
SCIENCE FOR ALL

5031/03

Paper 3

October/November 2019

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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This document consists of **8** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct / valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	180 (million years) ;	1
1(b)(i)	All died out / the species died out / no longer exist ;	1
1(b)(ii)	Dodo / mammoth (or any reasonable alternative) ;	1
1(c)(i)	<i>Any 2 from:</i> smaller ; orbits often not circular ; orbital direction often different from planets ; nor spherical ;	2
1(c)(ii)	(Dust thrown up into atmosphere) which blocks the Sun's light and heat ; Earth will get cold ; Plants will die / no plants / no photosynthesis / no food (for herbivores) ; Direct effect of the dust e.g. breathing ;	3
1(d)	Similarity: any one from four limbs / claws ; Difference: any one from feathers v scales / wings v front legs / size of tail / fody smaller / fody has a beak / wings / velociraptor has teeth ;	2

Question	Answer	Marks
2(a)	Direct contact is when people touch / indirect is when people do not touch ; Indirect is through the air / passed on things ; Direct is kissing or shaking hands or sharing cutlery / indirect is sneezing or coughing ;	3
2(b)	<i>Any 2 from:</i> Symptoms are similar to less serious diseases / names some symptoms ; not all patients show all symptoms ; babies cannot talk to the doctor / cannot describe their symptoms ;	2
2(c)	body produces antibodies ; produces antibodies quickly if meningitis is caught later / in the future ;	2
2(d)	stop people catching disease / long term immunity ; antibiotics are taken after people already have disease / might not be diagnosed in time / do not kill all (population of) bacteria / need multiple doses / need to complete the course of treatment ; antibiotics do not work against viruses ;	3

Question	Answer	Marks
3(a)(i)	people are at work all day / for 8 hours / more than 6 hours / this amount is safe for a whole working day / no noticeable effects until 6 hours / does not cause sickness (or danger of death) ;	1
3(a)(ii)	<i>Any 2 from:</i> people are at home for longer than 8 hours / longer time / may be harmful for very long exposure ; At home may be babies / children / elderly / people with health problems / pets ; Can find out cause of CO / blocked boiler might get worse idea ;	2
3(b)	<i>Any 2 from:</i> Will notice effects in less than 1 hour ; Will feel sick after 2 hours ; Significant risk of death in less than 6 hours	2
3(c)(i)	1 : 1.5	1

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Question	Answer	Marks
3(c)(ii)	limited oxygen supply / less oxygen ; causes incomplete combustion / complete combustion not possible ;	2
3(d)	gives amount / concentration of CO ; has an alarm ;	2

Question	Answer	Marks
4(a)	(tripod) stand	1
4(b)(i)	UV can damage the eyes / skin / cells / UV is ionising / to stop contact of UV with eyes / skin / cells ;	1
4(b)(ii)	Keeps (other) light out ;	1
4(c)	Same volume / amount of cream ; Evenly spread;	2
4(d)	Control allows you to check that it is only the cream that is different between the measurements ; How much UV absorbed by the Petri dish Compare with and without sunscreen ;	2
4(e)(i)	<i>Any 2 from:</i> A absorbs more than B ; B absorbs very little UV ; B is hardly better than the control ;	2
4(e)(ii)	How long it lasts without needing re-application / whether it is waterproof / whether it produces allergic reaction, etc.	1

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Question	Answer	Marks
5(a)	Same size idea / same area ; Can be picked up and put down / no need to measure out every time / samples small area / easy to count / don't need to count plantains over a large area idea / no need to count them all ;	2
5(b)(i)	3	1
5(b)(ii)	5.33	1
5(b)(iii)	number of plantains decrease with distance from main path ; until 4 metres / then they increase (again) / can't tell after 4 metres ;	2
5(c)(i)	might have been near pond / near play area ;	1
5(c)(ii)	Deliberately sample in or away from an area e.g. the grass / pond / play area / use a larger square / more repeats ;	1
5(d)	<i>Any 2 from</i> plantain needs light ; for photosynthesis ; grass too close or dense so plantains cannot grow / lack of space ; competition for water / nutrients ; space for seeds to land on soil ;	2

Question	Answer	Marks
6(a)	3 and 4 ; Ranges overlap ;	2
6(b)(i)	Set 3 ; large range / mean is towards bottom of range ;	2
6(b)(ii)	<i>Any 2 from:</i> incorrect mass / amount (of sodium hydrogen carbonate) used ; did not measure exactly 10 cm ³ ; parallax error / meniscus error / not on flat surface; time read incorrectly / heating longer / shorter ; did not put bung into tube quickly ;	2
6(c)	2.45; (2) Uses 24.5 in answer ; (1)	2
6(d)	heat the same mass of old and new baking soda ; old baking soda takes longer to make 10 cm ³ gas than new ;	2