



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

**BIOLOGY PAPER 1H**

**SPECIMEN 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.

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

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>1(a)</b>	any <b>three</b> from: <ul style="list-style-type: none"><li>oxygen used in aerobic respiration</li><li>more energy from aerobic respiration</li><li>carbon dioxide and water are end products of aerobic respiration</li><li>lactic acid is end product of anaerobic respiration</li></ul>		<b>3</b>
<b>1(b)</b>	(Student <b>Y</b> ) because she had the lower resting heart rate the lower heart rate increase and the quicker recovery time	accept converse for Student <b>X</b>	<b>1</b> <b>1</b> <b>1</b>
<b>1(c)</b>	when exercising the <u>rate</u> of respiration (in the muscles) is higher  (the increased heart rate) increases <u>rate</u> of delivery of oxygen to the (respiring) muscles  and increases <u>rate</u> of delivery of glucose to the (respiring) muscles  and results in faster removal of carbon dioxide and lactic acid		<b>1</b>  <b>1</b>  <b>1</b>  <b>1</b>
<b>Total</b>			<b>10</b>

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

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>2(a)</b>	A – cell membrane		1
	B – cytoplasm		1
	C – genes / genetic material / chromosome		1
	D – cell wall		1
<b>2(b)</b>	antibiotics do not affect viruses		1
	viruses live inside cells		1
	therefore inaccessible to drugs <b>or</b> drugs will damage cells as well as virus		1
<b>2(c)</b>	dead / weakened microbes		1
	stimulate antibody production		1
	antibody production rapid if microbe enters again		1
<b>2(d)</b>	the gene for (production of the hepatitis) protein / antigen is introduced into bacteria		1
	this gene is a section of a DNA molecule		1
	this section has specified sequence of bases		1
	which act as code		1
	for assembly of amino acids		1
	in the correct order to produce protein / antigen		1
<b>Total</b>			<b>16</b>

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

question	answers	extra information	mark
<b>3(a)(i)</b>	44 000 / 4 600 000	correct answer with or without working gains <b>2</b> marks	1
	0.96%		1
<b>3(a)(ii)</b>	any <b>two</b> from: <ul style="list-style-type: none"><li>• energy heats up leaves</li><li>• energy absorbed by non-photosynthetic parts</li><li>• energy transmitted through leaves</li></ul>		2
<b>3(a)(iii)</b>	because some energy is used by the primary consumers in movement		1
	because some energy is transferred to the surroundings as heat		1
	because some energy lost in waste from primary consumers <b>or</b> not all primary consumer is eaten		1
<b>3(b)</b>	temperature limits rate, when it is cold and bright		1
	light limits rate at dusk / night / dawn		1
	amount of carbon dioxide limits rate when it is warm and bright		1

**Question 3 continues on the next page . . .**

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

**COMPONENT NAME: Biology Paper 1H**

**STATUS: Accredited**

**Question 3 continued . . .**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>3(c)</b>	because microorganisms feed on / digest / break down leaves / carbohydrates		1
	and when these organisms respire		1
	carbon is released into the atmosphere as carbon dioxide		1
<b>Total</b>			<b>13</b>

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

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>4(a)</b>	any <b>two</b> from: <ul style="list-style-type: none"><li>• long / pointed horns <b>and</b> for defence</li><li>• large ears <b>and</b> to hear predators approaching</li><li>• appearance blends with background <b>and</b> gives camouflage</li></ul>	allow long legs <b>and</b> to run away or to kick predators allow tall <b>and</b> can see predators a long distance away allow eyes on the sides of their heads <b>and</b> to have all-round vision to spot predators	2
<b>4(b)(i)</b>	loss due to evaporation / transpiration in day <b>and</b> absorbed from air at night / when cool		1
<b>4(b)(ii)</b>	19.30 and 08.00		1
<b>4(b)(iii)</b>	this is when the moisture content in grass is highest therefore animal takes in most water if it eats at this time		1 1
<b>4(c)(i)</b>	to reduce water loss (in dry area) / conserve water		1
<b>4(c)(ii)</b>	large surface area of blood vessels / dilation of blood vessels for evaporation / radiation		1 1

**Question 4 continues on the next page . . .**



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

**COMPONENT NAME: Biology Paper 1H**

**STATUS: Accredited**

**Question 4 continued . . .**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>4(c)(iii)</b>	intertwining results in close contact of arteries and veins <b>or</b> splitting up of arteries and veins ensures larger surface area in contact		1
	cool venous blood / cools arterial blood		1
<b>Total</b>			<b>11</b>

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

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question	answers	extra information	mark
<b>5(a)</b>	(genotype / gametes from <b>P</b> / father) <b>D</b> and <b>d</b> (*)	(*) eg may be in Punnett square allow own upper and lower case symbols or allow any symbol correctly used with key	1
	(genotype / gametes from <b>Q</b> / mother) <b>d</b> and <b>d</b>		1
	offspring genotypes correctly derived from correct gametes(*)		1
	offspring phenotypes <b>R</b> and <b>S</b> identified		1
<b>5(b)</b>	<i>for cystic fibrosis</i>	maximum <b>3</b> marks for cystic fibrosis to include at least one pro and one con	3
	<i>pros:</i>		
	<ul style="list-style-type: none"> <li>allows decision / emotional argument, eg allows people to make choices about termination</li> </ul>		
	<ul style="list-style-type: none"> <li>termination of pregnancies would reduce number of people with cystic fibrosis (in population)</li> </ul>		
	<ul style="list-style-type: none"> <li>reduce health-care costs</li> </ul>		
	<i>cons:</i>		
	<ul style="list-style-type: none"> <li>possible damage / risk to embryo / fetus / baby / mother</li> </ul>		
<ul style="list-style-type: none"> <li>(may) have to make ethical / moral / religious decisions</li> </ul>			
<i>for polydactyly:</i>			
<ul style="list-style-type: none"> <li>detects possibility of 'disfigurement' in embryo</li> </ul>		1	
<ul style="list-style-type: none"> <li>but condition not life threatening</li> </ul>		1	
<ul style="list-style-type: none"> <li>so risks to fetus / mother unjustified</li> </ul>		1	
<b>Total</b>			<b>10</b>