

Assessment Schedule – 2013

Biology: Demonstrate understanding of biological ideas relating to micro-organisms (90927)

Evidence Statement

ONE	NØ	N1	N2	A3	A4	M5	M6	E7	E8
	No response/ no relevant evidence	ONE idea given	TWO ideas given	THREE ideas given	FOUR ideas given	THREE explanations given	FOUR explanations given	ONE full comparison between bacteria and fungi. Must link structure AND function	TWO full comparisons between bacteria and fungi, including both digestion and reproduction. Must link structure AND function
	<ul style="list-style-type: none"> • Bacteria feed by extra-cellular digestion. • Bacteria reproduce by binary fission / split in two. • Fungi feed by extra-cellular digestion. • Fungi reproduce from spores or budding (yeast). 					<ul style="list-style-type: none"> • Bacteria feed by extra-cellular digestion. They do this by releasing enzyme through their (cell wall), digesting the food outside the cell and reabsorbing the nutrients. • Fungi feed by extra-cellular digestion. They do this by releasing enzyme through the wall of their hyphae, digesting the food outside the cell and reabsorbing the nutrients. • Bacteria reproduce by replicating its DNA and then splitting in two by binary fission. • Fungi reproduce by producing many spores that are able to by carried away and grow new fungi (or implied). 		<ul style="list-style-type: none"> • Both the bacteria and fungi are able to use extracellular digestion to digest food. Fungi secrete enzymes through the hyphae AND bacteria secrete enzymes through their cell wall. • Both bacteria and fungi are able to reproduce asexually. Bacteria reproduce by the process of binary fission, whereby the bacterium replicates its DNA /genetic material before the cell divides into two. Fungi reproduce by producing many spores that are able to by carried away by wind and grow new fungi. 	

TWO	NØ	N1	N2	A3	A4	M5	M6	E7	E8
	No response/ no relevant information	ONE idea given	TWO ideas given	THREE ideas given	FOUR ideas given	Explains ONE idea	Explains TWO ideas	Discusses the use of disks to test antibiotic resistance AND discusses ONE point on how the experiment is set up.	Discusses the use of disks to test antibiotic resistance AND discusses TWO points on how the experiment is set up.
	<ul style="list-style-type: none"> • The most effective antibiotic is penicillin. • Penicillin has the <u>largest</u> area around it where no bacteria grew. • A control is an experiment where the sample has nothing done to it / contains no antibiotic. • The plate is sterile which means that there are no bacteria/fungi on the plate before the experiment is started. • Bacteria are transferred using a (sterile) swab/loop OR another suitable technique. 					<ul style="list-style-type: none"> • In this experiment, it is there to show that the presence of the paper disk has no effect on bacterial growth OR to compare the control with the experimental results. • Before beginning the experiment, the agar plate is sterile. This is so that any bacteria that grow are due to the experiment, not contamination / to prevent contamination adversely affecting the experiment in some way. • Bacteria are transferred by using a (sterile) swab/loop and moving it in a zig-zag pattern across the agar plate OR a reasonable alternative method. 		<ul style="list-style-type: none"> • The most effective antibiotic would be penicillin because the area around it where no bacteria grew is the biggest. This is because the antibiotic stopped the bacteria from being able to reproduce / killed the bacteria. • As for Merit column, but must link contamination with a reason why the results may be invalid. • Bacteria are transferred by using a (sterile) swab / loop and moving it in a zig-zag pattern across the agar plate OR a reasonable alternative method. 	

THREE	NØ	N1	N2	A3	A4	M5	M6	E7	E8	
	No response / no relevant evidence	ONE idea given	TWO ideas given	THREE ideas given	FOUR ideas given	Explains ONE of: <ul style="list-style-type: none"> • heat in the compost • the need for good air flow • nutrient cycling 	Explains TWO of: <ul style="list-style-type: none"> • heat in the compost • the need for good air flow • nutrient cycling 	Discusses ONE of: <ul style="list-style-type: none"> • heat in the compost • the need for good air flow • nutrient cycling 	Discusses by showing clear links between TWO of: <ul style="list-style-type: none"> • heat in the compost • the need for good air flow • nutrient cycling 	
	<ul style="list-style-type: none"> • A saprophyte is an organism/bacteria/micro-organism that feeds on/gains nutrients from dead/decomposing/decaying material / waste products – not lives off. • The temperature of the compost heap increases (up to about day 8) and then it decreases again • The number of micro-organisms in the compost heap increase (up to about day 8) and then decrease. • Air flow lets in more oxygen. • The saprophytes (bacteria) are aerobic / need oxygen. • Micro-organisms help to recycle the carbon / carbon dioxide. • Respiration of micro-organisms reaches a maximum in the compost at about day 8 and then decreases. 					<ul style="list-style-type: none"> • (During the first 8 days) the bacteria and fungi are reproducing rapidly and carrying out (aerobic) respiration. • This respiration produces heat, which increases the temperature of the compost. • Good air flow lets in more oxygen (for respiration). This is because the decomposers are aerobic, so need O₂/provides more O₂ to prevent anaerobic respiration. • Explains that without decomposition, nutrients / carbon would not be available/ would run out/be all locked up in living animals and plants OR that fungi AND bacteria make nutrients / carbon available in usable form. 		<p>This respiration produces heat, which increases the temperature of the compost. (After day 8) the heat / toxins kills the micro-organisms.</p> <p>Good air flow lets in more oxygen for aerobic respiration. The decomposers are aerobic so need O₂. During the first 8 days the bacteria and fungi are reproducing rapidly, because there is plenty of food, and are carrying out aerobic respiration. Aerobic respiration is more efficient / releases more energy OR anaerobic respiration is less efficient / releases less energy / has undesirable products.</p> <p>Without decomposition, nutrients such as carbon would be locked up in living and dead animals and plants. The decomposition of these materials releases carbon, in the form of CO₂, which is then able to be used by plants / producers / for photosynthesis.</p>		

Judgement Statement

	Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
Score range	0 – 6	7 – 12	13 – 18	19 – 24