Question	Answer	Marks	Further Information
1(a)	transports oxygen	**1**	**Accept** carries O_2 **Accept** binds with oxygen
1(b)	increased numbers of cell **B** / increased number of white blood cells to destroy pathogens / to fight infection	**2**	each correct answer = 1 mark
1(c)(i)	plasma	**1**	
1(c)(ii)	transports (dissolved) nutrients / transports (dissolved) carbon dioxide	**1**	**Accept** transports (dissolved) urea/hormones/ amino acids

Question	Answer	Marks	Further Information
2(a)	A	**1**	more than **one** letter circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
2(b)	angle of incidence = angle of reflection / (angle) *i* = (angle) *r*	**1**	
2(c)	D	**1**	more than **one** letter circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence

Question	Answer	Marks	Further Information
3(a)	ink will dissolve in the solvent / pencil does **not** dissolve in the solvent	**1**	**Accept** solvent does **not** affect pencil / the ink will also be separated / the ink might run / the ink might wash off
3(b)	(idea that) different dyes move up the paper at different speeds	**1**	**Accept** higher level answers, such as colours have different R_f values / colours have different attraction to the paper
3(c)	yellow **and** green yellow and green spots match the dyes in the food colouring	**2**	**both** colours needed any order for the mark **Accept** spots travel the same distance **Accept** higher level answers, such as R_f values are the same

Question	Answer	Marks	Further Information
4(a)	25 (%)	**1**	
4(b)	fossil fuels	**1**	**Accept** non-renewable
4(c)	**any two from** wind tidal solar power hydrogen(-oxygen) fuel cell geothermal biomass / biofuel / biogas / bioethanol	**2**	each correct answer = 1 mark **Accept** wood/charcoal as biofuel

Question	Answer	Marks	Further Information
5(a)	(a pure substance) contains the substance only / no impurities	**1**	
5(b)	$\frac{10.8}{12.0}$ (x 100) **or** 0.9 (x 100) 90 (%)	**2**	correct fraction / correct substitution = 1 mark correct answer (with or without working) = 2 marks

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>6(a)</td><td>(to make it) a fair test</td><td>1</td><td>Accept (mass) is a control variable</td></tr>
<tr><td>6(b)</td><td>(same) amount of water / (same) distance from flame</td><td>1</td><td>Accept same initial temperature

Ignore same equipment</td></tr>
<tr><td>6(c)</td><td><table><tr><th>food</th><th>start temperature in °C</th><th>final temperature in °C</th></tr><tr><td>nut</td><td>28</td><td>64</td></tr><tr><td>biscuit</td><td>26</td><td>40</td></tr><tr><td>cereal</td><td>26</td><td>44</td></tr><tr><td>bread</td><td>27</td><td>38</td></tr></table></td><td>2</td><td>correct headings = 1 mark

correct units = 1 mark

Accept initial for start / end for final

Note if no mark awarded accept 1 mark for three correct entries, e.g. two headings and one unit</td></tr>
<tr><td>6(d)</td><td>nut</td><td>1</td><td></td></tr>
<tr><td>6(e)</td><td>fat / carbohydrate</td><td>1</td><td>Accept sugar(s) / starch / monosaccharides / saccharides</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>7(a)</td><td>(idea that) make sure north pole faces north pole

(idea that) make sure south pole faces south pole</td><td>2</td><td>each correct answer = 1 mark

ensure like poles face each other = 2 marks

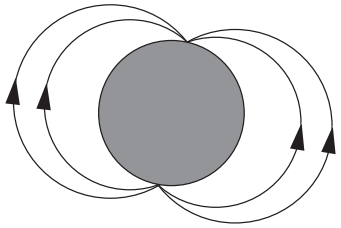
Accept marks from a labelled diagram</td></tr>
<tr><td>7(b)</td><td>(idea that) north pole faces south pole / unlike poles must face each other</td><td>1</td><td>Accept marks from a labelled diagram</td></tr>
</table>

Question	Answer	Marks	Further Information
8(a)	**any two from** (stellar) dust gas stars planetary systems	**1**	**both** answers correct for the mark **Accept** other objects found in galaxies **Accept** planets
8(b)	telescope	**1**	**Accept** named telescope, e.g. Hubble

Question	Answer	Marks	Further Information
9(a)	ecosystem	**1**	more than **one** answer circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
9(b)	**any two from** in the sand under a stone in the soil in the water	**2**	each correct answer = 1 mark **Accept** other suitable habitats shown in the picture

Question	Answer	Marks	Further Information
10(a)	magnesium + oxygen ⟶ magnesium oxide	1	**Accept** = instead of ⟶ either order for the reactants
10(b)	**any two from** fizzes / bubbles gets smaller / (eventually) disappears / forms a colourless solution yellow flame floats / moves on the surface solution left is alkaline	2	each correct answer = 1 mark **Accept** produces a gas / produces hydrogen **Accept** dissolves

Question	Answer	Marks	Further Information
11(a)	yes (no mark) **and** as the number of turns increases, the number of paper clips picked up increases	**1**	 **Ignore** makes the electromagnet stronger
11(b)	repeat the experiment (for each number of turns) as this will improve the reliability of the experiment / so results can be checked / so averages can be taken **or** do the experiment with different number of turns, e.g. 1, 3, 5, 7 and/or 9 turns makes it easier to see any patterns / as this will provide more data **or** use smaller paper clips (idea that) more paper clips are picked up / improves accuracy	**2**	correct improvement = 1 mark correct explanation = 1 mark **Do not accept** makes the investigation more accurate **Accept** other suitable ways of improving reliability, accuracy or precision **Ignore** reference to fair testing

Question	Answer	Marks	Further Information
12(a)	core magnet	**1**	**both** answers correct for the mark
12(b)	compass	**1**	
12(c)	**All** arrows must be in the same direction 	**1**	**Accept** all arrows drawn in opposite direction if the learner assumes the Earth's magnetic north pole is the same as the geographical north pole

Question	Answer	Marks	Further Information
13(a)	three points correctly plotted within ± half a square = 1 mark curve of best fit through the points as judged by eye = 1 mark	**2**	**Accept ecf** from incorrectly plotted points **Do not accept** dot to dot / curve that goes through the origin
13(b)	increases / rises / is greater	**1**	

Question	Answer	Marks	Further Information
14(a)	A	**1**	more than **one** letter circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
14(b)	D	**1**	more than **one** letter circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
14(c)	B	**1**	more than **one** letter circled = 0 marks **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence

Question	Answer	Marks	Further Information
15	force x distance is a moment balance when moments are equal / balance when clockwise moment equals anticlockwise moment **but for 2 marks** $\mathbf{F_1 \times d_1 = F_2 \times d_2}$	**2**	**Accept** $\mathbf{F_1 \times d_1}$ or $\mathbf{F_2 \times d_2}$ answer must refer to moments rather than force or pressure