

New
Specification



Rewarding Learning

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 1 (Biology)

Higher Tier

[GSS12]

MONDAY 12 NOVEMBER 2012

1.30 pm–2.45 pm

**MARK
SCHEME**

1 (a) (i)

	R	r
r	Rr	rr
R	RR	Rr

1 – parents [1]
 1 – each row F1 [2]
 [use ncm for offspring if parents incorrect]

(ii) 25%/1 in 4/1:3 [allow ncm] [1]

(b) (i) does not change/narrow range/discrete groups/small number of groups [not can be put into groups] [1]

(ii) Any example (e.g. eye colour, blood groups, ear lobes, sex) [1]

(c) descending curve [1]
 levelling out [1] [2]

AVAILABLE MARKS

8

2 Indicative content

- (Huge) increase over short time/1800–2000
- Increase more in future
- Increased demand for resources/supplies, e.g. food/will run out quicker
- Increased *pollution*
- Example of *pollution* ×2 e.g. carbon dioxide/sewage/nitrate/more fossil fuels burnt/more global warming [any two of final bullet point]

Band	Response	Mark
A	Candidates must use appropriate specialised terms throughout to explain the concern in a logical sequence using 5 or 6 of the IC. SPG, form and style is of a high standard.	[5–6]
B	Candidates use some appropriate specialised terms to partially describe the concern using 3 or 4 of the IC. SPG, form and style is of a satisfactory standard.	[3–4]
C	Candidates describe the concern using 1 or 2 of the IC. However these are not in a logical sequence. SPG, form, style and use of specialised terms are limited.	[1–2]
D	Not worthy of credit.	[0]

6

- 3 (a) (i) A-microorganisms trapped [1] swan neck/bend [1] could not reach soup [1]/B – not trapped [1] no bend [1] could reach soup [1] [not just can or cannot cause contamination] [3]
- (ii) knew to stop microorganisms getting in/cover wounds [1]
- (b) (i) only affect diseases caused by bacteria [1] flu viral [1] [2]
- (ii) TB/gonorrhoea/salmonella/chlamydia/MRSA/tonsillitis/meningitis/acne/tetanus [1]

AVAILABLE
MARKS

7

4 (a)

Differences	Voluntary	Reflex
speed of response	<i>slow/varies</i>	<i>fast</i>
response to stimulus	<i>varies</i>	<i>always the same</i>

$\frac{1}{2}$ mark each response, rounded down [2]

- (b) (sound) receptors/ear sends signal [1] signal to coordinator/brain [1] effector/muscles [1] or sensory neurone [1] sends signal to relay neurone [1] sends signal to motor neurone [1] [3]

- (c) slows reactions/depressant [1] quicker/more alert/stimulant [1] [2]

7

- 5 (a) 90% [1]

- (b) Group two more effective (as reduced more) [not just reference to or quoting figures] [1]

- (c) bigger drop for female groups than men [1] bigger drop initially [1] did not stop all of the women [1] [3]

- (d) small numbers [1] short time [1] [2]

7

- 6 (a) protect (species) numbers [1] protect habitat [1] protect food supply [1] less pollution [1] no fishing [1] no wind turbines [1] [not just protected on own] Any 3 [3]

- (b) restricts operations/financial implications [1]

- (c) (i) biodiversity [1]

- (ii) economic benefits e.g. food/clothing/shelter/fuel/medicines ecological/recreational/cultural/aesthetic Any 2 [2]

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- 7 land – recycling/reducing/reusing/any valid [1]
land/water/air – scrubbers/desulphurisation methods/catalytic converters/
renewable sources/alternative energy [1] [3]
water – reduce use of fertilisers/do not use when raining/any valid [1] [3]

AVAILABLE
MARKS

3

8 (a) Indicative content

- 19% to 35% (+/- 1) or doubled/it increases and decreases
- Plants (evolved)
- Photosynthesis started/O₂ produced
- Animals (evolved)
- Animal respiration possible
- Uses oxygen

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe five or six points above. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5–6]
B	Candidates use some appropriate specialist terms to describe three or four of the points above in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3–4]
C	Candidates describe one or two of the above points. 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. The form and style are of a limited standard.	[1–2]
D	Response not worthy of credit.	[0]

[6]

- (b) denied role of God/uniqueness of man/reduced power *Any 2* [2]

8

- 9 (a) (i) worked together/helped each other [1]

- (ii) 3D structure/spiral shape/helix shape/bases inside [1] x-ray diffraction [1] [2]

- (b) (i) Watson and Crick [1]

- (ii) Equal amounts [1] A and T/C and G [1]
[A = T and C = G; 2 marks] [2]

6

			AVAILABLE MARKS
10 (a) (i)	decay/decomposition [1] nitrification [1]	[2]	7
(ii)	(over)farming/deforestation/(any valid answer that implies man stopping decomposition) [1] with suitable explanation [1]	[2]	
(b)	increase in combustion/use of fossil fuels [1] more CO ₂ /global warming/greenhouse effect [1] deforestation/reduced photosynthesis [1]	[3]	
11 (a) (i)	sisters	[1]	9
(ii)	person 4 – Cc [1] person 6 – cc [1]	[2]	
(iii)	25%/1 in 4/1:3	[1]	
(b) (i)	extra chromosome [1] 21st pair [1]	[2]	9
(ii)	cf. one allele/gene affected [1] one amino acid/protein affected [1] Down syndrome many genes affected [1] many amino acids/proteins affected [1]	Any 3 [3]	
		Total	75