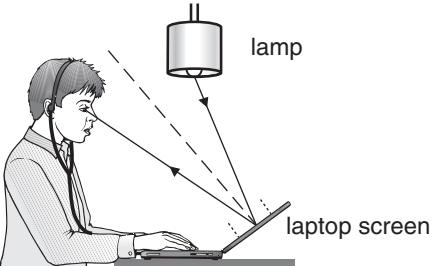
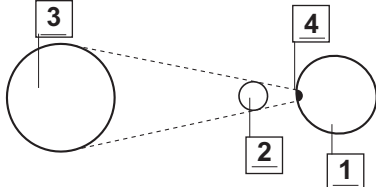


Tier 3–6 5–7	Q No 9 1	Part	Mark	Answer	Accept	Additional Guidance
		a i 1/2d	1	* (the type of) material	accept 'fabric'	
		a ii 1/2d	1	* the temperature after 20 minutes	accept 'temperature' accept 'temperature change' accept 'how hot the water is'	'temperature at start' is insufficient 'heat' is insufficient
		b i 1/2k	1	* B ✓		if more than one box is ticked, award no mark
		b ii 1/2k	1	* beaker B was warmer (at the end than the others)	accept the converse accept 'the temperature was higher' accept 'it dropped the least' accept 'it lost the least heat'	'B was 40°C at the end' is insufficient
		c 1/2d	2	any two from * temperature in cold room * style or size of coat * the clothes he wears for each test * level of activity	accept 'his temperature before he went in' accept 'amount of material' accept '(same) underclothes' accept 'he had eaten the same food before each test'	'temperature' is insufficient 'the person' or 'the time' is insufficient

Tier 3–6 5–7	Q No 9 1			
Part	Mark	Answer	Accept	Additional Guidance
d 1/2f	1	* do not let the volunteer's body temperature go down too far	accept 'do not let him or the room get too cold' accept 'have a doctor nearby' accept 'monitor or check him' accept 'measure his heart rate or breathing rate' accept 'wear gloves' or 'keep his head warm' accept 'make sure the volunteer is healthy' or 'is not allergic to the material'	
e 1/2e 1/2p	1	any one from * monitor the temperature from outside the room * it gives you a continuous record (of the temperature) * it is more accurate or precise	accept 'remote sensing' accept 'you have to open the coat to read the thermometer' accept 'you do not have to write down the results' accept 'it eliminates human error' accept 'the experiment is more reliable'	'accurate' is insufficient 'more reliable' is insufficient
Total	8			

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Tier 3–6 5–7	Q No 10 2			
Part	Mark	Answer	Accept	Additional Guidance
<p>a i 4/3c</p>	1	<p>* a continuous straight line from the lamp to the screen and from the screen to George's eye</p>	 <p>accept a reflection anywhere between the dotted lines on the laptop screen</p>	
	1	<p>* angle of incidence approximately equal to the angle of reflection</p>		
	1	<p>* arrows in the correct direction on the incident and reflected ray</p>		
<p>a ii 4/3c</p>	1	<p>* the reflected ray or the light image misses George's eyes</p>	<p>accept 'the ray of light is reflected at a different angle' accept 'it moves down'</p>	<p>'the lamp is not shining in his eyes' is insufficient <i>do not accept</i> responses referring to scattering 'it changes' is insufficient <i>do not accept</i> 'the ray of light is reflected above his eye'</p>
<p>b 4/5e</p>	1	<p>* <i>from electrical energy to sound energy</i></p>		<p>both answers are required for the mark answers must be in the correct order</p>
<p>Total</p>	<p>5</p>			

Tier 3–6 5–7	Q No 11 3	Part	Mark	Answer	Accept	Additional Guidance	
		a 4/4b 1/2m	2	*			<p>for all four numbers in the correct place, award two marks</p> <p>for any two or three numbers in the correct place, award one mark</p>
		b 1/2l 1/2m 4/4b	1 1	<p>any one from</p> <ul style="list-style-type: none"> * 21st August * 22nd August * 23rd August <p>* 2017</p>	accept dates written in another format		
Total			4				

Tier 3–6 5–7	Q No 12 4	Part	Mark	Answer	Accept	Additional Guidance
		a 2/1b	2	any two from * it has a flagellum or tail to help it move * it does not have a (cell) wall * it does not have a vacuole * it has a reservoir (for taking in food)	accept 'can move or swim' accept 'it has a tail' accept 'it does not have a fixed shape' or 'it changes shape' accept 'it takes in or eats food' accept 'it has a mouth-like structure'	'whip' is insufficient <i>do not accept</i> 'it does not have a membrane' 'it only has a cell membrane' is insufficient 'it has a mouth' is insufficient
		b 2/1b	1	* it has chloroplasts	accept 'chlorophyll'	'it makes food' is insufficient
		c 2/3b	1 1	* water * oxygen	accept 'H ₂ O' accept 'O ₂ '	answers must be in the correct order
		Total	5			

Tier 3–6 5–7	Q No 13 5	Part	Mark	Answer	Accept	Additional Guidance
		a 1/2d	2	any two from * same type of cardboard * same width (of cardboard) * same length (of cardboard) * same thickness of cardboard pieces * loaded in the centre * same (height of) blocks * same distance between blocks * measure in the same place	accept 'same cardboard or box' accept, for one mark, 'the same sized bridge' if not given with 'width' or 'length' or thickness accept 'equal-sized cardboard pieces' accept 'same height at the start' accept 'leave masses on for the same amount of time' accept 'masses of the same shape or type'	'same height of bridge' is insufficient
		b i 1/2j	1	* <i>bridge A</i> : any number from 0.0 to 2.9 * <i>bridge B</i> : any number from 5.1 to 5.5		both answers are required for the mark
		b ii 1/2n	1	any one from * it collapsed * it broke * it folded * it reached the bench		

Tier 3–6 5–7	Q No 13 5	Part	Mark	Answer	Accept	Additional Guidance
		c i 1/2k	1	* bridge A ✓ any one from * it bends less (at 200g) * bridge B bends more	accept 'there is a bigger gap to the bench' accept 'it is higher' accept 'bridge A is 7.0cm and bridge B is only 6.5cm'	if more than one box is ticked, award no mark both the bridge and a reason are required for the mark 'it is stronger' is insufficient 'bridge A is 7.0cm and bridge B is 6.5cm' is insufficient
		c ii 1/2k	1	* bridge B ✓ any one from * it bends less (at 300g) * bridge A bends more	accept 'there is a bigger gap to the bench' accept 'it is higher' accept 'bridge B is 5.6cm and bridge A is only 3.0cm' accept 'bridge A is about to break'	if more than one box is ticked, award no mark both the bridge and a reason are required for the mark 'it is stronger' is insufficient 'bridge A was 3.0cm, bridge B was 5.6cm' is insufficient 'it is about to break' is insufficient
		Total	6			

Tier 3–6 5–7	Q No 14 6				
Part	Mark	Answer	Accept	Additional Guidance	
a 3/2b	2	* <i>true</i> <i>false</i> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>		for all three correct boxes ticked, award two marks for any two correct, award one mark	
b 3/1h	1	* evaporate the water or evaporation	accept 'heat it' accept 'it goes from liquid to gas' accept 'boiling'	do not accept an incorrect use of evaporation, e.g. 'she evaporates salt from sand'	
	1	* condense the water vapour or condensation	accept 'it goes from gas to liquid' accept, for two marks, 'distil or distillation' accept, for one mark, 'condensation then evaporation'	do not accept 'it condenses to water vapour'	

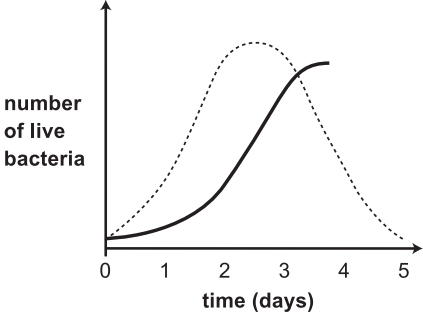
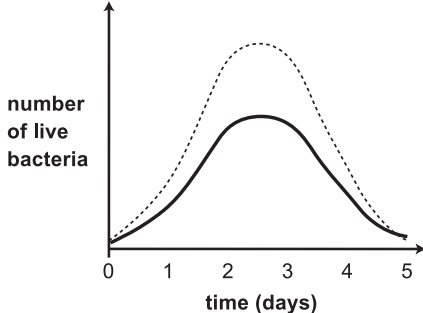
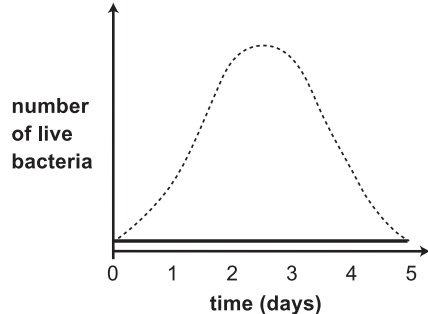
Tier 3–6 5–7	Q No 14 6			
Part	Mark	Answer	Accept	Additional Guidance
c i 3/1g	1	<p><i>substance</i> <i>group</i></p> <p>* seawater compound</p> <p> salt mixture</p> <p> oxygen element</p>		all three lines are required for one mark if more than one line goes from any one box, do not award the mark
c ii 3/1g	1	<p><i>group</i> <i>description</i></p> <p>* compound It contains two or more types of atoms or molecules which can be physically separated.</p> <p> mixture It contains only one type of atom.</p> <p> element Two or more types of atoms are chemically joined together.</p>		all three lines are required for one mark if more than one line goes from any one box, do not award the mark
Total	6			

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Tier 3–6 5–7	Q No 16 8	Part	Mark	Answer	Accept	Additional Guidance
		a i 2/2n	2	* fewer bacteria * less acid (is produced)	accept 'bacteria have nowhere to breed' or 'there are no bacteria' or 'bacteria cannot live' accept 'there is no acid' or 'no acid is produced' accept, for two marks, 'there are less bacteria producing acid'	answers that just repeat or restate the leaflet are insufficient
		a ii 3/3f	1	any one from * it neutralises acid * it raises the pH of the mouth	accept 'to make the acid neutral' accept 'it makes the mouth less acid'	'the alkali cancels out the acid' is insufficient 'it reacts with the acid' is insufficient <i>do not accept</i> 'alkali gets rid of plaque or kills bacteria' references to brushing are insufficient
		b 1/2d	1	any one from * it would show how effective brushing is in removing plaque * to compare the amount of plaque before and after * to see how much plaque is removed	accept 'to see the effect' accept 'to compare teeth before and after' accept 'to see if there was a change in the amount of plaque or red'	'how clean their teeth have become' is insufficient 'to show how much plaque there is on the teeth' is insufficient 'so they can see when the plaque is gone or removed' is insufficient <i>do not accept</i> 'to see how much decay is removed'

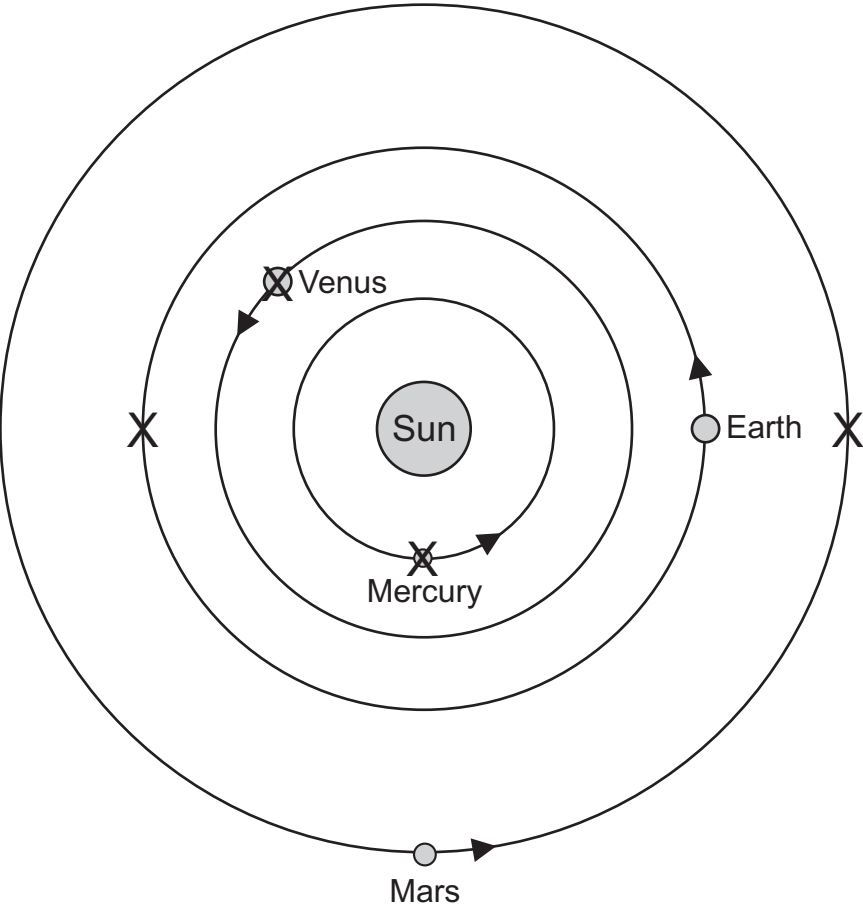
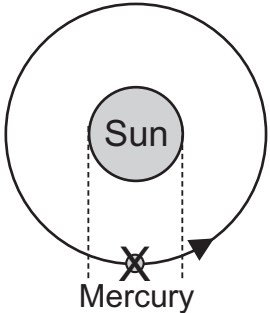
Tier	Q No			
3–6	16			
5–7	8			
Part	Mark	Answer	Accept	Additional Guidance
c i 1/2e	1	any one from * it is more precise * it is a better estimate * to see exactly how much	accept 'more accurate' accept 'there are more squares fully shaded so you do not have to count as many fractions'	'more reliable' is insufficient 'accurate or precise' is insufficient 'to see more clearly or more easily' is insufficient 'it is more detailed' is insufficient
c ii 1/2h	1	* a number from 13 to 17 inclusive		
Total	6			

Tier 5–7	Q No 9	Answer	Accept	Additional Guidance
a i 1/2m 2/2n	1	any one from * the pH is too low * it is too acidic	accept 'acid is killing the bacteria' accept 'the bacteria could be poisoned' accept 'not enough nutrients or sugar'	'the milk goes off' is insufficient 'the bacteria were dying' is insufficient 'there is no sugar left' is insufficient
a ii 1/2m 2/2n	1	* the pH was still decreasing on day 5	accept 'it was going down' accept 'the acidity was increasing'	<i>do not accept</i> 'it has not reached 0' 'it has not reached the bottom of the graph' is insufficient 'the line continues' is insufficient

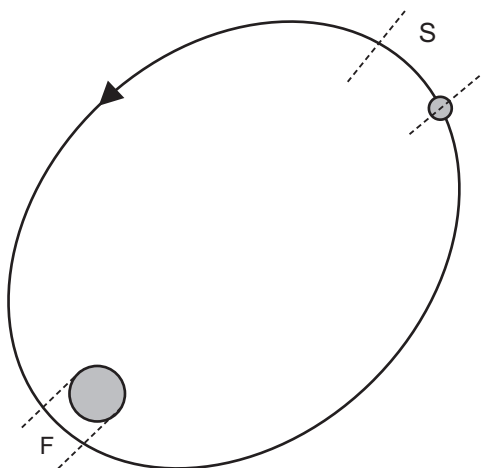
Tier 5–7	Q No 9			
Part	Mark	Answer	Accept	Additional Guidance
b i 1/2c 1/2i	1 1	* a line that starts at pH 6.5 and then falls * a response that decreases less than 3.5 over 5 days		
b ii 1/2c 1/2i	1	* a graph that indicates that the number of bacteria increases more slowly, starting at same point	accept a lower graph over the same time	the line must be below the dotted line for the first 2.5 days do not accept a horizontal line above the <i>x</i> axis as shown below
Total	5			

Tier 5–7	Q No 10			
Part	Mark	Answer	Accept	Additional Guidance
a i 2/2b	1	* enzyme(s)	accept '(hydrochloric) acid' accept 'biological catalyst' accept any named enzyme (e.g. amylase or protease)	<i>do not accept</i> other named acids 'catalyst' is insufficient 'saliva' is insufficient
a ii 2/2b	1	* it is broken down (into smaller molecules)	accept 'forms amino acids' accept 'breaks up'	'it is absorbed' is insufficient <i>do not accept</i> 'it breaks down into glucose'
b i 1/2d	1	any one from * as a control * to show that enzyme digested the jelly * to show that water does not digest the jelly	accept 'control' accept 'as a comparison' accept 'to show what would happen without the enzyme or pineapple'	'so that it is a fair test' is insufficient
b ii 1/2k 2/2b	1	any one from * it took less time to digest the jelly (than B) * chopped up jelly digested more quickly	accept 'it breaks it down or up more quickly' accept 'it only takes an hour to digest'	an explanation of why it is faster is insufficient 'it is easier to swallow' is insufficient 'it is easier to digest' is insufficient 'it digests in an hour' is insufficient
c i 1/2a	1	* 5 g cube of (chopped up) jelly and same amount or 15 cm ³ of juice	accept 'use same amount of jelly and juice'	<i>do not accept</i> 'water'
	1	* boil the juice first	accept 'use (fresh) boiled juice'	<i>do not accept</i> 'boiling juice'
c ii 1/2c	1	* the jelly was not digested	accept 'how much jelly had broken down' accept 'nothing happened' accept '5g of jelly (cubes)' accept 'a small amount of jelly has dissolved'	'nothing' is insufficient as it implies nothing is left in the test tube 'the jelly has not dissolved' is insufficient
Total	7			

Tier 5–7	Q No 11			
Part	Mark	Answer	Accept	Additional Guidance
a i 3/1f	1	* sodium carbonate		'Na ₂ CO ₃ ' is insufficient
a ii 1/2k 3/2g	1	* 18		
a iii 1/2k 3/2g	1	* 88		
b i 3/1a	1 1	* carbon dioxide sinks any one from * it prevents oxygen reaching the fire * carbon dioxide displaces (air containing) oxygen	accept 'the density of carbon dioxide is greater' accept 'fire is starved of oxygen'	'carbon dioxide is heavy' is insufficient 'carbon dioxide is heavier than air' is insufficient <i>do not accept</i> 'air' in place of oxygen 'it takes away oxygen' is insufficient 'the carbon dioxide keeps oxygen away from the fire' is insufficient as this implies it is an active process 'it suffocates or covers the fire' is insufficient
b ii 3/2c	1	* energy or heat is needed to evaporate the water	accept 'taking heat out of the fire'	'it makes the temperature less' is insufficient 'water cools the fire down' is insufficient
Total	6			

Tier 5–7	Q No 12	
Part	Marks	Answer Accept Additional Guidance
<p>a <i>1/2j</i></p>	<p>2</p>	<p>*</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>for all four correct, award two marks for any two or three correct, award one mark</p> <p>accept a cross drawn that lies within the width of the Sun for each planet, e.g.</p>

Tier 5–7	Q No 12	Answer	Accept	Additional Guidance
b BS/1f 4/4b	1	* 42	accept '150-108'	
	1	* 258	accept '150+108'	
c 4/2a	1	* 500	accept $\frac{150,000,000}{300,000}$ or $\frac{150 \text{ million}}{300,000}$ accept '8.3 minutes' accept 'about 8 minutes'	
d i 4/4c	1	*		both answers are required for the mark accept an answer within the dotted lines at either end of the ellipse
d ii 4/4c	1	* attracted by the Sun's gravity	accept 'increased gravity near to Sun'	
Total	7			



Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional Guidance
a 2/5c	1	any one from * less cellulose is needed or fewer cell walls produced or less glucose changed to cellulose * less glucose or energy needed or used for growth * more glucose is available to be changed into starch	accept 'less stalk is made' accept 'less glucose used in respiration' accept 'it does not have to grow as much' accept 'more glucose goes to the grain' accept 'blown over less easily or less frequently'	'less starch is used for growth' is insufficient <i>do not accept</i> 'the glucose gets to the grain quicker'
b i 2/4c	2	any two from * cross plants with short stalks and low grain mass with plants with long stalks and high grain mass * collect or plant the seeds * choose offspring with shortest stalks and which produce a high mass of grain	accept 'breed from varieties A and B' accept 'choose the best'	'mix varieties A and B' is insufficient
	1	* repeat with offspring or continue the whole process		a three mark answer must include two of the first three marking points and a reference to repeating or continuing the process

Tier 5–7	Q No 13			
Part	Mark	Answer	Accept	Additional Guidance
b ii 2/4c	1	any one from * disease resistance * pest resistance * drought tolerance * frost resistance * resistance to herbicides or weed killers * resistance to wind	accept 'strong stalk' or 'long roots' accept 'hardy' accept 'big or long leaves or lots of leaves' accept 'faster growing'	'increased amount of grain' or 'number of ears of corn' are insufficient 'more stalks' is insufficient accept 'corn' for 'wheat'
Total	5			