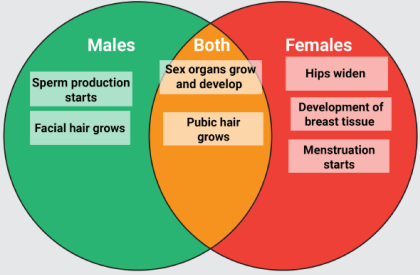
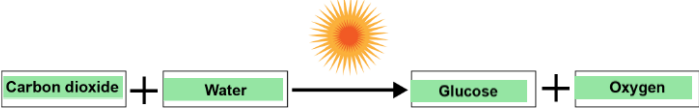


Question	Answers	Notes	Total	Crit	
1	a	Sea urchin <i>or</i> small fish <i>or</i> large crab		1	A
	b	Producers carry out photosynthesis <i>or</i> producers can convert/capture light energy  Into sugar <i>or</i> chemical energy <i>or</i> food for a consumer	<i>Accept references to autotrophs for mp1</i>  <i>WTTE Accept nutrition</i>	2	A
	c	<b><i>Accept any reasonable suggestion, for example [max 1]</i></b> <ul style="list-style-type: none"> <li>• Conservation zones or creation of national parks</li> <li>• Captive breeding program</li> <li>• Reintroduction into the wild</li> </ul>	<i>The role of humans in the action must be clear</i>	1	A
	d	Number of sea urchins has decreased  (as) more are being eaten by the sea otters  There are fewer sea urchins to eat kelp  (so) the number of kelp (plants) has increased	<i>Accept reference to prey with respect to sea urchins and otters eating them</i>	4	A

2	a	Carbohydrates <i>or</i> fats <i>or</i> sugars <i>or</i> named example	<i>"Protein" alongside a correct answer is a CON do not award a mark</i>	1	A
	b	Amino acids		1	A
	c	A The optimum pH is acidic or 1.9	<i>No ecf. First mark must be correct for second to be awarded</i>	2	A
	d	Diffusion (passively) moved from an area of high concentration to an area of lower concentration  <i>or</i> Active transport (actively) moved from an area of low concentration to an area of higher concentration	<i>Accept facilitated or passive diffusion</i>	2	A
	e	<b>Accept any feature, [max 2]</b> <ul style="list-style-type: none"> <li>• no nucleus</li> <li>• haemoglobin</li> <li>• biconcave disc <i>or</i> curved shape</li> <li>• small and flexible</li> </ul> <b>Accept any correctly linked explanation, [max 2]</b> <ul style="list-style-type: none"> <li>• to create more space</li> <li>• binds to oxygen (to transport around the body)</li> <li>• maximize surface area (to volume ratio)</li> <li>• can pass through <u>capillaries</u></li> </ul>	<i>Do not accept arteries or veins</i>	4	A

3	a	<table border="0" style="width: 100%;"> <tr> <td style="border: 1px solid black; padding: 5px; width: 50%; text-align: center;">Sex hormone</td> <td style="border: 1px solid black; padding: 5px; width: 50%; text-align: center;">Site of production</td> </tr> <tr> <td style="border: 1px dashed black; padding: 5px; text-align: center;">testosterone</td> <td style="border: 1px dashed black; padding: 5px; text-align: center;">testes</td> </tr> <tr> <td style="border: 1px dashed black; padding: 5px; text-align: center;">progesterone</td> <td style="border: 1px dashed black; padding: 5px; text-align: center;">ovaries</td> </tr> </table> <p>Correct row <b>or</b> correct column All correct</p>	Sex hormone	Site of production	testosterone	testes	progesterone	ovaries		2	A
Sex hormone	Site of production										
testosterone	testes										
progesterone	ovaries										
	b	 <p>One zone correct All correct</p>		2	A						
	c	<p>Two sex cells will come together (in fertilization) To produce offspring with 46 chromosomes</p>		2	A						
	d	<p>Female (genotype) is XX <b>and</b> male is XY Sperm can pass on either X or Y (chromosome) Egg always passes on X</p>		3	A						

4	a	 <p>all correct</p>	1	A
	b	<p><b>IV:</b> Temperature</p> <p><b>DV:</b> O<sub>2</sub> concentration or amount of O<sub>2</sub></p> <p><b>Accept any two control variables, for example [max 2]</b></p> <ul style="list-style-type: none"> <li>• CO<sub>2</sub> concentration</li> <li>• Length of plant stem</li> <li>• Type of plant</li> <li>• Light level</li> </ul>	Do <b>not</b> accept biomass	4 B
	c	<p><b>If:</b> The temperature increases</p> <p><b>Then:</b> oxygen concentration will increase</p> <p><b>Because:</b> (the rate of) <u>photosynthesis</u> increases</p>	ORA. Direction of change must be stated.	3 B
	d	<p>260.666...</p> <p>261</p>	Award 2 marks for correct answer only	2 C
	e	Add units for temperature to the table		1 C
	f	<p>Results do not support the prediction from 20(°C) to 40(°C)</p> <p>Results support the prediction as temperature rises above 40(°C)</p> <p><b>or</b></p> <p>There is insufficient data to draw a conclusion</p> <p>At least five increments <b>or</b> temperatures are needed to show a reliable trend</p>		2 C

<b>5</b>	<b>a</b>	<p><b>Accept any two reasonable CV, for example [max 2]</b></p> <ul style="list-style-type: none"> <li>• One CV associated with plant eg stem length or type of plant or number of leaves</li> <li>• light level/intensity was not controlled</li> <li>• Initial O<sub>2</sub> concentration</li> </ul>		<b>2</b>	C
	<b>b</b>	<p>To control the temperature <b>or</b> temperature is a control variable</p> <p>This is the optimum temperature for the reaction <b>or</b> the reaction will take place quickly</p>	WTTE	<b>2</b>	B
	<b>c</b>	<p><b>Accept any reasonable suggestion, for example [max 2]</b></p> <ul style="list-style-type: none"> <li>• more trials/repeats</li> <li>• more increments of IV <b>or</b> intermediate values of IV</li> <li>• there is no control experiment (with CO<sub>2</sub>=0% <b>or</b> atmospheric CO<sub>2</sub> level)</li> </ul> <p><b>Accept any correctly linked justification, for example [max 2]</b></p> <ul style="list-style-type: none"> <li>• more reliable data <b>or</b> allows identification of outliers <b>or</b> can calculate an average <b>or</b> more accurate results</li> <li>• more values give a clearer pattern</li> <li>• cannot establish a baseline</li> </ul>	WTTE	<b>4</b>	C
	<b>d</b>	<p>As the concentration of CO<sub>2</sub> increases the rate of photosynthesis increases (below 0.10%)</p> <p>The line plateaus (above 0.10% CO<sub>2</sub>)</p> <p>Value of 0.10% correctly referenced</p> <p>Because CO<sub>2</sub> is limiting (below 0.10%)</p> <p>Other limiting factors are involved (above 0.10%)</p>		<b>5</b>	C
	<b>e</b>	Increase the temperature <b>or</b> light intensity		<b>1</b>	C

<b>6</b>			<b>1 mark</b>	<b>2 marks</b>	<b>3 marks</b>	<b>4 marks</b>	<b>15</b>	<b>B</b>
	<b>Variables</b>	IV as light intensity <i>or</i> a measurable DV <i>or</i> one CV is identified	IV as light intensity <i>and</i> a measurable DV <i>and</i> one CV is identified	IV as light intensity <i>and</i> a measurable DV <i>and</i> two CV are identified				
	<b>Hypothesis</b>	Formulates a hypothesis connected to a relevant variable	Formulates a testable hypothesis correctly linked to a (stated) DV (no explanation)	Formulates a testable hypothesis correctly linked to a (stated) DV with correct scientific explanation				
	<b>Equipment (included in method)</b>	Some relevant equipment is referenced	Equipment to measure (stated) DV <i>and</i> manipulate IV	Equipment to measure (stated) DV <i>and</i> manipulate IV <i>and</i> monitor at least one CV				
	<b>Method</b>	Attempt at a method but detail is insufficient to collect relevant data	Detail of the method is incomplete but some relevant data could be collected	Detail of method is sufficient to follow and similar data could be collected	Detail of method is sufficient to repeat the experiment			
	<b>Data</b>	Plans to repeat at least three trials <i>or</i> to collect data for at least five increments	Plans to repeat at least three trials <i>and</i> to collect data for at least five increments					

<b>7</b>	<b>a</b>	Plant W		<b>1</b>	C
	<b>b</b>	Boric acid does not have an impact on the pest species attacking those plants  <b>or</b> Not all plants are affected by pests	<i>Allow reference to plant X only</i>	<b>1</b>	C
	<b>c</b>	To control all other variables		<b>1</b>	C
	<b>d</b>	Plant W – 4%  Plant Y – 6%		<b>2</b>	C
	<b>e</b>	The farmer should use 6%  Because, 6% is the lowest concentration which gives maximum yield of both plants	<i>WTTE</i>	<b>2</b>	C

8	a	<p><b>Similarity: Accept any reasonable trend, for example [max 1]</b></p> <ul style="list-style-type: none"> <li>Number of new cases increases and then decreases with age in both males and females</li> </ul> <p><b>Difference: Accept any reasonable trend, for example [max 1]</b></p> <ul style="list-style-type: none"> <li>Males increase until 74 (peak) while females increase until 69 (peak)</li> <li>Female cases higher than males 0 – 59 and 85+ / male cases higher than females 60 - 84</li> </ul>		2	D
	b	<p>(Greater) exposure to (named) risk factor(s) over time</p> <p><b>Accept a correctly linked justification [max 1]</b></p> <ul style="list-style-type: none"> <li>Greater chance of mutations occurring</li> <li>(and) more mutations can accumulate over time</li> </ul>		2	D
	c	<p><b>Accept any reasonable positive impact, for example [2 max]</b></p> <ul style="list-style-type: none"> <li>Good for mental health / SAD</li> <li>Vitamin D production / Calcium absorption and strong bones / Rickets</li> <li>Able to do sports outside</li> </ul> <p><b>Accept any reasonable negative impact, for example [2 max]</b></p> <ul style="list-style-type: none"> <li>Increased risk of (skin) cancer</li> <li>Cataracts</li> <li>Sunburn</li> </ul> <p>A brief concluding statement</p> <p>A statement giving advice linked to minimizing health concerns</p>		6	D

9							
			<b>1 mark</b>	<b>2 marks</b>	<b>3 marks</b>	<b>4 marks</b>	
	Medical	One statement of a medical benefit	Two statements of a medical benefit <i>or</i> One statement of a medical benefit with further development	Two statements of a medical benefit, one with further development	Two statements of a medical benefit, both with further development		
	Economic	One statement of an economic consideration	Two statements of an economic consideration <i>or</i> One statement of an economic consideration with further development	Two statements of an economic consideration, one with further development	Two statements of an economic consideration, both with further development		
	Ethical	One statement of an ethical consideration	Two statements of an ethical consideration <i>or</i> One statement of an ethical consideration with further development	Two statements of an ethical consideration, one with further development	Two statements of an ethical consideration, both with further development		
	Conclusion	A simple conclusion is stated	A conclusion is stated with further development				
						14	D