External Assessment Report 2015

Subject(s)	Biology
Level(s)	Higher

Comments on candidate performance

General comments

There was a large decrease in entries for Higher Biology this year; this was mainly due to candidates being presented for the New Higher Biology Course instead. The general performance of candidates in the 2015 Higher Biology question paper was very good, and there was an increase in the pass rate. The average score for Section A was 20.40, from 30; for Sections B and C combined the average score was 56.30 from 100. It was in Section B that the main improvement from 2014 was noted.

Literacy levels were very good and a significant improvement in Extended Response questions in Section C was noted this year. There was, however, as highlighted in previous external assessment reports, evidence of difficulties for many candidates when attempting to give explanations for observations or results.

Spelling of biological terms was generally very good.

Numeracy levels were very good, particularly responses to questions that required calculation. Candidates should continue to be aware of the need to include units in answers that involve describing trends in data.

The presentation of data was excellent this year. 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 from data sources when describing these.

Areas in which candidates performed well

Section A
Candidates performed especially well in Questions 6, 8 and 9 from Unit 1; Questions 14 and 16 from Unit 2; and Questions 22, 27 and 29 from Unit 3.

Section B
The following questions were answered well:

Question 1(a)	straightforward recall of cell structure and function; abbreviation ER widely used.
Question 1(b)(ii)	most opting for the term carrier.
Question 2(b)	most candidates easily converting minutes to hours.
Question 3(a)	most also spelling 'phospholipid' correctly.
Question 3(c)	very few confusing peptide and hydrogen bonding.
Question 4(a)(i)	identification of the outer boundary as protein gave few problems.
Question 5(a)	many opting for temperature but a good variety of variables offered.
Question 5(d)(i)	excellent graph presentation with good plotting to the Y-axis.

Question 7(a)	good understanding of the term heterozygous.
Question 7(b)	a well revised and recalled area.
Question 8(a)(i)	good understanding of the year scale shown by most candidates.
Question 9(b)(ii)	straightforward graph reading gave no problem.
Question 10(a)	many candidates scored the first mark related to idea of camouflage.
Question 11(b)(ii)	no problem with straightforward arithmetic mean.
Question 11(b)(iii)1	excellent responses to a tricky question requiring both data sources.
Question 12(a)	most candidates realised they did not need to do a percentage calculation here.
Question 14(a)(iii)	most candidates choosing food or disease as would be expected.
Question 14(a)(iv)	principle of feedback in population well understood.

Section C

The extended responses were answered excellently again this year, and the improvements in this section seen in recent years were more than sustained.

Candidates slightly favoured Question 1B on Genetic control over Question1A on Growth factors. The average mark for Question 1B was higher, and there were many excellent answers to B(ii), with most candidates sensibly using labelled diagrams. There were many very precise and succinct answers to 1A.

Candidates favoured Question 2B on Osmoregulation over Question 2A on Genetic engineering and somatic fusion. However, the average mark for Question 2A was higher. There were many very well prepared answers to Question 2A, often including labelled diagrams of genetic engineering and use of the phrase 'overcoming sexual incompatibility' when describing somatic fusion.

Areas which candidates found demanding

Section A

Candidates had more difficulty with Questions 12, 13, 18 and 20 from Unit 2; Questions 25 and 28 from Unit 3.

Section B

Question 1(b)(i)	many candidates did not explain that there is usage as well as gain of ATP.
Question 1(b)(ii)	candidates often added extra products such as oxygen to the cytochrome stage.
Question 2(a)	still evidence of candidates not appreciating the need to quote figures to quantify the point where trends in data change.
Question 2(c)	candidates often failed to link the lack of oxygen with cessation of aerobic respiration.
Question 3(c)(i)	surprising difficulty with the idea of a gene even although it is required knowledge for National 5 Biology.

Question 3(c)(iv)	although many candidates know that tRNA binds to amino acids, they did not mention its specificity and often failed to give its role in transfer to the ribosomes.
Question 4(a)(iii)	many candidates confusing replication with protein synthesis and failing to adequately describe the assembly process.
Question 5(b)	candidates lacked clarity in describing the control often simply stating that the algae should be left out.
Question 5(d)(ii)	many candidates not giving rate or effectiveness of photosynthesis as part of their answer.
Question 5(e)	although many candidates gave appropriate colorimeter readings they were not clear that this wavelength was being transmitted or reflected from *Scenedesmus.*
Question 6(a)	chromosome number still present a problem for candidates although answers using human numbers not often seen this year.
Question 7(a)(iii)	as in last year's paper, many candidates seemed to struggle with the language needed to answer concisely with many simply referring to differences in male and female chromosome complements.
Question 9(a)(ii)	many candidates linked open stomata with the entry of light to the plant and failed to mention gas exchange.
Question 9(b)(iii)	although many candidates realised that the units allowed valid comparison between plants of different sizes, they did not emphasise the use of the per cm^2 of leaf as the key feature of the unit
Question 10(a)	most candidates did not say anything about the melanistic alleles being passed on to offspring, however limited their answers to surviving predation.
Question 11(a)(iii)	many candidates found the multi-part calculation challenging.
Question 11(b)(i)	significant number of candidates focused in on the fact that there were three trials as being important in reliability, rather than the replicate cattle in each group.
Question 11(c)	most candidates simply linked phosphate to protein directly and not through its role in phosphorylation and energy release.
Question 12(b)	many candidates referred to autumn or winter wood in their answers.
Question 13(b)(ii)	although many candidates realised that the shoot would get to light more effectively, they did not link light to the photosynthesis needed for later growth.

Section C

Question 1A	Some candidates had specific gaps in knowledge which lost them marks.
Question 1B	Few candidates demonstrated understanding of the key points in (i) and many confused phenylalanine with phenylketonuria itself and referred to mutation occurring in enzymes.
Question 2B	Many candidates failed to give the location of glomeruli and the filtering process; they often did not give salt secretion as an active process.

Advice to centres for preparation of future candidates

It is good practice to ensure that candidates attempting Higher Biology have appropriate prior attainment at SCQF level 5.

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.

In instances where candidates have Assessment Arrangements such as scribing and transcribing, it is **essential** that the papers returned to SQA clearly indicate their origins and that any loose inserts are securely attached to the question paper.

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' SQA question papers. This may help, for example, in the pitching of answers to questions involving standard explanations such as the need for oxygen in the release of energy for active processes, the role of transfer RNA in protein synthesis, and the idea of evolution by natural selection.

Use of the vocabulary offered in the Course arrangements documentation continues to be important; for example the use of the terms 'action spectrum', 'net gain of ATP', and 'apical dominance'.

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 should always make changes in data trend clear using actual values from the data itself whether it is from a graph or a data table.

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 design of control procedures and how best to describe these in question paper responses.

Choice of extended response questions is important, and candidates should be encouraged to spend a few minutes making the best choice for them. As stated previously in this report, the study of Marking Instructions from past years is highly recommended. The use of appropriately labelled diagrams should be recommended to candidates.

Statistical information: update on Courses

Number of resulted entries in 2014	10197

Number of resulted entries in 2015	7127

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	28.5%	28.5%	2033	92
B	21.5%	50.0%	1533	78
C	21.4%	71.5%	1527	64
D	9.6%	81.0%	683	57
No award	19.0%	-	1351	-

For this Course, grade boundaries have been stable for a number of years and the intention was to set similar grade boundaries to previous years. The Course assessment functioned as intended, therefore no adjustment to grade boundaries was required.

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.