explain the force-extension relationship. - Describe work done as an energy transfer. - Explain useful and unwanted friction. - Calculate speed using distance and time. - Interpret speed and motion data.	**Component 5: Energy, Forces and the Structure of Matter** - Define thinking distance, braking distance and stopping distance. - Explain factors affecting stopping distance. - Recall that some atoms are radioactive. - Describe alpha, beta and gamma radiation. - Explain how radiation can be detected.		- Describe the difference between acids and alkalis. - Explain neutralisation and identify the products formed. - Describe the reactions of acids with metals. - Describe the reactions of acids with carbonates. - Explain how salts are named and formed. - Describe how soluble salts are produced. - Compare exothermic and endothermic reactions. - Explain how energy transfers affect temperature changes during reactions. - Describe factors that affect the rate of reaction. - Explain collision theory in simple terms. **Component 6: Electricity, Magnetism and Waves** - Describe the structure and function of a plug. - Identify live, neutral and earth wires.	- Describe air pollution and its causes. - Explain how air pollution can be reduced. - Describe the greenhouse effect. - Explain how human activities increase greenhouse gases. - Explain the relationship between greenhouse gases and climate change. - Recognise how carbon dioxide emissions contribute to environmental impact. - Define potable water and desalination. - Describe how drinking water is produced and treated. - Explain the difference between pure water and potable water. - Describe the stages of a life cycle assessment. - Evaluate the environmental impact of different products **Component 6: Electricity, Magnetism and Waves** - Identify transverse and longitudinal waves. - Describe wavelength, amplitude and frequency. - Calculate wave speed. - Describe the electromagnetic spectrum. - Identify the order of electromagnetic waves. - Explain uses of electromagnetic waves.

	- Explain how energy is transferred between stores. - Draw energy transfer diagrams. - Recall that energy cannot be created or destroyed. - Identify useful and wasted energy transfers. - Explain how wasted energy can be reduced. - Describe energy transfer by conduction. - Compare conductors and insulators. - Identify renewable and non-renewable energy resources. - Explain advantages and disadvantages of different energy resources.				- Explain why electrical safety devices are used. - Describe how fuses and earth wires protect users. - Explain how energy transferred by appliances depends on power and time. - Calculate energy transferred by an appliance. - Describe magnetic fields. - Explain attraction and repulsion between magnetic poles. - Describe the magnetic field around a current-carrying wire. - Explain factors affecting electromagnet strength. - Describe how electromagnets are used in everyday life.	- Describe hazards associated with some electromagnetic waves. - Explain how infrared radiation is absorbed and emitted by different surfaces.
Key vocabulary	**Component 1: The Human Body** Microscope Magnification Cell Nucleus Cytoplasm Cell membrane Specialised cell Diffusion Osmosis	**Component 1: The Human Body** Artery Vein Capillary Blood Plasma Digestive system Enzyme Substrate Respiration	**Component 1: The Human Body** Pathogen Communicable Non-communicable Vaccine Immunity Antibiotic Addiction Reflex Neuron	**Component 2: Environment, Evolution and Inheritance** Competition Biotic Abiotic Community Habitat Quadrat Transect Population	**Component 2: Environment, Evolution and Inheritance** DNA Gene Chromosome Inheritance Sexual reproduction Asexual reproduction Variation	**Component 2: Environment, Evolution and Inheritance** Evolution Natural selection Selective breeding Genetic engineering Fossil Biodiversity **Component 4: Chemistry in our World**

	Concentration Tissue Organ Organ system **Component 3: Elements, Mixtures and Compounds** Atom Element Compound Proton Neutron Electron Periodic table Group Period Reactivity Relative formula mass (Mr) Solid Liquid Gas Particle **Component 5: Energy, Forces and Structure of Matter** Energy store Energy transfer Conservation Dissipated Useful energy Conduction Insulator Conductor Renewable Non-renewable	Aerobic Nutrient Balanced diet Lifestyle **Component 3: Elements, Mixtures and Compounds** Mixture Pure substance Impure substance Filtration Chromatography Solvent Solute Rf value Diamond Graphite Polymer Metal Ore Density Alloy **Component 5: Energy, Forces and Structure of Matter** Force Resultant force Balanced force Unbalanced force Extension Work done Friction Speed Distance Time	Hormone Menstrual cycle Contraception Fertility **Component 2: Environment, Evolution and Inheritance** Photosynthesis Producer Consumer Chloroplast Adaptation Food chain Food web Predator Prey Decay Decomposer **Component 5: Energy, Forces and Structure of Matter** Thinking distance Braking distance Stopping distance Radioactive Alpha Beta Gamma Radiation	Distribution Pollution **Component 6: Electricity, Magnetism and Waves** Current Voltage Resistance Circuit Series Parallel Ammeter Voltmeter Direct current (DC) Alternating current (AC) Live wire Neutral wire Earth wire Fuse	**Component 4: Chemistry in our World** Acid Alkali Neutralisation Indicator pH Salt Exothermic Endothermic Rate of reaction Collision theory **Component 6: Electricity, Magnetism and Waves** Magnet Magnetic field Electromagnet Solenoid Core Current Density Mass Volume	Atmosphere Combustion Hydrocarbon Crude oil Fractional distillation Pollution Greenhouse effect Climate change Carbon footprint Potable water Desalination Life cycle assessment **Component 6: Electricity, Magnetism and Waves** Transverse Longitudinal Amplitude Frequency Wavelength Wave speed Electromagnetic spectrum Infrared Ultraviolet X-ray Gamma ray Microwave Radio wave