



GCSE COMBINED SCIENCE: TRILOGY 8464/B/1F

Biology Paper 1F

Mark scheme

June 2026

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

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Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the examiner make their judgement
- the Assessment Objectives and specification content that each question is intended to cover.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right-hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent (for example, a scientifically correct answer that could not reasonably be expected from a student's knowledge of the specification).

2. Emboldening and underlining

- 2.1** In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following bullet points is a potential mark.
- 2.2** A bold **and** is used to indicate that both parts of the answer are required to award the mark.
- 2.3** Alternative answers acceptable for a mark are indicated by the use of **or**.
Alternative words in the mark scheme are shown by a solidus eg allow smooth / free movement.
- 2.4** Any wording that is underlined is essential for the marking point to be awarded.

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error / contradiction negates each correct response. So, if the number of errors / contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution?

[1 mark]

Student	Response	Marks awarded
1	green, 5	0
2	red*, 5	1
3	red*, 8	0

Example 2: Name **two** magnetic materials.

[2 marks]

Student	Response	Marks awarded
1	iron, steel, tin	1
2	cobalt, nickel, nail*	2

3.2 Use of symbols / formulae

If a student writes a chemical symbol / formula instead of a required chemical name, or uses symbols to denote quantities in a physics equation, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Marks should be awarded for each stage of the calculation completed correctly, as students are instructed to show their working. At any point in a calculation students may omit steps from their working. If a subsequent step is given correctly, the relevant marks may be awarded.

Full marks should be awarded for a correct numerical answer, without any working shown. Full marks are **not** awarded for a correct final answer from incorrect working.

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

An error can be carried forward from one question part to the next and is shown by the abbreviation 'ecf'.

Within an individual question part, an incorrect value in one step of a calculation does not prevent all of the subsequent marks being awarded.

3.6 Phonetic spelling

Marks should be awarded if spelling is not correct but the intention is clear, **unless** there is a possible confusion with another technical term.

3.7 Brackets

(.....) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.8 Allow

In the mark scheme additional information, 'allow' is used to indicate creditworthy alternative answers.

3.9 Ignore

Ignore is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

3.10 Do not accept

Do **not** accept means that this is a wrong answer which, even if the correct answer is given as well, will still mean that the mark is not awarded.

3.11 Numbered answer lines

Numbered lines on the question paper are intended to support the student to give the correct number of responses. The answer should still be marked as a whole.

4. Level of response marking instructions

Extended response questions are marked on level of response mark schemes.

- Level of response mark schemes are broken down into levels, each of which has a descriptor.
- The descriptor for the level shows the average performance for the level.
- There are two marks in each level.

Before you apply the mark scheme to a student's answer, read through the answer and, if necessary, annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1: Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level.

The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer. Do **not** look to penalise small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level.

Use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 2 with a small amount of level 3 material it would be placed in level 2 but be awarded a mark near the top of the level because of the level 3 content.

Step 2: Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do **not** have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

You should ignore any irrelevant points made. However, full marks can be awarded only if there are no incorrect statements that contradict a correct response.

An answer which contains nothing of relevance to the question must be awarded no marks.

Question 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	(A) leaf / leaves and (B) root(s)	do not accept root hair / cell	1	AO1 4.2.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	by transpiration		1	AO1 4.2.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	root hair (cell)		1	AO1 4.1.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	X		1	AO3 4.2.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	greater wind speed		1	AO2 4.2.3.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	grows	must be in this order	1	AO1 4.1.2.2
	doubles		1	
	divides		1	

Total Question 1	8
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Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	B		1	AO1 4.2.2.1
	C		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	C		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	stomach		1	AO1 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	amylase has an active site which is specific to starch		1	AO2 4.2.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5	black	allow blue-black allow <u>dark blue</u>	1	AO1 4.2.2.1 RPA3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	pH 7		1	AO3 4.2.2.1 RPA3 RPA4
	(because) it has the lowest value (for time)	dependent on MP1 being awarded	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.7	the enzyme / amylase had been destroyed / denatured	allow the shape of the active site has changed allow the shape of the enzyme has changed do not accept enzyme / amylase has been killed	1	AO2
	(so) the starch was not (fully) broken down	allow (so) starch is still present	1	AO3 4.2.2.1 RPA3 RPA4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.8	keep the pH the same and change the temperature		1	AO3 4.2.2.1 RPA4

Total Question 2	11
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Question 3

Question	Answers	Mark	AO / Spec. Ref.
03.1	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Disease</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">HIV</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">Rose black spot</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Salmonella food poisoning</div> </div> <div style="width: 45%;"> <p>Type of pathogen</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">Bacteria</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">Fungi</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px; text-align: center;">Protists</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Viruses</div> </div> </div> <p>do not accept more than one line from a box on the left</p>	<div style="text-align: center;">1</div> <div style="text-align: center;">1</div> <div style="text-align: center;">1</div>	AO1 4.3.1.2 4.3.1.3 4.3.1.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.2	any one from: <ul style="list-style-type: none"> • cough / sneeze • breathing • droplets in the air 		1	AO2 4.3.1.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.3	mucus in the trachea		1	AO2 4.2.2.2 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.4	antibodies		1	AO1 4.3.1.6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.5	weakened		1	AO1 4.3.1.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.6	bacteria will become resistant		1	AO1 4.3.1.8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.7	any one from: <ul style="list-style-type: none"> • (use a) condom • (use a) barrier method of contraception • abstain from intercourse 	allow (use a) female condom allow (use a) dental dam ignore use protection unqualified ignore contraception unqualified	1	AO2 4.3.1.3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.8	willow		1	AO1 4.3.1.9

Total Question 3	10
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Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	any one from: <ul style="list-style-type: none"> • volume of dough (at the start) • time (to record volume of dough) 	allow use 20cm ³ of dough allow mass of dough / sugar / flour / yeast allow amount of dough / sugar / flour / yeast allow type of sugar / flour / yeast allow volume of water (in the dough) allow one hour do not accept volume of dough after one hour	1	AO2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	$\frac{80}{20}$ 4		1 1	AO2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	50 °C		1	AO3 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	fermentation		1	AO1 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	(sugar / glucose is needed) for respiration / fermentation	ignore references to energy ignore aerobic / anaerobic	1	AO2 4.4.2.1

Question	Answers	Mark	AO / Spec. Ref.
04.6	<p>Product</p> <p>Use in alcoholic drinks</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 30%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Carbon dioxide</div> <div style="border: 1px solid black; padding: 5px;">Ethanol</div> </div> <div style="width: 60%;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To add bubbles</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">To give the drinks colour</div> <div style="border: 1px solid black; padding: 5px;">To provide the alcohol</div> </div> </div> <p>do not accept more than one line from a box on the left</p>	<div style="display: flex; flex-direction: column; align-items: center;"> <div>1</div> <div>1</div> </div>	AO2 4.4.2.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.7	any one from: <ul style="list-style-type: none"> (muscle) fatigue (muscles) stop contracting efficiently 	allow (muscle) cramps / pain / ache allow reduced performance allow (muscles) have an oxygen debt	1	AO1 4.4.2.2

Total Question 4	9
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Question 5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	(reactants) carbon dioxide	allow CO ₂	1	AO1 4.4.1.1
	(products) oxygen and glucose	products in either order	1	
		allow O ₂ for oxygen allow C ₆ H ₁₂ O ₆ for glucose		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.2	palisade or (palisade) mesophyll		1	AO1 4.2.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	the colour of the light from the bulb		1	AO2 4.4.1.2 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.4	control the temperature of the water		1	AO3 4.4.1.2 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.5	$\frac{24 + 19 + 20}{3}$	allow $\frac{63}{3}$	1	AO2 4.4.1.2 RPA5
	= 21 (bubbles)		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.6	a ring around 49		1	AO3 4.4.1.2 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.7	from 14 to 18 (bubbles)	allow from 18 to 14 (bubbles)	1	AO2 4.4.1.2 RPA5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.8	not much photosynthesis	allow no photosynthesis	1	AO3
	(so) not much gas / oxygen produced	allow no gas / oxygen produced	1	AO2 4.4.1.2 RPA5

Total Question 5	11
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Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	(A) (cell) membrane		1	AO1 4.1.1.1 4.1.1.2
	(B) cytoplasm		1	
		if neither mark awarded allow 1 mark for cell body for either A or B		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	has a long (axon)	allow has an elongated (axon)	1	AO2 4.1.1.3
	to carry impulses (over long distances)	allow carry electrical signals (over long distances) ignore messages	1	
	alternative pair 1 has many mitochondria (1)			
	to release energy (1)	ignore respiration unqualified do not accept energy produced / made / created alternative pair 2 has a fatty sheath or has myelin (1) to increase the speed of the nerve impulses or for insulation (1) alternative pair 3 has branches / dendrites (1) to make multiple connections or to connect to other cells / neurones (1)		

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3	<i>substitution</i> $40 = \frac{\text{image length}}{0.15}$		1	AO2 4.1.1.5
	<i>rearrangement</i> $40 \times 0.15 (= \text{image length})$		1	
	<i>image length</i> 6 (mm)		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	nucleus	must be in this order	1	AO1 4.1.1.1 4.1.1.2 4.1.2.1
	plasmid		1	

Total Question 6	9
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Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	as the height (above sea level) increases the oxygen decreases	allow converse allow inversely proportional allow as one increases the other decreases do not accept directly proportional	1	AO2 4.1.3.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	suitable scale	scale must occupy $>\frac{1}{2}$ of grid	1	AO2 4.1.3.1
	all points plotted correctly	allow a tolerance of $\pm \frac{1}{2}$ small square allow 4 or 5 correct plots for 1 mark do not accept plots where there is no attempt at a linear scale	2	
	suitable curved line of best fit	ignore plots joined point to point with straight lines	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	a value consistent with student's line of best fit	allow a tolerance of $\pm \frac{1}{2}$ a small square if no line allow an answer in the range 7.6 to 8.0 (arbitrary units)	1	AO3 4.1.3.1

Question	Answers	Mark	AO / Spec. Ref.
07.4	Level 3: Relevant points (reasons / causes) are identified, given in detail and logically linked to form a clear account.	5–6	AO3
	Level 2: Relevant points (reasons / causes) are identified, and there are attempts at logical linking. The resulting account is not fully clear.	3–4	AO2
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1–2	AO1
	No relevant content	0	4.1.3.1 4.2.2.2 4.2.2.3
	Indicative content In species B : <i>adaptation</i> <ul style="list-style-type: none"> • alveoli have a bigger surface area • capillaries (around alveoli) have larger surface area • lungs have higher / greater volume (of air per unit body mass) • increased blood pumped out of the heart or <ul style="list-style-type: none"> • increased cardiac output • more (red) blood cells <ul style="list-style-type: none"> • appropriate manipulation of data <i>consequences</i> <ul style="list-style-type: none"> ○ more oxygen can diffuse into the blood ○ more blood / oxygen transported to cells / muscles / organs ○ more carbon dioxide removed from the blood ○ increased (aerobic) respiration ○ increased energy release ○ increased muscle contraction ○ less anaerobic respiration For Level 3 , answers must describe adaptations linked to consequences		4.4.2.1 4.4.2.2 4.4.2.3

Total Question 7	12
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