

GCSE FURTHER ADDITIONAL SCIENCE

FAS1FP
Mark scheme

4410
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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 Assessment Objectives and specification content that each question is intended to cover.

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 and underlining

- 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.
- 2.4** Any wording that is underlined is essential for the marking point to be awarded.

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 is 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 are 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 7 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 / spec ref.
1(a)(i)	<p>White blood cells</p> <p>Red blood cells</p> <p>Platelets</p> <p>carry glucose around the body</p> <p>carry oxygen around the body</p> <p>help the blood to clot</p> <p>destroy microorganisms</p>	one mark for each line extra line negates a mark	3	AO1 3.2.2c, d,e
1(a)(ii)	any one from: <ul style="list-style-type: none"> carbon dioxide / CO₂ urea 	do not allow urine ignore water ignore ions	1	AO1 3.2.2b
1(b)(i)	B		1	AO1 3.2.1d
1(b)(ii)	D		1	AO1 3.2.1d
1(b)(iii)	vein	accept correct named examples	1	AO1 3.2.1e
1(c)(i)	any one from: <ul style="list-style-type: none"> keeps artery / blood vessel open or widens artery / blood vessel allows (more) blood to heart / cardiac muscle (allows) blood to flow more easily allows (more) oxygen to heart / cardiac muscle 		1	AO1 3.2.1f
1(c)(ii)	any two from: <ul style="list-style-type: none"> bleeding infection damaging blood vessels damaging the heart risk from anaesthetic 	allow blood clots	2	AO3 3.2
Total			10	

Question	Answers	Extra information	Mark	AO / spec ref.
2(a)(i)	pancreas glucose		1 1	AO1 3.3.3a
2(a)(ii)	pancreas	allow phonetic spelling	1	AO1 3.3.3a
2(b)(i)	D		1	AO3 3.3.3c
2(b)(ii)	C		1	AO3 3.3.3c
2(b)(iii)	any one from: <ul style="list-style-type: none"> controlling diet (attention to) exercise 	ignore healthy / balanced diet accept 'pancreas transplant' accept 'use of stem cells' allow named drug	1	AO1 3.3.3d
Total			6	

Question	Answers	Extra information	Mark	AO / spec ref.
3(a)	osmosis partially permeable		1 1	AO1 3.1.1b
3(b)(i)	any two from: <ul style="list-style-type: none"> • vacuole is small(er) • cytoplasm has shrunk • gap between cytoplasm and cell wall • cell wall curves inwards • the (cell) membrane has moved away from the wall 	allow correct answers in terms of A allow cytoplasm is smaller allow cell B is flaccid or cell A is turgid	2	AO2 3.1.1
3(b)(ii)	any one from: <ul style="list-style-type: none"> • water will move / diffuse in • (cells) will swell • (cells) will burst 	ignore turgid	1	AO2 3.1.1c
3(c)	villi give the small intestines a large surface area villi have many blood capillaries		1 1	AO1 3.1.1k,j ,l
Total			7	

Question	Answers	Extra information	Mark	AO / spec ref.
4(a)(i)	xylem		1	AO1 3.2.3a
4(a)(ii)	phloem		1	AO1 3.2.3a
4(a)(iii)	transpiration		1	AO1 3.2.3a
4(a)(iv)	stomata		1	AO1 3.1.3d
4(b)(i)	any one from: <ul style="list-style-type: none"> reduce / prevent evaporation of water from flask holds plant shoot in place prevent damage to the plant 		1	AO2 3.2.3
4(b)(ii)	same surface area or number of leaves	(because if they used larger / smaller size shoots) there would be a larger / smaller surface area or a larger/ smaller number of leaves allow same number of stomata	1	AO2 3.2.3
	from which (the same amount of) water evaporates	(and therefore) more / less water would escape allow from which water escapes	1	
4(b)(iii)	4.5	look for answer written in table	1	AO2 3.2.3
4(b)(iv)	increasing temperature / heat increases (rate of) water loss / evaporation		1	AO3 3.2.3
4(b)(v)	having moving air / a fan increases (rate of) water loss / evaporation		1	AO3 3.2.3
4(c)(i)	0.3 g		1	AO2 3.2.3
4(c)(ii)	plastic bag reduces air flow across leaves or air is humid around the leaves	allow plastic bag stops water (vapour) leaving allow air (in plastic bag) becomes saturated (with water)	1	AO3 3.2.3
Total			12	

Question	Answers	Extra information	Mark	AO / spec ref.
5(a)(i)	(37C is the same as human) body temperature		1	AO2 3.3.1
5(a)(ii)	any one from: <ul style="list-style-type: none"> • urea • glucose • sodium 	ignore water	1	AO2 3.3.1f
5(a)(iii)	(as they are) small enough to pass through (the membrane)	allow because there is a high concentration in the fake blood and a low concentration in the water (so will diffuse across)	1	AO2 3.3.1f
5(a)(iv)	glucose		1	AO1 3.3.1f
5(b)	any two from: <ul style="list-style-type: none"> • don't have to go to hospital or done at home rather than hospital • less effect on lifestyle / can be mobile • always filtering urea out • don't need a medical professional (to do it for you) 	continuous is insufficient allow takes a shorter time allow does not have to be connected to blood vessels ignore 'less painful'	2	AO3 3.3
Total			6	

Question	Answers	Extra information	Mark	AO / spec ref.
6(a)(i)	76.0 / 76	correct answer with or without working gains 2 marks allow 76.04 for 2 marks allow 76.04 with extra decimal places eg 76.042 for 1 mark $\frac{465}{611.5}$ for 1 mark	2	AO2 3.4.4c
6(a)(ii)	mass of fish declines (until 2008) (due to an) increase in fishing / overfishing and then rises (until 2010) (which could be due to) quotas / net restrictions working	ignore use of numbers allow number of fish decline (until 2008) allow any reasonable suggestion, such as countries swapping quotas or restrictions on fishing during breeding seasons ignore less fishing if no other marks awarded allow 1 mark for a decrease in mass and an increase in mass if answer relates to sustainable fishing	1 1 1 1	AO2 / AO3 3.4.4c
6(a)(iii)	(this is due to) public awareness / demand	allow legislation / rules	1	AO3 3.4.4c
6(b)	fishing quotas / bans (small) net / mesh size	 if size of net is stated then it must be smaller if size of mesh is stated then it must be larger	1 1	AO1 3.4.4c

6(c)	(fish) cannot move freely / as much		1	AO1 / AO2 3.4.4b
	(therefore) less <u>energy</u> loss from the fish	do not allow 'no energy is lost' ignore references to less heat loss though controlling body temperature ignore references to respiration	1	
	(there is) more food available / better quality food / fed more often	accept 'high-protein food (for making cells)'	1	
	(so) there is more energy for growth or (more food) is converted to biomass		1	
Total			13	

Question	Answers	Extra information	Mark	AO / spec ref.
7			6	AO1 3.4.1
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 pollutant is identified or the cause (of the increased pollutant) or the effect (of the increased pollutant) is given.	Pollutants are identified and at least one pollutant is correctly linked to the cause (of the increased pollutant) or the effect (of the increased pollutant) is given. At least two of air, water and land should be included in the answer.	At least one pollutant for each of air, water and land are given and at least one pollutant should be correctly linked to the cause and the effect.	
examples of the points made in the response water: • sewage <ul style="list-style-type: none">○ (from more people)○ (effect) eutrophication • fertilisers <ul style="list-style-type: none">○ to help grow more food○ (effect) eutrophication • toxic chemicals, such as pesticides <ul style="list-style-type: none">○ to help grow more food / crops○ (effect) poisons animals / builds up in food chain air: • smoke / gases / sulphur dioxide / SO ₂ <ul style="list-style-type: none">○ from (increased) cars / industry / factories○ (effect) contributes to acid rain. • methane <ul style="list-style-type: none">○ caused by (increased) cattle farming○ (effect) contributes to greenhouse effect/global warming • CO ₂ / carbon dioxide <ul style="list-style-type: none">○ (through) reductions in photosynthesis OR due to deforestation OR (increased) use of cars / industry / factories○ (effect) contributes to greenhouse effect/global warming land: • pesticides (used on crops) and / or herbicides <ul style="list-style-type: none">○ to help grow more food / crops		extra information give credit for any other type of correct pollution allow nitrous oxides accept described effect of global warming, eg can lead to changes in the earth’s climate OR a rise in sea levels accept explanations of the effect of water vapour		

<ul style="list-style-type: none"> ○ (effect) poisons animals / builds up in food chain or may be washed in to waterways. • rubbish / landfill <ul style="list-style-type: none"> ○ more packaging ○ (effect) leads to an increase in landfill sites 		
Total		
		6