



# Science

Stage 9

Paper 2

**2024**

Cambridge Lower Secondary Progression Test

## Mark Scheme

Question	Answer	Marks	Further Information
1(a)(i)	photosynthesis	1	
1(a)(ii)	oxygen carbon dioxide	2	each correct answer = 1 mark <b>Accept</b> either order <b>Accept</b> O <sub>2</sub> and CO <sub>2</sub> <b>Ignore</b> water vapour
1(b)	(idea that) absorbs light (energy)	1	<b>Ignore</b> to help with photosynthesis

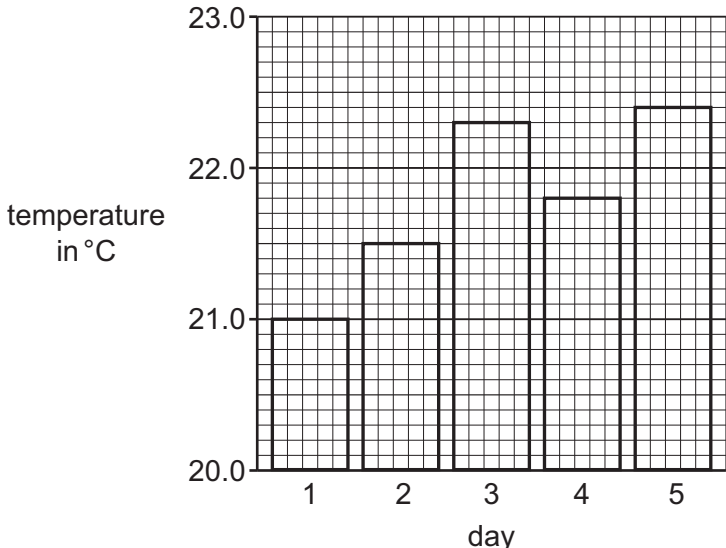
Question	Answer	Marks	Further Information
2(a)	(sodium atom) loses one electron (chlorine atom) gains one electron	2	each correct answer = 1 mark  <b>Accept</b> sodium atom gains an electron <b>and</b> chlorine atom loses an electron <b>or</b> sodium atom loses electrons <b>and</b> chlorine atom gains electrons = 1 mark if no other mark is scored
2(b)	ions are attracted to each other (because) they are oppositely charged	2	each correct answer = 1 mark <b>Ignore</b> ionic bond  <b>Accept</b> electrostatic attraction between ions = 2 marks  <b>Accept</b> attraction between positive ions and negative ions = 2 marks

Question	Answer			Marks	Further Information
3	sentence	true	false	4	<p><b>all eight</b> correct = 4 marks</p> <p><b>six</b> or <b>seven</b> correct = 3 marks</p> <p><b>four</b> or <b>five</b> correct = 2 marks</p> <p><b>two</b> or <b>three</b> correct = 1 mark</p> <p><b>one</b> correct = 0 marks</p> <p><b>Note</b> a tick in both boxes for a sentence means that sentence is incorrect</p> <p><b>Accept</b> any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence</p>
	Heat is the word used to measure how hot an object is.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	Thermal energy is measured in °C.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	When thermal energy is transferred more thermal energy is created.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	Thermal energy always transfers from hotter objects to colder objects.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	Heat dissipation happens when thermal energy transfers from a hotter region to a colder region.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	A liquid is a good thermal energy conductor.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
	Convection happens in liquids and gases only.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	Radiation needs particles to transfer thermal energy.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

Question	Answer	Marks	Further Information
4(a)	volcanic eruption <b>or</b> mountain building <b>or</b> earthquakes	1	<b>Accept</b> seismic activity  <b>Accept</b> volcano <b>or</b> description of volcanic eruption
4(b)	convection (currents)	1	<b>Accept</b> movement of magma

Question	Answer	Marks	Further Information
5		2	voltmeter symbol = 1 mark  <b>Note</b> ignore wire through voltmeter symbol if drawn in series  voltmeter connected in parallel across one lamp = 1 mark  <b>Ignore</b> junction of conductors

Question	Answer	Marks	Further Information
6(a)	copper carbonate + hydrochloric acid → copper chloride + water + carbon dioxide	2	correct reactants any order = 1 mark correct products any order = 1 mark
6(b)	filtration <b>or</b> filtering heat(ing)  crystallise	3	each correct answer = 1 mark <b>Accept</b> using a funnel and filter paper <b>Accept</b> boiling  <b>Accept</b> evaporate <b>Accept</b> form crystals
6(c)	goggles	1	<b>Accept</b> local name for safety goggles  <b>Ignore</b> gloves <b>or</b> heat-proof mat <b>or</b> laboratory coat <b>or</b> fume cupboard <b>or</b> fume hood  <b>Do not accept</b> face mask

Question	Answer	Marks	Further Information
7(a)	 <p>temperature in °C</p> <p>day</p>	2	<p>graph with <b>all five</b> bars correct = 1 mark</p> <p><b>Accept</b> <math>\pm \frac{1}{2}</math> small square tolerance</p> <p>same thickness bars <b>and</b> same spacing between the bars = 1 mark</p> <p><b>Ignore</b> any space between the first bar and the y-axis</p> <p><b>Ignore</b> shading of bars</p>
7(b)	<p><b>any one from</b></p> <p>identifies anomalous results</p> <p>to take an average</p> <p>increases reliability</p>	1	<p><b>Do not accept</b> more accurate</p>

Question	Answer	Marks	Further Information
8	<p><b>any three from</b></p> <p>Moon rock contains material that forms quickly at high temperatures</p> <p>Moon rock contains less iron than Earth rock (as collision blew away crust and mantle in debris)</p> <p>Moon rock has less water than Earth rock (as collision evaporated all of water)</p> <p>Moon rock and Earth rock are very similar in (chemical) composition</p> <p>if the Moon was created somewhere else, it would have a very different (chemical) content</p>	<b>3</b>	<p>each correct answer = 1 mark</p> <p><b>Accept</b> Moon rock and Earth rock have the same (chemical) content</p>

Question	Answer	Marks	Further Information
9(a)	<b>D</b>	<b>1</b>	more than <b>one</b> answer circled = 0 marks  <b>Accept</b> any indication of the correct answer, e.g. ticking or underlining, but circling on answer line takes precedence
9(b)	<b>E</b>	<b>1</b>	more than <b>one</b> answer circled = 0 marks  <b>Accept</b> any indication of the correct answer, e.g. ticking or underlining, but circling on answer line takes precedence
9(c)	DNA	<b>1</b>	<b>Accept</b> deoxyribonucleic acid


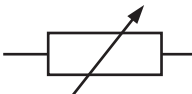
Question	Answer	Marks	Further Information
10	(density =) mass / volume <b>or</b> 150 / 100  (density =) 1.5  (unit) g / cm <sup>3</sup>	<b>3</b>	<b>Accept</b> 1.5 g / cm <sup>3</sup> with or without working = 3 marks  <b>Accept</b> 1.5 with or without working = 2 marks  correct equation <b>or</b> substitution = 1 mark   correct units = 1 mark



Question	Answer	Marks	Further Information
11(a)	no ticked (no mark)  <b>and</b>  the current is less <b>or</b> the resistance is more	<b>1</b>	if yes ticked = 0 marks  if both boxes are ticked = 0 marks  if neither box ticked <b>accept</b> no within the reason
11(b)	          (resistance =) voltage $\div$ current <b>or</b> $1.5 \div 4.5$    (resistance =) 0.33 ( $\Omega$ )	<b>2</b>	<b>Accept</b> correct answer with or without working = 2 marks  <b>Accept</b> equation <b>or</b> evidence of equation, e.g. correct substitution = 1 mark  <b>Accept</b> $V \div I$    <b>Accept</b> 0.3 or 0.333 or 0.3333 etc.  <b>Ignore</b> any unit given

Question	Answer	Marks	Further Information
12(a)	<b>any two from</b> more (scientific) evidence <b>or</b> data better understanding (of the evidence) models have improved carbon dioxide <b>or</b> pollutants (in the air) increased (more than expected)	<b>2</b>	each correct answer = 1 mark       <b>Ignore</b> they have changed their mind
12(b)(i)	22.8 (°C)	<b>1</b>	
12(b)(ii)	Measure the air temperature twice a day for one year.	<b>1</b>	more than <b>one</b> answer ticked = 0 marks  <b>Accept</b> any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence

Question	Answer	Marks	Further Information
13(a)(i)	(idea that) (pure water) does <b>not</b> contain impurities <b>or</b> (pure water) does <b>not</b> contain other minerals	1	<b>Accept ora</b> , e.g. tap water is impure <b>Ignore</b> universal solvent <b>or</b> dissolves minerals <b>or</b> it's not dirty
13(a)(ii)	<b>any two from</b>  (idea that) magnesium has no effect on chlorophyll content between 0 and 5 days  (idea that) after 5 days magnesium increases chlorophyll content  (idea that) it takes 5 days to make chlorophyll after magnesium is introduced	2	each correct answer = 1 mark  <b>Accept</b> Mg for magnesium  <b>Accept</b> Mg for magnesium  <b>Accept</b> Mg for magnesium
13(b)	C (no mark)  <b>and</b>  highest percentage of magnesium (for chlorophyll and sufficient nitrate for leaf growth)	1	<b>Note</b> if A <b>or</b> B = 0 marks

Question	Answer	Marks	Further Information
14(a)		1	<b>Ignore</b> wires from the buzzer
14(b)		1	

Question	Answer	Marks	Further Information
15	<p>(polar bear population)</p> <p>(idea of) population decrease <b>or</b> extinction</p> <p>(reason)</p> <p><b>any two from</b></p> <p>(idea of) decrease in reproduction</p> <p>(idea of) less places to rest <b>or</b> sleep <b>or</b> give birth</p> <p>(idea of) less food <b>or</b> loss of hunting grounds <b>or</b> starvation</p>	<b>3</b>	<p>correct effect = 1 mark</p> <p>each correct reason = 1 mark</p> <p><b>Accept more</b> cubs die <b>or more</b> bears die <b>or</b> polar bears <b>now</b> endangered</p> <p><b>Accept</b> correct answers wherever seen</p>