Curriculum Plans: Year ___8___ (Science)

	Topic	Knowledge: By the end of the unit students will know:	Skills: What skills will students have developed by the end of this unit?	Key terms: What new key terms and vocabulary will be learnt in this unit?	Summative Assessment: How will pupils be assessed in this unit?
Michaelmas 1	Health and lifestyle	Explain what makes a food a healthy option. - Explain how each nutrient contributes to a healthy, balanced diet. - Interpret nutritional information to make health comparisons between foods. Explain how an unhealthy diet causes health issues. - Explain that different people require different amounts of energy using energy calculations and data to support explanations. - Interpret experimental data and suggest ways to improve the experiment. - Explain how an unhealthy diet causes health issues. - Explain that different people require different amounts of energy, using energy calculations and data to support explanations. - Interpret experimental data and suggest ways to improve	Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. **Interpret Observations and Data** • Identify patterns in observations and measurements. • Use data to draw conclusions based on evidence. **Make and Record Observations and Measurements** • Employ a range of methods for different investigations (e.g., surveys, experiments). • Evaluate the reliability of these methods and suggest possible improvements. **Present Observations and Data**	**Absorb** Movement of a substance across a cell membrane **Active site** Region of an enzyme where the chemical reaction takes place **Carbohydrate** Food group used as a source of energy **Catalyst** Chemical that speeds up a reaction **Denature** Change the shape of the enzymes active site **Digestive enzyme** Enzymes which speed up the process of digest **Enzyme** Protein which acts as a biological catalyst **Lipid** Other name for fats, needed as a source of energy	End of unit assessment

		Give a structured account of digestion using information gathered by research. - Explain how each part of the digestive system works in sequence, including adaptations of the small intestine for its function. - Explain why food needs to be digested Explain how enzymes affect the rate of digestion. - Explain how some bacteria improve health. - Record experimental data using a suitable results table, and evaluate the quality of the data obtained. - Explain why people take different medicinal and recreational drugs. - Explain how recreational drugs can have a negative effect on people's lifestyles. - Record accurate and detailed observations from an experiment to draw detailed conclusions, and evaluate methods. Explain in detail how alcohol affects health and behaviour,	• Use appropriate methods to present data, including tables and graphs for clarity.	**Product** Chemical made during a reaction **Protein** Food group needed for growth and repair **Substrate** Other name for reactant, starting chemical in a reaction	

		detailing its effect on life processes. - Explain the importance of providing information about drinking to the general public, not just pregnant women Explain how smoking causes diseases. - Explain which chemicals in tobacco smoke affect the development of a fetus. - Interpret and present secondary data in an appropriate manner, drawing conclusions, and extrapolating data from trends shown.			
	Periodic table	• **Differentiate between metallic and non-metallic properties of metalloids.** **Predict Properties of an Element:** • **Use an element's position on the Periodic Table to forecast its properties.** **Identify Anomalous Properties:** • **Recognize materials that exhibit unusual properties compared to expected trends.**	**Classify Properties of Metalloids:** • **Metalloids exhibit both metallic and non-metallic properties, such as being semiconductors.** **Predict the Properties of an Element:** • **Given its position on the Periodic Table, you can infer**	**Periodic table** Table that shows all the elements. **Metals** Shiny elements which conduct electricity and heat well & often have high melting and boiling points. **Non-metals** A substance that is not a metal. Non-	End of unit assessment

		Explain Element Position and Properties: • **Discuss how the location of an element on the Periodic Table can indicate its properties.** **Apply Patterns to Unknown Elements:** • **Utilize trends from known elements within groups or periods to make predictions about unknown elements.** **Explain Missing Values Using Numerical Trends:** • **Justify predictions of missing data by analyzing trends, and compare these trends across different groups and periods.** **Describe Patterns in Group 1 Elements:** • **Analyze and articulate the patterns in properties of Group 1 elements using provided data.** **Compare Predictions with Evidence:** • **Assess the accuracy of predictions regarding Group 1 reactivity by comparing them with experimental results.** **Use Observations to Explain Reactivity Trends:** • **Relate experimental observations to explain trends in reactivity among Group 1 elements, including properties like reactivity and conductivity.** **Identify Anomalous Properties:** • **Some materials may display unexpected properties that don't fit typical classifications of metals or non-metals.** **Explain Position of Elements:** • **The position in the Periodic Table suggests properties like electronegativity and atomic radius.** **Apply Patterns to Unknown Elements:** • **Use trends from known elements in groups or periods to predict properties of unknown elements.** **Explain Prediction of Missing Values:** • **Use numerical trends to estimate missing values and compare trends across groups and periods**	metals are not shiny and do not conduct heat and electricity well. **Atom** The smallest part of an element. **Element** All the atoms in an element are the same. A substance that cannot be split up into anything simpler by chemical reactions.	

		writing balanced chemical equations for reactions. **Explain Predictions for Group 7 Elements:** • Provide rationale for any predictions made regarding the properties of Group 7 elements. **Write Word Equations for Displacement Reactions:** • Formulate word equations to illustrate the processes occurring in displacement reactions involving Group 7 elements. **Suggest Sources for Risk Information:** • Identify resources to learn about the risks associated with Group 7 elements and methods for managing those risks. **Link Group 0 Properties:** • Connect properties of Group 0 elements to their chemical and physical characteristics. **Compare Trends Across Groups:** • Analyze and compare the trends of Group 0 with those of Groups 1 and 7. **Predict Missing Data:** • Explain how to infer missing data points by utilizing information from other elements.			

Curriculum Plans: Year __8__ (Science)

Michaelmas 2	Separation techniques	**Identify Anomalous Properties:** • **Some materials may display unexpected properties that don't fit the typical classification as metals or non-metals.** **Explain Position of Elements:** • **The position of an element in the Periodic Table can indicate its properties, such as electronegativity and atomic radius.** **Apply Patterns to Unknown Elements:** • **Use known trends in groups or periods to predict properties of unknown elements based on their position.** **Predict Missing Values:** • **Use numerical trends to estimate missing values and compare similar trends between groups and periods** **Use Particle Models to Represent Mixtures**: • Create models that illustrate how particles in mixtures are not chemically bonded and retain their individual properties.	**Chemistry** - Mixtures, including dissolving. - The identification of pure substances. **WS** - Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. **Chemistry** - Mixtures, including dissolving. **WS** - Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate. **Chemistry** - Simple techniques for separating mixtures: filtration, evaporation. **WS**	**Compound** Two or more different particles chemically bonded **Mixture** Two or more different substances not chemically bonded **Diffusion** The net movement of particles from an area of high concentration **Convection** Particles in liquids getting heated and rising. They then cool and fall back to bottom, the process is then repeated. **Particle model** A model that shows particles as spheres to show what state they are in and how they are arranged. **Solid**	End of unit assessment

		Comment on a Substance's Purity: • Interpret temperature change data to assess the purity of a substance, noting that pure substances have sharp melting or boiling points. **Explain Separation Techniques**: • Justify why specific separation techniques (like filtration or distillation) are suitable based on the physical properties (e.g., solubility, boiling point) of the constituent substances. **Explain the Relationship between Solutes, Solvents, and Solutions**: • Discuss how solutes dissolve in solvents to form solutions, highlighting their interactions at the particle level. **Draw Particle Diagrams**: • Illustrate particle diagrams to represent the arrangement of particles in solutions compared to pure substances. **Explain Applications of Solution Chemistry**:	- Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. **Chemistry** - Simple techniques for separating mixtures: evaporation, distillation. **WS** - Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. **Chemistry** - Simple techniques for separating mixtures: chromatography. **WS** - Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions.	Particles that vibrate around a fixed position and are closely packed together **Liquid** Particles closely packed together but can have no fixed shape and can move freely. **Gas** Particles spread far apart, move freely and fill any container they are in. **Gas Pressure** Gas Pressure is caused by particles hitting the inside or outside of a container.	

		• Describe how concepts in solution chemistry apply to real-world scenarios, such as environmental science or pharmaceuticals. **Explain Why Temperature Affects Solubility**: • Discuss the molecular interactions that cause temperature changes to impact the solubility of solutes. **Explain What a Solubility Graph Shows**: • Interpret solubility graphs, explaining how they represent the relationship between solubility and temperature for different substances. **Justify Method Choices for Investigating Solubility**: • Defend the chosen methodology for studying the solubility of salt in seawater based on the properties involved. **Use Particle Diagrams to Illustrate Filtration**: • Create diagrams that show how particles are separated during filtration, indicating which particles pass			

		through and which are retained. **Explain Filtering Situations**: • Assess whether filtering is appropriate for given mixtures based on particle size and solubility. **Explain Filtration Apparatus Use**: • Provide detailed descriptions of how to effectively use filtration apparatus to separate salt from a mixture of salt and sand. **Compare Evaporation and Distillation**: • Analyze the differences between evaporation and distillation in terms of effectiveness for separating mixtures. **Discuss Separation Suitability**: • Evaluate whether evaporation or distillation is more suitable for particular mixtures based on their physical properties. **Consider Physical Properties in Distillation**: • Interpret observations made during distillation by considering the physical			

		properties utilized, such as boiling points. **Explain Chromatography in Different Scenarios**: • Discuss various applications of chromatography in fields such as forensics, food science, and environmental testing. **Monitor Reaction Progress with Chromatography**: • Explain how chromatography can track the progress of chemical reactions over time. **Suggest Issues with Chromatography**: • Identify potential problems or limitations in using chromatography, such as resolution or sensitivity issues			
Lent 1	Electricity and Magnetism	**Physics** - Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects. - The idea of electric field, forces acting across the space between objects not in contact.	**xplain, in Terms of Electrons, Why Something Becomes Charged**: • Discuss how the movement of electrons results in an object gaining a positive or negative charge.	**Magnet** Something that can attract magnetic materials **Magnetic field** The space around a magnet where it	End of unit assessment

		- Non-contact forces: forces due to static electricity. - Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems. **WS** - Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. **Physics** - Electric current, measured in amperes in circuits. - Current as a flow of charge. - Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems. **WS** - Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. **Physics** - Potential difference, measured in volts. - Battery and bulb ratings. **WS**	**Predict How Charged Objects Will Interact**: • Use the principles of charge (like like charges repel and opposite charges attract) to make predictions about interactions. **Compare a Gravitational Field and an Electric Field**: • Analyze the similarities and differences in how gravitational and electric fields operate, including their effects on mass and charge. **Use Observations to Make Predictions**: • Apply observations from experiments to forecast the outcomes of similar scenarios. **Use a Model to Explain How Current Flows in a Circuit**: • Create a conceptual model illustrating the flow of current through a circuit and	can affect magnetic materials or other magnets. **Magnetism** A non-contact force. **Magnetic** Material attracted to a magnet. **Magnetic material** Material that is attracted to a magnet; iron, cobalt, nickel and steel are all magnetic materials**.** **North pole** One end of a magnet. The end points north if the magnet can move. **South pole** One end of a magnet. The end points south if the magnet can move. **Electromagnet** A coil of wire with electricity flowing in it. An electromagnet has	

		- Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. **Physics** - Series and parallel circuits, currents add where branches meet. **WS** - Interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions. **Physics** - Resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. - Differences in resistance between conducting and insulating components (quantitative). **WS** - Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate. **Physics**	how components interact. **Predict the Current in Different Circuits**: • Use Ohm's law and circuit principles to anticipate current values based on circuit configurations. **Measure Current Accurately in a Number of Places in a Series Circuit**: • Conduct measurements at various points in a circuit to understand current distribution. **Explain the Difference Between Potential Difference and Current**: • Clarify the distinct roles of potential difference (voltage) and current in electrical circuits. **Explain Why Potential Difference is Measured in Parallel**: • Discuss the necessity of measuring potential	a magnetic field like a bar magnet. **Solenoid** A coil of wire.	

		- Magnetic poles, attraction and repulsion. - Magnetic fields by plotting with compass, representation by field lines. - Earth's magnetism, compass, and navigation. - Non-contact forces: forces between magnets. - Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about changes in systems. **WS** - Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Physics** - The magnetic effect of a current, electromagnets, D.C. motors (principles only). **WS** - Make predictions using scientific knowledge and understanding. **Physics** - The magnetic effect of a current, electromagnets,	difference in parallel to capture the voltage across components accurately. **Predict the Effect of Changing the Rating of a Battery or Bulb in a Circuit**: • Analyze how alterations in battery or bulb ratings will influence current and potential difference in a circuit. **Set Up and Measure Potential Difference Across Various Components in a Circuit**: • Conduct experiments to measure voltage drops across different components, understanding how potential difference behaves in circuits. **Explain the Most Suitable Type of Circuit for the Domestic Ring Main**: • Justify the use of parallel circuits in		

		D.C. motors (principles only). **WS** - Identify further questions arising from their results.	household wiring due to the need for independent operation of devices. **Explain Why Current and Potential Difference Vary in Series and Parallel Circuits**: • Analyze the fundamental reasons behind the differences in current and voltage behavior in series versus parallel circuits. **Explain the Pattern in Current and Potential Difference Readings for Series and Parallel Circuits**: • Draw conclusions based on collected data regarding how current and voltage behave in different circuit configurations. **Explain the Causes of Resistance**: • Discuss factors such as material, temperature, and cross-sectional area		

			that contribute to electrical resistance. **Explain What Factors Affect the Resistance of a Resistor**: • Detail how length, cross-sectional area, and material type influence the resistance of a resistor. **Compare the Effect of Resistance in Different Materials**: • Evaluate how different materials exhibit varying levels of resistance, influencing their applications in circuits. **Independently Select and Control All Variables in the Investigation**: • Plan and execute experiments while managing variables to ensure accurate and precise results. **Explain How Magnets Can Be Used**: • Discuss various applications of		

			magnets in technology, industry, and everyday life. **Compare Magnetic Field Lines and a Magnetic Field**: • Analyze the relationship between visual representations of magnetic field lines and the actual magnetic field they depict. **Explain How a Compass Works**: • Describe the principles behind compass operation, including the alignment of the needle with Earth's magnetic field. **Suggest Improvements to an Experiment to Observe Field Lines Around a Magnet**: • Propose modifications to experimental designs to enhance the observation and accuracy of		

			magnetic field line demonstrations. **Explain How an Electromagnet Works**: • Detail the principles of electromagnetism, focusing on how electric current generates a magnetic field. **Predict the Effect of Changes on the Strength of Different Electromagnets**: • Use scientific knowledge to forecast how alterations (like current or coil turns) affect an electromagnet's strength. **Predict the Effect of Changes Made to an Electromagnet, Using Scientific Knowledge to Justify the Claim**: • Provide reasoned predictions about how specific modifications to an electromagnet will impact its		

			performance based on principles of physics. **Apply Existing Knowledge About Electromagnets to Design a Circuit**: • Utilize understanding of electromagnetism to create functional circuits that incorporate electromagnets effectively. **Suggest Ways to Make a Motor Turn Faster**: • Propose adjustments (like increasing current or optimizing design) to enhance the speed of a motor. **Suggest Investigations About Electromagnets Used in Different Applications**: • Recommend potential research projects exploring the use of electromagnets in various fields such as transportation,		

			industry, or electronics.		
Lent 2	Ecosystem process	Explain the importance of photosynthesis in the food chain. • Explain how the plant obtains the reactants for photosynthesis. • Carry out and record observations for an experiment to test for the presence of starch in a leaf, explaining results obtained. • Explain how the structures of the leaf make it well adapted for photosynthesis. • Explain the role of chloroplasts in photosynthesis. • Make observations of stomata from the underside of the leaf, and record as a labelled diagram with annotations. • Explain deficiency symptoms in plants.	**Use Appropriate Techniques, Apparatus, and Materials:** • **Employ suitable methods and tools during fieldwork and laboratory work, ensuring health and safety practices are followed.** **Make and Record Observations and Measurements:** • **Use various methods to observe and measure during investigations; evaluate the reliability of these methods and suggest possible improvements.** **Undertake Basic Data Analysis:** • **Analyze data using simple statistical techniques to interpret results.**	**Food chain** Diagram showing which organism eat which from the same ecosystem. **Food web** Shows how the food chains of an ecosystem are linked. Shows more interactions between species**.** **Ecosystem** The living things in a given area and their non-living environment. **Environment** The surrounding air, water and soil where an organism lives. **Population** Group of the same species living in an area. **Producer** Green plant or algae that makes its own food using	End of unit assessment

		• Explain how proteins are made for plant growth. • Record measurements in a table, and calculate arithmetic means of results, giving answers to the correct number of significant figures. • Explain how some chemosynthetic organisms form symbiotic relationships. • Compare similarities and differences between photosynthesis and chemosynthesis. • Explain why the view of chemosynthesis by the scientific community changed with time. • Explain how the reactants for respiration get into the cells. • Explain the process of aerobic respiration. • Plan an investigation to explain the effect of exercise on respiration rates.	**Select, Plan, and Carry Out Scientific Enquiries:** • **Identify independent, dependent, and control variables when designing experiments to test predictions.** **Evaluate Data:** • **Assess data quality, being aware of potential sources of random and systematic error.** **Present Observations and Data:** • **Use appropriate methods, such as tables and graphs, to present findings clearly.** **Apply Sampling Techniques:** • **Implement various sampling methods for collecting data in ecological studies.**	sunlight in a process called Photosynthesis. **Consumer** An animal that eats another animal or plant **Decomposer** Organism that breaks down dead plant and animal material so that nutrients can be recycles back to the soil or water **Carbon cycle** The idea that carbon is constantly recycled through the environment from carbon dioxide in the air to stores in plants and animals. **Competition** When organisms within an ecosystem compete for the same resource. The ones who win will survive reproduce and thrive.	

		• Explain the uses of the products from anaerobic respiration. • Explain the differences between the two types of respiration. • Evaluate data collected, showing awareness of potential sources of random and systematic errors. • Explain the link between food chains and energy. • Explain why a food web gives a more accurate representation of feeding relationships than a food chain. • Explain the interdependence of organisms. • Explain why toxic materials have a greater effect on top predators in a food chain. • Present population data as a graph, explaining trends and drawing detailed conclusions from data provided.		**Bioaccumulation** The process which causes the build up of poisonous chemicals in the higher levels of the food chain. **Predator** An animal which preys on others. **Prey** An animal hunted or killed for food **Carnivore** An animal which eats meat. **Herbivore** An animal which eats plants **Omnivore** An animal which eats meat and plants.	End of unit assessment

	Metals and acids	• Explain why different organisms are needed in an ecosystem. • Explain why different organisms within the same ecosystem have different niches. • Use quadrats and transects to take unbiased measurements in an ecosystem, describing trends observed in data • **Use formula equations to show what happens when metals react in different acids.** • **Use word and formula equations to explain the test for hydrogen gas.** • **Suggest how temperature changes may be linked with differences in reactivity between metals and acids.**	• **Order of Metals and Carbon**: Understand and recall the order of metals and carbon in the reactivity series. • **Data Interpretation**: Interpret observations and data, identifying patterns to draw conclusions. • **Scientific Enquiry Planning**: Select, plan, and conduct appropriate scientific enquiries,	**Reactivity Series** **A list from highest reactivity to lowest reactivity of metals** **Metal** **An element found on the left or middle side of the periodic table** **Displacement reaction** **A displacement reaction is when a more reactive element takes the**	

		• **Explain the reactivity of metals according to how they react with oxygen.** • **Construct balanced equations that include state symbols.** • **Predict the reactivity of unfamiliar metals from information about their behaviour.** • **Link a metal's reaction with its place in the reactivity series.** • **Explain predictions made about a metal's reactivity.** • **Consider why it is important to determine the reactivity of metals.** • **Explain why given displacement reactions are predicted to occur or not occur.**	identifying independent, dependent, and control variables. • **Reaction Types**: Understand combustion, thermal decomposition, oxidation, and displacement reactions. • **Predictions**: Make predictions based on scientific knowledge and understanding. • **Carbon in Metallurgy**: Understand the use of carbon in obtaining metals from metal oxides. • **Qualitative Properties**: Describe and interpret the properties of ceramics, polymers, and composites. • **Data Presentation**: Present observations and data using appropriate methods, including tables and graphs	**place of a less reactive element.** **Non-metal** **An element found on the right hand side of the periodic table** **Reactant** **Chemical that are mixed together to change how the particles are arranged** **Product** **A new chemical that is made after particles have reacted** **Reaction** **The rearrangement of particles** **Brittle** **A substance that can be easily broken** **Malleable** **A substance that can be hammered into shape** **conductivity** **How easily heat/electricity**	

		• **Use particle models and diagrams to represent displacement reactions.** • **Predict which combinations of metals and metal compounds will lead to displacement reactions, with scientific reasons.** • **Explain why metals can be extracted using carbon, using the idea of displacement.** • **Convert amounts of metals within ores from masses to percentages, or vice versa.** • **Use balanced formula equations to illustrate examples of metal extraction.** • **Distinguish between chemical and physical properties of ceramics.** • **Justify why you identify possible ceramics from data about material properties.** • **Plan a method for comparing the strength of**		**can pass through a substance**	

		ceramic materials, justifying choices of experimental techniques and apparatus. • **Explain properties of different polymers.** • **Compare properties of different polymers.** • **Suggest advantages and disadvantages of using polymers.** • **Explain composite properties.** • **Suggest advantages and disadvantages of composite properties.** • **Suggest the role played by composite components when describing a graph of composite strengths**			
Trinity 1	Energy	• **Calculate Energy Requirements**: Calculate energy requirements for various	• **Compare Energy Values**: Compare the	**non-renewable energy resources cannot be replaced**	End of unit assessment

		situations, considering diet and exercise. • **Suggest Foods for Specific Situations**: Suggest different foods needed in unusual situations, such as training for the Olympics. • **Explain Athlete's Energy Needs**: Explain why an athlete needs more energy from food using provided data. • **Account for Energy Dissipation**: Account for energy dissipation during energy transfers. • **Compare Energy Transfers**: Compare energy transfers to energy conservation. • **Present Detailed Observations**: Present detailed observations of energy transfers in a table, including useful and non-useful transfers. • **Differentiate Energy and Temperature**: Provide examples	energy values of different foods using labels (kJ). • **Understand Fuels and Energy Resources**: Identify and explain various fuels and energy resources. • **Present Reasoned Explanations**: Provide reasoned explanations, linking data to predictions and hypotheses. • **Quantify Energy**: Understand energy as a measurable quantity that can be calculated, maintaining consistency before and after changes. • **Analyze Energy Changes**: Compare starting and final conditions of a system, describing increases and decreases in energy associated with various processes.	**once they are all used up** **renewable energy resources can be replaced, and will not run out** **Fossil fuels** **Are formed over millions of years, from the remains of dead organisms (Crude oil, coal and gas)** **Temperature** **The average kinetic energy of the particles in a substance.** **Measured in degrees Celsius, °C.** **Heat** **An energy store (thermal)** **measured in joules, J.** **Conduction** **Heat energy passed on by particles in solids** **Convection**	

		to show that energy and temperature are different. • **Explain Energy Transfer in Particles**: Explain, in terms of particles, how energy is transferred. • **Give Examples of Equilibrium**: Provide examples of equilibrium. • **Describe Error Sources**: Describe sources of error as systemic or random and suggest ways to minimize them. • **Explain Heat Transfer Processes**: Explain in detail the processes involved during heat transfers. • **Explain Insulator Properties**: Explain why certain materials are good insulators. • **Establish Thermal Equilibrium**: Explain how thermal equilibrium can be established.	• **Identify Energy Transfer Processes**: Recognize processes that involve energy transfer, such as motion changes, dropping objects, electrical circuits, spring stretching, food metabolism, and fuel burning. • **Energy Changes on Deformation**: Analyze energy changes that occur during deformation. • **Make Observations and Measurements**: Record observations and measurements using a variety of methods for different investigations. • **Evaluate Data**: Analyze data with awareness of potential random and systematic errors. • **Understand Heating and Thermal Equilibrium**: Explain	**Heat energy carried up away from heat source by particles in fluids** **Radiation Transferred as electromagnetic waves, not carried by particles**	

		• **Explain Energy Radiation**: Explain why some objects radiate more energy. • **Compare Energy Resources**: Compare the advantages and disadvantages of using renewable and non-renewable energy resources. • **Justify Information Sources**: Justify your choice of secondary information. • **Compare Power Consumption**: Compare the power consumption of different activities. • **Calculate Energy Costs**: Calculate and compare energy costs in different scenarios. • **Evaluate Experimental Results**: Evaluate results (including random and systematic errors) and suggest how the experiment can be improved	energy transfer due to temperature differences between objects, including conduction and insulation. • **Interpret Data**: Identify patterns in observations and measurements to draw conclusions. • **Evaluate Risks**: Assess risks associated with various experiments and processes. • **Analyze Domestic Fuel Use**: Understand domestic fuel bills, usage, and costs. • **Compare Power Ratings**: Compare the power ratings of appliances (watts, kW) and energy transferred (J, kJ, kWh). • **Make Predictions**: Use scientific knowledge to make predictions about energy use and transfer.		

			• **Calculate Work Done**: Understand the concept of work done (work = force × distance) and how simple machines affect force and distance. • **Evaluate Data with Error Awareness**: Analyze data with a focus on identifying potential sources of errors.		
Trinity 2	Variation and inheritance	• **Explain the Effect of Competition**: Analyze the impact of competition on individuals and populations. • **Explain Adaptations for Survival**: Discuss how adaptations enable organisms to survive in their environments. • **Explain Adaptation to Seasonal Changes**: Describe how organisms adapt to seasonal variations in their environments. • **Explain Evolutionary Adaptation and Extinction**: Analyze how competition and	• **Understand Natural Selection**: Recognize how variation between species and individuals affects competition and drives natural selection. • **Identify Species Differences**: Compare and analyze differences between species. • **Evaluate Environmental Impact**: Assess how environmental changes can impact species adaptation,	**Competition** **Competing with other organisms for resources** **Adaptation** **Characteristics that help an organism survive in its environment** **Variation** **Differences in characteristics with the same species** **Species** **Organisms that have lots of characteristics in**	End of unit assessment

		long-term environmental changes can lead to evolutionary adaptations or extinction. • **Explain Variation and Speciation**: Discuss how variation contributes to the emergence of different species. • **Explain Environmental and Inherited Variation**: Analyze how both environmental and inherited factors influence variation. • **Explain Continuous and Discontinuous Variation**: Discuss the causes and distinctions between continuous and discontinuous variation. • **Explain Inheritance through Genes**: Analyze how characteristics are inherited and coded by genes. • **Explain Contributions to DNA Structure**: Discuss the contributions of various scientists to the development of the DNA model and the effects	competition, and potential extinction. • **Interpret Data**: Interpret observations and data to identify patterns and draw conclusions. • **Graphical Representation of Variation**: Measure and graphically represent continuous and discontinuous variation within a species. • **Understand Heredity**: Explain heredity and the role of chromosomes, genes, and DNA in genetic transmission. • **Acknowledge Scientific Development**: Recognize how scientific methods and theories evolve with new evidence, emphasizing the importance of publishing results and peer review.	**common and can mate to produce fertile offspring** **Inherited Variation** **Characteristics that have been inherited from their parents. Eg eye colour** **Environmental Variation** **Variation caused by your surroundings and what happens to you eg. Dyed hair or a scar** **Continuous Variation** **Characteristics that can take any value within a range of values. Eg height.** **Discontinuous Variation** **Characteristic that can only be a certain value. Eg blood group.**	

		of communication issues on scientific progress. • **Explain Natural Selection and Evolution**: Discuss how natural selection drives evolution and how scientists understand changes over time in organisms. • **Explain Factors Leading to Extinction**: Analyze factors that contribute to extinction and discuss strategies scientists use to prevent it. • **Explain Types of Gene Banks**: Describe different types of gene banks and their purposes in conservation efforts	• **Analyze Organism-Environment Interactions**: Understand how organisms interact with their environment and the implications for natural selection. • **Maintain Biodiversity**: Appreciate the importance of biodiversity and the role of gene banks in preserving genetic material.		
	Earth and atmosphere	• **Earth's Structure and Atmosphere**: • Name the layers of the Earth and the main components of the atmosphere. • Describe properties of the different layers of the Earth and the	• **Understand Earth's Composition and Structure**: Know the composition and structure of the Earth and its atmosphere. • **Analyze Rock Formation**: Understand the formation of	**Sedimentary** **Formed over many years, layers of sediment fall on top of one another and over time gets compressed into rocks.** **Igneous** **Lava (molten rock) that has exited a volcano and cools**	End of unit assessment

		composition of the atmosphere. • **Sedimentary Rocks**: • State a property of sedimentary rocks and how they are made. • Explain two properties of sedimentary rocks and how they are formed. • **Igneous and Metamorphic Rocks**: • State one difference between igneous and metamorphic rocks and describe their formation. • Compare and explain how igneous and metamorphic rocks form. • **Rock Cycle**: • Give simple facts about how a rock can change type and describe the rock cycle using a wax model.	sedimentary, igneous, and metamorphic rocks. • **Interpret the Rock Cycle**: Explain the processes involved in the rock cycle. • **Explore the Carbon Cycle**: Understand the carbon cycle and the impact of human activity on carbon dioxide production and climate change. • **Evaluate Resources and Recycling**: Analyze Earth as a source of limited resources and evaluate the efficacy of recycling. • **Present Data Effectively**: Use appropriate methods, including tables and graphs, to present observations and data. • **Draw Conclusions from Data**: Interpret	**down forms igneous rocks** **Metamorphic** **When rocks are heated enough, they combine/join together to form a new type of rock that is a combination.** **Crust** **The outer layer of the earth where we live.** **Mantle** **Underneath the curst, made up of magma (molten rock)** **Core** **The centre of the earth, made of two metals which are iron and nickel** **Freeze-thaw** **The process of water entering a rock, freeing and expanding, before melting again. This happens over and**	

		• Explain how the rock cycle recycles material in rocks. • **Carbon Cycle**: • State changes in levels of carbon dioxide over time and name a storage location. • Explain why carbon dioxide concentration remained stable for years and identify carbon reservoirs. • **Global Warming**: • State a cause and impact of global warming. • Explain the reasons for global warming and describe its impacts. • **Recycling**: • Describe how aluminium is recycled and identify its advantages and disadvantages. • Explain the recycling process for aluminium	observations and data to identify patterns and draw conclusions. • **Make Predictions**: Use scientific knowledge and understanding to make informed predictions. • **Apply Mathematical Concepts**: Utilize mathematical concepts to calculate results related to chemical processes and data analysis.	**over again before breaking the rock.** **Chemical weathering** **Acid rain falls on rocks and overtime dissolves the rock, weathering it.** **Biological weathering** **Plant roots/plants grow into rocks. As the plant grow, these expand and gradually break**	

		and analyze its benefits and drawbacks.			