Year 9 Science Autumn Term

BIOLOGY - Health and gas exchange

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The structure and functions of the gas exchange system in humans including adaptations to function	Identify key parts of the gas exchange system (windpipe, lungs, diaphragm, air sacs) and their main function	Identify key parts of the gas exchange system (trachea, lungs, diaphragm, air sacs) and their functions	Label the gas exchange system (trachea, bronchi, lungs, diaphragm, alveoli) describe the functions of the key parts	Label the gas exchange system (trachea, bronchi, lungs, diaphragm, alveoli) and explain the functions	Label the gas exchange system and explain the functions and relevant adaptations
The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume	Make a simple model with support, of the breathing system and label how the gas moves	Make a simple model with support, of the breathing system and label how the gas moves	Carry out and write up simple techniques for separating mixtures	Plan, carry out and write up simple techniques for separating mixtures in context.	Make a simple model of the breathing system and explain how the model compares; Describe what happens to the gases inside the lungs
The impact of exercise, asthma and smoking on the human gas exchange system	Identify one consequence of exercise, asthma and smoking on	Identify the consequences of exercise, asthma and smoking on	Describe one consequence of exercise, asthma and smoking on	Explain the consequences of exercise, asthma and smoking on	Explain the consequences from the breathing system with specific reference to

	the breathing system	the breathing system	the breathing system	the breathing system	exercise, asthma and smoking
The role of stomata on gas exchange in plants	Use a model and support to identify the role of stomata on gas exchange	Use a model to identify the role of stomata on gas exchange	Define the role of stomata on gas exchange	Explain the role of stomata in the process of gas exchange	Explain the role and the adaptations of stomata for gas exchange
The effects of recreational drugs (including substance misuse) on behaviour, health and life processes	Match the recreational drugs with the effects on behaviour, with support	Match the recreational drugs with the effects on behaviour and health	Identify different recreational drugs and link them to their effect on behaviour	Describe the effects of given recreational drugs on behaviour. Identify some issues with substance misuse	Explain the effects of recreational drugs including substance misuse.

CHEMISTRY - Pure and Impure substances

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Mixtures, including dissolving	Sort out well-known mixtures (salt water) from well-known pure substances (water)	Identify a mixture based on its properties	Describe a simple mixture, of sand and water, using scientific terms	Describe a mixture using scientific terms	Explain how to make a mixture using scientific terms
Simple techniques for separating mixtures: filtration, evaporation,	Safely carry out, with support, simple techniques for	Safely carry out simple techniques for separating mixtures	Carry out and write up simple techniques for separating mixtures	Plan, carry out and write up simple techniques for separating	Plan, carry out, write up and evaluate simple techniques for

distillation and chromatography.	separating mixtures			mixtures in context.	separating mixtures in context.
The concept of a pure substance The identification of pure substances	Match definition of a pure substance with an example	Identify an example of a pure substance	Describe a pure substance	Describe, with examples, a pure substance	Explain, with an example, the definition of a pure substance
Diffusion in terms of the particle model	Identify, with support, the direction of movements of the particles	Identify the direction of movement of particles in given example	Describe, with support, diffusion using common example.	Describe diffusion using common example.	Explain diffusion in simple terms

PHYSICS - Physical changes

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving	With support, identify the materials conserved during chemical processes to begin to understand the conservation of them	Identify the materials conserved during chemical processes to begin to understand the conservation of them	Describe the conservation of materials through various chemical processes	Explain the conservation of mass and materials through various chemical processes	Explain the principle of conservation of mas and materials through various chemical processes
Similarities and differences, including density	With support, identify a similarity and difference	Identify a similarity and difference	List the similarities and differences	Describe the similarities and differences	Explain the similarities and differences

differences, between solids, liquids and gases	for a solid, liquid and gas	for a solid, liquid and gas	for solids, liquids and gases	between solids, liquids and gases.	between solids, liquids and gases.
Heating and thermal equilibrium: temperature difference between two objects leading to energy transfer from the hotter to the cooler one, through contract (conduction) or radiation; use of insulators	Observe the changes in temperature of an object over time, and begin, with support, to make links to energy.	Describe how an object's temperature changes over time when heated or cooled.	Describe observations about changing temperature in terms of energy transfer. Describe how an object's temperature changes over time when heated or cooled.	Explain, with support, observations about changing temperature in terms of energy transfer. Explain, with support, how an object's temperature changes over time when heated or cooled.	Explain observations about changing temperature in terms of energy transfer. Explain how an object's temperature changes over time when heated or cooled.
Other processes that involve energy transfer; changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of	With support, identify other processes that involve an energy transfer; With support, identify the starting energy store and the energy store after the transfer.	Identify other processes that involve an energy transfer; Identify the starting energy store and the energy store after the transfer.	With support, describe other processes that involve an energy transfer; With support, describe the starting energy store and the energy store after the transfer.	Describe other processes that involve an energy transfer; Describe the starting energy store and the energy store after the transfer.	Explain other processes that involve an energy transfer; Explain the starting energy store and the energy store after the transfer.

food, burning fuels.					

Year 9 Science Spring Term

BIOLOGY - Cellular respiration

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules.	With support, match the definitions of aerobic and anaerobic respiration	Match the definitions of aerobic and anaerobic respiration	With support, identify the circumstances of aerobic and anaerobic respiration and the products of each	Identify the circumstances of aerobic and anaerobic respiration and the products of each	Describe the differences between aerobic and anaerobic respiration and the need for both.
A word summary for aerobic respiration	With support, correctly place the reactants and products	Correctly place the reactants and products in to the word equation	With support, write out the word equation for aerobic respiration	Write out the word equation for aerobic respiration	Write out the word equation for aerobic and anaerobic respiration
The process of anaerobic respiration in humans and micro-organisms, including fermentation, and	With support, match the correct definition to anaerobic respiration and an example of use.	Identify the correct definition of anaerobic respiration and an example of use.	Begin to describe the process of anaerobic respiration and give an example of use	Describe the process of anaerobic respiration and give two uses	Explain the process of anaerobic respiration and give its uses

a word summary for anaerobic respiration					
The differences between aerobic and anaerobic respiration in terms of the reactants, the products formed and the implications for the organism	Choose the main difference between aerobic and anaerobic respiration	Identify the main difference between aerobic and anaerobic respiration	Identify the differences between aerobic and anaerobic respiration	Describe the differences between aerobic and anaerobic respiration including the reactants and products	Explain the main differences between aerobic and anaerobic respiration including reactants and products.

CHEMISTRY - Materials

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The order of metals and carbon in the reactivity series	Correctly place, with some support, carbon in the reactivity series	Identify the most reactive and least reactive in the series	Correctly order, with some support, the reactivity series	Correctly order the reactivity series	Correctly order the reactivity series and give reasons for the order
The use of carbon in obtaining metals from metal oxides	Carry out, with close supervision, the	Carry out the process of extracting	Plan and carry out the process of extracting	Plan, carry out and evaluate, with support,	Plan, carry out and evaluate the process of extracting

	process of extracting copper from copper oxide	copper from copper oxide	copper from copper oxide	the process of extracting copper from copper oxide	copper from copper oxide
Properties of ceramics, polymers and composites (qualitative)	Match basic properties of ceramics, polymers and composites	Identify two properties of ceramics, polymers and composites	Explain two properties of ceramics, polymers and composites	Describe two properties of ceramics, polymers and composites	Describe the properties of ceramics, polymers and composites

PHYSICS - Current electricity

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge	Recognise the differences between the current in a series and parallel circuit	Identify the behaviour of current in a parallel circuit	Describe, using a model, the changes in current between series and parallel circuits	Explain the behaviour of current in two types of circuit: series and parallel.	Explain the behaviour of current in two types of circuit: series and parallel, in terms of calculations
Potential difference, measured in volts, battery and bulb ratings;	Recognise and measure potential difference in a circuit.	Identify that there is a relationship between potential	Describe the relationship V=IR; Calculate resistance with a	Explain the relationship V=IR; Calculate resistance with results from	Explain the relationship between current, potential difference and

resistance, measured in ohms, as the ratio of potential difference to current		difference and resistance	set of given examples	measurements of current and potential difference	resistance; Calculate resistance with results from investigations
Differences in resistance between conducting and insulating components (quantitative)	Identify materials as conductors and as insulators within a simple circuit	With support, describe how to identify conductors and insulators in a simple circuit	Describe how to identify conductors and insulators in a simple circuit	With support, investigate the resistance provided by conductors and insulators in a simple circuit	Investigate the resistance provided by conductors and insulators in a simple circuit

Static electricity

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects	Correctly label a diagram to show the movement of electrons to cause static charge	Using a simple diagram identify the movement of electrons between charged objects	Describe how electrons are transferred between charged objects.	Explain, in simple terms, how electrons are transferred between charged objects.	Explain how electrons are transferred between objects
The idea of electric field,	With support, show examples of	Show examples of electric forces	With support, describe how the	Describe how the electric forces	With support begin to explain

forces acting across the space between objects not in contact	electric forces acting across space between objects	acting across space between objects	electric forces can act across the spaces between objects	can act across the spaces between objects	how the forces acting on the objects can cross the space.