



	Unicellular Organisms	Plants and reproduction	Breathing and respiration	Food and nutrition	Plant growth	Genetics and evolution
Key concepts	A detailed look at what unicellular organisms are, the differences between different types, their problems and their uses.	Reproduction in plants, both sexual and asexual, although the former is of chief importance. Classification and biodiversity are also covered.	This unit covers gas exchange in humans and other organisms, together with details of aerobic and anaerobic respiration in humans.	Components of the human diet and why they are needed. The digestive system is also covered in some detail, and the idea of enzymes is introduced.	Photosynthesis and aerobic respiration in plants in more detail, and then considers plant adaptations. The products we get from plants are then looked at, before studying farming methods and their problems.	DNA is introduced before students consider how inherited genes can affect an organism's survival. The unit ends with coverage of natural selection.
Themes	What causes diseases?	The various uses that we have for plants.	Water sports	Human diet	Farming/production of food	How do we survive?
Challenge	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.	Outcomes, questioning, tasks and worksheets in all lessons. Regular progress checks.
Support						
Literacy focus	Understanding how modal verbs are used to express certainty.	Understanding paragraph construction to develop logical and fluid text.	Understanding how sentences can be constructed to show cause and effect.	How verbs and adjectives can be used to add 'weight' to an opinion bias.	Develop logical sequences of points in writing.	Construct convincing arguments. Construct balanced arguments.
Numeracy focus	Pie charts (identifying, describing, extracting information, presenting/drawing).	Use appropriate units for and calculate area for squares/rectangles, use a sample to calculate an estimate of population size.	Describe the ranges of readings in data/explain why data with a small range is of good quality, calculate means, identify anomalous results.	Use appropriate units for area measurements, calculate area for a variety of shapes, including rectangles and cuboids.	Bar chart and line graph drawing/interpretation. Identifying random samples (and their use in avoiding bias).	Probability (calculate and represent as fractions, decimals and percentages).
Cross-curricular links	Food technology – baking, brewing, yoghurt-making, cheesemaking.	Art – drawing plants, plants as decoration, plants for textiles and dyes English – plant poetry	PE – effects of exercise on pulse and breathing rates History – use of chemical weapons (e.g. in WWI)	Art – advertising posters English – advertising and persuasive language PE – energy from food	Geography – the Green Revolution and the breeding of rice by the IRRI	Art – DNA models
SMSC & MBV	See SMSC and MBV Grid					
ASSESSMENTS	Waterfall assessment 5	Waterfall assessment 2	Waterfall assessment 4	Waterfall assessment 1	End of year assessment	End of year assessment
Out of school learning	Educake for consolidation of learning and Seneca for flipped learning.					








Unicellular Organisms				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Uni or multi - how do some microorganisms cause diseases? Differences between multicellular and unicellular organisms and the reasons for those differences (i.e. diffusion). Division of organisms into kingdoms.	B1 – Recall MRS GREN and characteristics of the kingdoms, describe why transport systems are needed. B2 – Justify why viruses have no kingdom and classify given organisms using the key characteristics of microorganism cell structure. B3 – Explain the importance of surface area: volume ratio for organisms.	Outcomes, questioning, tasks and worksheets in all lessons.	Lesson 1 - Unicellular or multicellular Beakers, potato cubes, cutting board, scalpels, gloves, iodine solution, stopwatches, rulers, goggles, paper towels, forceps
2	Microscopic Fungi - looks in more detail at microscopic fungi and yeast in particular. Aerobic and anaerobic respiration are considered in the contexts of baking and brewing, respectively.	B1 - recall how yeast grow quickly and explain how yeast can be used. B2 - describe how yeast multiply and the different stages of their growth curve. B3 - use graphs to calculate population growth rates and apply this to other organisms.		Lesson 2 - Microscopic fungi Conical flasks, yeast, glucose, luke warm water, water bath (at 35 °C), balloons.
3	Bacteria - considers bacteria and includes a look at their reproduction, together with yoghurt- and cheesemaking.	B1 - draw and label a bacteria cell, recalling functions and use a statement key. B2 - describe how bacteria multiply and why they grow well in certain conditions. B3 - describe how Gram staining works and utilise results.		Lesson 3 - Bacteria Agar plates, swabs/cotton buds, whiteboard pens.
4	Protoctists - looks at protoctists, including their importance in ecosystems.	B1 – describe the basic functions of common parts in protocist cells and make links to their role in feeding relationships. B2 – explain the functions of light and chlorophyll in photosynthesis and recall the word equation. B3 - explain how eutrophication occurs		Lesson 4 - Protoctists
5	Decomposers and carbon - focuses on the carbon cycle.	B1 – describe how carbon is moved through an ecosystem and explain the importance of decomposers. B2 – make predictions about how changes in the ecosystem will affect the carbon cycle. B3 - explain ways in which decay can be prevented.		Lesson 5 - Decomposers and carbon








Plants and reproduction				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Classification and biodiversity	Band 1: Interpret scientific organism names Band 2: Describe how organisms are classified Band 3: Explain the importance of biodiversity	Outcomes, questioning, tasks and worksheets in all lessons.	
2	Types of reproduction	Band 1: Recall the difference between sexual and asexual reproduction Band 2: Recall examples of asexual reproduction in plants Band 3: Explain characteristics of offspring produced by sexual and asexual reproduction		
3	Pollination	Band 1: Describe how pollination leads to fertilisation Band 2: Explain how the structures of flowers and pollen allow pollination, by animals or wind Band 3: Explain how plants ensure cross-pollination		
4	Fertilisation and dispersal	Band 1: Identify parts of a plant, including the male and female reproductive organs Band 2: Describe the formation of seeds and fruits Band 3: Explain the functions of seeds and fruits		
5	Germination and growth	Band 1: Describe what happens in germination Band 2: Explain why seeds and plants need certain resources Band 3: Describe how organisms are interdependent		



Breathing and respiration				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Aerobic respiration		Outcomes, questioning, tasks and worksheets in all lessons.	 8Ca-Aerobic-respiration-RAP.pptx
2	Gas exchange systems			 8Cb-Gaseous-exchange-RAP.pptx
3	Getting oxygen			 8Cc-Getting-oxygen-RAP.pptx
4	Comparing gas exchange			 8Cd-Comparing-gaseous-exchange-RAP.pptx
5	Anaerobic respiration			 8Ce-Anaerobic-respiration-RAP.pptx



Food and nutrition				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Nutrients	B1: Recall the nutrients we need in our diets B2: Interpret nutrition information labels B3: Explain the tests used to detect some nutrients	Outcomes, questioning, tasks and worksheets in all lessons.	 Nutrients.pptx
2	Uses of nutrients	B1: Recall good sources of different nutrients B2: Describe how factors change the amount of energy we need B3: Explain what each nutrient does in the body		 Uses-of-Nutrients.pptx
3	Balanced diets	B1: Define a balanced diet using the 'eat well plate' B2: Describe the benefits of a balanced diet B3: Explain how different types of malnutrition are caused and their effects		 Balanced-Diets.pptx
4	Digestion	B1: Describe the main parts of the digestive system including enzymes B2: Describe the functions of the main parts of the digestive system and identify enzymes as biological catalysts B3: Explain why enzymes and bacteria are useful for digestion		 Digestion.pptx
5	Absorption	B1: Describe diffusion in the small intestine B2: Explain how diffusion enables absorption by the small intestine B3: Explain how the small intestine is adapted to its function		 Absorption.pptx

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Plant Growth				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Reactions in plants		Outcomes, questioning, tasks and worksheets in all lessons.	
2	Plant adaptations			
3	Plant products			
4	Growing crops			



Genetics and evolution				
Lesson	Key concepts	Learning outcomes	Differentiation	Resource
1	Variation (inherited and environmental)	B1 – Define variation B2 – Identify inherited and environmental variation factors B3 – Explain how variation may occur	Outcomes, questioning, tasks and worksheets in all lessons.	
2	DNA	B1 - Outline how the structure of DNA was discovered B2 - Explain the importance of DNA B3 - Describe the relationship between chromosomes, DNA, genes, genetic information and nuclei		
3	Genes and extinction	B1 - Describe how organisms become endangered or extinct B2 - Explain how adaptations affect the survival of organism B3 - Explain some ways of preserving biodiversity		
4	Natural selection	B1 - Recall that individuals in a population vary genetically B2 - Explain how natural selection works on these variations B3 - Explain natural selection and evolution		