

Principal Assessor Report 2005

Assessment Panel:

Biology

Qualification area

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

Biology Intermediate 2

Statistical information: update

Number of resulted entries in 2004	4,672
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Number of resulted entries in 2005	5,336
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General comments re resulted entry numbers

There was a 15% increase in the overall number of candidates presented compared with 2004.
There was a further increase in the number of S4 candidates. The number of S4 candidates represented approximately 18% of the total number of candidates compared with 12% in 2004.

Statistical Information: Performance of candidates

Distribution of awards including grade boundaries

Distribution of awards	%	Cum %	Number of candidates	Lowest mark
Maximum Mark - 100		-	-	-
A	20.5	20.5	1,096	69
B	23.8	44.3	1,270	57
C	25.8	70.1	1,376	46
D	11.8	81.9	630	40
No award	18.1	100.0	964	-

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 arrangements evolve and change.

Comments on any significant changes in distribution of awards/grade boundaries

The questions in Sections B and C were of a similar level of demand to previous years. However, Section A was more difficult than in previous years. Consequently, the pass mark was reduced from 48 (the 2004 pass mark) to 46.

The increase in the percentage of candidates gaining a grade C or better reflects the increase in the number of candidates who were well prepared for this examination.

The increase in the percentage of candidates gaining a grade A reflects the increase in the number of candidates who performed well in this examination.

Comments on candidate performance

General comments

Feedback from markers indicated that the majority of candidates

- were better prepared than in previous years.
- completed most of the questions in Section B.
- made a reasonable attempt at two of the extended response questions in Section C.
- showed more knowledge and had a better understanding of Biology at Intermediate 2 level than in previous years.

Areas of external assessment in which candidates performed well

Section A

1. Identifying the labelled parts of a plant cell that were also found in an animal cell.
2. Identifying the functions of the cell wall and chloroplasts.
4. Working out what happened to the weight of a piece of potato when placed in solutions of different water concentrations.
5. Recalling how many molecules of ATP are produced from 1 glucose molecule during anaerobic respiration.
6. Identifying from 2 different graphs the conditions at which an enzyme is most active.
13. Calculating how much energy is converted into new plant material from given data and a food chain.
15. Identifying an example of co-dominant inheritance.
19. Re-arranging the stages of genetic engineering into the correct sequence.
22. Recalling the function of the stomach muscles.
24. Identifying from a diagram the part of the brain that is responsible for memory and conscious responses.

Section B

Knowledge & Understanding

- 1(a) Naming the parts of the alimentary canal
- 2(c) Naming the hormone that is produced in response to a reduction in the water concentration of the blood.
- 4(a) iii Naming 2 essential substances carried by the blood that would be prevented from reaching the heart muscle.
- 5(a)i Naming the process by which oxygen moves from the air sac into the capillary.
- 5(a)iii Describing the movement of oxygen in response to a concentration gradient.
- 5(a)iv Naming a substance which moves from the capillary into the air sac.
- 5(b) Describing 2 features of the air sacs.
- 6(b) Naming the molecule that comprises all enzymes.
- 7(a)i Constructing a food chain from the food web.
- 7(a)ii Identifying all the primary consumers in the food web.
- 7(a)iii Drawing and labelling a pyramid of numbers from the food web.

- 9(c) Identifying the sex of an individual from a diagram of the chromosomes and giving a correct justification.
- 9(d) Identifying the correct terms relating to meiosis and zygote formation.
- 11(a) Identifying from information given the finch which ate insects and giving a valid reason.
- 11(b) Identifying 2 ways in which competition between the two finches could be reduced.

Problem Solving

- 3(b) Constructing a bar graph from results given in a table.
- 3(c) Calculating the energy content of a food using an equation given in the text.
- 3(d) Drawing a conclusion from data given in the results.
- 10(a)i Completing diagrams to show how an experiment should be set up.

Areas of external assessment in which candidates had difficulty

Section A

9. Identifying the purpose of ATP in the carbon fixation stage of photosynthesis.
14. Recalling the name of the substance of which DNA determines the structure and function.
16. Calculating a percentage increase.
17. Calculating the phenotypic ratio of offspring in the given example.
18. Calculating the percentage of children who would inherit a dominant characteristic in the given example.
23. Calculating a percentage increase from data given in the form of a graph.
25. Calculating the time taken for a reflex response from data given in a diagram.

Section B

Knowledge & Understanding

- 1(b) Identifying where in the alimentary canal different secretions were produced.
- 1(c) Naming the insoluble substance produced in the liver from excess glucose.
- 2(a) Identifying different parts of the urinary system and describing their functions.
- 2(b) Explaining why glucose is not normally present in the urine.
- 2(c)ii Describing the effect of ADH on the kidney tubules.
- 4(a) i & ii Naming blood vessels.
- 4b)i Identifying the type of white blood cell shown.
- 5(a)ii Explaining why oxygen is required by an organism.
- 6(a)i Identifying from the diagram the type of reaction and naming the enzyme involved.
- 6(c) Describing what happens to the active site when an enzyme is denatured.
- 6d) Stating the effect of an enzyme on the energy input of a chemical reaction.
- 7b) Defining the term 'omnivore'.
- 7c) Identifying the term used to describe the variety of species within an ecosystem.
- 8b) Explaining why temperature affected decomposition.
- 8c)ii Describing the role of a decomposer.
- 9b) Identifying the type of variation given.

Problem Solving

- 3a) Calculating a simple whole number ratio.
- 4b)iii Describing differences in the antibody production from data given in graph form.
- 8(a)i Calculating how many times greater decomposition was at 24°C than at 14 °C from data given in a graph.
- 8a)ii Describing a relationship between the 2 variables shown in a graph that has more than one trend.
- 10a)ii Identifying the observations and measurements which need to be made to obtain results in the investigation shown.
- 10a)iii Being able to work out a control for the investigation.

Recommendations

Feedback to centres

- The majority of candidates were well prepared for the examination.
- There were fewer 'very poor' candidates presented than in previous years. However, there are still candidates being presented who have little knowledge or understanding of the Biology taught at Intermediate 2 level.
- The majority of candidates attempted most of the questions in Section B.
- Most candidates made a reasonable attempt at two extended response questions in Section C. However very few candidates attempted the question on yoghurt and alternative fuel production (question 2A).
- As in previous years there are still a large number of candidates who have problems with the 'explain' questions. These questions tend to be the more difficult questions. In question 5(a)ii many candidates did not make the connection between oxygen and respiration or oxygen and energy production. Therefore, it would benefit candidates if they were given more practice at 'explain' type questions throughout the course.
- Many candidates have a problem with 'comparison' questions. In question 4(b)iii many candidates did not make it clear which injection they were referring to.
- The questions assessing the Problem Solving and Practical Abilities skills PS4 and PS5 were not answered well by candidates (question 10(a)ii and iii). It would be of help to candidates if they were given more practice at answering similar questions in unfamiliar experimental situations.
- The construction of the bar graph was well done.
- The calculation of a ratio, a percentage increase and 'how many times greater' continue to give problems to many candidates.