



Course report 2023

National 5 Environmental Science

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 in conjunction with the published assessment documents and marking instructions.

The statistics in the report were compiled before any appeals were completed.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2022: 350

Number of resulted entries in 2023: 413

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	43	Percentage	10.4	Cumulative percentage	10.4	Minimum mark required	66
B	Number of candidates	72	Percentage	17.4	Cumulative percentage	27.8	Minimum mark required	54
C	Number of candidates	75	Percentage	18.2	Cumulative percentage	46	Minimum mark required	43
D	Number of candidates	105	Percentage	25.4	Cumulative percentage	71.4	Minimum mark required	31
No award	Number of candidates	118	Percentage	28.6	Cumulative percentage	100	Minimum mark required	N/A

Please note that rounding has not been applied 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 more statistical reports on the [statistics and information](#) page of SQA's website.

Section 1: comments on the assessment

Question paper

The majority of the question paper performed as expected. Feedback from the marking team and teachers and lecturers indicated that it was received positively by centres and was fair and accessible for candidates. Most candidates understood what was required and completed the question paper in the allocated time.

There were some candidates who appeared to have been presented at an inappropriate level as they struggled to access many of the questions. Feedback from markers indicated that lower levels of literacy and numeracy skills in some candidates presented a barrier to accessing marks for several questions.

Assignment

The requirement to complete the assignment was removed for session 2022–23.

Section 2: comments on candidate performance

Areas that candidates performed well in

Question paper

The following comments identify questions where candidates performed well.

Question 2(a)	Stating the term used to describe the place where the partridge lives. Most candidates were able to state habitat correctly.
Question 2(c)(i)	Determining the duration of the breeding season. Most candidates were able to use the diagram to determine how many weeks the breeding season lasts.
Question 2(d)	Identifying the most likely nesting site. Most candidates were able to identify the most likely nesting site correctly.
Question 2(e)(ii)	Predicting the impact on chick numbers of the use of pesticides. Most candidates were able to predict the impact correctly and many were able to explain the reason for their prediction.
Question 3(a)(ii)	Describing a human activity that could result in damage to plants through trampling. Most candidates could describe an appropriate human activity.
Question 3(b)(i)	Identifying the plant species most likely to be damaged by trampling. Most candidates could identify the correct plant species using the information in the table.
Question 3(b)(ii)	Calculating the percentage of plant species that are very resistant to trampling. Most candidates could calculate the percentage correctly.
Question 3(c)	Suggesting a way in which sand dunes can be protected from human activity. Many candidates were able to suggest a suitable approach.
Question 4(b)	Naming an Earth system other than the atmosphere. Most candidates were able to name another Earth system.
Question 5(b)(ii)	Comparing the heat energy transferred from edible kernels with that from the shells. Most candidates could make an appropriate comparison between the two sets of data.

Question 6(b)(ii)(A)	Explaining whether local authority initiatives to reduce waste going to landfill have been successful. Most candidates could identify that the initiatives have been successful, and many were able to use the data to explain why.
Question 6(c)(i)	Suggesting a reason for the global increase in waste production. Most candidates were able to suggest an appropriate reason.
Question 9(b)(i)	Drawing a bar graph. Candidates performed well in constructing a bar graph, with many awarded full marks.
Question 9(d)(i)	Calculating the average number of oil wells drilled per platform. Most candidates calculated the value correctly.
Question 9(d)(ii)	Describing environmental and social impacts of limestone quarrying. Many candidates were able to identify social and environmental impacts of quarrying.
Question 9(f)	Many candidates performed well in the environmental decision-making question, providing a rationale behind their decision.

Areas that candidates found demanding

Question paper

The following comments identify questions where candidates did not perform well, or areas of particular concern.

Most candidates found definitions challenging, particularly in questions 1(a) (carbon footprint), 1(c)(i) (carbon offsetting), 6(c)(ii) (global citizenship), and 9(b)(i) (recycling). In these questions, most candidates gave an incorrect response, or no response.

Many candidates confused the terms carbon and carbon dioxide in their responses. Additionally, some candidates provided the incorrect chemical formula for carbon dioxide and therefore, could not be awarded the mark in particular questions. Whenever chemical formulae are given as a response, including when using ICT, the chemical formulae must be correct. For example, for carbon dioxide CO_2 and not CO^2 , CO_2 , or Co_2 .

Many candidates found practical-based questions, such as question 5, challenging. Most candidates were unable to identify two variables that should be controlled in the experiment, and most candidates were unable to suggest two sources of error between the students' results and the published values.

A few candidates misinterpreted the instructions for the essay questions and answered both options A and B for question 10, rather than attempting one option from question 10 and one from question 11. In addition to this, a few candidates only answered part (a) of the structured essays in question 10, which limited the marks that could be achieved.

Question 1(c)(ii)	Suggesting one way in which a family could offset carbon. Many candidates described ways in which carbon dioxide emissions could be reduced, and not how the family could offset carbon.
Questions 2(e)(i), (ii)	Stating the terms used to describe the type of feeder. Many candidates confused the expected response for type of feeder. These should relate to the terms carnivore, herbivore, and omnivore.
Question 3(a)(i)	Stating what is meant by SSSI. Few candidates were able to state 'Site of Special Scientific Interest'. A few candidates tried to describe the purpose of an SSSI, rather than what the letters represented. Some candidates thought that one of the letters meant 'Scottish', with answers such as 'Scottish Site of Scientific Interest' or 'Special Site of Scottish Interest' being quite common.
Question 4(a)	Explaining the importance of the natural greenhouse effect for sustaining life on Earth. Many candidates were unable to explain the importance of the natural greenhouse effect. A similar question was asked in the 2022 exam.
Question 6(b)(i)	Describing one initiative introduced by local authorities to reduce waste going to landfill. Instead of identifying one initiative introduced by local authorities, many candidates identified either an initiative that the Government would be responsible for actioning, or a personal action that individuals could take.
Question 7(b)(i)	Stating the location of nitrogen-fixing bacteria in legumes. Most candidates could not identify the location of the nitrogen-fixing bacteria in legumes.
Question 8(c)	Describing the two processes involved in the water cycle that would take place at location Y. Most candidates were unable to either name or describe the processes of infiltration and percolation. A significant number of candidates did not attempt this question.
Question 8(d)(i)	Giving reasons for their choice of where to site a hydro-electric power station. Many candidates were unable to identify appropriate reasons for their choice of where to site a hydro-electric power station.
Question 9(a)(i)	Describing the formation of crude oil. Many candidates were unable to describe the stages involved in the formation of crude oil. A similar question was asked in the 2022 exam.

Section 3: preparing candidates for future assessment

Question paper

Teachers and lecturers are encouraged to incorporate the command words used in exam questions into teaching at an early stage, especially the difference between 'describe' and 'explain'.

Teachers and lecturers should continue to familiarise and expose candidates to the format of the question paper to ensure that they understand the requirements of the paper. For example, ensuring that candidates understand that they must select one essay from the first set of essay questions, and one essay from the second set.

Chemical formulae

It is important for candidates to express the correct chemical formulae in their responses. If teachers and lecturers are using or giving candidates chemical formulae, then the correct use of uppercase and lowercase letters and subscripted numbers must be highlighted and promoted. This also applies to the use of digital papers and ICT.

Definitions and terminology

It is important that candidates learn definitions and have the ability to express them accurately, using scientifically appropriate terminology. Acceptable definitions are listed in the National 5 Environmental Science Course Specification.

Centres should ensure that candidates are provided with a copy of the mandatory content tables and glossary available in the National 5 Environmental Science Course Specification. These will enable candidates to familiarise themselves with phrasing and terminology used at National 5 level.

Practical skills

Candidates must be given the opportunity to take an active part in a wide range of practical work and fieldwork, to develop the necessary knowledge and skills. This will help candidates with questions that ask about practical or fieldwork contexts. In particular, this should include the planning and evaluation of the practical setup and procedure. While demonstration of experiments, videos and computer simulations may be useful additional tools, they cannot replace active practical or fieldwork, and do not develop the knowledge and skills associated with them.

Candidates should experience the use of a variety of apparatus and techniques and be aware of the purpose and methodology of each. A list of apparatus and techniques is detailed in the National 5 Environmental Science Course Specification.

Extended responses

Candidates should consider how to structure their responses to extended-response questions, such as essays. This will help them respond effectively. Teachers and lecturers should support candidates with practise in exam technique throughout the course for this purpose.

Past papers and marking instructions are a useful resource to show candidates the expected level and depth of response required. Centres should encourage candidates to practise past paper questions.

Centres must ensure that candidates are presented at an appropriate level.

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.

Grade boundaries from question papers in the same subject at the same level tend to be marginally different year on year. This is because the specific questions, and the mix of questions, are different and this has an impact on candidate performance.

This year, a package of support measures was developed to support learners and centres. This included modifications to course assessment, retained from the 2021–22 session. This support was designed to address the ongoing disruption to learning and teaching that young people have experienced as a result of the COVID-19 pandemic while recognising a lessening of the impact of disruption to learning and teaching as a result of the pandemic. The revision support that was available for the 2021–22 session was not offered to learners in 2022–23.

In addition, SQA adopted a sensitive approach to grading for National 5, Higher and Advanced Higher courses, to help ensure fairness for candidates while maintaining

standards. This is in recognition of the fact that those preparing for and sitting exams continue to do so in different circumstances from those who sat exams in 2019 and 2022.

The key difference this year is that decisions about where the grade boundaries have been set have also been influenced, where necessary and where appropriate, by the unique circumstances in 2023 and the ongoing impact the disruption from the pandemic has had on learners. On a course-by-course basis, SQA has determined grade boundaries in a way that is fair to candidates, taking into account how the assessment (exams and coursework) has functioned and the impact of assessment modifications and the removal of revision support.

The grade boundaries used in 2023 relate to the specific experience of this year's cohort and should not be used by centres if these assessments are used in the future for exam preparation.

For full details of the approach please refer to the [National Qualifications 2023 Awarding — Methodology Report](#).