



Cambridge Lower Secondary Checkpoint

SCIENCE

0893/01

Paper 1

April 2023

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 **16** pages.

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)	kidney ureter urethra	3	each correct answer = 1 mark Accept nephron Accept ureta or ureter Do not accept uretra or uretha or urether or urater or urethera Accept ureathra or urethera Do not accept urether or uretha or urathra
1(b)	urea	1	Accept any indication of correct answer, e.g. ticking, underlining or circling, but answer line takes precedence

Question	Answer	Marks	Further Information
2(a)(i)	(density =) $\frac{\text{mass}}{\text{volume}}$	1	Accept mass ÷ volume Accept m/v Ignore g/cm³
2(a)(ii)	7.87 (g/cm ³)	1	Accept 7.9 or 7.872 Ignore any unit in answer Note no ecf from (a)(i)
2(b)	C and has a (very) low density	1	both correct for the mark Accept any indication of correct answer, e.g. ticking, underlining or in explanation, but circling takes precedence Accept has the lowest density Note a density below 1 is not sufficient Note it is the lowest is not sufficient – must mention density or dense in answer Ignore it is the lightest

Question	Answer	Marks	Further Information
3(a)	plastic	1	more than one answer circled = 0 marks Accept any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
3(b)(i)	(idea that) shiny surface reflects thermal energy back into the liquid	1	Accept they are good reflectors (of thermal energy) Accept reflect radiation Ignore reflects light Ignore reference to absorbing Ignore silver is a good conductor
3(b)(ii)	convection cannot take place conduction cannot take place	2	each correct answer = 1 mark Accept conduction and convection in any order Do not accept radiation cannot take place max 1 mark for the question

Question	Answer	Marks	Further Information
3(c)	(liquid) cools down or (temperature) decreases high(er) energy particles (near the surface of the liquid) escape (into the air) (average) energy of the remaining particles decreases	3	each correct answer = 1 mark Accept (idea that) temperature becomes low or becomes colder or results in a low temperature Note temperature is cold is not sufficient Accept fast(er) moving particles escape or high(er) energy particles evaporate Accept particles that evaporate take some energy with them or particles use energy to evaporate Do not accept answers that refer to heat particles having more energy or moving faster Accept energy of the particles in the liquid decreases or slow moving particles left in liquid or low energy particles left in liquid Accept evaporation is an endothermic process as additional marking point Ignore ideas about conduction and convection Ignore answers that refer to hot particles and cold particles

Question	Answer	Marks	Further Information
4(a)	tectonic plates	1	more than one answer circled = 0 marks Accept any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
4(b)	(the earthquakes) occur at the plate boundaries or (the earthquakes) happen at the edges of the pieces of crust	1	Accept earthquakes happen when the plates collide or occur at places where tectonic plates meet Ignore earthquakes happen at fault lines
4(c)(i)	(idea that) the coastlines fit together (like a jigsaw puzzle)	1	Accept coastlines have a complementary shape or coastlines combine together like a jigsaw puzzle Accept continents fit together or tectonic plates fit together Ignore after many years the continents no longer fit together Ignore countries fit together Do not accept have the same shape
4(c)(ii)	any two from magma moves or magma flows convection currents (in the mantle) (convection currents or magma movements) drag/pull the continents or drag/pull the tectonic plate (apart or together)	2	each correct answer = 1 mark Ignore continents move Accept convection currents in mantle or convection currents of magma = 2 marks Note tectonic plates move is not sufficient

Question	Answer	Marks	Further Information
5(a)	covalent (pair of) shared electrons	2	each correct answer = 1 mark Note ionic bond = 0 marks for the question
5(b)	(chlorine atom) gains one electron (to make a chloride ion)	1	Note assume answer refers to a chlorine atom Accept gains an electron Do not accept chloride gains an electron
5(c)	attraction between positive and negative ions	1	Accept electrostatic attraction (between ions) Note by an ionic bond is not sufficient Do not accept reference to intermolecular forces

Question	Answer	Marks	Further Information
6(a)	B (and) D	2	each correct answer = 1 mark Accept either order Accept palisade (and) guard cell, but letter takes precedence Accept any indication of the correct answer, e.g. ticking, underlining or circling on the diagrams, but answer line takes precedence
6(b)(i)	any one from magnesium will make plants green or magnesium makes the plant's green pigment or magnesium will make chlorophyll lack of magnesium will reduce plant growth lack of magnesium will result in yellow (leaves)	1	Note answers must specifically refer to either the presence or the absence of magnesium Accept ora Accept if magnesium not present the plants are not green Ignore without magnesium there is no photosynthesis or without magnesium the rate of photosynthesis decreases
6(b)(ii)	(acts as a) control or (idea of) to be able to compare (the seedlings with or without specific nutrients)	1	Accept (idea of) to see the differences

Question	Answer	Marks	Further Information
6(c)	(idea of) smaller in size or reduced growth or fewer leaves (idea of) less protein made	2	each correct answer = 1 mark Accept less nitrogen to make protein or no nitrates to make protein or less amino acids made Ignore plants will die or no growth Ignore reference to colour of the leaves Ignore reference to carbohydrate
6(d)	carbohydrate or glucose	1	Accept oxygen or starch Accept chlorophyll

Question	Answer	Marks	Further Information
7	(similarity) they have the same amplitude (difference) waveform B has a higher frequency than waveform A / ora	2	each correct answer = 1 mark Accept they have the same loudness or same volume Accept waveform B has a higher pitch (than waveform A) / ora Accept waveform B has a shorter wavelength (than waveform A) / ora

Question	Answer	Marks	Further Information
8(a)	(rock) asteroid (soil) Earth or crust (hole) crater	2	all three correct = 2 marks one or two correct = 1 mark
8(b)	(strength) any one from helps to visualize asteroid collisions which you cannot see normally can investigate relationship between size/speed/height of asteroid and crater size can investigate relationship between size/speed/height of asteroid and distance travelled by debris (idea that) it is very easy to do (idea that) it is easy to repeat (idea that) it shows how craters are formed	2	correct strength = 1 mark Accept (idea that) provides an understanding about what happens during an asteroid collision Accept the model is easy to understand Accept the model can be used with different sizes of rocks/asteroids Accept can see what happens when an asteroid hits the Earth surface Accept simulates a real event Accept can accurately represent an asteroid collision

Question	Answer	Marks	Further Information
8(c)	(limitation) any one from difficult to make it a fair test, e.g. rocks not all the same size/mass rocks may hit the bottom of the container or soil may not be deep enough rocks are (much) smaller than real asteroids or forces are (much) smaller than for real asteroids cannot represent the real speed of an asteroid hitting the Earth does not show other consequences of impact, e.g. dust formation the Earth's surface is not just made of soil	2	correct limitation = 1 mark Accept (idea that) model cannot be done on a large scale Accept (idea that) does not investigate what happens when an asteroid hits oceans Accept (idea that) cannot tell you about a collision of a large asteroid Accept does not (fully) represent the force at which an asteroid hits the Earth Accept (idea that) there is a limited drop height Ignore it is inaccurate is not sufficient but accept inaccurate that is qualified, e.g. cannot be scaled up accurately

Question	Answer	Marks	Further Information
9(a)	(causes) a decrease or decline	1	Accept it goes down or drops or falls Ignore extinction or killed
9(b)	A (no mark) any two from smaller population size of foxes compared to rabbits larger population rise seen at the start in rabbit or prey when population of foxes decreases, the rabbit population will increase or when population of rabbit declines, the population of foxes will also decline	2	B ticked = 0 marks for the question each correct answer = 1 mark Accept change in line A is bigger than change in line B Accept ora Accept ora Accept (idea that) fox population rises after rabbit population rises = 2 marks Accept (idea that) predator population rises after prey population rises = 2 marks Accept (idea that) fox population declines after rabbit population declines = 2 marks Accept (idea that) predator population declines after prey population declines = 2 marks Accept change in line B is always after change in line A = 2 marks

Question	Answer	Marks	Further Information
10(a)	filtration or filtering	1	Accept use filter paper Do not accept sieving or strainer
10(b)	evaporation or evaporate the mixture	1	Accept heat or heating or boil off water Accept leave in a hot place Ignore crystallization
10(c)	(metal) zinc (acid) (dilute) hydrochloric acid	1	both correct for the mark Accept Zn or HCl but name takes precedence

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Question	Answer	Marks	Further Information																								
11(a)		1	Accept symbol drawn on diagram, but answer space takes precedence if symbol drawn there Do not accept a line through the ammeter symbol																								
11(b)	<table><tr><th>switch R</th><th>switch S</th><th>switch T</th><th>lamp J</th><th>lamp K</th><th>lamp L</th></tr><tr><td>(closed)</td><td>(open)</td><td>(open)</td><td>(off)</td><td>off</td><td>off</td></tr><tr><td>(open)</td><td>(closed)</td><td>(closed)</td><td>off</td><td>(off)</td><td>off</td></tr><tr><td>closed</td><td>open</td><td>closed</td><td>(on)</td><td>(off)</td><td>(on)</td></tr></table>	switch R	switch S	switch T	lamp J	lamp K	lamp L	(closed)	(open)	(open)	(off)	off	off	(open)	(closed)	(closed)	off	(off)	off	closed	open	closed	(on)	(off)	(on)	3	each correct row = 1 mark
switch R	switch S	switch T	lamp J	lamp K	lamp L																						
(closed)	(open)	(open)	(off)	off	off																						
(open)	(closed)	(closed)	off	(off)	off																						
closed	open	closed	(on)	(off)	(on)																						
11(c)	in parallel (with lamp J)	1	Accept annotations added to the diagram may help the award of the mark Accept description of parallel e.g. need to connect one end of the meter before the lamp and one after the lamp																								

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Question	Answer	Marks	Further Information												
12(a)	(electronic, top pan, lever-arm) balance	1	Accept scale(s) Ignore weighing												
12(b)	<table><tr><th>time in minutes</th><th>(loss in mass in g)</th></tr><tr><td>0</td><td>0.0 or 0</td></tr><tr><td>1</td><td>0.8</td></tr><tr><td>2</td><td>1.1</td></tr><tr><td>3</td><td>1.2</td></tr><tr><td>4</td><td>1.5</td></tr></table>	time in minutes	(loss in mass in g)	0	0.0 or 0	1	0.8	2	1.1	3	1.2	4	1.5	2	left hand column labelled time in minutes and numbers entered = 1 mark Accept start for 0 minutes right hand column correct with no units in body of table and masses matched against the correct time = 1 mark
time in minutes	(loss in mass in g)														
0	0.0 or 0														
1	0.8														
2	1.1														
3	1.2														
4	1.5														