



External Assessment Report 2010

Subject	Biology
Level	Standard Grade (Credit and General)

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

Markers reported that candidate performance was better with Problem Solving questions than it was with Knowledge and Understanding questions. This pattern is the same as previous years.

Markers commented that candidate performance was reasonably good overall but that many failed to gain marks when extended answers, such as explanations, were required.

Areas in which candidates performed well

Credit level — Knowledge and Understanding

- ◆ Question 8 (b) — identifying the parts of a joint which reduce friction.
- ◆ Questions 14 (a)(i), (ii) (b) Genetics — giving genotypes and phenotypes and explaining the reason for differences between actual and predicted phenotype ratios.

Credit level — Problem Solving

- ◆ Question 1 (b) — completing and using a key.
- ◆ Question 5 (a)(i) — calculating an average.
- ◆ Question 9 (a), (b), (c) — selecting information from text.
- ◆ Question 13 (a)(i) — constructing a pie chart.
- ◆ Question 16 (a)(i) — interpreting a line graph.

General level — Knowledge and Understanding

- ◆ Question 1 (a)(i) — identifying a producer from a food web.
- ◆ Question 1 (b) — naming other organisms as consumers.
- ◆ Question 3 (b) — knowing why animals need food.
- ◆ Question 14 (a) — matching names of cell parts to their descriptions.
- ◆ Question 14 (c) — sex determination.
- ◆ Question 14 (f) — naming a plant feature suitable for improvement by selective breeding.
- ◆ Question 16 (b)(iii) — describing how to measure recovery time.
- ◆ Question 17 (c)(i), (ii) — the use of yeast in the raising of dough.
- ◆ Question 17 (d)(i), (ii) — naming products obtained by the use of yeast and bacteria.

General level — Problem Solving

- ◆ Question 1 (a)(ii) — identifying a component food chain from a food web.
- ◆ Question 1 (iii) — identifying an example of competition from a food web.
- ◆ Question 3 (a)(i) — extracting information from a pie chart and associated data.
- ◆ Question 8 (a)(ii), (iii) — commenting on experimental procedure.
- ◆ Question 9 (b) — completing a description of fertilisation in fish and mammals.
- ◆ Question 11 — selecting information from text.
- ◆ Question 13 — selecting information from a table.
- ◆ Question 14 (b) — describing phenotypes from genotypes.

- ◆ Question 15 (c) — completing a line graph.
- ◆ Question 17 (a) — completing a bar chart.

Areas which candidates found demanding

Credit level — Knowledge and Understanding

- ◆ Question 2 (a) — giving a disadvantage of the use of nuclear fuel.
- ◆ Question 2 (b)(i)(ii) — explaining changes following the release of sewage into a river. Candidates failed to include a comparative aspect to their answers. For example, explaining that the sewage represented an increase in the food available to micro-organisms.
- ◆ Question 4 (c) — naming a clone as a group of plants produced asexually from a single parent. Candidates did not understand that such a group forms a single clone. Many gave 'clones' as their answer, which is incorrect in terms of the question asked.
- ◆ Question 5 (a)(ii) — explaining the difference in the number of eggs produced by fish and mammals. Candidates commented on one of the types of animal but failed to provide the comparison demanded by the question.
- ◆ Question 5 (b) — describing the function of the placenta. Candidates failed to be explicit enough in describing the direction of movement of materials across the placenta.
- ◆ Question 7 (b) — describing and explaining changes to blood cells due to osmosis. Many candidates used inappropriate terms such as 'plasmolysed' when describing the change in appearance of the blood cells.
- ◆ Question 8 (a)(i) — explaining the need for pairs of muscles at a joint. Candidates failed to gain both marks either by not stating that muscles only work by contracting or pulling, or by not then stating that a second muscle is needed to move the joint back.
- ◆ Question 9 (d) — recognising the phrase from a passage, 'burn more energy', referred to the process of respiration.
- ◆ Question 10 (a)(ii) — identifying fat as the food component with the highest energy value.
- ◆ Question 10 (b) — naming the chemical elements present in fats. Candidates commonly answered fatty acids and glycerol. They did not understand what is meant by a chemical element.
- ◆ Question 15 (a) — identifying a process as an example of a continuous flow process and explaining the idea of immobilisation of enzymes.
- ◆ Question 15 (c)(ii) — explaining the benefit to the yeast of sterilising a reactor vessel prior to fermentation. Candidates failed to appreciate that this removes competition from other micro-organisms.

Credit level — Problem Solving

- ◆ Question 5 (a)(i)2 — calculating a percentage. Candidates failed to read the question properly and used the wrong number to start their calculation.
- ◆ Question 6 (a) — Constructing a line graph. An increase in the number of candidates lost a mark by failing to include a zero on the scale of the x-axis.
- ◆ Question 6 (c) — explaining the need to bring enzyme and substrate to the required temperature before mixing when investigating the effect of temperature on the rate of reaction.

- ◆ Question 12 (a)(ii) — giving conclusions from results shown in a bar chart. Candidates tended to simply restate the results from the chart without trying to draw conclusions from them.

General level — Knowledge and Understanding

- ◆ Question 1 (c)(i) — defining a 'population'.
- ◆ Question 2 (b) — describing how to measure an abiotic factor of their choice. Candidates tended to simply name a measuring instrument without adding some relevant information on its use.
- ◆ Question 7 (b) — naming the main components of bone.
- ◆ Question 14 (e) — giving the number of chromosome sets in a gamete. Candidates commonly gave answers based on the 46 chromosomes present in human cells and clearly do not think of chromosome complements in terms of sets.
- ◆ Question 16 (b)(i) — explaining the reason for increases in pulse and breathing rates with exercise. Candidates failed to include the working muscles as the structures needing the additional oxygen.

General level — Problem Solving

- ◆ Question 5 (b) — improving the design of an investigation. Many candidates failed to address the question and gave inappropriate answers such as 'repeat the investigation'.
- ◆ Question 6 — interpreting the results of an investigation into the factors needed for photosynthesis.
- ◆ Question 8 (a)(iv)1 — describing the effect of increasing light intensity on the rate of photosynthesis. Candidates can produce good answers to these types of questions when the results are presented as a graph but they fail to use the same format of answer when the results are presented as a table.
- ◆ Question 10 (a) — describing the changes in bull sperm production over a year. See comment for Question 8 (a)(iv).

Advice to centres for preparation of future candidates

Candidates must be encouraged to revise their work. The Knowledge and Understanding questions of the examinations cannot be tackled by most candidates without revision. It is important that their knowledge is based on the Learning Outcomes of the Arrangements. This is demonstrated by Question 4 (c) of the Credit paper and 14 (e) of the General paper.

Candidates must be given the opportunity to practise Problem Solving questions similar to those of the examinations. They should be able to recognise styles of questions and be able to adapt particular formats of answers to new situations.

Candidates do well overall when calculating ratios but they have problems when calculating percentages, particularly if the question involves a percentage increase or decrease and when an answer is greater than 100%.

The use of a ruler when joining the points of a line graph and drawing the tops of the bars of a bar chart should be encouraged as well as the need for both a minimum and maximum value on a scale.

Statistical information: update on Courses

Number of resulted entries in 2009	21028
Number of resulted entries in 2010	20570

Statistical information: performance of candidates

Distribution of overall awards

Grade 1	22.1%
Grade 2	27.5%
Grade 3	26.7%
Grade 4	8.5%
Grade 5	10.0%
Grade 6	4.1%
Grade 7	0.1%
No award	1.0%

Grade boundaries for each assessable element in the subject included in the report

Assessable Element	Credit Max Mark	Grade Boundaries		General Max Mark	Grade Boundaries		Foundation Max Mark	Grade Boundaries	
		1	2		3	4		5	6
KU	40	24	18	50	29	22	n/a	n/a	n/a
PS	40	28	20	50	28	20	n/a	n/a	n/a