



Cambridge Lower Secondary Checkpoint

SCIENCE

0893/02

Paper 2

October 2024

MARK SCHEME

Maximum Mark: 50

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 Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' 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 End of Series Report. Cambridge will not enter into discussions about these mark schemes.

This document has **18** pages. Any blank pages are indicated.

General guidelines on marking

Many descriptive answers can be expressed in a variety of ways. Professional judgement can be used in these cases, providing it matches the marking points and further information in the mark scheme.

Answers may have words spelt incorrectly. Credit is normally given for phonetically correct answers, unless the word has a scientifically different meaning. For example, where the answer should be antennae, credit will be given for antenna but not for anthen (too close to anther).

Only the science is being assessed so answers do not need to be grammatically correct. Significant figures will be indicated in the question or in the mark scheme.
Unless specified all marking points are independent.

Annotations and abbreviations

/ or	alternate responses for the same marking point
() brackets	the words or units in brackets do not need to be stated, for example, (recycles or releases or provides) minerals = minerals scores the mark
<u>Underline</u>	exact word is required
Accept	an acceptable response
Do not accept	indicates an incorrect response that would contradict another otherwise correct alternative
Ignore	indicates an irrelevant answer that is not creditworthy. Full marks can still be achieved even with answers that are ignored.
Note	provides extra information when necessary
ecf	error carried forward; marks are awarded if an incorrect response has been carried forward from earlier working, provided the subsequent working is correct
ora	or reverse argument; for example, as mass increases, volume increases could be written as mass decreases, volume decreases

Question	Answer	Marks	Further Information
1(a)	variation	1	Ignore traits / inheritance Do not accept genes / DNA / natural selection
1(b)	any three from attached earlobes blood group eye colour colour blindness sex / gender tongue rolling dimples and freckles	3	each correct answer = 1 mark Ignore shape of ears Ignore facial features Accept any other suitable characteristic e.g. curly hair etc. Accept named genetic disorders such as polydactyly or cystic fibrosis

Question	Answer	Marks	Further Information
2	any three from (fossil record) (idea that) similar fossil (record) is found on continents that are far apart (idea that) the continents were together (a long time ago) or (idea that the) continents have moved apart (taking the fossils with them) (magnetic material) (idea of) same pattern of alignment of the magnetic materials is seen in rocks either side of the mid-Atlantic ridge (idea that) the rocks have moved away from the mid-Atlantic ridge	3	each correct answer = 1 mark Ignore reference to shapes of plates Accept same or similar fossil (record) on different continents or same or similar fossil (record) in different parts of the world or same or similar fossil (record) in different countries or same or similar fossil (record) in different areas or same or similar fossil (record) on different plates Accept (idea of) Pangaea or supercontinent Accept alignment is symmetrical about the plate boundary or same pattern of alignment on either side of plate boundary or same part of alignment on adjacent tectonic plates Accept rocks have moved away from the plate boundary

Question	Answer	Marks	Further Information
3(a)(i)	2.8.3	1	Accept drawing of correct electronic structure Accept K2 L8 M3 Ignore 13
3(a)(ii)	11	1	
3(b)	ionic made up of positive and negative ions	2	Note covalent bonding or intermolecular forces = 0 marks for the question each correct answer = 1 mark Note award the marks wherever they appear Accept electrovalent Accept oxide is negative and magnesium (ion) is positive Ignore negative atoms and positive atoms or reference to electrons even if incorrect or is a metal and non-metal compound Note consists of ions is insufficient but accept electrostatic attraction between ions

Question	Answer	Marks	Further Information
4(a)	(open) switch lamp	1	Both correct for the mark
4(b)	(hypothesis) the more lamps (added) the smaller the current (explanation) (the more lamps the) greater the resistance	2	each correct answer = 1 mark Accept the current decreases Accept reverse argument Ignore comments about brightness Do not accept the current is slower, weaker or stronger Accept reverse argument Accept ecf for incorrect hypothesis

Question	Answer	Marks	Further Information
4(c)	(safety hazard) electric shock (idea of) turn off the circuit before adding lamps or (safety hazard) (idea that) lamps get hot or circuit gets hot (idea of) turn off the circuit before adding lamps or do not use a high current	2	safety hazard = 1 mark linked reduction = 1 mark Accept safety hazard and reduction wherever written Note the reduction is dependent on the idea of a correct safety hazard Accept electrocution Accept keep circuit away from water or use a lower voltage Accept can get burnt by (hot lamps) Accept use a lower voltage or add a resistor or reduce the number of cells used Accept open the switch rather than turn off Accept wear gloves

Question	Answer	Marks	Further Information
5(a)	B	1	Accept B circled on the map, but answer line takes precedence
5(b)	convection (currents)	1	

Question	Answer	Marks	Further Information
6	any two from (increased) hunting (increased) disease lack of food or lack of water climate change (increased) competition loss of habitat (idea of) increase in conservation work if linked to increase (in population)	2	each correct answer = 1 mark Accept idea of hunting for the skin or killed for horns or predation or poaching Accept insufficient nutrients Accept examples of climate change, e.g. extreme weather or global warming Accept deforestation or pollution for loss of habitat Accept death rate is larger than reproduction rate as an extra marking point Note environmental change unqualified is not sufficient Accept put into reserves

Question	Answer	Marks	Further Information
7(a)	magnesium sulfate + zinc	1	Both required either order for the mark Accept correct formulae or mix of words and formulae, but words take precedence e.g. $\text{MgSO}_4 + \text{Zn}$
7(b)	zinc is more reactive than copper	1	more than one box ticked = 0 marks Accept any indication of the correct answer, e.g. underlining or circling, but ticking takes precedence

Question	Answer	Marks	Further Information
8(a)	reinforce	1	Accept reinforcement or constructive interference Note unqualified constructive is not sufficient
8(b)(i)	(same) frequency or pitch	1	Accept (same) wavelength
8(b)(ii)	quieter	2	each correct answer = 1 mark Accept less or lower or smaller Accept softer Note answer must be comparative
	amplitude		

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Question	Answer	Marks	Further Information										
9	M1 table drawn with suitable headings, e.g. soil and mass of magnesium (salts in 1 kg) M2 units in g or grams included in headings (but not in the body of the table) M3 all data entered correctly	3	Note M1 does not need units Accept Mg for magnesium table with headings = 1 mark unit only included in the heading = 1 mark correctly entered data = 1 mark <table><tr><th>type of soil</th><th>mass of magnesium in g</th></tr><tr><td>A</td><td>5.0 or 5</td></tr><tr><td>B</td><td>0.4</td></tr><tr><td>C</td><td>35.0 or 35</td></tr><tr><td>D</td><td>6.4</td></tr></table> Ignore the order of the soil types	type of soil	mass of magnesium in g	A	5.0 or 5	B	0.4	C	35.0 or 35	D	6.4
type of soil	mass of magnesium in g												
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Question	Answer	Marks	Further Information
10(a)	(idea that) new information may be discovered	1	Accept (idea of) better technology Accept atom is 3D and not 2D Accept (idea that) the model has a flaw (so needs changing or (idea that) may find a better model Ignore idea that it changed in the past so will change again
10(b)	Fe_2O_3 Na_2CO_3	2	each correct answer = 1 mark Accept O_3Fe_2 Do not accept superscripted numbers Do not accept FE Accept O_3CNa_2 or CNa_2O_3 or CO_3Na_2 Accept $\text{Na}_2\text{C}_1\text{O}_3$ or Na_2Co_3 Do not accept superscripted numbers Do not accept NA

Question	Answer	Marks	Further Information
11(a)	350 (J)	1	
11(b)	any three from M1 air above candle is heated or air above the candle warms (up) M2 warm air expands or is less dense M3 less dense air rises (up tube A) M4 more dense air sinks (down tube B to replace air above candle) M5 convection (current formed)	3	each correct answer = 1 mark Ignore particles for M1 Accept particles move further apart Do not accept particles expands or particles less dense for M2 Accept hot or warm air rises or hot air moves upwards for M3 Ignore particles for M3 Accept cold or cool air sinks for M4 Ignore particles for M4 Accept M6 a drop in pressure in the box (due to the rising air at A) = 1 mark causing air to enter through tube B = 1 mark

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Question	Answer	Marks	Further Information
12(a)	process respiration feeding decomposition combustion description breakdown of dead organisms releases energy in cells a chemical reaction between a fossil fuel and oxygen obtaining nutrients from other organisms	2	all four correct = 2 marks two or three correct = 1 mark one correct = 0 marks if more than one line from one process to different descriptions = 0 marks for that process
12(b)	3 or three	1	Accept respiration, decomposition and combustion
12(c)	(process) combustion and (explanation) (idea of) (increased) use of fossil fuels or increase in population or to provide energy	1	both correct for the mark Accept burning for combustion Accept combustion and (more) transport or combustion and (more) slash and burn or combustion and (more) burning trash or waste Accept respiration and increase in population
12(d)	photosynthesis	1	Accept correct carbon storage example, e.g. rock formation or sedimentation or formation of fossil fuels

Question	Answer	Marks	Further Information
13(a)(i)	total volume of gas made in cm³ time in s	2	correctly plotted points including the origin = 1 mark Accept tolerance within $\pm$ half a small square Accept one error in plotting or missing plot Ignore size of crosses or blobs curve of best fit = 1 mark Note the curve must be a smooth curve and not feathery with more than one line showing Note line must go through the origin and must not go above 50.5 cm³ Accept line going through any part of a cross/dot or within $\pm$ half a small square of a point Accept ecf from points plotted incorrectly Do not accept dot-to-dot
13(a)(ii)	44	1	Accept tolerance within $\pm$ half a small square Accept ecf from incorrect curve of best fit Accept correct reading from incorrect graph

Question	Answer	Marks	Further Information
13(b)	M1 lumps have smaller surface area M2 so fewer (successful) collisions	2	each correct answer = 1 mark Accept ora if powdered magnesium specified Accept fewer particles exposed to the acid Accept smaller area exposed Ignore particles are less crowded Do not accept for M1 particles move slower or particles have less energy Accept for M1 and M2 less frequent collisions or collisions less often or less chance of collisions or fewer collisions per second or lower frequency of collisions per surface area = 2 marks Do not accept slower collisions

Question	Answer	Marks	Further Information
14	any one from (idea of) Lily and because idea that a good diet leads to healthy birth mass Lily and because there is a better chance of baby surviving birth Lily and because it is an unknown secondary source on the internet Lily and because the internet data could be biased Jamila and because she has used some secondary data Jamila and because Lily is just an opinion or not backed up with data	1	Note if Lily given accept answers that suggest the mother should have a good diet or should avoid a poor diet Lily and idea that a healthy diet leads to a healthy baby or fetus Lily and idea that a pregnant mother should have a balanced diet Lily and fetus getting all nutrients needed or and fetus getting nutrients needs for growth or bone growth etc Lily and (idea that) mother should avoid alcohol or (idea that) mother should avoid drugs Lily and (idea that) fetus gets the nutrients the mother gets Lily and the mother's eating habits affect the baby

Question	Answer	Marks	Further Information
15(a)	carbon dioxide + water → glucose + oxygen	2	reactants any order = 1 mark products any order = 1 mark Accept correct formulae or mix of words and formulae, but words take precedence e.g. $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2$ Accept = for → Do not accept 'and' for '+'
15(b)	Sunlight	1	Accept Sun or light Ignore chlorophyll and chloroplast

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