



Rewarding Learning

**General Certificate of Secondary Education
2023–2024**

**Single Award Science:
Biology**

Unit 1

Foundation Tier

[GSA11]

FRIDAY 17 MAY 2024, 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)	<table><tr><th>Substance</th><th>Found in cigarette smoke</th></tr><tr><td>oxygen</td><td></td></tr><tr><td>nicotine</td><td>✓</td></tr><tr><td>carbon monoxide</td><td>✓</td></tr><tr><td>carbon dioxide</td><td></td></tr></table>	Substance	Found in cigarette smoke	oxygen		nicotine	✓	carbon monoxide	✓	carbon dioxide			AVAILABLE MARKS
	Substance	Found in cigarette smoke												
	oxygen													
	nicotine	✓												
	carbon monoxide	✓												
carbon dioxide														
		[1] mark for each correct tick	[2]											
	(b) (i)	Liver	[1]											
	(ii)	Large [1] short [1]	[2]	5										
2	(a) (i)	<table><tr><th>Biological molecule</th><th>Food</th></tr><tr><td>carbohydrate</td><td>A</td></tr><tr><td>protein</td><td>C</td></tr><tr><td>vitamin C</td><td>B</td></tr></table>	Biological molecule	Food	carbohydrate	A	protein	C	vitamin C	B				
	Biological molecule	Food												
	carbohydrate	A												
	protein	C												
	vitamin C	B												
		All three correct [2] One or two correct [1]	[2]											
	(ii)	To prevent constipation	[1]											
	(b)	5.2 – 4.5 [1] 0.7 [1]	[2]											
	(c)	B D C A All correct [2] Any two in the correct order [1]	[2]											
	(d)	Biuret	[1]	8										
3	(a) (i)	Vagina	[1]											
	(ii)	Allows the sperm cell to move through the female reproductive system	[1]											
	(b)	Four cells drawn [1] cells all touching [1]	[2]											
	(c)	Nutrients [1] urea [1]	[2]											
	(d)	Amniotic fluid [1] to cushion the developing baby [1]	[2]	8										

4 (a) (i) Kangaroo [1] (ii) The crab has the most chromosomes but is not the greatest mass/the human is the greatest mass but does not have the most chromosomes [1] (b) DNA [1] (c) (i) All bars plotted correctly [2] 3 bars plotted correctly [1] less than 3 bars plotted correctly [0] [2] (ii) (As the age group of mothers increases the) number of babies born with Down's syndrome increases [1] (iii) To make sure the needle does not touch/harm the developing baby [1] (iv) 35–39 [1]	AVAILABLE MARKS 8
5 (a) Any two from: • skin • mucous membranes • blood clotting [2] (b) Any three from: • antibodies are complementary (in shape) • antibodies attach on to the • antigens • the microorganisms are clumped together [3] (c) (i) Memory lymphocytes (were made during the first infection) [1] (ii) Blood antibody level goes up higher [1] Blood antibody level stays high for longer [1] [2] (d) (i) Phagocyte [1] (ii) (Phagocyte) engulfs [1] and digests [1] the microorganism [2]	11
6 (a) (i) To lower/reduce blood glucose levels [1] (ii) Better control over blood glucose levels/reduces the need for multiple injections per day [1] (iii) $1500 \div 8000$ [1] $\times 100 = 18.75$ [1] [2] (b) Any two from: • chemical messenger • travels in the blood • to a target organ • produced by a gland [2]	6

- 7 (a) Range of species/different types of living organism in a particular area [1]
- (b) (i) Bigger boats/fishing for longer/more nets/more fishing boats [1]
- (ii) Any **two** from:
- quotas
 - fishing bans
 - restrictions on net sizes
 - closed seasons
 - decommission boats [2]

8 (a) Indicative content:

- number of pots each with a different number of seeds
- any **two** from: same type/volume of compost/same amount of water/ same light/ same temperature/left for the same length of time/same size of pot/same type of seed
- (at end measure) mass/number of leaves/any suitable plant feature
- most growth would be in pots with the fewest seeds (or converse)
- due to reduced competition between the plants (or converse)
- for limited water/space/nutrients/light

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe how to investigate the effect of planting density on plant growth using five, six or seven 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 how to investigate the effect of planting density on plant growth 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 describe how to investigate the effect of planting density on plant growth 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]

- (b) (i) Water [1]
glucose [1] [2]
- (ii) Chloroplast [1]
- (iii) Endothermic [1]

Total

**AVAILABLE
MARKS**

4

10

60