
GCSE SCIENCE B

SCB2HP – Unit 2 My Family and Home
Mark scheme

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Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer 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 associates 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 associate understands and applies it in the same correct way. As preparation for standardisation each associate 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, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

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

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. Boldening

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 boldened. 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 / ; e.g. 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	green, 5	0
2	red*, 5	1
3	red*, 8	0

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

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

3.2 Use of chemical symbols / formulae

If a student 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.

Quality of Written Communication and levels marking

In Question 5(c) students 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.

Students 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.

Question	Answers	Extra information	Mark	AO and Spec Ref
1 (a)	(a large number of) monomers or small molecules		1	AO1 3.4.2.1.9
	polymerisation or joined together		1	
	to form a polymer or long molecule		1	
1 (b)	any two from: • cheaper • does not corrode • easier to mould • does not conduct heat <u>as readily</u> • lighter	accept converse for steel	2	AO2 3.4.2.1.10
1 (c)(i)	any one from: • it is brittle • high melting point • hard • resistant to chemical attack • hard wearing	accept insulator	1	AO1 3.4.2.1.11
1 (c)(ii)	limestone is heated (with) sand and sodium carbonate	accept soda for sodium carbonate	1 1	AO1 3.4.2.1.4
1(d)(i)	sand gravel cement water	all four correct for 2 marks any two correct for 1 mark allow hard core for gravel ignore clay	2	AO1 3.4.2.1.5

Question 1 continues on the next page

Question 1 continued

Question	Answers	Extra information	Mark	AO and Spec Ref
1(d)(ii)	any one from: - to add strength - to add flexibility		1	AO3 3.4.2.1.13
Total			11	

Question	Answers	Extra Information	Mark	AO and Spec Ref																
2 (a)	any two from: - polydactyly - sickle cell (anaemia) - cystic fibrosis - haemophilia	accept any correctly named genetic disorder e.g: - Huntington's - Down's syndrome - dwarfism - colour blindness - muscular dystrophy	2	AO1 3.4.1.3.6																
2 (b)	<table><tr><td></td><td></td><td>(Mother)</td><td></td></tr><tr><td></td><td></td><td>G</td><td>g</td></tr><tr><td>(Father)</td><td>G</td><td>GG</td><td>Gg</td></tr><tr><td></td><td>g</td><td>Gg</td><td>gg</td></tr></table>			(Mother)				G	g	(Father)	G	GG	Gg		g	Gg	gg	correct alleles for both parents Punnett square completed correctly gg identified correctly	1 1 1	AO2 3.4.1.3.5
		(Mother)																		
		G	g																	
(Father)	G	GG	Gg																	
	g	Gg	gg																	
2 (c)	in the nucleus on chromosomes	ignore DNA ignore numbers on chromosomes	1 1	AO1 3.4.1.3.1,2																

Question 2 continues on the next page

Question 2 continued

Question	Answers	Extra Information	Mark	AO and Spec Ref
2 (d)	any two from: • potential harm to the woman from screening • potential harm to foetus • screening might not show up genetic abnormality (that the mother has) • ethical issues linked to abortion • discrimination against the baby if it has 'inferior' genes • availability of treatment for the disorder if pregnancy continues	ignore reference to cost	2	AO3 3.4.1.3 box
Total			9	

Question	Answers	Extra Information	Mark	AO and Spec Ref
3 (a) (i)	porpoise		1	AO1 3.4.1.1.6
3 (a) (ii)	20 to 20 000 (Hz)	accept 20 kHz for 20 000 Hz ignore units unless KHz	1	AO1 3.4.1.1.6
3 (a) (iii)	longitudinal (wave)	do not accept transverse ignore mechanical / pressure / audio	1	AO1 3.4.1.1.5
3 (a) (iv)	any one similarity from: - transfers energy from one place to another - as wavelength increases frequency decreases - as frequency increases the energy of the wave increases. any one difference from: - electromagnetic waves are (much) faster - sound waves are caused by vibrations and electromagnetic waves are not	1 mark for similarity and 1 mark for the difference accept electromagnetic waves are transverse sound is longitudinal accept electromagnetic waves travel through a vacuum sound waves do not sound waves need particles to travel through electromagnetic waves do not	1 1	AO3 3.4.1.1.5 3.4.3.2

Question 3 continues on the next page

Question 3 continued

Question	Answers	Extra Information	Mark	AO and Spec Ref
3 (b) (i)	each implication scores a maximum of 1 mark any one health implication from:	allow any sensible health or social implication for 1 mark	1	AO3 3.4.1.1 box
	• cause deafness • tinnitus any one social implication from: • find it harder to socialise • difficult to interact with others • annoying others with loud music	allow cost if qualified	1	
3 (b) (ii)	skin / receptor		1	AO1 3.4.1.1.4
	sensory neurone motor neurone	middle two in the correct order for the third mark	1	
	muscle / effector		1	
3 (b) (iii)	2200 (Hz) frequency = $\frac{\text{wave speed}}{\text{wavelength}}$ correct conversion of 15 cm to 0.15 m correctly calculated	equation correctly rearranged to frequency = wave speed / wavelength gains 1 mark allow correct substitution of numbers into the correct equation evidence of 15cm = 0.15m gains 1 mark. allow 22 (Hz) for 2 marks	3	AO2 3.4.3.2.5
Total			13	

Question	Answers	Extra Information	Mark	AO and Spec Ref
4 (a)	any one from: - safety goggles – because it will stop acid entering the eye - lab coat – because it will prevent acid getting onto clothes / skin	any sensible safety precaution and reason needed no mark for precaution only	1	AO1 3.4.1.2.2
4 (b) (i)	hydrogen ion	accept H^+ ignore reference to pH	1	AO1 3.4.1.2.5a
4 (b) (ii)	$H^+ + OH^-$ H_2O	Either order Ignore state symbols	1 1	AO1 3.4.1.2.5c
4 (c) (i)	increase surface area or speed up reaction or dissolves faster		1	AO3 3.4.1.2.7
4 (c) (ii)	any one from: - to make the reading more accurate - more precise - respond to change more quickly	allow universal indicator is less accurate allow more reliable, easier to read, to get a precise reading	1	AO3 3.4.1.2.7

Question 4 continues on the next page

Question 4 continued

4 (c) (iii)	interpretation of results - A has too much antacid (too strong) - A would neutralise too much acid stomach needs acid for digestion (because) the stomach (enzymes) need acid to work (because) the stomach won't work if alkaline apply interpretation to the stomach (because) mild heartburn means only small amounts of acid needs to be neutralised	accept to converse for B	1 1 1	AO3 3.4.1.2.7, box
Total			9	

Question	Answers	Extra information	Mark	AO and Spec Ref
5 (a)	oxygen	left-hand side allow O ₂	1	AO2 3.4.2.2.4
	water (vapour)	right-hand side allow H ₂ O allow OH ₂	1	
5 (b)	cannot be replaced once used up	ignore can be used once	1	AO1 3.4.2.3.1
5 (c)			6	AO1/AO2 3.4.2.3.6
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 part correctly named or a process identified	at least one part correctly named and a process described correctly	a correct sequence given, in which most parts are correctly named and some are correctly linked to a description of the appropriate processes	
examples of the points made in the response (part A) – fuel rods / (nuclear) fuel / (nuclear) reactor / core / control rod • fuel undergoes fission • fission releases heat / energy (part B) – boiler / heat exchanger • heat used in the boiler • water into steam (part C) – turbine • steam turns turbine (part D) – generator • turbine turns generator • generator produces electricity		extra information		
Total			9	

Question	Answers	Extra Information	Mark	AO and Spec Ref
6 (a) (i)	0.11 1 mark for rearranging 1 mark for substitution of correct values 1 mark answer calculated correctly from substituted values	6600 kWh gains 2 marks 6.6 kWh gains 2 marks If no other mark awarded allow 1 mark for correct conversion	3	AO2 3.4.3.1.3
6 (a) (ii)	1.76p	allow 1.8p ; £0.02 allow ecf from 6 (a)(i) allow 105,600p if 6600kWh 105.6p if 6.6kWh used 176p if 11kWh used	1	AO2 3.4.3.1.5
6 (b)	234 000 1 mark for rearranging 1 mark for substitution of correct values 1 mark answer calculated correctly from substituted values J	allow 0.065 kWh for 4 marks as an alternative correct calculation evidence of 780W or 0.78 kW gains 1 mark (65% of 1200W) accept joules	3 1	AO2 3.4.3.1.7
6 (c)	any one from: - mobile phones - satellite communication - satellite TV	satellite alone insufficient	1	AO1 3.4.3.2.6b
Total			9	