

Tier 3–6	Q No 1												
Part	Mark	Answer	Accept	Additional guidance									
a i 2/5c	1	any one from * A * B	accept 'tadpole' accept 'trout' or 'fish'										
a ii 2/4b	1	any one from * B * D	accept 'trout' or 'fish' accept 'crocodile' or 'reptile'										
b 2/4b	1	* backbones											
c 2/5c	1	any one from * it has fins * it is streamlined	accept 'the tail helps it swim' accept a description of streamlining such as 'it is narrow or thin' accept 'scales make it smooth' or 'it is smooth'	'it has a tail' is insufficient 'it has gills' or 'it has gills to breathe or to take in oxygen' are insufficient									
d 2/4b	2	* <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding: 5px;">frog</td> <td style="border: none; padding: 0 10px;">\</td> <td style="padding: 5px;">reptiles</td> </tr> <tr> <td style="padding: 5px;">crocodile</td> <td style="border: none; padding: 0 10px;">/</td> <td style="padding: 5px;">mammals</td> </tr> <tr> <td style="padding: 5px;">water vole</td> <td style="border: none; padding: 0 10px;">/</td> <td style="padding: 5px;">amphibians</td> </tr> </table>	frog	\	reptiles	crocodile	/	mammals	water vole	/	amphibians		if all three lines are correct, award two marks if one or two lines are correct, award one mark if more than one line is drawn from any animal, award no credit for that animal
frog	\	reptiles											
crocodile	/	mammals											
water vole	/	amphibians											
Total	6												


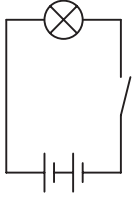
Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional guidance
a i <i>2/3a</i>	1	* light	accept 'sunlight'	<i>do not accept 'Sun'</i>
a ii <i>2/5b</i>	1	* support		
b <i>2/3a</i>	1	* no water ✓		if more than one box is ticked, award no mark
c <i>2/3c</i>	1	* minerals ✓		if more than one box is ticked, award no mark
d <i>2/3d</i>	1	* C ✓		if more than one box is ticked, award no mark
Total	5			

Tier 3–6	Q No 3			
Part	Mark	Answer	Accept	Additional guidance
a i 2/5e	1	* oak tree → caterpillar → blackbird → owl		all three answers are required for the mark
a ii 2/3a	1	* It makes food by photosynthesis. ✓		if more than one box is ticked, award no mark
b 2/5d	1 1 1 1	either * decreased or went down any one from * fewer leaves to feed on * gypsy moth caterpillars ate most of the leaves * less food or any one from * increased or went up * stayed the same 1 any one from * they had enough food or leaves * more eggs hatched	accept 'gypsy moth caterpillars ate the leaves' accept 'the gypsy moth caterpillars ate all the leaves or all the food' accept 'no food' accept 'they were competing for food'	
c 2/5b	1	* the tree loses its leaves	accept 'no leaves' or 'no food' accept 'it is too cold' accept 'caterpillars change into pupae or chrysalises or moths'	<i>do not accept</i> 'caterpillars hibernate in winter'
Total	5			

Tier 3–6	Q No 4			
Part	Mark	Answer	Accept	Additional guidance
a 3/1d	1 1	* metal any one from * heat * thermal energy		
b 3/3a	1	any one from * nail * paper-clip	accept 'iron' accept 'steel' or 'clip'	
c i 3/1d	1	any one from * plastic * rubber * PVC	accept a named plastic	
c ii 3/1d BS/2b	1	any one from * to stop you getting a shock * so the wires do not touch	accept 'to stop you being electrocuted' accept 'to make it safe' accept 'to prevent them short circuiting' accept 'it does not conduct electricity'	'to insulate them' is insufficient as it is given in the question
d 3/1d	1	* iron nail and steel paper-clip ✓		if more than one box is ticked, award no mark
Total	6			

Tier 3–6	Q No 5									
Part	Mark	Answer	Accept	Additional guidance						
a i 1/2i	1	* temperature of water	accept 'temperature'	<i>do not accept</i> 'heat'						
a ii 1/2i	2	* <table border="1"> <tr> <td>57</td> <td>34</td> </tr> <tr> <td>40</td> <td>74</td> </tr> <tr> <td>20</td> <td>144</td> </tr> </table>	57	34	40	74	20	144		award one mark for all three rows of information recorded accurately in the table award one mark for the temperature presented in ascending or descending order
57	34									
40	74									
20	144									
b 1/2e	2	any two from * clock or timer or stopwatch * thermometer or temperature sensor * measuring cylinder * balance	accept 'beaker' accept 'scales'	'measuring jug' is insufficient						
c 1/2d	1	* to make the test fair	accept 'as a control'							
d 1/2k	1	any one from * it did not use her results * she did not describe the relationship between temperature and dissolving	accept 'it did not describe what she has found out' accept 'she has not given the pattern in her results' accept 'she did not say if changing the temperature affected the time' accept 'she did not say what the result showed'	'she did not explain in detail' is insufficient answers referring to her evaluation of her investigation or method are insufficient 'she did not say what the results were' is insufficient						

Tier 3–6	Q No 5			
Part	Mark	Answer	Accept	Additional guidance
e 1/2k	1	any one from * the hotter the water the quicker it dissolves * the higher the temperature the less time is taken for the cold cure to dissolve	accept 'the hottest dissolved quickest' accept the converse accept 'when the water is cold it takes longer to dissolve' accept 'when the water is hot it dissolves quickly' accept 'temperature does affect the time to dissolve'	the conclusion should refer to the independent and dependent variable
Total	8			

Tier 3–6	Q No 6			
Part	Mark	Answer	Accept	Additional guidance
a i 4/3c	1	* 		if more than one box is ticked, award no mark
a ii 4/3c	1	* it is reflected	accept 'it reflects' accept 'it bounces off'	
b i 4/1a	1 1 1	* bulb * battery or cells * switch	accept 'lamp' or 'light' accept 'cell'	answers must be in the correct order
b ii 4/1a	1	* a series circuit drawn with the correct symbols such as 	accept '— —' for '— —' accept '— —' or '— ---- —' accept curved wires	
Total	6			

Tier 3–6	Q No 7					
Part	Mark	Answer	Accept	Additional guidance		
a 4/1d	1	* <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>S</td></tr> <tr><td>N</td></tr> </table>	S	N		both poles are required for the mark
S						
N						
b i 4/1d	1	* repel				
b ii 4/1d	1	* it moved upwards or returned to its original position	accept 'it would move up and down'			
c 1/2j	1	* decreased	accept 'got smaller' accept 'moved closer'			
d 4/1d	1	any one from * it was attracted to the base * it moved down * it sank	accept 'the magnets are attracting' accept 'the N and S poles attract' accept 'it would not float' accept 'it would stick to the base'			
Total	5					

Tier 3–6	Q No 8			
Part	Mark	Answer	Accept	Additional guidance
		<p>markers should read the answers to all parts before marking this question</p> <p>the draft box should be consulted for clarification of any ambiguity or omission</p> <p>if an answer is correct, ignore contradictory statements written in the draft box</p>		
a 1/2d	1	any suitable independent variable such as * the surface * the angle of the slope * the kind of object * the size of the push	accept specific variations in objects, such as, 'weight' or 'mass' or 'surface area' or 'type of trainer sole' or 'type of shoe'	
b 1/2d 1/2e	1	any suitable dependent variable such as * the distance travelled * the time to move down the ramp * the force needed to start the object moving * the angle of the ramp at which the object starts moving	accept 'the time to reach a given point' accept 'angle or height of ramp' accept 'speed'	a dependent variable (DV) without an independent variable (IV) can gain credit
	1	any appropriate equipment to measure the dependent variable such as * ruler or metre rule * stopwatch or timer or light gates * newton meter * protractor	accept 'tape measure' accept 'clock'	<i>do not accept</i> a measurement strategy if a DV is not given or is incorrect
c 1/2d	1	any appropriate control variable such as * the object used * the angle of the slope * the surface used * the height of the ramp * the length of the ramp	accept 'distance travelled'	only give credit for a control variable which does not conflict with the suggested investigation
Total	4			

Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional guidance
a i 2/5f	1	any one from * blackbirds eat earthworms and sparrowhawks eat blackbirds * it eats blackbirds which eat earthworms * it is passed on through the food chain	accept 'from their food or from blackbirds' accept 'it is passed on or up'	
a ii 2/5d	1	any one from * they are more easily seen * brown earthworms are better camouflaged	accept 'there are more yellow earthworms'	
b 2/5f	1	* the level of copper or arsenic or pollution	accept 'whether it contained arsenic or copper' accept 'where the copper or arsenic is'	
c 2/4b	1	* it has segments	accept 'its body is split into sections'	award a mark for any appropriate description of segments such as 'rings' or 'lines' or 'creases' 'they look similar' is insufficient 'same texture' or 'body shape' or 'structure' are insufficient
d 2/5b	1	* They feed on other living things and harm them. ✓		if more than one box is ticked, award no mark
Total	5			

Tier 3–6 5–7		Q No 10 2		
Part	Mark	Answer	Accept	Additional guidance
a 2/2i	1	* carbon monoxide	causes addiction to smoking	if more than one line is drawn from any substance, award no mark for that substance
	1	* nicotine	causes influenza (flu)	
	1	* tar	causes lung cancer causes red blood cells to carry less oxygen	
b i 2/2i	1	any one from * fat has been deposited * the artery has become narrower	accept 'fat' accept 'it is blocked'	
b ii 2/2i	2	any two from * less oxygen to the cells or heart muscle * less glucose to the cells or heart muscle * less blood to the cells or heart muscle	accept 'no oxygen' accept 'no glucose' accept 'it stops the circulation of blood' accept 'blood cannot flow through' accept 'it stops blood getting to the heart' accept 'there is a build-up of carbon dioxide' accept for two marks 'they get less oxygenated blood'	<i>do not accept</i> 'less air to the cells' 'nothing can get through' is insufficient
Total	6			

Part	Mark	Answer	Accept	Additional guidance		
<table border="1"> <tr> <td>Tier 3–6 5–7</td> <td>Q No 11 3</td> </tr> </table>		Tier 3–6 5–7	Q No 11 3			
Tier 3–6 5–7	Q No 11 3					
a 2/2e	1	any one from * the force of the muscle would be less or lost * the (fore)arm or bone would not move * the biceps or muscle could not pull on the bone * the biceps or muscle would have no effect * the biceps or muscle would have less effect	accept 'you could not bend or straighten your arm' accept 'the biceps or muscle would not work properly'	'the arm would not work properly' is insufficient		
b 2/2e	1	any one from * when one contracts the other relaxes * when the biceps contracts the forearm is raised and when the triceps contracts the forearm is lowered	accept 'one muscle moves the joint or bone or arm one way and the other muscle moves it the other way'	<i>do not accept</i> 'when one contracts the other expands' 'they work together' or 'they do opposite things' is insufficient		
c i 2/2e	1	* C				
c ii 2/2e	1	* B and C ✓				
	1	* D and A ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero		
Total	5					

Tier 3–6 5–7	Q No 12 4			
Part	Mark	Answer	Accept	Additional guidance
a 3/1h	1	* evaporation then condensation ✓		if more than one box is ticked, award no mark
b 3/1h	1	* water	accept 'distillate'	
c 3/1a	1	* 100	accept a temperature from 99 to 101	
d i 4/5d	1	* a temperature above 15 but below 100 any one from * it is heated by the water vapour	accept 'vapour or steam or hot water' for water vapour accept 'it heats up'	both the answer and the correct explanation are required for the mark
d ii 3/1h 3/2c	1	any one from * it condenses * it changes to a liquid	accept 'it makes condensation' accept 'it is liquid' accept 'it changes state' accept 'it turns to water'	
	1	* its temperature falls	accept 'it cools'	'it changes temperature' is insufficient


Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 12 4			
e <i>3/1h</i>	1	any one from * cold water replaces warm water * the water stays cold or cooler * there is a bigger difference in temperature between the water vapour and the water * some vapour escapes in B	accept 'it cools the water vapour better or more efficiently or quickly' accept 'it will work faster'	
Total	7		accept 'it is cooled over a bigger length or for longer' accept 'more water is collected'	

Tier 3–6 5–7		Q No 13 5		
Part	Mark	Answer	Accept	Additional guidance
a i 4/5a	1	any two from * coal * peat * natural gas * oil	accept 'gas' accept 'petrol' or 'diesel'	answers may be in either order both answers are required for the mark
a ii 3/1e	1	* sulphur dioxide	accept 'sulphur oxide' or 'sulphur trioxide'	
b i 3/3e 3/3f	1	* it raises the pH or it	accept 'it neutralises it' or 'it neutralises some of the acid'	
b ii 3/3e	1	* calcium sulphate ✓		if more than one box is ticked, award no mark
c i 2/3e	1	* leaves are needed for photosynthesis or for making food	accept 'they absorb light'	
c ii 3/2i 3/3g	1	any one from * it weathers limestone * it reacts with the stone	accept 'it erodes them or wears away the building' accept 'it dissolves limestone or the building'	'it damages the stone' is insufficient 'it corrodes them' is insufficient
Total	6			

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 14 6			
a i 4/4c	1	* C it is the closest to the Sun	accept 'it is closer or close'	both the letter and the correct explanation are required for the mark
a ii 4/4c	1	* an arrow from each of the points A, B, C and D towards the Sun		all four arrows are required for the mark
a iii 4/4c	1	* A it is furthest from the Sun or the effect of the Sun's gravity is weakest	accept 'it is further or far away' accept 'gravity is low or lower'	both the letter and the correct explanation are required for the mark
b i 1/2j 4/4b	1	* a number greater than 2870 and smaller than 5900		
b ii 1/2j 4/4b	1	* the further away the lower the temperature	accept the converse accept 'the further away the colder it is'	
b iii 4/5g	1	any one from * planets further away receive less energy or heat * energy from the Sun spreads out * less heat reaches the planets that are further away	accept 'light' for energy accept 'the Sun's rays are weaker or not as strong'	<i>do not accept</i> 'the Sun's heat cannot reach planets that are far away' 'the Sun is weaker' is insufficient
Total	6			

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 15 7			
a i 1/2d	1	* the number of turns or coils of wire	accept 'the coils' accept 'the turns'	
a ii 1/2d	1	any one from * the current * the length or thickness or material of the wire or coil * the circumference of the coil * the size of paper-clips	accept 'the voltage or power' accept 'the wire' accept 'the paper-clips' accept 'position of the coil on the nail' accept 'tightness of the coil' accept 'distance between turns' accept 'the nail'	<i>do not accept</i> 'the number of paper-clips'
a iii 1/2e	1	any one from * count the paper-clips picked up * measure their mass	accept 'number of paper-clips' accept 'count them' accept 'weigh them' accept 'the more clips the stronger the magnet' accept 'measure the distance at which a magnet will just pick up a paper-clip'	
b 1/2n	1	any one from * an inaccuracy in results * a problem with the data or results * a problem with the method	accept a description of inaccuracies, such as 'she counted the number of clips wrongly' accept 'something wrong with the tests' accept 'she used different sized paper-clips' accept 'the paper-clips were already magnetised' accept 'she did something wrong'	'the test is unfair' is insufficient

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 15 7			
c i 1/2g	1	* <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		if more than one box is ticked, award no mark
c ii 1/2e	1	any one from * with bigger paper-clips she might miss the precise point at which the electromagnet stopped picking up paper-clips * the smaller paper-clips might help to identify the precise point at which the electromagnet stopped picking up paper-clips	accept 'she would pick up differences between the number of turns of the coil' accept 'she might not see a change with big paper-clips or she would see a change with smaller paper-clips' accept 'it is more precise or more sensitive'	'it will pick up a few large paper-clips but a lot of small paper-clips' is insufficient award a mark for a response identifying that greater precision is possible with smaller increments 'they are smaller' is insufficient
Total	6			

Part	Mark	Answer	Accept	Additional guidance
Tier 3–6 5–7	Q No 16 8			
a 4/2c	1	* A		
b 4/2c	1	any one from * he will remain stationary * he will continue moving at a constant speed	accept 'he floats' accept 'nothing'	
	1	any one from * there is no net force * the pairs of forces are equal	accept 'all the forces cancel out' accept 'they cancel each other out' accept 'the forces are balanced'	'the forces are equal' is insufficient
c 4/2c	1	* 	accept any arrow drawn going up and to the right	
Total	4			