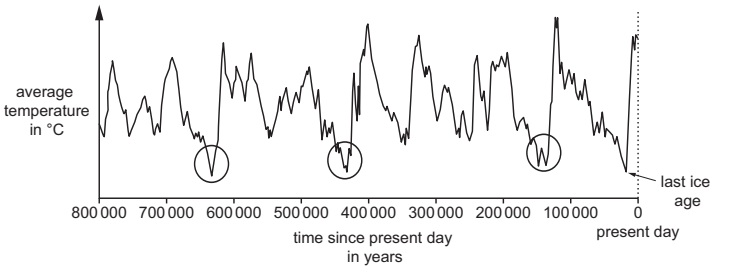


Question	Answer	Marks	Further Information										
1	<table border="0"> <thead> <tr> <th>blood component</th> <th>function</th> </tr> </thead> <tbody> <tr> <td>red blood cell</td> <td>carries carbon dioxide</td> </tr> <tr> <td>white blood cell</td> <td> fights pathogens</td> </tr> <tr> <td>plasma</td> <td> digests food</td> </tr> <tr> <td></td> <td> transports oxygen</td> </tr> </tbody> </table>	blood component	function	red blood cell	carries carbon dioxide	white blood cell	fights pathogens	plasma	digests food		transports oxygen	2	<p>all three correct = 2 marks</p> <p>one or two correct = 1 mark</p> <p>if two lines from one blood component and one is incorrect = 0 marks for that blood component</p>
blood component	function												
red blood cell	carries carbon dioxide												
white blood cell	fights pathogens												
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Question	Answer	Marks	Further Information
2(a)	nucleus	1	<p>Ignore protons or neutrons</p> <p>Accept protons and neutrons</p>
2(b)	protons and neutrons	1	both needed any order for the mark
2(c)	Rutherford	1	Accept Bohr
2(d)	negative or minus or –ve	1	Accept 1– or –1 or minus 1
2(e)	<p>(idea that) positive or charge or protons or nucleus and negative charge on electrons</p> <p>(electrostatic) attraction</p>	2	<p>each correct answer = 1 mark</p> <p>Accept electrostatic attraction between protons and electrons = 2 marks</p>

Question	Answer	Marks	Further Information
3	<p>(The mistake at B) the angle of incidence does not equal the angle of reflection or the angles each side of the normal are not equal or it does not obey the law of reflection.</p> <p>(The mistake at D) there is refraction or the ray of light escapes or the ray of light leaves the optical fibre.</p> <p>(The mistake at F) the (reflected) ray of light is not straight or the (reflected) ray of light bends or the (reflected) ray of light curves.</p>	3	<p>each correct answer = 1 mark</p> <p>Accept dotted line for normal</p>
4(a)		1	<p>Accept any indication of the correct answer, e.g. tick or cross, but circle takes precedence</p> <p>Accept circle drawn in any one of the three areas shown</p> <p>Accept circle drawn in the correct place on the x-axis</p> <p>if more than one circle drawn and any are incorrect = 0 marks</p>
4(b)	cyclic or fluctuating (on a regular basis)	1	<p>Accept constantly changing</p> <p>Accept goes up and down</p>
4(c)	carbon dioxide or methane	1	<p>Accept CO₂ or CH₄</p> <p>Do not accept CO or CO²</p> <p>Accept other greenhouse gases such as sulfur (VI) fluoride or oxides of nitrogen or water vapour</p>

Question	Answer	Marks	Further Information		
5(a)(i)	diffusion	1	Accept gas exchange Ignore absorption		
5(a)(ii)	carbon dioxide passes from the blood into the alveolus (air sac)	1	Accept lung(s) for alveolus (air sac)		
5(b)	any number greater than 0.04 for carbon dioxide and 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 Accept direction of magnetic field = 2 marks		
6(b)	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="padding: 2px 10px;">N</td><td style="padding: 2px 10px;">S</td></tr></table>	N	S	1	more than one answer circled = 0 marks Accept any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
N	S				

Question	Answer	Marks	Further Information
7(a)	(paper) chromatography	1	
7(b)	brown and purple (idea that) these colours have more than one 'dot' in the results	2	each correct answer = 1 mark both needed any order for the mark
7(c)	red and blue	1	both needed any order for the mark Accept 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 or 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>Accept particle arrangement for solid, liquid or gas</p> <p>Accept particle arrangement for solid, liquid or gas</p> <p>Note for impure water, some of the molecules must not be linked for the mark</p>
9(b)	analogy	1	<p>more than one answer circled = 0 marks</p> <p>Accept 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	Accept one muscle contracts and the other muscle relaxes Accept muscles can only contract or muscles can only pull a bone
10(c)	Lily (no mark) and more oxygen more respiration (to provide energy)	2	Note if incorrect name given = 0 marks Note if no name given = max 1 mark each correct explanation = 1 mark Ignore breathing

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

Question	Answer	Marks	Further Information										
12(a)	<table border="1"> <thead> <tr> <th>renewable</th> <th>non-renewable</th> </tr> </thead> <tbody> <tr> <td>bioplastics</td> <td>fossil fuels</td> </tr> <tr> <td>tidal power</td> <td></td> </tr> <tr> <td>vegetable oil</td> <td></td> </tr> <tr> <td>solar power</td> <td></td> </tr> </tbody> </table>	renewable	non-renewable	bioplastics	fossil fuels	tidal power		vegetable oil		solar power		2	<p>all five correct = 2 marks</p> <p>two, three or four correct = 1 mark</p> <p>one correct = 0 marks</p> <p>Accept answers in any order in the correct column</p>
renewable	non-renewable												
bioplastics	fossil fuels												
tidal power													
vegetable oil													
solar power													
12(b)	<p>(wind power) is renewable</p> <p>(wind power) will not run out</p>	2	<p>each correct answer = 1 mark</p> <p>Note assume answer refers to wind power unless otherwise specified</p> <p>Accept ora if coal is specified</p> <p>As extra marking points: Accept it is a clean resource or it is a green resource = 1 mark</p> <p>Accept wind is 'free' = 1 mark</p> <p>Accept no pollutants are produced during electricity generation = 1 mark</p> <p>Accept 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>or</p> <p>(dragonflies) increase in number because there are more insects</p> <p>because there are fewer lizards and small birds</p>	2	<p>each correct answer for decrease = 1 mark</p> <p>Accept (dragonflies) decrease in numbers because the quolls have fewer food sources to eat</p> <p>or</p> <p>Accept 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>or</p> <p>lizards, birds and dragonflies eat poisoned insects and poison concentrates in the quoll</p>	1	<p>Accept quoll eats many insects and poison accumulates in quoll</p>

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