Alcester Academy Curriculum Planning: Key Stage 3

Department: Science **Year Group:** 8						
Term	Topic/ subject	Assessment Objectives	Knowledge	Skills Include detail of any differentiation	Literacy, numeracy and SMSC opportunities	Final assessment task and title
Autumn	Health and lifestyle	B2 1.1 Nutrients B2 1.2 Food tests B2 1.3 Unhealthy diet B2 1.4 Digestive system B2 1.5 Bacteria and enzymes in digestion B2 1.6 Drugs	Describe the components of a healthy diet Explain the result of each food group in the body Describe how to test foods for starch, lipids, sugar and protein Describe the positive test for each food Describe some health issues caused by an unhealthy diet Calculate the energy requirements of different people Describe the structure and function of the main parts of the digestive system Describe the process of digestion Describe the role of enzymes in digestion Describe the role of bacteria in digestion Describe the difference	**Experimental skills and investigations** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Analysis and evaluation** Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements	N: Quantative problem solving N: Calculate means N: plotting & drawing graphs N: direct proportion & ratios N: Number size & scale, quantative relationships between units N: Using estimation N: Formulae and equation substitution & units N: simple calculations L: select, synthesis & compare information from a range of sources (SMSC) L: Use of Scientific terminology in discussions & writing (SMSC) L: organizing ideas, evidence info L: Identify ideas & supporting evidence in text (SMSC) L: forms of writing rules	See assessment plan

			between recreational and medicinal drugs Describe the effects drugs have on health and behaviour	and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses	L: Well-developed, linked paragraphs	
		B2 1.7 Alcohol	Describe the effect of alcohol on health and behaviour Describe the effect alcohol has on pregnancy and conception	**Measurement** Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques.		
		B2 1.8 Smoking	Describe the effects tobacco smoke has on health Describe the effects of tobacco smoke on pregnancy			
	Electricity and Magnetism		- Explain how elements are classified as metals and non-metals. - Use patterns to classify an element as a metal or non-metal. -Use observations about materials to decide if they are metals or non-metals.			
		P2 1.1 Charging up P2 1.2 Circuits and current P2 1.3 Potential difference P2 1.4 Series and parallel	Explain how objects can become charged Describe how charged objects interact Describe what is meant by an electric field Describe what is meant by			

		P2 1.5 Resistance P2 1.6 Magnets and magnetic fields P2 1.7 Electromagnets P2 1.8 Using electromagnets C2 1.1 Metals and non-metals	current Describe how to measure current Describe what is meant by potential difference Describe how to measure potential difference Describe what is meant by the rating of a battery or bulb Describe the difference between series and parallel circuits Describe how current and potential difference vary in series and parallel circuits Describe what is meant by resistance Calculate the resistance of a component of a circuit Describe the difference between conductors and insulators in terms of resistance Describe how magnets interact Describe how to represent magnetic fields Describe the Earth's magnetic field Describe how to make an electromagnet			

	The periodic table	C2 1.2 Groups and periods C2 1.3 The elements of Group 1 C2 1.4 The elements of Group 7	Describe how to change the strength of an electromagnet Describe some uses of an electromagnet Describe how a simple motor works Use patterns to predict properties of elements. - Compare patterns in properties in the groups and periods of the Periodic Table. - Use trends shown by numerical data to predict missing values. Interpret data to describe patterns in properties of the Group 1 elements. -Use patterns to predict properties of Group 1 elements. - Record observations about how Group 1 metals react with water, and the pH of the solution formed. - Use patterns to predict properties of Group 7 elements.			

		C2 1.5 The elements of Group 0	- Describe displacement reactions. - Identify risks of using Group 7 elements using the hazard symbols associated with them. Describe the physical and chemical properties of the Group 0 elements. - Use patterns to predict properties of Group 0 elements. -Draw conclusions on the properties and trends of Group 0 elements based on experimental and secondary data.			
spring	Metals and their reactions	C2 3.1 Acids and metals C2 3.2 Metals and oxygen	Compare the reactions of different metals with dilute acids. - Explain the test for hydrogen gas. -Decide which metals react more vigorously from practical observations. Compare the reactions of different metals with oxygen. - Use state symbols in balanced formula equations. - Rank metals in order of how vigorously they react with	**Experimental skills and investigations** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a	N: Quantative problem solving N: Calculate means N: plotting & drawing graphs N: direct proportion & ratios N: Number size & scale, quantative relationships between units N: Using estimation N: Formulae and equation substitution & units N: simple calculations	

			oxygen.	range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.	L: select, synthesis & compare information from a range of sources (SMSC)	
		C2 3.3 Metals and water	Compare the reactions of metals with water. - Use the reactivity series to predict reactions. - Plan a practical to compare the reactivity of three metals.	**Analysis and evaluation** Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses	L: Use of Scientific terminology in discussions & writing (SMSC) L: organizing ideas, evidence info L: Identify ideas & supporting evidence in text (SMSC) L: forms of writing rules	
		C2 3.4 Metal displacement reactions	Predict if a given pair of substances will undergo displacement. - Use the reactivity series to explain displacement reactions. - Predict which combinations of metals and metal compounds will lead to displacement reactions.		L: Well-developed, linked paragraphs	
		C2 3.5 Extracting metals	Use the reactivity series to decide which metals can be extracted from their ores by heating with carbon. - Calculate the amounts of metals in ores. - Link an example of metal extraction to knowledge of the reactivity series.	**Measurement** Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques.		
		C2 3.6 Ceramics	Explain ceramic properties. - Explain why properties of ceramics make them suitable for their uses. - Plan a method for comparing the strength of ceramic materials, identifying the variables that need to be	**Experimental skills and**	N: Quantative problem	

			controlled	**investigations** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Analysis and evaluation** Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses	solving N: Number size & scale, quantative relationships between units N: Use of calculations with conversion between fractions, %, ratios N: plotting & drawing graphs N: interpreting data (charts/tables/graphs) N: use common units & simple compound units N: simple calculations L: Identify meaning in scientific text,bias (SMSC) L: Summarising information from a range of sources L: Use of Scientific terminology in discussions & writing (SMSC) L: approach detailed writing tasks by creating a plan L: arguments are well presented, discussing issues, ethic & opinions of other (SMSC) L: Use of correct form in a range of writing	
		C2 3.7 Polymers	Describe polymer properties. - Explain how polymer properties make them suitable for their uses. - Interpret data on polymers to decide on the best polymer for a given purpose, justifying the choice			
		C2 3.8 Composites	Describe composite properties. - Explain why composite properties make them suitable for their uses. - State the relationship shown on a graph of composite strengths.			
	Energy	P2 2.1 Food and fuels	Compare the energy values of food and fuels Compare the energy in foods and fuels with the energy needed for different activities			
		P2 2.2 Energy adds up	Describe energy before and after a change Explain what brings about changes in energy			
		P2 2.3 Energy and	State the difference between energy and temperature			

		temperature P2 2.4 Energy transfer: particles P2 2.5 Energy transfer: radiation P2 2.6 Energy resources P2 2.7 Energy and power	Describe what happens when you heat up solids, liquids and gases Explain what is meant by equilibrium Describe how energy is transferred by particles in conduction and convection Describe how an insulator can reduce energy transfer Describe some sources of infrared radiation Explain how energy is transferred by radiation Describe the difference between a renewable and non-renewable energy resource Describe how electricity is generated in a power station Explain the difference between energy and power Describe the link between power, fuel use and the cost of using domestic appliances	**Measurement** Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques.	styles & text, including info relevant to audience (SMSC) L: Taking different roles in discussions & writing showing understand & sensitivity (SMSC) L: Well-developed, linked paragraphs L: Alternative ways of presenting info used appropriately (SMSC)	
summer 	Adaptation Inheritanc	B2 3.1 Competition and adaptation B2 3.2 Adapting to	Describe some resources that plants and animals compete for	**Experimental skills and investigations** Select, plan and carry out the	N: Quantative problem solving N: Number size & scale,	

	e, genes and DNA	change B2 3.3 Variation B2 3.4 Continuous and discontinuous B2 3.5 Inheritance B2 3.6 Natural selection B2 3.7 Extinction B2 2.1 Photosynthesis B2 2.2 Leaves	Describe how organisms are adapted for their environment Describe how organisms adapt to environmental changes Describe how competition can lead to adaptation Describe how variation within a species occurs Describe the difference between environmental and inherited variation Describe the difference between continuous and discontinuous variation Represent variation within a species using graphs Describe the process of photosynthesis State the word equation for photosynthesis	most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Analysis and evaluation** Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses **Measurement**	quantative relationships between units N: Use of calculations with conversion between fractions, %, ratios N: plotting & drawing graphs N: interpreting data (charts/tables/graphs) N: use common units & simple compound units N: simple calculations L: Identify meaning in scientific text,bias (SMSC) L: Summarising information from a range of sources L: Use of Scientific terminology in discussions & writing (SMSC) L: approach detailed writing tasks by creating a plan L: arguments are well presented, discussing issues, ethic & opinions of other (SMSC) L: Use of correct form in a range of writing styles & text, including info relevant to audience	

	Ecosystems – plants Cellular processes	B2 2.3 Plant minerals B2 2.4 Chemosynthesis B2 2.5 Aerobic respiration B2 2.6 Anaerobic respiration	Describe the structure and function of the main components of a leaf Explain the distribution of chloroplasts in a leaf Describe how the plant uses minerals for healthy growth Explain the role of nitrates in plant growth Describe where chemosynthesis takes place Describe the process of chemosynthesis State the word equation for aerobic respiration Describe the process of aerobic respiration State the word equation for anaerobic respiration Describe the differences	Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques. **Experimental skills and investigations** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Analysis and evaluation**	(SMSC) L: Taking different roles in discussions & writing showing understand & sensitivity (SMSC) L: Well-developed, linked paragraphs L: Alternative ways of presenting info used appropriately (SMSC) : Quantative problem solving N: direct proportion & simple ratios N: Use of calculations with conversion between fractions, %, ratios N: Calculate means N: interpreting data (charts/tables/graphs) N: plotting & drawing graphs N: Number size & scale, quantative relationships between units N: calculation using +-*/ singly & in combination N: understanding < > = ≈ L: Identify meaning in scientific text,bias (SMSC) L: Summarising information from a	

			between aerobic and anaerobic respiration	Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses **Measurement** Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques. **Experimental skills and investigations** Select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control	range of sources L: Use of Scientific terminology in discussions & writing (SMSC) L: Collaboration & contribution to group discussions (SMSC) L: Identify ideas & supporting evidence in text (SMSC) L: Well-developed, linked paragraphs L: Use of correct form in a range of writing styles & text, including info relevant to audience (SMSC) : Quantative problem solving N: direct proportion & simple ratios N: Use of calculations with conversion between fractions, %, ratios N: Calculate means N: interpreting data (charts/tables/graphs) N: plotting & drawing graphs N: Number size & scale, quantative relationships between units	
	Forces and Motion Pressure	B2 2.7 Food chains and webs B2 2.8 Disruption to food chains and webs B2 2.9 Ecosystems 2 3.1 Speed P2 3.2Motion graphs	Describe what food chains show Describe what food webs show escribe the interdependence of organisms Describe how toxic materials can accumulate in food chains Describe how different organisms co-exist within an ecosystem Identify niches within an ecosystem Calculate speed Describe relative motion Interpret distance- time graphs Calculate speed using a distance time graph Describe the factors that			

	Structure of the Earth	P2 3.3 Pressure in gases P2 3.4 Pressure in liquids P2 3.5 Pressure on solids P2 3.6 Turning forces C2 4.1 The Earth and its atmosphere C2 4.2 Sedimentary rocks C2 4.3 Igneous and metamorphic rocks	affect gas pressure Describe the atmospheric pressure changes with height Describe how liquid pressure changes with depth Explain why some things sink and some float Calculate pressure Apply ideas of pressure to different situations Describe what is meant by a moment Calculate the moment of a force Compare the layers of the Earth Describe the composition of the atmosphere Explain 2 properties of sedimentary rocks Explain how sedimentary rocks are made Compare the ways that igneous and metamorphic rocks form Explain how igneous and metamorphic rocks form	variables, where appropriate Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements. **Analysis and evaluation** Present observations and data using appropriate methods, including tables and graphs. Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. Present reasoned explanations, including explaining data in relation to predictions and hypotheses **Measurement** Understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature	N: calculation using +-*/ singly & in combination N: understanding < > = ≈ L: Identify meaning in scientific text,bias (SMSC) L: Summarising information from a range of sources L: Use of Scientific terminology in discussions & writing (SMSC) L: Collaboration & contribution to group discussions (SMSC) L: Identify ideas & supporting evidence in text (SMSC) L: Well-developed, linked paragraphs L: Use of correct form in a range of writing styles & text, including info relevant to audience (SMSC)	

		C2 4.4 The rock cycle C2 4.5 The carbon cycle C2 4.6 Climate change C2 4.7 Recycling	Use the rock cycle to explain how the material in rocks is recycled Explain why the concentration of carbon dioxide did not change for many years Use the carbon cycle to identify stores of carbon Explain why global warming happens Explain some impacts of global warming Explain how aluminium is recycled Analyse the advantages of disadvantages of recycling	Use and derive simple equations and carry out appropriate calculations Undertake basic data analysis including simple statistical techniques.		