External Assessment Report 2013

Subject(s)	Biology
Level(s)	Higher

Comments on candidate performance

General comments

The **general performance** of candidates in the 2013 Higher Biology Examination was very good, and although there was a slight decrease in the pass rate, the percentage of candidates gaining A passes increased.

Literacy levels were good and there was continued improvement in answers to Extended Response questions in Section C, which was answered especially well this year. Candidates once again had difficulty with the use of comparative terms such as 'lower' and 'higher' when describing differences between observations. There was some evidence of confusion between simply describing results and offering explanations for them.

Spelling of biological terms was generally good' although there was renewed concern over terms such as 'pituitary', 'phototropism', 'xanthophyll' and 'xerophyte'.

Numeracy levels were again good, though candidates should continue to be aware of the need to include units in answers that involve describing data. The presentation of data improved again this year, including very good graph scaling and axis labelling. There were very good responses to questions that required calculation. 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 to challenge candidates and allow the demonstration of knowledge and skills related to Grade A. These questions are:

Section A

♦ Questions: 3, 5, 11, 14, 20, 25, 26, 27, 29

Section B

♦ Unit 1 Questions: 1b); 2a)i) andii); 4a)iii), 4b) and 4d)ii)
♦ Unit 2 Questions: 5a)ii); 6a)ii), 6b)iii); 7a) and 7c); 8a)i) andii), 8b); 9b); 10a)i)
♦ Unit 3 Questions: 11c) andd); 11b)i) 1; 12a)iii); 13a)i); 14b)i)

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, 4, 7 and 10 from Unit 1; Questions 12 and 18 from Unit 2 and Questions 22, 28, and 30 from Unit 3.

Section B

♦ Q1a) familiar context.
♦ Q1b)ii) most candidates opting to suggest ATP.
♦ Q3b) although the context was challenging for some candidates.
♦ Q4b) (practical setting) excellent graph presentation.
♦ Q4c) most candidates were able to bring in background knowledge here.
♦ Q5b)i) recognising the recombinants seemed straightforward for many.
♦ Q6a) good knowledge in potentially confusing context.
♦ Q6b)i) good knowledge in slightly unfamiliar context.
♦ Q7a) most candidates able to identify and notate sex-linked genotypes.
♦ Q10b)iii) (data question) calculating the average proved straightforward for most.
♦ Q11a) whole number ratio answered well by most.
♦ Q12a)ii) and iii) very pleasing understanding shown by many despite unfamiliar context.
♦ Q12b) commonly asked question.
♦ Q13a)i) and ii) excellent understanding shown in an unfamiliar context.
♦ Q14b)ii) excellent response.

Section C

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

Candidates strongly favoured Question 1A on Photosynthesis over Question1B on Proteins; the average mark for Question 1A was higher. Many candidates sensibly used diagrammatic approaches to describing the light-independent stage. There was some evidence of confusion between transcription and translation in answers to 1B.

Candidates very slightly favoured Question 2B on Succession and Population Monitoring over Question 2A on Blood Water Concentration, and the average mark for Question 2B was slightly higher. Many candidates seemed to have well-prepared answers to question 2A and sensibly made use of flow chart approaches.

Areas which candidates found demanding

Section A

Candidates had more difficulty with Questions 3 and 5 from Unit 1; Questions 11 and 14 from Unit 2 and Question 25, 26 and 27 from Unit 3.

Section B

♦ Question 1b)iii): candidates continue to find it difficult to express the importance of replication in terms of preservation of genetic information into daughter cells.
♦ Q2a)i) and ii): many candidates found difficulty with the double axis graph and failed to link the reduction in glycoside with the formation of cyanide.
♦ Q2b): many candidates linked resin specifically with the trapping of insects and did not emphasise its role as a barrier.
♦ Q3a): there was unexpected difficulty in the identification of the root hair cell — maybe the answer was seen as too obvious.
♦ Q4a)ii) and iii): candidates found the timing gaps extremely challenging, and clearly had difficulty in visualising the processes occurring during the procedure.
♦ Q5a)ii): the chromosome diagrams seemed difficult for some candidates, although this approach has been used in questions in the past.

- Q5a)iii): some evidence of failure to distinguish between first and second meiotic divisions, and many candidates used the segregation of chromosomes as an explanation.
- Q6a)iii): there are still many candidates not appreciating the need to word answers carefully to emphasise failure when interbreeding is attempted.
- Q6b)iii): candidates struggled with wording to describe the break in the base sequence of the tetracycline resistance gene.
- Q7c): many convoluted explanations for the propensity of male to be affected by conditions caused by sex-linked recessive alleles.
- Q8b): the need for explanation not noticed by many candidates who simply described what the adaptations would do to the plants.
- Q10b)i) and ii): many candidates not seeing the importance of the stem information in the answering of these questions; very few seemed to attach importance to the birds breeding in summer as indicated in the stem.
- Q12a)i): many candidates did not read the year periods above the response boxes.
- Q13a)i): the use of wording such as 'bending' towards light lost marks for many candidates here.

Section C

- Q1B Some candidates confused DNA transcription with the translation of mRNA, and so failed to score marks when they obviously had some grasp of concepts.
- Q1B Candidates often wasted time with quite detailed descriptions of succession that involved specific habitats and named species, instead of focusing on the general principles of habitat change.

Advice to centres for preparation of future candidates

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

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

Candidates should be reminded that the legibility of their writing is important.

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 standard explanation such as the importance of DNA replication and the propensity for human males to show sex-linked recessive conditions.

Use of the vocabulary offered in the Arrangements documentation continues to be important, for example the use of the terms 'translation', 'root hair cell' and 'negative feedback'.

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 encouraged to think carefully when using words such as 'always', 'never' or 'none'.

Candidates should be reminded that references or descriptions of data should include the **units** and that they should always make changes in data trends clear using actual values from the data itself.

Practical work continues to be important in Biology and candidates should continue to be exposed to apparatus and experimental procedures appropriate to their studies. There is a need to emphasise the biological processes occurring during practical procedures and to link this with the timing protocols within the experimental methods.

Choice of extended response questions is important and candidates should be encouraged to spend a few minutes making the best choice for them. Study of Marking Instructions from past years is highly recommended.

Statistical information: update on Courses

Number of resulted entries in 2012	9548

Number of resulted entries in 2013	9964

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	26.6%	26.6%	2653	90
B	22.2%	48.8%	2211	76
C	21.5%	70.3%	2138	63
D	10.0%	80.3%	997	56
No award	19.7%	100.0%	1965	-

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.