



**General Certificate of Secondary Education
June 2012**

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.

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

Copyright © 2012 AQA and its licensors. All rights reserved.

Copyright

AQA retains the copyright on all its publications. However, registered schools/colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools/colleges to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

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	Neptune, Mars, Moon	1
2	Neptune, 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 not allow

Ignore or 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 6(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

SERIES: June 2012

question	answer	extra information	mark
1(a)	proteins and carbohydrates		1
	carbon dioxide		1
1(b)	idea of plants getting more light	ignore reference to carbon dioxide/oxygen/warmth/nutrients	1
	for photosynthesis or to <u>make</u> food	'to grow' insufficient	1
1(c)	kingdom		1
1(d)	cutting down trees		1
	cooking with natural gas		1
	driving cars		1
Total			8

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

question	answer	extra information	mark
2(a)	fractional distillation		1
2(b)(i)	plotting correct	± ½ square 3 or 4 bars correct = 2 marks 1 or 2 bars correct = 1 mark ignore bar width	max 2
	correct labelling	must be consistent with labels already given	1
2(b)(ii)	as number of (carbon) atoms increases	accept as carbon chain increases do not accept carbon atoms get bigger	1
	<u>boiling point</u> increases		1
2(b)(iii)	viscosity increases as chain length increases		1
Total			7

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

question	answer	extra information	mark
3(a)(i)	decomposers	allow microbes / microorganisms / bacteria / fungi / detritivores ignore flies / maggots / bugs	1
3(a)(ii)	moist / damp warm	ignore wet do not accept hot / heat accept more oxygen	1 1
3(b)(i)	20(%)	correct answer with or without working gains 2 marks if answer incorrect, allow 3000 / 15 000 (x 100) for 1 mark	2
3(b)(ii)	any three from: <ul style="list-style-type: none"> • energy used for movement • energy used to heat organism • energy transferred to environment as heat • energy leaves organism in (excreted) waste 	accept energy used for hunting accept energy transferred to environment during respiration ignore faeces ignore stored as fat	3
Total			8

COMPONENT NUMBER: SCB1FP
COMPONENT NAME: My World
SERIES: June 2012

question	answer	extra information	mark
4(a)	<pre> graph LR air[air] --- mixture[mixture] magnesium_oxide[magnesium oxide] --- compound[compound] element[element] </pre>	1 mark for each correct line more than one line from a substance negates the mark	2
4(b)(i)	2.53		1
4(b)(ii)	a (chemical) reaction has occurred (between magnesium and oxygen) (so the mass of) oxygen has been added (to the mass of magnesium)	owtte accept conservation of mass	1 1
Total			5

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

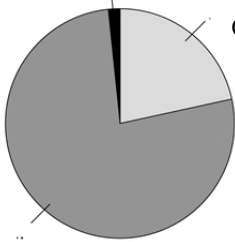
question	answer	extra information	mark
5(a)	B plants are taller	accept the converse statements	1
	B plants have smaller / thinner leaves	accept B plants have a thinner stem ignore the plants are closer together	1
5(b)	water / moisture	do not accept food allow carbon dioxide / CO ₂ / oxygen / O ₂ ignore soil / warmth / heat / air	1
	nutrients / minerals		1
5(c)(i)	growth longer	ignore extra leaves / seedlings	1
	growth towards the hole in the box		1
5(c)(ii)	phototropism		1
5(c)(iii)	any two from: <ul style="list-style-type: none"> • temperature • water / moisture • minerals / nutrients 	if no other marks gained allow amount of light or colour of light for 1 mark	2
5(d)(i)	right hand diagram		1
5(d)(ii)	gravity		1
Total			11

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

question	answer	extra information	mark
----------	--------	-------------------	------

6(a)	Other gases and water vapour	sector proportions correct labels correct ignore percentage	1
			1

6(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 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 a superficial account, which is poorly structured and demonstrates significant lack of detail.	The account has one or two omissions in detail and may not be in a logical sequence.	There is a complete account, presented in a logical sequence.
examples of the points made in the response <ul style="list-style-type: none"> the crust is broken into sections called (tectonic) plates which float on the mantle the continents are on the plates idea of the mantle behaving like a liquid, so convection currents in the mantle caused by heat from the core move the tectonic plates some idea of very slowly. 		extra information	

Total			8
--------------	--	--	----------

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

question	answer	extra information	mark
7(a)(i)	so the paint cannot be seen by predators		1
7(a)(ii)	341	correct answer with or without working gains 2 marks if answer incorrect, allow $\frac{66 \times 62}{12}$ for 1 mark	2
7(b)	Y because it is visible or because X is camouflaged	no mark ignore hidden	1
7(c)	there would have been more of Y than X		1
	because X would be less well camouflaged than Y or because Y would be better camouflaged than X		1
	so fewer Y would be eaten or so more of X would be eaten	allow reference to Y not being seen by predators	1
Total			7

COMPONENT NUMBER: SCB1FP

COMPONENT NAME: My World

SERIES: June 2012

question	answer	extra information	mark
8(a)	when the motor bike is approaching the frequency is increased	accept pitch for frequency answers must be comparative	1
	and the wavelength is decreased	allow wavelength mark once only	1
	when the motor bike is moving away the frequency is decreased (and the wavelength is increased) (1)	allow wavelength mark once only	1
	the faster the bike the greater the effect	ignore any references to volume	1
8(b)	red shift	accept Doppler (effect) allow red shifted / shifting	1
8(c)	Big Bang		1
Total			6

UMS conversion calculator www.aqa.org.uk/umsconversion