Cambridge Assessment International Education

Cambridge Lower Secondary Checkpoint

SCIENCE **0893/01**

Paper 1 **October 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.

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Question	Answer	Marks	Further Information
1(a)	(root) hair (cell)	**1**	
1(b)	large surface area	**1**	**Accept** long **and** thin **or** elongated **Note** thin alone **or** long alone is **not** sufficient **Accept** thin membrane **or** short diffusion pathway **Ignore** does not contain chloroplasts
1(c)	xylem (vessel)	**1**	**Accept** xylem tube **or** zylem
1(d)	magnesium (ion)	**1**	**Ignore** nitrates **or** nitrogen **or** phosphorus

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Question	Answer	Marks	Further Information
2	**any three from** **M1** heat (dilute) solution (of copper sulfate) **M2** to make a concentrated solution **or** to make a saturated solution **or** until first appearance of crystals or solid **M3** let (hot) solution cool **or** leave hot solution to evaporate (for a few days) **M4** filter off crystals	**3**	each correct answer = 1 mark **Note** all marks can be awarded from an appropriate labelled diagram **Ignore** any references to how the copper sulfate solution is made. **Accept** for **M1** evaporate solution **or** leave solution to evaporate **Note** heat or boil solution until all water evaporates gets **M1** only **Accept** for **M2** (evaporate or heat) to get half of the volume of solution **Accept** for **M1** and **M2** heat solution until first appearance of crystals = 2 marks **Accept** for **M1** and **M2** evaporate water from solution until a saturated solution is made = 2 marks **Accept** for **M1** and **M2** leave to evaporate in a warm place = 2 marks **Accept** for **M4** and **M5** pick out crystals and dry between pieces of filter paper = 2 marks

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	M5 wash crystals with a small amount of cold water **or** dry crystals between filter paper		**Accept** alternative way of making crystals • hang copper sulfate crystal into copper sulfate solution = 1 mark • copper sulfate solution used is saturated or concentrated = 1 mark • leave for days (for crystal to grow) = 1 mark

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Question	Answer	Marks	Further Information
3(a)	a measure of how cold something is ☐ a measure of how hot something is ☐ a measure of the thermal energy of a substance ✓ measured in MJ ✓ transferred by conduction ✓	**2**	**all three** correct ticks = 2 marks **two** correct ticks = 1 mark **four** ticks and **three** correct ticks = 1 mark **four** ticks and **two** correct ticks = 0 marks **five** ticks = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
3(b)	**any two from** (idea that) the temperature is negative when water is a solid (idea that) if the temperature is 0 (°C) water is a liquid **or** if the temperature is 0 (°C) water is a solid (idea that) the temperature is positive when water is a liquid **or** the temperature is positive when water is a gas	**2**	each correct answer = 1 mark **Do not accept** temperature is negative or zero if water is a gas = max 1 mark for the question **Accept** ice for solid **Do not accept** temperature is positive if water is a solid = max 1 mark for the question **Accept** (idea that) the temperature is 0° C at the melting point where solid is changing into liquid **or** the temperature is 0° C at the freezing point where liquid is changing into ice

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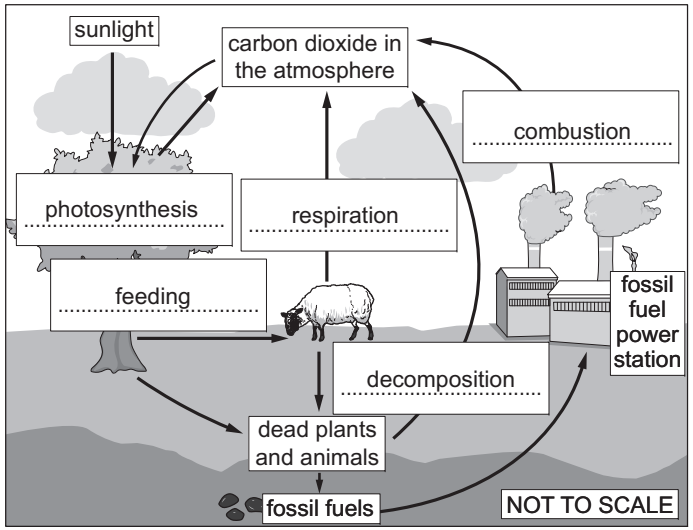
Question	Answer	Marks	Further Information
4(a)		**3**	**all five** correct = 3 marks **three or four** correct = 2 marks **one or two** correct = 1 mark **Accept** respiration for decomposition
4(b)	the breakdown of dead material (to release carbon dioxide)	**1**	**Accept** digests dead material **or** feeding on dead materials **Accept** decay **or** rot for breakdown **Accept** waste material for dead material **Ignore** eaten by microorganisms is **not** sufficient **Ignore** decomposition **or** decompose **Note** carbon dioxide is released is **not** sufficient **or** breakdown of material is **not** sufficient **or** breakdown of organisms is **not** sufficient

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Question	Answer	Marks	Further Information
4(c)	**any one from** sea level change flooding drought extreme weather events species loss **or** killing of species **or** extinction (global) increase in (average) temperature	**1**	**Accept** named examples of extreme weather events, e.g. heatwave, cyclone **or** weather very hot **Ignore** destroying animals or plants **Accept** global warming **or** named examples of the consequence of global warming, e.g. polar ice caps melting **or** glaciers retreating or melting **or** flowering time change / changes in rainfall patterns **Ignore** unqualified ice melting **Ignore** greenhouse effect **Ignore** changes in temperature **Ignore** Earth is warm but **accept** Earth is warmer **Do not accept** acid rain **or** ozone depletion

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Question	Answer	Marks	Further Information
5(a)	Mia (no marks) (idea of) decision based on (scientific) evidence **or** using evidence from a secondary source	**1**	**Note** if Aiko chosen = 0 marks **Accept** decision based on research **or** decision based on data **or** based on scientific or research study **Accept** Aiko's comment is an opinion **or** Mia's ideas include a fact
5(b)	smoking **or** drugs	**1**	**Accept** any correct idea not linked to diet, e.g. alcohol **or** genetics/genes (of mother or fetus) **or** age (of mother) **or** health (of mother) **or** multiple births etc. **or** medication of mother e.g. antibiotics **or** oxygen intake of fetus **Accept** emotional status of mother **or** stress **Ignore** diet **or** level of activity **or** life-style unqualified **or** fitness

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Question	Answer	Marks	Further Information
6(a)	(mass) extinction	**1**	**Accept** named mass extinction, e.g. extinction of dinosaurs **Ignore** kills animals and plants **Accept** fires **or** dust clouds **or** air borne debris **or** sunlight being unable to penetrate to surface **or** shockwaves **or** seismic shaking **or** earthquakes **or** tsunami **or** heat radiation **or** wind blasts **or** acid rain **or** decrease in photosynthesis **Ignore** climate change and effects of climate change **or** destroying ecosystem **or** loss of habitat **or** global warming **or** explosions **or** temperature decrease **Do not accept** reference to formation of new planet or the Moon
6(b)(i)	(steel ball) asteroid (sand) (surface of the) Earth	**2**	each correct answer = 1 mark **Accept** named parts of the surface of the Earth, e.g. soil **or** crust **or** land **Do not accept** sea **or** ocean

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Question	Answer	Marks	Further Information
6(b)(ii)	**any two from** throw the (steel) ball use a (steel) ball with **more** mass use a (steel) ball with a larg**er** diameter drop the (steel) ball from a high**er** height **increase** density of ball	**2**	each correct answer = 1 mark **Accept** use **more** force when releasing the ball **Accept** heavi**er** ball **or more** weight **Accept** bigg**er** ball **or** larg**er** ball **Ignore** use a higher angle **Ignore** more sand **or** increasing surface area **Ignore** idea of dropping more than one ball or dropping same ball several times **Ignore** change the sand

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Question	Answer	Marks	Further Information
7(a)	cancel **or** cancelled **or** cancellation	**1**	**Accept** (complete) destructive interference **Accept** interference cancellation **Ignore** neutralisation
7(b)	**A**	**1**	more than **one** letter = 0 marks
7(c)	**B**	**1**	more than **one** letter = 0 marks

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Question	Answer	Marks	Further Information
8(a)	contains X **and** Y chromosomes	**1**	**Accept** contains green **and** yellow balls **Accept** contains two different chromosomes **or** contains two different coloured balls **Accept** contains XY chromosomes **Ignore** reference to number of chromosomes or balls
8(b)(i)	(male or female offspring) female male female male female female	**1**	**all correct** for the mark **Accept** boy for male and girl for female
8(b)(ii)	(idea of) **not** enough data (to be reliable)	**1**	**Accept** idea that the sample size is too small **or** did not use all the balls **Accept only** did it 6 times **Accept** need to repeat more times (for reliability)

Question	Answer	Marks	Further Information
9	a sodium atom loses an electron	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence

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Question	Answer	Marks	Further Information
10(a)	The albatross with longer wings pass on their genes to their offspring. ✓ There is **no** variation in the length of albatross wings. ☐ The albatross do **not** compete for food. ☐ The length of the wings decreased over many generations. ☐ The albatross with longer wings are more likely to survive. ✓	**2**	each correct tick = 1 mark **three** boxes ticked and **two** correct = 1 mark **three or more** boxes ticked and **one** correct = 0 marks **four or more** boxes ticked = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
10(b)	decreased environmental extinct	**3**	each correct answer = 1 mark **Accept** climate **or** habitat (destruction) **or** food supply **or** hunting **or** pollution **or** death rate is more than birth rate **or** increased number of predators **Ignore** weather **Accept** endangered

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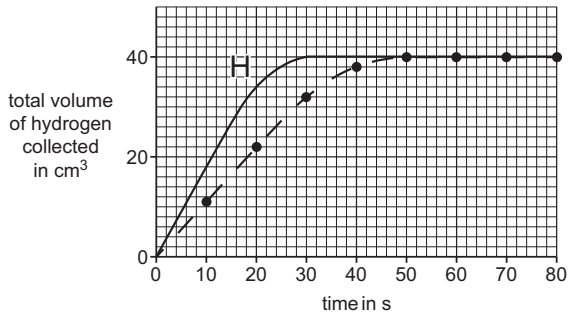
Question	Answer	Marks	Further Information
11(a)	$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$	**2**	reactants in either order = 1 mark products in either order = 1 mark **Ignore** any names of chemicals
11(b)(i)	 line starting at origin with an initial steeper gradient same volume of gas produced	**2**	each correct answer = 1 mark **Accept** a tolerance of ± one small square for (0,0) **Accept** two straight lines **or** dot-to-dot type graphs **Note** the gradient must never increase over time **Accept** a tolerance of ± half a small square **Do not accept** any line which goes above 41 cm^3 for this marking point
11(b)(ii)	(lump has) smaller surface area fewer collisions	**2**	each correct answer = 1 mark **Accept ora** if specified **Accept** fewer exposed particles **Accept** collisions less often **or** less chance of collisions **or** less collision frequency = 2 marks

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Question	Answer	Marks	Further Information
12(a)	(float) peel **and** seed **and** (explanation) density less than water	**1**	**both** answers **and** explanation correct for the mark
12(b)	make different concentrations of salt solution **or** add different amounts of salt to water drop each part of the lemon into the salt solution and see if it floats	**2**	each correct answer = 1 mark **Note** mark independently **Accept** each part of the lemon into the salt solution and see the results **Ignore** drop (whole) lemon into salt solution and see if it floats

Question	Answer	Marks	Further Information
13	**substance** / **structure (giant or simple)** **J** simple **K** giant **L** simple **M** giant **N** giant	**2**	**all five** correct = 2 marks **two**, **three** or **four** correct = 1 mark **one** correct = 0 marks

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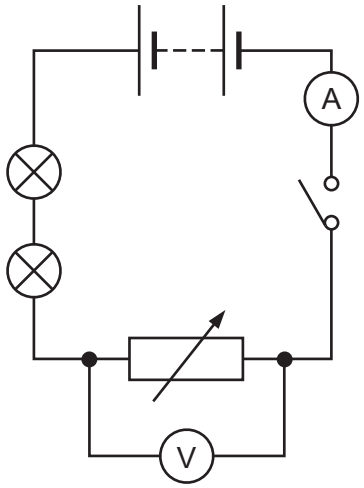
Question	Answer	Marks	Further Information
14		**4**	**M1** two lamps in series and one open switch = 1 mark **M2** ammeter in series and **must** measure the total current = 1 mark **M3** variable resistor and no significant gaps in circuit (by eye) = 1 mark **Accept** for **M3** two minor gaps in circuit **M4** voltmeter across any attempt at a variable resistor = 1 mark **Note** correct symbols must be drawn for **M1, M2** and **M3** but **ignore** line going through ammeter, lamp and voltmeter symbol **Accept** incorrect variable resistor for **M4** but symbol for voltmeter must be correct **Ignore** missing junction symbols

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