



**General Certificate of Secondary Education
2022–2023**

**Single Award Science:
Biology**

Unit 1

Foundation Tier

[GSA11]

MONDAY 21 NOVEMBER 2022, MORNING

**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)	Cytoplasm	[1]	4
	(b)	B	[1]	
	(c)	Nucleus	[1]	
	(d)	Microscope	[1]	
2	(a)	(i) Prostate gland	[1]	6
		(ii) To produce sperm	[1]	
	(b)	Method	Description	
		condom vasectomy cutting the sperm ducts to prevent sperm entering the penis prevents the ovaries releasing eggs by changing hormone levels acts as a barrier to trap sperm	[2]	
(c)	(i)	Fertilisation	[1]	6
	(ii)	Zygote	[1]	

3	(a)	(i)	Shrew/small bird/owl	[1]	AVAILABLE MARKS									
		(ii)	The flow of energy	[1]										
		(iii)	Four	[1]										
		(iv)	Any one from:											
			leaves → caterpillar → small bird → owl leaves → worms → shrew → owl leaves → beetle → shrew → owl (Award [1] for leaves)	[2]										
	(b)		Carbon dioxide levels [1] rain fall [1]	[2]										
	(c)	(i)	Land that was previously built on/used to have buildings on it	[1]										
		(ii)	Destroyed/disappears	[1]	9									
4	(a)		<table><tr><th>Disease</th><th>Microorganism</th><th>Spread by</th></tr><tr><td>HPV</td><td>virus [1]</td><td>sexual contact</td></tr><tr><td>Salmonella</td><td>bacteria</td><td>contaminated food [1]</td></tr></table>	Disease	Microorganism	Spread by	HPV	virus [1]	sexual contact	Salmonella	bacteria	contaminated food [1]	[2]	
Disease	Microorganism	Spread by												
HPV	virus [1]	sexual contact												
Salmonella	bacteria	contaminated food [1]												
	(b)	(i)	Microorganisms are trapped	[1]										
		(ii)	Blood clotting/the skin	[1]										
	(c)	(i)	Antigen	[1]										
		(ii)	Phagocytes [1] antibodies [1]	[2]	7									
5	(a)	(i)	Carbohydrate	[1]										
		(ii)	Healthy growth of teeth and bones	[1]										
		(iii)	Pregnancy	[1]										
		(iv)	Vitamins/fibre/water	[1]										
	(b)		3 bars correctly drawn [2] (2 bars correct [1])	[2]	6									

				AVAILABLE MARKS		
6	(a)	(i)	Type 2 because he has too much sugar in his diet	[1]		
		(ii)	Exercise more	[1]		
	(b)	(i)	Insulin	[1]		
		(ii)	Lowers blood glucose [1] turning glucose into glycogen/increasing uptake of glucose/ increases respiration [1]	[2]		
	(c)	Eye damage/kidney failure/heart disease/stroke		[1]	6	
7	(a)	Any two from:				
		• Amount of water • Light • Heat/temperature • Size of pot • Type of compost/soil • Amount of compost/soil		[2]		
	(b)	125		[1]		
	(c)	As the number of plants in the pot increases, the average mass of each plant decreases		[1]		
	(d)	15 plants per pot		[1]		
8	(a)	(i)	Tar	[1]		
		(ii)	Heart	[1]		
	(b)	(i)	No blood flow [1] no oxygen/glucose reaches the heart muscle cells [1]	[2]		
		(ii)	Heart muscle dies/leading to a heart attack	[1]		
	(c)	(i)	As age increases the percentage of smokers with bronchitis increases	[1]		
		(ii)	20–3 [1] 17 [1]	[2]		
		(iii)	The percentage of smokers with bronchitis is higher than non-smokers [1] at all ages [1]	[2]		
						10

9 (a) Antibiotics do not kill viruses/only kill bacteria

[1]

(b) Indicative content

- Testing in the lab
- To see if the drugs work
- Animal testing
- On whole body/on a complete organ system/organism
- To find side effects
- Clinical trials
- On humans/volunteers
- To find the correct dosage
- Drug is licensed

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe each stage of testing using six to nine 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 describe each stage of testing using four or five 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 describe each stage of testing using one to three 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]

Total

AVAILABLE
MARKS

7

60