Question	Answer	Marks	Further Information
1(a)(i)	**Z**	**1**	
1(a)(ii)	run at the same speed for 1 minute	**1**	more than **one** answer ticked = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
1(b)(i)	(improves) eyesight or vision (in low light conditions)	**1**	**Accept** for healthy skin **or** (improves) immune system **or** cell growth
1(b)(ii)	obesity **or** heart disease **or** increase in (bad) cholesterol **or** high blood pressure **or** stroke	**1**	

Question	Answer	Marks	Further Information
2(a)	exothermic (idea of) temperature increase	**2**	each correct answer = 1 mark **Accept** any indication of the correct answer, e.g. circling or underlining, but answer line takes precedence
2(b)	iron + sulfuric acid → iron sulfate + hydrogen	**1**	reactants correct in either order **and** products correct in either order = 1 mark **Ignore** dilute **Accept** correct formulae, but name takes precedence $Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$ **Accept** = instead of →

Question	Answer	Marks	Further Information
3(a)	refracted dispersion	**2**	each correct answer = 1 mark **Ignore** refraction in second sentence
3(b)	(red + green =) **yellow** (green + blue =) **cyan** (red + blue + green =) **white**	**2**	**all three** correct = 2 marks **one** or **two** correct = 1 mark

Question	Answer	Marks	Further Information
4	**any two from** (stellar) gas (stellar) dust stars planets moons asteroids comets nebulae	**2**	each correct answer = 1 mark **Accept** any other suitable objects found in **all** known galaxies, e.g. black hole **or** meteorites **Accept** planetary systems if planets and moons have not been given

Question	Answer	Marks	Further Information
5(a)	**any two from** fallen tree stream **or** river **or** water fallen leaves tree canopy **or** treetops **or** branches of the tree	**2**	each correct answer = 1 mark **Accept** any suitable habitat shown in the picture, e.g. grass
5(b)(i)	length of time she looks for **or** time of day	**1**	**Accept** any suitable factor that must be kept the same, e.g. temperature **or** weather
5b(ii)	number of **species** of bird	**1**	
5b(iii)	yes **or** no **or** maybe (no mark) **any two explanations from** the results are very close to each other number of species (of bird) has decreased may have misidentified species must identify if the new species is still present should sample over a longer time interval may have looked for species for different lengths of time there may be migration into or out of the woodland there may be seasonal differences not sampled enough places in the woodland	**2**	**Note** the explanations must match the decision about the hypothesis each correct explanation = 1 mark if no decision about the hypothesis but **two** correct explanations = 1 mark

Question	Answer	Marks	Further Information
6(a)	(Metal **A** is) gold (Metal **B** is) sodium (Metal **C** is) calcium (Metal **D** is) zinc	**3**	**all four** correct = 3 marks **three** correct = 2 marks **one** or **two** correct = 1 mark **Accept** metal **C** is magnesium
6(b)	hydrogen	**1**	**Accept** H_2

Question	Answer	Marks	Further Information
7(a)	(idea of) a complete circuit (idea of) coil the wire around the nail	**2**	each correct answer = 1 mark **Accept** answer in the form of a diagram
7(b)	cover the copper wire in plastic ☐ use a non metal for the wire ☐ use two batteries ✓ remove the iron nail ☐ increase the current ✓ connect the equipment for a shorter time ☐	**2**	each correct tick = 1 mark **one** incorrect tick = maximum 1 mark **two** incorrect ticks = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Further Information</th></tr>
<tr><td>8(a)(i)</td><td>(small) rock in space</td><td>1</td><td>Accept minor planet or planetoid for rock

Accept (small) rock orbiting the Sun</td></tr>
<tr><td>8(a)(ii)</td><td>collisions with other asteroids or dust or objects</td><td>1</td><td></td></tr>
<tr><td>8(b)(i)</td><td><table><tr><th>asteroid or name</th><th>(orbit) time in years</th><th>radius in kilometres</th></tr><tr><td>Vesta</td><td>3.63</td><td>286</td></tr><tr><td>Ceres</td><td>4.60</td><td>469</td></tr><tr><td>Juno</td><td>4.36</td><td>123</td></tr><tr><td>Pallas</td><td>4.61</td><td>256</td></tr></table></td><td>3</td><td>correct headings including unit in headings = 1 mark

all four rows (in any order) correct = 2 marks

one, two or three rows (in any order) correct = 1 mark

Do not accept units in the body of table

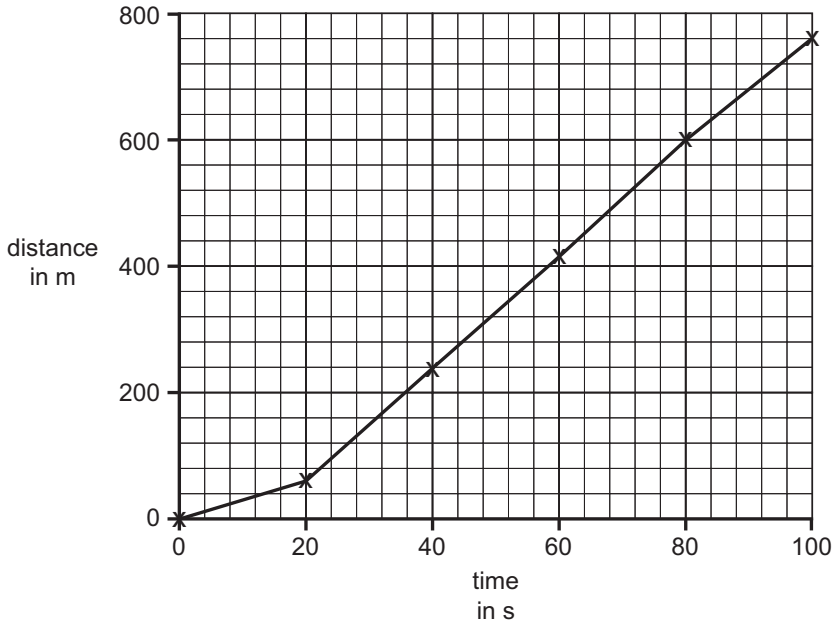
Accept km for kilometres

Note columns can be in any order

Ignore additional columns</td></tr>
<tr><td>8(b)(ii)</td><td>Vesta</td><td>1</td><td>Accept ecf from 8(b)(i) for whichever asteroid is shown as completing its orbit in the shortest time</td></tr>
</table>

Question	Answer	Marks	Further Information
9(a)	glucose + oxygen → carbon dioxide + water	**2**	reactants correct in either order = 1 mark products correct in either order = 1 mark **Accept** correct formulae, but name takes precedence $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$ **Accept** sugar for glucose
9(b)	**C**	**1**	more than **one** letter on answer line = 0 marks **Accept** any indication of the correct answer, e.g. circling, but answer line takes precedence

Question	Answer	Marks	Further Information
10(a)	**C** (idea of) greatest mass of salt per cm^3 of water	**2**	each correct answer = 1 mark more than **one** answer circled = 0 marks if **A**, **B** or **D** indicated = 0 marks for the question **Accept** any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence **Accept** any calculation that demonstrates greatest mass of salt per cm^3 of water e.g. 1/10 = 0.1, 6/30 = 0.2, 5/20 = 0.25, 10/50 = 0.2
10(b)	(idea that the solubility) increases	**1**	

Question	Answer	Marks	Further Information
11(a)	(time to measure 20 s) stop-watch **or** timer **or** stop-clock (distance to measure 60 m) measuring tape	**2**	**both** answers correct for the mark **Ignore** watch **or** clock **or** chronometer **Accept** trundle wheel **Ignore** meter rule(r)
11(b)		**2**	**all four** points plotted correctly = 1 mark dot-to-dot line drawn = 1 mark **Accept ecf** for dot-to-dot line from incorrectly plotted points **Accept** plots ±½ small square
11(c)	3 (m / s)	**1**	

Question	Answer	Marks	Further Information
12	Weather changes over a short period of time. Climate changes over a long period of time.	**2**	**two** correct ticks = 2 marks **one** correct tick = 1 mark **three** ticks and **two** correct = 1 mark **three** ticks and **one** correct = 0 marks **Accept** any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence

Question	Answer	Marks	Further Information
13(a)	CO_2	**1**	**Accept** O_2C
13(b)	HNO_3	**1**	**Accept** O_3NH **or** O_3HN **or** NO_3H **or** HO_3N **or** NHO_3
13(c)	$Na_2CO_3 + HNO_3 \rightarrow NaNO_3 + CO_2 + H_2O$	**2**	reactants correct in either order = 1 mark products correct in any order = 1 mark **Accept ecf** from parts **(a)** and **(b)** **Accept** = instead of $\rightarrow$ **Ignore** any attempt to balance the equation