Course report 2024

National 5 Biology

This report provides information on candidates' performance. 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. You should read the report with the published assessment documents and marking instructions.

We compiled the statistics in this report before we completed the 2024 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2023:   22,937

Number of resulted entries in 2024:   22,346

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	6,267	Percentage	28.0	Cumulative percentage	28.0	Minimum mark required	86
B	Number of candidates	3,978	Percentage	17.8	Cumulative percentage	45.8	Minimum mark required	72
C	Number of candidates	4,175	Percentage	18.7	Cumulative percentage	64.5	Minimum mark required	58
D	Number of candidates	4,254	Percentage	19.0	Cumulative percentage	83.6	Minimum mark required	44
No award	Number of candidates	3,672	Percentage	16.4	Cumulative percentage	100	Minimum mark required	N/A

We have not applied rounding to these statistics.

You can read the general commentary on grade boundaries in the appendix.

In this report:

♦ 'most' means greater than 70%

♦ 'many' means 50% to 69%

♦ 'some' means 25% to 49%

♦ 'a few' means less than 25%

You can find statistical reports on the statistics and information page of our website.

Section 1: comments on the assessment

Question Paper

Overall, the question paper proved to be slightly more demanding than intended. This was considered when setting grade boundaries.

Markers commented that the question paper was fair and balanced. Most candidates made a good attempt at answering most of the questions; however, the number of unanswered questions was similar to previous years. Some candidates' knowledge of basic biology was poor.

The question paper was designed to provide a spread of marks across the course and to give candidates the opportunity to display a range of skills, as well as demonstrating and applying their knowledge and understanding.

Literacy skills and knowledge of practical apparatus and experimental set up continues to be a problem area for candidates. Some candidates' literacy and spelling were poor when naming and stating biological terms. However, there was an improvement in numerical skills.

As in previous years, candidates had difficulty distinguishing between questions that ask them to 'describe' and those that ask them to 'explain'. Many candidates gave an inadequate answer to these types of questions.

Candidates' responses to questions involving calculations continued to improve, with fewer instances of no response this year. Candidates' responses to experimental set-up questions showed a lack of understanding, particularly when referring to validity and reliability.

An increasing number of candidates failed to complete the answer grid for their responses to Section 1.

Candidates coped well with the scientific literacy question (question 9). This type of question mirrors the research skills used in the assignment and aims to help develop scientific and critical thinking in candidates. In keeping with previous years, candidates had difficulty with the idea of validity but coped well with the rest of the question.

Assignment

Overall, candidates' performance in the assignment, following its return in session 2023–2024, was slightly higher than the last time it was assessed in 2019.

It was evident from the structure of the assignments that teachers and lecturers have benefitted from the materials provided during Understanding Standards events prior to the return of the assignments. Candidates made good use of the 'Instructions for candidates' section of the assignment assessment task when working on their reports. Some sections of the assignment proved challenging for some candidates; centres should concentrate on these sections with future candidates.

Although many candidates carried out successful experiments, their knowledge of the underlying biology could be improved. It was evident that some candidates had not understood the basis of their experimental work, particularly where an indirect method of measuring the dependent variable was used.

The underlying biology section must contain information at National 5 level to allow candidates to access all available marks.

Section 2: comments on candidate performance

Areas that candidates performed well in

Question paper

Section 1

Question 6	Most candidates were able to correctly identify the stages of genetic engineering.
Question 10	Most candidates were able to identify the function of the cerebrum.
Question 12	Most candidates were able to use data in the graph to identify the correct conclusion.
Question 19	Most candidates were able to correctly identify the statement that was true for organisms in a food web.
Question 20	Most candidates were able to calculate the correct difference using data in the graph.
Question 21	Most candidates were able to identify a biotic factor affecting biodiversity.
Question 24	Most candidates were able to identify the changes to algal population, light levels, bacteria number and oxygen concentration when fertiliser leaches into a river.

Section 2

Question 1(a)(i)	Most candidates could name the nucleus.
Question 1(b)	Most candidates were able to suggest why Euglena was not a typical plant cell.
Question 2(a)	Most candidates were able to calculate the percentage change in mass of turnip tissue using data in the table.
Question 3(a)(ii)	Most candidates were able to state the number of ATP molecules produced.
Question 3(b)	Most candidates demonstrated knowledge of the cell structure where aerobic respiration is completed.
Question 5(a)	Most candidates demonstrated the ability to select a particular value from a complex graph.
Question 6(a)(i)	Most candidates could identify the neurons in a diagram of a reflex arc.

Question 7(a)(i)	Nearly all candidates were able to name the organ that produces an egg.
Question 7(a)(iii)	Most candidates were able to name the zygote.
Question 9(b)(ii)	Nearly all candidates could complete the table by adding the relevant data from the scientific literacy passage.
Question 11(b)	Most candidates were able to use data from a table to describe a relationship. However, some did get cause and effect the wrong way around.
Question 12(a)(i)	Most candidates could calculate the average correctly.
Question 14	Candidates coped well with the extended response.
Question 15(b)(i)	Most candidates were able to produce a scale and label, with units, for the graph and complete the bars at the correct height.
Question 15(b)(ii)	Most candidates were able to identify the crop with the lowest combined percentage loss.

Assignment

Section 1	Most candidates were able to state an appropriate aim.
Section 3(a)	Many candidates were able to give a brief description of the approach used to collect their data.
Section 3(b)	Nearly all candidates could include sufficient raw data (number and range of values) appropriate to their aim.
Section 3(f)	Most candidates could reference their internet/literature source.
Section 4(a)	Nearly all candidates could select the correct format for their graphical presentation.
Section 4(b)	Most candidates could provide suitable scales for their graph.
Section 4(c)	Most candidates could provide suitable labels and units for the axes of their graph.
Section 8(a)	Most candidates were able to provide an informative title for their assignment.
Section 8(b)	Most candidates could write a clear and concise report.

Areas that candidates found demanding

Question paper

Section 1

Question 2	Many candidates were unable to calculate the average length of cells from a diagram.
Question 3	Many candidates were unable to identify the cell that would require most mitochondria to allow movement of molecules across a membrane.
Question 5	Most candidates were unable to correctly identify the concentration of product in a degradation reaction.
Question 8	Many candidates found it difficult to identify a suitable control for the investigation.
Question 11	Many candidates were unable to identify the site of production and target tissue for a hormone.
Question 13	Many candidates could not correctly identify the chromosome complement of cells.
Question 16	Many candidates were unable to identify factors that would cause a decrease in transpiration.
Question 23	Most candidates were unable to calculate the correct number of eggs laid per female per day using the data in the table.

Section 2

Question 2(c)	Many candidates were unable to calculate the final mass of tissue when given the percentage change and starting mass.
Question 3(c)	Many candidates had difficulty suggesting a reason why a cell might carry out fermentation.
Question 4(b)(i)	Most candidates had difficulty suggesting a reason for the previously made starch being removed.
Question 4(b)(ii)	Many candidates had difficulty stating two variables that should be controlled in this investigation. Some candidates gave very generic responses.
Question 4(b)(iii)	Most candidates found difficulty in explaining how the results showed the enzyme was required. Many candidates gave a restatement of the results.
Question 5(b)	Many candidates were unable to calculate the percentage decrease.

Question 6(a)(ii)	Many candidates were unable to state how messages are transferred across the synapse.
Question 6(c)	Many candidates were unable to give the definition of a reflex.
Question 7(a)(ii)	Many candidates were unable to describe what happens during fertilisation.
Question 9(d)	Most candidates were unable to suggest why the study was invalid. Instead, they gave answers relating to reliability.
Question 10(b)(ii)	Most candidates were unable to explain why the heart muscle cells would stop contracting if the coronary artery became blocked.
Question 13(a)(i)	Many candidates had difficulty in describing the relationship. Several candidates did not state the carbon dioxide concentration where the mass of sugar becomes constant.
Question 13(b)(i)	Many candidates were unable to describe how hydrogen is produced during the light reactions.
Question 13(b)(ii)	Many candidates were unable to name cellulose as another substance the sugar can be converted into. Several candidates answered 'glucose'.
Question 15(b)(iv)	Most candidates found it difficult to calculate the yield that would have been produced if 20% had not been lost.
Question 15(c)	Many candidates were unable to state the term given to the build-up of pesticides. Many candidates did not attempt this question.
Question 16(c)	Most candidates were unable to suggest a selection pressure that would have led to the birds having different shapes of beak.

Assignment

Section 1: aim

Some candidates found difficulty in providing an account of the relevant biology worth more than one mark. Some wrote simple statements of fact, without giving expanded descriptions and/or explanations; this does not demonstrate relevant understanding. Candidates must ensure the information they include in the underlying biology is relevant to their aim. Some candidates included everything they knew about a subject, whether it was relevant or not. Irrelevant information is not awarded marks.

Section 5: analysis

Many candidates had difficulty giving a valid comparison in their analysis of the data they had gathered with data/information from the internet/literature. They did not fully comment on similarities between the two sets of data, and often ignored differences, especially when the

researched data did not completely support their experimental data. Often, their statements just restated the results. On many occasions, there was no comparison of the actual data.

Section 6: conclusion

Many candidates were unable to draw a valid conclusion that related to the aim and was supported by all the data/information in the report Some conclusions did not relate to the aim, and some were not supported by the data in the report.

Section 7: evaluation

Many candidates had difficulty with the evaluation. Some candidates opted for increasing the number of repeats to increase reliability. Unless there is clear evidence that the repeats already carried out have failed to establish reliability, then this would not be a suitable response. Some candidates did manage to correctly identify a factor that would affect the results but did not go on to describe what was done or what could have been done to minimise that effect.

Some candidates did not gain marks due to the incorrect use of the terms 'valid', 'reliable' and 'accurate'. It is not essential that these terms are used in the evaluation.

Section 3: preparing candidates for future assessment

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 candidates' depth of knowledge can be assessed in the question paper. Centres must ensure that they are using the most up-to-date versions of all documents, which are available on SQA's website.

Question paper

Candidates must spend time consolidating the mandatory knowledge and understanding of the course. Centres are encouraged to build revision exercises into their delivery throughout the course to ensure that candidates spend enough time learning terminology and definitions.

As well as demonstrating their knowledge and understanding, candidates must be able to apply their knowledge, which allows them to show greater understanding. Many candidates find this difficult and do not cope well with questions of this nature. Centres should provide opportunities for candidates to practise questions set in new and unfamiliar situations.

Candidates should also be given opportunities to evaluate experimental design and results. The reintroduction of the assignment should provide opportunities for candidates to do this.

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

Teachers and lecturers should practise both 'describe' and 'explain' questions with candidates. Information on valid responses to command words can be found in the general marking principles within the marking instructions.

Candidates should continue to review their responses to calculations, checking to see if they are feasible, as some answers were unrealistic.

Teachers and lecturers are encouraged to incorporate practical work into the course where possible to reinforce learning and provide opportunities for data analysis and evaluation.

Centres are reminded that the table of apparatus and techniques included in the course specification is an assessable part of the course.

Centres should deter candidates from using pencils in National 5 Biology question papers, as some candidates' responses were difficult to read.

Candidates must complete the answer grid for their responses to the multiple-choice questions. Centres should continue to prepare candidates by providing assessment opportunities that mirror the external exam.

Assignment

Centres must carefully consider the candidates' choice of topic for the assignment to ensure candidates can access all marks. Centres should consider a variety of topics that lend themselves to carrying out experimental work. This not only gives more experience at engaging in practical work to increase skills, but could allow candidates a choice of topic for their assignment.

An appropriate title should be provided for the report. This should provide information about the content of the report, but not be a reiteration of the aim.

Centres must discuss the aim with each candidate and advise them on the suitability of the aim before the candidate proceeds. Teachers and lecturers should not assist candidates in relation to the wording of the aim, but they can check to ensure that it is a feasible investigation. Centres should discourage candidates from providing multiple aims, as they rarely manage to address all of them in their conclusion.

All candidates are required to take an active part in experimental work or fieldwork. The nature of this must allow candidates to gather data that they can use in the report stage. Conditions for assessment are provided in the assignment assessment task.

Although candidates are showing improvement in averaging their results, many lost marks due to inappropriate rounding of figures. If candidates cannot accurately plot average figures on the available graph paper and need to apply rounding, they should make sure that they do so correctly and consistently.

Candidates should practise the skills involved in graph drawing more often, as some found this difficult. Teachers and lecturers should encourage candidates to use a ruler, and should explain the use of a common zero more carefully, as this was often used inappropriately in a bar graph. There were still instances where candidates produced a scale that was not linear.

Candidates often fail to gain marks in the analysis and conclusion. These involve skills that can be developed through practical work carried out during the course. Evaluation skills can also be developed in this way. Candidates must ensure in their analysis and conclusion that they are not just restating results, but discussing trends and patterns and highlighting similarities and differences. Conclusions must relate to the aim and be supported by all the evidence in the report.

There is no word count for the assignment, but candidates are permitted 1 hour and 30 minutes to complete their report. The report stage must be conducted under a high degree of supervision and control. It 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.

Centres must ensure that they are adhering to the conditions of assessment in the assignment assessment task and are applying them fully. Issuing pre-prepared tables for candidates is not permitted. Candidates must prepare their own tables, individually, to record the data they collect. The instructions for candidates must not be altered and template answer sheets for candidates are not allowed.

SQA takes very seriously its obligation to ensure fairness and equity for all candidates in all qualifications through consistent application of assessment conditions, and investigates all cases to which we are alerted that conditions may not have been applied.

Appendix: general commentary on grade boundaries

SQA's main aim when setting grade boundaries is to be fair to candidates across all subjects and levels and maintain comparable standards across the years, even as arrangements evolve and change.

For most National Courses, SQA aims to set examinations and other external assessments and create marking instructions that allow:

♦ a competent candidate to score a minimum of 50% of the available marks (the notional grade C boundary)

♦ a well-prepared, very competent candidate to score at least 70% of the available marks (the notional grade 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 for each course to bring together all the information available (statistical and qualitative) and to make final decisions on grade boundaries based on this information. Members of SQA's Executive Management Team normally chair these meetings.

Principal assessors utilise their subject expertise to evaluate the performance of the assessment and propose suitable grade boundaries based on the full range of evidence. SQA can adjust the grade boundaries as a result of the discussion at these meetings. This allows the pass rate to be unaffected in circumstances where there is evidence that the question paper or other assessment has been more, or less, difficult than usual.

♦ The grade boundaries can be adjusted downwards if there is evidence that the question paper or other assessment has been more difficult than usual.

♦ The grade boundaries can be adjusted upwards if there is evidence that the question paper or other assessment has been less difficult than usual.

♦ Where levels of difficulty are comparable to previous years, similar grade boundaries are maintained.

Every year, we evaluate the performance of our assessments in a fair way, while ensuring standards are maintained so that our qualifications remain credible. To do this, we measure evidence of candidates' knowledge and skills against the national standard.

During the pandemic, we modified National Qualifications course assessments, for example we removed elements of coursework. We kept these modifications in place until the 2022–23 session. The education community agreed that retaining the modifications for longer than this could have a detrimental impact on learning and progression to the next stage of education, employment or training. After discussions with candidates, teachers, lecturers, parents, carers and others, we returned to full course assessment for the 2023–24 session.

SQA's approach to awarding was announced in March 2024 and explained that any impact on candidates completing coursework for the first time, as part of their SQA assessments, would be considered in our grading decisions and incorporated into our well-established

grading processes. This provides fairness and safeguards for candidates and helps to provide assurances across the wider education community as we return to established awarding.

Our approach to awarding is broadly aligned to other nations of the UK that have returned to normal grading arrangements.

For full details of the approach, please refer to the [National Qualifications 2024 Awarding — Methodology Report](#).