



External Assessment Report 2013

Subject(s)	Biology
Level(s)	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

Centres had generally prepared candidates well so that the majority of candidates were able to complete all sections of the question paper. Section C Extended Response answers showed an improvement on last year, but there is still evidence of a small number of candidates struggling with literacy and numeracy at this level.

As in previous years, some candidates lost marks by not reading the question properly. Overall, candidate performance was slightly poorer than in previous years, though some candidates performed to an exceptionally high standard and should be congratulated on their efforts.

Areas in which candidates performed well

Section A

Candidate performance is generally better in this section as the appropriate wording is given.

- Q9 Most candidates were able to describe a niche.
- Q11 Most candidates could identify the consumers and carry out the calculation.
- Q13 Most candidates could identify the zygote.
- Q20 Most candidates could use the equation to calculate the energy value.
- Q24 Most candidates were able to identify the part of the brain dealing with memory.
- Q25 Most candidates described the pathway of nerve impulses.

Section B

- Q3c) Most candidates knew how to read the bar graph to state the correct temperature for highest catalase activity.
- Q4a)ii) Most candidates could explain that starch was too large a molecule to move out of the model cell.
- Q4b) Most candidates labelled the diagram to show entry and exit of the materials in the given example.
- Q5a) Most candidates could describe photosynthesis using the options given.

- Q5b) Most candidates selected the correct True/False option for photosynthesis and gave the correction if required.
- Q7b) Most candidates could plot the graph and add the Y axis scale.
- Q8b)ii) Most candidates were able to work out the expected ratio from the results of the genetic cross.
- Q9a) Most candidates described the function of DNA by selecting the correct options. This is usually a difficult area of the arrangements for poorer candidates to describe.
- Q13b) Most candidates could explain the effect of an increase in blood temperature by selecting the correct options.

Section C Extended Response Questions

- Q1A Most candidates chose this option and were able to describe the structure and function of the three types of blood vessel.
- Q1B Candidates choosing this option could describe the responses of the brain and the kidney to a decrease in blood water concentration.

Areas which candidates found demanding

Section A

- Q5 Many candidates found difficulty in identifying which of the given reactions occurred in yeast respiration.
- Q8 Many candidates found difficulty in using the data to identify the light intensity which caused a 50% increase in the rate of photosynthesis.
- Q22 Many candidates found difficulty in identifying the multiple sites of peristalsis with most stating it occurred only in the oesophagus.

Section B and Section C

Candidate performance tends to be poorer in these sections as candidates are required to find the appropriate wording for their answer.

- Q1b)ii) Many candidates found difficulty in explaining why the cell remained the same size in an isotonic solution. Most tried to give a description of an isotonic solution, but often gave no comparison, stating only 'it is the same'; some candidates did not state what was the same; for example, internal and external concentration.

- Q2a) Many candidates found difficulty in giving a reason for choosing species X. Some thought species X was the antibiotic while others could not find suitable words to describe the difference in growth around each disc.
- Q7a) Many candidates found difficulty in explaining that the woodlice were left for 5 minutes to adjust to their surroundings. Many candidates stated it was to give them 'time to spread out'.
- Q7b) Many candidates found difficulty in labelling the Y axis with the heading from the table, although they gave the correct scale. Another common mistake was forgetting to label the correct plot that they had given.
- Q7c) Many candidates found difficulty in stating the conclusion to match the aim given in the stem of the question. Most included the anthropomorphic answers, 'like/prefer the dark', instead of stating movement towards the darker end.
- Q9b) Many candidates found difficulty in relating the male gamete to both chromosome complement 22+X and 22+Y.
- Q10) Many candidates found difficulty in identifying R as the tricuspid or right AV valve.
- Q11a)ii) Many candidates found difficulty in relating the pancreas to both amylase and lipase.
- Q11b)ii) Many candidates found difficulty in naming the hepatic portal vein.
- Q11b)iii) Many candidates found difficulty in naming the carbohydrate stored in the liver as glycogen. Most gave the answer as starch, the plant storage carbohydrate.
- Q12a) Many candidates found difficulty in using the units required to describe the changes in the graph. Most stated mg instead of $\text{mg}/100\text{cm}^3$ as given in the graph.
- Q12b) Many candidates found difficulty in calculating the percentage increase in blood glucose concentration from 0-60 minutes. Many read the 60 minute value as $125 \text{ mg}/100\text{cm}^3$ instead of the correct value of 124.
- Q12c) Many candidates found difficulty in stating a correct possible source of error.
- Q13a) Many candidates found difficulty in stating the response of the blood vessels and their function as constriction to reduce blood flow to the skin and so reduce heat loss. Many candidates gave descriptions of blood vessels moving up and down in the skin or hairs raising on the skin surface.

Section C

- Q2A) Many candidates found difficulty in answering the question asked about the numbers of the light form of peppered moth when air pollution reduced. Most

candidates gave the 'story' about before, during and after the industrial revolution which lacked the required detail.

Q2B Many candidates found difficulty in answering the second part of this question on the advantages and disadvantages of genetic engineering. Many compared genetic engineering to selective breeding or gave very general answers 'very expensive' or 'dangerous'.

Advice to centres for preparation of future candidates

As stated in previous reports, candidates need to read questions more carefully so they can give the answers to achieve maximum marks. It may help if candidates underline the important words in the question, helping them to focus on what is needed in their answer.

Candidates should be encouraged to become familiar with answers in past SQA examination papers (available on SQA's website). These should help candidates find the correct language for their answers.

Candidates should undertake as much practical work as possible; this helps to reinforce the knowledge and understanding in many topics. If time for practical work is limited, suitable videos could be used. An example of this is Question 2, which showed that candidates need to have a better understanding of bacterial growth on agar plates.

Candidates need to understand the difference between 'describe' (state what happened), and 'explain' (give a reason for what happened), to gain marks in these types of questions. Examples of the type of answers required for each are exemplified in SQA past papers.

For conclusions, candidates should refer to the aim in the stem of the question and address that aim in their answer.

Candidates should be encouraged to use the exact headings from the results table for the labels on graphs. Graphs should be completed in pencil and single straight lines used to join one point to the next. Several lines between two points will lose the plot mark.

Graphs should be read carefully to allow the correct data to be used for calculations.

Candidates should practise the various types of calculation found in the Intermediate 2 Biology paper, for example % change; percentages; times greater/less; ratios; averages.

There was some confusion between osmosis and diffusion in Question 4 in this year's paper. Candidates should be aware that only water moves by osmosis.

Candidates need to be able to name various body structures; marks are often lost in these questions. Candidates could be encouraged to label blank diagrams of the different body systems. The names of blood vessels to/from various organs and the heart chambers are a particular problem.

Generally, centres prepared candidates well for the Course assessment. However, centres are reminded to refer to the Biology pages of SQA's website — these provide the most up-to-date information needed to prepare future candidates

Another valuable tool to aid understanding of the required standard for Intermediate 2 Biology is SQA's Understanding Standards website.

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.

**Statistical information: update on Courses
Intermediate 2**

Number of resulted entries in 2012	7995
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Number of resulted entries in 2013	8035
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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	21.5%	21.5%	1729	71
B	23.4%	44.9%	1880	60
C	26.0%	70.9%	2090	49
D	11.5%	82.4%	924	43
No award	17.6%	100.0%	1412	-

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.