External Assessment Report 2012

Subject(s)	**Biology**
Level(s)	**Higher**

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the examination.

Comments on candidate performance

General comments

The **general performance** of candidates in the 2012 Higher Biology Examination was excellent and this has resulted in increased average marks and improvements to pass rates. Improvement was especially noticeable in Section A and, to some extent, in Section C.

Literacy levels were good and there was sustained improvement in answers to Extended Response questions in Section C especially in Question 2. Candidates had difficulty with the use of comparative terms when describing differences between observations. There was some evidence of confusion between describing data and drawing conclusions from it. Spelling of biological terms was generally better than last year.

Numeracy levels were again good but candidates should be aware of the need to include units in numerical answers and in answers which involve describing data as appropriate. The presentation of data was improved including good graph scaling and axis labelling. There were excellent responses to questions in Section B which required calculations including percentage change, average and ratio. In describing trends in data, candidates should be aware of the crucial importance of changes in data trends and the need to quote figures and units when describing these.

Note

As always, certain questions are designed with the specific intent that they challenge candidates and allow the demonstration of knowledge and skills related to Grade A. These questions are listed below.

Section A

Questions 6, 8, 12, 16, 21, 25, 28, 29

Section B

Unit 1

Question 1 (a)(iii)(1), (b)(2)
Question 4 (c), (f)(1)
Question 5 (a)(i), (a)(ii)

Unit 2

Question 6 (a)(1)
Question 7 (a)(ii)
Question 8 (a)(i)(1)
Question 9 (a), (b)(1), (c)(1)
Question 10 (a)(i)(1), (a)(ii)

Unit 3

Question 10 (b), (d), (e), (f)(1)
Question 11 (b)(i)(1)
Question 12 (a)(ii), (b)(i)
Question 13 (a)(iii)(1) and (iv)
Question 14 (a)(i)(1), (b)(1)
Question 15 (a)(ii)(2)

Section C

Some extended response marks, often those with two-part explanations are designed to be more demanding than others.

Areas in which candidates performed well

Section A

Candidates performed especially well in Questions 1, 3, 4 and 8 from Unit 1; Questions 15 and 17 from Unit 2; and Questions 24, 25, 27 and 30 from Unit 3.

Section B

The following questions were answered well:

Question 1 (a): Unfamiliar context
Question 2: Familiar context
Question 3 (b) and (c): Good grasp of the important comparative terms isotonic, etc shown
Question 4 (practical setting): More evidence of understanding of the concept of control
Question 5: Most candidates dealt well with the less usual use of pie-charts
Question 8
Question 10 (data question)
Question 11
Question 14
Question 15

Section C

The extended responses were generally very well answered again this year with sustained increases in the average marks throughout.

Candidates favoured Question 1A on evolution of new species over Question1B on adaptations for obtaining food, although the average marks attained for each question were very similar. There was some evidence of failure to grasp some of the biological ideas involved in the responses to both questions although this seems likely to be connected to use of language and vocabulary in each case.

Candidates favoured Question 2B on phagocytes and lymphocytes over Question 2A on mitochondria, and the average marks for the 2B option was a little higher than that for 2A. Many candidates seemed to have prepared answers to Question 2B.

Question 1A was relatively well answered in comparison to recent years but remains a challenging area for candidates.

Question 2A was very well answered and responses often showed the value of using appropriately labelled diagrams.

Question 2B was extremely well done with many candidates obviously having prepared answers to these cameo areas.

Areas which candidates found demanding

Section A

Candidates had more difficulty with Questions 5 and 7 from Unit 1; Questions 11 and 20 from Unit 2; and Question 21 from Unit 3.

Section B

Question 1 (b): Very few candidates realised that the short term continued conversion of GP to RuBP would contribute to the increase in RuBP levels.

Question 3 (a): Many candidates wrongly assumed that changes in the tissue length were linked to growth rather than osmotic effects.

Question 4 (a): There was evidence of a lack of appreciation of the role of the tap and its link to pressure equalisation; significant numbers of candidates linked it to the need to supply the snail with oxygen.

Question 6 (a): Many candidates gave descriptions of the graph line rather than conclusions which could be drawn from it.

Question 7 (a) (iii): Haploid and diploid numbers gave candidates some problems with many choosing to use the human complement number rather than that of the hawkweed.

Question 9 (b): Most candidates failed to appreciate the significance of the levelling out of the data from day 9 and did not mention this in their responses.

Question 10 (a) (i) and (f): Few candidates gave the required units in describing the graph, possibly because of their compound and complex nature. Candidates had difficulty with the idea that lead would affect growth through its inhibitory effects on enzymes.

Question 12 (a) (ii): There were many responses which suggested that genes controlling development of a cell might be switched on **and** off periodically rather than some genes being switched on whilst others were switched off.

Question 13: Many candidates mentioned sweating as a likely response to increased body temperature but failed to emphasise that it would be **increased** rather than simply start occurring.

Section C

Question 1A: Candidates had difficulty with the concepts of biological species and their individual populations. Correct terminology is essential to show understanding. There was evidence that many candidates linked mutation rates with environmental differences on either side of a barrier to gene flow.

Question 1B: Candidates need to be sure of scoring marks by using the accepted language. Some candidates negated marks for territorial behaviour by failing to link it with advantages in obtaining food preferring to discuss mating or other resources.

Advice to centres for preparation of future candidates

General

As always, it is good practice to ensure that candidates attempting Higher Biology have appropriate prior attainment.

It is worth sharing the points made in this report (and in reports from previous years) with candidates. The 'Areas candidates found demanding' sections could be especially helpful.

It is highly recommended that candidates are given the opportunity to work with published marking instructions from previous years' exams. This may help, for example, in the pitching of answers to questions involving variables and control.

Use of the vocabulary offered in the Arrangements documentation continues to be important, for example the use of the terms 'species' and 'population' when describing evolutionary change.

Use of comparative language is expected when appropriate and the difference between nominative terms such as 'large' and the comparative 'larger' should be emphasised.

Candidates should be reminded that references or descriptions of data should include the units even when these units are compound and complex.

Practical work continues to be important in Biology and candidates should continue to be exposed to apparatus and experimental procedures appropriate to their studies.

The underpinning importance of enzymes in metabolic pathways should continue to be emphasised and the effects of factors such as temperature on metabolic reactions should be related to enzyme action.

Choice of extended response questions is important. Study of marking instructions from past years is highly recommended.

Statistical information: update on Courses

Number of resulted entries in 2011	9,767

Number of resulted entries in 2012	9,548

Statistical information: performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 130				
A	24.6%	24.6%	2,349	92
B	24.1%	48.7%	2,299	77
C	23.3%	72.0%	2,226	62
D	10.7%	82.7%	1,026	54
No award	17.3%	100.0%	1,648	-

General commentary on grade boundaries

While SQA aims to set examinations and create marking instructions which will allow a competent candidate to score a minimum of 50% of the available marks (the notional C boundary) and a well prepared, very competent candidate to score at least 70% of the available marks (the notional A boundary), it is very challenging to get the standard on target every year, in every subject at every level.

Each year SQA therefore holds a grade boundary meeting for each subject at each level where it brings together all the information available (statistical and judgemental). The Principal Assessor and SQA Qualifications Manager meet with the relevant SQA Business Manager and Statistician to discuss the evidence and make decisions. The meetings are chaired by members of the management team at SQA.

The grade boundaries can be adjusted downwards if there is evidence that the exam is more challenging than usual, allowing the pass rate to be unaffected by this circumstance.
The grade boundaries can be adjusted upwards if there is evidence that the exam is less challenging than usual, allowing the pass rate to be unaffected by this circumstance.
Where standards are comparable to previous years, similar grade boundaries are maintained.

An exam paper at a particular level in a subject in one year tends to have a marginally different set of grade boundaries from exam papers in that subject at that level in other years. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set in centres. If SQA has already altered a boundary in a particular year in, say, Higher Chemistry this does not mean that centres should necessarily alter boundaries in their prelim exam in Higher Chemistry. The two are not that closely related as they do not contain identical questions.

SQA's main aim is to be fair to candidates across all subjects and all levels and maintain comparable standards across the years, even as Arrangements evolve and change.