Alcester Academy Curriculum Planning: Key Stage 3 (Year 8)

Department: Science Year Group: 8							
Term	Topic/Subject	Assessment Objectives	Knowledge acquisition	Skill building *Intent*	Wider reading to include numeracy and SMSC	SEND & PP Identify where access and learning is supported	Final assessment task and title
autumn	Diet	content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed calculations of energy requirements in a healthy daily diet the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases	To understand what is meant by a balanced diet Describe the constituents of a balanced diet and their role within the body Describe how to test foods for starch, lipids and protein To explain the effects of malnutrition / deficiency Identify the parts of the digestive system To explain the role of the digestive system Explain the role of bacteria and enzyme in digestion Describe the energy requirements for different groups of people	To carry out food tests. To use information to explain the digestive process and the effects of malnutrition. Analyse information from food labels	Numeracy- Using patterns in data to evaluate risk between diet and diseases. Understanding surface area. Literacy to explain the digestive system and the processes. Interpret food labels eg per portion and 100g Use units	Impact of lifestyle choice on health (e.g. cardiovascular disease, fitness, BMI etc.) Careers in medicine.	Data **Diet and drugs**
Autumn	Drugs	the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.	To understand the effects of medicinal, recreational and illegal drugs. Classify drugs into suitable groups	To interpret data into the effect of drugs. Evaluate the consequences of drug use	To use data to explain the potential risk.	Effects of drugs – social and economic impacts Understanding the laws around the use of recreational drugs	Literacy Thalidomide reading comprehension Diet and drugs test

			Describe the effects of a range of drugs on the body including alcohol and tobacco Identify what is meant by passive smoking and how laws around smoking have changed Identify what is meant by addiction and withdrawal			Effects of drugs during pregnancy Careers in medicine.	
Autumn	Periodic table	differences between atoms, elements and compounds chemical symbols and formulae for elements and compounds the varying physical and chemical properties of different elements the principles underpinning the Mendeleev Periodic Table the Periodic Table: periods and groups; metals and non-metals how patterns in reactions can be predicted with reference to the Periodic Table	To be able to understand how atoms are arranged in terms of their properties To be to understand the reactivity of certain elements. To understand how the periodic table was developed	Carry out practical's to discover the properties of certain elements. To be able to use and write chemical symbols to describe a reaction. Use data to describe trends of elements.	Literacy into how the periodic table was developed. Numeracy using data's to identify properties and trends. Wider reading- research into the discovery of certain elements and their uses.	Understanding and appreciating personal influences- Celebrating the role scientists have played in our society- Mendeleev British valves- The Rule of Law Undertake safe practices, following class rules during projects and activities for the benefit of all	Exam style questions of periodicity from Activate 2 - Formative assessment
autumn	Metals and other Materials	the properties of metals and non-metals the order of metals and carbon in the reactivity series the use of carbon in obtaining metals from metal oxides	Identify the properties of metals Identify what an acid is and how UI shows the pH scale Learn the reactivity sequence for metals and be able to apply this to individual experiment results	Carry out practicals and record data in suitable ways including tables and graphs Use appropriate equipment safely	Balance symbol equations Convert between units Carry out simple calculations including %including ratio	Work collaboratively in lessons Evaluate the use different materials and their environmental	Metal reactivity data assessment Periodic table, chemical reactions and

		properties of ceramics, polymers and composites (qualitative)	Describe how metals react with water, acid and oxygen including the associated equations Identify the test for hydrogen Describe how metal oxides react with acids Describe metal displacement reactions and explain why they happen Explain how displacement is used to extract metals from their ores Identify where ceramics are used and their properties Describe what a polymer is and how some are used To understand commercial uses of materials according to their properties particularly metals.	Use equations to show reactions and balance symbol equations Use data to describe trends of elements Carry out practical's to discover the properties of metals.	Use graphs or data to extract information Wider reading around the use of plastics and polymers Wider reading- the recycling and reusing of metals	impact including plastics Be aware of careers around polymer sciences	metal reactions test
Spring	Electricity	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, as the ratio of potential difference (p.d.) to current differences in resistance between conducting and	To be able to understand simple electrical circuits and their uses in domestic life. Identify the components that make up a circuit Identify circuits as series and parallel	To carry out practical investigations to see patterns in current, potential difference and resistance.	Numeracy calculating, resistant, current and potential difference. Safe use of electricity. Use of electricity in the modern world.		Skills **Circuit diagrams**

		insulating components (quantitative). Static electricity 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.					
Spring	Magnetism	magnetic poles, attraction and repulsion magnetic fields by plotting with compass, representation by field lines Earth's magnetism, compass and navigation	To be able to understand magnetic fields. To describe how we use magnetic fields in everyday life.	To carry out practical investigations to see patterns in magnetic fields and in making electromagnets.	Wider reading- electrical bells, and elays.		Electricity and magnetism test
spring	Adaptation and inheritance	heredity as the process by which genetic information is transmitted from one generation to the next a 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 the variation between individuals within a species	To describe how organisms are adapted to their environment. To explain the laws of inheritance and the theory of evolutions. Identify variations between individuals and how these might be caused To describe the role DNA plays in inheritance	To explain characteristics of organisms. To be able to use Punnett square. To be able to piece evidence together to explain how it supports a theory.	Numeracy, probability from Punnett squares. Literacy explain natural selection Wider reading- origin of the species Discussion of genetic diseases. Debate over Darwin's theory and evolution of humans.	Students are ability set Syllabus is pared down for lowest set and KS2 resources used where needed Use of skill building tasks throughout units Use of experienced staff to teach lower sets	Design a Well adapted creature- formative. Adaptations and inheritance test

		being continuous or discontinuous, to include measurement and graphical representation of variation the 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 the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.				Sets regularly reviewed to allow for progress within subject Ongoing TA support Continued use of HW club for support Revision guides provided to PP Same teacher throughout KS3 to build learning relationships	
spring	Energy	heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contact (conduction) or radiation; such transfers tending to reduce the temperature difference: use of insulators	Identify the main stores of energy Describe how energy is transferred Explain why energy transfers are not perfect State the law of the conservation of energy Describe the difference between heat and temperature	Be able to carry out simple calculations to show energy transfer and efficiency Carry out practicals and record data in suitable ways	Convert between units Carry out simple calculations including % efficiency Re-arrange simple formulae Represent transfers graphically	Work collaboratively in lessons Evaluate ways of reducing heat loss and identify possible economic and environmental impacts	Clockwork radio reading comprehension Energy test

		other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels. Changes in systems energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes.	Describe how heat is transferred by conduction, convection and radiation Identify methods of insulating and reducing heat transfer Identify ways of generating electricity from both renewable and non-renewable sources Evaluate the cost of electricity and the amount used Identify how simple levers and gears work in machines To be able to explain how heat can be transferred. To be able to describe power and efficiency.	including tables and graphs Use appropriate equipment safely Evaluate various methods of insulation Evaluate the use of a variety of electricity generation methods Carry out calculations to show the cost of electricity Carry out calculations to show work done	Use graphs or data to extract information Reading comprehension clockwork radio Reading comprehension energy saving light bulbs Writing a letter to MP about renewable sources	Discuss the impact of renewable and non-renewable methods on the environment Evaluate the cost of electricity and ways of reducing energy consumption Discuss possible reasons for climate change and the impact of this	
Summer	Ecosystem processes	plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.	Describe the process of photosynthesis including the equation Identify the key structures in plants and the structure within the leaf	Be able to carry out practicals safely Write a method for testing a leaf for starch	Convert between units Carry out simple calculations including %	Discuss the use of farm chemicals and the consequences of these on humans Understand the limitations of	Quadrats assessment Ecosystem test

		the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops the importance of plant reproduction through insect pollination in human food security how organisms affect, and are affected by, their environment, including the accumulation of toxic materials the reactants in, and products of, photosynthesis, and a word summary for photosynthesis the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere the adaptations of leaves for photosynthesis.	Describe how gases are exchange by diffusion Explain why plants need minerals and the consequences of these Identify what is meant by chemosynthesis Describe the process of respiration Describe the process of anaerobic respiration and how this is used by humans in food and drink production Identify the organisms within a food chain and web and their interdependence Link the use of chemicals to the food chains and potential damage	Make links between key processes in plants and animals Analyse data showing gas exchange and breathing / heart rate	Reading comprehension on carnivorous plants Reading comprehension on parasites	humans in exploring the oceans and how our knowledge changes over time Discuss vegans and vegetarians within the human food chains Work collaboratively with others	
Summer	Earth and atmosphere	The composition of the Earth. - The structure of the Earth. - The composition of the atmosphere.	- Describe properties of the different layers of the Earth's structure - Describe the composition of the atmosphere	Present observations and data using appropriate methods, including	Numeracy using pie charts, data to evaluate the difference of gases between the early	A bar chart is available on the support sheet, so that students can focus on the calculations.	End of year test

		The carbon cycle. - The production of carbon dioxide by human activity and the impact on climate. The production of carbon dioxide by human activity and the impact on climate. Earth as a source of limited resources and the efficacy of recycling.	- Describe advantages and disadvantages of a given model of the Earth's structure - Explain why the concentration of carbon dioxide in the atmosphere did not change for many years - Use the carbon cycle to identify reservoirs of carbon - Explain why global warming happens - Explain some impacts of global warming - Design a model to represent global warming, and describe how it represents the real situation - Explain how aluminium is recycled - Analyse the advantages and disadvantages of recycling - Plot a bar chart of recycling rates for two towns	tables and graphs Apply mathematical concepts and calculate results	and present day atmosphere. Literacy-being able to explain the carbon cycle and evaluate recycling methods.	The support sheet includes a diagram of the carbon cycle with labels for students to complete as a word-fill.	
Summer	Pressure	atmospheric pressure, decreases with increase of height as weight of air above decreases with height pressure in liquids, increasing with depth; upthrust effects, floating and sinking	Describe what is meant by pressure Relate pressure to the structure of solids, liquids and gases Apply understanding of pressure to real life situations	Be able to carry out practicals safely Convert units Carry out calculations to show pressure and re-arrange the equation	Convert between units Carry out simple calculations	Consider the use of gases like hydrogen in cars and the safety implications Work collaboratively in practicals	Extended answer on using pressure

		pressure measured by ratio of force over area – acting normal to any surface.					

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