



GCSE MARKING SCHEME

SUMMER 2024

**GCSE
DOUBLE AWARD SCIENCE
BIOLOGY 1 - UNIT 1
3430U10-1 AND 3430UA0-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

DOUBLE AWARD SCIENCE
UNIT 1 BIOLOGY 1: FOUNDATION AND HIGHER TIER
SUMMER 2024 MARK SCHEME

GENERAL INSTRUCTIONS

Recording of marks

Examiners must mark in red ink.

One tick must equate to one mark (apart from the questions where a level of response mark scheme is applied).

Question totals should be written in the box at the end of the question.

Question totals should be entered onto the grid on the front cover and these should be added to give the script total for each candidate.

Marking rules

All work should be seen to have been marked.

Marking schemes will indicate when explicit working is deemed to be a necessary part of a correct answer.

Crossed out responses not replaced should be marked.

Credit will be given for correct and relevant alternative responses which are not recorded in the mark scheme.

Extended response question

A level of response mark scheme is used. Before applying the mark scheme please read through the whole answer from start to finish. Firstly, decide which level descriptor matches best with the candidate's response: remember that you should be considering the overall quality of the response. Then decide which mark to award within the level. Award the higher mark in the level if there is a good match with both the content statements and the communication statement. Award the middle mark in the level if most of the content statements are given and the communication statement is partially met. Award the lower mark if only the content statements are matched.

Marking abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

cao	=	correct answer only
ecf	=	error carried forward
bod	=	benefit of doubt

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)	(i)		Lungs	1			1		
		(ii)	I	Aorta	1			1		
			II	Capillary	1			1		
	(b)	(i)	I	dm ³ / min dm ³ min ⁻¹		1		1	1	
			II	all five bars correct = 2 3 / 4 bars correct = 1 Tolerance = less than one small square Max one mark for line graph		2		2	2	
		(ii)		4.4		1		1	1	
		(iii)	I	Increases / more		1		1		
			II	oxygen (1) respiration (1)		2		2		
				Question 1 total	3	7	0	10	4	0

Question				Marking details	Marks Available																			
					AO1	AO2	AO3	Total	Maths	Prac														
2	(a)			Platelets	1			1																
	(b)	(i)	I	{It / clotting} is <u>fastest</u> at {37 (°C) / that temperature} / that is when the clot forms <u>fastest</u>			1	1																
			II	(it is at) pH 7.4 / the pH is above 7			1	1																
		(ii)		<table><tr><td>enzymes</td><td>true or false</td></tr><tr><td>are made of amino acids</td><td></td></tr><tr><td>are needed to clot blood</td><td>true</td></tr><tr><td>may be found in the liquid part of blood</td><td>true</td></tr><tr><td>are lipids</td><td>false</td></tr><tr><td>have specific active sites</td><td>true</td></tr><tr><td>are not affected by temperature</td><td>false</td></tr></table> <div>5 correct = 4 4 correct = 3 3 correct = 2 2 correct = 1</div>	enzymes	true or false	are made of amino acids		are needed to clot blood	true	may be found in the liquid part of blood	true	are lipids	false	have specific active sites	true	are not affected by temperature	false	3		1	4		
enzymes	true or false																							
are made of amino acids																								
are needed to clot blood	true																							
may be found in the liquid part of blood	true																							
are lipids	false																							
have specific active sites	true																							
are not affected by temperature	false																							
				Question 2 total	4	0	3	7	0	0														

Question				Marking details	Marks Available											
					AO1	AO2	AO3	Total	Maths	Prac						
3	(a)			<ul style="list-style-type: none">{lowers / places / adds} <u>cover slip</u> (1)onto the {<u>slide</u> / cells} / using the (mounted) <u>needle</u> (1) MP2 linked to MP1		2		2		2						
	(b)			400		1		1	1	1						
	(c)			<table><tr><th>Cell structure</th><th>Function</th></tr><tr><td></td><td>controls cell / {holds / stores / contains / carries} {DNA / chromosomes / genes / genetic information} (1)</td></tr><tr><td>cytoplasm (1)</td><td></td></tr></table>	Cell structure	Function		controls cell / {holds / stores / contains / carries} {DNA / chromosomes / genes / genetic information} (1)	cytoplasm (1)		2			2		
Cell structure	Function															
	controls cell / {holds / stores / contains / carries} {DNA / chromosomes / genes / genetic information} (1)															
cytoplasm (1)																
	(d)			make {structures / parts / organelles / them / it / cells} {more visible / clearer / stand out} Ignore: easier to see	1			1		1						
	(e)	(i)		{too / very} small / {magnification / microscope} not {powerful / strong} enough / magnification not high enough		1		1								
		(ii)		<u>Electron</u>	1			1								
				Question 3 total	4	4	0	8	1	4						

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			A = bronchus (1) B = alveolus(i) (1) C = rib (1) Accept ribcage D = diaphragm (1)	4			4		
	(b)	(i)	I	{catch / hold / stick to / traps / collects / contains} {bacteria / them}		1		1		
			II	{move / push / carry / transfer / waft / sweeps / owtte} <u>mucus</u> {up / to throat / to mouth / away / out}		1		1		
		(ii)		cilia {paralysed / stop (working) / inactive} (1) {mucus / bacteria} enter lungs / {mucus / bacteria} not removed (1) Accept {thicker / more / build up} of {mucus / bacteria} / clogs the mucus OR heat of cigarette smoke {dries / clogs} mucus (1) {mucus / bacteria} {not removed / more difficult to remove} (1)		2		2		
	(c)	(i)		cancer / emphysema / COPD / bronchitis Accept asthma	1			1		
		(ii)		Idea of {passive / second hand} smoking / or description of		1		1		
				Question 4 total	5	5	0	10	0	0

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)	(i)		10 = 2 marks If incorrect award 1 mark for 100 – 90		2		2	2	
		(ii)		Any two (×1) from: obesity (1) ignore fat / overweight (Coronary) Heart Disease (1) circulatory disease / CVD (1) (type 2) diabetes (1) mobility issues (1) correct health related issue (1)	2			2		
	(b)			A {large number of / lots of / many} people B {different places / or description of} C ref to different {sex / ethnicity / language} D ref to different ages / children and adults E do it before (campaign) / do it {any date before July / in July} 2025 F repeat {after (campaign) / in July 2026} G ask {the question / 'do you eat a healthy diet?} H any ref. to {answers / results} I compare / more people were eating a healthy diet / OWTTE			6	6		

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
				<p>5-6 marks At least seven points from the indicative content To gain 6 marks must refer to all three areas in question <i>There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</i></p> <p>3-4 marks At least four points from the indicative content <i>There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</i></p> <p>1-2 marks At least one point from the indicative content <i>There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</i></p> <p>0 marks <i>No attempt made or no response worthy of credit.</i></p>						
				Question 5 total	2	2	6	10	0	0

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
6/1	(a)			absorb {sunlight / light (energy)} Accept trap / catch / capture etc	1			1		
	(b)	(i)		<ul style="list-style-type: none"> no carbon dioxide / carbon dioxide removed / sodium hydroxide absorbs carbon dioxide (1) Ignore reference to any other factor as well as CO₂ reject less {no / for} photosynthesis / unable to photosynthesise (1) {no / to make} starch (produced) / negative starch test (1) ignore ref to destarching / or description ignore ref to leaf being dead 	1	1	1	3		3
			II	Light blocked (by card) / no light / leaf under card not able to absorb light (1) Reject ref to no carbon dioxide / oxygen. {no / for} photosynthesis / no starch (produced) (1)	1	1		2		2
		(ii)		(leaf) C (1) Any one (x1) from has both light and carbon dioxide (1) not deprived of light and carbon dioxide (1) has all the limiting factors (1) has not been experimented on / owtte (1) 2 nd mp linked to first i.e. to the letter C			2	2		2
				Question 6 total	3	2	3	8	0	7

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
7/2	(a)			run off / wash off (by rain) / or description of (blown by) wind / carried in air ground water seepage / or description leaching / flooding	1			1		
	(b)	(i)		250 = 2 marks If incorrect award 1 mark for identifying 1 and 3.5 from graph 2.5 $((3.5-1) / 1) \times 100$ (doesn't matter what is being done with the 1 and 3.5)		2		2	2	
		(ii)		Any three (x1) from <ul style="list-style-type: none"> • (Number of) bacteria increase (1) • Bacteria {break down / decompose / decay} (1) • (dead) {plants / organisms} (1) • (bacteria) carry out respiration(1) • use up oxygen / oxygen decreases (1) 	2	1		3		
		(iii)		cold / colder / low temperature / not enough food / {not enough / low} oxygen / fertilisers not used in winter Ignore reference to light.		1		1		
				Question 7/2 total	3	4	0	7	2	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		<p>Quality of drawing 1 mark only. No fuzzy / sketchy outline. No breaks in outline (wall) Plant cell - elongated shape and thick surrounding wall and nucleus. (Wall must be thicker than cell membrane of cheek cell drawing). Wall can be a double line. Any organelles other than nucleus & cytoplasm = 0 marks</p> <p>Labels any two (x1): cell wall (1) nucleus (1) cytoplasm (1) cell membrane (1)</p> <p>2 correct labels + 1 incorrect label = 1 mark 1 correct label + 2 incorrect labels = 0 marks</p> <p>Labelling line must touch structure being labelled.</p>		3		3		3
		(ii)		<p>make {structures / parts / organelles / them / it / cells} {more visible / clearer / stand out} Ignore: easier to see</p>	1			1		
		(iii)	I	Measurement of cell length = 39 mm Accept 38-40		1		1	1	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
			II	<p>Using 39mm Magnification range = $\times 560$ (2 sf) = 2 marks Award 1 mark for any one of: Answer is correct but not given to 2 sf e.g 557.142857 If answer is incorrect but method is correct: $39000 \div 70$ $39 \div 0.07$</p> <p>Using 38mm Magnification range = $\times 540$ (2 sf) = 2 marks Award 1 mark for any one of: Answer is correct but not given to 2 sf e.g 542.857143 If answer is incorrect but method is correct: $38000 \div 70$ $38 \div 0.07$</p> <p>Using 40mm Magnification range = $\times 570$ (2 sf) = 2 marks Award 1 mark for any one of: Answer is correct but not given to 2 sf e.g 571.428571 If answer is incorrect but method is correct: $40000 \div 70$ $40 \div 0.07$</p> <p>ECF from (iii) Answer in (iii) $\times 1000 \div 70$</p>						
	(b)	(i)		Tissue	1			1		
		(ii)		(they have the same job and if grouped together they do the job) (more) efficient(ly) / productive / effective / owtte			1	1		
				Question 3 total	2	6	1	9	3	3

Question				Marking details	Marks available																	
					AO1	AO2	AO3	Total	Maths	Prac												
4	(a)	(i)		gall bladder correctly labelled	1			1														
		(ii)		pancreas correctly labelled reject pancrease	1			1														
	(b)	(i)		{Carbohydrazase / amylase} (1) has {digested / broken down} starch to glucose (1)		2		2														
		(ii)	I	diffusion / active transport	1			1														
			II	Blood / (blood) plasma		1		1														
		(iii)	I	amino acid(s)		1		1														
			II	<ul style="list-style-type: none">protease (1){digests / breaks down} {protein / it} (to amino acids) / {Protein / it} is broken down (into amino acids) (1) Broken into amino acids = 0	2			2														
	(c)			one mark for each correct row <table><tr><td></td><td></td><td></td><td></td></tr><tr><td>Biuret (solution)</td><td></td><td></td><td>protein (present)</td></tr><tr><td>Benedict's (solution)</td><td>blue</td><td></td><td></td></tr></table>					Biuret (solution)			protein (present)	Benedict's (solution)	blue					2	2		2
Biuret (solution)			protein (present)																			
Benedict's (solution)	blue																					
				Question 4 total	5	4	2	11	0	2												

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5				<p>Indicative content:</p> <p>A. <u>intercostal</u> muscles contract</p> <p>B. {ribs / rib cage / chest (wall) / thorax (wall)} {moves up / moves out / expands}</p> <p>C. diaphragm contracts.</p> <p>D. and {moves down / flattens}</p> <p>E. increase in <u>volume</u></p> <p>F. of {thorax / chest / space around the lungs / rib cage} ignore volume of lungs</p> <p>G. decrease in <u>pressure</u></p> <p>H. lungs {inflate / expand}</p> <p>I. and so air {drawn into / enters} {bronchi / bronchus / bronchiole / alveolus / air sac} (in correct context) reject oxygen</p> <p>5-6 marks At least seven points from the indicative content <i>There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</i></p> <p>3-4 marks At least four points from the indicative content <i>There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</i></p>	6			6		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				1-2 marks At least one point from the indicative content <i>There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</i> 0 marks <i>No attempt made or no response worthy of credit.</i>						
				Question 5 total	6			6		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			(+)3 (+)1 -1 -3 -5 (negative value must be shown) All correct for 1 mark		1		1	1	1
	(b)			<ul style="list-style-type: none"> Concentration of water outside {potato / cylinder} is greater (than inside) / or description of / ORA (1) Not MORE water outside than inside Water (molecules) moves into {potato / cylinder} (1) Causes {expansion / increase in size / length} (of cylinder) (1) (3 rd mark linked to 2 nd mark) Can be answered by ref. to dilute vs concentrated solutions OR hypotonic vs hypertonic solutions A straightforward definition of osmosis (not related to the information given in this question) = 0 marks		3		3		
	(c)	(i)		Any value within the range of >1% but <2%			1	1		1
		(ii)		Use a narrower range of solutions / smaller intervals / use 0.5 intervals (1) between 1.0% - 2.0% (1) {Use 1.1% - 1.9% / more concentrations between 1 and 2%} = 2 marks If candidate gives you a narrower range e.g. - 'Use 0.5, 1.0, 1.5, 2.0, 2.5, 3.0 ...' or use 1.5% award the 1 st mark.			2	2		2
	(d)			Temperature {Type / variety / age} of potato			1	1		1
				Question 6 total	0	4	4	8	1	5

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)			glucose + oxygen \longrightarrow carbon dioxide + water (+ energy / ATP) 1 mark for the reactants 1 mark for the products	2			2		
	(b)	(i)	I II	Both correct for 1 mark 3.5 - 4.5 minutes 14.5 -15.5 minutes			1	1	1	
		(ii)		As heart rate increases breathing rate increases / as one increases the other increased / higher the heart rate, higher the breathing rate / ORA (1) Any one (x1) from Breathing rate increases after heart rate increases / ORA (1) Breathing rate decreases after heart rate decreases / ORA (1) Changes in breathing rate lag behind changes in heart rate / owtte / ORA (1) Breathing rate takes longer to return to {normal / resting} / breathing rate does not return to normal but heart rate does / ORA (1)		2		2		
		(iii)	I	119 = 2 marks If incorrect award 1 mark 140 x 85 / 100 140 x 0.85 85% of 140		2		2	2	2

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
			II	Horizontal line drawn at 119 (length of line is not important) Tolerance less than one small square 116- 123 Ecf			1	1		1
		(iv)		Lactic acid {build up / produced} / anaerobic respiration creates lactic acid (1) Ref to oxygen debt (1) ref to oxygen required to {break down / get rid of / remove} lactic acid / oxygen is required to convert lactic acid to carbon dioxide and water (1)	2			2		
	(c)			Because less ATP produced / ORA) / only produces 2 ATP / Anaerobic produces 2 ATP but aerobic produces {more / 38} incomplete breakdown of glucose during anaerobic respiration / less energy <u>released</u> / ORA	1			1		
				Question 7 total	5	4	2	11	3	3

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	3	7	0	10	4	0
2	4	0	3	7	0	0
3	4	4	0	8	1	4
4	5	5	0	10	0	0
5	2	2	6	10	0	0
6	3	2	3	8	0	7
7	3	4	0	7	2	0
Paper total	24	24	12	60	7	11

HIGHER TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	3	2	3	8	0	7
2	3	4	0	7	2	0
3	2	6	1	9	3	3
4	5	4	2	11	0	3
5	6	0	0	6	0	0
6	0	4	4	8	1	5
7	5	4	2	11	3	3
ACTUAL	24	24	12	60	9	21