

Tier 3–6	Q No 1			
Part	Mark	Answer	Accept	Additional guidance
a i 2/4a	1	* Katie ✓ Becca ✓		both answers are required for the mark if more than two boxes are ticked, award no mark
a ii 2/4a	1	any one from * their mother or Pam has freckles * their father or David has freckles * their parents have freckles * their grandmother or Mary has freckles * only family B has freckles	accept 'Rachel and Bill do not have freckles' accept 'a grandparent has freckles' accept 'their family or the family on the right has freckles' accept 'freckles run in the family' accept 'family A does not have freckles'	
a iii 2/4a	1	* his parents or Bob and Emily do not have freckles	accept 'his family does not have freckles' accept 'his grandparents do not have freckles' accept 'he is not in family B' if the answer for a ii is 'only family B has freckles'	
b i 2/1e	1	* egg cell ✓ sperm cell ✓		both answers are required for the mark if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
b ii 2/2g	1	* reproductive system ✓		if more than one box is ticked, award no mark
Total	5			

Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional guidance
a 1/2e	1	any one from * to make the measurements reliable * to make it fair * make sure the measurement is correct * to make it accurate	accept 'it is hard to measure a bent finger' accept 'the measurement would be wrong'	
b i 1/2g	1	* mm	accept 'millimetres'	
b ii 1/2i	1	any one from * some of the lengths appear in more than one bar * some people were counted twice * the range varies for the bars * some lengths are missed out	accept 'they did 65 twice or three times' accept correct references to specific numbers eg 'they could not record 55.5 or 60.5 mm' accept suggestions for improving the bar chart such as 'the last bar should be 71–75'	'the numbers are written wrongly' is insufficient
c 1/2b	1	* observe pupils' tongues ✓		if more than one box is ticked, award no mark
d 1/2i	1	* a bar drawn to 10		

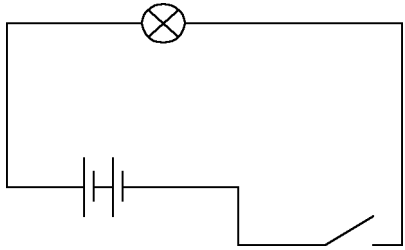
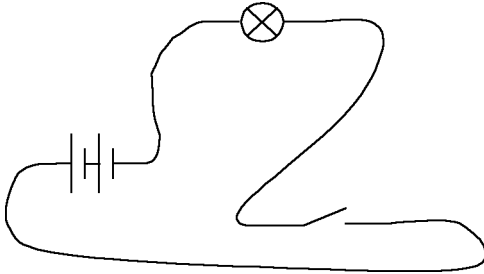
Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional guidance
e 1/2e	1	* more children were recorded in investigation 1 than in investigation 2	accept the converse accept '16 children recorded with measurements 50–60 mm. Only 14 children recorded in investigation 2' accept '36 people in the first investigation, but only 14 in the second' accept 'there are more higher bars' accept 'higher bars' accept 'they add up to different numbers'	numbers need not be precise for this mark <i>do not accept</i> an answer which only compares the number of bars on the bar charts
Total	6			

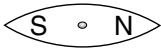

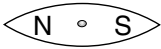
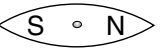
Tier 3–6	Q No 3			
Part	Mark	Answer	Accept	Additional guidance
a i 2/2l	1	* oxygen	accept 'O ₂ '	<i>do not accept</i> 'air'
a ii 2/2c	1	any one from * glucose * digested food * vitamins * minerals * water	accept 'sugar' accept 'amino acids' or 'fatty acids' or 'glycerol' accept 'food' or 'nutrients' accept a named vitamin accept a named mineral	
b 2/2c 2/2l	1	any one from * it prevents oxygen getting to the organ * it prevents food getting to the organ * it stops blood getting to the organ	accept 'it stops oxygen' accept 'it blocks the blood vessel' accept 'it causes a heart attack' or 'a stroke' or 'thrombosis' accept 'it stops the flow of blood' or 'it stops blood flowing around the body'	'you would die' is insufficient
c 2/2n	1	any one from * it stops bleeding * it prevents bacteria or viruses from entering	accept 'microbes' or 'germs' for bacteria accept 'it stops dirt getting in' accept 'it stops infection' accept 'it stops disease'	these less precise terms are accepted if the answer indicates that the scab acts as a barrier 'to keep it clean' is insufficient 'it stops diseases getting in' is insufficient
Total	4			

Tier 3–6	Q No 4			
Part	Mark	Answer	Accept	Additional guidance
a 3/1d	1 1	* It has a high melting point. ✓ * It is a good conductor of heat and electricity. ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
b i 3/1h	1	* filtration or filtering	accept 'filter'	
b ii 3/1h	1 1	* A: black particles or solid or residue * B: blue solution or filtrate	accept 'particles' or 'solids' accept 'solution' accept 'liquid'	<i>do not accept</i> 'blue particles' <i>do not accept</i> 'black solution' <i>do not accept</i> 'mixture'
c 3/1h	1	* the water had evaporated	accept 'the liquid had evaporated' or 'it had evaporated' accept a description of evaporation eg 'it turned into gas'	'it had dried up' is insufficient <i>do not accept</i> 'the solution evaporated'
Total	6			

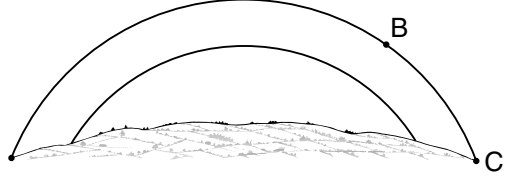
Tier 3–6	Q No 5			
Part	Mark	Answer	Accept	Additional guidance
a i 4/3g	1	* vibrate	accept 'move in and out'	'move' is insufficient
a ii 4/3g	1	any one from * it stops the sound waves or vibrations reaching our eardrums * it stops the eardrum vibrating * the eardrum vibrates less	accept 'it stops sound reaching our eardrum' accept 'it absorbs sound' accept 'it blocks the ear' accept 'it stops the eardrum moving in and out' accept 'soundwaves are reflected by the wax'	
b i 1/2k	1	* human <i>and</i> sparrow <i>and</i> rabbit	accept 'bird' for sparrow	answers may be in any order all three answers are required for the mark
b ii 1/2k	1	* cat		
Total	4			

Tier 3–6	Q No 6			
Part	Mark	Answer	Accept	Additional guidance
a 1/2a	1	any one from * it describes how they will carry out their investigation * it has more information or detail * it includes a fair test * it includes measurement	accept a description which identifies a factor to be kept constant accept 'the second plan includes apparatus to be used or a measurement or a comparison'	accept the converse of any marking point accept a statement referring to any of the points in the second plan accept answers which describe a consequence of the test not being fair
b 1/2f	1	* to avoid scalding or burning themselves	accept 'it is very hot' accept 'to avoid spilling'	credit may be given for answers which, although not accurate, imply that the water is at a high temperature eg 'it is nearly boiling'
c 1/2h	1	any one from * it allowed them to compare the times for different tea bags * it told them when the measurement was completed * so they knew when to stop	accept 'as soon as it has gone they stopped timing' accept 'so they know how long it takes' accept 'the cross let them see when the tea produced by the 3 bags was the same' accept 'so they could stop at the right time' accept 'it tells them when they have dissolved the same'	answers must indicate that the cross shows when the teas are the same colour or allows a measurement to be made 'it made it fair' is insufficient
d i 1/2i	1	* results ✓		if more than one box is ticked, award no mark
d ii 1/2k	1	* triangle circle square	accept a drawing of a triangle, a circle and a square	all three answers are required in the correct order
Total	5			

Part	Mark	Answer	Accept	Additional guidance
a i 4/1a	1	any one from * it let the current or electricity flow * current could flow through the bulb * it completed the circuit	accept 'the contacts came together'	
a ii 4/1a	1	* all three components must be correctly connected in series 	accept 	a mark may be awarded for any correctly connected circuit drawn with straight or curved wires award a mark for a correct circuit diagram in which the pupil has drawn the symbols instead of connecting the printed symbols
b i 4/1b	1	any one from * the bulb is broken or blown * the filament is broken	accept 'the coil is broken'	'the bulb is not connected properly' is insufficient
b ii 4/1b	1	* turn one of the cells around	accept 'turn a battery round' accept 'turn the battery' accept 'put the batteries in the right way'	'turn the batteries round' is insufficient the mark may be awarded for a description of the fault eg 'both batteries are the same way up'
c 4/1b	1	any one from * it stopped current from flowing * paper does not conduct or is an insulator * the circuit was broken or incomplete * so that the circuit can be completed	accept 'to stop the batteries running down' accept 'to stop the contacts coming together'	
Total	5			

Tier 3–6	Q No 8			
Part	Mark	Answer	Accept	Additional guidance
a 4/1d	1	* 		all four poles must be correct for the mark
b 4/1d	1	* 		all four poles must be correct for the mark
c 3/1d	1	any one from * nothing * they would both point towards magnetic north	accept 'they would not point to the aluminium' accept 'they would all point north or up or down' accept 'they would point the same way or in the same direction' accept 'they would go back to how they were'	<i>do not accept</i> 'the compasses or the experiment or it would not work'
Total	3			

Tier 3–6		Q No 9		
Part	Mark	Answer	Accept	Additional guidance
a 4/4b	2	* Earth: B * Sun: A * Moon: C		answers must be in the correct order if all three answers are correct, award two marks if one or two answers are correct, award one mark
b 4/4e	1	any one from * weather forecasting * communications * television or TV * spying * space telescope * global positioning system or GPS	accept 'to look at the weather' accept 'telephone' or 'internet' accept 'Hubble telescope' accept 'to find out more about the universe' accept 'navigation' accept 'monitoring the Earth' accept 'searching for meteors or comets'	
c 4/4d	1	* the Sun ✓		if more than one box is ticked, award no mark
d i 4/4a	1	* point A marked halfway between 5.00 am and 1.00 pm	accept any point within the tolerances shown	
d ii 4/4a	1	* 4 hours ✓		if more than one box is ticked, award no mark

Tier 3–6	Q No 9	Answer	Accept	Additional guidance
e 4/4a	1	* a curve below the printed line at all points		ignore arrows the line must start and finish on the horizon <i>do not accept</i> a curve which begins or finishes at the same points as the existing curve
Total	7			

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

Tier	Q No			
3–6	11			
5–7	2			
Part	Mark	Answer	Accept	Additional guidance
a 1/2h	1	any one 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 1/2k	1	* his heart rate went up after he drank some cola	accept 'his heart rate or pulse went up' accept 'it shows his heart rate went up' accept 'the graph shows his heart rate changed' accept 'the line goes up or changed' accept 'the points get higher'	
c 1/2o	1	any one 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 or 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	Additional guidance
d <i>1/2d</i>	1	<p>any one from</p> <ul style="list-style-type: none"> * drinking fizzy water would be a control * it would enable them to see whether fizziness or sparkling drinks would have an effect * it would allow them to see if carbon dioxide or carbonation has an effect * it would show it was something else in cola that had an effect 	<p>Accept</p> <p>accept 'you would know if it was bubbles that had an effect'</p> <p>accept 'using more or different drinks would give more evidence'</p> <p>Additional guidance</p> <p>'to see if something else had an effect' is insufficient</p>
Total	4		

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

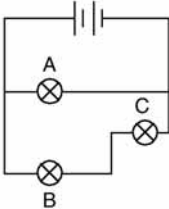
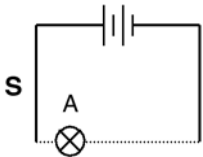
Tier	Q No			
3–6	13			
5–7	4			
Part	Mark	Answer	Accept	Additional guidance
a i 3/3d 1/2k	1	* carbon dioxide any one from it took more or most alkali to neutralise it or to change the colour of the indicator back to green	accept 'CO ₂ ' accept 'it took most drops' or 'it took 160'	both the answer and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

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

Tier 3–6 5–7	Q No 15 6		
Part	Mark	Answer	Additional guidance
a i <i>3/2c</i>	1	* B	
a ii <i>3/2c</i>	1	* 55	accept answers from 54 to 56
a iii <i>3/2c</i>	1 1	* <i>point A</i> : solid * <i>point D</i> : liquid	
b <i>4/5f</i>	1	* conduction ✓	if more than one box is ticked, award no mark
c <i>3/1a</i>	1	any one 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'
Total	6		

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

Tier	Q No
3–6	17
5–7	8

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

Tier	Q No		
3–6	18		
5–7	9		
Part	Mark	Answer	Accept
a i 4/3c	1	* A and C	
a ii 4/3d	1	any one from * B * D	
b 4/5g	1	any one 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' or 'it splits'
Total	3		

Additional guidance

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