

Level	Obj No	B1 Cell structure and transport	Started (/) Completed	Level Achieved
		1.1 Microscopes		
Grade 4	1	Use a light microscope.		1 2 3 4 5 6 7 8
	2	State why microscopes are useful in the study of cell biology.		1 2 3 4 5 6 7 8
	3	Calculate total magnification.		1 2 3 4 5 6 7 8
Grade 6	4	Compare and contrast the magnification and resolution obtained by using light and electron microscopes.		1 2 3 4 5 6 7 8
	5	Justify the use of an electron microscope.		1 2 3 4 5 6 7 8
	6	Rearrange the magnification formula and measure the size of cells.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast the magnification and resolution obtained by using light and electron microscopes.		1 2 3 4 5 6 7 8
	8	Justify the use of an electron microscope.		1 2 3 4 5 6 7 8
	9	Rearrange the magnification formula and measure the size of cells.		1 2 3 4 5 6 7 8

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		1.10 Exchanging Materials		
Grade 4	1	Define active transport as the movement of a substance against a concentration gradient using energy.		1 2 3 4 5 6 7 8
	2	Identify where active transport takes place.		1 2 3 4 5 6 7 8
	3	Use a representational model to show active transport.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how the effectiveness of exchange surfaces is increased.		1 2 3 4 5 6 7 8
	5	Use ideas about surface area to volume ratio to describe why multicellular organisms need exchange surfaces.		1 2 3 4 5 6 7 8
	6	Calculate the surface area to volume ratio of a cylinder.		1 2 3 4 5 6 7 8
Grade 8	7	Link ideas about diffusion to explain how the adaptations of exchange surfaces increase their effectiveness.		1 2 3 4 5 6 7 8
	8	Use ideas about surface area to explain the shape of a leaf.		1 2 3 4 5 6 7 8
	9	Calculate the surface area to volume ratio of a sphere.		1 2 3 4 5 6 7 8

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		1.2 Plant and Animal Cells		
Grade 4	1	Identify a plant and an animal cell from a diagram.		1 2 3 4 5 6 7 8
	2	Name the main parts of cells.		1 2 3 4 5 6 7 8
	3	Prepare a microscope slide.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the functions of the parts of cells.		1 2 3 4 5 6 7 8
	5	Compare plant and animal cells.		1 2 3 4 5 6 7 8
	6	Use a microscope to study plant and algal cells.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how the main structures of cells are related to their functions.		1 2 3 4 5 6 7 8
	8	Suggest reasons why some cells do not contain all cell structures.		1 2 3 4 5 6 7 8
	9	Compare the sizes of cells using units of length and standard form.		1 2 3 4 5 6 7 8

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		1.3 Prokaryotic and Eukaryotic Cells		
Grade 4	1	Identify structures in prokaryotic cells.		1 2 3 4 5 6 7 8
	2	State that prokaryotic cells do not contain a nucleus and eukaryotic cells do.		1 2 3 4 5 6 7 8
	3	Use orders of magnitude to correctly order objects according to size.		1 2 3 4 5 6 7 8
Grade 6	4	Compare prokaryotic and eukaryotic cells.		1 2 3 4 5 6 7 8
	5	Describe the functions of the parts of a prokaryotic cell.		1 2 3 4 5 6 7 8
	6	Use orders of magnitude to compare the sizes of organisms.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how the main structures of prokaryotic cells are related to their functions.		1 2 3 4 5 6 7 8
	8	Perform calculations to work out orders of magnitude.		1 2 3 4 5 6 7 8

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		1.4 Specialised Cells Animals		
Grade 4	1	Identify specialised animal cells from diagrams.		1 2 3 4 5 6 7 8
	2	Describe the function of specialised animal cells.		1 2 3 4 5 6 7 8
	3	Write a basic explanation of how animal cells are adapted.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why animals have specialised cells.		1 2 3 4 5 6 7 8
	5	Compare the structure of a specialised and a generalised animal cell.		1 2 3 4 5 6 7 8
	6	Write a coherent explanation of how animal cells are adapted.		1 2 3 4 5 6 7 8
Grade 8	7	Discuss how the structure of specialised animal cells is related to their function within an organ and the whole organism.		1 2 3 4 5 6 7 8
	8	Suggest the function of an unknown specialised cell based on its structure.		1 2 3 4 5 6 7 8
	9	Write an effectively structured explanation of how animal cells are adapted.		1 2 3 4 5 6 7 8

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		1.5 Specialised Cells Plants		
Grade 4	1	Identify specialised plant cells from diagrams.		1 2 3 4 5 6 7 8
	2	Describe the function of specialised plant cells.		1 2 3 4 5 6 7 8
	3	Use a light microscope to view a root hair cell.		1 2 3 4 5 6 7 8
Grade 6	4	Compare the structure of a specialised and a generalised plant cell.		1 2 3 4 5 6 7 8
	5	Describe the adaptations of specialised plant cells.		1 2 3 4 5 6 7 8
	6	Draw a scientific drawing of a root hair cell observed using a light microscope		1 2 3 4 5 6 7 8
Grade 8	7	Discuss how the structure of specialised plant cells is related to their function within an organ and the whole organism.		1 2 3 4 5 6 7 8
	8	Design a cell, tissue, or organ to perform a certain function.		1 2 3 4 5 6 7 8
	9	Measure a root hair cell observed using a light microscope.		1 2 3 4 5 6 7 8

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		1.6 Difussion		
Grade 4	1	State that diffusion is the spreading of the particles of any substance in solution, or particles of a gas.		1 2 3 4 5 6 7 8
	2	List the factors that affect the rate of diffusion.		1 2 3 4 5 6 7 8
	3	Write a simple hypothesis.		1 2 3 4 5 6 7 8
Grade 6	4	Predict which way substances will move across a cell membrane.		1 2 3 4 5 6 7 8
	5	Explain why surface area affects the rate of diffusion.		1 2 3 4 5 6 7 8
	6	Write a hypothesis using scientific knowledge.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how temperature and concentration gradient affect the rate of diffusion.		1 2 3 4 5 6 7 8
	8	Write a hypothesis using detailed scientific knowledge and explain how it could be tested.		1 2 3 4 5 6 7 8

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		1.7 Osmosis		
Grade 4	1	Describe what osmosis is.		1 2 3 4 5 6 7 8
	2	State that if animal cells lose or gain too much water by osmosis they can stop working properly.		1 2 3 4 5 6 7 8
Grade 6	3	State the differences between osmosis and diffusion.		1 2 3 4 5 6 7 8
	4	Use ideas about osmosis to explain why maintaining constant internal conditions in living organisms is important.		1 2 3 4 5 6 7 8
	5	Write a prediction using scientific knowledge of osmosis.		1 2 3 4 5 6 7 8
Grade 8	6	Explain how a model shows osmosis in a cell.		1 2 3 4 5 6 7 8
	7	Use the terms isotonic, hypotonic, or hypertonic to explain the movement of water across a cell membrane.		1 2 3 4 5 6 7 8

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		1.8 Osmosis in Plants		
Grade 4	1	State that if a plant loses too much water from its cells then they become soft.		1 2 3 4 5 6 7 8
	2	Write a simple method with support.		1 2 3 4 5 6 7 8
	3	Use given data to plot a suitable graph with some support.		1 2 3 4 5 6 7 8
Grade 6	4	Use osmosis to explain the effect of placing plant tissue in salt or sugar solutions.		1 2 3 4 5 6 7 8
	5	Write a suitable plan to investigate the effect of salt or sugar solutions on plant tissue.		1 2 3 4 5 6 7 8
	6	Calculate percentage change and use this to plot a line graph with negative numbers and draw a line of best fit.		1 2 3 4 5 6 7 8
Grade 8	7	Explain the mechanisms that lead to turgid or flaccid plant cells and plasmolysis.		1 2 3 4 5 6 7 8
	8	Write a detailed plan for an investigation independently.		1 2 3 4 5 6 7 8
	9	Use a line graph to estimate the concentration of solution inside a plant		1 2 3 4 5 6 7 8

Level	Obj No	B1 Cell structure and transport	Started (/) Completed	Level Achieved
		1.9 Active Transport		
Grade 4	1	Define active transport as the movement of a substance against a concentration gradient using energy.		1 2 3 4 5 6 7 8
	2	Identify where active transport takes place.		1 2 3 4 5 6 7 8
	3	Use a representational model to show active transport.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why active transport is important for living organisms.		1 2 3 4 5 6 7 8
	5	Explain the differences between diffusion, osmosis, and active transport.		1 2 3 4 5 6 7 8
	6	Suggest some limitations of/improvements to a representational model that shows active transport.		1 2 3 4 5 6 7 8
Grade 8	7	Describe how active transport takes place.		1 2 3 4 5 6 7 8
	8	Suggest how a cell that carries out active transport is adapted to this function.		1 2 3 4 5 6 7 8
	9	Design and evaluate a representational model to show active transport.		1 2 3 4 5 6 7 8

Level	Obj No	B2 Cell division	Started (/) Completed	Level Achieved
		2.1 Cell Division		
Grade 4	1	State that human body cells have 46 chromosomes and gametes have 23.		1 2 3 4 5 6 7 8
	2	State that mitosis is a stage in cell division.		1 2 3 4 5 6 7 8
	3	State the meaning of most of the key words – mitosis, chromosomes, gene, gametes.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why chromosomes in body cells are normally found in pairs.		1 2 3 4 5 6 7 8
	5	Describe situations where mitosis is occurring.		1 2 3 4 5 6 7 8
	6	Use the key words to describe the process of mitosis.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why genetic material must be doubled during mitosis.		1 2 3 4 5 6 7 8
	8	Explain in detail what happens at each stage of the cell cycle.		1 2 3 4 5 6 7 8
	9	Use the key words to write detailed explanations of why mitosis is an important process in living things and how characteristics are inherited.		1 2 3 4 5 6 7 8

Level	Obj No	B2 Cell division	Started (/) Completed	Level Achieved
		2.2 Frowth and differentiation		
Grade 4	1	Define the terms growth and differentiation.		1 2 3 4 5 6 7 8
	2	State why plant clones are genetically identical to each other.		1 2 3 4 5 6 7 8
	3	Attempt to clone a plant by using apparatus correctly.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the importance of cell differentiation in multicellular organisms.		1 2 3 4 5 6 7 8
	5	Explain how using tissue culture creates a clone of a plant.		1 2 3 4 5 6 7 8
	6	Attempt to clone a plant by using apparatus correctly and following safety rules.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast differentiation in plants and animals.		1 2 3 4 5 6 7 8
	8	Explain why it is easier to clone a plant than an animal.		1 2 3 4 5 6 7 8
	9	Explain and carry out a practical accurately and safely in order to successfully clone a plant.		1 2 3 4 5 6 7 8

Level	Obj No	B2 Cell division	Started (/) Completed	Level Achieved
		2.3 Stem cells		
Grade 4	1	State that a stem cell is a cell that is not differentiated.		1 2 3 4 5 6 7 8
	2	State that plant stem cells can be used to create clones.		1 2 3 4 5 6 7 8
	3	State ways in which stem cells can be used to treat medical conditions.		1 2 3 4 5 6 7 8
Grade 6	4	Describe differences between embryonic and adult stem cells.		1 2 3 4 5 6 7 8
	5	Explain why plant clones are produced in agriculture.		1 2 3 4 5 6 7 8
	6	Describe how stem cells can be used to treat medical conditions.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why embryonic stem cells are particularly useful for treating medical conditions.		1 2 3 4 5 6 7 8
	8	Explain how stem cells can be used to treat medical conditions.		1 2 3 4 5 6 7 8

Level	Obj No	B2 Cell division	Started (/) Completed	Level Achieved
		2.4 Stem cell dilemma		
Grade 4	1	List some arguments for and against the use of stem cells.		1 2 3 4 5 6 7 8
	2	Verbally communicate simple ideas during a group discussion.		1 2 3 4 5 6 7 8
Grade 6	3	Explain the reasons for ethical and religious objections to use of stem cells in medicine.		1 2 3 4 5 6 7 8
	4	Verbally communicate well-constructed arguments.		1 2 3 4 5 6 7 8
Grade 8	5	Explain the process of therapeutic cloning.		1 2 3 4 5 6 7 8
	6	Evaluate the use of stem cells in medicine.		1 2 3 4 5 6 7 8
	7	Clearly communicate strong, well-researched arguments in a persuasive manner.		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.1 Organisation and the digestive system		
Grade 4	1	State examples of cells, tissues, organs, and organ systems.		1 2 3 4 5 6 7 8
	2	Name organs found in a given organ system		1 2 3 4 5 6 7 8
	3	Order cells, tissues, organs, and organ systems according to their relative sizes.		1 2 3 4 5 6 7 8
Grade 6	4	Define the terms tissue, organ, and organ system.		1 2 3 4 5 6 7 8
	5	Describe the function of certain organs and organ systems.		1 2 3 4 5 6 7 8
	6	Identify tissues that make up organs.		1 2 3 4 5 6 7 8
Grade 8	7	Relate levels of organisation to familiar organ systems in order to give examples of cells, tissues, and organs.		1 2 3 4 5 6 7 8
	8	Explain why the cells of multicellular organisms are organised into tissues, organs, and organ systems.		1 2 3 4 5 6 7 8
	9	Suggest the function of glandular, epithelial, and muscular tissue in organs.		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.2 The human digestive system		
Grade 4	1	Identify some of the organs of the digestive system.		1 2 3 4 5 6 7 8
	2	State the function of some of the organs of the digestive system.		1 2 3 4 5 6 7 8
	3	State simply what happens to food during digestion.		1 2 3 4 5 6 7 8
Grade 6	4	Name all of the organs of the digestive system.		1 2 3 4 5 6 7 8
	5	Describe the functions of the organs of the digestive system.		1 2 3 4 5 6 7 8
	6	Summarise the process of digestion.		1 2 3 4 5 6 7 8
Grade 8	7	Link the process of digestion to other processes in the body in order to explain its function.		1 2 3 4 5 6 7 8
	8	Explain in detail how the small intestine is adapted to its function.		1 2 3 4 5 6 7 8
	9	Explain in detail what happens to food during digestion.		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.3 The chemistry of food		
Grade 4	1	Recall that food contains the molecules carbohydrates, lipids (fats), and proteins.		1 2 3 4 5 6 7 8
	2	State the function of each food molecule in the diet.		1 2 3 4 5 6 7 8
	3	Carry out a food test and record results in a table.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the structure of simple sugars, starch, lipids, and proteins.		1 2 3 4 5 6 7 8
	5	Carry out multiple food tests in an organised manner.		1 2 3 4 5 6 7 8
	6	Design a results table to clearly record results from food tests.		1 2 3 4 5 6 7 8
Grade 8	7	Explain which food molecules are polymers.		1 2 3 4 5 6 7 8
	8	Apply knowledge of the function of food molecules in the body to give diet advice.		1 2 3 4 5 6 7 8
	9	Suggest what a food contains using results from food tests, evaluating the observed data collected		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.4 Catalysts and enzymes		
Grade 4	1	Recall that enzymes are proteins that are biological catalysts.		1 2 3 4 5 6 7 8
	2	State one function of enzymes inside the body.		1 2 3 4 5 6 7 8
	3	State the independent variable in a given investigation.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how enzymes are used in digestion.		1 2 3 4 5 6 7 8
	5	Use the lock and key theory to explain why the shape of an enzyme is vital for it to function.		1 2 3 4 5 6 7 8
	6	Identify the key variables in a given investigation.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how enzymes speed up reactions.		1 2 3 4 5 6 7 8
	8	Explain how enzymes control metabolism.		1 2 3 4 5 6 7 8
	9	Plan an experiment to investigate how different catalysts affect the rate of a reaction.		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.5 Factors affecting enzyme action		
Grade 4	1	State that temperature and pH affect how well an enzyme works.		1 2 3 4 5 6 7 8
	2	Plot a line graph.		1 2 3 4 5 6 7 8
	3	State simply what a line graph shows about how temperature or pH affects the rate of an enzyme-catalysed		1 2 3 4 5 6 7 8
Grade 6	4	Explain why high temperatures and changes in pH prevent enzymes from catalysing reactions.		1 2 3 4 5 6 7 8
	5	Draw a tangent to a line and calculate the rate of a reaction with guidance.		1 2 3 4 5 6 7 8
	6	Plot a line graph and use it to draw conclusions about how temperature and pH affect the rate of an enzyme-catalysed reaction.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how a change in temperature or pH affects the rate of an enzyme-catalysed reaction.		1 2 3 4 5 6 7 8
	8	Apply knowledge of enzymes to explain how some organisms can survive in extreme conditions.		1 2 3 4 5 6 7 8
	9	Draw tangents in order to calculate the rate of a reaction.		1 2 3 4 5 6 7 8

Level	Obj No	B3 Organisation and the digestive system	Started (/) Completed	Level Achieved
		3.6 How the digestive system works		
Grade 4	1	State that enzymes are used in digestion to break down food molecules.		1 2 3 4 5 6 7 8
	2	Identify that carbohydrases break down carbohydrates, proteases break down proteins, and lipases break down lipids.		1 2 3 4 5 6 7 8
	3	Plan a simple method to carry out an investigation.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why enzymes are needed for digestion.		1 2 3 4 5 6 7 8
	5	For each food molecule, name the enzyme that acts on it, where it is produced, and which products are formed.		1 2 3 4 5 6 7 8
	6	Plan and carry out an investigation in order to gather accurate results.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest how to test for substrates and products in a model gut.		1 2 3 4 5 6 7 8
	8	Make a prediction with a clearly structured scientific explanation.		1 2 3 4 5 6 7 8
	9	Analyse results in order to evaluate a method and the validity of conclusions, explaining suggestions for possible improvements.		1 2 3 4 5 6 7 8

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		3.7 Making digestion efficient		
Grade 4	1	State that the stomach contains acid.		1 2 3 4 5 6 7 8
	2	State that the liver produces bile.		1 2 3 4 5 6 7 8
	3	Write a simple hypothesis and prediction.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the functions of bile.		1 2 3 4 5 6 7 8
	5	Calculate the mean rate of an enzyme-catalysed reaction.		1 2 3 4 5 6 7 8
	6	Analyse data in order to determine whether a hypothesis is correct.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how acid in the stomach increases the efficiency of pepsin.		1 2 3 4 5 6 7 8
	8	Explain how bile increases the efficiency of fat digestion.		1 2 3 4 5 6 7 8
	9	Explain how the rate of an enzyme-catalysed reaction shows how efficient the reaction is.		1 2 3 4 5 6 7 8

Level	Obj No	B4 Organising animals and plants	Started (/) Completed	Level Achieved
		4.1 Organising animals and plants		
Grade 4	1	State the main components in blood.		1 2 3 4 5 6 7 8
	2	Recognise the components of blood from photomicrographs.		1 2 3 4 5 6 7 8
	3	Describe the function of each component in blood.		1 2 3 4 5 6 7 8
Grade 6	4	Summarise the process of blood clotting.		1 2 3 4 5 6 7 8
	5	View blood under a light microscope and recognise components.		1 2 3 4 5 6 7 8
	6	Explain how red blood cells are adapted to their function.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest how white blood cells are adapted to their function.		1 2 3 4 5 6 7 8
	8	Estimate the diameter of a red blood cell and comment on its uncertainty.		1 2 3 4 5 6 7 8
	9	Evaluate in detail a model of the blood.		1 2 3 4 5 6 7 8

Level	Obj No	B4 Organising animals and plants	Started (/) Completed	Level Achieved
		4.2 The blood vessels		
Grade 4	1	State the three main types of blood vessel and recognise them from diagrams.		1 2 3 4 5 6 7 8
	2	Estimate heart rate		1 2 3 4 5 6 7 8
Grade 6	3	Explain how the structure of blood vessels relates to their function.		1 2 3 4 5 6 7 8
	4	Comment on how accurate estimations are.		1 2 3 4 5 6 7 8
Grade 8	5	Explain in detail the importance of a double circulatory system.		1 2 3 4 5 6 7 8
	6	Explain how to make estimates more accurate in terms of precision of data.		1 2 3 4 5 6 7 8

Level	Obj No	B4 Organising animals and plants	Started (/) Completed	Level Achieved
		4.3 The heart		
Grade 4	1	Describe the function of the heart.		1 2 3 4 5 6 7 8
	2	State the main structures of the human heart.		1 2 3 4 5 6 7 8
	3	List examples of problems that can develop in blood vessels in the human heart.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the function of the main structures of the human heart.		1 2 3 4 5 6 7 8
	5	Describe the problems that can develop in blood vessels in the human heart, and their treatments.		1 2 3 4 5 6 7 8
	6	Suggest advantages and disadvantages of using stents and statins.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how the structure of the different parts of the human heart is related to their function.		1 2 3 4 5 6 7 8
	8	Recognise the main structures of the heart when carrying out a heart dissection.		1 2 3 4 5 6 7 8
	9	Evaluate the use of stents and statins in treating problems with blood vessels.		1 2 3 4 5 6 7 8

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		4.4 Helping the heart		
Grade 4	1	State that the heartbeat is maintained by a group of cells that acts as a pacemaker.		1 2 3 4 5 6 7 8
	2	Give some ways in which the heart can stop functioning efficiently.		1 2 3 4 5 6 7 8
	3	Describe why a person may need an artificial pacemaker or an artificial heart.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why an irregular heartbeat is detrimental to health.		1 2 3 4 5 6 7 8
	5	Describe why people may have objections to heart transplants.		1 2 3 4 5 6 7 8
	6	Summarise the advantages and disadvantages of different treatments for heart problems.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how a natural pacemaker maintains the heartbeat.		1 2 3 4 5 6 7 8
	8	Suggest how an artificial pacemaker regulates an irregular heartbeat.		1 2 3 4 5 6 7 8
	9	Evaluate in detail the different methods used in the treatment of heart problems.		1 2 3 4 5 6 7 8

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		4.5 Breathing and gas exchange		
Grade 4	1	List the main structures of the gas exchange system.		1 2 3 4 5 6 7 8
	2	State that gas exchange happens in the alveoli.		1 2 3 4 5 6 7 8
	3	Use data in the form of percentages to describe the differences between the composition of inhaled and exhaled air.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the function of the main structures of the gas exchange system.		1 2 3 4 5 6 7 8
	5	Describe how alveoli are adapted for gas exchange.		1 2 3 4 5 6 7 8
	6	Describe the processes of ventilation and gas exchange.		1 2 3 4 5 6 7 8
Grade 8	7	Evaluate in detail a model of the lungs.		1 2 3 4 5 6 7 8
	8	Explain in detail how the adaptations of alveoli result in efficient gas exchange.		1 2 3 4 5 6 7 8
	9	Explain the differences between the composition of inhaled and exhaled air.		1 2 3 4 5 6 7 8

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		4.6 Tissues and organs in plants		
Grade 4	1	Recognise examples of plant organs and state their functions.		1 2 3 4 5 6 7 8
	2	Use a light microscope to view a cross-section of a leaf.		1 2 3 4 5 6 7 8
	3	State the functions of different plant tissues.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how plant organs are involved in the transport system.		1 2 3 4 5 6 7 8
	5	Use a microscope to identify the different tissues in a cross-section of a leaf.		1 2 3 4 5 6 7 8
	6	Explain how the structures of tissues in the leaf are related to their functions.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest what type of plant organs unfamiliar structures are.		1 2 3 4 5 6 7 8
	8	Use a light microscope to draw a cross-section of a leaf and calculate scale.		1 2 3 4 5 6 7 8
	9	Suggest functions for unknown plant tissues.		1 2 3 4 5 6 7 8

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		4.7 Transport system in plants		
Grade 4	1	Describe the function of xylem and phloem tissue.		1 2 3 4 5 6 7 8
	2	Describe evidence for movement of water through xylem.		1 2 3 4 5 6 7 8
Grade 6	3	Describe why transport in plants is important.		1 2 3 4 5 6 7 8
	4	Explain how the structure of xylem and phloem is adapted to their functions.		1 2 3 4 5 6 7 8
Grade 8	5	Explain in detail how the rate of transport through a plant can be measured.		1 2 3 4 5 6 7 8

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		4.8 Evaporation and transpiration		
Grade 4	1	State that transpiration is the evaporation of water vapour from the leaves.		1 2 3 4 5 6 7 8
	2	State the function of stomata.		1 2 3 4 5 6 7 8
	3	Calculate the mean number of stomata on a given area of leaf.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how transpiration maintains the movement of water from roots to leaves.		1 2 3 4 5 6 7 8
	5	Describe how the opening and closing of stomata is controlled by guard cells.		1 2 3 4 5 6 7 8
	6	Use sampling to estimate the number of stomata on a leaf.		1 2 3 4 5 6 7 8
Grade 8	7	Evaluate drinking from a straw as a model for transpiration.		1 2 3 4 5 6 7 8
	8	Explain in detail how stomata control transpiration.		1 2 3 4 5 6 7 8
	9	Suggest reasons for differences in the number and distribution of stomata, as well as their adaptations.		1 2 3 4 5 6 7 8

Level	Obj No	B4 Organising animals and plants	Started (/) Completed	Level Achieved
		4.9 Factors affecting transpiration		
Grade 4	1	Recognise the factors that affect transpiration.		1 2 3 4 5 6 7 8
	2	Describe how a potometer can be used to estimate the volume of water lost by a plant.		1 2 3 4 5 6 7 8
	3	Identify control variables when investigating rate of transpiration.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why temperature, humidity, light intensity, and amount of air flow affect the rate of transpiration.		1 2 3 4 5 6 7 8
	5	Describe the differences between a moving bubble potometer and a mass potometer.		1 2 3 4 5 6 7 8
	6	Make a prediction using scientific knowledge when investigating rate of transpiration.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why temperature, humidity, light intensity, and amount of air flow affect the rate of transpiration.		1 2 3 4 5 6 7 8
	8	Describe the differences between a moving bubble potometer and a mass potometer. Make a prediction using scientific knowledge when investigating rate of transpiration.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.1 Health and diseases		
Grade 4	1	Describe health as a state of physical and mental wellbeing.		1 2 3 4 5 6 7 8
	2	State some causes of ill health.		1 2 3 4 5 6 7 8
	3	Draw a simple conclusion from data on health.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the difference between communicable and non-communicable diseases.		1 2 3 4 5 6 7 8
	5	Use a scatter diagram to identify a correlation between two variables.		1 2 3 4 5 6 7 8
	6	Construct and interpret bar charts, frequency tables, frequency diagrams, and histograms.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest how communicable diseases are spread.		1 2 3 4 5 6 7 8
	8	Suggest links between lifestyle and health.		1 2 3 4 5 6 7 8
	9	Discuss the validity of a statement based on evidence in the form of data.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.10 More about plant diseases		
Grade 4	1	Describe some signs of plant disease.		1 2 3 4 5 6 7 8
	2	Name organisms that can cause disease in plants.		1 2 3 4 5 6 7 8
	3	State that plants can be damaged by ion deficiency.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how a plant disease is detected, and the methods used to identify the cause.		1 2 3 4 5 6 7 8
	5	Explain how disease damages a plant.		1 2 3 4 5 6 7 8
	6	Match signs of plant disease to ion deficiency.		1 2 3 4 5 6 7 8
Grade 8	7	Analyse data on plant growth to write conclusions using scientific knowledge.		1 2 3 4 5 6 7 8
	8	Suggest how plant diseases affect food security.		1 2 3 4 5 6 7 8
	9	Explain in detail how and why ion deficiencies affect plant growth.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.11 Plant defence response		
Grade 4	1	State examples of plant defence responses.		1 2 3 4 5 6 7 8
	2	Describe why plants need to defend themselves.		1 2 3 4 5 6 7 8
Grade 6	3	Classify plant defences as physical, chemical, or mechanical.		1 2 3 4 5 6 7 8
	4	Carry out research using secondary resources of own choice to present examples of plant defence responses.		1 2 3 4 5 6 7 8
Grade 8	5	Explain in detail how plant defence responses work.		1 2 3 4 5 6 7 8
	6	Interpret information from a scientific article to explain how plant-to-plant communication can be used as a form of defence.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.2 Pathogens and disease		
Grade 4	1	State that pathogens are microorganisms that cause disease.		1 2 3 4 5 6 7 8
	2	Describe ways in which pathogens can be spread.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how bacteria and viruses cause disease.		1 2 3 4 5 6 7 8
	4	Explain why communicable diseases spread rapidly following a natural disaster.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why viruses are always pathogens, but not all bacteria are.		1 2 3 4 5 6 7 8
	6	Explain how pathogens are passed from one organism to another, and use this to suggest ways of preventing the spread.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.3 Growing bacteria in the lab		
Grade 4	1	State that bacteria reproduce by cell division and this is called binary fission.		1 2 3 4 5 6 7 8
	2	Prepare a bacterial culture on agar gel.		1 2 3 4 5 6 7 8
	3	Follow the rules needed to prepare an uncontaminated culture.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why numbers of bacteria on an agar plate will eventually stop growing.		1 2 3 4 5 6 7 8
	5	Explain why it is important to use an uncontaminated culture to investigate bacterial growth.		1 2 3 4 5 6 7 8
	6	Describe and explain why each safety rule is needed in order to safely prepare, incubate, and dispose of a culture.		1 2 3 4 5 6 7 8
Grade 8	7	Explain what is meant by exponential growth and analyse a graph showing it.		1 2 3 4 5 6 7 8
	8	Suggest how to measure the growth of bacteria and discuss uncertainty.		1 2 3 4 5 6 7 8
	9	Plan a detailed investigation to find out how a variable affects the growth of bacteria.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.4 Preventing bacterial growth		
Grade 4	1	Describe the difference between antiseptics, disinfectants, and antibiotics.		1 2 3 4 5 6 7 8
	2	Write a prediction.		1 2 3 4 5 6 7 8
	3	Measure the diameter of clear areas around colonies.		1 2 3 4 5 6 7 8
Grade 6	4	Explain when an antiseptic, a disinfectant, and an antibiotic would be used.		1 2 3 4 5 6 7 8
	5	Calculate the number of bacteria in a population after a certain time if given the mean division time.		1 2 3 4 5 6 7 8
	6	Calculate the area of the clear areas around colonies using πr^2 .		1 2 3 4 5 6 7 8
Grade 8	7	Write a prediction using detailed scientific knowledge.		1 2 3 4 5 6 7 8
	8	Calculate the number of bacteria in a sample when using a counting chamber.		1 2 3 4 5 6 7 8
	9	Apply knowledge of sampling techniques to ensure samples are representative.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.5 Preventing infections		
Grade 4	1	List some ways in which communicable diseases are spread.		1 2 3 4 5 6 7 8
	2	Take a role in designing a form of communication to inform the public about how to prevent the spread of a disease.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how the spread of diseases can be reduced or prevented.		1 2 3 4 5 6 7 8
	4	Communicate to the public about how to stop the spread of a disease.		1 2 3 4 5 6 7 8
Grade 8	5	Use scientific knowledge to explain in detail how different methods reduce or prevent the spread of disease.		1 2 3 4 5 6 7 8
	6	Use an example to explain how scientific method has been applied to help prevent the spread of disease		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.6 Viral diseases		
Grade 4	1	Name some diseases that are caused by viruses.		1 2 3 4 5 6 7 8
	2	Describe how measles and HIV are spread.		1 2 3 4 5 6 7 8
	3	Summarise information in a table.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how measles, HIV, and tobacco mosaic virus affect the infected organism.		1 2 3 4 5 6 7 8
	5	Interpret data to describe how the number of people infected with measles in the UK has changed over time.		1 2 3 4 5 6 7 8
	6	Design a table and use it to summarise information.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how measles, HIV, and tobacco mosaic virus affect the infected organism.		1 2 3 4 5 6 7 8
	8	Explain why viral infections are often more difficult to prevent and treat than bacterial infections.		1 2 3 4 5 6 7 8
	9	Write a persuasive letter to parents urging them to vaccinate their children against measles.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.7 Bacterial diseases		
Grade 4	1	Name some diseases that are caused by bacteria.		1 2 3 4 5 6 7 8
	2	Describe how salmonella and gonorrhoea are spread.		1 2 3 4 5 6 7 8
Grade 6	3	Describe similarities and differences between salmonella and gonorrhoea.		1 2 3 4 5 6 7 8
	4	Describe how the spread of salmonella and gonorrhoea is controlled.		1 2 3 4 5 6 7 8
Grade 8	5	Suggest why more people die from viral diseases than from bacterial diseases.		1 2 3 4 5 6 7 8
	6	Explain in detail how methods to control the spread of salmonella and gonorrhoea work.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.8 Diseases caused by fungi and protists		
Grade 4	1	State that rose black spot is caused by fungi and malaria is caused by protists.		1 2 3 4 5 6 7 8
	2	Use a diagram to describe the life cycle of the malaria protist.		1 2 3 4 5 6 7 8
	3	State some ways in which malaria is controlled.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how rose black spot affects the plant and how it is treated.		1 2 3 4 5 6 7 8
	5	Link ways of controlling the spread of malaria to specific parts of the protist's life cycle.		1 2 3 4 5 6 7 8
Grade 8	6	Explain how rose black spot affects the growth of a plant.		1 2 3 4 5 6 7 8
	7	Explain why it is so expensive to stop the spread of malaria.		1 2 3 4 5 6 7 8

Level	Obj No	B5 Communicable disease	Started (/) Completed	Level Achieved
		5.9 Human defence response		
Grade 4	1	Describe some ways in which the human body defends itself against the entry of pathogens.		1 2 3 4 5 6 7 8
	2	State that white blood cells help defend the body against pathogens.		1 2 3 4 5 6 7 8
	3	Show how one part of a model is similar to real life.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how human body defence mechanisms stop the entry of pathogens.		1 2 3 4 5 6 7 8
	5	Describe the role of white blood cells in the defence against disease.		1 2 3 4 5 6 7 8
	6	Use a model to explain how the body defends itself against disease.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how a reduced or overactive immune system can cause illness.		1 2 3 4 5 6 7 8
	8	Explain in detail how antibody production fights pathogens.		1 2 3 4 5 6 7 8
	9	Evaluate an analogy of the human defence systems against disease.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.1 Vaccination		
Grade 4	1	Describe why people are vaccinated.		1 2 3 4 5 6 7 8
	2	State that vaccines contain dead or inactive forms of a pathogen.		1 2 3 4 5 6 7 8
Grade 6	3	Explain how vaccination works.		1 2 3 4 5 6 7 8
	4	Describe what an antibody and an antigen are.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why, if a large proportion of the population is vaccinated, the spread of the pathogen is reduced.		1 2 3 4 5 6 7 8
	6	Apply ideas about specificity of antibodies.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.2 Antibiotics and painkillers		
Grade 4	1	Describe what an antibiotic is.		1 2 3 4 5 6 7 8
	2	State that viral infections cannot be treated with antibiotics.		1 2 3 4 5 6 7 8
	3	Decide when a painkiller or antibiotic should be used to treat an illness.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how antibiotics work.		1 2 3 4 5 6 7 8
	5	Describe what is meant by antibiotic-resistant bacteria.		1 2 3 4 5 6 7 8
	6	Explain why it is difficult to develop drugs to treat viral infections.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest a reasoned explanation for a pattern in data.		1 2 3 4 5 6 7 8
	8	Explain in detail how antibiotic-resistant bacteria arise.		1 2 3 4 5 6 7 8
	9	Explain why scientists are constantly developing new antibiotics.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.3 Discovering drugs		
Grade 4	1	Name some drugs based on extracts from plants or microorganisms.		1 2 3 4 5 6 7 8
	2	Order the events that led to the development of penicillin.		1 2 3 4 5 6 7 8
	3	Draw a simple conclusion using data.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how antibiotics work.		1 2 3 4 5 6 7 8
	5	Describe what is meant by antibiotic-resistant bacteria.		1 2 3 4 5 6 7 8
	6	Explain why it is difficult to develop drugs to treat viral infections.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest why mould naturally produces antibiotics.		1 2 3 4 5 6 7 8
	8	Discuss how effective herbal remedies are.		1 2 3 4 5 6 7 8
	9	Analyse data to evaluate the effectiveness of new antibiotics and make a reasoned decision on which one to develop further.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.4 Developing drugs		
Grade 4	1	State that new medical drugs have to be tested to check that they are safe and effective.		1 2 3 4 5 6 7 8
	2	Give the procedures used to trial a new drug in the correct order.		1 2 3 4 5 6 7 8
	3	Describe what is meant by a placebo.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why each procedure in drugs testing and trialling is used.		1 2 3 4 5 6 7 8
	5	Describe how a double blind trial is carried out.		1 2 3 4 5 6 7 8
	6	Explain why a placebo is used during drug trialling.		1 2 3 4 5 6 7 8
Grade 8	7	Describe in some detail how new medical drugs are tested and trialled for safety, effectiveness, toxicity, efficacy, and dose.		1 2 3 4 5 6 7 8
	8	Critically analyse the results from a double blind trial.		1 2 3 4 5 6 7 8
	9	Explain why the results of drug trials are published in journals.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.5 Hybridoma cells		
Grade 6	1	Describe what a monoclonal antibody is.		1 2 3 4 5 6 7 8
	2	Outline the procedure used to produce monoclonal antibodies.		1 2 3 4 5 6 7 8
	3	Give some uses of monoclonal antibodies.		1 2 3 4 5 6 7 8
Grade 8	4	Explain why hybridoma cells are used to produce monoclonal antibodies.		1 2 3 4 5 6 7 8
	5	Explain in detail how pregnancy tests work.		1 2 3 4 5 6 7 8
	6	Describe how monoclonal antibodies are used to produce ELISA tests and outline how they are used.		1 2 3 4 5 6 7 8

Level	Obj No	B6 Preventing and treating disease	Started (/) Completed	Level Achieved
		6.6 Monoclonal antibodies		
Grade 6	1	Describe the ways in which monoclonal antibodies can be used to treat cancer.		1 2 3 4 5 6 7 8
	2	Outline the advantages and disadvantages of using monoclonal antibodies.		1 2 3 4 5 6 7 8
Grade 8	3	Explain in detail how the methods of using monoclonal antibodies to treat cancer work.		1 2 3 4 5 6 7 8
	4	Evaluate the use of monoclonal antibodies in treating cancer compared to other treatments.		1 2 3 4 5 6 7 8

Level	Obj No	B7 Non-Communicable Diseases	Started (/) Completed	Level Achieved
		7.1 Non-communicable diseases		
Grade 4	1	Name some non-communicable diseases.		1 2 3 4 5 6 7 8
	2	List some risk factors that are linked to an increased rate of a disease.		1 2 3 4 5 6 7 8
	3	Identify correlations in data.		1 2 3 4 5 6 7 8
Grade 6	4	Classify diseases as communicable or non-communicable.		1 2 3 4 5 6 7 8
	5	Draw conclusions from data on risk factors.		1 2 3 4 5 6 7 8
	6	Decide whether a link is causal.		1 2 3 4 5 6 7 8
Grade 8	7	Describe some impacts of non-communicable diseases.		1 2 3 4 5 6 7 8
	8	Identify risk factors from data.		1 2 3 4 5 6 7 8
	9	Explain why a correlation does not prove a causal mechanism.		1 2 3 4 5 6 7 8

Level	Obj No	B7 Non-Communicable Diseases	Started (/) Completed	Level Achieved
		7.2 Cancer		
Grade 4	1	Define a tumour as a mass of abnormally growing cells.		1 2 3 4 5 6 7 8
	2	State some causes of cancer.		1 2 3 4 5 6 7 8
	3	List some of the benefits and risks of chemotherapy.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the difference between benign and malignant tumours.		1 2 3 4 5 6 7 8
	5	Describe why carcinogens and ionising radiation increase the risk of tumours forming.		1 2 3 4 5 6 7 8
	6	Analyse data to assess the risks and benefits of chemotherapy.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how benign and malignant tumours can be life-threatening.		1 2 3 4 5 6 7 8
	8	Link a lack of control in the cell cycle to tumour formation.		1 2 3 4 5 6 7 8
	9	Evaluate the risks of chemotherapy in relation to data, drug testing, and consequences in order to come to an informed decision.		1 2 3 4 5 6 7 8

Level	Obj No	B7 Non-Communicable Diseases	Started (/) Completed	Level Achieved
		7.3 Smoking and the risk of disease		
Grade 4	1	Name the harmful substances found in tobacco smoke.		1 2 3 4 5 6 7 8
	2	State that smoking increases your risk of developing lung diseases.		1 2 3 4 5 6 7 8
Grade 6	3	Describe the effects of the harmful substances found in tobacco smoke.		1 2 3 4 5 6 7 8
	4	Analyse data to describe evidence for the link between smoking and lung disease.		1 2 3 4 5 6 7 8
Grade 8	5	Explain in detail the effects of the harmful substances found in tobacco smoke.		1 2 3 4 5 6 7 8
	6	Suggest possible causal mechanisms to explain trends shown in data, and explain how the causal link between smoking and lung cancer was identified.		1 2 3 4 5 6 7 8

Level	Obj No	B7 Non-Communicable Diseases	Started (/) Completed	Level Achieved
		7.4 Diet, exercise and disease		
Grade 4	1	Describe some health problems caused by a poor diet and lack of exercise.		1 2 3 4 5 6 7 8
	2	List some ways in which people can avoid becoming overweight.		1 2 3 4 5 6 7 8
Grade 6	3	Describe causal mechanisms for the link between exercise and health.		1 2 3 4 5 6 7 8
	4	Suggest measures to prevent a further rise in the number of people with type 2 diabetes.		1 2 3 4 5 6 7 8
Grade 8	5	Suggest reasons for the correlation between exercise and health, and decide which are causal.		1 2 3 4 5 6 7 8
	6	Explain in detail why eating a poor diet can lead to health problems.		1 2 3 4 5 6 7 8

Level	Obj No	B7 Non-Communicable Diseases	Started (/) Completed	Level Achieved
		7.5 Alcohol and other carcinogens		
Grade 4	1	State that drinking too much alcohol can affect liver and brain function.		1 2 3 4 5 6 7 8
	2	State that alcohol can affect unborn babies.		1 2 3 4 5 6 7 8
	3	Define the term carcinogen.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the short- and long-term effects of drinking alcohol.		1 2 3 4 5 6 7 8
	5	Describe the effects of alcohol on unborn babies.		1 2 3 4 5 6 7 8
	6	Describe the link between ionising radiation and cancer.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how drinking alcohol affects the nervous system.		1 2 3 4 5 6 7 8
	8	Evaluate evidence on the effects of alcohol on a developing baby.		1 2 3 4 5 6 7 8
	9	Explain the link between ionising radiation and cancer.		1 2 3 4 5 6 7 8

Level	Obj No	B8 Photosynthesis	Started (/) Completed	Level Achieved
		8.1 Photosynthesis		
Grade 4	1	Describe how plants get the materials they need for growth.		1 2 3 4 5 6 7 8
	2	State the word equation for photosynthesis.		1 2 3 4 5 6 7 8
	3	Describe why plants need light to carry out photosynthesis.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how the leaf is adapted for photosynthesis.		1 2 3 4 5 6 7 8
	5	Write the balanced symbol equation for photosynthesis.		1 2 3 4 5 6 7 8
	6	Describe an experiment to prove that plants carry out photosynthesis when exposed to light.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how adaptations of the leaf make photosynthesis efficient.		1 2 3 4 5 6 7 8
	8	Explain why photosynthesis is an endothermic reaction.		1 2 3 4 5 6 7 8
	9	Explain why chlorophyll is needed for photosynthesis.		1 2 3 4 5 6 7 8

Level	Obj No	B8 Photosynthesis	Started (/) Completed	Level Achieved
		8.2 The rate of photosynthesis		
Grade 4	1	List the factors that affect the rate of photosynthesis (temperature, carbon dioxide concentration, light intensity, amount of chlorophyll).		1 2 3 4 5 6 7 8
	2	State simply the relationship between these factors and the rate of photosynthesis.		1 2 3 4 5 6 7 8
	3	Plot a line graph and write a simple conclusion.		1 2 3 4 5 6 7 8
Grade 6	4	Describe why low temperature, shortage of carbon dioxide, shortage of light and shortage of chlorophyll limit the rate of photosynthesis.		1 2 3 4 5 6 7 8
	5	Suggest which factor limits the rate of photosynthesis in a given situation.		1 2 3 4 5 6 7 8
	6	Interpret and explain graphs of photosynthesis rate involving one limiting factor.		1 2 3 4 5 6 7 8
Grade 8	7	Apply knowledge of enzymes to explain why a high temperature affects the rate of photosynthesis.		1 2 3 4 5 6 7 8
	8	Predict how the rate of photosynthesis will be affected with more than one limiting factor.		1 2 3 4 5 6 7 8
	9	Understand and use the inverse square law and light intensity in the context of photosynthesis.		1 2 3 4 5 6 7 8

Level	Obj No	B8 Photosynthesis	Started (/) Completed	Level Achieved
		8.3 How plants use glucose		
Grade 4	1	Apply knowledge of enzymes to explain why a high temperature affects the rate of photosynthesis.		1 2 3 4 5 6 7 8
	2	Predict how the rate of photosynthesis will be affected with more than one limiting factor.		1 2 3 4 5 6 7 8
	3	Understand and use the inverse square law and light intensity in the context of photosynthesis.		1 2 3 4 5 6 7 8
Grade 6	4	Describe all the ways in which plants use glucose, including how they make proteins.		1 2 3 4 5 6 7 8
	5	Evaluate risks involved in the starch test.		1 2 3 4 5 6 7 8
Grade 8	6	Explain how carnivorous plants are adapted to their environment.		1 2 3 4 5 6 7 8
	7	Explain how and why plants convert glucose to starch for storage.		1 2 3 4 5 6 7 8

Level	Obj No	B8 Photosynthesis	Started (/) Completed	Level Achieved
		8.4 Greenhouses		
Grade 6	1	Describe why greenhouses increase plant growth.		1 2 3 4 5 6 7 8
	2	Comment on the cost-effectiveness of adding heat, light, or carbon dioxide to greenhouses.		1 2 3 4 5 6 7 8
	3	Discuss the benefits of using greenhouses and hydroponics.		1 2 3 4 5 6 7 8
Grade 8	4	Explain in detail how using greenhouses can help control limiting factors increase the rate of photosynthesis.		1 2 3 4 5 6 7 8
	5	Use data to comment on the cost-effectiveness of greenhouses.		1 2 3 4 5 6 7 8
	6	Evaluate the use of greenhouses and hydroponics in terms of economics.		1 2 3 4 5 6 7 8

Level	Obj No	B9 Respiration	Started (/) Completed	Level Achieved
		9.1 Aerobic respiration		
Grade 4	1	State the word equation for aerobic respiration.		1 2 3 4 5 6 7 8
	2	List ways in which living organisms use energy.		1 2 3 4 5 6 7 8
	3	Identify a control		1 2 3 4 5 6 7 8
Grade 6	4	Write the balanced symbol equation for respiration.		1 2 3 4 5 6 7 8
	5	Describe respiration as an exothermic reaction.		1 2 3 4 5 6 7 8
	6	Plan an investigation to include a control.		1 2 3 4 5 6 7 8
Grade 8	7	Apply understanding of respiration in new contexts.		1 2 3 4 5 6 7 8
	8	Explain why respiration is an exothermic reaction.		1 2 3 4 5 6 7 8
	9	Explain why a control is necessary in some scientific investigations.		1 2 3 4 5 6 7 8

Level	Obj No	B9 Respiration	Started (/) Completed	Level Achieved
		9.2 The response to exercise		
Grade 4	1	Describe how heart rate, breathing rate, and breath volume change with exercise.		1 2 3 4 5 6 7 8
	2	Draw a suitable chart/graph to display data with some support.		1 2 3 4 5 6 7 8
Grade 6	3	Explain why heart rate, breathing rate, and breath volume change with exercise.		1 2 3 4 5 6 7 8
	4	Choose the best way to display data and calculate percentage changes.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why stores of glycogen change with exercise.		1 2 3 4 5 6 7 8
	6	Justify the choice of chart/graph used to display data.		1 2 3 4 5 6 7 8

Level	Obj No	B9 Respiration	Started (/) Completed	Level Achieved
		9.3 Anaerobic respiration		
Grade 4	1	State the word equation for anaerobic respiration in animals, plants, and microorganisms.		1 2 3 4 5 6 7 8
	2	Describe the reason why cells respire anaerobically.		1 2 3 4 5 6 7 8
	3	Give some uses of fermentation.		1 2 3 4 5 6 7 8
Grade 6	4	Write the balanced symbol equation for anaerobic respiration in plants and microorganisms.		1 2 3 4 5 6 7 8
	5	Compare and contrast aerobic and anaerobic respiration.		1 2 3 4 5 6 7 8
	6	Explain why muscles get tired during exercise.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast anaerobic respiration in animals, plants, and microorganisms.		1 2 3 4 5 6 7 8
	8	Explain in detail why heart and breathing rate continue to be high for a period of time after exercise.		1 2 3 4 5 6 7 8
	9	Write a prediction based on scientific knowledge.		1 2 3 4 5 6 7 8

Level	Obj No	B9 Respiration	Started (/) Completed	Level Achieved
		9.4 Matabolism and the liver		
Grade 4	1	Define metabolism as the sum of all reactions in a cell or the body.		1 2 3 4 5 6 7 8
	2	List some metabolic reactions.		1 2 3 4 5 6 7 8
Grade 6	3	Describe the role of the liver in repaying the oxygen debt.		1 2 3 4 5 6 7 8
	4	Discuss whether it is possible to increase metabolism.		1 2 3 4 5 6 7 8
de 8	5	Evaluate information to assess credibility.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.1 principles of homeostasis		
Grade 4	1	Name some human internal conditions that are controlled.		1 2 3 4 5 6 7 8
	2	Show the pathway of a control system as receptor, coordination centre, effector.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how the lens changes shape to focus on near or distant objects.		1 2 3 4 5 6 7 8
	4	Describe how lenses and surgery can help with long and short sightedness.		1 2 3 4 5 6 7 8
Grade 8	5	Apply knowledge of enzymes and osmosis to explain in detail why internal conditions need to be maintained.		1 2 3 4 5 6 7 8
	6	Explain how drugs affect homeostasis.		1 2 3 4 5 6 7 8
	7	Explain how nervous and chemical responses differ.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.2 The structure and function of the human nervous system		
Grade 4	1	Identify the stimuli that sense organs detect.		1 2 3 4 5 6 7 8
	2	Describe what a neurone and a nerve are.		1 2 3 4 5 6 7 8
	3	Measure reactions times using repeats to increase accuracy.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the pathway of impulses from receptor to effector.		1 2 3 4 5 6 7 8
	5	Describe how information is passed along neurones.		1 2 3 4 5 6 7 8
	6	Evaluate a method and describe how accuracy could be increased.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how the nervous system coordinates a response.		1 2 3 4 5 6 7 8
	8	Evaluate results in detail in order to discuss precision and accuracy.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.3 Reflex action		
Grade 4	1	Identify reflex actions		1 2 3 4 5 6 7 8
	2	Describe why refl ex actions are important.		1 2 3 4 5 6 7 8
	3	Order the events involved in a refl ex action.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how refl ex actions are fast and automatic.		1 2 3 4 5 6 7 8
	5	Describe the events involved in a refl ex action.		1 2 3 4 5 6 7 8
	6	Describe the function of synapses.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how impulses travel across a synapse.		1 2 3 4 5 6 7 8
	8	Apply knowledge of synapses to explain the effects of drugs.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.4 The brain		
Grade 4	1	Identify the main structures of the brain.		1 2 3 4 5 6 7 8
	2	Display data		1 2 3 4 5 6 7 8
Grade 6	3	Describe the function of brain structures.		1 2 3 4 5 6 7 8
	4	(H) H Describe how regions of the brain have been mapped to particular functions.		1 2 3 4 5 6 7 8
	5	Choose the correct way to display data.		1 2 3 4 5 6 7 8
Grade 8	6	(H) Evaluate in detail the benefits and risks of investigating and treating brain disorders.		1 2 3 4 5 6 7 8
	7	(H) Consider ethical dilemmas surrounding brain research.		1 2 3 4 5 6 7 8
	8	Independently plan a method to test a hypothesis.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.5 The eye		
Grade 4	1	Identify the main structures of the eye.		1 2 3 4 5 6 7 8
	2	Describe what happens to the eye in bright light.		1 2 3 4 5 6 7 8
Grade 6	3	Relate the structures of the eye to their functions.		1 2 3 4 5 6 7 8
	4	Describe how the eye focuses light.		1 2 3 4 5 6 7 8
Grade 8	5	Draw an accurate ray diagram to show how the eye focuses light.		1 2 3 4 5 6 7 8
	6	Explain in detail the changes to the eye in response to changes in light intensity.		1 2 3 4 5 6 7 8

Level	Obj No	B10 The nervous system	Started (/) Completed	Level Achieved
		10.6 Common problems of the eye		
Grade 4	1	State that the lens changes shape to focus on near or distant objects.		1 2 3 4 5 6 7 8
	2	Describe what causes long and short sightedness.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how the lens changes shape to focus on near or distant objects.		1 2 3 4 5 6 7 8
	4	Describe how lenses and surgery can help with long and short sightedness.		1 2 3 4 5 6 7 8
Grade 8	5	Draw accurate ray diagrams to explain what happens during accommodation and what causes long and short sightedness.		1 2 3 4 5 6 7 8
	6	Evaluate the risks and benefits of surgery to treat long and short sightedness.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.1 Principals of hormonal control		
Grade 4	1	Match the pituitary gland, pancreas, thyroid, adrenal gland, ovary, and testes to their position on a diagram of the human body.		1 2 3 4 5 6 7 8
	2	Describe how hormones are chemicals secreted into the bloodstream by glands, and have an effect on a target organ.		1 2 3 4 5 6 7 8
Grade 6	3	Explain why the pituitary gland is known as a 'master gland'.		1 2 3 4 5 6 7 8
	4	Describe the role of hormones released by endocrine glands.		1 2 3 4 5 6 7 8
Grade 8	5	Compare and contrast nervous and hormonal action.		1 2 3 4 5 6 7 8
	6	Apply knowledge to suggest and explain how changes in hormone production could affect the body.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved							
		11.10 Plant hormones.									
Grade 6	1	Describe some uses of plant hormones (giberellins, ethene, and auxins) in agriculture, horticulture, and the food industry.		1	2	3	4	5	6	7	8
	2	Observe the effects of plant hormones.		1	2	3	4	5	6	7	8
Grade 8	3	Explain how the effects of plant hormones are useful in agriculture, horticulture, and the food industry.		1	2	3	4	5	6	7	8
	4	Evaluate the use of synthetic plant hormones.		1	2	3	4	5	6	7	8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.2 the control of blod glucose levles		
Grade 4	1	State that blood glucose concentration is controlled by the pancreas.		1 2 3 4 5 6 7 8
	2	State that there are two types of diabetes.		1 2 3 4 5 6 7 8
Grade 6	3	Describe what happens when blood glucose levels become too high or too low.		1 2 3 4 5 6 7 8
	4	Describe the difference in the causes of Type 1 and Type 2 diabetes.		1 2 3 4 5 6 7 8
Grade 8	5	Explain how glucagon interacts with insulin to control blood glucose levels.		1 2 3 4 5 6 7 8
	6	Explain why it is important to control the level of glucose in the blood.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.3 Treating diabetes		
Grade 4	1	State that Type 1 diabetes is normally treated with insulin injections.		1 2 3 4 5 6 7 8
	2	State that Type 2 diabetes can be treated by changes to diet and exercise.		1 2 3 4 5 6 7 8
	3	Describe data that shows a link between obesity and Type 2 diabetes.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why Type 1 diabetes is treated with insulin injections.		1 2 3 4 5 6 7 8
	5	Explain how Type 2 diabetes can be treated by changes to diet and exercise.		1 2 3 4 5 6 7 8
	6	Describe how the production of insulin for people with diabetes has developed over time.		1 2 3 4 5 6 7 8
Grade 8	7	Evaluate different treatments for Type 1 diabetes.		1 2 3 4 5 6 7 8
	8	Explain in detail how lifestyle choices affect the risk of developing Type 2 diabetes.		1 2 3 4 5 6 7 8
	9	Summarise how scientists are working to find a cure for diabetes.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.4 The role of negative feedback		
Grade 4	1	Recall that enzymes are proteins that are biological catalysts.		1 2 3 4 5 6 7 8
	2	State one function of enzymes inside the body.		1 2 3 4 5 6 7 8
	3	State the independent variable in a given investigation.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the function of adrenaline and thyroxine.		1 2 3 4 5 6 7 8
	5	Interpret and explain diagrams of negative feedback control.		1 2 3 4 5 6 7 8
Grade 8	6	Explain in detail how adrenaline prepares the body for 'fight or flight'.		1 2 3 4 5 6 7 8
	7	Design labelled flow diagrams of negative feedback control.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved							
		11.5 Human reproduction									
Grade 4	1	Identify oestrogen and testosterone as reproductive hormones in women and men respectively.		1	2	3	4	5	6	7	8
	2	Describe what happens during the menstrual cycle.		1	2	3	4	5	6	7	8
Grade 6	3	Compare and contrast the changes to boys and girls during puberty.		1	2	3	4	5	6	7	8
	4	Name the hormones involved in the menstrual cycle.		1	2	3	4	5	6	7	8
Grade 8	5	Explain why fertility changes with age in men and women.		1	2	3	4	5	6	7	8
	6	Explain the role of each hormone in the menstrual cycle.		1	2	3	4	5	6	7	8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved							
		11. 6 Hormones									
Grade 6	1	Name the glands that produce the hormones oestrogen, progesterone, LH, and FSH.		1	2	3	4	5	6	7	8
	2	Describe the function of the hormones that control the menstrual cycle..		1	2	3	4	5	6	7	8
Grade 8	3	Suggest how to test for substrates and products in a model gut.		1	2	3	4	5	6	7	8
	4	Make a prediction with a clearly structured scientific explanation.		1	2	3	4	5	6	7	8
	5	Analyse results in order to evaluate a method and the validity of conclusions, explaining suggestions for possible improvements.		1	2	3	4	5	6	7	8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.7 The artificial control of fertility		
Grade 4	1	Describe what contraception is and list examples.		1 2 3 4 5 6 7 8
	2	Categorise contraceptives as hormonal and non-hormonal.		1 2 3 4 5 6 7 8
Grade 6	3	Explain how contraceptives work.		1 2 3 4 5 6 7 8
	4	List the advantages and disadvantages of different contraceptives.		1 2 3 4 5 6 7 8
Grade 8	5	Apply knowledge of hormones in the menstrual cycle to suggest how hormonal contraceptives work.		1 2 3 4 5 6 7 8
	6	Evaluate different methods of contraception in detail.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved
		11.8 Infertility		
Grade 6	1	Describe what is meant by infertility and suggest reasons for it.		1 2 3 4 5 6 7 8
	2	Describe the steps used in IVF.		1 2 3 4 5 6 7 8
	3	Outline the issues surrounding IVF.		1 2 3 4 5 6 7 8
Grade 8	4	Describe how FSH and IVF can be used to help treat infertility.		1 2 3 4 5 6 7 8
	5	Evaluate the advantages and disadvantages of IVF.		1 2 3 4 5 6 7 8
	6	Use different viewpoints to make an informed decision on unused IVF embryos.		1 2 3 4 5 6 7 8

Level	Obj No	B11 Hormonal coordination	Started (/) Completed	Level Achieved							
		11.9 Plant hormones and responses									
Grade 4	1	Describe that plant shoots grow towards the light and away from the force of gravity, and roots grow in the direction of the force of gravity.		1	2	3	4	5	6	7	8
	2	Identify plant responses as phototropism or gravitropism.		1	2	3	4	5	6	7	8
	3	Plan and carry out an investigation into the effect of light on plant growth, given support.		1	2	3	4	5	6	7	8
Grade 6	4	Explain why plants need tropisms.		1	2	3	4	5	6	7	8
	5	Use diagrams and descriptions to explain how plant shoots and roots respond to light and gravity.		1	2	3	4	5	6	7	8
	6	Plan and carry out an investigation into the effect of light on plant growth, with limited guidance.		1	2	3	4	5	6	7	8
Grade 8	7	Explain in detail how the production and diffusion of auxin affects the growth of shoots and roots.		1	2	3	4	5	6	7	8
	8	Independently plan and carry out an investigation into the effect of light on plant growth.		1	2	3	4	5	6	7	8
	9	Predict the results of an investigation of tropisms, with detailed scientific reasons.		1	2	3	4	5	6	7	8

Level	Obj No	B12 Homeostasis in action	Started (/) Completed	Level Achieved
		12.1 Controlling body temperature		
Grade 4	1	State that the thermoregulatory centre in the brain monitors and controls body temperature.		1 2 3 4 5 6 7 8
	2	Predict whether certain activities will raise or lower body temperature.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how body temperature is monitored and controlled.		1 2 3 4 5 6 7 8
	4	Describe the mechanisms that take place if body temperature is too high or too low.		1 2 3 4 5 6 7 8
Grade 8	5	(H) Explain in detail how mechanisms lower or raise body temperature.		1 2 3 4 5 6 7 8
	6	Explain why it is dangerous if body temperature is too high or too low.		1 2 3 4 5 6 7 8

Level	Obj No	B12 Homeostasis in action	Started (/) Completed	Level Achieved
		12.2 Removing waste products		
Grade 4	1	State that the level of water in the body has to be controlled.		1 2 3 4 5 6 7 8
	2	List the ways in which water is lost from the body.		1 2 3 4 5 6 7 8
	3	State that excess water, ions, and urea are removed from the body by the kidneys.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why the body needs to get rid of carbon dioxide, urea, excess ions, and water.		1 2 3 4 5 6 7 8
	5	Describe how the body forms the waste products carbon dioxide and urea.		1 2 3 4 5 6 7 8
	6	Describe the difference between urea and urine.		1 2 3 4 5 6 7 8
Grade 8	7	Calculate percentage changes in volumes of water lost or gained by the body.		1 2 3 4 5 6 7 8
	8	Suggest an effect of liver failure on the body.		1 2 3 4 5 6 7 8
	9	Explain the link between high levels of protein in the diet and an increase in urea concentration of urine.		1 2 3 4 5 6 7 8

Level	Obj No	B12 Homeostasis in action	Started (/) Completed	Level Achieved
		12.3 The human kidney		
Grade 4	1	State the function of the kidneys.		1 2 3 4 5 6 7 8
	2	List the substances found in urine.		1 2 3 4 5 6 7 8
	3	Describe how the amount of liquid you drink affects your urine.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the processes of filtering and selective reabsorption in the kidneys.		1 2 3 4 5 6 7 8
	5	Suggest how the composition of the urine will change in given situations.		1 2 3 4 5 6 7 8
	6	Describe the effect of ADH on the kidneys.		1 2 3 4 5 6 7 8
Grade 8	7	Apply knowledge of the processes of filtering and selective reabsorption to diagnose problems and suggest treatments for patients using results from a urine test.		1 2 3 4 5 6 7 8
	8	Explain how the production of ADH will change in given situations.		1 2 3 4 5 6 7 8
	9	Explain how these changes will affect the amount of water in the urine.		1 2 3 4 5 6 7 8

Level	Obj No	B12 Homeostasis in action	Started (/) Completed	Level Achieved
		12.4 Dialysis-an artificail kidney		
Grade 4	1	State what kidney failure is.		1 2 3 4 5 6 7 8
	2	Describe why kidney failure is a threat to life.		1 2 3 4 5 6 7 8
	3	State that kidney dialysis is a way of treating kidney failure.		1 2 3 4 5 6 7 8
Grade 6	4	Use a diagram to show how kidney dialysis works.		1 2 3 4 5 6 7 8
	5	List advantages and disadvantages of kidney dialysis.		1 2 3 4 5 6 7 8
	6	Describe how a model is similar to kidney dialysis.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest and explain suitable concentrations of substances in dialysis fl uid.		1 2 3 4 5 6 7 8
	8	Apply knowledge of what affects the rate of diffusion to explain how dialysis is made effi cient.		1 2 3 4 5 6 7 8
	9	Evaluate in detail a model of kidney dialysis.		1 2 3 4 5 6 7 8

Level	Obj No	B12 Homeostasis in action	Started (/) Completed	Level Achieved
		12.5 Kidney transplants		
Grade 4	1	Describe what an organ transplant is.		1 2 3 4 5 6 7 8
	2	List some advantages and disadvantages of kidney transplants.		1 2 3 4 5 6 7 8
Grade 6	3	Explain why kidney donors can be living.		1 2 3 4 5 6 7 8
	4	Compare the advantages and disadvantages of treating kidney failure using dialysis or kidney transplant.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why family members are usually a good choice for an organ donor.		1 2 3 4 5 6 7 8
	6	Use economic, social, and ethical arguments to evaluate treating kidney failure by dialysis or kidney transplant.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.1 Types of reproduction		
Grade 4	1	Define sexual and asexual reproduction.		1 2 3 4 5 6 7 8
	2	Name some organisms that use either sexual or asexual reproduction.		1 2 3 4 5 6 7 8
	3	Use a model to show why variation is produced in offspring from sexual reproduction but not from asexual reproduction.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the differences between sexual reproduction.		1 2 3 4 5 6 7 8
	5	Describe the advantages and disadvantages of sexual and asexual reproduction.		1 2 3 4 5 6 7 8
	6	Design a model to show why variation is produced in offspring from sexual reproduction but not from asexual reproduction.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast sexual and asexual reproduction.		1 2 3 4 5 6 7 8
	8	Explain in detail why meiosis is important for sexual reproduction.		1 2 3 4 5 6 7 8
	9	Evaluate a model to show that variation is produced in offspring from sexual reproduction but not from asexual reproduction.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.10 Screening for genetic disorders		
Grade 4	1	Give a reason why embryos might be screened.		1 2 3 4 5 6 7 8
	2	Describe one concern about embryo screening.		1 2 3 4 5 6 7 8
Grade 6	3	Outline the methods used to screen embryos.		1 2 3 4 5 6 7 8
	4	List advantages and disadvantages of embryo screening.		1 2 3 4 5 6 7 8
Grade 8	5	Explain how screening shows whether an embryo has a genetic disorder.		1 2 3 4 5 6 7 8
	6	Make an informed judgement about embryo screening by evaluating in detail the economic, social, and ethical issues.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.2 Cell division in sexual reproduction		
Grade 4	1	State that gametes (sex cells) are formed by meiosis.		1 2 3 4 5 6 7 8
	2	State that meiosis halves the number of chromosomes in gametes and fertilisation restores the full number.		1 2 3 4 5 6 7 8
	3	Solve simple probability questions.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the processes of meiosis and mitosis.		1 2 3 4 5 6 7 8
	5	Explain how meiosis halves the number of chromosomes in gametes and fertilisation restores the full number.		1 2 3 4 5 6 7 8
	6	Solve simple probability questions.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast mitosis and meiosis.		1 2 3 4 5 6 7 8
	8	Explain in detail why gametes are all genetically different to each other.		1 2 3 4 5 6 7 8
	9	Solve complex calculations to determine the number of possible gametes formed during meiosis.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.3 The best of both worlds		
Grade 4	1	Name an organism that can reproduce both asexually and sexually.		1 2 3 4 5 6 7 8
	2	Give a simple reason why an organism reproduces sexually or asexually.		1 2 3 4 5 6 7 8
	3	State that flowers are a plant's reproductive organs.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how malarial parasites and fungi reproduce both asexually and sexually.		1 2 3 4 5 6 7 8
	5	List the ways in which plants can reproduce asexually.		1 2 3 4 5 6 7 8
Grade 8	6	Suggest and explain the advantages and disadvantages of using both asexual and sexual methods of reproduction.		1 2 3 4 5 6 7 8
	7	Explain in detail how plants reproduce sexually.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.4 DNA and the genome		
Grade 4	1	State that DNA contains a code to build proteins.		1 2 3 4 5 6 7 8
	2	Describe what the the Human Genome Project was.		1 2 3 4 5 6 7 8
	3	Give one goal of the Human Genome Project.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the relationship between DNA, genes, and chromosomes.		1 2 3 4 5 6 7 8
	5	Describe some of the benefits of studying the human genome.		1 2 3 4 5 6 7 8
	6	Explain why genome projects are costly and take a long time.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why the cost of genome sequencing has reduced since it was started.		1 2 3 4 5 6 7 8
	8	Explain why knowledge of the genomes of other species is useful.		1 2 3 4 5 6 7 8
	9	Discuss possible issues surrounding genome sequencing.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.5 DNA structure and protein synthesis		
Grade 4	1	Describe the structure of DNA.		1 2 3 4 5 6 7 8
	2	State that groups of three nucleotides code for an amino acid.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how the four bases make up a code.		1 2 3 4 5 6 7 8
	4	Explain why the correct folding of a protein is important to its function.		1 2 3 4 5 6 7 8
Grade 8	5	Describe the steps involved in producing a protein inside the cell.		1 2 3 4 5 6 7 8
	6	Discuss possible issues surrounding genome sequencing.		1 2 3 4 5 6 7 8
	7	Explain how the order of bases determines the type of protein made.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		B13.6 Gene expression and mutations		
Grade 4	1	Describe what a mutation is.		1 2 3 4 5 6 7 8
Grade 6	2	Explain why the correct folding of a protein is important to its function.		1 2 3 4 5 6 7 8
	3	Outline the reasons why most mutations are harmless.		1 2 3 4 5 6 7 8
de 8	4	Explain in detail how a mutation can affect the function of a protein.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.7 Inheritance in action		
Grade 4	1	Recognise examples of inherited traits. Higher Tier.		1 2 3 4 5 6 7 8
	2	Recognise a genotype and a phenotype.		1 2 3 4 5 6 7 8
Grade 6	3	Use a simple diagram to state how offspring have inherited traits.		1 2 3 4 5 6 7 8
	4	Use the terms allele, dominant, recessive, homozygous, and heterozygous correctly.		1 2 3 4 5 6 7 8
Grade 8	5	Describe a phenotype when given the genotype.		1 2 3 4 5 6 7 8
	6	(H) Use a Punnett square diagram to predict the outcome of a monohybrid cross using the theory of probability.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.8 More about genetic		
Grade 4	1	State that in females the sex chromosomes are XX and in males they are XY.		1 2 3 4 5 6 7 8
	2	Use a family tree to describe how people are related.		1 2 3 4 5 6 7 8
Grade 6	3	Carry out a genetic cross to show sex inheritance.		1 2 3 4 5 6 7 8
	4	Use direct proportion and simple ratios to express the outcome of a genetic cross.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why you only get the expected ratios in a genetic cross if there are large numbers of offspring.		1 2 3 4 5 6 7 8
	6	Use a family tree to work out whether an individual is likely to be homozygous or heterozygous for particular alleles.		1 2 3 4 5 6 7 8

Level	Obj No	B13 Reproduction	Started (/) Completed	Level Achieved
		13.9 Inherited disorders		
Grade 4	1	Describe what is meant by an inherited disorder and recognise examples.		1 2 3 4 5 6 7 8
	2	Use secondary sources of information to describe symptoms of an inherited disorder.		1 2 3 4 5 6 7 8
Grade 6	3	Name examples of inherited disorders, such as cystic fibrosis and polydactyly.		1 2 3 4 5 6 7 8
	4	Use a genetic cross to explain how inherited disorders are passed on.		1 2 3 4 5 6 7 8
Grade 8	5	Evaluate in detail the use of genetic engineering to cure inherited disorders.		1 2 3 4 5 6 7 8
	6	Use a genetic cross to predict the probability of a child inheriting a genetic disorder.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.1 Variation and evolution		
Grade 4	1	List some examples of human variation.		1 2 3 4 5 6 7 8
	2	Categorise some human traits as being due to genetic causes, environmental causes, or both.		1 2 3 4 5 6 7 8
	3	Describe why identical twins share the same genes.		1 2 3 4 5 6 7 8
Grade 6	4	List some examples of variation in plants and categorise these as being due to genetic causes, environmental causes, or both.		1 2 3 4 5 6 7 8
	5	Suggest reasons why identical twins will start to show variation as they get older.		1 2 3 4 5 6 7 8
	6	Use data to explain why studying identical twins helps scientists investigate which traits have genetic causes.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why some traits are only due to genetic causes.		1 2 3 4 5 6 7 8
	8	Explain why it is so hard to get valid results from identical-twin studies.		1 2 3 4 5 6 7 8
	9	Discuss some of the issues scientists face when conducting twin studies.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.2 Evolution by natural selection		
Grade 4	1	Describe a mutation as a change in the DNA code.		1 2 3 4 5 6 7 8
	2	Describe the theory of evolution by natural selection as a process by which living things have evolved from simple life forms.		1 2 3 4 5 6 7 8
	3	State some useful adaptations.		1 2 3 4 5 6 7 8
Grade 6	4	Explain how a mutation may lead to a new phenotype.		1 2 3 4 5 6 7 8
	5	Describe the steps that take place during evolution by natural selection.		1 2 3 4 5 6 7 8
	6	Analyse data from an activity modelling natural selection.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why it is rare that a mutation leads to a new phenotype.		1 2 3 4 5 6 7 8
	8	Apply the theory of evolution by natural selection to suggest how a specific organism evolved.		1 2 3 4 5 6 7 8
	9	Explain how a change in a model can make it useful for explaining something else.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.3 Selective breeding		
Grade 4	1	Describe selective breeding as a process where humans choose which plants or animals to breed together.		1 2 3 4 5 6 7 8
	2	Give one example where selective breeding has been used.		1 2 3 4 5 6 7 8
	3	Choose organisms to breed together to result in desired traits in the offspring.		1 2 3 4 5 6 7 8
Grade 6	4	Explain the process of selective breeding.		1 2 3 4 5 6 7 8
	5	Explain why humans have used selective breeding.		1 2 3 4 5 6 7 8
	6	Explain what inbreeding is, and why it is a problem in dog breeding.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast natural and artificial selection.		1 2 3 4 5 6 7 8
	8	Explain in detail how the variation of alleles in a population is reduced through selective breeding.		1 2 3 4 5 6 7 8
	9	Explain in detail why the reduction of variation in a population through selective breeding is a problem.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.4 Genetic engineering		
Grade 4	1	Describe GM organisms as containing a gene from another organism, and order the stages of genetic engineering.		1 2 3 4 5 6 7 8
	2	Give examples of GM organisms and describe why they are useful to humans.		1 2 3 4 5 6 7 8
Grade 6	3	Describe the steps used in genetic engineering to produce GM organisms.		1 2 3 4 5 6 7 8
	4	Analyse data to describe why growing GM crops may be beneficial to a farmer.		1 2 3 4 5 6 7 8
Grade 8	5	Explain the process of genetic engineering using technical vocabulary (e.g., plasmid, vector, restriction enzymes, marker genes, recombinant DNA).		1 2 3 4 5 6 7 8
	6	Explain how genetic engineering could be used to cure people with inherited disorders, and discuss the limitations.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.5 Cloning		
Grade 4	1	Describe how to take stem and leaf cuttings of plants.		1 2 3 4 5 6 7 8
	2	Define the term clone, and use a diagram to describe why embryo transplants are clones.		1 2 3 4 5 6 7 8
Grade 6	3	Describe the benefits for plant growers of reproduction using cuttings or tissue culture rather than seeds.		1 2 3 4 5 6 7 8
	4	Describe how embryo transplants are undertaken, and why they produce clones.		1 2 3 4 5 6 7 8
Grade 8	5	Explain the benefits of embryo transplants over sexual reproduction for farmers.		1 2 3 4 5 6 7 8
	6	Compare and contrast tissue culture in plants and embryo transplantation in animals.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.6 Adult cell cloning		
Grade 4	1	Describe adult cell cloning as producing a complete clone of an adult animal.		1 2 3 4 5 6 7 8
	2	Describe the process of adult cell cloning using a diagram.		1 2 3 4 5 6 7 8
	3	Give one reason why scientists may want to clone an adult animal.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why the animal produced using adult cell cloning is a clone.		1 2 3 4 5 6 7 8
	5	Design a flow chart to describe the process of adult cell cloning.		1 2 3 4 5 6 7 8
	6	List some benefits and drawbacks of adult cell cloning.		1 2 3 4 5 6 7 8
Grade 8	7	Use advanced terminology to explain the process of adult cell cloning.		1 2 3 4 5 6 7 8
	8	Compare and contrast the processes of adult cell and embryo cloning.		1 2 3 4 5 6 7 8
	9	Evaluate the possible uses of adult cell cloning.		1 2 3 4 5 6 7 8

Level	Obj No	B14 Variation and evolution	Started (/) Completed	Level Achieved
		14.7 Ethics of genetic technologies		
Grade 4	1	Give one concern people may have about growing GM crops.		1 2 3 4 5 6 7 8
	2	Describe why some people are against the cloning of animals.		1 2 3 4 5 6 7 8
Grade 6	3	Outline the potential benefits and risks of genetic engineering.		1 2 3 4 5 6 7 8
	4	Describe economic and ethical concerns that people may have about cloning animals.		1 2 3 4 5 6 7 8
Grade 8	5	Evaluate the potential benefits and risks of genetic engineering.		1 2 3 4 5 6 7 8
	6	Explain in detail the significance of events in the field of genetics.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Use an example to describe the results from Mendel's experiments.		1 2 3 4 5 6 7 8
	2	Describe some important discoveries in gene theory.		1 2 3 4 5 6 7 8
Grade 6	3	Discuss why the importance of Mendel's work was not recognised until after his death.		1 2 3 4 5 6 7 8
	4	Correctly order important discoveries in gene theory.		1 2 3 4 5 6 7 8
Grade 8	5	Use a Punnett square to draw conclusions from the results of Mendel's experiments.		1 2 3 4 5 6 7 8
	6	Suggest why Mendel's work was not recognised during his lifetime, but the work of Watson and Crick was.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Name the three domains.		1 2 3 4 5 6 7 8
	2	Recognise that ideas about classification have changed over time.		1 2 3 4 5 6 7 8
	3	Draw a conclusion from a simple evolutionary tree.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how organisms are divided in the three-domain system.		1 2 3 4 5 6 7 8
	5	Describe why the three-domain system was proposed.		1 2 3 4 5 6 7 8
	6	Draw several conclusions from a simple evolutionary tree.		1 2 3 4 5 6 7 8
Grade 8	7	Compare and contrast the Linnaean system with the three-domain system.		1 2 3 4 5 6 7 8
	8	Outline how ideas about classification have developed over time.		1 2 3 4 5 6 7 8
	9	Draw conclusions from a more complex evolutionary tree.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Define the term evolution.		1 2 3 4 5 6 7 8
	2	State that Charles Darwin proposed the theory of evolution by natural selection.		1 2 3 4 5 6 7 8
	3	Describe the stages of evolution by natural selection.		1 2 3 4 5 6 7 8
Grade 6	4	Compare and contrast Darwin and Lamarck's theories of evolution.		1 2 3 4 5 6 7 8
	5	Describe the theory of inheritance of acquired characteristics proposed by Jean-Baptiste Lamarck.		1 2 3 4 5 6 7 8
	6	Design a storyboard to highlight important events that helped Darwin develop his theory.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why Lamarck's theory is no longer accepted in the vast majority of cases.		1 2 3 4 5 6 7 8
	8	Describe an example of where Lamarck's theory could be correct.		1 2 3 4 5 6 7 8
	9	Explain how and why theories, such as how evolution takes place, change over time.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe how finches have different-shaped beaks so they can eat different foods.		1 2 3 4 5 6 7 8
	2	Give one piece of evidence that supports Darwin's theory of natural selection.		1 2 3 4 5 6 7 8
	3	State one reason why most people did not accept Darwin's theory when it was first published.		1 2 3 4 5 6 7 8
Grade 6	4	Explain how finches on different islands evolved different-shaped beaks by natural selection.		1 2 3 4 5 6 7 8
	5	Describe several reasons why most people did not accept Darwin's theory when it was first published.		1 2 3 4 5 6 7 8
	6	Explain why it was important that Darwin collected a variety of evidence.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how the finch species on the different Galapagos Islands are evidence for evolution by natural selection.		1 2 3 4 5 6 7 8
	8	Discuss why Darwin was conflicted over publishing his theory.		1 2 3 4 5 6 7 8
	9	Explain why scientists eventually accepted Darwin's theory.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what a species is.		1 2 3 4 5 6 7 8
	2	Define speciation as the process by which new species form.		1 2 3 4 5 6 7 8
	3	Give an example of an important discovery by Wallace.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the steps in the process of speciation.		1 2 3 4 5 6 7 8
	5	Explain why there are species living on Madagascar that share some similarities with species found elsewhere.		1 2 3 4 5 6 7 8
	6	Carry out research to describe other examples of speciation.		1 2 3 4 5 6 7 8
Grade 8	7	Explain the relationship between the length of isolation and the number of unique species that evolve.		1 2 3 4 5 6 7 8
	8	Suggest how new species of organisms evolved.		1 2 3 4 5 6 7 8
	9	Explain why Wallace's work prompted Darwin to publish The Origin of Species.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what a fossil is and give an example.		1 2 3 4 5 6 7 8
	2	Recognise that fossils are evidence for evolution by natural selection.		1 2 3 4 5 6 7 8
	3	Order geological events.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how fossils are formed.		1 2 3 4 5 6 7 8
	5	Describe how fossils are evidence for evolution by natural selection.		1 2 3 4 5 6 7 8
	6	Explain why the fossil record is not complete.		1 2 3 4 5 6 7 8
Grade 8	7	Evaluate the use of fossils as evidence for evolution by natural selection and how life first formed.		1 2 3 4 5 6 7 8
	8	Use standard form to discuss the large timescales used when considering the evolution of life.		1 2 3 4 5 6 7 8
	9	Create a geological timeline to scale.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what is meant by extinction.		1 2 3 4 5 6 7 8
	2	Describe one way that an animal could become extinct.		1 2 3 4 5 6 7 8
	3	Order fossil diagrams to show the evolution of the horse.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how other organisms can cause an animal or plant to become extinct.		1 2 3 4 5 6 7 8
	5	Suggest a hypothesis for why an organism became extinct.		1 2 3 4 5 6 7 8
	6	Explain how fossil diagrams show how the horse has evolved.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest alternative hypotheses for why an organism became extinct.		1 2 3 4 5 6 7 8
	8	Evaluate in detail the need to conserve endangered plants.		1 2 3 4 5 6 7 8
	9	Apply knowledge of speciation to explain why dodos were only found on one island.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what a mass extinction is.		1 2 3 4 5 6 7 8
	2	State that environmental change and a catastrophic event are two possible causes of mass extinction.		1 2 3 4 5 6 7 8
	3	Describe one theory that explains why the dinosaurs became extinct.		1 2 3 4 5 6 7 8
Grade 6	4	Suggest the effects of an asteroid, comet, or meteorite strike on Earth.		1 2 3 4 5 6 7 8
	5	Explain how environmental change can cause mass extinctions.		1 2 3 4 5 6 7 8
	6	Identify strengths and weaknesses in two different theories of mass extinction.		1 2 3 4 5 6 7 8
Grade 8	7	Link ideas to give a scientific explanation of why an asteroid could have caused the dinosaurs to become extinct.		1 2 3 4 5 6 7 8
	8	Suggest why mass extinctions are important for the evolution of life on Earth.		1 2 3 4 5 6 7 8
	9	Evaluate two theories to come to a conclusion about which is more believable, and explain why scientists are not sure what caused the extinction of		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what is meant by an antibiotic resistant bacteria.		1 2 3 4 5 6 7 8
	2	Describe why scientists want to slow down the rate of development of new strains of antibiotic resistant bacteria.		1 2 3 4 5 6 7 8
	3	List some ways in which scientists can slow down the development of new strains of antibiotic resistant bacteria.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how antibiotic resistant bacteria evolve.		1 2 3 4 5 6 7 8
	5	Explain why scientists need to develop new antibiotics.		1 2 3 4 5 6 7 8
	6	Create an information sheet outlining important facts about antibiotic resistant bacteria to the public.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how a fast reproduction rate is linked to the development of antibiotic resistance strains of bacteria.		1 2 3 4 5 6 7 8
	8	Explain how antibiotic resistant bacteria are evidence for evolution.		1 2 3 4 5 6 7 8
	9	Summarise the reasons why the development of new antibiotics is unlikely to keep up with the emergence of new strains of antibiotic resistant bacteria.		1 2 3 4 5 6 7 8

Level	Obj No	B15 Genetics and evolution	Started (/) Completed	Level Achieved
		15.10 New systems of classification		
Grade 4	1	Describe what classification is.		1 2 3 4 5 6 7 8
	2	Classify animals into groups based on their shared characteristics.		1 2 3 4 5 6 7 8
	3	Write an organism's name correctly using the binomial system.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the classification system developed by Carl Linnaeus, to include the order of the taxonomic groups.		1 2 3 4 5 6 7 8
	5	Identify genus and species from a scientific name.		1 2 3 4 5 6 7 8
	6	Explain why a binomial naming system is useful.		1 2 3 4 5 6 7 8
Grade 8	7	Use the Linnaean system to name the groups that given organisms belong to.		1 2 3 4 5 6 7 8
	8	Suggest why hybrids are not assigned scientific names using the binomial system.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.1 The importance of communities		
Grade 4	1	Describe what is meant by ecosystem, population, and community.		1 2 3 4 5 6 7 8
	2	List some resources that living things need.		1 2 3 4 5 6 7 8
	3	Use a given example to describe why one species relies on another.		1 2 3 4 5 6 7 8
Grade 6	4	Define the terms community, population, habitat, ecosystem, abiotic factor, biotic factor.		1 2 3 4 5 6 7 8
	5	Describe what a stable community is and give an example.		1 2 3 4 5 6 7 8
	6	Suggest how one species relies on another.		1 2 3 4 5 6 7 8
Grade 8	7	Link key words to explain why a community is stable and important.		1 2 3 4 5 6 7 8
	8	Use evidence to write hypotheses about why populations have changed in a community.		1 2 3 4 5 6 7 8
	9	Explain why interdependence is important in maintaining a stable community.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.2 Organisms in their environment		
Grade 4	1	Identify factors as biotic or abiotic		1 2 3 4 5 6 7 8
	2	Use an instrument to measure an abiotic factor.		1 2 3 4 5 6 7 8
Grade 6	3	Describe how a factor influences the distribution of organisms.		1 2 3 4 5 6 7 8
	4	Record measurements of abiotic factors.		1 2 3 4 5 6 7 8
Grade 8	5	Describe in detail how to measure the pH and water content of soil.		1 2 3 4 5 6 7 8
	6	Analyse data in detail and draw appropriate conclusions.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.3 Distribution and abundance		
Grade 4	1	Describe the function of a quadrat and a transect.		1 2 3 4 5 6 7 8
	2	Follow a method to estimate a population using a sampling technique.		1 2 3 4 5 6 7 8
	3	Calculate the mean of a set of results.		1 2 3 4 5 6 7 8
Grade 6	4	Explain how to use a quadrat and a transect to estimate population sizes.		1 2 3 4 5 6 7 8
	5	Design a method to estimate a population using a sampling technique.		1 2 3 4 5 6 7 8
	6	Calculate range, mean, median, and mode in order to analyse results.		1 2 3 4 5 6 7 8
Grade 8	7	Discuss what factors determine the size of the quadrat used.		1 2 3 4 5 6 7 8
	8	Design independently an investigation based around a question or hypothesis.		1 2 3 4 5 6 7 8
	9	Evaluate in detail the use of sampling to estimate population size.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.4 Competition in animals		
Grade 4	1	Recognise that animals compete with each other for resources.		1 2 3 4 5 6 7 8
	2	List resources that animals compete with each other for.		1 2 3 4 5 6 7 8
	3	Describe what will happen to an animal if it cannot compete for resources.		1 2 3 4 5 6 7 8
Grade 6	4	Use information to suggest factors that animals are competing for in a given habitat.		1 2 3 4 5 6 7 8
	5	Explain tactics that help an animal compete for a resource.		1 2 3 4 5 6 7 8
	6	Describe how the distribution of a species has changed because of competition.		1 2 3 4 5 6 7 8
Grade 8	7	Evaluate a model of competition between organisms.		1 2 3 4 5 6 7 8
	8	Use the terms inter-specific and intra-specific competition, and give examples of each.		1 2 3 4 5 6 7 8
	9	Suggest and explain how animals are adapted to compete for resources.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.5 Competition in plants		
Grade 4	1	List resources that plants compete with each other for.		1 2 3 4 5 6 7 8
	2	Describe what seed dispersal is and give some ways in which plants carry it out.		1 2 3 4 5 6 7 8
	3	Make measurements of seedlings.		1 2 3 4 5 6 7 8
Grade 6	4	Suggest factors that plants are competing for in a given habitat.		1 2 3 4 5 6 7 8
	5	Explain why plants use seed dispersal.		1 2 3 4 5 6 7 8
	6	Describe the methods plants use to outcompete others or avoid competition.		1 2 3 4 5 6 7 8
Grade 8	7	Plan a method to investigate competition between cress seeds.		1 2 3 4 5 6 7 8
	8	Analyse data to explain the effects of overcrowding.		1 2 3 4 5 6 7 8
	9	Suggest the problems caused by plants that can easily outcompete others.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.6 Adapt and survive		
Grade 4	1	Describe one example of how an organism is adapted.		1 2 3 4 5 6 7 8
	2	Define an extremophile.		1 2 3 4 5 6 7 8
Grade 6	3	Suggest features that an organism may have in order to survive in a given habitat.		1 2 3 4 5 6 7 8
	4	Explain how adaptations allow an organism to survive in its habitat.		1 2 3 4 5 6 7 8
Grade 8	5	Suggest and explain in detail how an organism in an extreme location might evolve to become better adapted to its habitat.		1 2 3 4 5 6 7 8
	6	Apply knowledge of extremophiles to discuss why scientists believe there could be life on other planets (or moons).		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.7 Adaptations in animals		
Grade 4	1	Describe one example of an animal adaptation.		1 2 3 4 5 6 7 8
	2	Describe why it is important that most animals maintain the correct body temperature.		1 2 3 4 5 6 7 8
	3	Describe why fur or feathers can be used to maintain a warm body temperature.		1 2 3 4 5 6 7 8
Grade 6	4	Classify adaptations as structural, behavioural, or functional.		1 2 3 4 5 6 7 8
	5	Calculate surface area to volume ratio.		1 2 3 4 5 6 7 8
	6	Describe how animals are adapted to live in hot, dry, and cold habitats.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest structural, behavioural, or functional adaptations.		1 2 3 4 5 6 7 8
	8	Explain and illustrate how surface area to volume ratio is linked to maintaining the correct body temperature.		1 2 3 4 5 6 7 8
	9	Discuss how and why climate change is affecting the distribution of animals.		1 2 3 4 5 6 7 8

Level	Obj No	Biology - B16 Adaptations, interdependence, and competition	Started (/) Completed	Level Achieved
		16.8 Adaptations in plants		
Grade 4	1	Describe one example of a plant adaptation.		1 2 3 4 5 6 7 8
	2	Describe why plants need a constant supply of water.		1 2 3 4 5 6 7 8
	3	Draw a graph to display data, with guidance.		1 2 3 4 5 6 7 8
Grade 6	4	Explain how a plant adaptation allows it to survive in its habitat.		1 2 3 4 5 6 7 8
	5	Explain why plants need to reduce water loss by transpiration.		1 2 3 4 5 6 7 8
	6	Display data using a graph and describe what it shows.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how an unfamiliar plant is adapted and give reasons for its adaptations.		1 2 3 4 5 6 7 8
	8	Link and explain rate of transpiration to leaf structure.		1 2 3 4 5 6 7 8
	9	Suggest and explain why a cactus would not survive in a cold climate.		1 2 3 4 5 6 7 8

Level	Obj No	B17 Organising and ecosystem	Started (/) Completed	Level Achieved
		17.1 Feeding relationships		
Grade 4	1	State the meaning of the terms producer, consumer, predator, and prey, and give examples of each.		1 2 3 4 5 6 7 8
	2	Identify producers, consumers, predators, and prey in a food chain.		1 2 3 4 5 6 7 8
	3	Describe what a graph shows about how the numbers of predators and prey change over time.		1 2 3 4 5 6 7 8
Grade 6	4	Identify producers, primary consumers, secondary consumers, tertiary consumers, predators, and prey in a food web.		1 2 3 4 5 6 7 8
	5	Describe what happens to a population in a food web when another population changes.		1 2 3 4 5 6 7 8
	6	Plot data as a line graph and explain the pattern of predator and prey populations.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail why all living things depend on producers.		1 2 3 4 5 6 7 8
	8	Evaluate in detail food chains/webs as models to show feeding relationships.		1 2 3 4 5 6 7 8
	9	Make predictions based on data on a predator–prey relationship.		1 2 3 4 5 6 7 8

Level	Obj No	B17 Organising and ecosystem	Started (/) Completed	Level Achieved
		17.2 Materials cycling		
Grade 4	1	Describe what a decomposer is and give examples.		1 2 3 4 5 6 7 8
	2	Name some substances that are recycled in the living world.		1 2 3 4 5 6 7 8
	3	Describe the events in the water cycle.		1 2 3 4 5 6 7 8
Grade 6	4	Explain why decomposers are important to a stable ecosystem.		1 2 3 4 5 6 7 8
	5	Explain the importance of recycling substances.		1 2 3 4 5 6 7 8
	6	Describe the events in the decay cycle.		1 2 3 4 5 6 7 8
Grade 8	7	Explain how detritivores increase the rate of decay using ideas about surface area.		1 2 3 4 5 6 7 8
	8	Explain how substances change as they decay.		1 2 3 4 5 6 7 8
	9	Comment on the limitations of a simple model of decay.		1 2 3 4 5 6 7 8

Level	Obj No	B17 Organising and ecosystem	Started (/) Completed	Level Achieved
		17.3 The carbon cycle		
Grade 4	1	Recognise that carbon atoms are moved around the Earth (recycled).		1 2 3 4 5 6 7 8
	2	Give one reason why we need to recycle carbon.		1 2 3 4 5 6 7 8
	3	Use a diagram of the carbon cycle to describe the main processes involved.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the events in the carbon cycle.		1 2 3 4 5 6 7 8
	5	Explain why the carbon cycle is vital to life on Earth.		1 2 3 4 5 6 7 8
	6	Write word equations for photosynthesis, respiration, and combustion.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail why the concentration of carbon dioxide in the atmosphere is rising, and why this is an issue.		1 2 3 4 5 6 7 8
	8	Explain the links between photosynthesis, respiration, and combustion in the carbon cycle.		1 2 3 4 5 6 7 8
	9	Write balanced symbol equations for photosynthesis, respiration, and combustion.		1 2 3 4 5 6 7 8

Level	Obj No	B17 Organising and ecosystem	Started (/) Completed	Level Achieved
		17.4 Competition in animals		
Grade 4	1	List the factors that affect the rate of decay.		1 2 3 4 5 6 7 8
	2	Choose a suitable independent variable and a way of changing it.		1 2 3 4 5 6 7 8
	3	Plot a line graph with more than one line plotted on the same axes, with guidance.		1 2 3 4 5 6 7 8
Grade 6	4	Identify factors that speed up or slow down decay.		1 2 3 4 5 6 7 8
	5	Choose a suitable dependent variable and plan a way to measure it accurately.		1 2 3 4 5 6 7 8
	6	Plot a line graph with more than one line plotted on the same axes.		1 2 3 4 5 6 7 8
Grade 8	7	Explain why factors speed up or slow down decay.		1 2 3 4 5 6 7 8
	8	Apply factors which affect the rate of decay to real life situations (e.g., compost making, preserving food).		1 2 3 4 5 6 7 8
	9	Calculate percentage change and rate of decay.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.1 The human population explosion		
Grade 4	1	Describe what biodiversity means.		1 2 3 4 5 6 7 8
	2	List some resources that humans are using up.		1 2 3 4 5 6 7 8
	3	Describe some ways that air, water, and land are polluted.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how sewage, fertilisers, pesticides, and herbicides pollute the land and water.		1 2 3 4 5 6 7 8
	5	Describe the processes of eutrophication and bioaccumulation.		1 2 3 4 5 6 7 8
	6	Draw conclusions from data.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how pollution affects biodiversity.		1 2 3 4 5 6 7 8
	8	Explain how pesticides in water can kill top predators in food chains.		1 2 3 4 5 6 7 8
	9	Consider a land- or water-based pollution issue, stating opinions with reasoning.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.10 Factors affecting food security		
Grade 4	1	Describe what food security and malnutrition mean.		1 2 3 4 5 6 7 8
	2	List some factors that reduce food security.		1 2 3 4 5 6 7 8
	3	Present information in a debate.		1 2 3 4 5 6 7 8
Grade 6	4	Define sustainable food production and describe how it could help increase food security.		1 2 3 4 5 6 7 8
	5	Explain how factors affect food security.		1 2 3 4 5 6 7 8
	6	Present information based on research.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest and explain how events could affect food security.		1 2 3 4 5 6 7 8
	8	Consider whether malnutrition is just a problem in developing countries.		1 2 3 4 5 6 7 8
	9	Present information clearly with supporting evidence.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.11 Making food production efficient		
Grade 4	1	Describe the difference between free-range and factory farming of chickens.		1 2 3 4 5 6 7 8
	2	List some advantages and disadvantages of free-range and factory farming of chickens.		1 2 3 4 5 6 7 8
Grade 6	3	Explain why there could be more food for everyone if we ate less meat.		1 2 3 4 5 6 7 8
	4	Explain why there are ethical objections to some factory farming techniques.		1 2 3 4 5 6 7 8
	5	Explain how factory farming techniques increase rate of growth.		1 2 3 4 5 6 7 8
Grade 8	6	Use viewpoints from a range of people during a debate on farming.		1 2 3 4 5 6 7 8
	7	Explain in detail why, in terms of food production efficiency, it is a good idea to reduce meat in the diet or replace it with insects.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.12 Sustainable food production		
Grade 4	1	Give one reason why fish stocks in the oceans are decreasing.		1 2 3 4 5 6 7 8
	2	Describe one reason why a reduction in fish stocks is a problem.		1 2 3 4 5 6 7 8
	3	Describe what mycoprotein is.		1 2 3 4 5 6 7 8
Grade 6	4	Describe the reasons why fish stocks in the oceans are decreasing.		1 2 3 4 5 6 7 8
	5	Describe the techniques used to conserve fish stocks.		1 2 3 4 5 6 7 8
	6	Describe how mycoprotein is produced.		1 2 3 4 5 6 7 8
Grade 8	7	Explain the negative impacts of fishing restrictions on communities.		1 2 3 4 5 6 7 8
	8	Compare and contrast the production of mycoprotein with intensive farming.		1 2 3 4 5 6 7 8
	9	Explain the advantages of eating mycoprotein for the individual and for society as a whole.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.2 Land and water pollution		
Grade 4	1	List some substances that pollute water and land.		1 2 3 4 5 6 7 8
	2	Describe some effects of rubbish, pesticides, and sewage on land and water.		1 2 3 4 5 6 7 8
	3	Display data appropriately with guidance.		1 2 3 4 5 6 7 8
Grade 6	4	Describe why a good level of biodiversity is important to the future of the human species.		1 2 3 4 5 6 7 8
	5	Describe some effects of human population growth.		1 2 3 4 5 6 7 8
	6	Analyse and interpret data and information concerning human population growth.		1 2 3 4 5 6 7 8
Grade 8	7	Use word and symbol equations to show how burning some fuels produces acidic gases.		1 2 3 4 5 6 7 8
	8	Explain what causes global dimming and smog, and describe their effects.		1 2 3 4 5 6 7 8
	9	Analyse in detail data showing sulfur emissions over the last 30 years, and suggest reasons for the trend.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.3 Air pollution		
Grade 4	1	State that acid rain is caused as a result of burning some fuels.		1 2 3 4 5 6 7 8
	2	List some effects of acid rain on plants and animals.		1 2 3 4 5 6 7 8
	3	Analyse observations and data, with guidance.		1 2 3 4 5 6 7 8
Grade 6	4	Describe how acid rain is formed.		1 2 3 4 5 6 7 8
	5	Plan an investigation to find out how acid rain affects the germination of seeds.		1 2 3 4 5 6 7 8
	6	Choose a suitable method for analysing data.		1 2 3 4 5 6 7 8
Grade 8	7	Explain in detail how deforestation and peat removal increase the amount of carbon dioxide in the air.		1 2 3 4 5 6 7 8
	8	Analyse data to describe a trend in deforestation rate, and give an explanation.		1 2 3 4 5 6 7 8
	9	Explain the conflict between using peat to increase food production and the need to conserve peat bogs.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.4 Deforestation and peat destruction		
Grade 4	1	Define deforestation		1 2 3 4 5 6 7 8
	2	Describe an effect of deforestation		1 2 3 4 5 6 7 8
	3	Give a use for peat		1 2 3 4 5 6 7 8
Grade 6	4	Explain the effects of deforestation and peat removal.		1 2 3 4 5 6 7 8
	5	Categorise reasons for and effects of deforestation as environmental, social, economic, and/or political.		1 2 3 4 5 6 7 8
	6	Describe why there is a conflict between using peat to increase food production and the need to conserve peat bogs.		1 2 3 4 5 6 7 8
Grade 8	7	Produce scale diagrams showing some of the contributors to the greenhouse effect.		1 2 3 4 5 6 7 8
	8	Explain in detail the causes and effects of rising carbon dioxide and methane levels in the atmosphere.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.5 Global warming		
Grade 4	1	Describe how global warming is caused by increased levels of carbon dioxide and methane in the atmosphere.		1 2 3 4 5 6 7 8
	2	Give one biological consequence of global warming.		1 2 3 4 5 6 7 8
Grade 6	3	Use the terms greenhouse effect, global warming, and climate change correctly.		1 2 3 4 5 6 7 8
	4	Describe in detail the biological consequences of global warming.		1 2 3 4 5 6 7 8
Grade 8	5	Categorise environmental changes as due to seasonal changes, geographical changes, human interaction, or a combination.		1 2 3 4 5 6 7 8
	6	Explain how people are attempting to reduce the problems caused by a change in distribution of organisms.		1 2 3 4 5 6 7 8
	7	Predict and explain how an environmental change will affect the distribution of an organism.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.6 Environmental change		
Grade 6	1	State some examples of environmental changes that affect the distribution of species in an ecosystem.		1 2 3 4 5 6 7 8
	2	Explain how humans can cause environmental changes.		1 2 3 4 5 6 7 8
	3	Describe an example of how environmental change has affected the distribution of a species.		1 2 3 4 5 6 7 8
Grade 8	4	Evaluate the conflicting pressures on maintaining biodiversity in some habitats.		1 2 3 4 5 6 7 8
	5	Link ideas to suggest why recycling can help protect habitats.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.7 Maintaining biodiversity		
Grade 4	1	List some ways in which people can help maintain biodiversity.		1 2 3 4 5 6 7 8
	2	Describe the reasons why some habitats are at risk.		1 2 3 4 5 6 7 8
Grade 6	3	Describe programmes to reduce negative effects on ecosystems and explain how they work.		1 2 3 4 5 6 7 8
	4	Use information to explain the conflicting pressures on maintaining biodiversity.		1 2 3 4 5 6 7 8
Grade 8	5	Explain why pyramids of biomass are always pyramid shaped.		1 2 3 4 5 6 7 8
	6	Evaluate a method for collecting information about biomass.		1 2 3 4 5 6 7 8
	7	Calculate the percentage of biomass passed between trophic levels.		1 2 3 4 5 6 7 8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved							
		18.8 Trophic levels and biomass									
Grade 4	1	Identify a producer, primary consumer, and secondary consumer from a food chain and pyramid of biomass.		1	2	3	4	5	6	7	8
	2	Identify organisms using a chart and group organisms into feeding types.		1	2	3	4	5	6	7	8
	3	Draw a pyramid of biomass, with guidance.		1	2	3	4	5	6	7	8
Grade 6	4	Number the trophic levels in a food chain, food web, and pyramid of biomass.		1	2	3	4	5	6	7	8
	5	Describe how decomposers feed.		1	2	3	4	5	6	7	8
	6	Use data to draw a pyramid of biomass and explain what it shows.		1	2	3	4	5	6	7	8
Grade 8	7	Calculate the efficiency of energy transfers.		1	2	3	4	5	6	7	8
	8	Explain in detail the reasons why not all biomass is passed from one trophic level to the next.		1	2	3	4	5	6	7	8
	9	Link the reduction in biomass to energy transfers, and evaluate a model used to represent this.		1	2	3	4	5	6	7	8

Level	Obj No	B18 Biodiversity and ecosystems	Started (/) Completed	Level Achieved
		18.9 Biomass transfers		
Grade 4	1	Describe the energy transfer that occurs during photosynthesis.		1 2 3 4 5 6 7 8
	2	Calculate the percentage of biomass passed between trophic levels, with guidance.		1 2 3 4 5 6 7 8
	3	Give a reason why not all biomass is passed from one trophic level to the next.		1 2 3 4 5 6 7 8
Grade 6	4	Calculate the percentage of biomass passed between trophic levels.		1 2 3 4 5 6 7 8
	5	Calculate the efficiency of transfers, with guidance.		1 2 3 4 5 6 7 8
	6	Explain how the loss of biomass at each trophic level affects the number of organisms at each level.		1 2 3 4 5 6 7 8
Grade 8	7	Suggest and explain how events could affect food security.		1 2 3 4 5 6 7 8
	8	Consider whether malnutrition is just a problem in developing countries.		1 2 3 4 5 6 7 8
	9	Present information clearly with supporting evidence.		1 2 3 4 5 6 7 8