

Principal Assessor Report 2003

Assessment Panel:

Biology

Qualification area

**Subject(s) and Level(s)
Included in this report**

Biology
Intermediate 2

Statistical information: update

Number of entries in 2002	
Pre appeal	3,490
Post appeal	3,492

Number of entries in 2003	
Pre appeal	3,920

General comments re entry numbers

There was an increase in candidate numbers. There was about a 12% increase on the 2002 entries.

General comments

Generally, the candidate group was similar to that of previous years. However, there was a small number of centres presenting S4 candidates for the first time. These candidates on the whole performed very well.

Grade boundaries at C, B and A for each subject area included in the report

Maximum mark = 100

Grade boundaries expressed as a percentage mark in brackets

Year	Upper A	Lower A	B	C
2002	84 (84%)	70 (70%)	60 (60%)	50 (50%)
2003	83 (83%)	67 (67%)	56 (56%)	45 (45%)

General commentary on passmarks and grade boundaries

- While SQA aims to set examinations and create mark schemes which will allow a competent candidate to score a minimum 50% of the available marks (notional passmark) and a very well-prepared, very competent candidate to score at least 70%, it is almost impossible to get the standard absolutely on target every year, in every subject and level
- Each year we therefore hold a passmark meeting for each subject at each level where we bring together all the information available (statistical and judgmental). 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 senior management team at SQA
- We adjust the passmark downwards if there is evidence that we have set a slightly more demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- We adjust the passmark upwards if there is evidence that we have set a slightly less demanding exam than usual, allowing the pass rate to be unaffected by this circumstance
- Where the standard appears to be very similar to previous years, we maintain similar grade boundaries
- 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 are different. This is also the case for exams set in centres. And just because SQA has altered a boundary in a particular year in say Higher Chemistry 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
- Our main aim is to be fair to candidates across all subjects and all levels and maintain standards across the years, even as syllabuses evolve and change

Comments on grade boundaries for each subject area

It was judged that the examination paper was more difficult than in previous years both for grade C and grade A candidates. To ensure that these candidates were not penalised in any way the pass mark was lowered by 5 marks (compared to the 2002 pass mark) and the mark required to gain a grade A was also lowered by 3 marks (compared to the 2002 minimum grade A mark).

Comments on candidate performance

General comments

Candidate performance was very similar to previous years but there was a noticeable number of high performing S4 candidates. Performance in the extended-response questions was generally good indicating candidates being well prepared for these types of questions.

Areas of external assessment in which candidates performed well

In Section A candidates performed well in the following areas:

- knowledge of the chemical composition of plant cell walls
- knowledge of the active site of an enzyme
- *working out an average*
- the conditions required for producing earlier crops
- knowledge of peristalsis
- identifying the lacteal in a diagram of a villus
- *extracting information from a table*
- *extraction of data from a graph*
- the definition of a species
- identifying a graph showing the effect of competition between 2 species.

In Section B candidates performed well in the following areas:

- cell structure and function
- diffusion and osmosis including identifying hypertonic and isotonic solutions
- co-dominance, working out gametes, completing a punnet square, working out the F₂ ratio, and defining genetic terms
- *completing a table using information from a food web and a pyramid of energy*
- *extracting data from a graph to complete a table on pulse rates.*

In Section C candidates performed well in the following questions:

- identifying and describing the two stages of photosynthesis
- describing the structure and function of arteries, veins and capillaries.

Areas of external assessment in which candidates had difficulty

In Section A candidates had most difficulty with the following areas:

- identifying the role of enzymes in terms of energy input
- deamination of proteins
- *calculating the heart rate from a graph*
- identifying the sex chromosomes in different human cells
- *calculating the water percentage of soil.*

In Section B candidates had most difficulty with the following areas:

- *identifying that a line graph was the most appropriate form of graph for this data*
- *drawing a uniform scale on the X axis*
- describing the effect of human activity on biodiversity
- describing an adaptation of desert plants and explaining how this aids their survival
- describing the response of brine shrimps to light
- describing what would happen to the population of periwinkles if the mussels were removed from the food web
- explaining why the biomass of a producer is greater than the biomass of primary consumers
- explaining why the energy value decreases from one level to the next
- explaining why an improvement in wheat was a desirable characteristic
- describing the steps in genetic engineering
- explaining why it was necessary to calculate the percentage of moths recaptured
- providing the term natural selection
- explaining why breathing rate increases with exercise
- stating two ways by which blood carries carbon dioxide.

In Section C candidates had most difficulty with the following area:

- describing the anaerobic pathway which results in wine production.

Areas of common misunderstanding

In Section B

Question 7b The majority of candidates wrote that the algae were producers.

Question 7c(i) The majority of candidates repeated the information that was in the question, ie they wrote that the energy was less.

In both cases it was apparent that the candidates had not understood the questions.

Recommendations

Feedback to centres

Candidates should be given more practice at answering questions in which they are required to 'explain how' or to 'explain why'.

Candidates should be encouraged not to attribute anthropomorphic characteristics to animals in animal behaviour experiments.

There is evidence that some candidates, who have the potential to achieve grade A, are not achieving marks which test their problem solving skills.

There was some very encouraging evidence that candidates showed a good knowledge and understanding of certain aspects of the course such as co-dominance and the process of photosynthesis (both of these bridge to Higher).

Candidates should be given more opportunities to draw graphs from given data so that they become more confident in selecting the most appropriate form of graph and in drawing a uniform scale.

There was evidence that many candidates were not familiar with the adaptations of desert plants. It is important that centres use the most up to date arrangements documents, which are available on the SQA website on www.sqa.org.uk