



Rewarding Learning

**General Certificate of Secondary Education
2024–2025**

**Single Award Science:
Biology**

Unit 1

Higher Tier

[GSA12]

MONDAY 11 NOVEMBER 2024, AFTERNOON

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are intended to ensure that the GCSE examinations are marked consistently and fairly. The mark schemes provide markers with an indication of the nature and range of candidates' responses likely to be worthy of credit. They also set out the criteria which they should apply in allocating marks to candidates' responses.

Assessment objectives

Below are the assessment objectives for GCSE Single Award Science

Candidates must:

- AO1** Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures;
- AO2** Apply knowledge, skills and understanding of scientific ideas, scientific enquiry, techniques and procedures; and
- AO3** Analyse information and ideas to interpret and evaluate; make judgements and draw conclusions; develop and improve experimental procedures.

Quality of candidates' responses

In marking the examination papers, examiners should be looking for a quality of response reflecting the level of maturity which may reasonably be expected of a 16-year-old which is the age at which the majority of candidates sit their GCSE examinations.

Flexibility in marking

Mark schemes are not intended to be totally prescriptive. No mark scheme can cover all the responses which candidates may produce. In the event of unanticipated answers, examiners are expected to use their professional judgement to assess the validity of answers. If an answer is particularly problematic, then examiners should seek the guidance of the Supervising Examiner.

Positive marking

Examiners are encouraged to be positive in their marking, giving appropriate credit for what candidates know, understand and can do rather than penalising candidates for errors or omissions. Examiners should make use of the whole of the available mark range for any particular question and be prepared to award full marks for a response which is as good as might reasonably be expected of a 16-year-old GCSE candidate.

Awarding zero marks

Marks should only be awarded for valid responses and no marks should be awarded for an answer which is completely incorrect or inappropriate.

Marking Calculations

In marking answers involving calculations, examiners should apply the 'own figure rule' so that candidates are not penalised more than once for a computational error.

Types of mark schemes

Mark schemes for tasks or questions which require candidates to respond in extended written form are marked on the basis of levels of response which take account of the quality of written communication.

1	(a) (i)	Scrotum	[1]	AVAILABLE MARKS
	(ii)	Carries sperm from the testis to the urethra [1] adds fluid to the sperm [1]	[2]	
	(iii)	Penis	[1]	
	(b) (i)	Chromosomes	[1]	
	(ii)	DNA	[1]	
	(c) (i)	Fertilisation	[1]	
	(ii)	Oviduct	[1]	
				8
2	(a) (i)	Uncontrolled cell division	[1]	
	(ii)	UV light	[1]	
	(b) (i)	4501	[1]	
	(ii)	9183/13684 [1] $\times 100 = 67.10757\%$ [1] 67.1% [1]	[3]	
				6

(b) Indicative content:

(Condom):

- mechanical barrier/physical barrier
- prevents sperm entering female body/passing through cervix

(Pill):

- changes hormone levels
- no egg released/no egg development

(Sterilisation):

- sperm tubes cut
- sperm can't leave male body/no sperm released

(Method that helps protect against STIs)

- condom

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to explain how each method of contraception prevents the sperm from reaching an egg using five or more of the points above, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms throughout to explain how each method of contraception prevents the sperm from reaching an egg using three or four of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates explain how each method of contraception prevents the sperm from reaching an egg using one or two of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and the form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

7

			AVAILABLE MARKS
4	(a) (i)	Fungus [1] virus [1]	[2]
	(ii)	Fungus [1]	[1]
	(b) (i)	Lymphocyte	[1]
	(ii)	Injection	[1]
	(iii)	Any two from: • antibody levels rise slowly/takes longer to become immune • immune for longer • antibody levels decrease more slowly/don't go back to zero (allow converse if qualified for passive immunity)	[2]
5	(a) (i)	5 points correct [2] 4 points correct [1] straight line joining points [1]	[3]
	(ii)	As years increase mass of sulfur dioxide released decreases	[1]
	(b) (i)	30	[1]
	(ii)	Crusty [1] moves/not sensitive to sulfur dioxide/most sulfur dioxide in city centre [1]	[2]
6	(a)	Phototropism	[1]
	(b)	A	[1]
	(c)	C	[1]
	(d)	Auxin [1] moves/diffuses to the shaded side/more cell elongation on shaded side [1][2]	
	(e)	Any two from: • more light • more photosynthesis • more growth	[2]
7	(a)	A human insulin gene [1] has been inserted into ring of bacterial DNA [1]	[2]
	(b)	Advantage – production of human insulin/other products [1] Disadvantage – unforeseen outcome/spread of genes into the wild/moral issues [1]	[2]

7

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4

8 (a) Allele – (alternative) form of a gene [1] recessive – gene only expressed if no dominant allele is present [1]	[2]	AVAILABLE MARKS									
(b) (i) aa	[1]										
(ii) 2	[1]										
(iii) One circle and one square drawn (either order) [1] both shaded [1]	[2]										
(c) (i) <table border="1" data-bbox="295 488 616 804"> <tr> <td></td><td>A</td><td>a</td></tr> <tr> <td>A</td><td>AA</td><td>Aa</td></tr> <tr> <td>a</td><td>Aa</td><td>aa</td></tr> </table> Both parents correct, Aa and Aa [1] correct cross [1]		A	a	A	AA	Aa	a	Aa	aa	[2]	
	A	a									
A	AA	Aa									
a	Aa	aa									
(ii) 25%	[1]	9									
9 (a) Darwin	[1]										
(b) Brighter tail attracts more females [1] to reproduce [1] (tail) gene passed on to offspring [1]	[3]										
(c) Becomes extinct	[1]	5									
Total		60									