

Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 2/5f	1	any <b>one</b> 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 <b>or</b> from blackbirds'  accept 'it is passed on <b>or</b> up'	
<b>a ii</b> 2/5d	1	any <b>one</b> from * they are more easily seen * brown earthworms are better camouflaged	accept 'there are more yellow earthworms'	
<b>b</b> 2/5f	1	* the level of copper <b>or</b> arsenic <b>or</b> pollution	accept 'whether it contained arsenic <b>or</b> copper' accept 'where the copper <b>or</b> arsenic is'	
<b>c</b> 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' <b>or</b> 'lines' <b>or</b> 'creases' 'they look similar' is insufficient 'same texture' <b>or</b> 'body shape' <b>or</b> 'structure' are insufficient
<b>d</b> 2/5b	1	* They feed on other living things and harm them. ✓		if more than one box is ticked, award no mark
<b>Total</b>	<b>5</b>			

Tier 3–6 5–7		Q No 10 2		
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 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>b i</b> 2/2i	1	any <b>one</b> from * fat has been deposited * the artery has become narrower	accept 'fat' accept 'it is blocked'	
<b>b ii</b> 2/2i	2	any <b>two</b> from * less oxygen to the cells <b>or</b> heart muscle * less glucose to the cells <b>or</b> heart muscle * less blood to the cells <b>or</b> 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
<b>Total</b>	<b>6</b>			

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					
<b>a</b> 2/2e	1	any <b>one</b> from * the force of the muscle would be less <b>or</b> lost * the (fore)arm <b>or</b> bone would not move  * the biceps <b>or</b> muscle could not pull on the bone * the biceps <b>or</b> muscle would have no effect  * the biceps <b>or</b> muscle would have less effect	accept 'you could not bend <b>or</b> straighten your arm'  accept 'the biceps <b>or</b> muscle would not work properly'	'the arm would not work properly' is insufficient		
<b>b</b> 2/2e	1	any <b>one</b> 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 <b>or</b> bone <b>or</b> 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' <b>or</b> 'they do opposite things' is insufficient		
<b>c i</b> 2/2e	1	* C				
<b>c ii</b> 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		
<b>Total</b>	<b>5</b>					

Tier 3–6 5–7	Q No 12 4			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 3/1h	1	* evaporation then condensation ✓		if more than one box is ticked, award no mark
<b>b</b> 3/1h	1	* water	accept 'distillate'	
<b>c</b> 3/1a	1	* 100	accept a temperature from 99 to 101	
<b>d i</b> 4/5d	1	* a temperature above 15 but below 100 any <b>one</b> from * it is heated by the water vapour	accept 'vapour <b>or</b> steam <b>or</b> hot water' for water vapour accept 'it heats up'	<b>both</b> the answer and the correct explanation are required for the mark
<b>d ii</b> 3/1h 3/2c	1	any <b>one</b> 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
<b>Tier</b> 3–6 5–7	<b>Q No</b> 12 4			
<b>e</b> 3/1h	1	any <b>one</b> from * cold water replaces warm water  * the water stays cold <b>or</b> 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 <b>or</b> more efficiently <b>or</b> quickly' accept 'it will work faster'	
<b>Total</b>	<b>7</b>		accept 'it is cooled over a bigger length <b>or</b> for longer' accept 'more water is collected'	


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

Part	Mark	Answer	Accept	Additional guidance
<b>Tier</b> 3–6 5–7	<b>Q No</b> 14 6			
<b>a i</b> 4/4c	1	* C it is the closest to the Sun	accept 'it is closer <b>or</b> close'	<b>both</b> the letter and the correct explanation are required for the mark
<b>a ii</b> 4/4c	1	* an arrow from each of the points A, B, C and D towards the Sun		<b>all four</b> arrows are required for the mark
<b>a iii</b> 4/4c	1	* A it is furthest from the Sun <b>or</b> the effect of the Sun's gravity is weakest	accept 'it is further <b>or</b> far away' accept 'gravity is low <b>or</b> lower'	<b>both</b> the letter and the correct explanation are required for the mark
<b>b i</b> 1/2j 4/4b	1	* a number greater than 2870 and smaller than 5900		
<b>b ii</b> 1/2j 4/4b	1	* the further away the lower the temperature	accept the converse accept 'the further away the colder it is'	
<b>b iii</b> 4/5g	1	any <b>one</b> from * planets further away receive less energy <b>or</b> 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 <b>or</b> 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
<b>Total</b>	<b>6</b>			

Tier 3–6 5–7	Q No 15 7			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 1/2d	1	* the number of turns <b>or</b> coils of wire	accept 'the coils' accept 'the turns'	
<b>a ii</b> 1/2d	1	any <b>one</b> from * the current * the length <b>or</b> thickness <b>or</b> material of the wire <b>or</b> coil * the circumference of the coil * the size of paper-clips	accept 'the voltage <b>or</b> 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'
<b>a iii</b> 1/2e	1	any <b>one</b> 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>b</b> 1/2n	1	any <b>one</b> from * an inaccuracy in results * a problem with the data <b>or</b> 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
<b>Tier</b> 3–6 5–7	<b>Q No</b> 15 7			
<b>c i</b> 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
<b>c ii</b> 1/2e	1	any <b>one</b> 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 <b>or</b> she would see a change with smaller paper-clips' accept 'it is more precise <b>or</b> more sensitive'	'it will pick up a few large paper-clips but a lot of small paper-clips' is insufficient  <b>award a mark for a response identifying that greater precision is possible with smaller increments</b> 'they are smaller' is insufficient
<b>Total</b>	<b>6</b>			

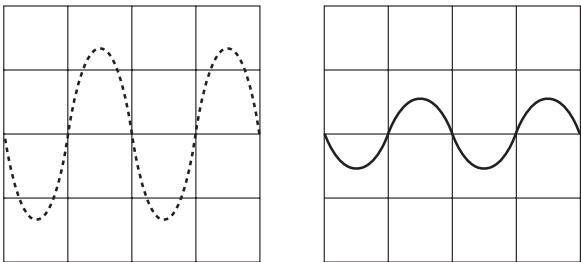
Part	Mark	Answer	Accept	Additional guidance
<b>Tier</b> 3–6 5–7	<b>Q No</b> 16 8			
<b>a</b> 4/2c	1	* A		
<b>b</b> 4/2c	1	any <b>one</b> from * he will remain stationary * he will continue moving at a constant speed	accept 'he floats'  accept 'nothing'	
	1	any <b>one</b> from * there is no net force * 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
<b>c</b> 4/2c	1	* 	accept any arrow drawn going up and to the right	
<b>Total</b>	<b>4</b>			

Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 1/2j	1	* B the graph increases most steeply	accept 'the graph is steepest' accept 'the line is steeper' accept 'it is very steep'	<b>both</b> the answer and the correct explanation are required for the mark
<b>b</b> 1/2j 2/5d	1	* C any <b>one</b> from * the slope of the graph becomes less steep * the growth of the population slows down	accept 'the population begins to level off'	<b>both</b> the answer and the correct explanation are required for the mark <i>do not accept</i> 'they stop having offspring' <b>or</b> 'they stop multiplying'
<b>c</b> 1/2j 2/5d	1	* they are equal <b>or</b> the same any <b>one</b> from * the graph is horizontal * the population does not change	accept 'the graph is flat'	<b>both</b> the answer and the correct explanation are required for the mark 'they are steady' is insufficient  'the line is straight' is insufficient
<b>d</b> 2/5d	2	any <b>two</b> from * new predators * no food * the population is poisoned  * disease * the lake <b>or</b> pond dried up <b>or</b> froze	accept 'more predators' accept 'not enough food' accept 'pollution in the water' accept 'acid rain'	<b>award marks for answers which indicate sudden, serious changes in conditions</b>
<b>Total</b>	<b>5</b>			

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional guidance
<b>a</b> 1/2e	1	any <b>one</b> from * it is the temperature of the human body <b>or</b> the stomach * the enzyme <b>or</b> pepsin works best at that temperature		
<b>b</b> 2/2b	1	* there was a larger surface for the enzyme to act on	accept 'the enzyme came into contact with more of the gelatin' accept 'the surface <b>or</b> area was bigger'	'because the gelatin had been chopped up' is insufficient
<b>c</b>	1	* it <b>or</b> the enzyme was destroyed <b>or</b> denatured		<i>do not accept</i> 'the enzyme was killed'
<b>d i</b> 2/2b	1	* amino acids ✓		if more than one box is ticked, award no mark
<b>d ii</b> 2/2c	1	any <b>one</b> from * proteins cannot be absorbed * proteins are too big to pass through the lining of the intestine <b>or</b> blood vessels * amino acids can be absorbed * amino acids can pass through the wall of the intestine <b>or</b> blood vessels * amino acids are small enough to be absorbed * to make them soluble	accept 'so proteins <b>or</b> they can be absorbed'	'they need to be digested <b>or</b> broken down' is insufficient
<b>Total</b>	<b>5</b>			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 3/1g	1	* B		
<b>a ii</b> 3/1e	1	* D		
<b>b i</b> 3/1e	1	any <b>one</b> from * a compound <b>or</b> a new substance has been formed  * R <b>or</b> the product is a new substance	accept 'the ratio is always 1P to 2Qs' accept 'the atoms <b>or</b> particles have joined'  accept 'the elements have joined'	
<b>b ii</b> 3/1e	1	* <i>substance Q</i> : oxygen * <i>substance R</i> : carbon dioxide		<b>both</b> answers are required for the mark
<b>b iii</b> 3/2g	1	* the same numbers of each type of atom are present	accept 'the same number of atoms is present' accept 'the same particles <b>or</b> same number of particles are present' accept 'there is the same amount of each element'	<i>do not accept</i> 'the same number of molecules is there'  'the same amount of elements' is insufficient
<b>Total</b>	<b>5</b>			

Tier 5–7	Q No 12																	
Part	Mark	Answer	Accept	Additional guidance														
<b>a</b>	1	* the metal																
1/2a	1	any <b>one</b> from																
1/2d	1	* the change in the mass of the contents of the crucible after burning	accept 'whether the mass of metal increases <b>or</b> decreases <b>or</b> stays the same'															
		* the change in the mass of the crucible and its contents after burning	accept 'weight before and after burning'															
1/2e	1	* make sure all the product is weighed	accept 'keep a lid on the crucible' accept 'starting mass of metal' accept 'mass of the metal' accept 'the same crucible' accept 'enough time for the reaction to occur' accept 'sufficient heat for burning to occur' accept 'burn the metals for the same length of time'	award a mark for any suitable rigour in the procedure <b>or</b> identification of any control variable 'the atmosphere it is heated in' is insufficient														
1/1c	1	* an increase in the mass following burning for all three metals	accept 'mass will increase' accept 'weight increase'															
<b>b</b>	1	* any appropriate table in which the results can be recorded such as	accept a table in which the rows rather than the columns are labelled accept 'weight' for mass accept	units are not required in the table ignore incorrect units														
1/2i		<table border="1"> <tr> <td>metal</td> <td colspan="2">gain <b>or</b> loss <b>or</b> change in mass</td> </tr> </table> <p><b>or</b></p> <table border="1"> <tr> <td>metal</td> <td>mass at the start</td> <td>mass after burning</td> </tr> </table>	metal	gain <b>or</b> loss <b>or</b> change in mass		metal	mass at the start	mass after burning	<table border="1"> <tr> <td></td> <td>change in mass</td> </tr> <tr> <td>metal 1</td> <td></td> </tr> <tr> <td>metal 2</td> <td></td> </tr> <tr> <td>metal 3</td> <td></td> </tr> </table>		change in mass	metal 1		metal 2		metal 3		
metal	gain <b>or</b> loss <b>or</b> change in mass																	
metal	mass at the start	mass after burning																
	change in mass																	
metal 1																		
metal 2																		
metal 3																		
<b>Total</b>	<b>5</b>																	

Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 4/3i	1	* Paul James Sylvia	accept 'light' accept 'vibration' accept 'sound'	answers must be in the correct order <b>all three</b> answers in the correct order are required for the mark
<b>a ii</b> 4/2a	1	* 3	1020 accept ' $\frac{1020}{3}$ ' 340	
<b>b i</b> 4/3j	1	* the energy <b>or</b> the sound is more spread out	accept 'some of the sound is absorbed by the air' accept 'the amplitude decreases'	'vibrations decrease' is insufficient
<b>b ii</b> 4/3k	2	* 		award one mark for a wave with a smaller amplitude award one mark for a wave with the same frequency award the marks for a wave with the correct amplitude and frequency but which is not centred on the middle line of the grid <b>or</b> which is not in phase with the drawn wave the marks may be awarded for a wave drawn on Sylvia's grid
<b>Total</b>	<b>5</b>			

Tier 5–7	Q No 14			
Part	Mark	Answer	Accept	Additional guidance
<b>a i</b> 4/2f	1 1	* 2 * Ncm	accept '0.2 × 10' accept 'cmN' accept '0.02 Nm' for both marks	
<b>a ii</b> 4/2f	1	* 2 (Ncm)	accept '0.02 Nm' accept 'the same'  accept the numerical answer to <b>a i</b>	unit not required the mark for the unit may be awarded here if not given in part <b>a i</b> <b>consequential marking applies</b>
<b>a iii</b> 4/2f	1	* 0.1	accept the numerical answer to <b>a ii</b> ÷ 20 accept the numerical answer to <b>a i</b> ÷ 20 if <b>a ii</b> has been omitted <b>or</b> if the answer given to <b>a ii</b> is 'the same'	<b>consequential marking applies</b>
<b>b</b>	1	* 0.3	accept the answer to <b>a iii</b> + 0.2	<b>consequential marking applies</b>
<b>Total</b>	<b>5</b>			