



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

**Single Award Science:
Biology**

Unit 1

Higher Tier

[GSA12]

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.

			AVAILABLE MARKS
1	(a)	Any two from:	
		- Amount/volume 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]
			5
2	(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

3 (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]

7

4 (a) (i) Can be put into distinct groups

[1]

(ii) Scars/tongue rolling/gender

[1]

(iii) Bar graph

[1]

(b) $3 \div 5$ [1]

$\times 100 = 60\%$ [1]

[2]

5

5 (a) (i)

	T	t
T	TT	Tt
t	Tt	tt

[1] gametes

[1] offspring

[2]

(ii) 3 : 1

[1]

(b) Allele – alternative form of the same gene;
dominant – the allele/trait that will be expressed if heterozygous

[2]

5

6 (a) (i) It has a tail/no cell wall

[1]

(ii) Chloroplasts

[1]

(iii) To be closer to the sun (for photosynthesis)

[1]

(b) $6\text{CO}_2 + 6\text{H}_2\text{O} \longrightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

[1] H_2O

[1] O_2

[1] balancing

[3]

6

7 (a) Ate a meal containing sugar/glucose/carbohydrates

[1]

(b) Person A – blood glucose levels are higher (throughout the day)

[1]

(c) 5 points plotted correctly [2]

(4 points correct [1])

line drawn with ruler [1]

[3]

(d) (i) Insulin

[1]

(ii) Pancreas

[1]

(iii) Glycogen

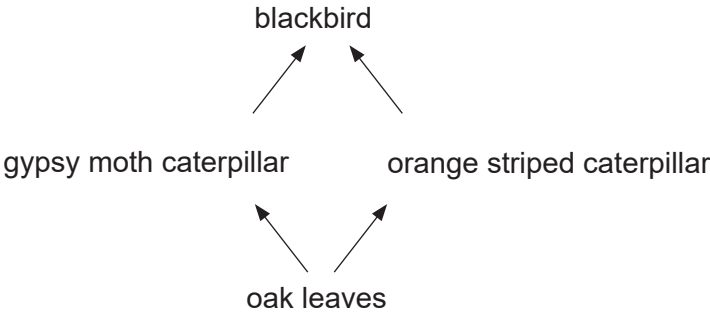
[1]

(e) More obesity/less exercise

[1]

9

8 (a)



2 × primary consumers [1]
blackbird [1] [2]

- (b) The orange striped caterpillar are easier to see/the gypsy moth caterpillar is better adapted/camouflaged/harder to see [1]
the blackbird is more likely to kill the orange-striped caterpillar/the gypsy moth caterpillar is more likely to survive [1]
reproduce and pass its genes onto its offspring [1] [3] 5

- 9 (a) (i) As time passed the amount of cod caught/fished increased until 1970 [1]
when there was a rapid drop/decline. [1] [2]

- (ii) The new technology in the 1950's and 1960's [1]
allowed fishermen to catch cod faster than they could be replenished/
replaced. [1] [2]

- (b) The numbers dropped to nearly 0/nearly disappeared. [1]
ban was to allow time for them to reproduce and grow. [1] [2]

- (c) The food that the cod eat will increase (as there is no cod to consume it) [1]
the animals that feed on the cod would decrease (less food for them) [1] [2] 8

Total 60