



**Headlands School Science - KS3 Assessment Strands** - *Key Knowledge and Application students need to be able to do to succeed*

Unit	Emerging	Developing	Secure	Excelling
B1 Health and Lifestyle	● <b>Recognise</b> elements of a healthy lifestyle	● <b>State</b> some impacts of unhealthy lifestyle choices on individuals and others	● <b>Describe</b> the purpose and functionality of the human digestive system as well as the effects of smoking	● Explain how each part of the digestive system functions with practical skills relied upon
C1 SoM and Energetics	● <b>Recognise</b> how particles move in their three states and some observations of chemical reactions	● <b>Identify</b> particles as atoms and molecules and <b>state</b> the properties of the 3 states of matter with their transitions	● <b>Describe</b> and explain the properties of matter in terms of the particle model with reference to exothermic and endothermic reactions	● <b>Explain</b> endothermic and exothermic changes in terms of energy transfer to and from the surroundings.
P1 Energy	● <b>Recognise</b> different types of energy that change from one form to another while doing work. Recognise the primary colours	● <b>Identify</b> heating as work in terms of electric heaters and burning fuel. Identify the refraction or reflection of light	● <b>Describe</b> and define work as energy transfer from one store to another, draw energy transfer diagrams for heating with a fuel and light bulbs	● <b>Outline</b> energy transfers including wasted energy. Draw ray diagrams to explain how mirrors and simple cameras work
B2 Cells and Organisms	● Recognise cells and tissues under a microscope	● Identify different parts of cells and organisms linking with how nutrients move	● Describe adaptations of cells, organs and unicellular organisms	● Compare how different cells and muscles work, specifically in gas exchange



			linking with how breathing and muscles work	
C2 Substances	<ul style="list-style-type: none"> <li>● State the difference between atoms, elements, compounds and mixtures and their properties</li> </ul>	<ul style="list-style-type: none"> <li>● Recognise reactants and products in a reaction</li> </ul>	<ul style="list-style-type: none"> <li>● Describe how to separate a mixture using distillation, chromatography, filtration and evaporation</li> </ul>	<ul style="list-style-type: none"> <li>● From word and formula equations, predict and explain whether the mass within a reaction vessel will stay the same</li> </ul>
P2 Electricity	<ul style="list-style-type: none"> <li>● Recognise energy in circuits and magnets</li> </ul>	<ul style="list-style-type: none"> <li>● Draw circuits and models involving electromagnets</li> </ul>	<ul style="list-style-type: none"> <li>● Predict the voltage across bulbs in different series and parallel circuits</li> </ul>	<ul style="list-style-type: none"> <li>● Use models to outline the effect of components on current and voltage.</li> </ul>
B3 Reproduction	<ul style="list-style-type: none"> <li>● <b>Recognise</b> some of the reproduction organs of humans and plants</li> </ul>	<ul style="list-style-type: none"> <li>● Label diagrams of the male and female reproductive organs <b>identify</b> some of the functions</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Describe</b> reproduction in different organisms with knowledge of the menstrual cycle, gametes, fertilisation, gestation and birth pollination, fertilisation, seed and fruit formation and seed dispersal</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Explain</b> how different cells or organs are adapted to perform their function in reproduction including fertilisation and seed dispersal</li> </ul>
C3 Fizzy bangy stuff	<ul style="list-style-type: none"> <li>● <b>Recognise</b> some reactions as combustion, oxidation or thermal decomposition</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Identify</b> with chemical formula how atoms are rearranged in chemical reactions. State pH of different indicators.</li> </ul>	<ul style="list-style-type: none"> <li>● Represent with formulae and equations combustion, oxidation and thermal decomposition, neutralisation reactions and <b>describe</b> how a</li> </ul>	<ul style="list-style-type: none"> <li>● Compare the different type of reactions and <b>explain</b> the role of catalysts in industry</li> </ul>



			catalyst will affect the reactions	
P3 Sound and Waves	<ul style="list-style-type: none"> <li>● <b>Recognise</b> waves as a transfer of energy over a distance without wires</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Identify</b> examples of waves encountered in everyday experience including loud speakers</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Describe</b> waves using key scientific terms: amplitude; wavelength; and frequency</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Outline</b> the motion of oscillations compared to the direction of energy transfer in waves, use the particle model to explain how wave speed is affected by the mediums</li> </ul>
B4 - Bioenergetics	<ul style="list-style-type: none"> <li>● <b>Recognise</b> the importance of plants and the difference between respiration and breathing</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Identify</b> and describe the photosynthesis and two types of respiration in words</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Describe</b> how a leaf is adapted for photosynthesis and how the products are used by the plant</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Compare</b> two types of respiration and the implications for the organism</li> </ul>
	<ul style="list-style-type: none"> <li>● <b>Recognise</b> simple food chains</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Identify</b> simple food webs</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Describe</b> the interdependence in food webs and ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Outline</b> how toxins can bio accumulate</li> </ul>
C4 – Periodic table	<ul style="list-style-type: none"> <li>● <b>Recognise</b> that elements have different properties</li> </ul>	<ul style="list-style-type: none"> <li>● <b>State</b> how the periodic table is broken up into metals, non-metals, periods and groups</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Explain</b> why elements are grouped in such a pattern – not just a long list</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Predict</b> the properties of an unknown element from its position in the periodic table</li> </ul>
	<ul style="list-style-type: none"> <li>● <b>State</b> the properties of metals and non - metals</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Identify</b> a metallic or a non-metallic element from its position in the periodic table</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Compare</b> the chemical properties of metal and non-metal oxides with respect to acidity</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Explain</b> how experiments can be used to find the relative reactivity of elements within a group</li> </ul>



P4 - Particles	<ul style="list-style-type: none"> <li>● <b>Recognise</b> the arrangement of particles in a solid, liquid or gas</li> </ul>	<ul style="list-style-type: none"> <li>● <b>State</b> the defining properties of solids liquids and gases in terms of shape, volume and density</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Describe</b> how properties of states link to the arrangement of particles, the relative motion and forces between particles</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Explain</b> what causes pressure in fluids in terms of particle collisions and the ratio of force to area</li> </ul>
	<ul style="list-style-type: none"> <li><b>State</b> how density links to particle arrangement and the anomaly of the ice-water transition</li> </ul>	<ul style="list-style-type: none"> <li><b>Define</b> the term density as the ratio of mass to volume</li> </ul>	<ul style="list-style-type: none"> <li><b>Describe</b> changes of state by linking temperature and density to internal energy</li> </ul>	<ul style="list-style-type: none"> <li><b>Explain</b> why objects float or sink using Archimedes principle</li> </ul>
B5 – Ecosystems and adaptations	<ul style="list-style-type: none"> <li><b>Recognise</b> how different animals are adapted to their different habitats</li> </ul>	<ul style="list-style-type: none"> <li><b>State</b> how adaptations to some organisms link to them being more successful than others at survival</li> </ul>	<ul style="list-style-type: none"> <li>Link adaptations and environment changes to <b>describe</b> successful reproduction or extinction</li> </ul>	<ul style="list-style-type: none"> <li><b>Explain</b> the role of gene banks in maintaining biodiversity.</li> </ul>
	<ul style="list-style-type: none"> <li><b>Name</b> the main organelles of plant and animal cells</li> </ul>	<ul style="list-style-type: none"> <li><b>State</b> the function the main organelles of different specialized plant and animal cells</li> </ul>	<ul style="list-style-type: none"> <li><b>Compare</b> different specialized cells</li> </ul>	<ul style="list-style-type: none"> <li><b>Explain</b> why cells have different organelles by linking to the cells function stem cells??</li> </ul>
C5 – Earth and Atmosphere	<ul style="list-style-type: none"> <li><b>Recognise</b> the basic structure and composition of the Earth</li> </ul>	<ul style="list-style-type: none"> <li><b>Compare</b> features of sedimentary, metamorphic and igneous rocks and how they were formed</li> </ul>	<ul style="list-style-type: none"> <li><b>Describe</b> the rock cycle using key scientific terms</li> </ul>	<ul style="list-style-type: none"> <li><b>Explain</b> the features of the different types of rocks using the rock cycle (and a model)</li> </ul>
	<ul style="list-style-type: none"> <li><b>State</b> the basic composition of the Earth's atmosphere</li> </ul>	<ul style="list-style-type: none"> <li><b>Identify</b> processes that might affect the composition of the atmosphere and therefore our climate</li> </ul>	<ul style="list-style-type: none"> <li><b>Describe</b> the role humans have played in the Carbon Cycle</li> </ul>	<ul style="list-style-type: none"> <li><b>Explain</b> how Earth is a limited resource and use the carbon cycle to explain the importance of recycling</li> </ul>
P5 - Forces	<ul style="list-style-type: none"> <li><b>Recognise</b> forces (using arrows) as pushes and pulls (or twists) on an object caused by interaction with other objects</li> </ul>	<ul style="list-style-type: none"> <li><b>State</b> how all the forces acting on an object can be replaced with one</li> </ul>	<ul style="list-style-type: none"> <li><b>Describe</b> the effect of a resultant force on an object – to change its shape or motion</li> </ul>	<ul style="list-style-type: none"> <li>Use the idea of unbalanced forces to <b>explain</b> change in simple situations such as objects in freefall or see saws</li> </ul>



		resultant force (or moment)		
	<b>Recognise</b> different types of contact and non-contact forces	<b>Identify</b> and calculate the speed of moving objects – interpret distance time graphs of simple journeys	<b>Describe</b> and define forces applied over distance as <b>work</b> (a way of transferring energy)	Use information about forces to predict and <b>explain</b> the motion of an object by sketching a distance time graph
B6 - Inheritance	<b>Recognise</b> what makes a species	<b>Identify</b> two causes of variation and traits in a species	<b>Describe</b> two types of variation as continuous or discontinuous and the graphical skills required to present it	Use punnet squares to <b>explain</b> the hereditary process outcomes.
	<b>Name</b> the molecule responsible for inheritance of traits	<b>Define</b> some key words; gene, DNA and chromosome. environmental and hereditary	<b>Explain</b> the roles of Watson, Crick, Wilkins and Franklin in the development of the DNA model	Use pedigree charts to <b>identify</b> dominant and recessive traits
C6 - Materials	<b>Recognise</b> via experiment that some elements are more reactive than others	<b>Identify</b> predictions about reactions using the reactivity series	<b>Describe</b> how carbon can be used to extract some metals from their ores	<b>Explain</b> why carbon cannot be used to extract all metals from their oxides
	<b>Recognise</b> how different materials differ in properties	<b>State</b> how we use some different materials	<b>Describe</b> properties of polymers, ceramics and composites.	<b>Explain</b> the link between properties of polymers, ceramics and composites to their uses.
P6 - Space	<b>Recognise</b> the nature of our sun as a star and its place in our galaxy and universe	<b>State</b> the link between the length of a day, year and month with the motion of the planets.	<b>Identify</b> the relationship between gravitational field strength and distance or mass (qualitatively only).	<b>Outline</b> how both lunar and solar eclipses form.



			Explain the variation in day length	
	<b>Recognise</b> the cause of the force responsible for the motion of planets.	<b>Identify</b> the relationship between gravitational field strength and distance or mass (qualitatively only).	<b>Describe</b> the link between orbital period, gravitational field strength and distance from the Sun.	<b>Outline</b> and <b>explain</b> the link between distance from the sun and orbital speed of a planet.
Working Scientifically	<ul style="list-style-type: none"> <li>● <b>Recognise</b> important variables in investigations, selecting the most suitable to investigate.</li> </ul>	<ul style="list-style-type: none"> <li>● Use scientific knowledge and understanding to plan investigations and <b>identify</b> the independent, dependent and control variables.</li> </ul>	<ul style="list-style-type: none"> <li>● Identify key variables in different and difficult situations and <b>describe</b> in the planning stage how to take control of some variables that cannot be controlled easily.</li> </ul>	<ul style="list-style-type: none"> <li>● Use key scientific words and terms to <b>explain</b> choice of methods and procedures to investigate different kinds of scientific questions.</li> </ul>
	<ul style="list-style-type: none"> <li>● Repeat sets of observations or measurements selecting suitable ranges and intervals</li> </ul>	<ul style="list-style-type: none"> <li>● Collect data by choosing a suitable range and using the right numbers and values for measuring and observing.</li> </ul>	<ul style="list-style-type: none"> <li>● Make a risk assessment by acting and seeking advice from the right sources of information.</li> </ul>	<ul style="list-style-type: none"> <li>● Choose and <b>explain</b> why the methods and procedures that are chosen will minimise error and allow precise and reliable data.</li> </ul>
	<ul style="list-style-type: none"> <li>● Write a straightforward conclusion from data found and explain the differences in repeats</li> </ul>	<ul style="list-style-type: none"> <li>● Use scientific knowledge to <b>identify</b> why some data or observations have limitations or don't follow a regular pattern.</li> <li>●</li> </ul>	<ul style="list-style-type: none"> <li>● Assess the strength of evidence, deciding whether it is sufficient to support a conclusion</li> </ul>	<ul style="list-style-type: none"> <li>● Process data, including using multi-step calculations and compound measures, to identify complex relationships between variables.</li> </ul>



	<ul style="list-style-type: none"><li>● Evaluate the effectiveness of chosen method and give practical ideas on how to improve the method</li></ul>	<ul style="list-style-type: none"><li>● Make valid comments on the quality of the collected data</li></ul>	<ul style="list-style-type: none"><li>● Suggest ways of changing the chosen method so that more reliable data can be collected.</li></ul>	<ul style="list-style-type: none"><li>● Use detailed scientific knowledge to suggest ways of modifying the experimental procedures with reasons and suggest strategies that will take the investigation further than it originally was</li></ul>
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