



**General Certificate of Secondary Education
2019–2020**

**Single Award Science:
Biology**

Unit 1

Foundation Tier

[GSA11]

WEDNESDAY 6 NOVEMBER 2019, 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) Fibre growth and repair [2]

(b) (i)

Food	Mineral	
	Iron	Calcium
cheese		✓
red meat	✓	
green cabbage	✓	
milk		✓

All correct [2]

3 correct [1]

[2]

- (ii) Strengthens teeth and bones [1]

5

- 2 (a) Nicotine – addictive and increases heart rate
carbon monoxide – reduces the amount of oxygen carried around the body by red blood cells [2]

- (b) (i) Percentage of smokers decreases from 2002–2014/over time
more men than women smoke [2]

- (ii) Decrease [1]

- (iii) Long term treatment/expensive drugs/surgery/treatment/equipment [1]

6

- 3 (a) (i) Sun/sunlight [1]

- (ii) Caterpillar/rabbit/grasshopper/aphid [1]

- (iii) Flowers and grass → rabbit → fox
[1] mark for the producer even if consumers are incorrect
[2] marks for a complete food chain [2]

- (b) (i) Decrease
less food for the ladybirds [2]

- (ii) Introduce more ladybirds [1]

7

			AVAILABLE MARKS
4	(a) (i) Roll tongue/hand preference	[1]	6
	(ii) Bar graph	[1]	
	(iii) $2 \div 5$ [1] $2 \div 5 \times 100 = 40\%$ [2] [2] for correct answer	[2]	
	(b) (i) Born with the ability/cannot be acquired throughout life	[1]	
	(ii) Eye colour/blood groups/ear lobes	[1]	
5	(a) (i) John thinks what to do	[1]	5
	(ii) 4	[1]	
	(b) (i) Nervous system is faster than hormonal/nervous system is electrical and hormonal system is chemical/hormones travel in blood and nervous system involves neurones	[1]	
	(ii) Insulin pancreas	[2]	
6	(a) Water levels/the size of (decreasing) ice fields/carbon dioxide levels/temperature/pH	[1]	6
	(b) (i) Level of air pollution decreases as distance from the city centre increases [1] and then levels off [1]	[2]	
	(ii) Less lichen as pollution levels increase	[1]	
	(iii) Increase in the number of trees with lichen in the city centre	[1]	
	(c) Air pollution created in one country can move/carried by wind to another	[1]	
7	(a) Double helix	[1]	6
	(b) Nucleus	[1]	
	(c) Entire genetic material	[1]	
	(d) (i) Change [1] in DNA/genes/chromosomes [1]	[2]	
	(ii) UV light	[1]	

8	(a)	(i)	Glucose carbon dioxide	[2]	AVAILABLE MARKS							
		(ii)	Exothermic	[1]								
		(iii)	<table><tr><th>Process</th><th>Plants</th><th>Animals</th></tr><tr><td>photosynthesis</td><td>✓</td><td>✗</td></tr><tr><td>respiration</td><td>✓</td><td>✓</td></tr></table>	Process		Plants	Animals	photosynthesis	✓	✗	respiration	✓
Process	Plants	Animals										
photosynthesis	✓	✗										
respiration	✓	✓										
			[1] mark for each correct line	[2]								
	(b)	(i)	Chloroplast	[1]	7							
		(ii)	Make its own food/not dependent on other organisms for food	[1]								
9	(a)	Any two from:			4							
		- removal of habitats - removal of food (variety of food) - removal of shelter - no camouflage for small birds and mammals - protection from birds of prey		[2]								
	(b)	Maintain field margins/don't plant crops to the edge of the field/ use fertilisers efficiently		[1]								
	(c)	Use brownfield sites/sites that previously had housing/old industrial site instead of agricultural land		[1]								

10 (a) (i) Florey/Chain [1]

(ii) Needed to be purified [1]

(b) Indicative content:

- in vitro testing
- on cells or tissues (in a lab)
- to find out if the drug works
- animal testing
- animals have similar organs to humans
- on whole body systems
- clinical trials
- tested on humans/volunteers
- to discover side effects/work out the dosage

Band	Response	Mark
A	Candidates must use appropriate specialist terms to describe the stages of testing using six or more of the above points 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 must use appropriate specialist terms to describe the stages of testing using four or five points 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 must describe the stages of testing using one, two or three points. 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

8

60