



GCSE MARKING SCHEME

SUMMER 2025

**GCSE
BIOLOGY – UNIT 1
3400U10-1 AND 3400UA0-1**

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.

WJEC GCSE BIOLOGY
SUMMER 2025 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.

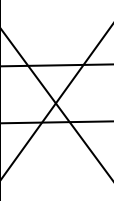
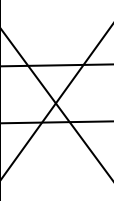
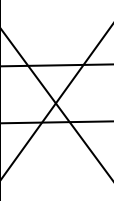
Extended response question

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 statements.

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)		Any single inclusion in the cell. If more than one inclusion, it must be labelled as the nucleus.	1			1		1					
		(ii)	I	Any two (×1) from - nucleus (1) - cytoplasm (1) <u>cell</u> membrane (1) - mitochondria (1)	2			2							
			II	Any one (×1) from - vacuole (1) - cell wall (1) - chloroplast (1)	1			1							
	(b)			<i>3/4 correct for 3 marks</i> <i>2 correct for 2 mark</i> <i>1 correct for 1 mark</i> <table><tr><td>chloroplast</td><td rowspan="4"></td></tr><tr><td>nucleus</td></tr><tr><td>cell membrane</td></tr><tr><td>cytoplasm</td></tr></table>	chloroplast		nucleus	cell membrane	cytoplasm	3			3		
chloroplast															
nucleus															
cell membrane															
cytoplasm															
	(c)	(i)		(Make structures) more visible / easier to see / see more clearly / add contrast	1			1		1					
		(ii)		30mm Accept 29-31		1		1	1	1					
		(iii)		(×)500 = 2 marks 30/0.06 = 1mark ecf		2		2	2	2					
				Total mark for question 1	8	3	0	11	3	5					

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)			A = liver (1) B = stomach (1) C = <u>large</u> intestine (1)	3			3		
	(b)			- oesophagus (1) - stomach (1) - small intestine (1)	3			3		
	(c)	(i)		{As age increases / the older they are} the { <u>percentage/% / number / population</u> } of overweight people increases (1) Or {As age increases / the older they are / as years increase} the more people are overweight (1)		1		1		1
		(ii)		Any one (×1) from Less exercise / Less active / sedentary lifestyle / owtte (1) High {fat / carbohydrate / sugar} diet / eating {more / too much} (1) / ORA			1	1		
		(iii)		Fat / oils / lipids (1) Carbohydrates / starch / sugar / any named sugar (1)	2			2		
		(iv)		216 000 = 2 marks Award 1 mark for: $60/100 \times 360\,000$ 0.6		2		2	2	
				Total mark for question 2	8	3	1	12	2	1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		Increases.		1		1		1
		(ii)		Respiration	1			1		
		(iii)		Glucose (1) Carbon Dioxide (1)	2			2		
	(b)			Any two (×1) from: (Same) {number / mass / volume/ 200g} of peas (1) (Flasks left for same length of) time/ 5 days (1) (Same) {volume / size / type of} flask (1) (Same) (species / type / variety) of peas (1) Cotton wool plug (used in both flasks) (1) (soaked in) disinfectant (1)		2		2		2
	(c)			Any two (×1) from: {Peas / Cells / they are} {dead / killed} / enzymes denatured (1) No respiration (1) No heat released (1)			2	2		2
	(d)			Kill {bacteria / fungi / micro-organisms} / stop {decomposition / decay}	1			1		1
				Total mark for question 3	4	3	2	9	0	6

Question				Marking details		Marks available					
						AO1	AO2	AO3	Total	Maths	Prac
4	(a)			A possible symptom of narrowing of coronary arteries is dizziness and fainting	True	1	1	1	3		
				The aim of angioplasty is to improve blood flow to the heart muscle cells.	True						
				Angioplasty is carried out whilst you are unconscious.	False						
				Stents are inserted by cutting open the heart during surgery.	False						
				Angioplasty always involves a stent	False						
				All four correct = 3 marks Three correct = 2 Two correct = 1 mark 0/1 correct = 0 marks							
	(b)			Keeps {artery / it} open / {widens / expands} {artery / it}				1	1		
	(c)	(i)		Any three (×1) from (Blood carries) oxygen (to the heart tissue) (1) (Blood carries) glucose (to the heart tissue) (1) For respiration (1) To give energy (to contract) (1)			2	1	3		
		(ii)		Any one (×1) from - Low / Less blood flow_(per contraction) (1) - Heart pumps less blood (per contraction) (1) - Heart has to pump more often {to pump enough blood} (1) - Heart pumps faster to increase blood flow				1	1		
				Total mark for question 4		1	3	4	8	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5				Indicative content A. Transparent {cuticle/epidermis} (to allow light in) B. {Palisade cells / chloroplasts / chlorophyll} {absorb / take in / use} light. Light {enters / goes} into {Palisade cells / chloroplasts / chlorophyll}. C. Palisade cells have (lots of) chloroplasts / tightly packed palisade cells / palisade cells close to top of leaf / owtte D. chlorophyll is in chloroplasts. E. photosynthesis occurs in {palisade cells / chloroplasts / chlorophyll} F. Water (carried) in xylem / sugars (carried) in phloem G. Carbon dioxide in / Carbon dioxide and oxygen in and out H. Oxygen out I. Correct reference to stoma(ta) / air spaces 5-6 marks At least 7 points from indicative content 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. 3-4 marks At least 4 points from indicative content 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.	2	4	0	6	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				1-2 marks At least 1 points from indicative content There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. 0 marks No attempt made or no response worthy of credit.						
				Total mark for question 5	2	4	0	6	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			Potometer	1			1		1
	(b)	(i)		Temperature scale (must cover ½ grid)		1		1	1	1
		(ii)		All plots correct = 2marks 4 plots correct = 1mark 3 or less plots correct = 0marks Plots to be within 1 small square.		2		2	2	2
		(iii)		Join plots with a ruler		1		1	1	1
	(c)			The higher the temperature the {greater the volume of / the more} water {lost / evaporates / transpires}.		1		1		1
	(d)			0.2 = 3 marks If incorrect award 2 marks for 0.18666666666667 / 0.18 / 0.19 / 0.1 (incorrect rounding) If incorrect award 1 mark for 5.6/30		3		3	3	3
	(e)	(i)	I	35 °C (1)			1	1		1
			II	All (3) results were the same / no variation in results/ all 7.9 (1)			1	1		1
		(ii)		Get another group to repeat their method / compare with another group			1	1		1
	(f)			Independent – {wind / fan} <u>speed</u> (1) Dependent – <u>volume</u> of water loss (in 30 minutes) / distance travelled by bubble (in 30 minutes) (1)			2	2		2
				Total mark for question 6	1	8	5	14	7	14

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7/1	(a)	(i)		A = Respiration (1) Reject: breathing C = Combustion (1) Accept burning D = feeding / eating / consuming / consumption/ ingestion (1) Ignore: digestion	3			3		
		(ii)		Photosynthesis		1		1		
		(iii)		Any one (×1) from - Carbohydrates / named e.g. glucose / starch / cellulose - Fats / oils / lipids - Proteins/ amino acids - Nucleic acids / DNA / RNA	1			1		
	(b)	(i)		20.93023256 = 2 marks Accept any correct rounding If incorrect award 1 mark for: 20 (any incorrect rounding) 4 500/21 500 x 100		2		2	2	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		Any two (x1) from • Nitrate (1) Reject: Nitrogen • Potassium (1) • Phosphate (1) Reject: phosphorus Award 1 for fertiliser / NPK if no answer above given Ignore: minerals / nutrients • manure / slurry (1) Accept animal waste • compost (1) • pesticide (1) • insecticide (1) • fungicide (1) • herbicide / weedkiller (1)	2			2		
				Total mark for question 7/1	6	3	0	9	2	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8/2	(a)			Lock and Key	1			1		
	(b)			24		1		1	1	1
	(c)	(i)		40(°C)			1	1		1
		(ii)		- Narrower range of temperatures / smaller intervals / e.g. 1, 2, 5(°C) (1) - between 30-50 (1) Award 2 marks for an example of a range between 30 and 50 e.g. Do 30, 32, 34, 36, 38, 40..... 50(°C) (2)			2	2		2
		(iii)		- No starch {digested / broken up / broken down} / starch cannot be broken down / {100% of / all} the starch remained / starch cannot be broken down (1) <u>Active site</u> changes shape / enzyme denatures / active site denatures (1) {Substrate / starch} does not fit / no enzyme-substrate complexes / substrate not complementary to the active site / so no successful collision (1)		3		3		
	(d)	(i)		Iodine (solution) (1)	1			1		1
		(ii)		(Stays) {brown / orange / yellow} (1) <u>Starch</u> {(molecules) too big / does not fit through {pores / visking / tubing / membrane}} (1)		1	1	2		2
				Total mark for question 8/2	2	5	4	11	1	7

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		Cell membrane correctly identified (line must be unambiguous) and Controls {the substances that/ what} enter(s) and leave(s) the {cell / <i>Amoeba</i> } (1)	1			1		
		(ii)		142.857143 or 141.428571 = 3 marks Accept any correct rounding If incorrect award 2 marks for 100000/700 or 99000/700 100/0.7 or 99/0.7 If incorrect award 1 mark for conversion of their measurement from mm to μm or 700 (μm) to 0.7(mm)		3		3	3	
		(iii)		Diffusion (1)	1			1		
	(b)			Any three (x1) from • Intercostal muscles contract (1) • Ribs move up and out (1) • Diaphragm {contracts / flattens} (1) • {Volume / it} {increases / expands} (1)	3			3		
				Total for Question 3	5	3	0	8	3	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		(Some is) reflected / passes through the leaf / {only certain / not all} {wavelengths / only some colours} are absorbed / wrong wavelength to be absorbed / {not enough / limited chloroplasts}		1		1		
		(ii)		8.5/ 9 = 2 marks If incorrect award 1 mark for 850/10 000 ×100 8 (incorrect rounding)		2		2	2	
		(iii)		Any one (x1) from heat (1) respiration (1) waste / faeces (1) not all {plant / animal / biomass / or example} is eaten (1) excretion (1) egestion (1) movement (1)	1			1		
		(iv)		{Not enough / little} energy (available)	1			1		
	(b)	(i)		60= 2 marks 5 x 12 = 1 mark		2		2	2	
		(ii)		Feeding levels labelled correctly in correct order (1) biomass + units (seen once) (ecf from (i)) (1) Accept correct scale Bars correct proportions (1) tolerance of less than one small square		3		3		
Total for Question 4					2	8	0	10	4	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5				Indicative content A. (Lack of) nitrate = {poor / less / stunted} growth / required for growth / needed to make {amino acids / proteins} B. (Lack of) potassium = yellow leaves / stop leaves going yellow C. (Lack of) phosphate = {poor / less / stunted} root(s) (growth) / required for root growth D. (Mineral ions taken up by) active transport E. (into) <u>root hair</u> (cells) F. Higher concentration in {root / plant} / lower concentration in {soil / solution / outside} / Example of data for one or more mineral ions from table G. {Ions / it / they} {taken up / move} {against concentration gradient / from a low to a high concentration} H. (Active transport) requires {ATP / energy} I. from (aerobic) respiration 5-6 marks At least 7 points from indicative content 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.	4	2	0	6	0	6

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				3-4 marks At least 4 points from indicative content 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. 1-2 marks At least 1 point from indicative content There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar. 0 marks No attempt made or no response worthy of credit.						
				Total for Question 5	4	2	0	6	0	6

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)	(i)		A – vena cava B – pulmonary vein	2			2		
		(ii)		{atrioventricular / tricuspid / bicuspid} valves are shut / valves between the atria and ventricles are shut (1) Semi lunar valves are open / valves in the {pulmonary artery / aorta / arteries} are open (1)		2		2		
	(b)			- Mixing of oxygenated and deoxygenated blood / deoxygenated blood enters the left side (of the heart) / oxygenated and deoxygenated blood not separated (1) - Less oxygen reaches the {cells / tissues / organs / body} / blood going to organs not fully oxygenated / owtte (1) - Tiredness / lack of energy / lethargic / fatigue (1) OR - Blood moves from left ventricle to right ventricle (1) - Extra blood in the lungs / oxygenated blood reaches the lungs (1) {High pressure (in the lungs) / pulmonary hypertension} / less oxygen taken up by blood (1)			3	3		
	(c)	(i)		Any three (×1) from: A. (Atheroma / blood clot) {narrows / blocks / clogs} {artery / blood vessel} (1) B. {Less / no} {oxygen / glucose / oxygenated blood / blood} reaches {heart / cardiac} {tissue / cells / muscle} (1) C. {Less/ no} respiration / less {oxygen / glucose} for respiration (1) D. Heart attack / Angina (1)	1	2		3		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)		(Atheroma) blocks blood flow to {larger / more} (area / part of the ventricle / heart) / ORA (1) Less (of it / the ventricle / heart (muscle)) contracts (1)			2	2		
		(iii)		Angioplasty (1) Any two (×1) from: Balloon inserted (into a blood vessel) (1) Balloon inflated (1) Reference to stent (1)	3			3		
				Total for Question 6	6	4	5	15	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)	(i)	I	{Animals / snails / organisms} carry out respiration (1) {Releasing / increasing} carbon dioxide (1)	1	1		2		2
			II	Plants carry out photosynthesis (1) {Using / decreasing / taking in} carbon dioxide (1)	1	1		2		2
			III	No light so no photosynthesis / photosynthesis requires light / no photosynthesis in the dark (1) (Only) respiration takes place (1)	1	1		2		2
		(ii)		{snails and plants / organisms} are producing {CO ₂ faster / more CO ₂ } than the plants are using it			1	1		1
		(iii)		Control / comparison (1) To show changes in carbon dioxide level are due to {plants / animals in tubes / owtte} / ORA (1)			2	2		2
	(b)			Any two (×1) from: Light intensity (for tubes A-D) (1) Volume of indicator (1) Concentration of indicator (1) Temperature (1) Volume of water (1) {Number / type} of snails (1) {Number / mass / type} of plants (1) Ignore pH / time			2	2		2
				Total for Question 7	3	3	5	11	0	11

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8	(a)	(i)		Stomata / stoma	1			1		
		(ii)		Higher magnification / owtte (1) Accept higher resolution / <u>more</u> detail /	1			1		
		(iii)		171 million/ 171 000 000 / 1.71×10^8 = 3 marks If incorrect award 2 marks for Evidence of calculating 60% e.g. $2\,850\,000 \times 60$ 171 (not included million) 1.71×10^x (incorrect standard form) If incorrect award 1 mark for 114 million = 40%		3		3	3	
	(b)	(i)		(Fungicides) enter water (1) {Accumulate / build up} through food chain / bioaccumulation / or description of (1) - Reach {toxic / poisonous / lethal / fatal} levels / reaches a {level / concentration} that {affects / decreases} {fertility / shell thickness / hatching} (1) OR (Fungicide) will kill fungi (1) - Which carry out decay (of dead plants and animals) (1) {Disrupting / affecting} {carbon / nitrogen} cycle (1)	2	1		3		
		(ii)		Less labour intensive / more efficient / less time consuming / quicker / OWTTE /			1	1		
	(c)			Increases {germination / growth} (of the fungus) / more favourable conditions for growth / increases enzyme activity			1	1		
				Total for Question 8	4	4	2	10	3	0

FOUNDATION TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

QUESTION	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	8	3	0	11	3	5
2	8	3	1	12	2	1
3	4	3	2	9	0	6
4	1	3	4	8	0	0
5	2	4	0	6	0	0
6	1	8	5	14	7	14
7	6	3	0	9	2	0
8	2	5	4	11	1	7
FOUNDATION TOTAL	32	32	16	80	14	33

HIGHER TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

QUESTION	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	6	3	0	9	2	0
2	2	5	4	11	1	7
3	5	3	0	8	3	0
4	2	8	0	10	4	0
5	4	2	0	6	0	6
6	6	4	5	15	0	0
7	3	3	5	11	0	11
8	4	4	2	10	3	0
HIGHER TOTAL	32	32	16	80	13	24