

Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional guidance
a 4/5e	1	any one from * she is not moving or falling * she is standing still	accept 'she has not dived or jumped' accept 'she is still'	award a mark for an answer which implies she is not moving
b i 4/5g	1	* 8		
b ii 4/5g	1	any one from * the total energy is the same * the gravitational potential and the kinetic energy add up to 8	accept 'they are the same' accept 'they all add up to 8'	
c i 4/2b	1	* gravity	accept 'gravitational' or 'gravitational pull' accept 'weight'	<i>do not accept 'mass'</i>
c ii 4/2a	1	any one from * the distance between stages or drawings increases * she falls further each time	accept 'they are further apart' accept 'the positions are further apart' accept 'the arrows get longer' accept 'her kinetic energy increases'	'by the position of her body' is insufficient
d 4/2d	1	any one from * friction * drag	accept 'water resistance' accept 'upthrust'	<i>do not accept 'air resistance'</i> 'resistance' is insufficient
Total	6			

Tier 3–6 5–7	Q No 10 2	Part	Mark	Answer	Accept	Additional guidance													
		a 4/1a	1	* E															
		b 4/1a	1 1	* *	<table border="1"> <thead> <tr> <th>P</th> <th>Q</th> <th>R</th> </tr> </thead> <tbody> <tr> <td><i>off</i></td> <td><i>off</i></td> <td><i>off</i></td> </tr> <tr> <td>on</td> <td>off</td> <td>on</td> </tr> <tr> <td>off</td> <td>off</td> <td>off</td> </tr> </tbody> </table>	P	Q	R	<i>off</i>	<i>off</i>	<i>off</i>	on	off	on	off	off	off		award one mark for each correct row
P	Q	R																	
<i>off</i>	<i>off</i>	<i>off</i>																	
on	off	on																	
off	off	off																	
		c 4/1b	1	* 0.8 0.8 ✓		if more than one box is ticked, award no mark													
		Total	4																

Tier 3–6 5–7	Q No 11 3			
Part	Mark	Answer	Accept	Additional guidance
a 1/2k	1	any one from * the clock works * the time on the clock	accept 'when the light goes on' accept 'it shows 12.30'	'it is making electricity' is insufficient
b 1/2e	1	* voltmeter		'multimeter' is insufficient
c 1/2d	1	any one from * the fruit or lemon * condition of metal * temperature	accept 'the size or surface area of the metal' accept 'the distance between them' accept 'the amount of metal' accept 'how far they push them in'	<i>do not accept</i> 'the acid'
d 1/2k	1	* copper <i>and</i> magnesium	accept 'most reactive with least reactive'	answers may be in either order both metals are required for the mark
e 1/2k	1	any one from * no difference in reactivity * they produce zero voltage	accept 'there would be no reaction between them' accept 'it would not work' accept 'there would be no difference'	
Total	5			

Tier 3–6 5–7	Q No 12 4	Part	Mark	Answer	Accept	Additional guidance
		a i 3/3d	1	* a number less than 7		
		a ii 3/3e	1	* it would turn milky or cloudy	accept 'white or chalky'	
		b 3/3h	1	* magnesium sulphate		
		c i 3/3d	1	* a number less than 7		
		c ii 3/2f	1	* lava		do not accept 'magma'
		Total	5			

Tier 3–6 5–7	Q No 13 5	Part	Mark	Answer	Accept	Additional guidance
		a <i>1/2d</i>	1	any one from * mass of salt (in the solution) * concentration	accept 'amount or weight of salt'	'salt' is insufficient
		b i <i>1/2n</i> b ii <i>1/2n</i>	1 1	* point at (10, 33) circled any one from * an incorrect reading * a recording error * an error during the investigation	accept 'she could have read the scale wrongly' accept 'she wrote the wrong result' accept 'she marked the wrong point on the graph' accept 'the wrong mass was added' accept 'not enough salt was added' accept 'too much water'	<i>do not accept</i> 'too much salt'
		c <i>1/2h</i>	1	either * Abi need to check accuracy or correct an error or check an anomaly or * Robert you can predict the results from the pattern in the graph	accept 'to check whether it is right or wrong' accept 'she might have done it differently' accept 'it's a freak result' accept 'you can use the graph' accept 'you can ignore the point' accept 'there is enough evidence'	both the answer 'Abi' and the correct explanation are required for the mark 'it is a fair test' is insufficient or both the answer 'Robert' and the correct explanation are required for the mark award a mark if both Abi and Robert are ticked if the reason given explains why both could be correct

Tier 3–6 5–7	Q No 13 5																	
Part	Mark	Answer	Accept	Additional guidance														
d 1/2k	2	* true false cannot tell				if all four rows are correct, award two marks if two or three rows are correct, award one mark if more than one box is ticked on any row, award no credit for that row												
		<table border="1"> <tbody> <tr> <td>✓</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>✓</td> <td></td> <td></td> </tr> <tr> <td></td> <td>✓</td> <td></td> </tr> </tbody> </table>	✓					✓	✓				✓					
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Total	6																	

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Tier 3–6 5–7	Q No 14 6			
Part	Mark	Answer	Accept	Additional guidance
a 3/1e	1	any one from * the mixture glowed * there was a colour change * a black solid formed * a new substance has been formed	accept 'the temperature increased' accept 'a compound or iron sulphide was formed' accept 'there is no longer any sulphur or yellow or iron or grey'	
b 3/1d 3/1e	2	* <i>iron</i> : metallic element * <i>sulphur</i> : non-metallic element * <i>iron sulphide</i> : compound	accept 'metal' accept 'non-metal'	if all three answers are correct, award two marks if two answers are correct, award one mark
c 3/1d	1	* <i>sulphur</i> : no <i>iron</i> : yes		both answers are required for the mark
d i 3/3h	1	* zinc sulphide		<i>do not accept</i> 'zinc sulphate'
d ii 3/1e 3/2i	1	* sulphur dioxide	accept 'sulphur oxide' or 'sulphur trioxide'	
Total	6			

Tier 3–6 5–7	Q No 15 7	Part	Mark	Answer	Accept	Additional guidance
		a i 2/2a 2/2d	1	* fat		
		a ii 2/2a 2/2d	1	* carbohydrate		
		a iii 2/2a 2/2d	1	* protein		
		b 1/2k	1	* 200 g ✓		if more than one box is ticked, award no mark
		c 2/2a	1	any one from * vitamins * water * fibre	accept a named vitamin accept 'roughage' accept 'minerals' or a named mineral	<i>do not accept</i> 'calcium'

Tier 3–6 5–7	Q No 15 7			
Part	Mark	Answer	Accept	Additional guidance
d i 2/2d	1	* 1100	accept a number from 1000 to 1300	
d ii 2/2d	1	any one from * to make milk * milk contains calcium * a breast-fed baby needs calcium for growth or for bones or teeth * she has to have enough calcium for herself and the baby	accept 'the baby needs calcium' accept 'to feed herself and the baby' accept 'the baby needs 600 and she needs 500' accept 'this is recommended for mother and baby'	'to feed the baby' is insufficient
Total	7			

Tier 3–6 5–7	Q No 16 8			
Part	Mark	Answer	Accept	Additional guidance
a 2/1b	1 1	* chloroplast any one from * photosynthesis * absorbs or traps light	accept 'chlorophyll' accept 'it produces food or glucose or sugar or carbohydrate'	'contains chlorophyll' is insufficient
b 2/1b	1 1	* nucleus * it controls the cell	accept 'it tells the cell what to do' accept 'it transfers or contains genetic information or chromosomes'	'brain of the cell' is insufficient <i>do not accept</i> 'for reproduction' 'it controls substances entering or leaving the cell' is insufficient
c 2/1b	1	any two from * A * B * D	accept 'chloroplast' or 'chlorophyll' accept 'vacuole' accept 'cell wall'	
d 2/1b	1	* it has chloroplasts or chlorophyll	accept 'it is green'	'it is a different shape' is insufficient 'it does not have a hair' is insufficient
Total	6			

Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional guidance
a i 4/3f	1	* only red light passes through the filter	accept 'the other colours are filtered out or absorbed'	'red light passes through' is insufficient a mark for this answer may be awarded in either a i or a ii provided there is no contradiction
	1	* the ball reflects red light	accept 'white objects reflect all colours'	
a ii 4/3f	1	* black	accept 'you cannot see it'	
	1	any one from * the green ball does not reflect red light or the light that passes through the filter * the ball absorbs red light	accept 'no green light reaches the ball'	
b 4/3f	1	* two red spots	accept 'red black red'	'two spots' is insufficient 'red spots' is insufficient do not accept 'only red light'
Total	5			

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional guidance
a i 4/2f	1 1	* 100 * Ncm	accept '5 × 20' accept 'cmN' accept '1.0 Nm' for two marks	<i>do not accept</i> lower case n
a ii 4/2f	1	* 100	accept 'the same' accept the numerical answer to part a i	the mark for the unit may be awarded in part a ii if not given in part a i the unit is not required for the mark
a iii 4/2f	1	* 10	accept the numerical answer to a ii ÷ 10	
b 4/5e	1	* it decreased any one from * less light energy changed to electrical energy * the voltage produced by the solar cell was lower	accept 'it slowed down' accept 'less light to power plane' accept 'it received less energy' accept 'less electrical or kinetic energy produced'	both the answer and the correct explanation are required for the mark <i>do not accept</i> 'it stopped' 'less light' is insufficient <i>do not accept</i> 'no light to provide energy'
Total	5			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
a 1/1a	1	* that water enters the cells in clusters of water molecules	accept 'that clusters of water molecules are too big to enter the cells' accept 'the size of the clusters matters' accept 'small clusters are more efficient' accept 'only their water would be absorbed by the cells'	<i>do not accept</i> 'tap water molecules are too large to be absorbed by the body' <i>do not accept</i> 'the size of the clusters does not matter'
b 1/2a	1	any one from * beauty cannot be measured * blood pressure can be measured	accept 'beauty is difficult to measure or judge or compare' accept 'feeling beautiful is subjective or an opinion'	
c 1/2d	1	any one from * so that judgement was not biased * to avoid influencing the outcome * to avoid influencing the researchers	accept 'so the company cannot rig the results' accept 'so you can trust it'	'bribing' is insufficient 'to make it fair' is insufficient
d 1/2d	1	any one from * if they believe there is a benefit they may report feeling better * so that they cannot prejudge the results * to get a more objective opinion * to prevent bias	accept 'so they cannot lie' accept 'so they do not just say what they believe about different types of water'	'to make it fair' is insufficient
Total	4			

Tier 5–7	Q No 12													
Part	Mark	Answer	Accept	Additional guidance										
a 3/3b	1	any one from * zinc displaces copper from the copper sulphate * zinc changes places with copper	accept 'copper is displaced by the zinc' accept 'the more reactive metal displaces or takes the place of the other one' accept 'zinc takes the sulphate'											
b 1/2e	1	* he only needed to find out the temperature rise or change												
c i 3/3c	1	any one from * magnesium is the most reactive metal used * the biggest difference in reactivity is between magnesium and copper	accept 'magnesium is above the others' accept 'magnesium is more reactive than iron and zinc'											
c ii 3/3c	1	any one from * the reactivity is nearly the same * they are next to each other in the reactivity series	accept 'zinc is slightly more reactive than iron'	'zinc is more reactive than iron' is insufficient										
c iii 3/3c	2	* <table border="1"> <thead> <tr> <th><i>mixture</i></th> <th><i>Would there be a rise in temperature?</i></th> </tr> </thead> <tbody> <tr> <td><i>aluminium + sodium chloride</i></td> <td>no</td> </tr> <tr> <td><i>calcium + zinc sulphate</i></td> <td>yes</td> </tr> <tr> <td><i>lead + zinc chloride</i></td> <td>no</td> </tr> <tr> <td><i>magnesium + iron chloride</i></td> <td>yes</td> </tr> </tbody> </table>	<i>mixture</i>	<i>Would there be a rise in temperature?</i>	<i>aluminium + sodium chloride</i>	no	<i>calcium + zinc sulphate</i>	yes	<i>lead + zinc chloride</i>	no	<i>magnesium + iron chloride</i>	yes		award one mark for identifying the two reactions that take place award one mark for identifying the two mixtures of chemicals which do not react
<i>mixture</i>	<i>Would there be a rise in temperature?</i>													
<i>aluminium + sodium chloride</i>	no													
<i>calcium + zinc sulphate</i>	yes													
<i>lead + zinc chloride</i>	no													
<i>magnesium + iron chloride</i>	yes													
Total	6													

Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional guidance
a i 2/2g	1	any one from * menstruation * the lining of the uterus is shed	accept 'the period' accept 'the lining of the uterus breaks up' accept 'the wall of the uterus breaks down'	<i>do not accept</i> 'the uterus is shed' 'the wall of the uterus breaks' is insufficient
a ii 2/2g	1	* a day from day 14 to day 18 any one from * it is just after ovulation or day of ovulation * that is when an egg is likely to be in the oviduct or fallopian tube * that is just after an egg is released * an egg is released on day 14	accept 'in the middle' accept 'that is when an egg is released'	both the answer and the correct explanation are required for the mark <i>do not accept</i> 'around day 14' 'it is in the middle of the cycle' is insufficient
a iii 2/2g	1	any one from * so that a fertilised egg can be implanted * to receive an egg		
b i 2/2g	1	* a line which continues to rise or remains horizontal after day 28	accept a line rising or remaining horizontal after day 1	
b ii 2/2g	1	any one from * menstruation stops * so the ovum or embryo will implant	accept 'the embryo or foetus or baby needs a blood supply' accept 'the lining would become thicker or stay thick' accept 'the lining is not shed'	'provides support' is insufficient
Total	5			

Tier 5–7	Q No 14	Answer	Accept	Additional guidance
a i 1/1c 1/2k	1	<p>Award a mark for an answer that shows that maggots will only be found in meat that flies have had contact with, for example:</p> <p>any one from</p> <ul style="list-style-type: none"> * there were no maggots in container 2 * there were no maggots in container 3 * there were only maggots on the meat in container 1 or in the container that was open * the meat the flies could not reach had no maggots in it * there are maggots on the mesh but not on the meat 	accept 'when the meat is sealed there are no maggots'	'there are maggots on the mesh' is insufficient
a ii 1/1c 1/2k	1	<p>Award a mark for an answer that shows that contact with air is not sufficient for maggots to develop, for example:</p> <p>any one from</p> <ul style="list-style-type: none"> * there were maggots in container 1 but no maggots in container 2 or 3 * air could get into container 3 * there is air in container 2 	<p>accept 'there were no maggots in container 2 or 3'</p> <p>accept 'there would have been maggots in all of them'</p>	
b 1/2m	1	<p>any one from</p> <ul style="list-style-type: none"> * they had no food * they starved or died 	<p>accept 'maggots could not get to the food'</p> <p>accept 'maggots could not eat the meat'</p>	'maggots could not get to the meat' is insufficient

Tier 5–7	Q No 14			
Part	Mark	Answer	Accept	Additional guidance
c 2/2n	2	any two from * flies or insects cannot reach the meat * too cold for bacteria or fungi to multiply or bacteria multiply more slowly * prevents meat rotting	accept 'microbes grow more slowly' accept 'keeps the meat or food fresh' or 'so it does not go off' or 'too cold for enzymes to work' accept 'eggs or maggots grow more slowly'	do not accept 'it kills bacteria' or 'stops the growth of bacteria' do not accept 'it is too cold or too cool' without qualification do not accept 'maggots are killed by the cold'
Total	5			