



**General Certificate of Secondary Education
June 2013**

Science A / Biology

BL1FP

(Specification 4405 / 4401)

Unit 1: Biology 1

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.

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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. 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 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.

Question 1

question	answers	extra information	Mark
1(a)(i)		<p>1 mark for each line do not award a mark for a 'change' that has two lines</p>	3
1(a)(ii)	receptor cells		1
1(b)	used to provide (extra) energy	<p>allow (more) used in respiration allow suitable reference to muscles do not accept used for sweat</p>	1
1(c)(i)	growth of muscles		1
1(c)(ii)	<p>(these drugs have) possible side / harmful effects or answers that refer to 'fairness of competition' e.g. cheating</p>		1
Total			7

Question 2

question	Answers	extra information	Mark
2(a)	looks like a leaf		1
	so predator less likely to / won't see it	allow 'camouflage' as alternative to either point	1
2(b)(i)	thorns (of acacia tree) hurt (predators)	allow idea that fewer animals / predators live in trees or ground living animals can't reach them (in the trees)	1
2(b)(ii)	(giraffe) avoids being bitten by ants	allow ants are poisonous / have unpleasant taste	1
2(c)	looks like / mimics a wasp or has warning colouration		1
	so predators think it has a sting		1
Total			6

Question 3

question	answers	extra information	Mark
3(a)(i)	25 °C		1
3(a)(ii)	pathogens		1
3(b)	D		1
	more / most bacteria killed	accept biggest area / ring where no bacteria are growing	1
3(c)	viruses live inside cells		1
Total			5

Question 4

question	answers	extra information	Mark
4(a)	sulfur dioxide		1
4(b)(i)	mutation		1
4(b)(ii)	pale form now (more) easily seen (by predators) or dark form now less easily seen (by predators)	accept ref to camouflage	1
	so pale form (more) likely to be eaten or dark form less likely to be eaten		1
	so dark form (more likely to) breed / pass on genes or pale form less likely to breed / pass on genes		1
4(c)(i)	pyramid of three layers of diminishing size	either way up	1
	three labels in food chain order	award 2 marks only if the pyramid is correctly labelled accept trees / birch accept (peppered) moth(s) / larvae	1
4(c)(ii)	some material is lost in waste from the birds		1
	peppered moth larvae do not eat all the leaves from the trees		1
Total			9

Question 5

question	answers	extra information	Mark
5(a)	8.05 / 8.1 / 8	correct answer with or without working gains 2 marks allow 1 mark for 8.0 or 8.10 allow 35/100 x 23 (million) for 1 mark if no answer or incorrect answer allow 1 mark for 805 or 8 050 000	2
5(b)(i)	any one from: <ul style="list-style-type: none"> • less landfill sites used • less cost (of landfill sites) / saves money • less effort / cost to collect 	allow less to collect	1
5(b)(ii)	compost can be used on garden	allow idea of compost can be used to help plant growth or compost provides minerals / named or compost improves the soil	1
Total			4

Question 6

question	answers	extra information	Mark
6(a)	sexual reproduction		1
6(b)(i)	genes		1
6(b)(ii)	gametes		1
6(c)(i)	any two from: <ul style="list-style-type: none"> • <u>more</u> meat (per cow) • <u>more</u> milk each day • can be milked for <u>more</u> time after giving birth / <u>greater</u> proportion of time 	answers must be comparative ignore bigger unqualified accept '(produce) <u>more</u> milk', for 1 mark, if neither more milk each day nor can be milked for more time after giving birth are given	2
6(c)(ii)	(milk contains) <u>more</u> protein	answers must be comparative	1
	<u>less</u> time before having a calf when no milk produced		1
6(d)(i)	genes from one organism are transferred to a different organism		1
6(d)(ii)	(possible) harm to babies' long term health	allow don't know long-term / side effects (on baby) accept idea that there may be other things in (genetically engineered) cow's milk that might harm babies' health e.g. bacteria ignore ethical / religious arguments	1
Total			9

Question 7

question	answers	extra information	Mark
7(a)(i)	lower percentage (of women) who died	allow fewer (women) died	1
	numerical reference to a pair of figures to show this	allow any difference in a pair of figures	1
7(a)(ii)	doctors were not <u>transferring</u> pathogens / bacteria / viruses / microorganisms / microbes	ignore reference to nurses	1
		allow fungi ignore disease / germs / infection	1
7(b)	<p>any three from:</p> <ul style="list-style-type: none"> • lower percentage of patients died (when doctors washed hands or in ward A) • large decrease or reference to proportional decrease • little / no difference / similar to ward B • continued drop (in ward A) 	<p>allow fewer for lower percentage</p> <p>ignore raw data</p>	3
7(c)	<p>any two from:</p> <ul style="list-style-type: none"> • better understanding / knowledge <u>of immunity</u> • better / new drugs • sterilisation of equipment or isolation of patients or some infectious diseases wiped out or earlier identification / treatment of infections 	<p>accept ref to immunisation / vaccination</p> <p>accept examples, e.g. antibiotics / penicillin (discovered)</p> <p>allow better / new medicines</p> <p>ignore references to general hygiene</p>	2
Total			9

Question 8

question	answers	extra information	Mark
8(a)(i)	idea of 'normal' food / diet	e.g. 'the same as usual' or 'the same as before' allow balanced diet allow none of the slimming programmes ignore healthy diet	1
8(a)(ii)	for comparison	accept to show the test is valid allow to show the effect of the slimming programmes allow to see if the slimming programmes work ignore idea of fair test / reliable do not allow accurate / precise	1
8(b)(i)	(at first) large / rapid (loss / change of body mass) then small (loss / change) / levelling off	accept 'loss of mass decreased' for 2 marks	1 1
8(b)(ii)	all lost body mass (compared to the control group)		1
Total			5

Question 9

question	Answers	extra information	Mark
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.		6
0 marks	Level 1 (1-2 marks)	Level 2 (3-4 marks)	Level 3 (5-6 marks)
No relevant content.	For at least one process either the organism that carries it out or the carbon compound used or the carbon compound produced is described or for at least one organism either the carbon compound it uses or the carbon compound it produces is described or at least one process is named	For some processes (at least one of which is named) either the organisms involved or the carbon compounds used or the carbon compounds produced are described	For at least one named process an organism and either the carbon compound used for the process or the carbon compound produced by the process are described and for other processes (at least one of which is named) either the organism or the carbon compounds used or the carbon compounds produced are described (as in Level 2)
examples of biology points made in the response:			
<ul style="list-style-type: none"> • (green) plants photosynthesise • photosynthesis takes in carbon dioxide • (green) plants use carbon to make carbohydrate / protein / fat / organic compounds / named (e.g. enzymes / cellulose) • animals eat (green) plants (and other animals) • (green) plants respire • animals respire • respiration releases carbon dioxide • (green) plants and animals die • microorganisms decay / decompose / rot / break down / feed on dead organisms • microorganisms respire 			
Total			6

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