



GCSE MARKING SCHEME

SUMMER 2025

**GCSE
BIOLOGY - UNIT 2
3400U20-1 AND 3400UB0-1**

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 – UNIT 2**FOUNDATION and HIGHER****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

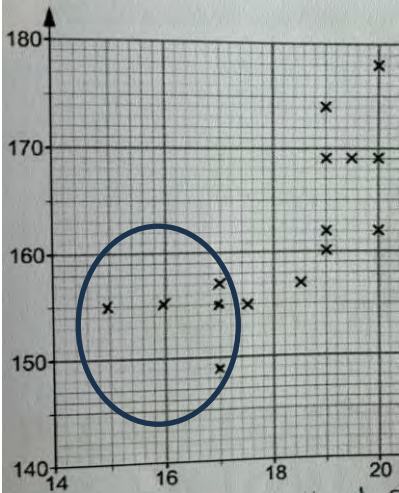
A level of response mark scheme is used. Before applying the mark scheme please read through the whole answer from start to finish. Firstly, decide which level descriptor matches best with the candidate's response: remember that you should be considering the overall quality of the response. Then decide 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)											
					mitosis	meiosis						
				produces 2 daughter cells	✓							
				produces daughter cells with half the number of chromosomes		✓						
				produces sex cells		✓						
				used for growth and repair	✓							
4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark												
	(b)			Cancer			1			1		
				Question 1 total			2	2	0	4	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)	(i)	I	Labels (Hand span+ height) (1) Units (cm + cm) (1)		2		2		2
			II	All 5 plots correct (3) Allow: 3 or 4 plots correct = 2 marks 2 plots correct = 1 mark 0/1 = 0 marks Tolerance $\pm$ less than one small square 		3		3	3	3
		(ii)	I	25, 155			1	1		1
			II	It does not fit the pattern / owtte			1	1		1
		(iii)		As hand span increases, so does height / As height increases, hand span increases / ORA Accept taller/bigger hands		1		1		1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iv)		The teacher was {a different age / more developed} / or description of / to make it a fair test			1	1		1
	(b)			Differences between individuals Not variety	1			1		
				Question 2 total	1	6	3	10	3	9

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		Antigens (1) Lymphocytes (1) Memory cells (1)	3			3		
		(ii)		Any one (x1) from: More antibodies can be produced / antibodies produced quicker (1) can destroy virus quicker (1) role of memory cell (1)			1	1		
	(b)			Circle antibody C		1		1		
	(c)	(i)		Choose to: Any one (x1) from do not want to catch flu (1) flu could be deadly (1) because they have a medical condition / owtte (1) Choose not to: Any one (x1) from - For most people symptoms are not severe (1) - right to choose / religious beliefs / influenced by media (1) - worrying about {possible / potential} side effects of vaccine (1) - usually recover (from flu) in a few days / owtte (1) - because they have a medical condition / owtte (1)			2	2		
		(ii)		Antibiotics {only destroy bacteria / do not destroy viruses}		1		1		
				Question 3 total	3	2	3	8	0	0

Question				Marking details			Marks available																		
							AO1	AO2	AO3	Total	Maths	Prac													
4	(a)	(i)		D (1) E (1) B (1)			3			3															
		(ii)		<table><tr><td>Structure</td><td>Cold conditions</td><td>Hot conditions</td></tr><tr><td>Erector muscle</td><td>Contracts (1) not constricts</td><td>relaxes</td></tr><tr><td>Hair</td><td>stands on end</td><td>Lies flat (1)</td></tr><tr><td>Sweat gland</td><td>{No / less} sweat (produced) (1)</td><td>sweat is produced</td></tr><tr><td>Blood vessel / capillary (1)</td><td>constricts / gets narrower</td><td>dilates / gets wider</td></tr></table>	Structure	Cold conditions	Hot conditions	Erector muscle	Contracts (1) not constricts	relaxes	Hair	stands on end	Lies flat (1)	Sweat gland	{No / less} sweat (produced) (1)	sweat is produced	Blood vessel / capillary (1)	constricts / gets narrower	dilates / gets wider	4			4		
Structure	Cold conditions	Hot conditions																							
Erector muscle	Contracts (1) not constricts	relaxes																							
Hair	stands on end	Lies flat (1)																							
Sweat gland	{No / less} sweat (produced) (1)	sweat is produced																							
Blood vessel / capillary (1)	constricts / gets narrower	dilates / gets wider																							
	(b)	(i)		Any two (x1) from Blood vessels {dilate / widen} (1) So more blood flowing to skin (1) More heat lost (1)				2		2															
		(ii)		(Muscles {shiver / contract}) releasing heat (1)			1			1															
		(iii)		Because they are sweating (1) Water needs to be replaced / ref to {stopping dehydration / staying hydrated / rehydration} (1)					2	2															
				Question 4 total			8	2	2	12	0	0													

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)	(i)		1 arrow drawn on renal artery towards kidney	1			1		
		(ii)		Bladder (1) Unambiguous labelled correctly on Image 7.1 (1)	2			2		
	(b)	(i)		Urea		1		1		
		(ii)		Protein would be present in the urine			1	1		
				Question 5 total	3	1	1	5	0	0

Question				Marking details	Marks available											
					AO1	AO2	AO3	Total	Maths	Prac						
6	(a)	(i)		Not native / alien species	1			1								
		(ii)		Any two (x1) from: Light (1) allow sunlight but not Sun unqualified Water (1) Minerals / nutrients (1) Accept named nutrients	2			2								
	(b)			Increase (1) Less competition (1)		2		2								
	(c)			Decrease (biodiversity) (1) Fewer <u>species</u> in an area (1)		2		2								
	(d)	(i)		<table><tr><th>Hazard</th><th>Risk</th><th>Control measure</th></tr><tr><td>Uneven ground on sand dune</td><td>{Tripping / falling} over when {counting / recording} (plants)</td><td>Wear suitable footwear / take care when walking</td></tr></table>	Hazard	Risk	Control measure	Uneven ground on sand dune	{Tripping / falling} over when {counting / recording} (plants)	Wear suitable footwear / take care when walking	1			1		1
Hazard	Risk	Control measure														
Uneven ground on sand dune	{Tripping / falling} over when {counting / recording} (plants)	Wear suitable footwear / take care when walking														
		(ii)	I	0.1		1		1	1	1						
			II	10000		1		1	1	1						
			III	1000 Ecf from I and II		1		1	1	1						
		(iii)		Any one (x1) from Use more quadrats Larger area Different areas of the dunes compare with other groups			1	1		1						

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iv)		Avoid bias	1			1		1
		(v)		(Same) time of year (1) (Same) location (1)			2	2		2
				Question 6 total	5	7	3	15	3	8

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7				Indicative content: A. two (long) chains B. (of alternating) sugar C. and phosphate D. connected by bases E. (the chains are twisted to form) a double helix F. there are four types of bases, G. A, T, C G H. base pairing I. between A and T, C and G 5-6 marks 7-9 points from IC <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> 3-4 marks 4-6 points from IC <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> 1-2 marks 1-3 points from IC <i>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.</i> 0 marks: No attempt made or no response worthy of credit.	2	4	0	6		
				Question 7 total	2	4	0	6	0	0

Question				Marking details	Marks available														
					AO1	AO2	AO3	Total	Maths	Prac									
8/1	(a)	(i)		Tongue and nose for 1 mark Ignore ref. to {mouth / taste buds / smell / taste}	1			1											
		(ii)	I	{Section / part / owtte} of a {DNA (molecule) / chromosome} / sequence of bases (1) which {determines / codes for / decides / controls} {characteristics / traits / phenotype / protein / sequence of amino acids} (1)	2			2											
			II	{{(Alternative) form / version / variation / type} of {a gene / the same gene} Reject different types of {genes / gene}	1			1											
	(b)	(i)		<table border="1"><tr><td>Gametes</td><td>T</td><td>t</td></tr><tr><td>t</td><td>Tt</td><td>tt</td></tr><tr><td>t</td><td>Tt</td><td>tt</td></tr></table> Gametes (1) Mechanics (1) (ecf)	Gametes	T	t	t	Tt	tt	t	Tt	tt		2		2		2
Gametes	T	t																	
t	Tt	tt																	
t	Tt	tt																	
		(ii)		Heterozygous genotype correctly circled		1		1											
		(iii)		50% / 0.5 / half/ $\frac{1}{2}$ Ecf from Punnett square		1		1	1										
	(c)			Any two (x1) from {Large number of / different / range of} countries (sampled / tested) (1) - Reference to {large / owtte} {sample size / number of people} (1) - the {percentage (of non-tasters / tasters) / results} are similar (1) - same test used (1)			2	2		2									
				Question 8/1 total	4	4	2	10	1	4									

Question				Marking details	Marks available															
					AO1	AO2	AO3	Total	Maths	Prac										
9/2	(a)			Fungi / fungus	1			1												
	(b)	(i)		Prevent <u>contamination</u> / prevent {microbes / bacteria} entering	1			1		1										
		(ii)		Any four (x1) from (explanation mark linked to factor mark – not marked independently) <table><tr><th>Factor</th><th>Explanation</th></tr><tr><td>oxygen (1)</td><td>(Sterile) air is pumped in (1)</td></tr><tr><td>pH (1)</td><td>{Acid / alkali} {is added/ reservoir} (1)</td></tr><tr><td>Temperature (of culture) (1)</td><td>{Water/cooling} jacket (1)</td></tr><tr><td>(Equal) mixing (of culture and broth) (1)</td><td>Paddles stir culture (1)</td></tr></table>	Factor	Explanation	oxygen (1)	(Sterile) air is pumped in (1)	pH (1)	{Acid / alkali} {is added/ reservoir} (1)	Temperature (of culture) (1)	{Water/cooling} jacket (1)	(Equal) mixing (of culture and broth) (1)	Paddles stir culture (1)	1			4		
Factor	Explanation																			
oxygen (1)	(Sterile) air is pumped in (1)																			
pH (1)	{Acid / alkali} {is added/ reservoir} (1)																			
Temperature (of culture) (1)	{Water/cooling} jacket (1)																			
(Equal) mixing (of culture and broth) (1)	Paddles stir culture (1)																			
					1															
						1														
	(c)	(i)		{Mass / it} increases up to {day 3 / 80 (a.u.)} (1) Then remains constant / owtte (1)		2		2		2										
		(ii)		Temperature = 26 (°C) (1) Time = 5 (days) (1)			2	2	2	2										
				Question 9/2 total	4	4	2	10	2	5										

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		Accept any hypothesis that links height (above ground) and number of spines e.g. as height (above ground) increases the number of spines increases (1) Hypothesis does not need to be correct			1	1		1
		(ii)	I	As height (of branch) increases number of spines decrease Accept low heights more spines and high heights less spines.		1		1		1
			II	(Increased spines) {stop / reduce} animals from {eating / feeding on} them / protect against herbivores Reject reference to predators			1	1		
		(iii)		Any two (x1) from - increase sample size / sample more leaves (1) - sample {between 2 and 3 metres / at regular height intervals} (1) - sample other (holly) trees (1) - compare with other groups (1)			2	2		2
				Question 3 total	0	1	4	5	0	4

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			A = <u>Erector</u> muscle B = Sweat gland C = <u>Blood</u> vessel / capillary 3 correct = 2 marks 2 correct = 1 mark 0 or 1 correct = 0 marks	2			2		
	(b)	(i)		Any four (x1) from (explanation must be linked to factor – do not mark independently) - vasoconstriction / blood vessels constrict / {Diameter / width} of blood vessels {decrease / narrow} (1) - less blood to skin / more blood remains in core (1) or - hair stands up (1) - trapping layer of air (1) or {less / no} sweat (produced) / {less / no} sweating / sweating stops (1) - less heat lost through evaporation (1)		4		4		
		(ii)		{Less / decreased} blood flow <u>to the brain</u> (1)			1	1		
				Question 4 total	2	4	1	7	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)	(i)		{Sugar phosphate / chain} correctly labelled with a line And base correctly labelled (1) Labelling must be unambiguous.	1			1		
		(ii)		Double helix (1)	1			1		
	(b)	(i)		Circle around 1 st A from the right (1) Accept CAC circled Ignore circling of amino acid.		1		1		
		(ii)		{Different / changed / altered} {base (sequence) / order of bases / triplet code / codons / triplets} / CTC has changed to CAC / T changed to A (1) {Different / changed / altered} {sequence / order} of amino acids / codes for different amino acid / glu has changed to val / one amino acid has changed (1) {Different / changed / altered} {protein / haemoglobin} / sickle cell {haemoglobin/ protein} made instead of normal {haemoglobin/ protein} (1)	1	2		3		
				Question 5 total	3	3	0	6	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)	(i)		4400 (2) If incorrect award 1 mark for 2200×2400/1200 (1)		2		2	2	2
		(ii)		11 (2) If incorrect award 1 mark for Correct calculation of area 400m ² 4400/400 Ecf from (i)		2		2	2	2
	(b)	(i)		Any one (x1) from - no immigration / emigration (1) Accept ref. to migration Any ref. to movement must be in context of in or out of <u>area</u> - marking technique does not affect {survival / predation} (1) - no births / deaths (1)	1			1		1
		(ii)		Any one (x1) from - avoid trampling / owtte (1) - use {non-toxic / non-permanent} marking technique (1) - minimise disturbance to habitat / owtte (1) - that method of marking does not {harm / affect chance of survival / increase predation / attract predators}			1	1		1
				Question 6 total	1	4	1	6	4	6

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)	(i)		Ultrafiltration (1) {Small molecules / named molecules} move from the {capillary (knot) / blood/ glomerulus} to the Bowman's capsule (1)	2			2		
		(ii)		Selective <u>re</u> absorption (of glucose) / {glucose / it} has been <u>re</u> absorbed (1)		1		1		
	(b)	(i)	I	Add Benedict's and heat (strongly) (1) turns {green / orange / red} (1) mark each point independently	2			2		2
			II	Add Biuret and turns {lilac / purple / violet } (1)	1			1		1
		(ii)	I	Diabetes			1	1		
			II	Kidney {disease / damage / failure}			1	1		
				Question 7 total	5	1	2	8	0	3

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8	(a)	(i)		{Fast / rapid} and {automatic / involuntary } (1)	1			1		
		(ii)		Indicative content: A. stimulus – heat B. receptor – {skin / finger} C. sensory neurone D. relay neurone E. motor neurone F. effector – muscle G. (response) – reference to description of withdrawal reflex H. coordinator – spinal cord I. ref. electrical {impulse / signal} Correct sequencing of C – F to access top band 5-6 marks 7-9 points of 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> 3-4 marks 4-6 points of 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> 1-2 marks 1-3 points of indicative content <i>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.</i> 0 marks: No attempt made or no response worthy of credit.	4	2		6		
				Question 8 total	5	2	0	7	0	0

Question				Marking details	Marks available														
					AO1	AO2	AO3	Total	Maths	Prac									
9	(a)	(i)		Any one(x1) from: - Morphological / (physical) {structure / characteristics / features / appearance} (1) - DNA / RNA (1) - genetic {analysis / sequencing / code} (1) {DNA / genetic} profiling (1)	1			1											
		(ii)		Any one from(x1) - Avoids confusion {with common names / in different parts of the world / between languages / between countries} (1) {Name is / it is / they are} universal / recognised {in all countries / globally} (1)	1			1											
	(b)			<table><tr><td></td><td>Type of cell division</td><td>Evidence</td></tr><tr><td>Image 9.1A</td><td>Meiosis (1)</td><td>4 {gametes / (daughter) cells} produced / gametes contain half the number of chromosomes/ cells are haploid (1)</td></tr><tr><td>Image 9.1B</td><td>Mitosis (1)</td><td>2 (daughter) cells produced / same number of chromosomes in (daughter) cells/ cells are diploid (1)</td></tr></table> Mark all points independently		Type of cell division	Evidence	Image 9.1A	Meiosis (1)	4 {gametes / (daughter) cells} produced / gametes contain half the number of chromosomes/ cells are haploid (1)	Image 9.1B	Mitosis (1)	2 (daughter) cells produced / same number of chromosomes in (daughter) cells/ cells are diploid (1)		4		4		
	Type of cell division	Evidence																	
Image 9.1A	Meiosis (1)	4 {gametes / (daughter) cells} produced / gametes contain half the number of chromosomes/ cells are haploid (1)																	
Image 9.1B	Mitosis (1)	2 (daughter) cells produced / same number of chromosomes in (daughter) cells/ cells are diploid (1)																	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(c)			Any one from(x1) - Male ant is {produced / {inherit / get / contain} chromosomes} from {unfertilised eggs / an egg / one gamete / one sex cell} whereas female ants are {produced / {inherit / get / contain} chromosomes} from {fertilised eggs / an egg and a sperm / 2 gametes / 2 sex cells} (1) - Male ants produced by asexual reproduction whilst female ants produced by sexual reproduction (1) Answer must be comparative			1	1		
	(d)			Asexual (reproduction) (1) Any one from(x1) {Same / original} {number / amount} of chromosomes in {offspring / worker ant} (1) - offspring {<u>genetically</u> identical / clones} (1) - only one parent (1) - no fertilisation (1) - No males present (1)		2		2		
				Question 9 total	2	6	1	9	0	0

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
10	(a)			A = protein coat / capsid (1) B = genes / genetic {material / information} / RNA (1) Accept DNA Reject chromosomes	2			2		
	(b)	(i)		90 = 2 marks If incorrect award 1 mark for $\frac{3800-2000}{2000} \times 100$ $\frac{1800}{2000} \times 100$		2		2	2	
		(ii)		{prevents / reduces} {it / virus / flu / aerosol / pathogen / droplets} from being {airborne / breathed {out / in} / spread <u>in air</u> } (1)		1		1		
	(c)			(elderly group) • Successful in that elderly group passed {target / 75%} (1) (any / all other group apart from elderly) • Not successful because {target not met / below the {target / 75%}} (1) • Use of data from table in comparison to {75% / WHO target} (in relation to either group) (1)			3	3		
	(d)	(i)		Antibiotics do not kill viruses / antibiotics only kill bacteria (1)	1			1		
		(ii)		Any three (x1) from • Antigen (in flu vaccine) (1) • (stimulates) lymphocytes (1) • to produce antibodies (1) • and memory cells (1) • which produce antibodies quickly (in response to infection) (1)	3			3		
				Question 10 total	6	3	3	12	2	0

FOUNDATION TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

QUESTION	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	2	2	0	4	0	0
2	1	6	3	10	3	9
3	3	2	3	8	0	0
4	8	2	2	12	0	0
5	3	1	1	5	0	0
6	5	7	3	15	3	8
7	2	4	0	6	0	0
8	4	4	2	10	1	4
9	4	4	2	10	2	5
TOTAL	32	32	16	80	9	26

HIGHER TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

QUESTION	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	4	4	2	10	1	4
2	4	4	2	10	2	5
3	0	1	4	5	0	4
4	2	4	1	7	0	0
5	3	3	0	6	0	0
6	1	4	1	6	4	6
7	5	1	2	8	0	3
8	5	2	0	7	0	0
9	2	6	1	9	0	0
10	6	3	3	12	2	0
TOTAL	32	32	16	80	9	22

3400U20-1 & 3400UB0-1 WJEC GCSE Biology – Unit 2 MS S25/MLS