

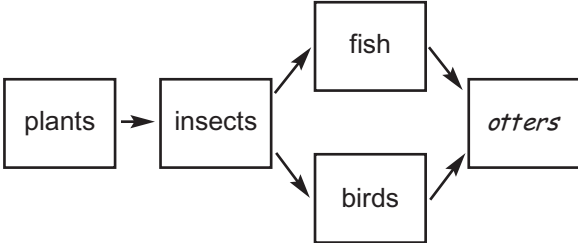
Tier 3–6	Q No 1			
Part	Mark	Answer	Accept	Additional Guidance
a i 1/2e	2	* thermometer calendar mass balance ruler	time temperature length mass	if all four lines are correct, award two marks if two or three lines are correct, award one mark if more than one line is drawn from any box, do not credit that line
a ii BS/2a	2	* time temperature length mass	cm °C days grams	if all four lines are correct, award two marks if two or three lines are correct, award one mark if more than one line is drawn from any box, do not credit that line

Tier 3–6	Q No 1			
Part	Mark	Answer	Accept	Additional Guidance
b 1/2g	1 1	* C any one from: * A and D start at 25 and B does not have a mark at 15 * there are not enough marks on A, B or D or the others * precise * C has the finest or most accurate scale * it is accurate at 15 cm ³	accept 'it has a mark for 15' accept 'you don't have to estimate the measurement' accept 'the measurement is reliable' accept 'it is accurate' accept 'it is the most exact' accept 'it goes up in ones' accept 'it has the smallest units in it' accept 'there are more lines on the scale'	<i>do not award</i> a mark if C has not been selected or identified in either part of item (b) 'it is easy to read' is insufficient 'more measurements on it' is insufficient 'it measures in cm ³ ' is insufficient
Total	6			

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Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional Guidance
a i 1/2j	1	* 200g		
a ii 1/2j	1	* it decreased	accept 'it went down'	
a iii 1/2j	1	any one from * the mass stayed the same or constant * it does not go down on day 7	accept 'it is the same on day 7'	'the graph or line is flat' is insufficient 'it stays the same' is insufficient
b BS/2a	1	any one from * it is flammable * it catches fire (easily)	accept 'it is inflammable' accept 'it will burn' accept 'it is a fire hazard'	'it explodes' is insufficient 'do not put it near the fire' is insufficient
c 3/2b	1	* it dissolves ✓		if more than one box is ticked, award no mark
d 3/1b	1	* it evaporated ✓		if more than one box is ticked, award no mark
Total	6			

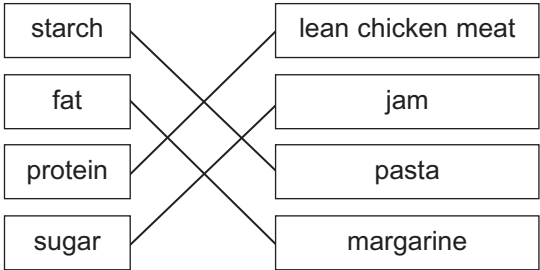
Tier 3–6	Q No 3			
Part	Mark	Answer	Accept	Additional Guidance
a 2/4b	1	* fur or hair or whiskers	accept 'feed their young with milk' accept 'producing milk or has nipples' accept 'give birth to live young' accept 'external or visible ears'	'they are warm blooded' is insufficient 'feed their young' is insufficient 'they do not lay eggs' is insufficient 'ears' is insufficient
b 2/5c	1	any one from * webbed or wide feet * streamlined	accept 'aerodynamic' accept 'smooth body' accept 'long and thin body' accept 'small ears' accept 'powerful or long tail' accept 'short fur'	'long body' or 'thin body' are insufficient 'tail' is insufficient 'they have fur' is insufficient
c i 2/5c	1	* protection from predators or the weather or the cold	accept 'keeps them warm'	'it keeps them safe' is insufficient 'for protection' is insufficient
c ii 2/5c	1	any one from * so otters can breathe * otherwise cubs would drown (if water entered the burrow) * so the water does not cause the burrow to cave in	accept 'otters breathe air' accept 'otherwise it could fill with water' accept 'cubs cannot swim' accept 'predators could be in the water' accept 'so the burrow does not collapse'	'otherwise water can get in' is insufficient 'so they do not get wet' is insufficient
d 2/5e	1	* predator ✓		if more than one box is ticked, award no mark

Tier 3–6	Q No 3			
Part	Mark	Answer	Accept	Additional Guidance
e 2/5e	2	<p>*</p>  <pre> graph LR plants --> insects insects --> fish insects --> birds fish --> otters birds --> otters </pre>		<p>if all four answers are correct, award two marks award one mark for either 'plants' and 'insects' in their correct places or for 'fish' and birds in their correct places</p> <p>'fish' and 'birds' can be interchanged</p>
f 2/5a	1	<p>any one from</p> <ul style="list-style-type: none"> * so they reproduce * for breeding * so they mate 	<p>accept 'produce more otters'</p> <p>accept 'so they can have babies'</p>	<p>'to increase otter numbers' is insufficient</p> <p>'so they protect each other' is insufficient</p>
Total	8			

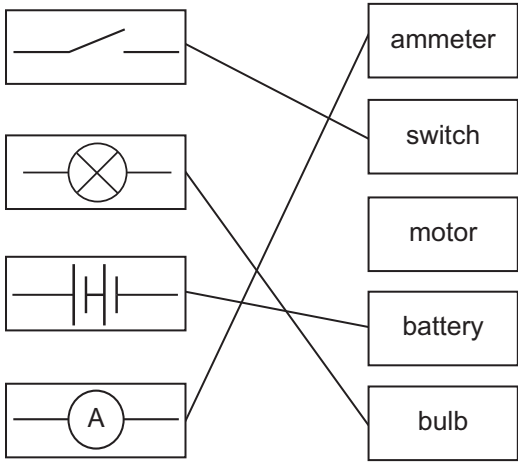
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Tier 3–6	Q No 4		
Part	Mark	Answer	Accept Additional Guidance
a 1/2k	1	* walls	
b i 4/5f	1	* roof	
b ii 1/2k	1	any one from * it now loses 700 (J) * the energy is less (than before) * the energy or heat is different * all the others do not change	accept 'it is only 700' accept 'it was 3400 (J)' accept 'it has gone down' accept 'insulation reduces heat loss' 'it is 700' is insufficient 'insulation keeps heat in' is insufficient
c i 4/5a 1/2j	1	* coal	'solid' is insufficient '25 000 J' is insufficient
c ii 3/1b	1	* it is a gas	accept 'physical state'
c iii 1/2j	1	* no sulphur dioxide (is given off)	accept 'it says no in the sulphur dioxide column' accept 'there is no sulphur in it' <i>do not accept</i> 'it has no sulphur dioxide in it'
Total	6		

Tier 3–6	Q No 5															
Part	Mark	Answer	Accept	Additional Guidance												
a 2/2a	1	* oranges ✓		if more than one box is ticked, award no mark												
b 1/2j 3/2b	1	* <table border="1"> <thead> <tr> <th>amount of vitamin C</th> <th>increases</th> <th>decreases</th> <th>stays the same</th> </tr> </thead> <tbody> <tr> <td>in the beans</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>in the water</td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>	amount of vitamin C	increases	decreases	stays the same	in the beans		✓		in the water	✓				both ticks are required for the mark
amount of vitamin C	increases	decreases	stays the same													
in the beans		✓														
in the water	✓															
c 2/2a	1	* for strong or hard teeth or bones	accept 'to keep the skeleton strong' accept 'for (healthy) bones or teeth'	'for toe or finger nails' is insufficient												

Tier 3-6	Q No 5			
Part	Mark	Answer	Accept	Additional Guidance
<p>d 2/2a</p>	<p>2</p>	<p>*</p> 		<p>all four lines are required for two marks any two or three lines are required for one mark</p> <p>if more than one line is drawn from any nutrient, do not give credit for that nutrient</p>
<p>e i 2/2c</p>	<p>1</p>	<p>* R</p>		
<p>e ii 2/2c</p>	<p>1</p>	<p>* Q</p>		
<p>Total</p>	<p>7</p>			

Tier 3–6	Q No 6	Answer	Accept	Additional Guidance
a i 4/2b	1	any one from * weight * gravitational force	accept 'gravity'	
a ii 4/2c	1	* the rope or elastic	accept 'bungee' accept 'upward force' accept 'tension'	<i>do not accept</i> 'air resistance' <i>do not accept</i> 'upthrust'
b 4/2b	1	* less than		
c i 4/3i	1	any one from * light travels faster than sound * sound travels slower than light	accept 'light travels faster' accept 'sound travels slower' accept 'light is faster than sound'	'light is fast' is insufficient 'sound is slow' is insufficient 'light travels before sound' is insufficient
c ii 4/3g	1	* louder		
c iii 4/3g	1	* eardrum	accept 'drum' accept 'hammer' or 'anvil' or 'stirrup' accept 'small bones' accept 'ossicles'	
Total	6			

Tier 3–6	Q No 7												
Part	Mark	Answer	Accept	Additional Guidance									
a 4/1a	3	* 		all four lines are required for three marks any three lines are required for two marks any two lines are required for one mark if more than one line is drawn from a symbol, do not give credit for that symbol									
b 4/1c	1	* battery	accept 'cell' or 'cells' accept 'power supply' or 'power pack'										
c 4/1a	1	* <table border="1"> <thead> <tr> <th></th> <th>series</th> <th>parallel</th> </tr> </thead> <tbody> <tr> <td>circuit 1</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>circuit 2</td> <td></td> <td style="text-align: center;">✓</td> </tr> </tbody> </table>		series	parallel	circuit 1	✓		circuit 2		✓		both ticks are required for one mark if more than one box is ticked in any row, award no mark
	series	parallel											
circuit 1	✓												
circuit 2		✓											
d 3/1d	1	* copper	accept 'aluminium' accept 'gold'	do not accept any other metal									
Total	6												

Tier 3–6 5–7	Q No 8 1	Part	Mark	Answer	Accept	Additional Guidance
		a 2/2e	1	* As one muscle contracts, the other relaxes. ✓		if more than one box is ticked, award no mark
		b 1/2j 2/2i	2	any two from * she gets more air or oxygen * it gets faster * it gets deeper	accept 'greater volume of air taken in or out' accept 'breathes out more carbon dioxide' accept 'speeds up' or 'she takes more breaths' accept 'she takes bigger breaths' accept, for one mark, 'she breathes more' if not given with 'it gets faster' or 'it gets deeper'	'she needs more oxygen' is insufficient 'shorter or heavier or louder or harder breaths' are insufficient 'it increases' is insufficient 'the volume of air in her lungs increases' is insufficient <i>do not accept 'the volume of her lungs increases'</i>
		c 2/2l	1	* muscle cells → bloodstream → lungs → windpipe → nose	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	if more than one box is ticked, award no mark
		Total	4			

Tier 3–6 5–7	Q No 9 2	Part	Mark	Answer	Accept	Additional Guidance
		a 3/3d	1	* lemonade	accept '4.4'	
		b i 3/3e 1/2k	1	any one from * it is less acidic * its pH has increased	accept 'it is weaker' accept 'it decreases' accept 'it has gone from 1.0 to 2.5'	do not accept 'it has become more alkaline' do not accept 'it increased' do not accept 'the acidity changed by pH 1.5'
		b ii 3/3h 1/2k	1	any one from * ethanoic acid is less acidic than the hydrochloric acid * ethanoic acid has a higher pH * it has a pH of 3 compared with 1 * it is a weaker acid	accept the converse accept 'it is less acidic' accept 'partially neutralised'	'ethanoic acid is pH 3' is insufficient 'ethanoic acid is weak' is insufficient 'it is weaker' is insufficient
		c i 3/1f	1	* hydrogen		'H ₂ ' or 'H' are insufficient
		c ii 3/1f	1 1	* sulphur * oxygen		answers can be in either order 'S' or 'O' or 'O ₂ ' are insufficient
		c iii 3/1e	1	* 5		
		Total	7			

Tier 3–6 5–7	Q No 10 3	Part	Mark	Answer	Accept	Additional Guidance
		a 1/2m	1	any one from * leaves or stems damaged by strong currents * roots could be pulled out	accept 'plants or seeds washed away' accept 'they cannot attach themselves to the water bed' accept 'leaves unable to float'	references to flowers are insufficient
		b 2/5c	1	any one from * there is insufficient light * the water is frozen * less or no photosynthesis occurs	accept 'too little sunshine' accept 'leaves may be damaged by frost or snow or ice' accept 'the plant freezes' accept 'not enough energy to produce leaves'	<i>do not accept</i> 'no light' 'too cold' is insufficient
		c i 2/5c	1	any one from * large leaves * flexible stems * waxy leaves * the leaves or flowers are able to float * air in the leaves or stems * roots that cover a wide area	accept 'flat leaves' accept 'thin or long stems' accept 'strong roots'	a mark may be awarded for part (ci) if the answer is given in part (cii) 'it or they can float' is insufficient
		c ii 2/5c	1	any one from * (large or floating leaves or thin or long stems) to collect sunlight * (large leaves or flexible stem or waxy leaves or air in the leaves) to make the leaves float * (thin or flexible stems) to allow the leaves to move * (floating flowers) for pollination * (roots that cover a wide area) to stop them being washed away	accept 'for photosynthesis' accept '(strong roots) to hold it firmly in the ground'	answers must give a function for the adaptation given in part (ci) a mark may be awarded for part (cii) if the answer is given in part (ci)

Tier	Q No			
3–6	10			
5–7	3			
Part	Mark	Answer	Accept	Additional Guidance
d 2/5c	1	any one from * (easily) seen by bees or insects * attract bees or insects * provide a landing platform for insects * they are more likely to be pollinated above water than underwater * they produce more seeds because they are more likely to be pollinated * animals are attracted to spread the seeds * they produce lots of pollen	accept 'bees or insects can get to them' accept 'flowers are above water where fish or water animals cannot eat them' accept 'they produce more seeds'	'they produce seeds' is insufficient
e 4/5f	1	any one from * leaves absorb the heat or light * less heat or light reaches the pond	accept 'leaves block or reflect the sunlight or heat' accept 'leaves shade the pond'	'lilies take the heat' is insufficient references to the Sun are insufficient
Total	6			

Tier 3–6 5–7	Q No 11 4	Part	Mark	Answer	Accept	Additional Guidance
		a 1/2a	1	any one from * the effect of temperature on the amount dough expanded * the effect of temperature on volume	accept 'the best temperature for dough to rise' accept 'the best temperature at which the yeast works'	<i>do not accept</i> 'the effect of temperature on how quickly dough rises' 'does heat affect the volume of the dough' is insufficient
		b i 1/2d	1	any one from * left it for 30 minutes * used the same starting volume or mass of dough * used the same amount of water (in the water bath)	accept 'length of time' accept 'used same amount of dough' accept 'she did it at the same time' accept 'use the same size or type of measuring cylinder'	'same mixture' is insufficient 'use the same measuring cylinder' is insufficient
		b ii 1/2d	1	* the dough could contain a different amount of yeast or sugar or flour or water or ingredients	accept 'different doughs might rise differently' accept 'different doughs have different properties'	'it might have different ingredients' is insufficient

Tier 3–6 5–7	Q No 11 4	Part	Mark	Answer	Accept	Additional Guidance
		c 1/2j	1	* as the temperature increased, the volume of dough increased to 60°C	accept 'it increased up to a volume of 77 cm ³ '	'it increased' is insufficient the unit of measurement is required for the mark
			1	* it does not rise as much (at temperatures higher than 60°C)	accept 'it decreases (after 60°C)' accept, for two marks, 'it has a maximum volume at 60°C' accept, for two marks, 'it increased to 60°C, then decreased' accept, for one mark, 'it increased then decreased'	
		d 1/2l 1/2m	1	any one from * repeat the experiment without yeast in the mixture * change the amount of yeast	accept 'do it without yeast' accept 'increase the amount of yeast'	<i>do not accept</i> 'use just yeast'
			Total	6		

Tier 3–6 5–7	Q No 12 5	Part	Mark	Answer	Accept	Additional Guidance
a 4/1d 3/1d	1			* iron		
	1			* nothing happens copper	accept 'nothing' or 'no force' or 'it does not attract or repel'	both answers are required for the mark
	1			* repel a magnet	accept 'move apart'	both answers are required for the mark <i>do not</i> accept 'magnetic'
b 4/1f	2			any two from * more turns in the coil * increase the current or voltage * coils closer together	accept 'more coils' accept 'increase power' accept 'add more cells or batteries' accept 'use thicker wire' accept 'make the coils tighter'	'use another battery' is insufficient 'use more wire' is insufficient 'use less wire' is insufficient 'make the wire tighter' is insufficient references to the iron rod are insufficient
Total	5					

Tier 3–6 5–7	Q No 13 6	Part	Mark	Answer	Accept	Additional Guidance
		a 1/1b	1	any one from * there is a colour change * a new metal is formed	accept 'it goes green or orange' accept 'the iron filings change colour'	'the colour' is insufficient
		b i 3/3b	1	* copper	accept 'Cu'	
		b ii 3/3b	1	* iron sulphate	accept 'FeSO ₄ '	
		b iii 3/3b	1	* no ✓ any one from * iron is more reactive than copper * copper is less reactive than iron	accept 'iron is higher on the reactivity series' accept 'copper does not displace iron'	both an indication that the reaction does not happen and the explanation are required for the mark
		c 3/3c 1/2c	1	* calcium ✓ potassium ✓		if more than two boxes are ticked, award no mark both answers are required for the mark
		Total	5			

Tier 3–6 5–7	Q No 14 7	Part	Mark	Answer	Accept	Additional Guidance
		a i 4/4b 1/2j	1	* it orbits the Sun	accept 'it goes round the Sun'	'it has an orbit' is insufficient
		a ii 4/4b 1/2j	1	any one from * it is not in the same plane as the other planets * the orbit is out of line or at a different angle	accept 'it is not in line with the others' accept 'the orbit or it is tilted'	'it has a different orbit' is insufficient <i>do not accept</i> 'it is too small' as this is not shown in the diagram
		b 1/1a 1/2j	1	any one from * it has the smallest diameter * all the other planets are bigger	accept 'it is too small'	'it is very small' is insufficient
		c 4/4b	1	any one from * Charon is a moon or satellite * other planets have moons	accept 'it is a moon' accept 'the Earth or Saturn has a moon' accept 'moons do not orbit other moons' accept 'other planets have objects orbiting them'	'Charon orbits Pluto' is insufficient
		d 1/1a 1/2l	1	any one from * both planets and moons have atmospheres * whether or not it has an atmosphere does not make it a planet * there is no pattern in the atmospheres * some planets do not have atmospheres	accept 'Venus has an atmosphere and Mercury does not' accept 'Earth's moon does not have an atmosphere and Titan does' accept 'Titan has an atmosphere and so does Neptune'	

Tier	Q No			
3–6	14			
5–7	7			
Part	Mark	Answer	Accept	Additional Guidance
e 1/1c 1/2l	1	any one from * scientists cannot decide on what a planet is * if Pluto is a planet there could be more planets orbiting our Sun or in our solar system * there is evidence for and against Pluto being a planet	accept specific arguments for and against e.g. 'it goes around the Sun but it is too small'	'there are reasons for and against' is insufficient 'it has an atmosphere like the Moon but orbits the Sun' is insufficient as atmosphere is not sufficient to classify moons or planets
Total	6			

Tier 3–6 5–7	Q No 15 8			
Part	Mark	Answer	Accept	Additional Guidance
a 1/2o 1/2j	2	<p><i>True False Cannot tell</i></p> <p>* <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p>		<p>all four ticks are required for two marks any two or three correct ticks are required for one mark if more than one box is ticked in any row, do not give credit for that row</p>
b i 1/2e	1	<p>any one from</p> <p>* there are a large number of observations</p> <p>* the observations are made over a wide area</p>	<p>accept 'lots of people made observations'</p> <p>accept 'people see them in a lot of different places'</p> <p>accept 'you do not have to pay them'</p> <p>accept 'it makes it more reliable'</p> <p>accept 'people knew where to look for conkers'</p>	
b ii 1/2e	1	<p>any one from</p> <p>* they are not spread uniformly over the country</p> <p>* the data is not representative of the conker tree population</p> <p>* the people may not know what a (ripe) conker looks like or whether a conker is ripe</p> <p>* the results may not be very reliable</p>	<p>accept 'they could count the same conker twice'</p> <p>accept 'people can make it up'</p> <p>accept 'people may not respond'</p>	<p>if the response 'it makes it more reliable' is given in bi, do not credit 'it is less reliable' in bii unless they describe how it is more and less reliable</p>
c 1/1a 1/2p	1	<p>* they would need to collect data each year or for more than one year</p>	<p>accept 'repeat each year'</p>	<p>'repeat it' is insufficient</p>

Tier	Q No			
3–6	15			
5–7	8			
Part	Mark	Answer	Accept	Additional Guidance
d <i>1/2m</i>	1	any one from * it is warmer * there is more energy from the Sun	accept 'it is cooler in the north' accept 'the Sun is brighter' accept 'they flower earlier'	'there is better weather in the south' is insufficient 'it is nearer the equator' is insufficient 'there is more sun' is insufficient as there are more hours of daylight in the north in summer 'they ripen faster' is insufficient
Total	6			