

Tier 3–6 5–7	Q No 9 1	Part	Mark	Answer	Accept	Additional guidance
		a i 1/2j	1	* more fishing boats	accept 'more people were fishing' accept 'more fishing' accept 'more boats'	'more being caught' is insufficient
		a ii 1/2m 1/2k	1	any one from * overfishing * fish were caught before they could breed * fish were not allowed time to breed	accept 'too many fish were caught' accept 'few fish or herring were left in the sea' accept 'fish were smaller'	'lots of fish were caught' is insufficient <i>do not accept</i> 'no herring or fish left' <i>do not accept</i> 'too many boats' 'the herring are too young' is insufficient 'less being caught' is insufficient
		a iii 2/5a	1	any one from * to allow numbers to recover or increase * to allow more herring to breed * to allow more herring to mature	accept 'so the herring would be old enough or mature enough to breed' accept 'it is the breeding time'	<i>do not accept</i> 'they were becoming extinct' 'to allow herring to be born' is insufficient 'there were fewer herring left' is insufficient

Tier 3–6 5–7	Q No 9 1	Part	Mark	Answer	Accept	Additional guidance
		b i <i>2/5d</i>	1	any one from * cod eat sand eels instead of herring * cod eat more sand eels * cod eat capelin instead of herring so there is less food for sand eels	accept 'cod would eat more capelin' accept 'cod would eat the sand eels' food'	'cod have to eat something else' is insufficient 'cod eat sand eels' is insufficient 'less food for sand eels' is insufficient as it implies that sand eels eat herring 'because the cod only had two choices' is insufficient
		b ii <i>2/5d</i>	1	any one from * there would be more animal plankton * fewer cod	accept 'more plankton'	'they will have more to eat or more food' is insufficient 'the animal plankton would get bigger' is insufficient 'less food for cod' is insufficient
		Total	5			

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Tier 3–6 5–7	Q No 10 2	Part	Mark	Answer	Accept	Additional guidance
		a 1/2m 2/5c	1	* leaves are bigger	accept 'there are leaves or a canopy' accept 'leaves open or grow'	'trees block the light' is insufficient
		b 2/3a 2/5c	2	any two from * light is needed for photosynthesis * more (photosynthesis) * light provides energy for growth * biomass or food or sugar or starch or carbohydrate is produced	accept 'photosynthesis' accept, for two marks, 'the rate or amount of photosynthesis increases if the light increases'	'they need light to grow' is insufficient 'light is a source of food' is insufficient
		c 2/2k	1 1	* glucose * water		answers must be in the correct order
Total	5					

Tier 3–6 5–7	Q No 11 3	Part	Mark	Answer	Accept	Additional guidance
		a 1/2m 2/5a	1	any two from * less or no competition for food * plenty of food or water or they get fed * they have shelter * veterinary or medical treatment * they are less likely to be injured or killed or there is no hunting of lions	accept 'good or balanced diet' accept 'protected from bad weather' accept 'they are vaccinated' accept 'they are kept healthier' accept 'they do not fight as much' accept 'there are no predators of lions'	both answers are required for the mark 'they are looked after' is insufficient 'protection' is insufficient because it is not specific 'they get fewer diseases' is insufficient <i>do not accept</i> 'they are less likely to get a disease' 'they are healthier' is insufficient
		b i 1/2j	1	* an appropriate line of best fit		accept a curved or straight line
		b ii 1/2j	1	any one from * animals with longer pregnancies live longer * the shorter the pregnancy the shorter the life span	accept 'the shorter the life span the shorter the pregnancy'	a comparative answer is required

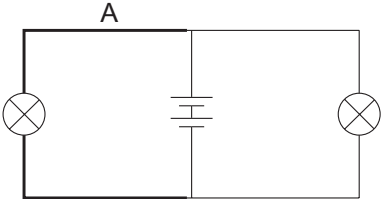
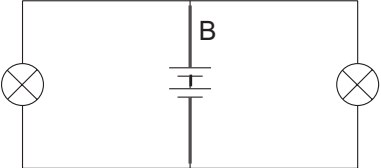
Tier 3–6 5–7	Q No 11 3	Part	Mark	Answer	Accept	Additional guidance
		c i 1/2i	2	* all three points plotted correctly	accept a tolerance of \pm half a small square	if all three points are correct, award two marks if one or two points are correct, award one mark
		c ii 1/2i	1	* no ✓ any one from * the data is more scattered * there is no link between the number of days pregnant and the expected life span * the human has the longest life span but the shortest pregnancy * the giraffe has the shortest life span but the longest pregnancy * the (new) points show the longer the pregnancy the shorter the life span	accept 'they do not go up in a straight line' accept 'they do not fit the line of best fit' accept 'giraffes or horses have a longer pregnancy than humans but a shorter life span' accept the converse accept 'they are opposite to the other results'	if more than one box is ticked, award no mark both the answer and the correct explanation are required for the mark
		Total	6			

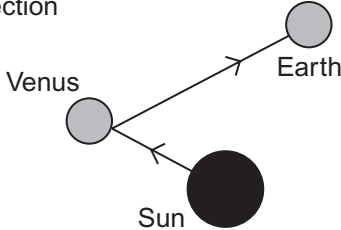
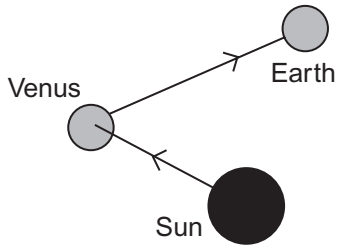
Tier 3–6 5–7	Q No 12 4	Part	Mark	Answer	Accept	Additional guidance
		a i 1/2k 3/1a	1	* mercury	accept 'Hg'	
		a ii 1/2k 3/1a	1	* iron	accept 'Fe'	
		a iii 1/2k 3/1a	1	* mercury	accept 'Hg'	
		a iv 1/2k 3/1a	1	* aluminium	accept 'Al'	
		b i 3/1a 1/2i	1	* an arrow drawn at 0°C	accept any unambiguous indication	
		b ii 3/1a 1/2i	1	* gas ✓		if more than one box is ticked, award no mark
		b iii 3/1a 1/2i	1	* liquid ✓		if more than one box is ticked, award no mark
Total			7			

Tier 3–6 5–7	Q No 13 5	Part	Mark	Answer	Accept	Additional guidance
		a i 3/1h BS/1b	1	any one from * to stop water vapour or steam escaping * to stop lavender oil vapour escaping * to reduce heat loss	accept 'gas or vapour or particles could escape' accept 'to stop oil escaping' accept 'to make sure the oil goes down the tube' accept 'the oil or vapours could not be collected' accept 'to stop heat loss' or 'to keep heat in' accept 'to stop the heat escaping' accept 'to maintain the pressure'	'to stop water escaping or spilling out' is insufficient 'to stop the smell escaping' is insufficient
		a ii 1/2f 3/1b	1	any one from * it could explode * it could break	accept 'the lid might come off' accept 'so the pressure does not break the seal'	'the pressure would be too high' is insufficient 'it would get too hot' is insufficient
		b i 3/2c	1	* <i>from gas to liquid</i>		both answers are required for the mark answers must be in the correct order
		b ii 3/1a	1	any one from * it sinks * it is at the bottom	accept 'lavender oil floats' accept 'the oil is on the top'	'they are not mixed' is insufficient
		c 3/1b	1	* B		if more than one letter is identified, award no mark
		Total	5			

Tier 3–6 5–7	Q No 14 6	Part	Mark	Answer	Accept	Additional guidance
		a 1/2c 4/5f	1	* African its ears have a larger surface area	accept 'larger surface area' accept 'larger ears'	both the answer and the correct explanation are required for the mark 'they have large ears' is insufficient
		b i 1/2d	1	any one from * he used identical cans * he used the same amount of water	accept 'the cans were made of the same metal' accept 'the cans were the same size or shape' accept 'he used the same metal for the strips' accept 'he kept them in the same place'	'he used metal for the strips' is insufficient 'he took the temperature every 5 minutes for both' is insufficient
		b ii 1/2i	1	any one from * the pattern or relationship can be seen more easily or more quickly * anomalous results can be seen more quickly or easily	accept 'the pattern or relationship is clearer' accept 'the temperature change is clearer' accept 'the pattern can be seen straight away' accept 'you can compare them more easily' accept 'you can make predictions more easily or more quickly'	'the pattern or the way the temperature changes can be seen' is insufficient 'it is clearer' is insufficient 'to see them better' is insufficient <i>do not accept</i> 'a graph is more accurate'

Tier 3–6 5–7	Q No 14 6			
Part	Mark	Answer	Accept	Additional guidance
b iii 1/2l	1	* yes ✓ the greater the surface area of metal the greater the heat loss or the lower the temperature	accept 'the bigger strips cause the greatest heat loss' accept 'metal A represents big ears' accept 'the can with bigger strips cooled more quickly' accept answers that relate the size or surface of the strips to the size or surface of the ears accept 'no' and a relevant supporting explanation only if 'Indian elephant' is given as an answer to part (a). An example would be 'no, as I thought smaller ears would cool quicker'	if more than one box is ticked, award no mark both the answer 'yes' and the correct explanation are required for the mark <i>do not accept</i> 'can B was a better insulator'
c 1/2g	1	any one from * it reduces error * readings are continuous * it can draw a graph	accept 'it is more accurate' accept 'less human error' or 'is more reliable' accept 'it is more precise' accept 'it takes more readings' accept 'you can leave it to take results' accept 'it would record the results for him'	'you can leave it' is insufficient
Total	5			

Tier 3–6 5–7	Q No 15 7			
Part	Mark	Answer	Accept	Additional guidance
a i 4/1a	1	* 	accept a switch drawn and labelled A marked on any part of the circuit highlighted	<i>do not accept</i> a switch at either junction the switch must be labelled for the mark
a ii 4/1a	1	* 	accept a switch drawn and labelled B marked on any part of the circuit highlighted	<i>do not accept</i> a switch at either junction the switch must be labelled for the mark
b 4/3f	1	* they are absorbed	accept 'they are blocked or filtered out'	'they are filtered' is insufficient
c 4/5e 4/5g	1 1 1 1	* chemical * electrical * light * thermal		answers must be in the correct order 'heat' is insufficient as the question asks for a word from the box
Total	7			

Tier 3–6 5–7	Q No 16 8	Part	Mark	Answer	Accept	Additional guidance
		a 1/2m 4/4c	1	any one from * Venus is nearer to the Sun * the Sun's gravity on Venus is greater * it travels faster * it has a smaller orbit	accept 'it does not have as far to go'	a comparative statement is needed 'it is closer' is insufficient
		b 4/3b 4/4d	1 1	* a straight line from the Sun to Venus and a straight line from Venus to Earth * arrows drawn on both rays in the correct direction 	accept two discontinuous straight lines that touch the Sun, Venus and the Earth 	<i>do not accept</i> a line from the Sun which touches the Earth
		c i 1/1a 1/1c	1	any one from * they had not been discovered * they had not been seen	accept 'he did not know they existed' accept 'they could not be seen'	<i>do not accept</i> 'they did not exist' 'they are too far away' is insufficient
		c ii 1/2m 4/4b	1	any one from * the Earth is not at the centre * the planets do not go round the Earth or the planets orbit the Sun * the Earth goes round the Sun * the Sun is in the middle	accept answers which give the correct order of the planets in the solar system	answers must refer to the arrangement and not to missing planets 'there are more planets' is insufficient
		Total	5			

Tier 5–7	Q No 9	Answer	Accept	Additional guidance
a i 1/2d	1	any one from * to see how the heart rate had changed * to compare the rate before and after the treatment	accept 'to see the result of the treatment' or 'to see if the treatment made a difference' accept 'to get a baseline or standard' or 'to make a comparison'	'to make it a fair test' or 'for a control' are insufficient responses
a ii 1/2e	1	* so the water fleas could adjust to the solution or settle down	accept 'to allow time for the drug to work' accept 'to allow the treatment to get around its body'	
a iii 1/2h	1	* use more than 20 water fleas in each group	accept 'use more water fleas' accept 'repeat it with the same fleas after the effects have worn off'	'repeat it' is insufficient
b i 1/2d	1	* to show if alcohol or kava affects the heart rates or water fleas	accept 'it shows alcohol alone increases or affects the heart rate' accept 'to see what effect alcohol has' accept 'to show it is the kava that affects or reduces the heart rate of fleas' accept 'to show it is not alcohol that affects or reduces the heart rate' accept '(it acts) as a control'	'as a comparison' is insufficient

Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional guidance
b ii 1/2k	1	any one from * take the average heart rate resulting from kava in alcohol away from the average heart rate resulting from alcohol * take the difference between kava in alcohol and alcohol only * look at the difference between group 1 and group 2 after treatment	accept 'add the increase with alcohol to the decrease with kava and alcohol' accept 'subtract 35 from 41 or 42'	
c 1/2o	1	any one from * there may be side effects * the effect could be different in humans * it has not been tested on humans * human hearts are different from fleas' hearts	accept 'humans are bigger or from a different group or species' accept 'we do not know anything about the dose or amount given'	'they are not the same' or 'they are different animals' are insufficient responses
Total	6			

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional guidance
a 2/1b	1	* genetic material or genes or DNA	accept 'nucleus' accept 'chromosomes'	
b 2/2n	1	<p>method * touch or contact</p> <p>prevention any one from * wash hands before or after touching a patient or before or after touching surfaces or articles * use alcohol rub when entering or leaving ward or room or hospital</p>	<p>accept 'quarantine patients suspected of carrying disease' accept 'change gloves between patients' accept 'stop contact with others' or 'limit visitors'</p>	<p>each method of prevention must be related to the method of spread for a mark the method of spread and prevention are required for each mark the same prevention method cannot be used for both methods of spread</p> <p>'cleaning' or 'washing hands' are insufficient 'wearing gloves' is insufficient</p>
	1	<p>method * coughing or sneezing</p> <p>prevention * cover mouth or nose or use a handkerchief or wear a mask</p>	<p>accept 'through the air' or 'breathing on someone'</p> <p>accept 'quarantine patients suspected of carrying disease' accept 'stop contact with others' or 'limit visitors'</p>	

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional guidance
c 2/2n	3	any three from * vaccine contains a dead or weakened form of the bacterium or virus * antibodies or antitoxins (are produced) * (made by) white blood cells * further infections are prevented or bacteria or viruses or toxins are destroyed	accept 'inject with protein from the bacterium or virus' accept 'white cells' accept 'kills the bacteria or viruses'	'it contains a small amount of bacteria or virus' is insufficient 'stop you getting it again' is insufficient 'fights bacteria' is insufficient 'you become immune to the disease' is insufficient as it is given in the question
Total	6			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional guidance
a i 4/2a	1	* 0.75 s	accept $\frac{1.5}{2}$ or $\frac{3}{4}$	
a ii 1/2a 1/2h 1/2e	2	any two from * measure the depth of the water * measure the time for the wave to travel * work out the speed * make sure the waves are the same size or use the same force or repeat at the same depth	accept an answer that indicates how high to fill the tank, for example 'fill the tank to 10 cm' accept 'measure the speed of the wave'	
	1	* repeat at different depths	accept 'add more water or change the depth and do it again' accept 'repeat with different volumes of water'	
b 1/2j	1	* A to B: decreases or slows down		
	1	* B to C: remains constant or stays the same		do not accept 'gets slower'
Total	6			

Tier 5–7	Q No 12	Answer	Accept	Additional guidance
a i 3/1f 3/3e	2	* sodium chloride + * water	accept 'hydrogen oxide' for water	answers must be in the correct order
a ii 3/1f	1	* H ₂ O		
b 3/2g	1	any one from * the same atoms are present in the reactants and the products * no gas was given off	accept 'mass is conserved' accept 'nothing was added or lost'	'the mass did not change' is insufficient 'the particles are the same' is insufficient <i>do not accept</i> 'the molecules are the same'
c i 3/3e 3/1f	1	* sodium chloride carbon dioxide water		answers may be in any order all three answers are required for the mark
c ii 3/2g 3/3e	1	any one from * carbon dioxide or gas escapes * carbon dioxide is a gas * one of the products is a gas or escapes		'mass is lost' is insufficient as it is given in the question
Total	6			

Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional guidance
a 1/2e	1	any one from * the original height of the plank and the height with masses * the height of the plank before and after adding masses	accept 'take the height with the mass added away from the height of the table' accept 'take the height of the plank with the mass added away from the height with no mass' accept 'vertical distance moved'	'distance moved' is insufficient
b i 1/2i 1/2j	1 1	* five points plotted to within one small square * smooth curve of best fit	accept an appropriate straight line of best fit	
b ii 4/2b	1	any one from * the weight or mass of the (wooden) plank * the (larger) overhang		'the weight or mass' is insufficient

Tier 5–7	Q No 13	Answer	Accept	Additional guidance
c i <i>1/2j</i>	1	* as the mass increases the sag increases	accept the converse accept 'the lines both went up' accept 'sag increases in both'	
c ii <i>1/2j</i>	1	any one from * there is more sag for each mass * the increase in sag is not constant * the increase in sag gets less	accept 'the plank sags more' accept 'in the second test they did not go up in equal amounts' accept 'first test gives a straight line, the second was a curve' accept 'first went up gradually, the second went up steeply'	'the plank sagged before he added any mass' is insufficient
Total	6			