



Rewarding Learning

**General Certificate of Secondary Education
2011**

Science: Biology

Paper 2
Foundation Tier

[G0902]

THURSDAY 2 JUNE, MORNING

**MARK
SCHEME**

- 1 (a) (i) 14, 20, 66; [2]
- (ii) Recycling; [1]
- (iii) Any **TWO** from:
Leaching/release of toxic chemicals;
Sight/smell/described;
Increased methane/CO₂/greenhouse gas;
Using up more land; [2]
- (b) (i) 30; [1]
- (ii) Reduced/smaller/lower/shorter/decreases; [1]
- (iii) Any **TWO** from:
Burn less fossil fuels;
Use alternative energy sources/described;
Greater use of public transport/described;
Catalytic convertors/chimney scrubbers;
Lead free petrol;
Reduce use of aerosols; [2]
- (iv) **Burning** Fossil fuels/named example; [1]
- (c) (i) Cutting down (mature) trees; [1]
- (ii) Any **TWO** from:
Increased oxygen;
Decreased carbon dioxide;
Less soil erosion/reduces flooding;
Fewer habitats lost; [2]
- (d) (i) Height: 25–30, 19–23; [1]
Weight: 600; 300; [2]
Tail: Short **and** rounded, Long **and** bushy; [1]
- (ii) Any **ONE** from:
Grey can eat/digest wider range of foods;
Grey breed more often/have larger litters;
Grey immune to/carries viral disease which kills red; [1]

AVAILABLE
MARKS

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			AVAILABLE MARKS	
2 (a)	(i)	A – Red blood cell;	[1]	22
		B – White blood cell;	[1]	
		C – Platelet;	[1]	
	(ii)	19:1;	[1]	
	(iii)	Transports oxygen;	[1]	
	(iv)	Any <i>TWO</i> from:		
		A no nucleus and nucleus in B;		
		A biconcave shape and B round shape;		
		A smaller/B larger;	[2]	
	(v)	Plasma;	[1]	
		transport;	[1]	
	(vi)	C/platelets;	[1]	
	(vii)	Stops blood loss;	[1]	
	<i>Prevents</i> infection/microorganism entering blood;	[1]		
(b)	(i)	A – Heart;	[1]	
		B – Lung(s);	[1]	
		C – Aorta;	[1]	
		D – Hepatic vein;	[1]	
	(ii)	Arrow draw pointing towards the liver;	[1]	
(c)		Thick; Fast/spurts;	[2]	
		Yes; Slow;	[2]	
		No;	[1] [5]	

- 3 (a) (i) A – petal; [1]
 B – stigma; [1]
 C – sepal; [1]
 D – ovule; [1]
- (ii) Filament longer than top of stigma **and** starts in correct area; [1]
 anther on top of filament. [1]
- (iii) Transfer of pollen from anther; to stigma; [2]
- (iv) Any **TWO** from:
Nectar;
 brightly coloured petals;
 scent;
 anther above stigma; [2]
- (b) (i) Seed labelled with line; [1]
- (ii) Bright colour; [1]
 Sweet smell/taste; [1]
- (iii) Prevent it being **digested**; [1]
- (iv) Wind; self/explosive; animal; [3]
- (c) (i) Iodine; [1]
- (ii) Boil; in Benedict's solution; [2]
- (iii) Does not contain starch; but does contain sugar; [2]

AVAILABLE
MARKS

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- 4 (a) (i) Less light; [1]
- (ii) *Absorbed* by plant/as energy source/chlorophyll; [1]
 (During) photosynthesis/produce glucose/starch; [1] [2]
- (iii) Any **TWO** from:
 Temperature; [2]
 Water/drainage/rainfall/humidity;
 pH;
 Minerals/nitrates/fertilizer;
 CO₂;
 Wind exposure;
- (iv) x-axis label – Sample Areas [1]
 Accurate plots (×2); [2]
- (b) (i) A, C, D; [1]
- (ii) Any **TWO** from:
 Wings; [2]
 Body temperature not constant;
 Lay eggs;
 No backbone;
- (iii) Arthropods; [1]
- (iv) Legs; [1]
- (c) (i) Death rate **higher/faster**; [1]
than birth rate; [1]
- (ii) People leaving Ireland/moving away from/moving out of [1]
 (Ireland);
- (iii) Any **TWO** from:
 Improved food supply;
 Improved medical care/less disease;
 Improved sanitation/housing/standard of living;
 Increased immigration/birth rate/decreased death rate; [2]

AVAILABLE
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- 5 (a) (i) Support/protection/movement; [1]
 Digestive system; [1]
 Transport/explained; [1]
 Nervous; [1]
- (ii) Group of **organs** working together; [1]
- (iii) Air is warmed/moistened; [1]
 Mucus traps dust/bacteria/air filtered (by hairs); [2]
- (b) (i) A – Trachea; [1]
 B – Bronchiole; [1]
- (ii) Any **THREE** from:
 Large surface area; good blood supply;
 Thin; moist; good diffusion/concentration gradient;
 Permeable; [3]
- Quality of written communication [2]
- (c) (i) 120,000 [1]
- (ii) 83; [1]
 Heart disease; [1]
 Lung cancer; 82; [1]
- (iii) 10 cigarettes per day **8 times** risk of
 dying compared to non smokers;
 30 per day have **25 times** the risk; [2]
- (iv) Tar; [1]
- (v) Addiction to nicotine; [1]

AVAILABLE
MARKS

22

6	(a)	Cell wall	✓	✗	[1]	AVAILABLE MARKS		
		Cytoplasm	✓	✓	[1]			
		Chloroplast	✓	✗	[1]			
		Vacuole	✓	✗	[1]			
	(b)	(i)	A – Epidermis;				[1]	
			B – Cortex;				[1]	
			C – Vascular bundle;				[1]	
		(ii)	Transport; sucrose/sugar/products of photosynthesis/food;				[2]	
		(iii)	Arrow pointing up in xylem;				[1]	
		(iv)	Transpiration;				[1]	
(v)		Osmosis;			[1]			
(vi)	Size of cell; shape /size of vacuole; position of nucleus ;			[3]				
(vii)	Root hair (cell); large surface area; to absorb water/minerals;			[3]	18			
Total						120		