



External Assessment Report 2011

Subject	Biology
Level	Intermediate 2

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 evidence showed that centres had prepared candidates well, resulting in a slightly better performance this year. The majority of candidates completed all sections of the question paper, and the graph was well handled by most candidates. There is still evidence of a small number of very poor candidates struggling with literacy and numeracy at this level. However, some candidates performed to an exceptionally high standard and both they and their centres should be congratulated.

Areas in which candidates performed well

Section A

Most candidates showed a very good knowledge and understanding (KU) in the following questions:

Question 12: Competition in plants.

Question 16: Environmental impact.

Question 22: Heart and pulmonary circulation.

Question 23: Response of the nervous system to a stimulus.

Section B

Question 1 (a)(i), (c): Most candidates were able to identify cell structures and describe differences and similarities between cell types.

Question 3 (a): Most candidates were able to label and construct a line graph.

Question 4 (b): Most candidates were able to state changes to an enzyme when boiled.

Question 5 (a), (c), (d): Most candidates were able to state the terms 'habitat' and 'producer'. They were also able to describe the effects of the introduction of mink, including an explanation of the effect on otters.

Question 6 (a): Most candidates were able to calculate average yield.

Question 7 (b), (c): Most candidates were able to state the term 'co-dominant' and describe the functions of DNA.

Question 9 (b), (c): Most candidates were able to predict the depth of jelly at pH 2 and name at least one enzyme produced by the pancreas.

Question 10 (b)(i): Most candidates were able to identify Bowman's capsule.

Question 11 (a): Most candidates were able to identify three true/false statements on gas exchange and give corrections for the false statements.

Question 12 (a): Most candidates were able to link three parts of the brain with their correct function.

Areas which candidates found demanding

Section A

Few candidates were able demonstrate good knowledge and understanding in the following questions:

Question 4: Stages of respiration producing ATP.

Question 7: Identify the factor which would not increase the rate of photosynthesis.

Question 21: Few candidates had the problem solving (PS) skills to calculate the volume of blood pumped per beat.

Section B

Question 1 (b) Few candidates were able to name the enzyme 'phosphorylase'.

Question 2 (b) Few candidates were able to explain how bacteria convert milk into yoghurt.

Question 4 (d) Few candidates were able to complete the word equation for the enzyme catalase.

Question 5 (d) Few candidates were able to give precise definitions for 'carnivore' and 'community'.

Question 6 (b) Few candidates were able to calculate percentage difference in yield.

Question 6 (c)(ii) Few candidates could give a reason for the use of the given control.

Question 6 (c)(iii) Few candidates were able to explain why use of ten farms would have increased the reliability of the results.

Question 6 (e)(ii) Few candidates were able to explain why growing R cotton was less likely to affect insect biodiversity.

Question 8 (b)(ii) Few candidates were able to calculate the percentage of total fat that was saturated fat.

Question 9 (a) Few candidates were able to describe trypsin activity as pH increased.

General comments from this year's exam

Many candidates lost a mark in Question 1 as they were unable to state the standard answer that the function of the nucleus is to 'control cell activities'. Although some leeway is given for the candidates to use their own words, this sometimes results in an ambiguous answer such as 'controls all cell activities'. Candidates should be encouraged to investigate different wording for answers and to develop the language skills necessary to demonstrate understanding at this level.

Candidates should be encouraged to include both parts when comparisons, differences or similarities are required. For example, Question 1: Plant cells have a cell wall, animal cells do not.

Some candidates showed a lack of numeracy skills when rounding numbers. For example, the answer to Question 8 (b)(ii) should be 67, not 66.

Candidates should be familiar with requirements for completing True/False questions. They should insert the correct word(s) into the box. There is no need for the entire sentence to be rewritten.

Enzymes

Candidates should know the names, substrates and products for several enzymes: *amylase*; *catalase*; *phosphorylase*; *pepsin*; *trypsin*; *lipase*. In the case of digestive enzymes, they should also be able to state their sites of production and action. Many candidates did not know these facts and this resulted in poor results for Questions 1 (b); 8 (a) and 9 (c).

Candidates should be encouraged to write extended response answers in short sentences to maximise marks. Any diagrams in these answers should be fully annotated and direction arrows added where applicable. Long, rambling answers tend to lose marks if wrong biology is mixed with correct biology.

Advice to centres for preparation of future candidates

Generally, centres prepared candidates well for the Course assessment but the following points might give additional support.

Centres are reminded to refer to the Biology pages of SQA's website (www.sqa.org.uk) as these provide the most up-to-date information needed to prepare future candidates.

These pages contain the most recent Arrangements documents (4th edition, June 2002) as a guide to the type of Course materials which should be used. Other useful materials are available and may be used for continuing professional development, for example SQA *Update* newsletters which are available from the Biology homepage. Another valuable tool to aid understanding of the required standard is the SQA Understanding Standards website (www.understandingstandards.org.uk).

The marking instructions for recent external assessments are also published on SQA's website. These allow centres to see detailed general and specific advice for marking Biology assessments and so to gauge the level of detail required for specific topics. This should help to inform the marking of internal assessments and so aid estimate setting.

Guidance is also available on how to construct prelims to meet SQA requirements for robust Appeals evidence. This will also help to prepare future candidates by ensuring that they have experience of an assessment of a similar structure and level to the external assessment. (General Prelim Advice p21–24; Intermediate 2 Biology — page 59 of the document *Estimates, Absentees and Assessment Appeals (March 2011)*).

Various commercial resources are available for different aspects of the Intermediate 2 Biology Course and centre staff must ensure that these meet the standards exemplified in the SQA documentation described above.

Learning activities

Although the third column of the Arrangements, *Learning Activities*, is only advisory, it helps students to understand the different topics. Practical work, case studies, websites or videos are useful to bring Biology alive. For example, use of the phosphorylase activity will allow candidates to see enzyme synthesis in action.

Use of mnemonics may help for enzyme word equations, for example:

SAM Starch converted by **A**mylase to **M**altose

Centres should try to encourage classroom discussion of as many of the learning activities as possible.

Graphs

The graph work of candidates was generally very good this year. Candidates should be reminded that pencils and rulers should be used for graphs, joining plotted points with straight lines. This allows opportunity for changing mistakes and also more accurate plotting. No extra lines should be added outwith the plotted points.

Information in questions

One of the required skills in Biology is selecting information. Marks were lost by candidates who failed to use this skill to read questions for relevant information to help with the answer. These were often, but not always, the candidates with poorer language skills.

Question 5 (b): The stem gave two habitats and only one was removed, but many candidates thought they had 'no home left'.

Question 6: The stem and photograph give information about this unfamiliar context.

Question 9 (a): The stem asks for changes in trypsin activity but many candidates instead wrote only about depth of jelly, thus reducing the available marks.

Centres should continue to encourage candidates to read all parts of the question and underline important information to improve the chance of increasing their marks.

Statistical information: update on Courses

Number of resulted entries in 2010	7,354
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Number of resulted entries in 2011	7,490
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Statistical information: performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 100				
A	26.1%	26.1%	1,958	71
B	23.6%	49.7%	1,767	60
C	24.1%	73.9%	1,808	49
D	10.0%	83.9%	750	43
No award	16.1%	100.0%	1,207	-

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, therefore, SQA 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 Head of Service 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.