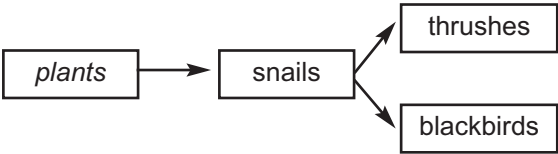
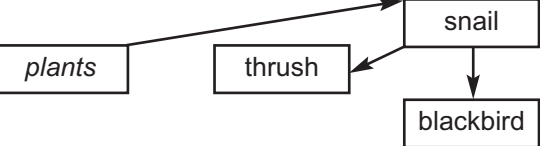
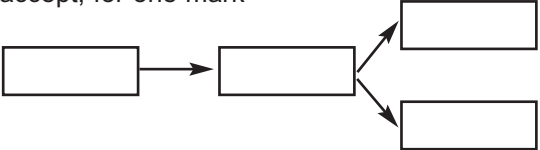
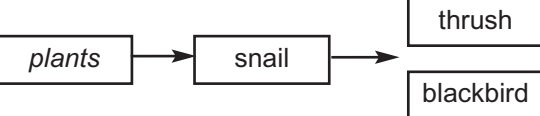
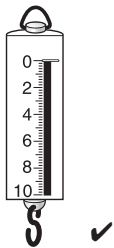


Tier 3–6	Q No 1			
Part	Mark	Answer	Accept	Additional Guidance
<b>a i</b> 3/1a	1	* <i>from a solid to a liquid</i>		<b>both</b> answers are required for the mark answers must be in the correct order
<b>a ii</b> 3/1a	1	any <b>one</b> from * his nose is hot <b>or</b> hotter  * the ground is colder	accept 'his nose is warm' accept 'his body (heat) melts the snow' accept 'heat' accept 'body temperature'	'the temperature is different' is insufficient
<b>a iii</b> 3/2a	1	* yes no no		<b>all three</b> answers are required for the mark answers must be in the correct order
<b>b i</b> 4/2b	1	* ↓	accept a downward arrow anywhere on or near the diagram	<b>do not accept</b> a response where the arrow is at a right angle to the board
<b>b ii</b> 4/2d	1	* friction		'air resistance' <b>or</b> 'drag' is insufficient 'pushing force' is insufficient
<b>Total</b>	<b>5</b>			

Tier 3–6	Q No 2	Answer	Accept	Additional Guidance
<b>a i</b> 1/2k 2/4b	1	any <b>one</b> from * the snail has a shell * the slug does not have a shell	accept 'the shell' accept 'patch on back'	references to size are insufficient
<b>a ii</b> 1/2k 2/4b	1	any <b>one</b> from * antennae * stalked eyes * shape of body	accept 'tentacles <b>or</b> feelers <b>or</b> horns'  accept 'mouth' accept 'no legs' accept 'no internal skeleton' accept 'they both produce mucus <b>or</b> are slimy <b>or</b> have a wet body' accept 'they have a muscular foot' accept 'slither along'	references to size are insufficient
<b>b</b> 1/2m 4/2d	1	* mucus reduces friction ✓		if more than one box is ticked, award no mark

Tier 3–6	Q No 2			
Part	Mark	Answer	Accept	Additional Guidance
c 2/5e	2	<p>*</p>  <pre> graph LR     plants[plants] --&gt; snails[snails]     snails --&gt; thrushes[thrushes]     snails --&gt; blackbirds[blackbirds]             </pre>	<p>accept, for two marks, other arrangements of arrows that are correct, e.g.</p>  <pre> graph LR     plants[plants] --&gt; snail[snail]     snail --&gt; thrush[thrush]     snail --&gt; blackbird[blackbird]             </pre> <p>accept, for one mark</p>  <pre> graph LR     A[ ] --&gt; B[ ]     B --&gt; C[ ]     B --&gt; D[ ]             </pre> <p>accept, for one mark</p>  <pre> graph LR     plants[plants] --&gt; snail[snail]     snail --&gt; thrush[thrush]     snail --&gt; blackbird[blackbird]             </pre>	<p>'thrushes' and 'blackbirds' may be in either order award one mark for the organisms in the correct place award one mark for the arrows showing the correct energy flow through the food web all <b>three</b> arrows are required for the mark</p>
d 2/4a	1	<p>any <b>one</b> from</p> <ul style="list-style-type: none"> <li>* they are camouflaged</li> <li>* they blend into their background</li> </ul>	<p>accept 'they are harder to see'</p> <p>accept 'birds or predators cannot see them'</p>	<p>'it is easier for them to hide' is insufficient 'fewer will be eaten' is insufficient as it does not refer to protection 'they are disguised' is insufficient</p>
<b>Total</b>	<b>6</b>			

Tier 3–6	Q No 3			
Part	Mark	Answer	Accept	Additional Guidance
<p><b>a i</b> 4/2c</p> <p><b>a ii</b> 4/2c</p> <p><b>a iii</b> 4/2c</p> <p><b>a iv</b> 4/2c</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p><i>moves to the left</i>   <i>moves to the right</i>   <i>stays still</i></p> <p>←   →</p> <p>* <input type="checkbox"/>   <input checked="" type="checkbox"/>   <input type="checkbox"/></p> <p>* <input type="checkbox"/>   <input type="checkbox"/>   <input checked="" type="checkbox"/></p> <p>* <input checked="" type="checkbox"/>   <input type="checkbox"/>   <input type="checkbox"/></p> <p>* <input type="checkbox"/>   <input type="checkbox"/>   <input checked="" type="checkbox"/></p>		<p>if more than one box is ticked in a row, award no mark for that row</p>
<p><b>b i</b> 1/2e</p> <p><b>b ii</b> 1/2e</p>	<p>1</p> <p>1</p>	<p>* </p> <p>any <b>one</b> from</p> <p>* newton meter</p> <p>* forcemeter</p>	<p>accept 'spring balance'</p>	<p>if more than one box is ticked, award no mark</p> <p>'balance' is insufficient</p> <p>'newtons' <b>or</b> 'N' is insufficient</p> <p>'meter' is insufficient</p> <p>'weighing scales' is insufficient</p>
<p><b>Total</b></p>	<p><b>6</b></p>			

Tier 3–6	Q No 4			
Part	Mark	Answer	Accept	Additional Guidance
<b>a i</b> 1/2k 2/4a	2	any <b>two</b> from * one has spots * one has upright <b>or</b> floppy <b>or</b> pointy ears * one has a straight <b>or</b> curvy <b>or</b> bent snout  * different shaped body * one is darker <b>or</b> lighter	accept 'the spots' <b>or</b> 'it has different markings' accept 'the ears' accept '(longer) nose <b>or</b> snout <b>or</b> face' accept 'shape of head' accept 'fatter' <b>or</b> 'thinner' accept 'they are different colours' accept 'length of legs'	'different shaped' <b>or</b> 'bigger' are insufficient 'skin' is insufficient
		<b>a ii</b> 2/4a	1	* variations ✓
<b>b</b> 2/4a	1	any <b>one</b> from * upright ears  * its snout is longer * its legs are longer	accept 'the ears' accept 'shape of head <b>or</b> body' accept 'its snout' accept 'its legs' accept 'thinner' <b>or</b> 'it is thin'	'smaller' is insufficient
<b>c i</b> 2/1e	1	* egg cell ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
	1	* sperm cell ✓		
<b>c ii</b> 2/2g	1	* fertilisation ✓		if more than one box is ticked, award no mark
<b>Total</b>	<b>7</b>			

Tier 3–6	Q No 5	Answer	Accept	Additional Guidance
<b>a</b> 1/2m	1	* roof tile statue	accept 'slate' accept 'marble'	<b>both</b> answers are required for the mark answers may be in either order
<b>b</b> 3/1d	1	any <b>two</b> from * greenhouse <b>or</b> frame * gate * watering can	accept 'aluminium' accept 'iron' accept 'steel'	<b>two</b> correct answers are required for the mark answers may be in either order
<b>c i</b> 3/3a	1	* oxygen	accept 'water vapour <b>or</b> steam'	'water' is insufficient
<b>c ii</b> 3/3a	1	* paint it	accept 'galvanise it' accept 'oil <b>or</b> grease it' accept 'varnish it' <b>or</b> 'put polish on it' accept 'wax it' accept 'coat it in plastic'	'use another metal' is insufficient  'polish it' is insufficient  'put a protective covering over it' is insufficient
<b>d</b> 3/1d	2	* iron ✓ * steel ✓		if more than two boxes are ticked, deduct one mark for each incorrect tick minimum mark zero
<b>Total</b>	<b>6</b>			

Tier 3–6	Q No 6													
Part	Mark	Answer	Accept	Additional Guidance										
<b>a</b> 1/2k	1	* 7 days												
<b>b</b> 1/2d	1	* air temperature and soil moisture ✓		if more than one box is ticked, award no mark										
<b>c</b> 1/2o	1	any <b>one</b> from * he only carried out his experiment at a medium light level * he only used one light level * he did not change the (amount of) light	accept 'he did not try other levels'	'it was not a fair test' is insufficient										
<b>d</b> 1/2l	2	* <table border="1"> <thead> <tr> <th>tray</th> <th>day 4</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>8</td> </tr> <tr> <td>B</td> <td>7</td> </tr> <tr> <td>C</td> <td>5</td> </tr> <tr> <td>D</td> <td>2</td> </tr> </tbody> </table>	tray	day 4	A	8	B	7	C	5	D	2	accept any whole number from 6 to 8 accept any whole number from 2 to 8 accept any whole number from 0 to 4	award two marks for all <b>four</b> correct answers award one mark for any <b>two</b> or <b>three</b> correct answers
tray	day 4													
A	8													
B	7													
C	5													
D	2													
<b>Total</b>	<b>5</b>													

Tier 3–6	Q No 7			
Part	Mark	Answer	Accept	Additional Guidance
<b>a</b> 1/2i 3/3d	2	* 7 * orange * an answer in the range 1–3 * purple	accept '1–3'	for <b>all four</b> rows correct, award two marks for any <b>two</b> or <b>three</b> rows correct, award one mark answers must be in the correct column and row in the table
<b>b</b> 1/2i BS/2b	1	any <b>one</b> from * they are corrosive * they burn <b>or</b> irritate	accept 'they can damage your skin <b>or</b> eyes'	'in case it touches your skin' is insufficient 'it is harmful <b>or</b> poisonous' is insufficient 'it can kill you' is insufficient 'wear gloves' is insufficient <i>do not accept</i> 'it is flammable'
<b>c i</b> 1/2i	1	* time, in days	accept 'time' accept 'days'	<i>do not accept</i> 'hours' or 'minutes'
<b>c ii</b> 1/2j	1	* it goes down <b>or</b> decreases	accept 'it becomes acidic' accept 'it goes from 6.5 to 2.5' accept 'the acid gets stronger'	'it goes red' is insufficient 'it goes sour' is insufficient  if the label for X is incorrect in part (ci), do not penalise again in part (cii)
<b>Total</b>	<b>5</b>			

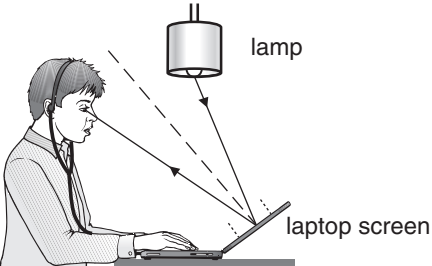


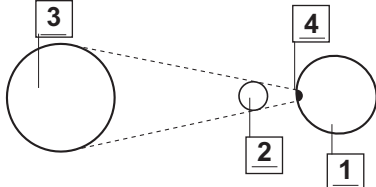
Tier 3–6	Q No 8	Answer	Accept	Additional Guidance
<b>a i</b> 1/2k 2/4b	1	* feathers	accept 'wings' accept 'beak' accept 'hollow <b>or</b> thin bones'	'it could fly' is insufficient
<b>a ii</b> 2/4b	1	* scales		
<b>b</b> 1/2o	1	any <b>one</b> from * only the imprint of feathers <b>or</b> bones are left <b>or</b> seen  * not enough evidence <b>or</b> proof * it is now extinct	accept 'they do not know whether it had feathers <b>or</b> scales' accept 'no feathers were found' accept 'its flesh <b>or</b> skin is not there' <b>or</b> 'only its bones are there'  accept 'there are no animals like it around today' accept 'they have not seen one'	'they do not know if it is a reptile or bird' is insufficient  'no evidence <b>or</b> proof' is insufficient  'they do not know what it looked like' is insufficient 'they do not know what colour it was' is insufficient
<b>c</b> 3/2f	1	* fossils		
<b>d</b> 3/2f	1	* it is too hot	accept 'they burn <b>or</b> melt' accept 'it is hot' accept 'heat'	'they are destroyed' is insufficient
<b>Total</b>	<b>5</b>			

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 <b>two</b> from * temperature in cold room  * style <b>or</b> 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
<b>d</b> 1/2f	1	* do not let the volunteer's body temperature go down too far	accept 'do not let him <b>or</b> the room get too cold' accept 'have a doctor nearby' accept 'monitor <b>or</b> check him' accept 'measure his heart rate <b>or</b> breathing rate' accept 'wear gloves' <b>or</b> 'keep his head warm' accept 'make sure the volunteer is healthy' <b>or</b> 'is not allergic to the material'	
<b>e</b> 1/2e 1/2p	1	any <b>one</b> from * monitor the temperature from outside the room  * it gives you a continuous record (of the temperature) * it is more accurate <b>or</b> 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
<b>Total</b>	<b>8</b>			

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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 <b>and</b> 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 <b>or</b> 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><b>both</b> answers are required for the mark answers must be in the correct order</p>
<p><b>Total</b></p>	<p><b>5</b></p>			

Tier 3–6 5–7	Q No 11 3	Part	Mark	Answer	Accept	Additional Guidance
		<b>a</b> 4/4b 1/2m	2	* 		for <b>all four</b> numbers in the correct place, award two marks  for any <b>two</b> or <b>three</b> numbers in the correct place, award one mark
		<b>b</b> 1/2l 1/2m 4/4b	1  1	any <b>one</b> from * 21st August * 22nd August * 23rd August  * 2017	accept dates written in another format	
		<b>Total</b>	<b>4</b>			

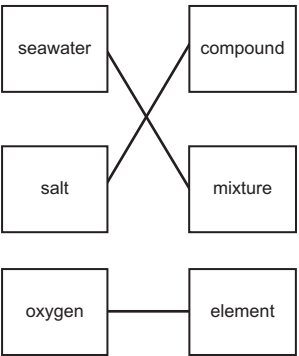
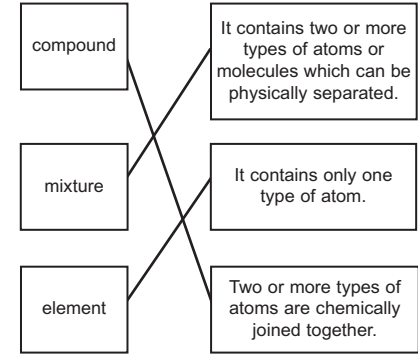
Tier 3–6 5–7	Q No 12 4	Part	Mark	Answer	Accept	Additional Guidance
		<b>a</b> 2/1b	2	any <b>two</b> from * it has a flagellum <b>or</b> tail to help it move  * it does not have a (cell) wall  * it does not have a vacuole * it has a reservoir (for taking in food)	accept 'can move <b>or</b> swim' accept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

Tier 3–6 5–7	Q No 13 5			
Part	Mark	Answer	Accept	Additional Guidance
<b>a</b> 1/2d	2	any <b>two</b> 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 <b>or</b> box' accept, for one mark, 'the same sized bridge' if not given with 'width' <b>or</b> 'length' <b>or</b> 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 <b>or</b> type'	'same height of bridge' is insufficient
<b>b i</b> 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		<b>both</b> answers are required for the mark
<b>b ii</b> 1/2n	1	any <b>one</b> 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 <b>one</b> 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 <b>only</b> 6.5cm'	if more than one box is ticked, award no mark <b>both</b> 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 <b>one</b> 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 <b>only</b> 3.0cm'  accept 'bridge A is about to break'	if more than one box is ticked, award no mark <b>both</b> 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
		<b>Total</b>	<b>6</b>			

Tier 3–6 5–7	Q No 14 6	Part	Mark	Answer	Accept	Additional Guidance
		<b>a</b> 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 <b>all three</b> correct boxes ticked, award two marks for any <b>two</b> correct, award one mark
		<b>b</b> 3/1h	1	* evaporate the water <b>or</b> evaporation	accept 'heat it' accept 'it goes from liquid to gas' accept 'boiling'	do <b>not accept</b> an incorrect use of evaporation, e.g. 'she evaporates salt from sand'
			1	* condense the water vapour <b>or</b> condensation	accept 'it goes from gas to liquid'  accept, for two marks, 'distil <b>or</b> distillation' accept, for one mark, 'condensation then evaporation'	do <b>not accept</b> '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> 		all <b>three</b> 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> 		all <b>three</b> 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 15 7			
Part	Mark	Answer	Accept	Additional Guidance
<b>a</b> 3/1c	1	* B ✓ C ✓		<b>both</b> answers are required for the mark if more than two boxes are ticked, award no mark
<b>b</b> 3/1d	2	any <b>two</b> from * it conducts electricity * it conducts heat  * it is ductile <b>or</b> malleable * it has a high melting <b>or</b> boiling point	 one mark may be awarded for 'it is a good conductor' if a reference to heat or electricity is not given  accept 'it is shiny' accept 'it is sonorous' accept 'it forms basic oxides'	 'it bends' is insufficient  'it is strong <b>or</b> hard' is insufficient
<b>c</b> 3/3a	1	* copper oxide	accept 'CuO'	<i>do not accept</i> 'copper dioxide'
<b>d</b> 3/2g 3/2a	1	* The atoms have combined in a different way to make a new substance. ✓		if more than one box is ticked, award no mark
<b>Total</b>	<b>5</b>			

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' <b>or</b> 'there are no bacteria' <b>or</b> 'bacteria cannot live' accept 'there is no acid' <b>or</b> '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 <b>one</b> 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 <b>or</b> kills bacteria' references to brushing are insufficient
		b 1/2d	1	any <b>one</b> 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 <b>or</b> removed' is insufficient <i>do not accept</i> 'to see how much decay is removed'

Tier	Q No	Part	Mark	Answer	Accept	Additional Guidance
3–6	16					
5–7	8					
		c i 1/2e	1	any <b>one</b> 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 <b>or</b> precise' is insufficient 'to see more clearly <b>or</b> more easily' is insufficient 'it is more detailed' is insufficient
		c ii 1/2h	1	* a number from 13 to 17 inclusive		
		<b>Total</b>	<b>6</b>			