



# Cambridge Primary Checkpoint

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**SCIENCE**

**0097/02**

Paper 2

**October 2023**

MARK SCHEME

Maximum Mark: 40

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## 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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This document has **16** 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.

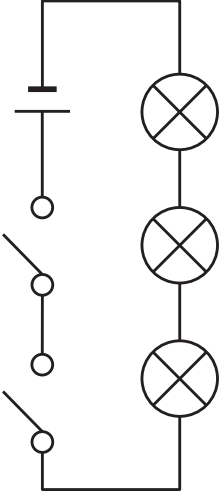
**Annotations and abbreviations**

|                         |                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>/ or</b>             | alternate responses for the same marking point                                                                                                              |
| <b>( ) brackets</b>     | the words or units in brackets do not need to be stated, for example, (recycles or releases or provides) minerals = minerals scores the mark                |
| <b><u>Underline</u></b> | exact word is required                                                                                                                                      |
| <b>Accept</b>           | an acceptable response                                                                                                                                      |
| <b>Do not accept</b>    | indicates an incorrect response that would contradict another otherwise correct alternative                                                                 |
| <b>Ignore</b>           | indicates an irrelevant answer that is not creditworthy. Full marks can still be achieved even with answers that are ignored.                               |
| <b>Note</b>             | provides extra information when necessary                                                                                                                   |
| <b>ecf</b>              | error carried forward; marks are awarded if an incorrect response has been carried forward from earlier working, provided the subsequent working is correct |
| <b>ora</b>              | 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)     | respiratory (system)       | <b>1</b> | <b>Accept</b> respiration (system)                                                                                                                    |
| 1(b)     | oxygen                     | <b>1</b> | <b>Accept</b> chemical formula O <sub>2</sub><br><b>Do not accept</b> carbon dioxide                                                                  |
| 1(c)     | the animal is a vertebrate | <b>1</b> | more than <b>one</b> box ticked = 0<br><b>Accept</b> any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence |

| Question | Answer                                                                                                                 | Marks | Further Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2(a)     | (idea that as) temperature increases mass/glucose increases<br><br>particles have more energy or particles move faster | 2     | each correct answer = 1 mark<br><b>Accept ora</b> for both marking points<br><br><b>Accept</b> °C for temperature<br><b>Accept</b> grams for mass<br><br><b>Accept</b> as temperature increases dissolving increases<br><br><b>Ignore</b> just 'mass increases' or references to speed, e.g. dissolves faster<br><br><b>Do not accept</b> any reference to melting<br><br><b>Accept</b> molecules for particles<br><br><b>Accept</b> more space between <b>particles</b> or <b>particles</b> further apart or <b>particles</b> spread out or <b>particles</b> move more |
| 2(b)     | (solvent) water<br><br>(solute) glucose                                                                                | 1     | <b>both</b> answers correct for the mark<br><br><b>Ignore</b> liquid<br><br><b>Ignore</b> solid<br><br><b>Do not accept</b> glucose solution                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Question | Answer                                              | Marks    | Further Information                                                                                                                                                                                                                                                                                               |
|----------|-----------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2(c)     | it can be reversed <b>or</b> no new substances made | <b>1</b> | <p><b>Accept</b> you can separate the glucose and water <b>or</b> you can get the glucose/water back</p> <p><b>Accept</b> you can get the solvent/solute back</p> <p><b>Ignore</b> correct methods of separation e.g. evaporation <b>or</b> condensing</p> <p><b>Do not accept</b> filter <b>or</b> filtering</p> |

| Question | Answer                                                                              | Marks | Further Information                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3(a)     | (one) cell<br><br>(two) switch(es)<br>(three) lamp(s)                               | 2     | <p><b>all three</b> correct = 2 marks<br/><b>one</b> or <b>two</b> correct = 1 mark</p> <p><b>Ignore</b> 1.5 (V) <b>or</b> energy source<br/><b>Do not accept</b> battery <b>or</b> battery cell</p> <p><b>Ignore</b> open <b>or</b> closed</p> <p><b>Accept</b> bulb(s)<br/><b>Ignore</b> light(s)</p> <p><b>Ignore</b> symbols</p>                                                                                |
| 3(b)     |  | 2     | <p>series circuit with at least a battery <b>or</b> cell<br/><b>or</b> switch <b>or</b> lamp = 1 mark</p> <p><b>but</b> series circuit with one cell, two <b>open</b> switches and three lamps = 2 marks</p> <p><b>Note</b> electrical symbols can be in any order around the circuit</p> <p><b>Accept</b> this lamp symbol</p>  |

| Question | Answer                                                                                                                                                                        | Marks | Further Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4(a)     |                                                                                                                                                                               | 2     | <b>all three</b> correct = 2 marks<br><b>one</b> or <b>two</b> correct = 1 mark                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4(b)     | <p><b>any two from</b></p> <p>trapped within sediment <b>or</b> buried by sediment</p> <p>soft parts decompose <b>or</b> soft parts rot</p> <p>minerals replace the bones</p> | 2     | <p><b>Accept</b> soil <b>or</b> mud <b>or</b> sand for sediment</p> <p><b>Accept</b> covered <b>or</b> surrounded <b>or</b> compressed <b>or</b> add pressure for buried</p> <p><b>Accept</b> decomposes leaving the skeleton <b>or</b> it rots leaving bones <b>or</b> flesh rots <b>or</b> soft parts eaten</p> <p><b>Accept</b> shells for bones</p> <p><b>Accept</b> descriptions of an impression fossil being formed, e.g. animal leaves imprint in mud = 1 mark (then) minerals fill empty space = 1 mark</p> |

| Question | Answer                                                                                                                                                                                                                                                                                    | Marks | Further Information                                                                                                                                                                                                                                       |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5(a)     | <p>Does the animal have a shell?</p> <p>yes → Is the animal inside two shells? → yes → scallop.....</p> <p>no → Is the animal star shaped? → yes → starfish</p> <p>no → Does the animal have 8 legs? → yes → octopus.....</p> <p>no → Does the animal have 8 legs? → no → shrimp.....</p> | 2     | all four correct = 2 marks<br>two or three correct = 1 mark<br>one correct = 0 marks                                                                                                                                                                      |
| 5(b)     | Sun                                                                                                                                                                                                                                                                                       | 1     | Accept light or sunlight                                                                                                                                                                                                                                  |
| 5(c)     | <p>(idea that) producer takes in the toxin</p> <p>snail eats the producer</p>                                                                                                                                                                                                             | 2     | <p>each correct answer = 1 mark</p> <p>Accept plant or named plant, e.g. grass, for producer</p> <p>Do not accept producer eats the toxic substance</p> <p>Accept herbivore or consumer for snail</p> <p>Note snail eats the toxic producer = 2 marks</p> |

| Question | Answer                                                                                                                                                                                                                                                                                                                                                                                                                                               | Marks    | Further Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6(a)     | 60 (g)                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>1</b> | <b>Accept</b> correct answer in answer space but answer in table takes precedence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 6(b)     | 30 to 37 (g)                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>1</b> | <b>Accept</b> a range of values providing it lies completely within the inclusive range of the answer, e.g. between 30 and 34 (g)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 6(c)     | <p>(safety risk) idea of using (hot) oven <b>or</b> the beakers will be hot <b>or</b> the hot salt solution</p> <p>(<b>linked</b> to how to reduce the <b>risk given</b>) wear gloves <b>or</b> transfer the beaker with tongs</p> <p><b>OR</b></p> <p>(safety risk) the salt (solution)/liquid/water may splash <b>into</b> eyes</p> <p>(<b>linked</b> to how to reduce the <b>risk given</b>) wear safety goggles <b>or</b> laboratory glasses</p> | <b>2</b> | <p>safety risk = 1 mark</p> <p><b>linked</b> to how to reduce the risk = 1 mark</p> <p><b>Accept</b> idea of being burnt <b>or</b> idea of using the (hot) oven</p> <p><b>Accept</b> (oven) mittens/mits for gloves</p> <p><b>Accept</b> ask an adult to help</p> <p><b>Ignore</b> may affect/harm eyes <b>or</b> just 'goes into eyes'</p> <p><b>Ignore</b> just glasses <b>or</b> protective clothing</p> <p><b>Accept</b> other suitable alternatives, e.g. (safety risk) <b>hot</b> salt solution may get knocked over when cooling = 1 mark (how to reduce the risk) place beaker out the way to avoid being knocked over = 1 mark</p> |

| Question | Answer                        | Marks    | Further Information                                                                                                                                        |
|----------|-------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6(d)     | mass of salt in salt solution | <b>1</b> | more than <b>one</b> box ticked = 0 marks<br><b>Accept</b> any indication of the correct answer e.g. circling or underlining, but ticking takes precedence |
| 6(e)     | temperature of the oven       | <b>1</b> | more than <b>one</b> box ticked= 0 marks<br><b>Accept</b> any indication of the correct answer e.g. circling or underlining, but ticking takes precedence  |

| Question | Answer                                                                  | Marks    | Further Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|-------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7(a)     | the mass increases <b>or</b> weight increases <b>or</b> force increases | <b>1</b> | <p><b>Accept</b> too much mass <b>or</b> too much weight <b>or</b> too much force</p> <p><b>Accept</b> idea it is heavier <b>or</b> too heavy</p> <p><b>Accept</b> ideas about the boat e.g. the coins are heavier than the boat <b>or</b> the boat cannot carry the mass of all these coins</p> <p><b>Accept</b> higher level answers, e.g. the density increases <b>or</b> the mass of the boat is greater than the mass of water displaced <b>or</b> the downward force is greater than upward force <b>or</b> force of gravity is stronger than upthrust</p> |
| 7(b)     | (idea of) make less of the bottom of the boat in contact with the water | <b>1</b> | <p><b>Accept</b> make a hole in the boat <b>or</b> make it (totally) flat (so it has no sides) <b>or</b> use thinner foil/material (so it collapses and sinks)</p> <p><b>Accept</b> methods to make the boat heavier, e.g. use thick(er) foil <b>or</b> use a different heavier material <b>or</b> use a heavier type of foil <b>or</b> increase the layers of the foil</p> <p><b>Accept</b> make a smaller boat <b>or</b> make a thin (shape) boat</p> <p><b>Ignore</b> changes to coins</p>                                                                    |

| Question | Answer                                                                                                                                                                                                    | Marks | Further Information                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8(a)     | <b>any one from</b><br>have (three) layers<br>(contain) humus <b>or</b> minerals <b>or</b> clay <b>or</b> sand <b>or</b> rocks <b>or</b> stones                                                           | 1     | <b>Accept</b> they have the same components                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 8(b)     | <b>any one from</b><br>(idea of) short roots (in plants in the grassland)<br>(idea of) less humus (in desert)<br><br>(idea of) less minerals (in desert)<br><br>(idea of) less water (in the desert soil) | 1     | <b>Accept</b> roots small <b>or</b> less roots<br><b>Accept</b> organic matter for humus<br><b>Accept</b> not enough humus <b>or</b> grassland plants need more humus<br><b>Accept</b> grassland plants need more minerals<br><b>Ignore</b> not enough nutrients<br><b>Accept</b> not enough water in the soil <b>or</b> grassland is wet but desert is dry<br><b>Ignore</b> they need different conditions<br><b>Accept</b> they are not adapted (to the desert) |

| Question | Answer                                                                                                                                         | Marks | Further Information                                                                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9(a)     | 2008                                                                                                                                           | 1     |                                                                                                                                                                                                                                                  |
| 9(b)     | 20000                                                                                                                                          | 1     |                                                                                                                                                                                                                                                  |
| 9(c)     | vector                                                                                                                                         | 1     | more than <b>one</b> answer circled = 0 marks<br><br><b>Accept</b> any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence                                                                              |
| 9(d)     | <p><b>any one from</b></p> <p>use (insect) repellent</p> <p>(idea of) cover up exposed areas</p> <p>use of (mosquito) nets (when sleeping)</p> | 1     | <p><b>Accept</b> bug spray <b>or</b> burning mosquito coil</p> <p><b>Accept</b> example of cover-up, e.g. wear long sleeves <b>or</b> wear trousers</p> <p><b>Accept</b> close the windows/doors <b>or</b> have fly screens on doors/windows</p> |

| Question | Answer                                          | Marks    | Further Information                                                                                                                                                                                                                                                                                                                                                                           |
|----------|-------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10(a)    | (car) changes direction<br><br>(car) slows down | <b>2</b> | each correct answer = 1 mark<br><br><b>Accept</b> changes its path <b>or</b> bends <b>or</b> doesn't go straight <b>or</b> changes angle<br><br><b>Accept</b> gets slow(er) <b>or</b> moves slowly<br><br><b>Do not accept</b> speeds up (on rough surface)<br><br><b>Accept</b> as an alternative marking point: makes more noise/sound <b>or</b> more force to move <b>or</b> more friction |
| 10(b)    | refraction                                      | <b>1</b> | more than <b>one</b> answer circled = 0 marks<br><br><b>Accept</b> any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence                                                                                                                                                                                                                           |
| 10(c)    | glass <b>or</b> (clear) plastic <b>or</b> water | <b>1</b> | <b>Accept</b> vacuum <b>or</b> (named) gas <b>or</b> clear/colourless/transparent liquid                                                                                                                                                                                                                                                                                                      |

| Question | Answer                                                                                                                                                         | Marks    | Further Information                                                                                                                                                                                                                                             |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11(a)    | there is no light on the Moon <b>or</b> the Moon cannot be seen <b>or</b> the Moon is dark                                                                     | <b>1</b> | <b>Accept</b> it will be black <b>or</b> Moon not visible<br><b>Accept</b> it is a new Moon                                                                                                                                                                     |
| 11(b)    | (similarity) shape <b>or</b> size<br><br>(difference) (idea they) appear on opposite sides of the Moon<br><b>or</b><br>Moon in Southern Hemisphere is brighter | <b>1</b> | <b>both</b> answers correct for the mark<br><b>Accept</b> same amount of light <b>or</b> same amount of shadow<br><b>Accept</b> different direction <b>or</b> different position <b>or</b> are flipped<br><br><b>Accept</b> one is bright and one is not bright |

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