

New  
Specification



*Rewarding Learning*

**General Certificate of Secondary Education  
2012–2013**

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**Double Award Science: Biology**

Unit B1

Higher Tier

[GSD12]

**MONDAY 12 NOVEMBER 2012**

**1.30 pm–2.30 pm**

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**MARK  
SCHEME**

- 1 (a) 

Fat	Ethanol		White
Protein	Biuret	Blue	

 [4]
- (b) Energy intake/food intake is higher/too much food eaten/junk food/bad food is cheaper/cheap alcohol [1]  
Not enough exercise/sedentary lifestyle described [1] [2]
- (c) sodium/salt/fat/cholesterol [1]  
glucose/sugar [1] [2]
- (d) (i) **Indicative Content:**
- Place DCPIP in test-tube
  - Add drops of juice to the DCPIP
  - Shake/mix
  - Count the number of drops of juice (needed to produce colour change in the DCPIP)
  - DCPIP goes colourless/clear or changes from blue to clear or changes from blue to pink/clear
  - Repeat for the other orange juice
  - The fewer the drops of juice needed the more vit. C or converse – more drops needed the less vit. C present (one that changes the fastest has most vit. C)
  - Repeat for reliability – same juice several times
  - Controlled variable – same amount of mixing/shaking – or same volume of DCPIP in both test-tubes

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout using at least <b>5</b> of the above points (which must include a controlled variable) to describe in a logical sequence how they would compare the amounts of vitamin C in freshly squeezed orange juice and processed orange juice. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use some appropriate specialist terms throughout using <b>3</b> or <b>4</b> of the above points to partially describe how they would compare the amounts of vitamin C in freshly squeezed orange juice and processed orange juice. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe using <b>1</b> or <b>2</b> of the above points how they would compare the amounts of vitamin C in freshly squeezed orange juice and processed orange juice. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

- (ii) More accurate determination of volume/size of drops can be variable [1]

AVAILABLE  
MARKS

15

		AVAILABLE MARKS	
2	(a) Place where an animal or plant is found/lives	[1]	
	(b) 1. Pitfall trap [1] 2. Sweep net/net [1]	[2]	
	(c) Vegetation figure correctly plotted [1] Air figure correctly plotted and shaded [1]	[2]	
	(d) Spiders	[1]	
	(e) Any <b>three</b> from: <ul style="list-style-type: none"> <li>• less insects/food</li> <li>• for chicks to feed on</li> <li>• so population decreases</li> <li>• fewer breeding adults as chicks do not survive to adults</li> </ul>	[3]	
3	(a) $-6.8/-7\% =$ [2]	[2]	
	(b) Decreasing (emissions)	[1]	
	(c) Any <b>three</b> from: <ul style="list-style-type: none"> <li>• While renewable does not produce carbon dioxide</li> <li>• Does not contribute to global warming</li> <li>• The cost of producing electricity is far greater than the non-renewables</li> <li>• People not prepared to pay extra cost</li> </ul>	[3]	
4	(a) Any <b>two</b> from: <ul style="list-style-type: none"> <li>• They break down <b>starch/fat/protein</b>/food</li> <li>• From large to small molecules/named correctly</li> <li>• From insoluble to soluble molecules</li> <li>• So that these can be absorbed/taken into the bloodstream</li> <li>• Biological catalyst/speed up chemical reactions</li> </ul>	[2]	
	only allow large surface area once	(b) (i) Long/large surface area	[1]
		(ii) Has villi/microvilli/good blood supply/walls only one cell thick/ lacteals/folds/large surface area/folded/semi-permeable/ permeable/short diffusion distance	[1]

		AVAILABLE MARKS
<p>(c) (i) <b>Tube A</b> Any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• (Amylase) breaks down starch (into glucose)</li> <li>• sugar/glucose passes through pores of Visking tubing/into water/solution/boiling tube</li> <li>• Benedict's turns <b>from blue to</b> brick red</li> </ul> <p><b>Tube B</b> Any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• Amylase does not break down the starch/starch not broken down</li> <li>• Enzyme it is destroyed/damaged (by boiling)</li> <li>• Negative result for Benedict's/remains blue/no colour change</li> <li>• No glucose present</li> </ul> <p>(ii) Enzyme specificity/lock and key fit/protease doesn't break down starch/only breaks down protein/only amylase breaks down starch/starch doesn't fit protease/no substrate for protease</p>	<p>[2]</p> <p>[2]</p> <p>[1]</p>	<p>9</p>
<p>5 (a) x-axis scale [1] y-axis scale [1] all points correctly plotted [1] points joined by straight lines [1]</p> <p>(b) When lamp is 10–15 cm away from plant, lots/more oxygen production/longer bubble/bubble [1] As lamp is moved away, less oxygen produced [1]</p> <p>(c) At lower light intensity/longer distances, as light increases photosynthesis increases [1] At shorter distances/higher light intensity, light does not limit rate of photosynthesis/something else is limiting [1]</p> <p>(d) Any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• temperature</li> <li>• pH</li> <li>• carbon dioxide</li> <li>• size of plant</li> <li>• wattage/power of lamp/size of bulb</li> </ul> <p>(e) Some of the oxygen will be used in <b>respiration</b>/some of the oxygen will dissolve in the water/funnel does not capture all bubbles produced/O<sub>2</sub> escapes into atmosphere</p>	<p>[4]</p> <p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[2]</p> <p>[1]</p>	<p>11</p>

		AVAILABLE MARKS
6	<p>(a) 1. Nitrifying bacteria [1] 2. Denitrifying bacteria [1]</p>	[2]
	<p>(b) Any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>• plants use <b>root hair cells</b></li> <li>• nitrates taken up by <b>active transport</b>/active uptake</li> <li>• process needs oxygen/respiration/energy</li> <li>• taken up against a concentration gradient/described</li> </ul>	[3]
	<p>(c) Any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>• decay/decomposition of algae</li> <li>• by bacteria</li> <li>• (bacteria) which uses up oxygen</li> <li>• fish/aquatic animals die</li> </ul>	[3]
	<p>(d) Amino acids/protein/nucleic acid/chlorophyll/urea</p>	[1]
9		
7	<p>(a) Liver</p>	[1]
	<p>(b) Any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• Converts glucose to glycogen</li> <li>• <b>Increases</b> respiration of glucose</li> <li>• <b>Increased</b> uptake</li> <li>• Converted to fat</li> </ul>	[2]
	<p>(c) Any <b>two</b> from:</p> <ul style="list-style-type: none"> <li>• nervous is very fast/hormonal is slow</li> <li>• nervous system is electrical/hormone system chemical</li> <li>• nervous travels along nerves/hormones travel in the blood</li> <li>• nervous does not affect target organs/hormones do affect target organs/nervous system more specific</li> </ul>	[2]
5		

**8 Indicative Content:**

- Midnight**
- indicator is yellow
  - plants respire/produce carbon dioxide/high CO<sub>2</sub>
  - no photosynthesis occurs
- 8 am**
- indicator is red
  - photosynthesis and respiration are balanced/equal/ at same rate/compensation point
  - carbon dioxide absorbed equals carbon dioxide given out
- 2 pm**
- indicator is purple
  - photosynthesis is greater than rate of respiration
  - more carbon dioxide taken in than is given out

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout using at least <b>5</b> of the above points to describe and explain the results. Answers must include the colour changes at the three times. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates must use some appropriate specialist terms throughout using <b>3</b> or <b>4</b> of the above points to describe and explain the results. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe and explain, using <b>1</b> or <b>2</b> of the above points, the results expected from this experiment. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and they have made little use of specialist terms.	[1]–[2]
D	Response not worthy of credit.	[0]

[6]

**Total**

6

**70**AVAILABLE  
MARKS