



**General Certificate of Secondary Education  
June 2013**

**GCSE Science B**

**SCB1FP**

**(Specification 4500)**

**Unit 1: My World**

**Final**

**Mark Scheme**

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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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## 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 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 7 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.

**SCB1FP****Question 1**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>1(a)</b>			<b>3</b>
<b>1(b)(i)</b>	atom		<b>1</b>
<b>1(b)(ii)</b>	a molecule		<b>1</b>
<b>1(b)(iii)</b>	a compound		<b>1</b>
<b>1(c)</b>	2 B (crushing using mortar and) 3 D (mix rock salt with water) 4 E (filtering) 5 A (evaporate water by heating)	B in correct position for 1 mark A in correct position for 1 mark D and E in correct consecutive order anywhere 1 mark	<b>max. 3</b>
<b>Total</b>			<b>9</b>

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**Question 2**

Question	Answers	Extra information	Mark
<b>2(a)(i)</b>	photosynthesis	accept reasonable phonetic spelling	1
<b>2(a)(ii)</b>	light	accept 'sun' ignore photosynthesis	1
<b>2(a)(iii)</b>	carbon dioxide (from the air)	accept carbonate/ bicarbonate/ hydrogencarbonate (from water)/CO <sub>2</sub> /CO <sub>2</sub> Ignore CO <sup>2</sup>	1
<b>2(b)(i)</b>	food (and drink)	allow 'what they eat/(other) animals/plants/producer/prey ignore digestion/ sun/ water/ fats/ carbohydrates/ protein/ hunting do not accept air/ soil	1
<b>2(b)(ii)</b>	respiration	accept respire/respiring	1
<b>2(c)</b>	break down food warm moist oxygen	either order	1 1 1 1 1
<b>Total</b>			<b>10</b>

**SCB1FP****Question 3**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>3(a)</b>	3 correct plots for 2 marks 1 or 2 plots for 1 mark straight line of best fit ignoring point (3,5) for 1 mark	allow <u>straight</u> line of best fit for their plots	3
<b>3(b)</b>	8 (°C)	value given must match evidence from (line on) graph (if drawn).	1
<b>3(c)</b>	ring round plot at 3 minutes human error / a cloud covered the sun		1 1
<b>3(d)</b>	repeat experiment <b>or</b> use a heater/reliable heat source instead of the sun.	allow do not forget to take a reading/take more care  ignore 'do it for longer'	1
<b>Total</b>			<b>7</b>



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**Question 4**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>4</b>	gene		1
	survive		1
	reproduce		1
	inherit		1
<b>Total</b>			<b>4</b>

**SCB1FP****Question 5**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>5(a)(i)</b>	640 (grams)	(320 + 660) = 980 for 1 mark	2
<b>5(a)(ii)</b>	the idea that one of the reactants would be left over which is a waste/a hazard.	allow idea of possible unpredictable reaction/wrong colour produced.	1
<b>5(b)(i)</b>	does not fade/ change colour <u>in sunlight</u>	ignore 'sunlight has no effect on the colour'	1
	does not wash away idea/ not dissolved <u>by rain / wet weather</u>	ignore 'does not dissolve in water' if no other marks allow idea of durability with a reason	1
<b>5(b)(ii)</b>	disadvantage – it is poisonous	allow 'it is very toxic' if qualified by Health and Safety idea	1
<b>Total</b>			<b>6</b>

**SCB1FP****Question 6**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>6(a)</b>	(the number of protons) increases by 1 (each time)		1
<b>6(b)</b>	mass = protons + neutrons	accept a rearranged equation	1
<b>6(c)</b>	electrons have a negative charge	ignore any reference to neutrons	1
	protons have a positive charge		1
	protons equal electrons		1
	so charges cancel out		1
<b>Total</b>			<b>6</b>

**SCB1FP****Question 7**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>7(a)(i)</b>	extremophiles		1
<b>7(a)(ii)</b>	any <b>two</b> from: very cold conditions or example very dry conditions or example very hot conditions or example very salty conditions or example very acidic/alkaline conditions or example	accept any correct suggestion of extreme conditions <u>for microbes</u> .	max 2

**Question 7 continues on the next page...**

**SCB1FP****Question 7 continued**

<b>Question</b>	<b>Answers</b>	<b>Extra information</b>	<b>Mark</b>
<b>7(b)</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.		<b>6</b>
<b>0 marks</b>	<b>Level 1 (1-2 marks)</b>	<b>Level 2 (3-4 marks)</b>	<b>Level 3 (5-6 marks)</b>
No relevant content	An outline method is suggested but essential practical details are omitted	The method suggested could be duplicated but has some details missing Eg exactly what readings would be taken to determine mass loss. The suggested method would be difficult to follow	The method suggested is in a logical sequence and includes most of the relevant details so that their procedure could be duplicated successfully. The use of results would be a reasonable attempt at calculation or comparison
<b>examples of the points made in the response</b> <b>Use of apparatus</b> <ul style="list-style-type: none"> <li>• Set up as in diagram</li> <li>• Use of balance and stop clock to gather results</li> </ul> <b>Controls</b> <ul style="list-style-type: none"> <li>• Temperature</li> <li>• Air flow</li> <li>• Light</li> </ul> <b>Measure and record</b> <ul style="list-style-type: none"> <li>• Leaf area (or same size leaf used)</li> <li>• Mass start and finish/loss</li> <li>• Time start/finish/left for</li> <li>• Calculation <b>OR</b> comparison</li> </ul>			<b>extra information</b>
<b>Total</b>			<b>9</b>

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## Question 8

Question	Answers	Extra information	Mark
8(a)(i)	the Doppler effect		1
8(a)(ii)	person B the idea that the sound is not moving relative to them	accept they are in the car accept the idea that the car is moving relative to A <u>and</u> C ignore reference to closeness/loudness	1 1
8(a)(iii)	person A  the car is <u>moving</u> away from him	ignore reference to loudness or distance	1 1
8(b)(i)	more or less complete vertical line drawn closer to the red end		1
8(b)(ii)	red shift		1
8(b)(iii)	the universe is expanding the universe started at one point	accept a description accept big bang	1 1
<b>Total</b>			<b>9</b>

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