



Rewarding Learning

**General Certificate of Secondary Education
2018–2019**

**Single Award Science:
Biology**

Unit 1

Higher Tier

[GSA12]

TUESDAY 14 MAY 2019, AFTERNOON

**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.

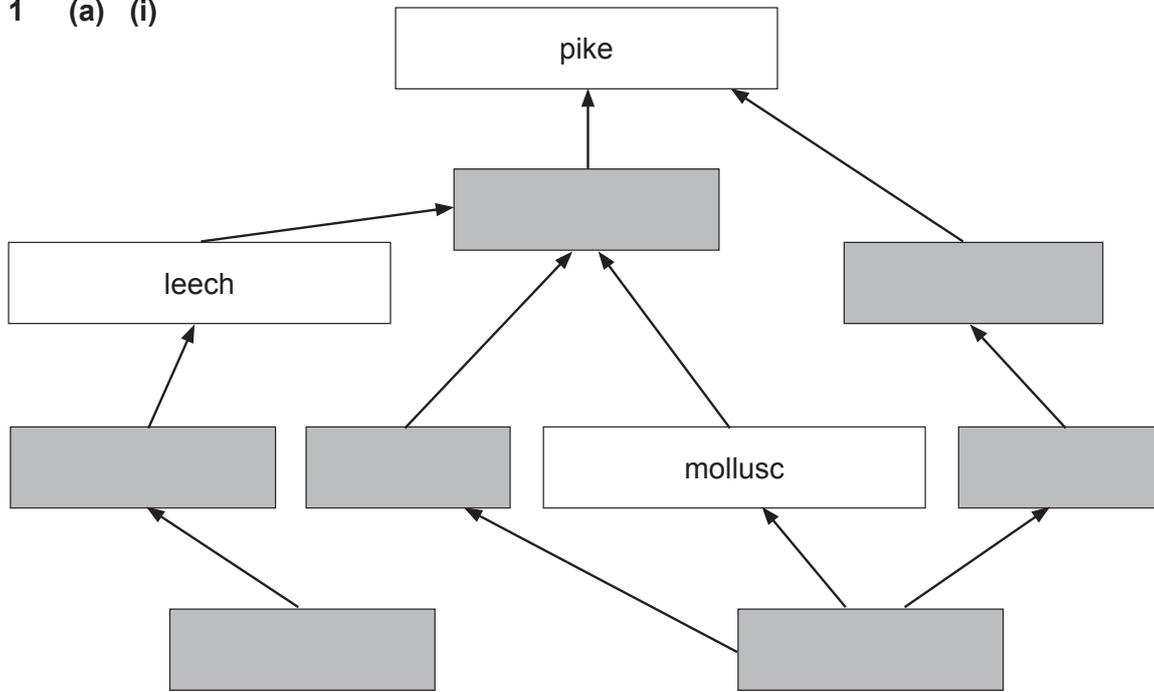
Marking Calculations

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) (i)



1/2 animals correct [1]
3 animals correct [2]

[2]

(ii) Energy flow

[1]

(iii) Reduction in the number of water beetles [1]
tadpoles are its **only** source of food [1]

[2]

(b) (i) A **living** factor

[1]

(ii) Carbon dioxide levels/size of ice fields/pH/temperature/water levels

[1]

(iii) As the concentration of sulfur dioxide increases the percentage cover of lichen decreases

[1]

(iv) Species B [1]

greatest range of sulfur dioxide concentration [1]

[2]

AVAILABLE MARKS

10

2 Indicative content:

- number of pots each with different number of seeds
- **any two** from: volume compost/same volume water/same light intensity/same temperature/left for same length of time
- measure mass of plants/seedlings at end
- find average mass of each pot
- most growth would be in pots with fewest seedlings (or converse)
- due to reduced **competition** between plants (or converse)
- light water/space/nutrients

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe and explain the effect of planting density on plant growth using seven to eight 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 to describe and explain the effect of planting density on plant growth using four to six 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 to three 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

3 (a) D [1]

it killed the most bacteria [1]

[2]

(b) Change [1]

in gene/chromosome/DNA/genome [1]

[2]

(c) (i) Does not cause the flu

[1]

(ii) Antibody level rises slowly/takes time for immunity to be achieved [1]
 antibody remains above immunity level for a long time/immunity level maintained [1]

[2]

7

		AVAILABLE MARKS
4	(a) As the numbers of grey squirrels increase the numbers of red squirrels decrease [1]	4
	(b) As the numbers of pine martens increase the numbers of grey squirrels decrease and red squirrels increase [1]	
	(c) Out-compete similar native species [1] reproduce/spread rapidly when introduced [1] [2]	
5	(a) Cod [1]	5
	(b) $(12 \div 32) \times 100$ [1] 37.5% [2] [2]	
	(c) Smaller fish escape [1] increased time for growth [1] [2]	
6	(a) Builds up the uterine lining (following menstruation) [1] causes ovulation/release of eggs [1] [2]	8
	(b) (i) Auxin [1] causes elongation of cells [1] uneven distribution/uneven elongation [1] [3]	
	(ii) (Bends toward the light for) more photosynthesis [1]	
	(c) (i) Indigo [1]	
	(ii) No bending/grows straight up [1]	
7	(a) Purple [1] yellow [1] [2]	5
	(b) $6\text{H}_2\text{O} + 6\text{CO}_2 \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{CO}_2$	
	H ₂ O [1] C ₆ H ₁₂ O ₆ [1] Correctly balanced [1] [3]	

- 8 (a) (i) Husband/male partner [1]
 (ii) 2 [1]
 (iii) Ff [1]

(b) (i)

	F	f
F	FF	Ff
f	Ff	ff

Both parents correct [1]
 correct cross [1] [2]

- (ii) 75% [1]

- (c) Type 1 diabetes [1]

- 9 (a) Any **three** from:
 • cyanogenic clover are **better adapted**
 • this provides a (selective) advantage against **predation**
 • individuals with advantage are more likely to **survive/reproduce**
 • **pass genes** on (to next generation) [3]

- (b) (Natural selection causes gradual) changes in a genotype or species [1]
 over a (long) period of time/many generations [1] [2]

- (c) (i) Remains of living organisms which have been **preserved** [1]
 for millions of years [1] [2]

- (ii) Fossils can be accurately dated so can be compared [1]

Total

**AVAILABLE
 MARKS**

7

8

60