Version 1.0

General Certificate of Secondary Education (GCSE-level)
November 2011

Science B SCB1FP

(Specification 4500)

Unit 1: My World

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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MARK SCHEME

Information to Examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following lines is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as * in example 1) are not penalised.

Example 1: What is the pH of an acidic solution? (1 mark)

Student	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Student	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

3.3 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column;

3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

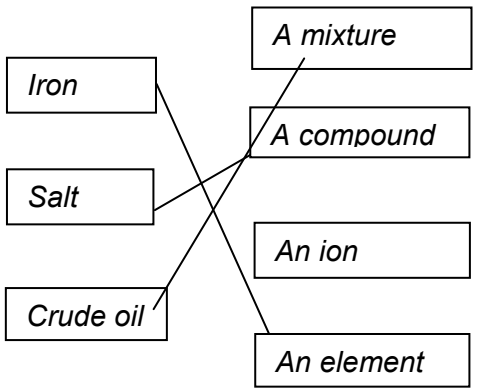
3.7 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: November 2011

question	answer	extra information	mark
1(a)		**one** mark for each correct line extra lines from the substance negate the mark	3
1(b)	gold		1
1(c)	mining carbon reduction		1 1 1
Total			**7**

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: November 2011

question	answer	extra information	mark
2(a)	earthquakes **and** volcanoes		1
2(b)	billion carbon dioxide water		1 1 1
2(c)	decreased increased photosynthesis	owtte owtte	1 1 1
2(d)	earthquakes happen at random (so can't be easily predicted) tsunamis happen some time after an (undersea) earthquake (so can be predicted)	accept happen suddenly **or** without warning accept you can see the wave / tsunami coming **or** tide suddenly goes out **or** fall in sea level ignore waves get bigger	1 1
Total			**9**

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: November 2011

question	answer	extra information	mark
3(a)(i)	sodium		1
3(a)(ii)	12		1
3(a)(iii)	11		1
3(b)	number of protons and neutrons (in an atom of an element)	accept mass of protons and neutrons or protons + neutrons	1
3(c)(i)	any **two** from: • surface area of metal • strength / concentration of acid • volume of acid • temperature	accept size of metal do **not** accept mass do **not** accept amount of metal allow amount of acid ignore heat	2
3(c)(ii)	**D** **A** **B** **C**	correct sequence **2** marks 2 in the correct position **1** mark	2
Total			**8**

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COMPONENT NAME: My World

SERIES: November 2011

question	answer	extra information	mark
4(a)(i)	**B D C A**	accept **B D A C** for **1** mark	2
4(a)(ii)	95	allow 95.3	1
4(a)(iii)	dark, damp conditions	allow chamber 4	1

Question 4 continues on the next page …

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question	answer	extra information	mark

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 4, and apply a 'best-fit' approach to the marking.

0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content.	At least one feature with a reason **or** two features described.	There may be reference to both animals with at least two features with reasons described **or** at least one feature described with a scientific explanation.	There must be reference to both animals and at least two features described together with a scientific explanation.

examples of areas addressed in the response	extra information
• Ear size, surface area and heat loss • Body size, surface area to volume ratio and heat loss • Body size, fat, insulation and heat loss • Fur thickness, insulation and heat loss • Fur colour, camouflage and predation	responses should be correctly linked to features from the images and data

Total			10

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question	answer	extra information	mark
5(a)	plant drawn horizontally to begin with	allow horizontal to at least first set of leaves	1
	end of plant growing upwards		1
5(b)	auxin / hormone		1
	is affected by gravity		1
	and moves to the lower side of the stem which stimulates cells (on the lower side) to grow		1
	causing the stem / plant to grow upwards	do **not** allow reference to light	1
5(c)	gravitropism	accept geotropism / tropism do **not** accept phototropism	1
5(d)	to prove the response is not to light	accept a correct reference to phototropism	1
Total			**8**

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question	answer	extra information	mark
6(a)(i)	respiration	apply list principle	1
6(a)(ii)	combustion / burning	apply list principle	1
6(a)(iii)	decomposers	accept bacteria / fungi / microbes / microorganisms / mould / detritivores eg worms ignore insects	1
6(b)	warm moist / damp aerobic / aerated	do **not** allow hot ignore heat ignore wet accept (plenty of) oxygen / air ignore any explanations ignore light / dark	1 1 1
6(c)	any **three** from: • no information on levels before 1950 • (60 years) is not long enough to monitor changes • the scale on the y axis makes the level appear to change considerably more • the graph shows data from only one location on the planet • there is nothing to show temperature rise matches / follows rise in CO_2 • not valid because Hawaii has volcanoes <u>which produce CO_2</u>		3
Total			**9**

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question	answer	extra information	mark
7(a)	sun		1
	moon		1
	sun and planets	either order accept moon / any named planet	2
	galaxy		1
7(b)	(as the source moves away) the wavelength (that the observer measures) increases	ignore further apart / stretches accept wave(length) gets longer	1
	and the frequency decreases	ignore louder / quieter / deeper accept pitch for frequency if clearly referenced to sound	1
	or		
	(as the source moves towards) the wavelength decreases (1)	ignore closer together / squashes	
	and the frequency increases (1)		
7(c)	light (from the distant stars) is shifted **or** moved into the red spectrum **or** red shifted **or** black lines are shifted / moved to the right / red	accept the observed wavelength of the dark line from the distant stars has increased	1
	this means that the stars are moving away (from Earth) / apart from Earth	accept reference to 'the further away the faster the movement' **or** 'the further the red shift the faster the movement' **or** the bigger the red shift the faster the movement'	1
Total			**9**

The UMS conversion calculator can be found on the following web link:

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