Course Report 2018

Subject	Biology
Level	National 5

This report provides information on the performance of candidates. Teachers, lecturers and assessors may find it useful when preparing candidates for future assessment. The report 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 assessment documents and marking instructions.

The statistics used in this report have been compiled before the completion of any Post Results Services.

Section 1: comments on the assessment

Summary of the course assessment

This is the first year of the revised National 5 Qualifications.

Component 1 — question paper

The National 5 Biology question paper was extended by 20 marks: 5 marks in Section 1 and 15 marks in Section 2.

The question paper broadly performed as expected. However, a small number of questions proved to be either less demanding or slightly more demanding than intended. This was taken into account when setting grade boundaries.

Markers commented that the question paper was fair and balanced, and that there was a broad range of questions to challenge candidates. Most candidates made a good attempt at answering most of the questions, which is encouraging.

The question paper was designed to provide a good spread of marks across the course and to give candidates the opportunity to display a range of skills and to apply their knowledge and understanding.

As in previous years, candidates continue to confuse 'describe' and 'explain' as command words, and many missed out on marks as a result. Examples of valid responses to command words are provided in the general marking principles within the published marking instructions.

A substantial number of candidates did not read the full question leading to incorrect or partially correct answers. As the time allocated to the examination has been increased, there should be ample time available for candidates to read with care each question in its entirety.

Component 2 — assignment

It was clear that some candidates were better prepared for the revised assignment than others. Teachers and lecturers should follow the guidance in the coursework assessment task document carefully to ensure they give candidates the appropriate level of guidance and support.

The assignment is marked out of 20 and is worth 20% of the course assessment. Candidates must undertake a practical investigation or fieldwork to generate data to include in the report stage of their assignment.

Some sections of the assignment proved challenging for some candidates, so teachers and lecturers should concentrate on these sections with future candidates.

The underlying biology that candidates include in their assignment should contain information at National 5 level to allow them to access the available marks.

Section 2: comments on candidate performance

Areas in which candidates performed well

Component 1 — question paper

Section 1 (objective test)

Candidates performed well in the following questions:

Question 1	Most candidates identified protein as the molecule indicated in the cell membrane.
Question 3	Most candidates identified the process of active transport being involved, given the particular scenario.
Question 6	Most candidates completed the missing step in the sequence of events of genetic engineering.
Question 7	Most candidates demonstrated their understanding of ensuring that experimental results were reliable.
Question 9	Most candidates identified the neurons in a reflex arc.
Question 10	Most candidates identified the name and function of a part of the brain.
Question 16	Most candidates used a biological key correctly.
Question 21	Most candidates gave the reason for less energy being available at each successive level in a pyramid of energy.
Question 22	Most candidates demonstrated an understanding of mutation.
Question 23	Most candidates showed an understanding of the result of selection pressures.
Question 24	Most candidates demonstrated knowledge of pesticides and their build up in living organisms.
Question 25	Most candidates identified biotic and abiotic factors.

Section 2 (structured and extended-response questions)

Candidates performed well in the following questions:

Question 1(a)	Most candidates demonstrated knowledge of cell parts and their functions.
Question 3(a)(i)	Most candidates described the shape of the DNA molecule.
Question 3(b)	Most candidates named the organelle that stores DNA in animal cells.
Question 6(a)(i)	Most candidates identified the optimum pH from the graph.

Question 8(a)	Most candidates identified a site of gamete production in humans.
Question 8(b)(i)	Most candidates showed an understanding of the terms ‘haploid’ and ‘diploid’.
Question 8(b)(ii)	Most candidates named the fertilised egg as a zygote.
Question 10(b)(ii)	Most candidates made a correct prediction from the graph.
Question 11(a)(iii)	Most candidates correctly completed a Punnett square.
Question 13(b)	Most candidates identified where a plant comes in a food chain.
Question 13(c)	Most candidates identified a substance, other than water, for which plants compete.
Question 14(a)(i)	Most candidates named a sampling technique used to collect ground-living organisms.
Question 14(a)(ii)	Most candidates demonstrated selecting skills from the graph.
Question 14(b)(ii)	Most candidates calculated an average correctly.
Question 15(b)	Most candidates made a correct prediction about the effect of high temperature on pH.

Component 2 — assignment

Candidates performed well in the following sections:

1 Aim	Most candidates stated an appropriate aim.
2 Underlying biology	Most candidates wrote at least one expanded description or explanation of biology relevant to their aim.
3(b) Data collection and handling	Most candidates included sufficient raw data (number and range of values) that was appropriate to their aim.
3(e) Data collection and handling	Most candidates included data/information from an internet/literature source that was relevant to their aim.
3(f) Data collection and handling	Most candidates referenced their internet/literature source.
4(a) Graphical presentation	Most candidates selected the correct format for their graphical presentation.
4(c) Graphical presentation	Most candidates provided suitable labels and units for the axes of their graph.
8(a) Structure	Most candidates provided an informative title for their assignment.
8(b) Structure	Most candidates wrote a clear and concise report.

Areas which candidates found demanding

Component 1 — question paper

Section 1 (objective test)

Candidates found the following questions more demanding:

Question 5	Some candidates had difficulty identifying a list of substances that were all types of protein.
Question 11	Some candidates had difficulty identifying organs and hormones involved in blood sugar regulation.
Question 13	Some candidates had difficulty identifying a factor that, when increased, would cause a decrease in transpiration.
Question 18	Some candidates had difficulty defining an ecosystem.
Question 19	Some candidates had difficulty identifying the effects of changes in a food web.

Section 2 (structured and extended-response questions)

Candidates found the following questions more demanding:

Question 3(a)(ii)	Many candidates had difficulty describing the way DNA strands are linked together.
Question 4(a)	Some candidates did not identify degradation from the diagrams supporting the question.
Question 4(b)	Many candidates had difficulty sequencing the events in a degradation reaction involving an enzyme. In particular, they seemed to struggle with the location of the active site, often referring to it being on the substrate. Some candidates did not attempt this question.
Question 5(a)	Many candidates did not attribute information about respiration to either aerobic, fermentation or both.
Question 7	Some candidates had difficulty describing the whole sequence of mitosis. They made muddled attempts and did not stick to a logical order. Some candidates did not attempt this question.
Question 9(c)	Many candidates did not identify the comparison group in research as a control group.
Question 9(d)	Many candidates did not express their reasons for selecting either reliable or not reliable, based on the available evidence.
Question 9(e)	Many candidates did not suggest a factor that researchers would take into consideration in the study described.
Question 10(b)(i)	Many candidates struggled with the relationship between the two given factors, with several confusing cause with effect.
Question 10(c)(i)	Many candidates did not describe the difference in oxygen concentration in the two blood vessels. They did not tailor their response to the question asked.

Question 12(a)(i)	Many candidates provided the response ‘spongy mesophyll’, suggesting that they cannot distinguish between the two types of mesophyll.
Question 12(a)(ii)	Many candidates failed to appreciate how the increased number of chloroplasts at the location in the leaf would allow more light to be absorbed.
Question 12(b)	Many candidates gave a function of xylem or phloem, rather than answering the question, which asked for a structural feature.
Question 13(a)(ii)	Some candidates did not express the relationship between the number of seeds and the percentage of seedlings. Candidates need to take more care when referring to factors.
Question 14(a)(iii)	Some candidates did not suggest how the investigation could be improved to make the samples more representative.
Question 16(a)(ii)	Many candidates did not describe the use of nitrates by plants. Although the revised course content does not require knowledge of the full nitrogen cycle, the use of nitrates by plants part of the mandatory content.
Question 16(b)(ii)	Many candidates did not explain that an increase in algae would mean an increase in food for bacteria (resulting in the increase in numbers).
Question 16(b)(iii)	Many candidates did not explain that oxygen levels would drop due to the bacteria using it up.

Component 2 — assignment

Candidates found the following sections more demanding:

2 Underlying biology	Some candidates had difficulty providing an account of the relevant biology. Some included information at a level below National 5. Others wrote simple statements of fact, without giving expanded descriptions and/or explanations that demonstrated they had an understanding of the facts.
5 Analysis	Many candidates had difficulty giving a valid comparison of the data they had gathered with data/information from the internet/literature. Often, the statements were either vague or just a restatement of the results. On many occasions, there was no comparison of the actual data. Candidates often ignored differences between the two sets of data.
6 Conclusion	Many candidates had difficulty drawing a valid conclusion. Sometimes the conclusion did not relate to the aim and/or it was not supported by the data in the report. The conclusion needs to address both of these points.
7 Evaluation	Many candidates had difficulty with the evaluation. Some opted for increasing the number of repeats to increase reliability. Unless there is clear evidence that the repeats already done have failed to establish reliability, then this is not a suitable response. Some candidates correctly identified a factor that would affect the results,

but did not go on to describe either what was done, or what could have been done to minimise its effect.

Section 3: advice for the preparation of future candidates

The National 5 Biology Course Specification explains the overall structure of the course, including its purpose and aims as well as information on the skills, knowledge and understanding required. Course support notes are provided as an appendix to the document. Both the key areas **and** the depth of knowledge **can be assessed in the question paper**.

The National 5 Biology Coursework Assessment Task explains the requirements for the assignment. This document provides guidance by including instructions for teachers and lecturers, as well as instructions for candidates.

Centres must ensure that they are using the most up-to-date versions of these documents, which are available on the SQA website.

Component 1 — question paper

Candidates need to spend time consolidating the mandatory knowledge and understanding for the course. The question paper requires them to apply this knowledge and to demonstrate their understanding. Teachers and lecturers should give candidates opportunities to practise questions set in new and unfamiliar situations.

Teachers and lecturers should encourage candidates to take time to read all parts of each question, not just the introductory section, with care and attention so they do not miss important pieces of information. Often candidates incorrectly interpret what they have to do and, therefore, their responses are often not appropriate to the question asked.

As in previous years, candidates had difficulty distinguishing between the command words ‘describe’ and ‘explain’. A large proportion of candidates gave an insufficient answer to these types of questions. Teachers and lecturers should practise these questions with candidates. The general marking principles within the marking instructions provides information on valid responses to command words.

Teachers and lecturers should also give candidates opportunities to practise answering extended-response questions. Many candidates did not express their ideas in a logical way in these responses. Some candidates answered questions 4(b) and 7 poorly, in terms of incorrect biology and incorrect sequencing. In question 4(b), a large proportion of candidates incorrectly stated that as soon as an enzyme passes its optimum temperature, it is denatured. They did not realise that it has a range of temperatures on either side of the optimum where it can work and that it only becomes denatured when the temperature is high enough to alter the protein’s structure.

This year, the scientific literacy style of question (question 9) was introduced. This type of question mirrors the research skills of the assignment and aims to help develop candidates’ scientific thinking. Candidates performed well in the first two parts of question 9. However, some had difficulty with the more probing parts of question 9. Overall, candidates completed the table in part (b) well. Throughout the course, teachers and lecturers should encourage candidates to be critical of the research they encounter and to develop enquiring minds.

Candidates' responses to questions involving calculations improved this year. Teachers and lecturers should provide examples of calculations for candidates to practise. Candidates should review their responses to calculations, to see if they are feasible, as some answers were unrealistic.

Component 2 — assignment

The choice of topic for the assignment needs to be carefully considered, to ensure that candidates have the opportunity to access all of the marks.

Candidates should give the report an appropriate title. It should inform about the content of the report, but should not be a reiteration of the aim.

Teachers and lecturers must discuss the aim with each candidate and advise them on its suitability before they proceed. Teachers and lecturers should discourage candidates from providing multiple aims as they rarely manage to address all of them in the conclusion.

All candidates must take an active part in experimental work/fieldwork. This work must allow them to gather data to use in the report stage. Teachers and lecturers should refer to the conditions for assessment in the coursework assessment task document.

Teachers and lecturers should practise the skills involved in graph drawing with candidates. Candidates should use a ruler and avoid abbreviations, as they often use inappropriate abbreviations.

Candidates often failed to gain marks in sections 5 (analysis) and section 6 (conclusion). These involve skills developed through practical work during the course. Evaluation skills can also be developed in this way. Teachers and lecturers should remind candidates that the analysis and conclusion sections should not just restate results, but discuss trends and patterns, and highlight similarities and differences. Conclusions must relate to the aim(s) and be supported by evidence in the report.

Centres are reminded that there is no word count for the assignment, however candidates are permitted 1 hour and 30 minutes for the completion of their report. The report stage must be conducted under a high degree of supervision and control. This may be completed in one session or over more sessions. Candidates' work must be retained and stored securely between sessions. Giving any kind of feedback to candidates, marking by centre staff, or redrafting by candidates is not permitted. Detailed conditions for all stages can be found in the coursework assessment task document and must be adhered to.

Teachers and lecturers must ensure that they are familiar with all the conditions for assessment and apply them fully. For example, issuing pre-prepared tables for candidates to use is not allowed, instructions for candidates (as issued by SQA) must not be altered, and template answer sheets for candidates are not allowed.

SQA investigates all cases alerted where assessment conditions may not have been met.

Grade boundary and statistical information:

Statistical information: update on courses

Number of resulted entries in 2017	21417

Number of resulted entries in 2018	20928

Statistical information: performance of candidates

Distribution of course awards including grade boundaries

Distribution of course awards	Percentage	Cumulative %	Number of candidates	Lowest mark
Maximum mark				
A	31.1%	31.1%	6504	88
B	21.7%	52.8%	4537	75
C	20.1%	72.9%	4212	63
D	16.6%	89.5%	3477	50
No award	10.5%	-	2198	-

General commentary on grade boundaries

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.

SQA aims to set examinations and create marking instructions which 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.

Therefore, SQA holds a grade boundary meeting every year for each subject at each level to bring 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.

Grade boundaries from exam papers in the same subject at the same level tend to be marginally different year to year. This is because the particular questions, and the mix of questions, are different. This is also the case for exams set by centres. If SQA alters a boundary, this does not mean that centres should necessarily alter their boundary in the corresponding practise exam paper.