



Rewarding Learning

General Certificate of Secondary Education
2016–2017

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

WEDNESDAY 22 FEBRUARY 2017, MORNING

**MARK
SCHEME**

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

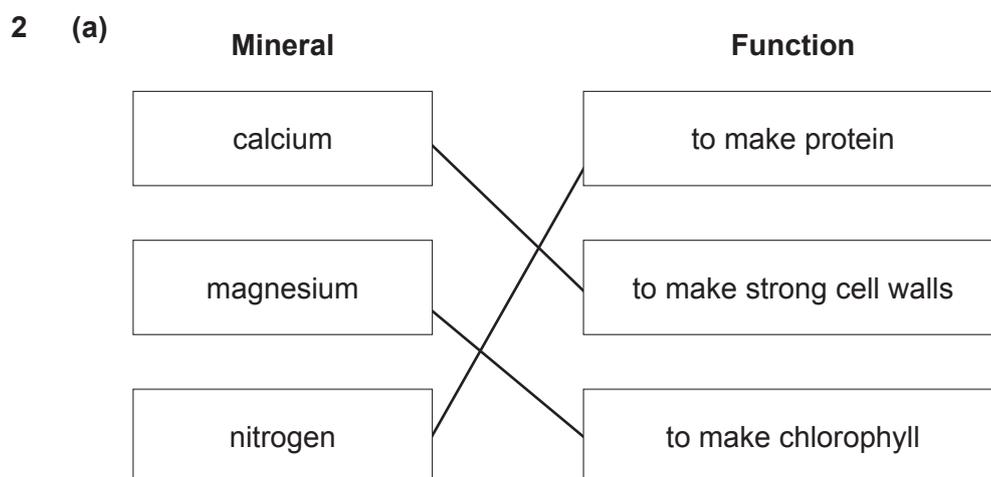
The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

- 1 (a) (i) Sun/sunlight/light [1]
- (ii) Aphids/caterpillars/weevils/wasps/mice [1]
- (b) Less blue tits/decrease in the population;
As the owls would eat more of them/owls have one less food source [2]
- (c) (i) Transfer of energy/energy flow [1]
- (ii) Oak tree at bottom, largest bar and labelled;
Pyramidal shape for the top three levels (with aphids widest bar);
Aphids, blue tits and owls labels in the top three bars (ascending order) [3]

AVAILABLE
MARKS

8

All three correct **or** two correct = 2 marks

One correct = 1 mark

[2]

- (b) (i) It has an extension [1]
- (ii) Provides increased surface area [1]
- (c) (i) Farmyard manure/FYM/manure/compost/slurry/animal waste/
cow dung **or** described [1]
- (ii) Artificial fertiliser has:
more minerals/more nitrates/easier to store
quicker release of minerals or nitrates/quicker release of nitrates
cleaner/less mucky/easier to apply/no smell/easier to get
know the mineral content precisely [1]

6

			AVAILABLE MARKS
3	<p>(a) Hedgerows/hedge [1]</p> <p>(b) Berries eaten by late winter/leaves the berries for the blackbirds over the winter/food produced in autumn cutting in the autumn would destroy the berries/so blackbird gets berries otherwise no berries [1]</p> <p>(c) Cutting once every three years; there are more berries/more food for blackbirds; 1.5 kg berries/m hedge is the largest (accept any relevant data point) [3]</p> <p>(d) Place to nest/shelter/protection from predators [1]</p>		6
4	<p>(a) Any two from:</p> <ul style="list-style-type: none"> • break down large molecules to small molecules; • break down insoluble molecules to soluble molecules; • so they can be absorbed into the blood/bloodstream/capillaries [2] <p>(b) (i) Blue to brick red [1]</p> <p>(ii) Starch has been broken down to glucose; Glucose is small enough to pass through the pores/starch is too large to pass through the pores [2]</p> <p>(c) Boiled amylase would not break down the starch/there would be no or reduced amylase activity; As boiling denatures/damages/destroys the amylase/starch will no longer fit (into the active site) into the amylase [2]</p>		7
5	<p>(a) Any two from:</p> <ul style="list-style-type: none"> • a chemical messenger/a chemical message • acts on target organ/a specific organ • carried in the blood/bloodstream [2] <p>(b) Pancreas;</p> <p>Any two from:</p> <ul style="list-style-type: none"> • converting glucose to glycogen/store glucose as glycogen • respiring more glucose/increase rate of respiration/respirate more • more uptake of glucose into cells • more glucose converted into fat/store as fat [3] <p>(c) $\frac{2.1}{100} \times 60$; = 1.26/1.3 (2.1 + 1.3) = 3.4 [3]</p> <p>(d) Glucose in the urine/lethargy/tiredness/thirst [1]</p>		9

			AVAILABLE MARKS
6	(a) E, A, C, B E+A 1st = 1 mark C+B 2nd = 2nd mark	[2]	
	(b) Respiration/energy/sucrose/cellulose/protein/fat/oil/seeds/fruit/flowers/ amino acids	[1]	
	(c) (i) Carbon dioxide	[1]	
	(ii) Temperature/light/water/heat/sun	[1]	
	(d) Any two from: • no photosynthesis occurs/no light/it's dark; • it is a waste of carbon dioxide/CO ₂ not used/uneconomic/pointless/no profit/waste of money/CO ₂ won't be limiting factor	[2]	
	(e) Spreads carbon dioxide better/more even distribution of carbon dioxide/ more plants close to carbon dioxide source/plants all receive CO ₂ /affects all the plants in the same way/one would only affect close plants	[1]	8
7	(a) Phototropism/tropism	[1]	
	(b) Any two from: • the hormone (auxin) accumulates on the shaded side/moves away from the light; • where it causes elongation/growth/gets bigger (on shaded side);	[2]	
	(c) Ignore seedling width Seedling B does not bend/grows straight up; It is the same height or only slightly taller	[2]	5
8	A – bloodworms; as the level of (nitrate)/pollution is high /more/low O ₂ /survive in low O ₂ /30 nitrate	[2]	
	C – freshwater shrimp and/or stonefly; as they can live where there is no or medium nitrate/pollution	[2]	4
9	(a) (i) Feeding/ingestion/consumption/eating/eaten/animals eat plants	[1]	
	(ii) Respiration	[1]	
	(b) Less photosynthesis; means less carbon dioxide is used/absorbed by plants/plants/trees take in CO ₂ /can't change CO ₂ to O ₂ ;	[2]	
	(c) (i) More carbon dioxide/ more greenhouse gas; more heat trapped/ less heat escapes;	[2]	
	(ii) Any two from: • ice caps melt/glaciers melt/arctic ice melts • coastal flooding/flooding of low lying areas • rise in sea levels		

<ul style="list-style-type: none"> • change in weather patterns/climate change • drought/desertification • loss of habitat/described 	[2]	AVAILABLE MARKS
<p>(d) (i) More transport/use more energy/related to personal use.</p>	[1]	
<p>(ii) More people in China/more densely populated country more factories in China/more industry in China/more fossil fuels burnt in China</p>	[1]	10

10 (a) Indicative content

- **Use measuring cylinder** to measure a given volume of DCPIP
- Same amount into a test tube
- **DCPIP** into tube
- Use dropper to add juice (to DCPIP)
- Shake test tube/swirl the contents/mix/stir
- **Count the number of drops** of juice added to change colour
- Colour change from blue to colourless or pink - need **both** colours
- Repeat procedure above for the **other juice**
- Use a different dropper for 2nd juice/or wash out dropper in between juices
- Do repeats for reliability

Response	Marks
Candidates use appropriate terms throughout in describing how to test the two juices for vitamin C content. They must use 5–6 points from the indicative content. They use good spelling, punctuation and grammar skills. Form and style are of a high standard.	[5]–[6]
Candidates use appropriate terms throughout in describing how to test the two juices for vitamin C content. They must use 3–4 points from the indicative content. They use satisfactory spelling, punctuation and grammar skills. Form and style are of a satisfactory standard.	[3]–[4]
Candidates include 1–2 points from the indicative content when describing how to test the two juices for vitamin C content. They use limited spelling, punctuation and grammar and have made little use of specialist terms.	[1]–[2]
Response not worthy of credit.	[0]

[6]

- (b) Less drops of grapefruit juice needed/more drops of lemon juice needed (to change the colour of the DCPIP)
The DCPIP turned blue to colourless quicker with grapefruit than lemon/or converse

[1]

7

Total**70**