GCSE Science B (Science in Context)

Higher Tier

Science B 1H

SPECIMEN MARK SCHEME

Version 1.0

Quality of Written Communication and levels marking

In Question 4(b) candidates are required to produce extended written material in English, and will be assessed on the quality of their written communication as well as the standard of the scientific response.

Candidates will be required to:

- use good English
- organise information clearly
- use specialist vocabulary where appropriate.

The following general criteria should be used to assign marks to a level:

Level 1: basic

- Knowledge of basic information
- Simple understanding
- The answer is poorly organised, with almost no specialist terms and their use demonstrating a general lack of understanding of their meaning, little or no detail
- The spelling, punctuation and grammar are very weak.

Level 2: clear

- Knowledge of accurate information
- Clear understanding
- The answer has some structure and organisation, use of specialist terms has been attempted but not always accurately, some detail is given
- There is reasonable accuracy in spelling, punctuation and grammar, although there may still be some errors.

Level 3: detailed

- Knowledge of accurate information appropriately contextualised
- Detailed understanding, supported by relevant evidence and examples
- Answer is coherent and in an organised, logical sequence, containing a wide range of appropriate or relevant specialist terms used accurately.
- The answer shows almost faultless spelling, punctuation and grammar.

In order to attain a mark within a certain level, **both** the science **and** the QWC must be of a standard appropriate to that level.

COMPONENT NUMBER: GCSE Science B (Science in Context) 1H

COMPONENT NAME: My World

STATUS: Specimen Version 1.0

question	answer	extra information	mark
1(a)	fractional distillation	allow distillation for **1** mark	2
1(b)	the boiling point increases with the number of carbon atoms the viscosity increases with the number of carbon atoms the higher the boiling point the greater the viscosity		1 1 1
1(c)	less petrol in crude oil less demand for fuel oil	accept converse (ie more fuel oil in crude oil, more demand for petrol)	1 1
Total			**7**

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question	answer	extra information	mark
2(a)	any **one** from: • less / no light pollution • less atmospheric distortion / interference • less / no cloud cover • image / picture is clearer	 accept no street lights accept less / thinner atmosphere do **not** accept no atmosphere accept less atmospheric pollution do **not** accept less pollution accept above the clouds do **not** accept gives a clearer view / signal	1
2(b)(i)	(the light is) red shifted		1
2(b)(ii)	the further away the galaxy is, the bigger the effect the universe is expanding		1 1
2(b)(iii)	observed – original = Z × original observed – 600 = 0.15 × 600 = 90 observed = 600 + 90 = 690	correct rearrangement correct substitution correct answer correct answer alone for **3** marks	1 1 1
Total			**7**

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question	answer	extra information	mark
3(a)	**correct calculation of scale:** plants 800 ÷ 16 = 50 herbivores 160 ÷ 16 = 10 carnivores 64 ÷ 16 = 4 top carnivores 16 ÷ 16 = 1	correctly labelled diagram for **4** marks four correct for **2** marks	max 2
	accurate plotting of pyramid	three correct for **1** mark allow ecf from calculations allow error ± ½ square	1
	correct labelling	diagram must look like pyramid drawn on a central axis	1
3(b)	**one** from: • energy lost to the environment between each trophic level • not all biomass is digestible **or** some lost in faeces / excretion • energy lost due to movement	owtte accept biomass that is not eaten and moves to decomposers	1
Total			**5**

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question	answer	extra information	mark
4(a)	gold		1

4(b)

Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 2.

0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content.	There is a brief description of the laboratory procedure for obtaining a sample of pure salt from rock salt. The answer would not necessarily allow the procedure to be completed successfully by another person.	There is a description of the laboratory procedure for obtaining a sample of pure salt from rock salt that could be followed by another person. The answer **must** mention that the rock salt is mixed with water.	There is a clear, detailed description of the laboratory procedure for obtaining a sample of pure salt from rock salt that could easily be followed by another person. The answer **must** mention that the rock salt is mixed with water.

examples of the points made in the response	extra information
• crush the rock salt • with a mortar and pestle • mix the crushed rock with water • in a beaker • stir and warm to dissolve the salt • filter the mixture to remove the undissolved solids • using filter paper and funnel • put the filtrate into an evaporating dish • warm using Bunsen burner, tripod and gauze • to evaporate to dryness	

4(c)(i)	sodium and chlorine	must have both for the mark do **not** accept chloride	1
4(c)(ii)	NaCl		1
Total			**9**

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question	answer	extra information	mark
5	lithium loses an electron <u>from its outer shell</u> to form Li^+ fluorine gains an electron <u>in its outer shell</u> to form F^-		1 1 1 1
Total			**4**

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question	answer	extra information	mark
6(a)	6 electrons in two orbitals, 2 in inner, 4 in outer		1
	nucleus identified, containing		1
	6 protons		1
	6 neutrons		1
6(b)	atomic number 6	allow ecf from diagram	1
	mass number 12		1
6(c)	CO_2 in atmosphere to carbon in plants by photosynthesis	some or all of these points may be shown in a diagram	1
	carbon from plants into animals (feeding)		1
	carbon from plants and animals into atmosphere as CO_2 by respiration **or** microbes respire, releasing CO_2 into atmosphere		1
	plants / animals die and are decayed by microbes	accept decomposers for microbes	1
	deforestation **or** CO_2 into atmosphere by burning trees **or** burning of fossil fuels releases CO_2 into atmosphere		1
Total			**11**

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question	answer	extra information	mark
7(a)(i)	$C + O_2 \rightarrow CO_2$		1
7(a)(ii)	$C + CO_2 \rightarrow 2\ CO$	**1** mark for equation **1** mark for balancing	max 2
7(b)(i)	3CO $2\ Fe + 3CO_2$		1 1
7(b)(ii)	iron oxide carbon monoxide		1 1
7(c)(i)	any metal above carbon in the reactivity series (eg Na, Al, Ca, Mg)		1
7(c)(ii)	use more energy to produce than iron metal more difficult to extract than iron	owtte accept metals less common than iron	1 1
Total			**10**

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question	answer	extra information	mark
8(a)	because they hide well and some could be missed		1
8(b)	30	correct answer if incorrect, accept (number in 1st capture × number in second capture) / number in population **or** (60×50)/100 **or** 3000/100 for **1** mark	2
8(c)	**Description 1** Area **B** because it will be cool / damp and there is plenty of food so will have most woodlice **Description 2** Area **C** because it will be cool / damp but may not have enough food for lots of woodlice **Description 3** Area **A** because it is not cool / damp so won't have many woodlice	 owtte owtte owtte	 1 1 1
8(d)	the dot makes them visible to predators **or** the paint may kill them **or** any reasonable suggestion		1
Total			**7**