

# Cambridge Lower Secondary Checkpoint

---

**SCIENCE**

**1113/02**

Paper 2

**April 2020**

MARK SCHEME

Maximum Mark: 50

---

Published

This mark scheme is published as an aid to teachers and learners, to indicate the requirements of the examination. However, we have not been able to adjust it to reflect the full range of answers that would have been seen as a part of the normal moderation and marking process, and it does not necessarily contain all the possible alternatives that might have arisen.

Cambridge will not enter into discussions about the mark scheme.

**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
<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
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)	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center; padding: 5px;"><b>C</b></td> <td style="text-align: center; padding: 5px;"><b>A</b></td> <td style="text-align: center; padding: 5px;">(E)</td> <td style="text-align: center; padding: 5px;"><b>D</b></td> <td style="text-align: center; padding: 5px;"><b>B</b></td> </tr> </table>	<b>C</b>	<b>A</b>	(E)	<b>D</b>	<b>B</b>	<b>2</b>	<b>C</b> and <b>A</b> correct = 1 mark  <b>D</b> and <b>B</b> correct = 1 mark
<b>C</b>	<b>A</b>	(E)	<b>D</b>	<b>B</b>				
1(b)	good tasting milk / disease free / healthy	<b>1</b>	<b>Ignore</b> lots of milk  <b>Accept</b> size / meat production / docile / good temperament					
1(c)	Copernicus  <div style="border: 1px solid black; border-radius: 50%; padding: 2px 10px; display: inline-block;"><b>Darwin</b></div>  Galileo  Pasteur  Rutherford	<b>1</b>						

Question	Answer	Marks	Further Information
2(a)	<p>increase the temperature of nitric acid</p> <p>increase the concentration of nitric acid</p> <p>more crowded particles so more collisions</p> <p>more surface area so more collisions</p> <p>particles move faster so more collisions</p> <p>has bigger particles so that there are more collisions</p>	2	<p>each correct link = 1 mark</p> <p>two lines from same way = 0 marks</p>
2(b)	<p><b>any two from</b></p> <p>(idea that) larger pieces have smaller (surface) area / ora</p> <p>reaction occurs at the surface</p> <p>so fewer collisions / ora</p>	2	<p><b>Note</b> assume answer refers to the reactant as a lump unless otherwise specified</p> <p><b>Accept</b> larger pieces have less surface / fewer particles exposed (on surface)</p> <p><b>Accept</b> particles collide less often / less frequent collisions / less chance of a collision</p>

Question	Answer	Marks	Further Information
3(a)	$86 \pm 1$ (m)	1	
3(b)	$4.7 \pm 0.2$ (s)	1	
3(c)(i)	(average speed = ) $\frac{\text{distance}}{\text{time}}$	1	<b>Accept</b> d/t or s/t <b>Ignore</b> m/s
3(c)(ii)	$\frac{110}{18}$ 6 or 6.1 (m/s)	2	correct answer = 2 marks correct working only = 1 mark <b>Accept</b> 6.111111 with any number of decimal places <b>Accept</b> $6\frac{1}{9}$

Question	Answer	Marks	Further Information						
4(a)	<table border="1"> <tr> <td>large flat feet</td> <td><b>stop sinking into sand</b></td> </tr> <tr> <td>thick eyelashes</td> <td><b>stop sand getting into eyes</b></td> </tr> <tr> <td>does not produce sweat</td> <td><b>stop too much water loss or stop dehydration</b></td> </tr> </table>	large flat feet	<b>stop sinking into sand</b>	thick eyelashes	<b>stop sand getting into eyes</b>	does not produce sweat	<b>stop too much water loss or stop dehydration</b>	3	each correct line = 1 mark
large flat feet	<b>stop sinking into sand</b>								
thick eyelashes	<b>stop sand getting into eyes</b>								
does not produce sweat	<b>stop too much water loss or stop dehydration</b>								
4(b)	<p><b>any two from</b></p> <p>thick fur</p> <p>lots of fat</p> <p>small ears</p> <p>short legs</p> <p>small surface area to volume ratio</p> <p>greasy coat</p> <p>large feet</p>	2	<p>each correct answer = 1 mark</p> <p><b>Accept</b> other valid answers</p>						

Question	Answer	Marks	Further Information
5(a)	filter it / filtration	1	
5(b)	evaporate the solution / crystallisation	1	<b>Accept</b> heat or boil the solution
5(c)	<div style="display: flex; align-items: center; justify-content: center; gap: 10px;"> <div style="border: 1px solid black; padding: 2px 10px;">magnesium</div> <span>+</span> <div style="border: 1px solid black; padding: 2px 10px;">sulfuric acid</div> <span>→</span> <div style="border: 1px solid black; padding: 2px 10px;">hydrogen</div> <span>+</span> <div style="border: 1px solid black; padding: 2px 10px;">magnesium sulfate</div> </div>	2	reactants (any order) = 1 mark products (any order) = 1 mark  <b>Accept</b> correct formulae but words take precedence  <b>Accept</b> mix of words and formulae  <b>note</b> magnesium is Mg, sulfuric acid is H <sub>2</sub> SO <sub>4</sub> , hydrogen is H <sub>2</sub> and magnesium sulfate is MgSO <sub>4</sub>

Question	Answer	Marks	Further Information
6(a)	decreases / gets lower	1	
6(b)	increases / gets higher	1	
6(c)	increase the temperature	1	<b>Accept</b> heat (it)

Question	Answer	Marks	Further Information
7(a)	Water and minerals enter plants through the <b>root hair</b> cells.  The water and mineral solution is transported in the stems through <b>xylem</b> cells.  The solution reaches the <b>palisade mesophyll</b> cells in the leaves and is used for growth.	3	each correctly sentence = 1 mark
7(b)	<b>any two from</b>  carbon dioxide  light  chlorophyll  enzymes	2	each correct answer = 1 mark



Question	Answer	Marks	Further Information
8(a)	metamorphic	1	<b>Accept</b> named metamorphic rock
8(b)	atmosphere inner core <b>mantle</b> outer core	1	more than one answer = 0 marks
8(c)	fossils	1	
8(d)	clay <b>loam</b> sandy silt	1	more than one answer = 0 marks

Question	Answer	Marks	Further Information
9	<p><b>change</b> angle <b>y</b></p> <p><b>control</b> <b>any two from</b> loudness of ticking clock  length of tubes  type of material / type of board  distance of clock from tube  distance of sound meter from tube  other sounds in the room</p> <p><b>measure</b> <b>any one from</b> loudness of sound / sound level  angle <b>y</b> (and <b>x</b>)</p>	4	<p>each correct answer = 1 mark</p> <p><b>Accept</b> position of board</p> <p><b>Ignore</b> distance</p>

Question	Answer	Marks	Further Information
<b>10(a)</b>	nerve cell has extensions/nerve cell has connections with other cells/nerve cell has larger surface area	<b>1</b>	<b>Accept</b> nerve cell is not round  <b>Ignore</b> have different shapes
<b>10(b)</b>	function – to carry oxygen  adaptation – (idea of) large surface area/rounded shape/flexible/ has haemoglobin/no nucleus	<b>2</b>	function = 1 mark  adaptation = 1 mark  <b>Note</b> accept mark points wherever they are written

Question	Answer	Marks	Further Information				
11(a)	2.4 (cm <sup>3</sup> )	1					
11(b)(i)	°C	1	<b>note</b> award unit mark if shown in table but answer line takes precedence				
11(b)(ii)	<table border="1"> <tr> <td>change in temperature</td> </tr> <tr> <td>(+3)</td> </tr> <tr> <td><b>-3</b></td> </tr> <tr> <td><b>+4</b></td> </tr> </table>	change in temperature	(+3)	<b>-3</b>	<b>+4</b>	1	correct numerical value <b>including</b> correct sign = 1 mark
change in temperature							
(+3)							
<b>-3</b>							
<b>+4</b>							
11(b)(iii)	<table border="1"> <tr> <td>type of reaction</td> </tr> <tr> <td><b>exothermic</b></td> </tr> <tr> <td><b>endothermic</b></td> </tr> <tr> <td><b>exothermic</b></td> </tr> </table>	type of reaction	<b>exothermic</b>	<b>endothermic</b>	<b>exothermic</b>	1	<b>all</b> correct for the mark
type of reaction							
<b>exothermic</b>							
<b>endothermic</b>							
<b>exothermic</b>							

Question	Answer	Marks	Further Information
12(a)	<p>any two from</p> <p>rub the objects together</p> <p>charges move / electrons move from the cloth</p> <p>electrons move to the rod</p>	2	<p>each correct answer = 1 mark</p> <p>charges / electrons moves must be mentioned for the second mark</p>
12(b)	<p>Opposite charges <b>attract</b>.</p> <p>Like charges <b>repel</b>.</p>	1	both correct = 1 mark
12(c)	<p>(A is positive.)</p> <p><b>B is positive.</b></p> <p><b>C is negative.</b></p> <p><b>D is negative.</b></p>	1	all three correct = 1 mark

Question	Answer	Marks	Further Information
13	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>light</b> energy = 10J         </div>	1	

**BLANK PAGE**