

Tier 3–6 5–7	Q No 10 1			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 1/2k	1	* 3.5	accept answers from 3.4 to 3.6	
<b>b</b> 2/2m	1	* It increases the time taken to react. ✓		if more than one box is ticked, award no mark
<b>c</b> 2/2c	1	* small intestine	accept 'intestine'	<i>do not accept</i> 'large intestine'
<b>d</b> 2/2m	1	any <b>one</b> from * liver * kidney * brain * heart		
<b>e</b> 2/2h	1	any <b>one</b> from * brain damage * low birth weight * premature birth <b>or</b> miscarriage  * less <b>or</b> not enough oxygen * less <b>or</b> not enough nutrients * build up of carbon dioxide <b>or</b> CO <sub>2</sub> <b>or</b> waste	accept 'kill the foetus'  accept 'not enough food'	'make the foetus ill' is insufficient  <i>do not accept</i> 'the baby gets no oxygen' <i>do not accept</i> 'the baby gets no food' 'less blood to foetus' is insufficient
<b>Total</b>	<b>5</b>			

Tier	Q No
3–6	11
5–7	2

Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 1/2h	1	any <b>one</b> from * to allow his resting pulse rate to be determined * to compare his pulse before and after drinking the cola * so he would know if it had changed	accept 'to get a reading of heart rate when relaxed' accept 'to make sure his heart rate was steady' accept 'to see if there was any change' accept 'so he could find out his normal heart rate' accept 'to get a reliable reading of his pulse rate' accept 'to find the average'	'he wanted to know his heart rate before he drank his cola' is insufficient as this is given in the question
<b>b</b> 1/2k	1	* his heart rate went up after he drank some cola	accept 'his heart rate <b>or</b> pulse went up' accept 'it shows his heart rate went up' accept 'the graph shows his heart rate changed' accept 'the line goes up <b>or</b> changed' accept 'the points get higher'	
<b>c</b> 1/2o	1	any <b>one</b> from * Yasmin's conclusion describes how it affected his heart rate while Harry's just says it affected his heart rate * Yasmin's conclusion describes the direction of the change in his heart rate * Yasmin's conclusion describes how his heart rate changed	accept 'Yasmin is more specific <b>or</b> more detailed'  accept 'Harry doesn't say what the effect is'  accept 'Harry's conclusion could mean that his heart rate was slower'	

Tier	Q No			
3–6	11			
5–7	2			
Part	Mark	Answer	Accept	Additional guidance
<b>d</b> <i>1/2d</i>	1	any <b>one</b> from * drinking fizzy water would be a control * it would enable them to see whether fizziness <b>or</b> sparkling drinks would have an effect * it would allow them to see if carbon dioxide <b>or</b> carbonation has an effect * it would show it was something else in cola that had an effect	accept 'you would know if it was bubbles that had an effect' accept 'using more <b>or</b> different drinks would give more evidence'	'to see if something else had an effect' is insufficient
<b>Total</b>	<b>4</b>			

Tier	Q No		
3–6	12		
5–7	3		
Part	Mark	Answer	Additional guidance
<b>a</b> 2/3d	1	* root hair	'root' is insufficient
<b>b</b> 2/5c	1	any <b>one</b> from * they prevent insects <b>or</b> flies from crawling out * insects slide in * they make it difficult for them to crawl out	'to attract insects' is insufficient
<b>c</b> 2/2n	1	* the more insects there are <b>or</b> food there is the more bacteria there will be	accept the converse
<b>d i</b> 2/3b	1	* carbon dioxide + <i>water</i> → <i>glucose</i> + * oxygen	
<b>d ii</b> 2/2d	1	* to provide energy ✓	if more than one box is ticked, award no mark
<b>Total</b>	<b>6</b>		

Tier	Q No			
3–6	13			
5–7	4			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/3d 1/2k	1	* carbon dioxide any <b>one</b> from it took more <b>or</b> most alkali to neutralise it <b>or</b> to change the colour of the indicator back to green	accept 'CO <sub>2</sub> '  accept 'it took most drops' <b>or</b> 'it took 160'	<b>both</b> the answer and the reason are required for the mark
<b>a ii</b> 3/3d	1	* air it did not change the colour of the indicator <b>or</b> the pH of the solution	accept 'no drops <b>or</b> alkali were needed' accept 'there was no change'	<b>both</b> the answer and the reason are required for the mark
<b>a iii</b> 3/3e	1	any <b>one</b> from * neutralises it * it raises the pH	accept 'it makes it less acidic' accept 'it makes it pH 7'  accept 'it forms a salt'	<i>do not accept</i> 'makes it more alkaline'
<b>b</b> 3/3a 3/1f	1 1	* zinc chloride + * hydrogen		answers may be in either order
<b>Total</b>	<b>5</b>			

Tier	Q No			
3–6	14			
5–7	5			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/1g	1	* a mixture ✓		if more than one box is ticked, award no mark
<b>a ii</b> 3/1e	1	* a compound ✓		if more than one box is ticked, award no mark
<b>a iii</b> 3/1a	1	any <b>one</b> from * they are denser than the liquid  * the liquid is less dense than the solid	accept 'it is heavier than the liquid <b>or</b> the paint' accept 'the solid particles are more dense <b>or</b> heavier <b>or</b> too heavy' accept 'the solid is denser' accept 'the liquid is less dense' <b>or</b> 'the liquid is lighter'	<i>do not accept</i> 'solid particles are heavy' without a comparison <b>or</b> qualifier eg 'too heavy'
<b>b</b> 3/2b	1	any <b>one</b> from * it is insoluble in water * water is not a solvent for the paint * it dissolves in white spirit * white spirit is a solvent for the paint		'it is waterproof' is insufficient
<b>Total</b>	<b>4</b>			

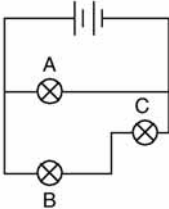
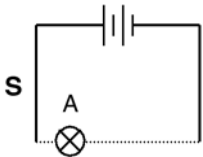
Tier 3–6 5–7	Q No 15 6		
Part	Mark	Answer	Additional guidance
<b>a i</b> <i>3/2c</i>	1	* B	
<b>a ii</b> <i>3/2c</i>	1	* 55	accept answers from 54 to 56
<b>a iii</b> <i>3/2c</i>	1 1	* <i>point A</i> : solid * <i>point D</i> : liquid	
<b>b</b> <i>4/5f</i>	1	* conduction ✓	if more than one box is ticked, award no mark
<b>c</b> <i>3/1a</i>	1	any <b>one</b> from * the boiling point of water is less than that of stearic acid * water could not transfer enough energy * the maximum temperature of water is 100°C * it cannot get hot enough	accept 'the water is not hot enough'  accept 'stearic acid has a very high boiling point'
<b>Total</b>	<b>6</b>		

Tier 3–6 5–7	Q No 16 7			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 4/5e	1	* A and F		answers may be in either order <b>both</b> answers are required for the mark
<b>a ii</b> 4/5e	1	* A		
<b>a iii</b> 4/5e	1	* E		
<b>b i</b> 4/2c	1	* gravity <b>or</b> gravitational force	accept 'weight'	
<b>b ii</b> 4/2d	1	any <b>one</b> from * friction * drag * water resistance	accept 'air resistance'	
<b>c</b> 4/5e 4/5g	1 1 1	* kinetic * sound * thermal	accept 'heat'	the last two answers may be in either order
<b>Total</b>	<b>8</b>			



Tier	Q No
3–6	17
5–7	8

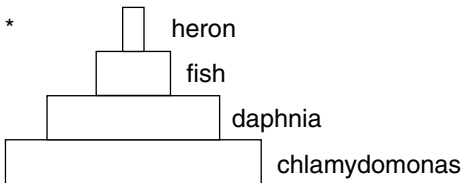
  

Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 4/1a	1 1	<ul style="list-style-type: none"> <li>* one mark for B and C in series</li> <li>* one mark for A in parallel with B and C for example</li> </ul> 		<p><b>both</b> marks should only be awarded if the circuit is correct</p> <p>award one mark if all three bulbs are drawn in parallel <b>or</b> all in series</p>
<b>b</b> 4/1b	1	<ul style="list-style-type: none"> <li>* A</li> <li>any <b>one</b> from</li> <li>* it has more current passing through it</li> <li>* A has 3 V across it and B and C have 1.5 V across them</li> <li>* A has twice the voltage of B <b>or</b> C</li> <li>* because it is directly connected to the supply</li> </ul>	<ul style="list-style-type: none"> <li>accept 'the others have less current passing through them'</li> <li>accept 'A has a greater voltage across it'</li> <li>accept 'B and C have less voltage across them'</li> <li>accept 'there is less resistance in the top <b>or</b> A branch of the circuit'</li> <li>accept 'the others are in series'</li> </ul>	<p><b>both</b> the letter and the reason are required for the mark</p> <p>answers should convey the idea that energy <b>or</b> voltage is shared between B and C but A is not sharing energy <b>or</b> voltage</p>
<b>c</b> 4/1a	1	<ul style="list-style-type: none"> <li>* a letter S in any part of the circuit before it branches</li> </ul> 	<ul style="list-style-type: none"> <li>accept a letter S in any part of the circuit if the three bulbs are drawn in series</li> </ul>	
<b>Total</b>	<b>4</b>			

Tier	Q No		
3–6	18		
5–7	9		
Part	Mark	Answer	Accept
<b>a i</b> 4/3c	1	* A and C	
<b>a ii</b> 4/3d	1	any <b>one</b> from * B * D	
<b>b</b> 4/5g	1	any <b>one</b> from * not all the light is reflected * some of the light is refracted * some of the light is absorbed * light is scattered by the glass	accept 'it splits into two rays' <b>or</b> 'it splits'
<b>Total</b>	<b>3</b>		

**Additional guidance**

answers may be in either order  
**both** answers are required for the mark

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 2/5e	1	* 		four boxes must be drawn, decreasing in width towards the top, and all labels must be correct for the mark
<b>a ii</b> 2/5f	1	any <b>one</b> from * each animal eats lots of the organism below it in the food chain  * DDT is not easily excreted * DDT is not broken down	accept 'DDT increases up the food chain'  accept 'the heron gets all the DDT in the other animals' accept 'the heron is at the top of the food chain' accept 'DDT is not excreted' accept 'DDT remains in the body' accept 'DDT is stored in the body'	
<b>b i</b> 2/2h 2/5f	1	* through the placenta	accept 'through the umbilical cord' accept 'from the mother's blood'	
<b>b ii</b> 2/2a 2/5f	1	* in milk	accept 'through the mammary glands' accept 'the mother breastfeeds the pup' accept 'the mother feeds the pup herself'	'the mother feeds the pup' is insufficient
<b>Total</b>	<b>4</b>			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> <i>1/2j</i>	1	* 1000		
<b>a ii</b> <i>2/2j</i>	3	any <b>three</b> from * she was using her muscles more * she needed more energy * her rate of respiration increased * more oxygen was used up * more carbon dioxide was produced	accept 'she was using her muscles'  accept 'more respiration' accept 'more oxygen was needed' accept 'there was more carbon dioxide to remove'  accept for the first two marking points 'her muscles need more energy'	
<b>b i</b> <i>1/2j</i>	1	* it became faster		
<b>b ii</b> <i>1/2j</i>	1	any <b>one</b> from * the breaths are closer together * there are more breaths in 10 s	accept 'the waves are closer together' accept 'there are more waves in 10 s' accept 'there are three breaths in the first ten seconds and five in the next ten seconds'	
<b>Total</b>	<b>6</b>			

Tier 5–7	Q No 12			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/1c 3/1g	1	* A		
<b>a ii</b> 3/1e 3/1g	1	* E		
<b>a iii</b> 3/1c 3/1e	1	* C		
<b>b</b> 3/1e 3/1g	1	any <b>one</b> from * a compound contains two <b>or</b> more elements chemically combined <b>or</b> bonded * a mixture contains two <b>or</b> more elements <b>or</b> compounds <b>or</b> substances not chemically combined <b>or</b> bonded	accept 'a compound contains different elements <b>or</b> atoms of different types joined together'  accept 'a mixture can be separated by physical means'	<i>do not accept</i> 'a compound contains two <b>or</b> more atoms joined together'  'a mixture can be separated' is insufficient
<b>c i</b> 3/1f	1	any <b>one</b> from * name: oxygen formula: O <sub>2</sub> * name: hydrogen formula: H <sub>2</sub> * name: nitrogen formula: N <sub>2</sub> * name: chlorine formula: Cl <sub>2</sub>	accept any other element which exists as diatomic molecules in the gaseous state	<b>both</b> the name and formula are required for the mark <i>do not accept</i> 'O' <b>or</b> 'H' <b>or</b> 'N' <b>or</b> 'Cl'
<b>c ii</b> 3/1f	1	any <b>one</b> from * name: carbon dioxide formula: CO <sub>2</sub> * name: water formula: H <sub>2</sub> O * name: sulphur dioxide formula: SO <sub>2</sub> * name: nitrogen dioxide <b>or</b> nitrogen oxide formula: NO <sub>2</sub>	accept any compound with the formula XY <sub>2</sub> , eg magnesium chloride MgCl <sub>2</sub>	<b>both</b> the name and formula are required for the mark
<b>Total</b>	<b>6</b>			

Tier 5–7		Q No 13		
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 3/1f	1 1	* CO <sub>2</sub> + * CaO		answers may be in either order ignore multiples
<b>b i</b> 3/2i	1	* sulphur dioxide	accept 'SO <sub>2</sub> ' accept 'sulphur trioxide' accept 'SO <sub>3</sub> '	
<b>b ii</b> 3/3e 3/3g	1 1	* calcium sulphate + * carbon dioxide	accept 'CaSO <sub>4</sub> ' accept 'CO <sub>2</sub> '	answers may be in either order
<b>Total</b>	<b>5</b>			

Tier 5–7		Q No 14		
Part	Mark	Answer	Accept	Additional guidance
				<b>markers should read through the whole answer before marking this question</b>
1/2d 1/2a	1	* modified and unmodified plants	accept 'type of plant'	'(flowers from) different plants' is insufficient
1/2d 1/2a	1	* the number of days <b>or</b> weeks <b>or</b> months the flowers stayed fresh	accept 'how long they stayed fresh'	
1/2d 1/2a	1	any <b>one</b> from * modified and unmodified plants should be the same variety * conditions under which flowers are kept should be the same  * modified and unmodified plants should be the same starting age	accept 'amount of sunlight should be the same' accept 'amount of water should be the same' accept 'nutrients added should be the same'	
1/2e	1	A suitable time span (which will allow comparison) for example * 'until they have all wilted' <b>or</b> * 'until all ordinary plants have wilted'		award a mark for answers of 2 weeks or more
<b>Total</b>	<b>4</b>			

Tier 5–7	Q No 15			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 4/2f	1	* 75	accept '50 × 1.5'	
	1	* Nm		<i>do not accept</i> lower case n
<b>a ii</b> 4/2f	1	* 750	accept $\frac{50 \times 1.5}{0.1}$ , <b>or</b> '50 × 15'	
			accept the numerical answer to part <b>a i</b> ÷ 0.1	
<b>b</b> 4/1f	1	any <b>one</b> from * a current flows in the coil * the coil <b>or</b> the iron core becomes magnetised	accept 'there is a magnetic field' <b>or</b> 'the electromagnet switches on'	<i>do not accept</i> 'the core becomes magnetic'
	1	any <b>one</b> from * the counterweight is attracted to the coil <b>or</b> core <b>or</b> the electromagnet * the electromagnet produces a bigger moment	accept 'the left-hand side of the barrier moves down'	'the right-hand side moves up' is insufficient
<b>Total</b>	<b>5</b>			