Version 1.0

General Certificate of Secondary Education
June 2012

Science B SCB2FP

(Specification 4500)

Unit 2: My Family and Home

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

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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	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 <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 9 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.

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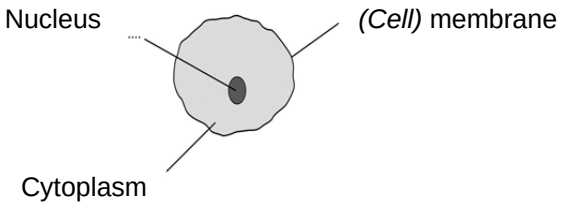
COMPONENT NAME: My Family and Home

SERIES: June 2012

question	answer	extra information	mark
1		**1** mark for each correct label do **not** accept cell wall	Max 3
Total			**3**

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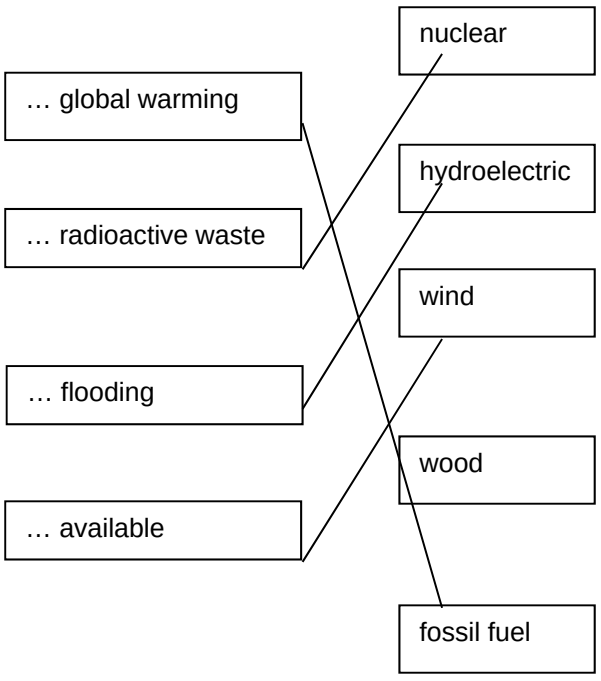
question	answer	extra information	mark
2		one mark for each correct line drawn extra lines from a disadvantage negate the mark	Max 4
Total			4

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question	answer	extra information	mark
3(a)	cement		1
3(b)	calcium oxide		1
3(c)	mortar		1
3(d)	calcium oxide		1
Total			**4**

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question	answer	extra information	mark
4(a)	helps enzymes to work kills some (harmful) microorganisms	accept breaks down food 'get rid of' insufficient	1 1
4(b)	idea of physical separation eg keeps acid off lining neutralises acid	'protects stomach' insufficient accept stops lining from being digested ignore 'gets rid of acid'	1 1
Total			**4**

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question	answer	extra information	mark
5(a)(i)	**A** receptor		1
	B sensory (neurone)		1
	C relay (neurone)		1
	D motor (neurone)		1
5(a)(ii)	stimulus		1
	receptor		1
	muscle contracts	accept muscle moves	1
5(a)(iii)	reflex (action)	accept phonetic spellings ignore reaction / arc	1
5(b)	hormones		1
	blood(stream)		1
	target	accept liver / effector	1
Total			**11**

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question	answer	extra information	mark
6(a)	haemophilia		1
6(b)(i)	X-rays		1
6(b)(ii)	different tissues absorb different amounts of X-rays	accept the idea of bones / dense material absorbing / stopping / blocking X-rays	1
6(b)(iii)	idea of extra finger		1
6(c)(i)	g g G **Gg** **Gg** **g** gg **gg**	male gamete **g** **both** progeny **Gg** / **gG** progeny **gg**	1 1 1
6(c)(ii)	0.5 **or** ½ **or** 50% **or** 1:1 **or** 50:50	**not** 1:2 **or** 50/50 accept 2/4 **or** 1 out of 2 **or** evens / an even chance / half a chance	1
Total			**8**

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question	answer	extra information	mark
7(a)(i)	3 correct plots	1 or 2 correct plots for **1** mark tolerance ± ½ small square	2
	smooth curve through most points	do **not** allow point to point	1
7(a)(ii)	the greater the angle the greater the voltage		1
	increasing size of angle has greatest effect for smaller angles		1
7(b)(i)	third box ticked		1
7(b)(ii)	because it has the angle closest to 90° to the light ray		1
	(and) the graph shows that the bigger the angle (to the light) the bigger the voltage	answer must relate to graph or data for this mark	1
Total			**8**

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question	answer	extra information	mark
8(a)(i)	**P** boiler / furnace / fire / heater where steam produced	both name **and** function required accept water is boiled	1
8(a)(ii)	**Q** turbine (spun by steam) rotates / turns / spins (the generator)	both name **and** function required accept goes round	1
8(a)(iii)	**R** generator / alternator produces electricity	both name **and** function required accept 'power' for 'electricity'	1
8(a)(iv)	**S** transformer changes / increases / steps up voltage (of electricity)	both name **and** function required ignore description of transformer	1
8(b)(i)	1596(p)	accept £15.96	1
8(b)(ii)	31.58	accept 31.6 / 32 accept calculator display (31.57894)	1
8(b)(iii)	cost of electricity for microwave 3.75 x 12 = 45p / £0.45 saving in electricity cost 504 – 45 = 459 / £4.59 9180 ÷ 459 **or** 91.80 ÷ 4.59 20	(units saved each week) 42 – 3.75 = 38.25 (money saved each week) 38.25 x £0.12 = £4.59 20 alone gains **4** marks allow ecf correctly between stages	1 1 1 1

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question	answer	extra information	mark
8(c)	2 kW	correct answer with or without working gains **2** marks if answer incorrect evidence of 30 minutes = 0.5 hours **or** 1 unit = 1kWh **or** 7 units = 7 kWh gains **1** mark	2
Total			**12**

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9			
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	At least one bad feature is given, which may not be explained. The answer may include a good feature.	The answer includes at least one bad feature with an attempt to justify it, together with a number of other good and bad points of experimental design. A brief comment about the reliability of the experiment or the student's conclusion is present.	The answer includes most or all of the good and bad points (including lack of units in the table). The clear justification of at least one of the bad points results in a reasoned comment concerning the validity of the scientific method or student's conclusion.

examples of the points made in the response	**extra information**
good features: • Area of metal the same • Distance from heater the same • Clear layout of table **bad features:** • Thickness of metal differs (so different times for heat to travel) • Colour of metal differs (so might not absorb the same amount of heat) • Mass of drawing pin differs (so heavier ones fall sooner) • No units given in table (so experiment cannot be repeated) • No evidence of any repeats in the table. **conclusion:** A statement within the answer that the reliability is suspect because of the bad features of the experiment.	

Total			**6**