



**AQA Level 1/2 Certificate in Science:
Double Award**

BIOLOGY PAPER 2F

SPECIMEN MARK SCHEME

MARK SCHEME

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 his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

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.

2. Emboldening

- 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 lines 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**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates 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 error/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)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, 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

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column.

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

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **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.

4. Quality of communication and levels marking

In Question 6a candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

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question	answers	extra information	mark
1(a)		<p>1 mark for each correct line mark each line from left hand box two lines from left hand box cancels mark for that box</p>	4
1(b)(i)	dish 2 has (colonies of) microorganisms / bacteria / (but there are none in dish 1)	<p>allow fungi / pathogens / microbes / germs allow more microorganisms in dish 2</p>	1
1(b)(ii)	<p>untreated milk contains <u>living</u> microorganisms or microorganisms killed by UHT or no <u>living</u> microorganisms in UHT milk</p>		1
1(b)(iii)	<p>dish 3 was not opened or it was sterilised or nothing / no milk was added</p>	<p>do not allow no growth of microorganisms because of lack of air / oxygen ignore microorganisms cannot enter from the air</p>	1
1(c)(i)	bacteria		1
1(c)(ii)	4 tonnes	<p>accept working ie 2 tonnes in 4 hours x 2</p>	1

Question 1 continues on the next page . . .

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

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Question 1 continued . . .

question	answers	extra information	mark
1(d)	mycoprotein contains less fat or less circulatory problems	fat must be comparative	1
	mycoprotein contains (more) fibre or reduces colon cancer		1
Total			11

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

COMPONENT NAME: Biology Paper 2F

STATUS: Accredited

question	answers	extra information	mark											
2(a)(i)	<table border="1"> <thead> <tr> <th>Grid Square</th> <th>Number of stomata</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>5</td> </tr> <tr> <td>B</td> <td>4</td> </tr> <tr> <td>C</td> <td>5</td> </tr> <tr> <td>D</td> <td>4</td> </tr> </tbody> </table>		Grid Square	Number of stomata	A	5	B	4	C	5	D	4	table drawn with 2 columns and suitable headings	1
	Grid Square	Number of stomata												
	A	5												
	B	4												
	C	5												
D	4													
		table correctly completed with letters and figures	1											
		ignore total												
2(a)(ii)	4.5	allow ecf from total box in (a)(i)	1											
2(a)(iii)	evidence of mean x 100		1											
	450	correct answer with or without working gains 2 marks	1											
2(b)	X		1											
	dry		1											
Total			7											

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question	answers	extra information	mark
3(a)	Place all the quadrats randomly in the field	extra boxes ticked cancels the mark	1
3(b)	2.2	correct answer gains 2 marks if answer incorrect, evidence of correct method gains 1 mark allow only 1 mark for a rounded mean	2
3(c)	15 120	correct answer gains 2 marks if answer incorrect, evidence of correct substitution gains 1 mark	2
Total			5

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

COMPONENT NAME: Biology Paper 2F

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question	answers	extra information	mark		
4(a)(i)	two		1		
4(a)(ii)	mitosis		1		
4(b)		Adv.	Disadv.	<p>1 mark for each correctly ticked advantage up to a maximum of 2 marks</p> <p>1 mark for each correctly ticked disadvantage up to a maximum of 2 marks</p> <p>if maximum marks achieved but incorrect boxes have also been ticked then deduct 1 mark each for every incorrect box up to a maximum of 2 deductions in each column</p>	4
	Stem cells can grow into many different kinds of body cells.	✓			
	Stem cells may grow out of control.		✓		
	Large numbers of stem cells can be grown in the laboratory.	✓			
	Stem cells may be used to treat some human diseases.	✓			
	Collecting and growing stem cells is expensive.		✓		
	Patients treated with stem cells need to take drugs for the rest of their life to prevent rejection.		✓		
Total			6		

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

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STATUS: Accredited

question	answers	extra information	mark
5(a)	1500 + 2000 + 500 4000	award both marks for correct answer, irrespective of working	1 1
5(b)	(day 2) any two from: <ul style="list-style-type: none">• more (water in) breath / breathing• more (water in) sweat / sweating• less (water in) urine		2
5(c)	cools / removes heat		1
Total			5

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award**COMPONENT NAME: Biology Paper 2F****STATUS: Accredited**

question	answers	extra information	mark
6(a)	Marks awarded for this answer will be determined by the quality of communication as well as the standard of the scientific response. Examiners should also refer to the information on page 4 and apply a best-fit approach to the marking.		
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content	The method described is basic but shows some understanding of the sequence of an investigation.	The method described is clear and will enable valid results to be collected.	The method described is clear and detailed and will enable valid results to be collected.
examples of biology points made in the response: <ul style="list-style-type: none">• use of scalpel to cut chips to same dimensions• use of range of sodium chloride concentrations• use of forceps to transfer chips• use of balance to measure mass of chips before immersion• chips blotted dry before weighing• use of balance to measure mass of chips after immersion• chips left in solutions for same length of time			
6(b)(i)	points or bars plotted correctly to within ± 1 mm	deduct 1 mark for each incorrect plot up to a maximum of 2	2
	suitable line of best fit drawn on graph		1
6(b)(ii)	0.3	allow correct reading from student graph	1
Total			10

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question	answers	extra information	mark
7(a)	towards spinal cord by A and away from spinal cord by B		1
7(b)	by chemicals		1
7(c)	muscle labelled X		1
7(d)(i)	distance moved by hammer		1
7(d)(ii)	permanent record of results provides means of measuring the very short time the hammer moved		1 1
7(d)(iii)	circle around distance in trial 5 eg hammer did not hit tendon fully		1 1
7(d)(iv)	increasing the speed of hammer increases the distance the toe moved up to a maximum of 10 cm		1 1
7(d)(v)	reduce grid size to eg 1 cm	award 1 mark for any feasible suggestion	1
Total			11

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

COMPONENT NAME: Biology Paper 2F

STATUS: Accredited

question	answers	extra information	mark
8(a)	(Number 1) reference to '98.6% of all people who used the new treatment reported an improvement in their condition'		1
8(b)	because <u>only</u> 30 patients or not enough / not many patients		1
8(c)	little effect / difference suggests that drug is not effective (in long term)		1 1
8(d)	to avoid bias eg company could change / ignore results		1
Total			5