



# Science

Stage 8

Paper 1

**2023**

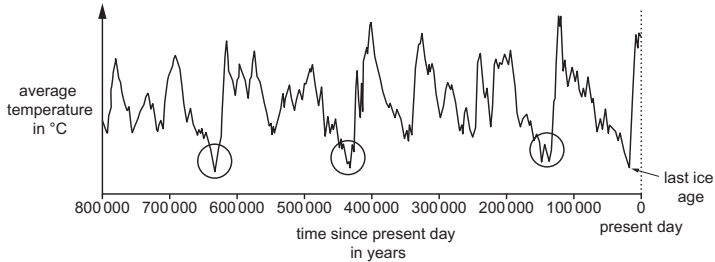
Cambridge Lower Secondary Progression Test

## Mark Scheme

Question	Answer	Marks	Further Information
1	<div> <div> <b>blood component</b> </div> <div> <b>function</b> </div> <div> </div> </div>	2	<b>all three</b> correct = 2 marks <b>one</b> or <b>two</b> correct = 1 mark if <b>two</b> lines from <b>one</b> blood component and <b>one</b> is incorrect = 0 marks for that blood component

Question	Answer	Marks	Further Information
2(a)	nucleus	1	<b>Ignore</b> protons <b>or</b> neutrons <b>Accept</b> protons <b>and</b> neutrons
2(b)	protons <b>and</b> neutrons	1	<b>both</b> needed any order for the mark
2(c)	Rutherford	1	<b>Accept</b> Bohr
2(d)	negative <b>or</b> minus <b>or</b> –ve	1	<b>Accept</b> 1– <b>or</b> –1 <b>or</b> minus 1
2(e)	(idea that) positive <b>or</b> charge <b>or</b> protons <b>or</b> nucleus <b>and</b> negative charge on electrons  (electrostatic) attraction	2	each correct answer = 1 mark  <b>Accept</b> electrostatic attraction between protons and electrons = 2 marks

Question	Answer	Marks	Further Information
3	<p>(The mistake at <b>B</b>) the angle of incidence does <b>not</b> equal the angle of reflection <b>or</b> the angles each side of the normal are <b>not</b> equal <b>or</b> it does <b>not</b> obey the law of reflection.</p> <p>(The mistake at <b>D</b>) there is refraction <b>or</b> the ray of light escapes <b>or</b> the ray of light leaves the optical fibre.</p> <p>(The mistake at <b>F</b>) the (reflected) ray of light is <b>not</b> straight <b>or</b> the (reflected) ray of light bends <b>or</b> the (reflected) ray of light curves.</p>	<b>3</b>	<p>each correct answer = 1 mark</p> <p><b>Accept</b> dotted line for normal</p>

Question	Answer	Marks	Further Information
4(a)		1	<p><b>Accept</b> any indication of the correct answer, e.g. tick or cross, but circle takes precedence</p> <p><b>Accept</b> circle drawn in any one of the three areas shown</p> <p><b>Accept</b> circle drawn in the correct place on the x-axis</p> <p>if more than <b>one</b> circle drawn and any are incorrect = 0 marks</p>
4(b)	cyclic <b>or</b> fluctuating (on a regular basis)	1	<p><b>Accept</b> constantly changing</p> <p><b>Accept</b> goes up and down</p>
4(c)	carbon dioxide <b>or</b> methane	1	<p><b>Accept</b> CO<sub>2</sub> or CH<sub>4</sub></p> <p><b>Do not accept</b> CO or CO<sup>2</sup></p> <p><b>Accept</b> other greenhouse gases such as sulfur (VI) fluoride <b>or</b> oxides of nitrogen <b>or</b> water vapour</p>

Question	Answer	Marks	Further Information
5(a)(i)	diffusion	1	<b>Accept</b> gas exchange <b>Ignore</b> absorption
5(a)(ii)	carbon dioxide passes from the blood into the alveolus (air sac)	1	<b>Accept</b> lung(s) for alveolus (air sac)
5(b)	any number greater than 0.04 for carbon dioxide <b>and</b> any number lower than 21.00 for oxygen  total for all gases breathed out adds to 100%	2	each correct answer = 1 mark
Question	Answer	Marks	Further Information
6(a)	magnetic field (lines)  direction	2	each correct answer = 1 mark  <b>Accept</b> direction of magnetic field = 2 marks
6(b)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">N                      S</div>	1	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 takes precedence

Question	Answer	Marks	Further Information
7(a)	(paper) chromatography	1	
7(b)	brown <b>and</b> purple  (idea that) these colours have more than one 'dot' in the results	2	each correct answer = 1 mark  <b>both</b> needed any order for the mark
7(c)	red <b>and</b> blue	1	<b>both</b> needed any order for the mark  <b>Accept</b> any indication of the correct answer, e.g. circling or underlining, but answer line takes precedence

Question	Answer	Marks	Further Information
8	the needle is magnetised/magnetic <b>or</b> the (steel) needle is magnetic  (idea that) so it lines up with the Earth's magnetic field	2	each correct answer = 1 mark

Question	Answer	Marks	Further Information
9(a)	<p>(pure water) box contains only ○ molecules</p> <p>(impure water) box contains ○ and at least one other type of molecule</p>	2	<p>each correct diagram = 1 mark</p> <p><b>Accept</b> particle arrangement for solid, liquid or gas</p> <p><b>Accept</b> particle arrangement for solid, liquid or gas</p> <p><b>Note</b> for impure water, some of the molecules must <b>not</b> be linked for the mark</p>
9(b)	analogy	1	<p>more than <b>one</b> answer circled = 0 marks</p> <p><b>Accept</b> any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence</p>

Question	Answer	Marks	Further Information
10(a)	banana	1	
10(b)(i)	ball and socket	1	
10(b)(ii)	(idea that) one muscle straightens the arm and the other bends the arm	1	<b>Accept</b> one muscle contracts and the other muscle relaxes  <b>Accept</b> muscles can only contract <b>or</b> muscles can only pull a bone
10(c)	Lily (no mark)  <b>and</b>  more oxygen  more respiration (to provide energy)	2	<b>Note</b> if incorrect name given = 0 marks  <b>Note</b> if no name given = max 1 mark  each correct explanation = 1 mark  <b>Ignore</b> breathing

Question	Answer	Marks	Further Information																
11(a)	force multiplied by distance	1	<b>Accept</b> $f \times d$ <b>or</b> $f \times s$																
11(b)(i)	<table border="1"> <thead> <tr> <th>(distance A in cm)</th><th>(force C in N)</th><th>(distance B in cm)</th><th><b>force D in N</b></th></tr> </thead> <tbody> <tr> <td>6</td><td>4</td><td>12</td><td>2</td></tr> <tr> <td>5</td><td>4</td><td>2</td><td>10</td></tr> <tr> <td>4</td><td>2</td><td>8</td><td>1</td></tr> </tbody> </table>	(distance A in cm)	(force C in N)	(distance B in cm)	<b>force D in N</b>	6	4	12	2	5	4	2	10	4	2	8	1	3	<p>correct heading including unit in heading = 1 mark</p> <p><b>Do not accept</b> units in the body of table</p> <p><b>all three</b> rows correct = 2 marks</p> <p><b>one</b> or <b>two</b> rows correct = 1 mark</p> <p><b>Note</b> rows can be in any row position in the table</p>
(distance A in cm)	(force C in N)	(distance B in cm)	<b>force D in N</b>																
6	4	12	2																
5	4	2	10																
4	2	8	1																
11(b)(ii)	<p>yes (no mark)</p> <p><b>and</b></p> <p>(idea that) the force x distance on each side of the ruler are always equal</p> <p><b>or</b></p> <p>no (no mark)</p> <p><b>and</b></p> <p>(idea that each row of) measurements have <b>not</b> been repeated</p>	1																	

Question	Answer	Marks	Further Information				
12(a)	<table><tr><th>renewable</th><th>non-renewable</th></tr><tr><td>bioplastics tidal power vegetable oil solar power</td><td>fossil fuels</td></tr></table>	renewable	non-renewable	bioplastics tidal power vegetable oil solar power	fossil fuels	2	<p><b>all five</b> correct = 2 marks</p> <p><b>two, three</b> or <b>four</b> correct = 1 mark</p> <p><b>one</b> correct = 0 marks</p> <p><b>Accept</b> answers in any order in the correct column</p>
renewable	non-renewable						
bioplastics tidal power vegetable oil solar power	fossil fuels						
12(b)	<p>(wind power) is renewable</p> <p>(wind power) will <b>not</b> run out</p>	2	<p>each correct answer = 1 mark</p> <p><b>Note</b> assume answer refers to wind power unless otherwise specified</p> <p><b>Accept ora</b> if coal is specified</p> <p>As extra marking points: <b>Accept</b> it is a clean resource <b>or</b> it is a green resource = 1 mark</p> <p><b>Accept</b> wind is 'free' = 1 mark</p> <p><b>Accept</b> no pollutants are produced during electricity generation = 1 mark</p> <p><b>Accept</b> all countries have wind (power) available and some countries do not have coal.</p>				

Question	Answer	Marks	Further Information
13(a)	<p>(dragonflies) decrease in number because the quolls have less food to eat</p> <p>so the quolls eat more dragonflies</p> <p><b>or</b></p> <p>(dragonflies) increase in number because there are more insects</p> <p>because there are fewer lizards and small birds</p>	<b>2</b>	<p>each correct answer for decrease = 1 mark</p> <p><b>Accept</b> (dragonflies) decrease in numbers because the quolls have fewer food sources to eat</p> <p><b>or</b></p> <p><b>Accept</b> quolls eat more insects so there is less food for the dragonflies</p> <p>each correct answer for increase = 1 mark</p>
13(b)	<p>bioaccumulation of toxin in quolls</p> <p><b>or</b></p> <p>lizards, birds and dragonflies eat poisoned insects and poison concentrates in the quoll</p>	<b>1</b>	<p><b>Accept</b> quoll eats many insects and poison accumulates in quoll</p>

Question	Answer	Marks	Further Information
14(a)	<b>any one from</b> does <b>not</b> touch the flame or fire or burning paper keeps fingers away from the balloon being pulled into the jar does <b>not</b> spill water on the floor when filling the balloon does <b>not</b> let the students too close <b>or</b> uses a screen	<b>1</b>	<b>Accept</b> any appropriate safety precaution  <b>Ignore</b> wear an apron
14(b)	particles are moving slower <b>or</b> particles have less energy fewer collisions (with surface)	<b>2</b>	each correct answer = 1 mark