



Rewarding Learning

**General Certificate of Secondary Education
2021–2022**

**Single Award Science:
Biology**

Unit 1

Higher Tier

[GSA12]

TUESDAY 17 MAY 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.

COVID-19 Context

Given the unprecedented circumstances presented by the COVID-19 public health crisis, senior examiners, under the instruction of CCEA awarding organisation, are required to train assistant examiners to apply the mark scheme in case of disrupted learning and lost teaching time. The interpretation and intended application of the mark scheme for this examination series will be communicated through the standardising meeting by the Chief or Principal Examiner and will be monitored through the supervision period. This paragraph will apply to examination series in 2021–2022 only.

1	(a) (i)	$35 - 20 = 15$	[1]	7
	(ii)	Same mass of biscuit	[1]	
	(iii)	Custard cream [1] more energy released per gram than the other biscuits [1]	[2]	
	(b) (i)	Add the biscuit to a boiling tube with reagent [1] heat [1]	[2]	
	(ii)	Brick red	[1]	
2	(a) (i)	$50 - 20 = 30$	[1]	9
	(ii)	Any two from:		
		• Kim's heart rate is the lowest throughout/lower resting heart rate/ lower heart rate during exercise		
		• Kim's heart rate does not rise as high/went up the least (during exercise)		
		• Kim's heart rate returns to resting rate quicker	[2]	
	(b) (i)	Exothermic	[1]	
	(ii)	Less energy [1] carbon monoxide combines with red blood cells [1] less oxygen transported/less respiration [1]	[3]	
	(iii)	Nicotine [1] it is addictive [1] or Tar [1] can cause lung cancer/bronchitis/emphysema [1]	[2]	

3 Indicative content

- to lower/reduce blood glucose levels
- convert glucose to glycogen
- increase respiration
- cause a greater uptake of glucose into the cells
- pancreas
- liver
- diabetes

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the effect of insulin using five to 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 and explain the effect of insulin 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 partially describe and explain the effect of insulin 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 have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

6

- 4 (a) $20 \div 100 \times 60$ [1]
12 [1]

[2]

- (b) All points plotted correctly [1]
straight line drawn between each point [1]

[2]

- (c) As the number of seeds sown increases the percentage of seedlings that survived after six days decreases [1]

[1]

- (d) (i) Auxin [1]
moves down the shaded side [1]
causing more growth/elongation of cells on the shaded side [1]

[3]

- (ii) Phototropism

[1]

9

5 (a) (i) TT and Tt

[1]

(ii) Straight thumb

[1]

(b)

	T	t
t	Tt	tt
t	Tt	tt

[1] gametes – they can be in either order

[1] correct offspring genotypes from cross

[2]

(c) (i) Continuous

[1]

(ii) Histogram

[1]

(d) DNA

[1]

(e) (i) Genome

[1]

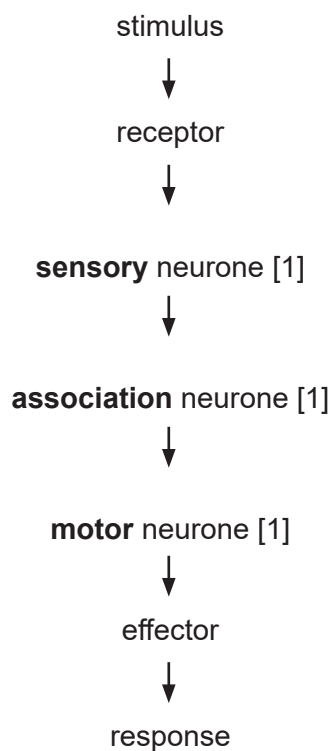
(ii) May not insure them/insurance may be too expensive

[1]

AVAILABLE
MARKS

9

6 (a) (i)



[3]

(ii) Muscle

[1]

(iii) 2

[1]

(b) Chemical [1]
blood [1]

[2]

7

7 (a) Days 1–5/6/7 shaded

[1]

(b) Oestrogen [1]
progesterone [1]

[2]

(c) Contraceptive pill/hormone implants

[1]

(d) It will break down/be expelled from the body

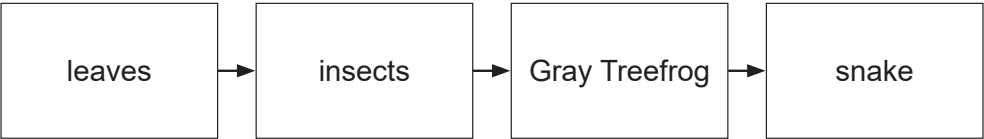
[1]

(e) Egg and sperm cannot meet/fertilisation cannot take place

[1]

6

8 (a) (i)



[1] leaves in first box
[1] insects and Gray Treefrog in boxes 2 and 3 [2]

(ii) Less insects so less food for them to eat/pesticides from insects pass into Gray Treefrogs when eaten [1]

- (b) (i)
- To allow them to survive [1]
 - to reproduce [1]
 - to pass on their genes to the next generation [1] [3]

(ii) (Charles) Darwin [1]

Total

AVAILABLE MARKS	
	7
	60