Version 1.0

General Certificate of Secondary Education
March 2012

Science B SCB1FP

(Specification 4500)

Unit 1: My World

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.

Further copies of this Mark Scheme are available from: aqa.org.uk

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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 bullet points 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 candidates 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)

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

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

Candidate	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, 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 or by each stage of a longer calculation.

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.

3.8 Ignore / Insufficient / Do <u>not</u> allow

Ignore of insufficient is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

Do **not** allow means that this is a wrong answer which, even if the correct answer is given, will still mean that the mark is not awarded.

4. Quality of Written Communication and levels marking

In Question 8(a) 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.

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

DATE: March 2012

question	answers	extra information	mark
1(a)(i)	mantle		1
1(a)(ii)	oxygen		1
1(b)	volcanic activity atmosphere		1 1
1(c)(i)	cooled		1
1(c)(ii)	tectonic convection		1 1
Total			**7**

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DATE: March 2012

question	answers	extra information	mark
2(a)	the Moon the Earth (the Sun) the Solar System the Milky Way Galaxy	all correct answers **3** marks two correct answers **2** marks if no other marks awarded allow galaxy, solar system, earth, moon **or** earth, moon, galaxy, solar system for **1** mark	3
2(b)(i)	red <u>shift</u>	accept Doppler effect allow red <u>shift</u>ing allow red <u>shift</u>ed allow redder shift / shifting / shifted ignore red alone	1
2(b)(ii)	the universe is expanding		1
2(c)	big bang		1
Total			**6**

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question	answers	extra information	mark
3(a)	decay		1
3(b)	grow		1
	warm (*)		1
	moist(*)	(*) these words can be either order more than one word in the space, unless crossed out, negates the mark	1
Total			**4**

COMPONENT NUMBER: SCB1FP

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question	answers	extra information	mark
4(a)	neutron(s) proton(s)	must be this order allow phonetic spellings	1 1
4(b)(i)	4 / four		1
4(b)(ii)	2 in inner 2 in outer	 allow ecf from (i) 9 or less	1 1
Total			**5**

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question	answers	extra information	mark
5(a)(i)	41/42/43 **or** 41 – 43 **or** 41 to 43		1
5(a)(ii)	palaeocene	allow phonetic spellings	1
5(a)(iii)	lemurs	allow phonetic spellings	1
5(b)	any **two** from: • allows scientists to use the same name regardless of language • so that all organisms are correctly identified • to avoid several different common names for the same organism **or** to avoid several different organisms having the same common name • to know what organisms they are related to	if none of these points gained, allow to avoid confusion for **1** mark	2
Total			**5**

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question	answers	extra information	mark
6(a)	in sequence: sparrowhawk blackbird caterpillar cabbage		1
6(b)	light / sun / sunlight	ignore photosynthesis / respiration cancel mark if water / ions given do **not** accept heat	1
6(c)(i)	243	correct answer with or without working gains **2** marks if answer incorrect, $\frac{(15 \times 1620)}{100}$ gains **1** mark	2
6(c)(ii)	(energy converted to) heat lost to the surroundings **or** lost during respiration (energy removed as) waste lost to the surroundings (energy) used in movement	do **not** accept wasted	1 1 1
Total			**7**

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question	answers	extra information	mark
7(a)	idea of reducing water loss		1
	because of the waxy coating and needle like leaves	second mark dependent on first	1
7(b)	(can't be seen against the background) so prevents predation		1
	(can't be seen against the background) so aids hunting		1
7(c)	the fur traps air		1
	air / fur is an insulator	accept air / fur is a poor (thermal) conductor	1
	(air / fur) traps body heat **or** reduces heat loss	ignore body fat NB: 'keep warm' is stem	1
7(d)	animal **B**		1
	because it has the lowest surface area to volume ratio	allow lowest surface area / ratio / number	1
	which means it has the lowest (rate of) heat loss (per unit body mass)	if only surface area is mentioned max **2** marks	1
Total			**10**

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question	answers	extra information	mark
8(a)	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 5, 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	There is an incomplete sequence which shows some progression.	There is a sequence which shows a logical progression but which may lack detail eg compression, time scale, CO_2 dissolving in water.	There is a complete sequence which shows a clear logical progression.

Examples of the points made in the response:	**Extra information**
• carbon dioxide dissolves in sea water • this is removed by marine plants / plankton • which are eaten by marine animals • used to make calcium carbonate in shells / etc • when these creatures die they fall to the sea floor • the shells become part of the sediment • the sediment is affected by pressure • converted to limestone rock • over a long time scale	ignore soft parts decay

Total			**6**

Question 8 continues on the next page

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Question 8 continued

question	answers	extra information	mark
8(b)	any **two** from: • transport (eg driving cars) • generation of electricity • industrial processes (eg cement / roasting of limestone / to make quicklime) • burning (forests / rubbish)	ignore breathing and respiration if no other marks gained, allow burning fossil fuels for **1** mark	2
Total			**8**

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question	answers	extra information	mark
9(a)	(bubble through) limewater	allow bubble through bicarbonate indicator	1
	which goes cloudy (if CO_2 present)	which goes yellow	1
9(b)(i)	because the plug stops liquid splash from the flask **or** to allow gas to escape	allow stopping the pressure building up	1
9(b)(ii)	line of best fit correctly drawn as curve	ignore extrapolations past 7 minutes allow first point missed	1
9(b)(iii)	8.5 (minutes)	accept value greater than 7	1
	because there are no results after 7 minutes	accept reference to reaction slowing down **or** reference to line gradually levelling off	1
9(b)(iv)	(carbon dioxide) gas is released during the reaction		1
	so the mass (of content and flask) decreases	accept gas has mass	1
Total			**8**

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