



**General Certificate of Secondary Education  
2011**

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**Science: Double Award (Modular)**

Paper 1  
Foundation Tier

[G8201]

**THURSDAY 19 MAY, AFTERNOON**

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**MARK  
SCHEME**

		AVAILABLE MARKS			
1	(a) (i) sugar/glucose; energy;	[2]	15		
	(ii) red blood cell/haemoglobin;	[1]			
	(iii) diffuses into blood/plasma/tissue fluid	[1]			
	(b) (i) blood vessel from body organs to right atrium of heart; blood vessel from right <i>ventricle</i> of heart to lungs; blood vessel from lungs to left atrium of heart; blood vessel from left <i>ventricle</i> to body organs;	[4]			
	(ii) Aorta;	[1]			
	(iii) needs to pump blood all around the body	[1]			
	(c) rises; drops; doesn't drop as low as starting level; quickly rises just after booster (day 16)/steeper gradient than 1st rise; rises to higher level;	[5]			
	2	(a) (i) sperm egg/ovum;		[2]	13
		(ii) testes; ovary;		[2]	
		(iii) fertilisation		[1]	
(b) (i) uterus;		[1]			
(ii) 9;		[1]			
(iii) glucose/amino acids/vitamins/minerals or named/water <b>not</b> oxygen/ <b>not</b> protein		[1]			
(c) contractions of uterus; mucus plug comes away; waters break; cervix dilates; baby moves down birth canal; headfirst; umbilical cord is cut; afterbirth; ( <i>any three</i> ) – in correct order		[3]			
QWC – 2 biological statements		[2]			

- 3 (a) (i) iodine; [1]
- (ii) edges – not shaded & centre shaded [1]
- (iii) centre has chlorophyll;  
(to traps light) for photosynthesis; [2]
- (b) (i) sunlight/sun/light [1]
- (ii) 2 and 3/2 and 3rd (need both) [1]
- (iii) marsh vegetation → grasshopper → herring → bald eagle  
(1 correct food chain, 1 arrows) → but must have marsh  
vegetation [2]
- (iv) population increases; more grasshoppers to eat/or more food/  
less competition for food/more marsh veg to eat; [2]
- (v) mosquito as top bar; salmon and seal [2]
- (vi) mosquito at top; mosquito smallest; symmetry + pyramid +  
steps;  
all rest bars all labels correct in correct order; [4]
- (c) (i) Effect – reduces population/number prey  
Explanation – more prey eaten/killed [2]

(ii)

Factor	Effect on population size
Immigration	Increase
Birth rate higher than death rate	Increase
Disease	Decrease

[3]

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		AVAILABLE MARKS
4	(a) (i) CO <sub>2</sub> – global warming; SO <sub>2</sub> – acid rain; Soot – reduces photosynthesis	[3]
	(ii) wind; solar power; wave; tidal power; geothermal; hydro electric; nuclear; water turbines; <i>any two</i>	[2]
	(b) (i) glass – bottle bank/recycling bin/reuse veg peelings – compost/feed to animals/brown or green bin/ use as fertiliser	[2]
	(ii) less fuel used transporting rubbish to landfill; less fuel used in manufacturing new materials; less artificial fertiliser manufactured; less raw materials being quarried; less polluting gases/less CO <sub>2</sub> /less global warming/just one gas; landfill sites not being filled so quickly less incineration; save forests/resources/fossil fuels <b>not</b> less pollution/less waste unqualified ( <i>any two</i> )	[2]
	(c) A – Photosynthesis; B – Respiration; C – Combustion/burning	[3]
5	(a) (i) DNA/genetics; Genes; environment;	[2]
	(ii) The animals in the population in the future would be taller/average height would be taller	[1]
	(b) A – gene/allele; B – chromosome; C – nucleus/nuclear membrane	[3]
	(c) (i) skin	[1]
	(ii) <i>Any two</i> cover up (e.g. wear hat); stay in the shade or out of the strongest sun e.g. 11 am–3 pm; use a sunscreen; don't use sunbeds; use fake tan;	[2]
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<b>(d) (i)</b> Cystic Fibrosis; colour blind/dwarfism	[1]	AVAILABLE MARKS
<b>(ii)</b> There are 3 chromosomes/extra chromosome/ extra No 21 chromosome	[1]	
<b>(iii)</b> Female; it has 2 X chromosomes/2 the same chromosomes/ no Y chromosome	[2]	
<b>(e) (i)</b> Bb, × bb this order;	[2]	
<b>(ii)</b> Punnett square; Correct cross;	[2]	
<b>(iii)</b> Phenotypes: Black (spots)      brown (spots) Ratios:                    1                    :                    1	[2]	
<b>Total</b>		<b>19</b>
		<b>80</b>