Course report 2024

Higher 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 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: 587

Number of resulted entries in 2024: 576

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

A	Number of candidates	38	Percentage	6.6	Cumulative percentage	6.6	Minimum mark required	105
B	Number of candidates	116	Percentage	20.1	Cumulative percentage	26.7	Minimum mark required	88
C	Number of candidates	156	Percentage	27.1	Cumulative percentage	53.8	Minimum mark required	71
D	Number of candidates	148	Percentage	25.7	Cumulative percentage	79.5	Minimum mark required	54
No award	Number of candidates	118	Percentage	20.5	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 papers

The feedback from teachers and lecturers, including those on the marking team, did not highlight any issues with either question paper. Comments suggest that the question papers were well balanced, covering a wide range of topics and skills, and were fair and accessible for candidates.

Some observations across both question papers include the following:

- The number of 'no responses' was noticeably lower than in previous years.
- Numeracy skills were much improved, with most candidates achieving at least partial marks for calculations.
- Recurring issues include poor understanding of command words; poor literacy skills; poor comprehension of basic environmental science concepts and skills; and illegible handwriting. All candidates should have developed numeracy and literacy skills that are commensurate with Higher level.
- Candidates frequently missed out on marks due to avoidable errors, such as omitting units in calculations; responses that were too brief or underdeveloped; or simply not reading the question properly.
- Questions requiring comparison between two factors were poorly done, with candidates typically focusing on one factor only, rather than comparing similarities or differences between the two.

Question paper 1

Question paper 1 focuses on an application of environmental science and has an intentional problem-solving focus. It also includes a relatively high proportion of A-type marks.

Question 3(c)(i) was more challenging than intended, and a mark adjustment was made to the grade boundary to take account of this.

Question paper 2

Question paper 2 followed the same format as question papers in previous years.

Questions 3(a)(iv) and 6(c)(i) were more challenging than intended, and mark adjustments were made to the grade boundary to take account of this.

Assignment

Although some candidates achieved very high marks, performance was relatively poor overall, and below that of 2019. However, it was similar to performance prior to 2019. Candidates frequently lost marks due to avoidable errors, such as omitting units in tables or graph-plotting errors, but there are also some areas where candidates need more guidance, support, and practical experience in preparation for undertaking the assignment, if marks are to improve in future. These are outlined in Section 3.

Section 2: comments on candidate performance

Areas that candidates performed well in

The following comments identify questions and assignment areas where candidates performed well.

Question paper 1

Question 2	Identifying which sector makes the largest contribution to the Scottish economy per employee Most candidates were able to correctly identify the sector, either through mental analysis of the data or by calculation.
Question 3(c)(ii)	Suggesting why trees planted at a higher density may be more vulnerable to damage Many candidates were able to suggest that the likelihood of contact increases with density, but only some candidates could then relate that to how that made the trees more vulnerable to damage.
Question 4	Suggesting why the removal of *Rhododendron ponticum* is part of the estate's annual maintenance programme Many candidates were able to use the information in the supplementary source booklet to suggest why this was the case.
Question 5(a)	Calculating percentage difference Most candidates successfully calculated the value.

Question paper 2

Question 1(b)(i)	Explaining the type of competition between squirrels Many candidates provided a valid reason for why competition between red and grey squirrels is inter-specific.
Question 1(b)(iii)	Calculating the percentage of red squirrels in Scotland. Many candidates correctly calculated the percentage
Question 1(c)(iii)	Stating an advantage and disadvantage of non-invasive sampling Most candidates correctly stated either an advantage or a disadvantage, though only some could state both.
Question 2(a)(i)	Stating the name given to the system that ranks waste management options according to what is best for the environment Many candidates were able to correctly identify the waste hierarchy from the description.
Question 2(b)(ii)	Explaining the benefit to the environment of the type of waste recovery used by the cheese factory

Most candidates could identify that, for example, it would reduce the need for fossil fuels or avoid waste going to landfill, but only some could explain why that was a benefit.

Question 2(b)(iii) Calculating the mass of CO_2 saved per household
Many candidates were awarded 1 mark for showing correct working. Some candidates were awarded both marks. A common issue for those that were awarded only 1 mark was omitting units from their final answer.

Question 2(b)(iv) Suggesting why anaerobic digestion may benefit companies financially
Most candidates were able to suggest a valid benefit, typically focusing on energy savings.

Question 3(a)(i) Suggesting why more earthworms are found in field margins compared to arable cropland
Many candidates were able to provide a valid response, typically referring to the area being undisturbed.

Question 3(a)(ii)(A) and Question 3(a)(ii)(B) Suggesting why low numbers of anecic and epigeic earthworms were found in intensively farmed arable cropland
Many candidates were able to use the information given in the table to deduce why this was the case.

Question 3(a)(iii) Explaining why the study data provided only an estimate of the earthworm population
Many candidates were able to give a valid explanation as to why the data was only an estimate.

Question 4(a)(ii) Suggesting a possible economic impact of E10 legislation on drivers
Most candidates were able to suggest a valid impact, with most recognising that there would be an increased cost to drivers, and some concluding motorists would have to buy more petrol to cover the same distance.

Question 4(b)(i) Calculating predicted CO_2 emissions
Many candidates were able to calculate the emissions value.

Question 4(b)(ii) Suggesting a reason for the predicted reduction in CO_2 emissions changing more slowly after 2025
Many candidates suggested a valid reason, such as drivers already having replaced older cars or already having switched to electric vehicles.

Question 4(c)(i) Explaining why widespread adoption of E10 petrol may reduce food security

Most candidates successfully explained an impact on food security of adopting E10 petrol, typically focusing on the reduction in land available for food crops.

Question 5(b)(i) Completing the diagram to include the Ferrel cell
Most candidates were able to draw in the Ferrel cell, with a correct label and arrows pointing in a clockwise direction. The most common error was in the direction of the arrows.

Question 5(d) Stating the term given to the rotation of the Earth that causes deflection in the surface wind patterns
Most candidates were able to name the Coriolis effect.

Question 6(b)(iii) Calculating the estimated difference in temperature between the top and bottom of the well
Many candidates were able to complete the calculation correctly. A common error was to omit the units in the answer.

Question 7(b)(ii) Suggesting a local human activity that might restrict distribution of upland plants, with justification
Most candidates were able to suggest a valid activity, with appropriate justification.

Question 8(a)(ii) Calculating the cost of cloud-seeding missions
Most candidates were able to calculate the cost of the missions.

Question 8(b)(i) Describing what is meant by desalination
Most candidates were able to provide a valid description of desalination.

Question 8(b)(iii) Suggesting a method that could be used to reduce demand for water in the agricultural sector (other than drip irrigation)
Many candidates were able to make a valid suggestion, such as growing drought-resistant crops or optimising watering times.

Question 8(b)(iv) Stating one method that could be used by industry to reduce water consumption
Many candidates were able to state a valid method.

Question 8(c) Stating an impact of climate change
Most candidates were able to provide a valid impact of climate change.

Assignment

1 Aim

Most candidates provided an aim that described the purpose of the investigation clearly.

3(b) Sufficient raw data from the candidate's experiment/field work

Most candidates provided sufficient raw data from their experiment/investigation, including

repeated measurements.

3(d) Data or information relevant to the experiment/field work investigation obtained from an internet/literature source, or data relevant to the aim from a second experiment/field work investigation

Many candidates included data/information from an internet or literature source or a second experiment or investigation.

However, some candidates appeared unsure about what counts as a second experiment or investigation — see 'Section 3: Areas that candidates found demanding' for more information.

4(a) An appropriate format from the options of bar graph, line graph, scatter graph, pie chart or other display method appropriate to environmental science

Most candidates used an appropriate graph format to present their data. However, some candidates produced overly complicated graphs, such as double *y*-axis graphs (with plotting issues), when producing two standalone but comparative graphs would have been more straightforward.

Most graphs were hand-drawn.

4(b) The axis/axes of the graph has/have suitable scale(s)

Most candidates produced a graph with suitable axis/axes scale(s).

4(c) The axis/axes of the graph has/have suitable labels and units

Many candidates produced a graph with suitable labels and units for the axes.

8 Structure (A clear and concise report with an informative title)

Most candidates produced a clear and concise report with an appropriate heading.

Areas that candidates found demanding

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

Question paper 1

Question 1	Stating a role of Scottish Forestry Some candidates could name a role of Scottish Forestry, but many responses were incorrect or too vague to be awarded the mark.
Question 3(a)	Using information to conclude why most softwoods are harvested around 40 years This question was intended to be demanding. However, candidates' responses were better than anticipated, with most

	being awarded at least 1 mark, and some being awarded at least 2 marks. Few candidates were able to develop their responses sufficiently to be awarded 3 marks.
Question 3(b)(i) and (b)(ii)	Explaining why natural disturbance processes are important in terms of succession and subsequent changes in biodiversity in a forest Many candidates appear to have missed the reference to the **importance** of natural disturbance processes such as windbreak and windthrow — that is, as a driver of change in the forest.
Question 3(c)(i)	Suggesting why softwoods are planted at a higher density than hardwoods Few candidates could suggest a valid reason.
Question 5(b)	Justifying which species would sequester most carbon over its crop rotation period Some candidates were able to provide a valid justification for their choice of species.
Question 6	The decision-making question This question was intended to be demanding, and functioned as expected. Some candidates merely restated information given in the sources but did not discuss these further. Marks are not awarded for just restating given information.

Question paper 2

Question 1(a)	Stating the name given to a species which has a serious negative impact on native species when introduced to an area outwith its native distribution Few candidates recognised the description of an invasive non-native species. Most omitted ‘invasive’ in their response.
Question 1(b)(ii)	Suggesting a reason for the increase in grey squirrel population Many candidates were unable to suggest a valid reason relating specifically to population.
Question 1(c)(i)	Defining genetic diversity Many candidates were unable to give a valid definition of genetic diversity.
Question 1(c)(ii)	Stating the type of random sampling used to sample the squirrel populations Many candidates were unable to state the type of random sampling being used.
Question 1(d)(i)	Predicting the red squirrel density

	Many candidates were unable to predict the red squirrel density in the area. Common incorrect responses were to use the data point that did not lie on the line of best fit, or to use the line representing areas where pine trees were absent, rather than present.
Question 1(d)(ii)	Suggesting why the red squirrel density is higher when pine trees are present Many candidates were unable to suggest a valid reason for the higher density.
Question 2(a)(ii)	Giving two reasons why recycling is a less preferable option than prevention Few candidates were awarded both marks, and a significant proportion did not achieve 1 mark. Many candidates did not compare recycling to prevention in their responses.
Question 2(b)(i)	Describing the process of anaerobic digestion Few candidates adequately described the process. The most common omission was reference to an oxygen-free environment. Reference to anaerobic bacteria was accepted.
Question 2(b)(v)	Justifying whether the model of waste management was an example of a linear or circular economy Although many candidates were able to identify that it was an example of a circular economy, many were unable to provide a valid justification for their choice.
Question 3(a)(iv)	Stating two ecological terms describing the common earthworm's ecological role This question required candidates to recognise definitions of two ecological terms included in a short paragraph. Few candidates identified both terms, and only some were able to identify one term.
Question 3(b)	Identifying the correct soil profile and justifying the choice Most candidates were able to identify the correct soil profile, but few were able to give a full justification for their choice.
Question 4(a)(i)	Describing how the aims of a policy are achieved Although many candidates were able to identify in part how the aims of a policy are achieved, few gave sufficient detail in their responses to be awarded both marks.
Question 4(c)(ii)	Suggesting how good waste management practices might mitigate the impact of biofuels on food security Many candidates were unable to make a valid suggestion.

Question 4(c)(iii)	Comparing the possible impact of the production of bioalcohols and biodiesel on food security Many candidates were unable to compare the impact of production. Commonly, candidates did not include a comparison or focussed on the impact of either bioalcohols or biodiesel only.
Question 5(a)	Stating what is meant by the global energy budget Few candidates provided an acceptable description of the balance between incoming and outgoing solar radiation.
Question 5(c)	Naming the biome close to the equator and associated with low atmospheric pressure Many candidates were unable to name the biome as equatorial rainforest. The most common error was omission of 'equatorial'. Tropical rainforest was also accepted.
Question 6(a)(i)	Defining energy security Few candidates were able to give an acceptable definition of energy security.
Question 6(a)(ii)	Explaining why drought further contributed to the energy crisis Few candidates recognised the importance of water in energy production, and the subsequent impact of drought on that production. Many candidates did not achieve 1 mark, and very few achieved both marks.
Question 6(b)(i)	Stating a source of geothermal energy Most candidates were unable to name a source of geothermal energy. Many incorrectly referred to convection currents in the mantle and core.
Question 6(b)(ii)	Stating the term used for the rate of energy change with depth Few candidates could name the geothermal gradient, and there was a significant number of no responses.
Question 6(c)(i)	Describing how ground source heat pumps deliver geothermal energy to homes Most candidates were unable to describe how a ground source heat pump operates.
Question 6(c)(ii)	Explaining why offering financial incentives to homeowners to install ground source heat pumps may help limit the rise in global temperature Although most candidates were able to identify that it would help limit emissions compared to fossil fuels, few could go on to explain why that would help limit the rise in global temperature.

Question 7(a)	Stating the designation that can be applied to a terrestrial area that has extremely high conservation value because of its plants, animals, geological or landscape features Many candidates did not recognise the description of a site of specific scientific interest (SSSI).
Question 7(b)(i)	Completing the paired statement key The Higher Environmental Science Course Specification, available on the subject page of the SQA website, indicates that candidates should be able to construct and use a paired statement key. While some candidates were able to complete the key successfully, a significant number of candidates seemed unaware of how to do this — or how to phrase the statements, despite exemplar statements being provided (that is, 'has'/'does not have…'). A paired statement key is based on visual characteristics of the species under investigation in comparison with other species; habitat information should not be used in a key.
Question 7(b)(iii)	Predicting the implication for genetic diversity where plants only reproduce via rhizomes and justifying the prediction Although many candidates were able to make an appropriate prediction only some could provide a valid justification for their prediction.
Question 7(b)(iv)	Suggesting why reproducing naturally via seed may no longer be successful for the alpine sow-thistle Few candidates were able to explain that seed production for this species relies on insect pollinators being present at the right time, or being able to move between the scattered patches of the plant.
Question 7(b)(v)	Naming a conservation practice that could be used to increase populations of vulnerable species Many candidates were unable to name an appropriate conservation practice for dealing with vulnerable species.
Question 8(a)(i)	Naming the process in the hydrological cycle being enhanced by cloud seeding Many candidates were unable to name the process as condensation.
Question 8(b)(ii)	Explaining why drip irrigation uses less water than more traditional techniques Many candidates were unable to provide a valid explanation.
Question 8(b)(v)	Calculating how much oil is being used in plastic water bottle production

	Although many candidates were able to calculate how many bottles the population of the UAE used each year, only some could then go on to calculate the volume of oil used correctly.
Question 8(d)	Describing the relationship between global warming and climate change Although many candidates were able to state what was meant by ‘climate change’ or ‘global warming’ or both, many did not describe the relationship between the two.
Essays	Mean marks for 9A, 9B, 10A, and 10B are comparable with mean marks achieved in 2023 and pre-2022. A few candidates did not attempt one or both essays. A poor standard of literacy and/or knowledge commensurate with Higher level continues to be noticeable in essay responses. Candidates frequently used bullet point lists and diagrams, though not always with accompanying discussion.
Question 9	More candidates selected option B (nuclear power generation) than option A (food production strategies), but the mean marks were comparable. Option A: Candidates covered a good range of changes in (a) land management and (b) technology. Option B: Markers commented that some candidates were able to discuss in detail the advantages and disadvantages of nuclear power generation.
Question 10	More candidates selected option B (mechanisms of destructive plate boundaries) than A (processes involved in the formation of soil). The mean marks for 10B were higher than for 10A. Option A: Rather than discussing processes involved in soil formation (weathering, decomposition and humification, and translocation), some candidates instead focused either on inputs (parent material, organisms, relief, climate, and time, which attracted a maximum of 2 marks) or how characteristic soil horizons form. Option B: Candidates commonly used diagrams, though not always with annotations and/or accompanying discussion.

Some candidates appeared confused about the difference between destructive and constructive plate boundaries, and either discussed the wrong one or intentionally provided accounts of both.

Candidates should be strongly discouraged from providing multiple responses as a catch-all, since the general marking principles (detailed within the marking instructions) state that marks should not be awarded 'if a candidate gives two answers, where one is correct and the other is incorrect' — that is, an incorrect statement negates a correct one.

Assignment

2 Underlying environmental science

Many candidates struggled to provide an account of the environmental science underlying the aim of their investigation, with around half achieving a 0 or 1 mark only.

Key issues included the following:

- The topic was not relevant to Higher Environmental Science course content. For example, some candidates conducted a wind energy-related investigation; wind energy is a National 5 topic, but candidates were credited where their underlying science account related wind energy to an aspect of the Higher course, such as climate change. Where there was no attempt to link to Higher course content, much of the underlying science account was essentially irrelevant.
- The underlying science was irrelevant to the aim and/or subsequent investigation.
- The account was too brief.
- The language and terminology used was not commensurate with Higher level.

3(a) A brief summary of the approach(es) used to collect experimental/field work data

The summary must be brief, containing only sufficient detail for the marker to be able to visualise the nature of the investigation.

Many candidates did not demonstrate the ability to summarise, instead providing descriptions that were too lengthy and/or too detailed.

3(c) Data, including any mean and/or derived values, presented in a correctly produced table(s)

Many candidates were not awarded the tabulation mark due to an avoidable error(s), for example, inappropriate column headings or omission of an appropriate unit(s).

3(d) Data or information relevant to the experiment/field work investigation obtained from an internet/literature source, or data relevant to the aim from a second experiment/field work investigation

Although many candidates did include relevant secondary data, either from an internet or literature source or from a second experiment, some candidates appeared confused over what counts as a second experiment/investigation, with some providing only one set of raw data but then referring to a second set of unseen data — or providing a hyperlink to data, expecting the marker to access it themselves.

A second experiment/investigation could be one that relates to the selected topic but would also operate as a standalone. For example, assessing the impact of varying soil pH on the growth rate of seedlings would be a valid single investigation, and the candidate would have to find data from the internet/literature to compare with their raw data.

Similarly, assessing the impact of differing concentrations of a named soil nutrient on the growth rate of seedlings would also be a valid single investigation (and would require comparative data from the internet/literature).

However, these two standalone investigations could be combined, with both data sets relating to the growth rate of seedlings. In this case, the candidate would not need to find comparative data from the internet/literature.

3(e) A citation and reference for a source of internet/literature data or information

Many candidates were not awarded the citation and reference mark due to either omitting a citation or including a full reference, typically the full URL, within the body of their report in place of a citation.

Also, the format of a reference must match the example laid out in the Higher Environmental Science Coursework Assessment Task, available on the Higher Environmental Science subject page of the SQA website.

5 and 6 Analysis versus conclusion

Many candidates seemed unsure about the difference between an analysis and a conclusion, and sometimes did not achieve either mark.

An analysis should be a detailed discussion of the data, including numerical values, where appropriate — for example, a comparison of the candidate's data with data from an internet/literature source.

The analysis supports the drawing of a conclusion, which is a summing up of what was found during the investigation, and should refer to the aim and all the data included in the report. Some candidates based their conclusion on only one set of data and ignored the other.

5(b) A correctly completed extended or statistical calculation based on the experimental/field work data

Many candidates did not achieve the extended/statistical calculation mark.

Key issues included the following:

- omission of an extended/statistical calculation
- omission of a worked example demonstrating how calculated values were obtained. The formula used for the calculation, and the relationships within it (for example, where x =), should also be included
- an error(s) in the calculated result(s)

An average/mean or simple percentage calculation does not count as an extended/statistical calculation.

The extended or statistical calculation should be appropriate to the investigation, but many candidates seemed unsure about selecting a type of calculation appropriate to their investigation, with many including only a percentage change calculation. Although a percentage change calculation was appropriate in some cases, for the majority it produced a correct, but meaningless, value that then compromised the analysis and conclusion marks, since these must take account of calculated values.

6 Conclusion

Some candidates achieved the conclusion mark, but many did not due to the reasons outlined in the 'Analysis versus conclusion' section above.

7 Evaluation

Candidates must make three statements, supported by justification, which can relate to their experimental/investigation methods, results, and/or data.

Many candidates commented on aspects that should be standard practice at Higher, such as repeating and calculating an average, which did not achieve a mark.

Most candidates achieved 0 or 1 mark for their evaluative statements, and few were awarded either 2 or 3 marks.

Section 3: preparing candidates for future assessment

Centres are reminded that Higher Environmental Science is a practical course that requires candidates to develop the knowledge and skills associated with practical work and fieldwork. Candidates **must** be given the opportunity to undertake a wide range of practical work and fieldwork in order to develop the knowledge and skills detailed in the Higher Environmental Science Course Specification.

Question papers

Centres are advised to provide candidates with a copy of the mandatory content table and glossary from the Higher Environmental Science Course Specification. These will enable candidates to familiarise themselves with the phrasing and terminology used in Higher Environmental Science question papers. It should be noted that section headings and sub-headings in the first column of the table often form part of question stems and extended-response questions, intended to direct candidates to the expected response.

Candidates should be encouraged to use past papers as revision tools, as these and the marking instructions demonstrate the expected breadth and depth of response required, including language commensurate with Higher level. Candidates should also be encouraged to read the annual course reports, which highlight areas where previous candidates performed well or had difficulty in and why.

Teachers and lecturers are encouraged to incorporate command words used in the question papers into teaching at an early stage, so candidates understand what is meant by, for example, ‘describe’, ‘explain’, ‘conclude’, and ‘evaluate’.

Candidates should be encouraged to improve their handwriting, since illegible responses may result in marks not being awarded if markers cannot understand the handwriting.

The areas where gaps in candidate knowledge and understanding were especially noticeable include the following:

- definitions — these do not have to be word-for-word versions of terms included in the course specification, but should convey the gist
- comparison questions — responses should refer to, or infer, similarities or differences in both components
- Living environment
  - qualitative techniques (paired statement key)
  - random sampling (simple, systematic, stratified)
  - key ecological terms (genetic diversity, detritivore, keystone species, SSSI)
  - species reduction/increase through human activities (conservation practices)
  - main roles of key environmental agencies (Scottish Forestry)
- Earth’s resources
  - mechanisms of plate boundaries (destructive)
  - geothermal energy (sources, geothermal gradient, use of ground source heat pumps)

- hydrological cycle (movement processes)
- oceanic circulation (global energy budget)
- soils (formation processes)
- atmospheric circulation (Hadley cell, biomes)

♦ Sustainability
- global challenges (energy security)
- waste management (waste hierarchy, anaerobic digestion)
- anthropogenic climate change (global warming, climate change)

Assignment

The requirements for the assignment are detailed in the coursework assessment task, and there are many materials available on the Higher Environmental Science Understanding Standards website to support both candidates and teachers and lecturers.

While candidates are only permitted to take the 'Instructions for candidates' section into the report stage, rather than the entire coursework assessment task document, it is in their interest to familiarise themselves with the assignment requirements and how marks are awarded. Centres are therefore recommended to provide candidates with a copy of the coursework assessment task document, and to ensure at an early stage that candidates understand fully what they are being asked to do.

It is important that candidates are provided with a choice of assignment topics. Centres should supply a list of topics that are relevant to Higher Environmental Science course content and have an associated experimental or fieldwork investigation(s). It is not acceptable for entire classes or cohorts to be undertaking the same assignment. Candidates are permitted to work either individually or in a small group (two, three, or four candidates) for the experiment/investigation, and centres must limit how many individuals and groups select any given topic.

Candidates may share data within their own group, but not outside the group. Once they have collected their experimental/investigation data, each candidate must carry out their own internet and/or literature research, and then produce their report independently.

The following are areas where gaps in candidate understanding of the assignment report requirements were especially noticeable:

1 Aim

Although most candidates achieved the mark for their aim, this is the area in which candidates must indicate clearly if they are collecting data from two experiments/investigations. This is important, since the aim(s) should be reflected in the underlying environmental science, and the marker should be able to anticipate the type and range of data to look for in the report. In addition, if the aim is unclear, it may not be possible to award the mark for the conclusion.

2 Underlying environmental science

Centres should ensure the topics they offer to candidates are appropriate to Higher— that is, each topic links either directly or indirectly to Higher course content. Candidates should be aware that the 3 marks on offer in this section indicates that their account should be relatively in-depth, demonstrate a good understanding of relevant environmental science, and use Higher-level terms.

3(a) A brief summary of the approach(es) used to collect experimental/field work data

Candidates should develop the skill of summarising their data collection process. The summary must be brief, containing only sufficient detail for the marker to be able to visualise the experiment/investigation. It should include details of equipment or chemicals used, but not exact volumes, concentrations, or number of repetitions.

3(c) Data, including any mean and/or derived values, presented in a correctly produced table(s)

Candidates should take a table containing **only** their raw data into the report stage. This table may be pasted or copied into their report, and additional columns and column headings and units then added; candidates **must not** take in a table that also includes pre-prepared columns (and headings) for mean and/or derived values. Candidates **must not** take in mean and derived values; these must be calculated during the report stage.

3(e) A citation and reference for a source of internet/literature data or information

Candidates should be aware of the difference between a citation and a reference, and where each should be placed in their report — that is, both are required.

If conducting a single experiment/investigation, the candidate must find comparative data from an internet or literature source. This source of data must be cited **within** the body of the report, close to where the data has been inserted, and the full reference placed at the end of the report. The citation could take the form of a $^{(1)}$ or (1), or similar, which should then be repeated alongside the reference to indicate the link.

5 and 6 Analysis versus conclusion

Candidates should be aware of the difference between an analysis and a conclusion, as described in the section, ‘Areas that candidates found demanding’.

5(b) A correctly completed extended or statistical calculation based on the experimental/field work data

Candidates should consider carefully the type of extended/statistical calculation that would be most appropriate to their experiment/investigation — that is, a calculation that will provide a meaningful value that augments the analysis and conclusion. A number of examples are listed in the coursework assessment task.

7 Evaluation

Candidates' evaluative statements, with accompanying justification, could relate to the data collection method, results, and/or data from internet or literature sources. The 'Instructions for candidates' section in the coursework assessment task provides a range of examples relating to accuracy, precision, adequacy, limitations, and reliability. Candidates should be aware that they do not need to use the terms 'reliability', 'accuracy', and 'precision', but if they do so, they must use them correctly.

It is important that all teachers and lecturers are familiar with the requirements for the Higher Environmental Science assignment. The requirements for Higher Environmental Science are similar to those of the other sciences. Teachers and lecturers should be aware that these may differ significantly from the requirements of other subjects.

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.