

Year 8 Science Autumn Term

BIOLOGY - Photosynthesis

National Curriculum	Launch	Breakthrough	Foundation	Developing	
<p>Plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots</p>	<p>Label, with support, a diagram to show photosynthesis in plants</p>	<p>Correctly label a diagram to show photosynthesis in plants</p>	<p>Draw and label a diagram to show photosynthesis in plants Identify the products and reactants</p>	<p>Draw and label a diagram to show photosynthesis in plants With support, write out the word equation for photosynthesis and identify the products and reactants</p>	<p>Draw and label a diagram to show photosynthesis in plants Write out the word equation for photosynthesis and identify the products and reactants</p>
<p>The reactants in, and the products of, photosynthesis, and a word summary for photosynthesis</p>	<p>Identify the reactants and products in the photosynthesis word equation</p>	<p>Name the reactants and products of the photosynthesis reaction. Construct the word equation with support</p>	<p>Names the reactants and products of photosynthesis reaction. Construct the word equation</p>	<p>Correctly write out the word equation for photosynthesis with reactants and products correctly placed.</p>	<p>Write out the word equation and the chemical equation for photosynthesis with reactants and products correctly placed</p>

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	Identify plants as the start of any food chain/web. Label, with support, the carbon cycle	Identify, with reason, plants as the start of any food chain/web. Labels, with support, the carbon cycle	Describe why plants are the start of any food chain/web. Describe the key features of the carbon cycle	Explain why plants are the start of any food chain/web. Describe the carbon cycle	Explain why plants are the start of any food chain/web; Describe the carbon cycle and how it is linked to photosynthesis
The adaptations of leaves for photosynthesis	Identify one adapted feature of a leaf	Identify all adapted features of a leaf and make some links to the purpose	Describe the adaptations of leaves	Explain the adaptations of leaves	Explain the adaptations of the leaves and give reasons why.

CHEMISTRY - Earth and Atmosphere

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The composition of the Earth	Correctly match the labels on a diagram of the structure of the Earth	Correctly label a diagram of the structure of the Earth	Describe the structure of the Earth in terms of state of matter and temperature	Describe the structure of the Earth and explain the properties of the different layers	Explain the structure of the Earth and the properties of the different layers
The structure of the Earth	Match the labels with the structure of the Earth	Label the structure of the Earth, with support	Independently label the structure of the Earth	Describe the structure of the Earth	Explain the structure of the Earth
The rock cycle and the formation of igneous, sedimentary and metamorphic rocks	Fill in the key words for the rock cycle; Label the four different types of rock when given their key features Give one example of the different types of rock.	Correctly label the processes involved in the rock cycle; Identify the four different types of rock Identify key features for one of the types of rock	With support, describe the process of the rock cycle Identify where the four different types of rock are found Identify two key features for each of the types of rock	Describe the process of the rock cycle; Identify how the four different types of rock are formed; Identify key features of the types of rock	Explain the process of the rock cycle; Describe how the four different types of rock are formed; Describe the differences in the types of rock.

Earth as a source of limited resources and the efficacy of recycling	Identify one resource that are available from the Earth; Match up how one of these resources is limited; Identify ways in which we can reduce the need for these resources	Identify three resources that are available from the Earth; Match up how these resources are limited from examples; Select one way, from a selection, in which we can reduce the need for these resources	Identify the resources that are available from the Earth; Describe one way in which they are limited; Suggest one way in which we can reduce the need for these resources	Identify the resources that are available; Describe the ways in which they are limited; Suggest three different ways in which we can reduce the need for these resources	Describe the resources that are available; Explain the ways in which they are limited; Give different ways in which we can reduce the need for these resources
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PHYSICS - Space physics

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Gravity force, weight = mass x gravitational field strength (g), on Earth $g = 10\text{N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between	Using $W=mg$, calculate (with support) the force of weight on the Earth. Choose the correct force which keeps us on the Earth and the Earth in orbit	Using $W=mg$, calculate (with support) the force of weight on the Earth and the moon. Identify the force which keeps the Earth and moon in orbit	Using $W=mg$ calculate the force of weight on Earth and the moon. Describe the force which keeps the Earth and moon in orbit.	Using $W=mg$ calculate the force of weight on Earth, the moon and one other planet; Explain how the Earth orbits the Sun and the moon orbits the Earth.	Use $W=mg$ to calculate the force of weight for given scenarios; Explain how orbits work and give examples.

Earth and Sun (qualitative)					
Our Sun as a star, other stars in our galaxy, other galaxies	Identify the Sun as a star.	Identify the Sun as a star and give one reason why.	Describe the differences between a star and a planet and how the Sun fits an example	Explain the main differences between a star and a planet and compare the Sun and the Earth	Explain the differences and similarities between a star and a planet
The seasons and the Earth's tilt, day length at different times of year, in different hemispheres	Match the correct season to its features (temp, day length) Show some understanding of the differences between UK and Australia	Name the four seasons and choose the properties of day length for the correct hemisphere.	Describe the changes in seasons in both hemispheres	Explain how the seasons are created in each of the hemispheres	Explain how the seasons are created and why there are the seasonal differences
The light year as a unit of astronomical distance					

Magnetism

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Magnetic poles, attraction and repulsion	Show the field lines around a magnet	Use the idea of field lines to show how the	Using the field lines describe how the	Using the field lines explain the direction and strength of the	Draw the field lines and explain the direction/strength

Magnetic fields by plotting with compass, representation by field lines		direction or strength of the field around a magnet varies.	direction or strength of the field around a magnet varies.	field around a magnet	of the field around a magnet
Earth's magnetism, compass and navigation	Observe the effect the Earth's magnetic field has on compasses	Demonstrate the effect the Earth's magnetic field has on compasses	Describe observations about the effect of the Earth's magnetic field on compasses	Explain, with support, observations about navigation using Earth's magnetic field.	Explain observations about navigation using Earth's magnetic field.
The magnetic effect of a current, electromagnets, D.C. motors (principles only)	With support label a diagram to show how an electromagnet can be made.	Use a diagram to describe how an electromagnet can be made and how to change its strength.	Use a diagram to describe how an electromagnet can be made and how to change its strength. Describe the choice of electromagnets or permanent magnets for a device in terms of their properties.	Use a diagram to explain how an electromagnet can be made and how to change its strength. Explain, with support, the choice of electromagnets or permanent magnets for a device in terms of their properties.	Draw a diagram and explain how an electromagnet can be made and how to change its strength. Explain the choice of electromagnets or permanent magnets for a device in terms of their properties.

Year 8 Science Spring Term

BIOLOGY - Nutrition and digestion

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Content of a healthy human diet: carbohydrates, lipids, proteins, vitamins, minerals, dietary fibre and water and why each is needed.	Create a healthy plate using a template and examples of foods; Link the nutrient role to the correct examples	Create a healthy plate using a template. Identify the correct nutrient for the roles given	Create a healthy plate with examples given. Describe the role of the nutrients in the body	Create a healthy plate with examples given. Explain the role of the nutrients in the body	Create a healthy plate with the correct proportions of the nutrients; Explain the role of nutrients in the body
The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases.	Match up the consequence pictures with the imbalance examples provided	Match up the consequence pictures with the imbalance examples; Match the missing nutrient to the deficiency diseases given	Describe what happens when there is too much or too little of the nutrients. Match the missing nutrient to the deficiency diseases given	Explain what happens when there is too much or too little of the nutrients. Give examples of when/why this may happen	Describe what happens when there is an imbalance of nutrients; Give examples of when this may happen

<p>The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts)</p>	<p>Identify the organs in the digestive system. Model the digestive system</p>	<p>Identify and correctly link the organs in the digestive system Model the digestive system and identify where nutrients are absorbed</p>	<p>Label the parts of the digestive system and match them to their function in digestion. Correctly match enzyme to nutrient and products</p>	<p>Label the parts of the digestive system and describe their function in digestion. Correctly match enzyme to nutrient and products and have some knowledge of how they work.</p>	<p>Identify the pathway of the digestive system and describe the organs function in digestion; Correctly match enzyme to nutrient and products and have some understanding of how they work</p>
<p>The importance of bacteria in the human digestive system</p>	<p>Sort bacteria and their role into good or bad</p>	<p>Identify good bacteria through the description of their role</p>	<p>Describe the role of digestive bacteria</p>	<p>Explain the role of digestive bacteria and its importance to digestion</p>	<p>Explain the importance of digestive bacteria and the consequence of the bacteria being harmed</p>
<p>Calculations of energy requirements in a healthy daily diet</p>	<p>Observe investigation into food energy levels. Make simple calculation with support, with given values</p>	<p>Collect results from investigation into food energy levels. Make simple calculations from values given</p>	<p>Investigate the different energy levels in food and use the results to calculate the energy in a healthy diet</p>	<p>Investigate the different energy levels in food and use the results to calculate the energy in a healthy diet. Analyse the results, with support.</p>	<p>Investigate the different energy levels in food and use the results to calculate the energy in a healthy diet. Analyse and evaluate the investigation</p>

CHEMISTRY - Chemical Reactions

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Representing chemical reactions using formulae and using equations	Sort reactants and products in simple chemical equations	Name some reactants and products in common chemical equations	Complete chemical equations given from common examples	Construct simple word equations for common reactions	Construct simple chemical equations from common word equations
Defining acids and alkalis in terms of neutralisation reactions	Using the pH scale show where a neutralisation reaction would lie	Predict what would happen in a neutralisation reaction	Investigate neutralisation reactions	Investigate the uses of the neutralisation reaction	Plan and investigate the uses of neutralisation reactions
The pH scale for measuring acidity/alkalinity; and indicators	Sort acids and alkalis based on their indicator colour	Identify acids and alkalis based on their colour	Identify acids and alkalis based on their pH value	Describe the position of household products in the periodic table	Explain the position of household products in the periodic table
Reactions of acids with metals to produce a salt plus hydrogen	Observe reaction between acids and metals Observe results of the reaction	Identify the test for the gas formed in the acid-metal reaction	Investigate the reaction of acids with metals	Describe the reaction between common metals and acids.	Explain the reaction between common metals and acids. Describe any patterns seen

Reactions of acids with alkalis to produce a salt plus water	Observe reaction between acids and alkalis Observe results of the reaction	Identify the salt produced, with support, in a given acid-alkali reaction	Investigate the reaction of acids and alkalis	Describe the reaction between acids and alkalis and any patterns	Explain the reaction between acids and alkalis Describe any patterns in the products
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Earth and atmosphere

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The Carbon cycle	Fill in key words on the diagram of the carbon cycle; Identify one key feature of the carbon cycle works	Label the diagram of the carbon cycle Describe two key features of the carbon cycle	Draw a diagram, with support, of the carbon cycle Describe key features of how the carbon cycle works	Draw a diagram of the carbon cycle. Explain the key features of the carbon cycle and how it works	Draw and label a diagram of the carbon cycle. Explain the features of the carbon cycle
The composition of the atmosphere	List the components of the atmosphere	Identify one way in which the atmosphere has evolved	Identify two ways in which the atmosphere has evolved	Describe the ways that the atmosphere has evolved	Explain how the atmosphere has evolved
The production of carbon dioxide by human activity and the impact on climate	Identify two ways in which humans have increased the amount of carbon released	List some ways in which humans have increased the amount of carbon being released.	Describe three ways in which humans have increased the amount of carbon being released.	Explain the ways in which humans have impacted on the production of carbon dioxide and the climate.	Explain how humans have impacted on the production of carbon

dioxide and the climate.

PHYSICS - Waves

Sound waves

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Frequencies of sound waves, measured in hertz (Hz); echoes reflection and absorption of sound	Listen to the different behaviours of sound waves in different situations eg. Echoes and absorption	Identify the different behaviour of sound waves in different situations eg. Echoes and absorption	Describe the different behaviours of sound waves, including echoes and absorption	Explain, with support, the behaviour of sound waves, including echoes and absorption.	Explain the behaviour of sound waves, including echoes and absorption.
Sound needs a medium to travel, the speed of sound in air, in water, in solids	Observe a model of how sound waves travel, linking it to the idea of longitudinal waves	Model how sound travels using the idea of longitudinal waves	Describe how sound travels using the idea of longitudinal waves	Explain, with support, how sound travels using the idea of longitudinal waves	Explain how sound travels using the idea of longitudinal waves
Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum;	With support, correctly label the pathway a sound wave takes from vibration to detection	Organise the key elements to the movement of a sound waves into the right order	Describe, with support, the journey of a sound waves from the vibration that causes it to the sensor that detects it	Describe the journey of a sound waves from the vibration that causes it to the sensor that detects it	Explain the journey of a sound waves from the vibration that causes it to the sensor that detects it

sound waves are longitudinal					
Auditory range of humans and animals					

Motion and Forces

Describing motion

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Forces being needed to cause objects to start or stop moving, or to change their speed or direction of motion	Correctly identify the larger force	Correctly identify and draw the larger force	Correctly identify when the forces are balanced	Describe the difference in the diagram when forces are balanced/unbalanced and the outcome	Explain the difference in the diagrams when forces are balanced/unbalanced and the outcome
Change depending on direction of force and its size					

Year 8 Science Summer Term

BIOLOGY - Relationships in an ecosystem

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The interdependence of organisms in an ecosystem, including food webs and insect pollinated crops	Identify two organisms in an ecosystem that are interdependent on one another	Identify two organisms in an ecosystem and give the relationship between them (prey/predator)	Describe the interdependence of a food web using specific examples	Explain how the populations in a food web can change dependent on the rest of the organisms present.	Explain how populations in a food web changes and how this links with other populations in the ecosystem
The importance of plant reproduction through insect pollination in human food security	Make links between the insect pollination of plants and human food	Identify key features in insect pollination, linking it to human food	Describe how human food is dependent upon insects in relation to pollination	Explain how human food is reliant upon the pollination of plants by insects	Explain how human food is reliant upon the pollination of plants by insects and the consequences of the reduction in insect pollination
How organisms affect, and are affected by, their environment, including the	Match some affects to their outcomes for a given environment	Identify some affects and their outcomes for a given environment	Describe the impact of some affects for a given environment	Explain the impact on an environment for given affects	Explain how humans impact on an environment and its inhabitants

accumulation of toxic materials					
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CHEMISTRY - Chemical Reactions

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Chemical reactions as the rearrangement of atoms	Identify, with support, the atoms in products and reactants	Identify the atoms in products and reactants	With support, describe the placement of atoms in reactants and products	Describe the placement of atoms in reactants and products	Explain the placement of atoms in reactants and products
Representing chemical reactions using formulae and using equations	Sort reactants and products in simple chemical equations	Name some reactants and products in common chemical equations	Complete chemical equations given from common examples	Construct simple word equations for common reactions	Construct simple chemical equations from common word equations
Combustion, thermal decomposition, oxidation and displacement reactions	Correctly match words and definitions for the different reactions.	Correctly identify examples of each reaction	Describe the different reactions with examples	Explain, with support, the different reactions and give examples and uses.	Explain the different reactions and give examples and uses.
What catalysts do	Identify the main function of a catalyst	Recall the function and main property of a catalyst	Describe the function of a catalyst in chemical reactions	Explain the role of a catalyst in chemical reactions	Explain the role of a catalyst in a specific chemical reaction
Exothermic and endothermic chemical reactions (qualitative)	Correctly match the definitions with the reactions	Identify the main difference between exothermic and endothermic reactions	Describe an exothermic reaction in terms of thermal energy.	Describe exothermic and endothermic reactions in terms of thermal energy.	Explain exothermic and endothermic reactions in terms of thermal energy.

PHYSICS - Energy

Calculation of fuel uses and costs in the domestic context

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Comparing energy values of different foods (from labels) (kJ)	Find the energy values of different foods.	Order the amounts of energy transferred by different foods and activities	Compare, with support, the amounts of energy transferred by different foods and activities.	Compare the amounts of energy transferred by different foods and activities.	Compare and explain the amounts of energy transferred by different foods and activities.
Comparing power ratings of appliances in watts (W, kW) Comparing the amounts of energy transferred (J, kJ, kW hour)	Compare the energy usage and cost of running different home devices.	Compare the energy usage and cost of running different home devices.	Compare, with support, the energy usage and cost of running different home devices.	Compare the energy usage and cost of running different home devices.	Compare and explain the energy usage and cost of running different home devices.
Fuels and energy resources	Sort the advantages and disadvantages of different energy resources.	Describe, with support, the advantages and disadvantages of different energy resources.	Describe the advantages and disadvantages of different energy resources.	Explain, with support, the advantages and disadvantages of different energy resources.	Explain the advantages and disadvantages of

					different energy resources.
Domestic fuel bills, fuel use and costs	With support identify the changes to fuel bills, use and costs over a year	Identify the changes to fuel bills, use and costs over a year	With support describe the changes to fuel bills, use and costs over a year	Describe the changes to fuel bills, use and costs over a year	Explain the changes to fuel bills, use and costs over a year

Describing motion

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Speed and the quantitative relationship between average speed, distance and time (speed = distance x time)	With support, calculate the speed of an object with given values for distance and time	Correctly calculate speeds for given distances and times	Investigate the relationship between speed, distance and time and, with support, use the results to calculate speed	Plan and investigate the relationship between speed, distance and time and, with support, use the results to calculate speed	Plan and investigate the relationship between speed, distance and time and use the results to calculate speed
The representation of a journey on a distance-time graph	Match the points of a distance-time graph as moving or stationary	Draw a distance-time graph using values given	Describe the journey shown on a distance-time graph	Explain, with support, the journey given by a distance-time graph	Explain the journey given by a distance-time graph
Relative motion: trains and cars	Recognise the difference in the distance-time	Identify the differences between a distance-time	Describe the difference in the distance-time	Explain the differences in the journey of a car and	Compare the journeys of the car and train,

passing one another	graph for a car and a train	graph of a car and train	graph of a car and train	train using the distance-time graph	using the distance-time graph
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