

Tier 3–6	Q No 1										
Part	Mark	Answer	Accept Additional guidance								
a 4/1a	1	* <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>P</td><td>off</td></tr> <tr><td>Q</td><td>on</td></tr> <tr><td>R</td><td>on</td></tr> </table>	P	off	Q	on	R	on	accept '1' for 'on' and '0' for 'off'  <b>all three</b> answers are required for the mark		
P	off										
Q	on										
R	on										
b 4/1c	1	any <b>one</b> from * battery * cell	accept 'batteries' accept 'cells'								
c 4/1a	2	* <table border="1" style="display: inline-table; vertical-align: middle; margin-right: 20px;"> <tr><td>on</td><td></td></tr> <tr><td>off</td><td>✓</td></tr> </table> <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>on</td><td></td></tr> <tr><td>off</td><td>✓</td></tr> </table>	on		off	✓	on		off	✓	if all three answers are correct, award two marks if two answers are correct, award one mark if more than one box is ticked for any circuit, award no credit for that circuit
on											
off	✓										
on											
off	✓										
<b>Total</b>	<b>4</b>										

Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> <i>1/2i</i>	1	* bar for material A drawn to 40 decibels		allow a tolerance of one small square for the drawn line, either above <b>or</b> below 40 decibels
<b>b</b> <i>1/2i</i>	1	* 4		
<b>c</b> <i>1/2k</i>	1	* D	accept '35'	
<b>d</b> <i>1/2d</i>	1 1	* Use the same box each time. ✓ * Keep the distance between the sound sensor and the bell the same each time. ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
<b>Total</b>	<b>5</b>			

Tier 3–6	Q No 3		
Part	Mark	Answer	Accept Additional guidance
<b>a</b> 4/2c	1	any <b>one</b> from * the forces are balanced  * the forces are equal <b>or</b> the same * the forces are both 1000 N  * they pull with the same force <b>or</b> equally hard	accept 'the forces are both 1000' accept 'the newtons are even' accept 'both teams have the same strength'  ignore references to gravity if the answer is in terms of balanced forces 'the sides are equal' is insufficient do <b>not</b> accept 'both teams weigh 1000 N'
<b>b</b> 4/2c	1	* an arrow drawn to the right	accept an arrow drawn to the right anywhere on the drawing
<b>c</b> 4/2c	1	any <b>one</b> from * team A pulled harder than team B  * team A was stronger * team A was pulling with more than 1000 * team B was pulling with less than 1000 * there was more force to the left	accept 'team A pulled harder' <b>or</b> 'team A pulled more' <b>or</b> 'they pulled harder' accept the converse accept 'they used more strength'  accept 'there are more newtons to the left'
<b>d</b> 4/2c	1	* 1200 N ✓	if more than one box is ticked, award no mark
<b>e</b> 4/2d	1	* friction	
<b>Total</b>	<b>5</b>		

Tier 3–6	Q No 4			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/2d 3/3g	1	* weathering ✓		if more than one box is ticked, award no mark
<b>a ii</b> 3/2e 3/3g	1	any <b>one</b> from * it is hard <b>or</b> harder * it is resistant to acid rain  * it is less permeable <b>or</b> porous  * it is less easily weathered	accept 'limestone is softer' accept 'it is resistant' accept 'limestone is affected by acid rain' accept 'limestone is more permeable <b>or</b> porous' accept 'granite is stronger' accept 'granite does not weather <b>or</b> erode'	'granite <b>or</b> it is solid' is insufficient
<b>b i</b> 4/5a	1	any <b>one</b> from * coal * gas * oil * peat	accept 'methane' accept 'petrol' <b>or</b> 'diesel' <b>or</b> 'kerosene' accept 'turf'	
<b>b ii</b> 4/5a	1	* All fossil fuels are a source of energy. ✓		if more than one box is ticked, award no mark
<b>b iii</b> 3/3g	1	* corrosion ✓		if more than one box is ticked, award no mark
<b>b iv</b> 3/2i	1	* paint	accept 'grease' <b>or</b> 'oil' accept 'plastic' <b>or</b> 'wax' <b>or</b> 'polish' accept 'varnish' accept 'zinc' <b>or</b> 'galvanise it'	'waterproof coating' is insufficient  'something to stop them reacting' is insufficient
<b>Total</b>	<b>6</b>			

Tier 3–6	Q No 5			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/1h	1	* filtration ✓		if more than one box is ticked, award no mark
<b>a ii</b> 3/1h	1	* chromatography ✓		if more than one box is ticked, award no mark
<b>b i</b> 3/3d	1	* it is alkaline	accept 'alkali'	
<b>b ii</b> 3/3d	1	* red		
<b>c</b> 3/3d	1	* indicator ✓		if more than one box is ticked, award no mark
<b>Total</b>	<b>5</b>			

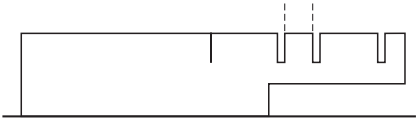
Tier 3–6	Q No 6			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/1d	1	* It is flexible. ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
	1	* It is strong. ✓		
<b>a ii</b> 3/1d	1	* It becomes rusty.		
<b>b i</b> 3/1e BS/2b	1	any <b>one</b> from	accept 'it is inflammable' <b>or</b> 'it catches fire' <b>or</b> 'it burns' accept 'it explodes' accept 'it is reactive <b>or</b> very reactive' accept 'it reacts with air <b>or</b> oxygen'	'it is poisonous' is insufficient
		* it is flammable		
		* it may explode		
<b>b ii</b> 3/1a	1	* helium		
<b>Total</b>	<b>5</b>			

Tier 3–6	Q No 7												
Part	Mark	Answer	Accept Additional guidance										
a 1/2g	1	* 10.5 or 10½	accept '105 mm'										
b 1/2k	1 1	* its teeth * its shape	answers may be in either order										
c 1/2k	1	* the cut on its body	accept 'fish cannot fly' accept 'it fell out of the sky' accept 'it dropped onto his boat'										
d 1/2b	1	any <b>one</b> from * use a key * use the Internet * ask an expert <b>or</b> fisherman <b>or</b> scientist <b>or</b> teacher * look in a book	accept 'use a computer' accept 'take it to a museum'  accept 'look it up' accept 'look at the features'										
e 1/1a	2	* <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>supported by evidence</th> <th>not supported by evidence</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td style="text-align: center;">✓</td> <td></td> </tr> </tbody> </table>	supported by evidence	not supported by evidence	✓		✓			✓	✓		if all four ticks are correct, award two marks if two <b>or</b> three ticks are correct, award one mark if there is more than one tick in any row, award no credit for that row
supported by evidence	not supported by evidence												
✓													
✓													
	✓												
✓													
<b>Total</b>	<b>7</b>												

Tier 3–6	Q No 8			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 2/5d	1 1	* they decreased <b>or</b> went down any <b>one</b> from * more were eaten * the mink ate them * more animals to eat them	accept 'more were killed' accept 'some died'	<i>do not accept</i> 'they all died'
<b>a ii</b> 2/5d	1	any <b>one</b> from * they decreased <b>or</b> went down * they had less food <b>or</b> rabbits * the mink ate their food	accept 'there were fewer of them' accept 'they had no food' accept 'they had to share their food <b>or</b> rabbits'	
<b>b</b> 2/5e	1	* prey		
<b>c i</b> 2/5d	1	any <b>one</b> from * fox * snake * badger * bird of prey	accept a named bird of prey such as 'owl' <b>or</b> 'hawk' <b>or</b> 'eagle' accept 'cat'	
<b>c ii</b> 2/5d	2	any <b>two</b> from * different climate * disease * not enough food  * shot <b>or</b> run over <b>or</b> trapped <b>or</b> poisoned * injury due to fighting * different habitat	accept 'no food' <b>or</b> 'they starved' <b>or</b> 'competition for food' accept 'people killed them'	references to old age are insufficient



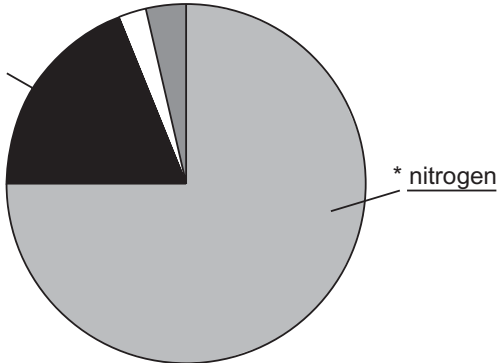
Tier 3–6	Q No 8			
Part	Mark	Answer	Accept	Additional guidance
d 2/4b	1	any <b>one</b> from * they have fur <b>or</b> hair * they have external ears	accept 'they give birth to live young' accept 'they feed their young on milk'	'they are warm-blooded' is insufficient
<b>Total</b>	<b>8</b>			

Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 4/2e	1	* it is between 20 g and 40 g	accept a number greater than 20 and less than 40	'more than 20' <b>or</b> 'less than 40' are insufficient
<b>a ii</b> 4/2f	1	any <b>one</b> from * cut a slot between 20 and 40 * cut more slots	accept 'add a mark for 30' accept 'add more weights'	award a mark for an answer referring to cutting a slot for any mass between 20 g and 40 g
<b>b i</b> 4/2f	1	any <b>one</b> from * it is on the wrong side of the pivot  * it would not make the scale tip	accept 'it is past the pivot line'  accept 'the scale is supported on this side' accept 'it does not produce a clockwise moment'	award a mark for an answer indicating that it is on the wrong side of the pivot  <i>do not accept</i> 'because the cardboard would tilt the other way' 'it would not work' is insufficient
<b>b ii</b> 4/2f	1	* a line drawn between the 40 g and 100 g slots  		accept answers which clearly indicate the correct position on the diagram the line must not touch the slots for 40 g <b>or</b> 100 g
<b>Total</b>	<b>4</b>			

Tier 3–6 5–7	Q No 10 2			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 4/3j	1	* pluck them harder	accept 'make the strings vibrate more <b>or</b> move more'	<i>do not accept</i> 'make the strings vibrate more quickly'
<b>b</b> 4/3k	1	* The sound has a higher pitch. ✓		if more than one box is ticked, award no mark
<b>c</b> 4/3k	1	* the sound from the thicker string has a lower pitch <b>or</b> a lower frequency	accept 'it has a lower pitch <b>or</b> a lower frequency'  accept 'the sound from the thicker string is louder' <b>or</b> 'it is louder'	answers must include a comparison 'it is lower' is insufficient
<b>d i</b> 4/3k	1	* the sound in A has a higher pitch <b>or</b> a higher frequency	accept 'it has a higher pitch <b>or</b> higher frequency'	answers must show a comparison 'the vibrations are quicker' is insufficient 'it is higher' is insufficient
<b>d ii</b> 4/3j	1	* the sound in A is louder	accept 'it is louder' accept 'the sound in C is quieter' accept 'it has a greater amplitude'	'the vibrations are stronger <b>or</b> of greater amplitude' is insufficient <i>do not accept</i> 'it is higher'
<b>Total</b>	<b>5</b>			



Tier 3–6 5–7	Q No 12 4		
Part	Mark	Answer	Additional guidance
<b>a i</b> 3/1d	1	any <b>one</b> from * iron * copper	accept 'calcium'
<b>a ii</b> 3/1d	1	any <b>one</b> from * sulphur * chlorine	accept 'oxygen' <b>or</b> 'carbon'
<b>a iii</b> 3/1e	1	any <b>two</b> from * calcium carbonate * calcium oxide * carbon dioxide * iron sulphide	answers may be in either order <b>both</b> answers are required for the mark  accept 'copper chloride'
<b>b</b> 3/1e	1	any <b>one</b> from * the iron reacted <b>or</b> combined with sulphur  * the sulphur had mass	accept 'the iron gained sulphur' <b>or</b> 'sulphur was added to the iron' accept 'the iron has joined with the sulphur' accept 'the sulphur weighed 0.8 g'  <i>do not accept</i> 'iron has mixed with the sulphur' <i>do not accept</i> 'sulphur <b>or</b> iron added a new layer'
<b>c</b> 3/1f	1	* copper chloride	
<b>Total</b>	<b>5</b>		

Tier 3–6 5–7	Q No 13 5	Part	Mark	Answer	Accept	Additional guidance
		<b>a</b> 3/1g	2	 <p>* oxygen</p> <p>* nitrogen</p>		
		<b>b</b> 3/2c	1 1	* water vapour * condenses	accept 'vapour'	'water' <b>or</b> 'moisture' are insufficient
		<b>c i</b> 2/2k <b>c ii</b> 2/2j	1 1	* respiration * Air breathed out has more carbon dioxide and less oxygen than air breathed in. ✓		if more than one box is ticked, award no mark
		<b>Total</b>	<b>6</b>			

Tier 3–6 5–7	Q No 14 6												
Part	Mark	Answer	Accept Additional guidance										
<b>a i</b> 2/3c	1	* magnesium											
<b>a ii</b> 2/3c	1	any <b>one</b> from * a potted plant has a limited amount of soil <b>or</b> minerals * less chance of minerals being returned to the soil by dying <b>or</b> decaying plants <b>or</b> by microbes <b>or</b> fungi <b>or</b> bacteria <b>or</b> worms * no room for roots to extend and find more minerals	accept the converse  accept 'no room for roots to grow'										
<b>b i</b> 3/1c	3	* <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>mineral</th> <th>letter of fertiliser</th> </tr> </thead> <tbody> <tr> <td><i>magnesium</i></td> <td>B</td> </tr> <tr> <td><i>nitrogen</i></td> <td>A or C</td> </tr> <tr> <td><i>phosphorus</i></td> <td>D</td> </tr> <tr> <td><i>potassium</i></td> <td>C</td> </tr> </tbody> </table>	mineral	letter of fertiliser	<i>magnesium</i>	B	<i>nitrogen</i>	A or C	<i>phosphorus</i>	D	<i>potassium</i>	C	<p>accept 'Epsom Salts' <b>or</b> 'MgSO<sub>4</sub>' <b>or</b> 'magnesium sulphate'</p> <p>accept 'A and C' <b>or</b> 'Easy Grow' <b>or</b> 'NH<sub>4</sub>NO<sub>3</sub>' <b>or</b> 'ammonium nitrate' <b>or</b> 'Saltpetre' <b>or</b> 'KNO<sub>3</sub>' <b>or</b> 'potassium nitrate'</p> <p>accept 'Superphosphate' <b>or</b> 'Ca(H<sub>2</sub>PO<sub>4</sub>)<sub>2</sub>'</p> <p>accept 'Saltpetre' <b>or</b> 'KNO<sub>3</sub>' <b>or</b> 'potassium nitrate'</p>
mineral	letter of fertiliser												
<i>magnesium</i>	B												
<i>nitrogen</i>	A or C												
<i>phosphorus</i>	D												
<i>potassium</i>	C												
<b>b ii</b> 3/1f	1	* 3											
<b>b iii</b> 3/1f	1	* 9											
<b>Total</b>	<b>7</b>												

answers must indicate that the soil available to the potted plant is limited **or** may not be replenished  
'the garden has more minerals' is insufficient  
'lack of sunlight' is insufficient

if all four answers are correct, award three marks  
if three answers are correct, award two marks  
if one **or** two answers are correct, award one mark

Tier 3–6 5–7	Q No 15 7			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 2/5e	1	any <b>one</b> from * it only eats other animals * it only eats meat <b>or</b> fish <b>or</b> flesh	accept 'predator' accept 'eats meat'	
<b>b i</b> 2/5c	1	any <b>one</b> from * it protects it * it stops it being damaged * it stops it drying out * it prevents infection * it keeps out disease organisms	accept 'it stops it being eaten' accept 'it keeps the contents in'  accept 'it stops bacteria <b>or</b> viruses <b>or</b> germs getting in' accept 'it allows air <b>or</b> oxygen in <b>or</b> carbon dioxide out'	<i>do not accept</i> 'it keeps it warm'
<b>b ii</b> 3/3g	1	* it reacts with the carbonate	accept 'they react' <b>or</b> 'it reacts with it' accept 'acid reacts with the shell' accept 'it dissolves the shell' accept 'it erodes it' <b>or</b> 'wears it away'	
<b>b iii</b> 2/5c	1	any <b>one</b> from * makes it easier <b>or</b> quicker <b>or</b> easy to hatch <b>or</b> break out of the egg * makes the shell more porous	accept 'air <b>or</b> oxygen gets in easily' <b>or</b> 'more air gets in' accept 'carbon dioxide gets out more easily'	'easy <b>or</b> easier to break' is insufficient  'to allow for growth' is insufficient



Tier 3–6 5–7	Q No 15 7		
Part	Mark	Answer	Additional guidance
c i 1/2k	1	any <b>one</b> from * keep the eggs between 26°C and 30°C  * keep the temperature at <b>or</b> below 30°C * keep the eggs at 26°C	'make it cooler' <b>or</b> 'use lower temperatures' are insufficient  accept any temperature from 26°C to 30°C accept 'use the three lower temperatures' <b>or</b> 'the lower temperatures in the table'
c ii 1/2j	1	* between 32°C and 34°C ✓	if more than one box is ticked, award no mark
<b>Total</b>	<b>6</b>		

Tier 3–6 5–7	Q No 16 8			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 1/2a	1	any <b>one</b> from * the distance the ruler dropped  * where the hand grabbed the ruler	accept 'how far until they caught it' accept 'length <b>or</b> measurement on the ruler' accept 'where she caught it' accept 'mm' <b>or</b> 'cm'	'ruler' is insufficient 'length of ruler' is insufficient
<b>b</b> 1/2e	1	any <b>one</b> from * to avoid the effect of his own reaction time  * the time is too short to measure with a stopwatch	accept 'he might stop the watch before <b>or</b> after she reacted' accept 'you cannot stop a stopwatch straightaway' accept 'it might be too fast for the stopwatch'	'the time keeper would not have been as accurate' is insufficient 'you can time incorrectly' is insufficient  'the ruler is more precise' is insufficient
<b>c</b> 1/2d	1	* pupils	accept 'pupil' <b>or</b> 'friend' <b>or</b> 'person' <b>or</b> 'human'	
<b>d</b> 1/2d	2	any <b>two</b> from * the position of the ruler above the hand  * the way the ruler is released  * the ruler * distance between finger and thumb * the conditions in the room * measure to same finger of catcher	accept 'height of ruler' accept 'the height it is dropped from' accept 'handedness' accept 'the same person dropping it'  accept 'position of hand' <b>or</b> 'position of ruler' accept examples of possible distractions	'where he put his hand on the ruler' is insufficient
<b>e</b> 1/2h	1	* repeat the investigation <b>or</b> it	accept 'do more than one test with each person'	<i>do not accept</i> 'use more people'
<b>Total</b>	<b>6</b>			