Course report 2025

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 2025 appeals process.

Grade boundary and statistical information

Statistical information: update on courses

Number of resulted entries in 2024: 576

Number of resulted entries in 2025: 491

Statistical information: performance of candidates

Distribution of course awards including minimum mark to achieve each grade

Course award	Number of candidates	Percentage	Cumulative percentage	Minimum mark required
A	59	12.0	12.0	104
B	90	18.3	30.3	87
C	108	22.0	52.3	71
D	120	24.4	76.8	54
No award	114	23.2	100%	Not applicable

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 or equal to 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 teams, did not highlight any issues with either question paper. Comments suggested that the question papers were well balanced, covering a wide range of topics and skills, and fair and accessible for candidates.

Some observations across both question papers include the following:

- The number of ‘no responses’ continues to decrease year on year, with most candidates attempting to answer questions. This includes essays, where most candidates attempted both essay questions.
- There was an improvement in language skills, particularly in essays, with fewer bullet-pointed lists without additional discussion. However, use of National 5-level language was frequent, and brevity of responses was often an issue, especially in questions requiring an explanation or justification.
- Numeracy skills were noticeably improved, with most candidates attempting calculations and achieving at least partial marks.
- Recurring issues include a limited understanding of command words, limited 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 continue to lose marks due to avoidable errors, such as omitting units in calculations, giving too brief or undeveloped responses, or not reading the question carefully.

Question paper 1

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

Question 2(c)(i) and question 4, the decision-making question, were considered to be more challenging than intended, and grade boundaries were adjusted to take account of this.

Question paper 2

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

Questions 1(a) and 2(d)(ii) were considered to be more challenging than intended, and grade boundaries were adjusted to take account of this.

Assignment

Some candidates achieved very high marks, and overall performance was slightly higher than in 2024 but still below that of 2019.

Candidates continue to lose marks due to avoidable errors, such as tabulation or graph production. To improve overall marks in future, candidates would benefit from more guidance, support, and practical experience before undertaking the assignment. In addition to careful reading of the ‘Instructions for candidates’ section in the Coursework Assessment Task, they may also benefit from reading this course report to gain a better understanding of areas of the assignment in which this year’s candidates did not perform well and how to avoid this in their own report.

Section 2: comments on candidate performance

Areas that candidates performed well in

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

Question paper 1

Question 1(a) Suggesting why Sargassum rafts offer a valuable habitat for marine species.

Most candidates could suggest a valid reason why Sargassum rafts offer a valuable habitat for marine species.

Question 1(b)(i) Suggesting why rooted algae and marine plants contribute so little to photosynthesis on oceans.

Most candidates identified that light penetration through water would be a limiting factor for photosynthesis.

Question 1(b)(iii) Calculating how much carbon dioxide is sequestered by Sargassum each year.

This question was intended to be challenging and functioned as such.

Many candidates successfully extracted relevant data from the supplementary booklet and converted petagrams (Pg) to kg, gaining at least partial marks. Some candidates then calculated the mass of carbon dioxide sequestered by Sargassum correctly. The most frequent error was failing to include $\times 10^{12}$ or $\times 10^{13}$ in the final answer.

Question 2(c)(ii) Describing fully the relationship between either depth and temperature or depth and salinity.

Most candidates chose to describe the relationship between depth and temperature.

Most candidates were awarded 1 mark for describing the general trend in the selected option, with some achieving the second mark for including relevant depth points where significant change occurred.

Question 2(c)(iii) Suggesting one reason why the results from the experimental setup in the Pacific Ocean may not be valid for the aquafarm in the South Atlantic Ocean.

Many candidates were able to provide an acceptable reason by relating their response to possible differences between the two oceans.

Question 3(b) Suggesting how a named natural event could impact on the aquafarm project.

Many candidates were able to name a natural event that could impact on the aquafarm and describe the possible impact.

A few candidates referred to decomposition of bales on the seafloor and subsequent release of nutrients, but this process would be unlikely to occur in the anoxic conditions — hence the carbon sequestration aim of the project — and such responses were not awarded the mark.

Question paper 2

Question 1(b)

Describing the role of coagulation and filtration in the water purification process.

Many candidates were able to describe the role of one of these stages. Coagulation tended to be described more successfully than filtration.

Question 1(e)(i)

Completing the 100% stacked bar graph.

Most candidates were awarded 1 or 2 marks for completing the graph, with only some achieving full marks. The most frequent errors were in omitting an x-axis label and/or the y-axis scale and label (yet correctly plotting the data).

Question 1(e)(iii)

Explaining why evidence provided suggests that biological oxygen demand (BOD) measurements are likely to be lower in Scotland than in the other countries shown.

This question required candidates to interpret information included in the table and apply their own knowledge and understanding of BOD. Many candidates were able to draw a partial conclusion based on the water quality ratings shown in the table and were awarded 1 mark. Fewer related Scotland's rating to BOD for the second mark.

Question 2(a)(i)

Naming an ore rich in aluminium oxide.

Most candidates were able to name an aluminium oxide ore.

Question 2(b)

Stating a possible environmental impact of mining aluminium ore.

	Most candidates were able to state a valid environmental impact of mining aluminium ore.
Question 2(c)(ii)	Stating a sustainability factor (other than environmental). Many candidates were able to name social or economic as factors in the sustainability relationship. However, it was evident that the three main components of sustainability were unfamiliar to some candidates.
Question 3(a)(ii)	Identifying two examples of sustainable practice shown in the flow chart. Many candidates were able to identify at least one example of sustainable practice shown in the flow chart, while some were able to identify two.
Question 3(a)(iii)	Naming a processed biofuel, other than biobutanol. Most candidates could name another processed biofuel.
Question 3(b)(i)	Calculating the percentage decrease in the mass of a new bottle. Most candidates were able to calculate the percentage decrease successfully.
Question 3(c)(ii)	Suggesting why reuse of greywater or blackwater would not be an appropriate option for the whisky industry. Most candidates understood the implications of using greywater or blackwater in a food and drink setting.

Questions 3(d)(i) and (d)(ii)	Suggesting an advantage and disadvantage of reusing casks. Most candidates were able to suggest an appropriate advantage and disadvantage of reusing casks.
Question 3(e)(i) and (e)(ii)	Suggesting why climate change and a lack of genetic diversity could impact on the long-term supply of barley. Most candidates were able to suggest a valid impact of climate change on barley supply. Only some candidates were able to suggest a valid impact of a lack of genetic diversity on barley supply.
Question 4	Performance in previous question papers has highlighted that candidates frequently have difficulty describing Milankovitch cycles and/or their impacts. The structure of this question was intended to highlight the theory behind each of the cycles, with explanatory diagrams and information to aid candidate knowledge and understanding, and make the marks more accessible. Candidates appeared to be reasonably familiar with eccentricity (shape of Earth's orbit) and obliquity (tilt of Earth's axis), but less so with precession (orientation of Earth's axis of rotation).
Question 4(a)(ii)	Describing a consequence of increased sunspot activity on Earth's climate.

	Most candidates were able to describe an appropriate consequence.
Question 4(b)(i)	Suggesting why summers in the Southern Hemisphere may be hotter than summers in the Northern Hemisphere. Many candidates achieved at least 1 mark.
Question 5(a)	Stating two variables that should be kept constant to ensure valid sampling of sites. Many candidates were able to name two appropriate variables to keep constant.
Question 5(c)(i)	Calculating Simpson's Biodiversity Index. Many candidates were able to calculate the index correctly.
Question 5(c)(ii)	Concluding which site has the highest biodiversity, with justification. Many candidates were able to draw the correct conclusion and explain why they had reached this conclusion.
Question 5(e)	Describing the application of another biotic index. Many candidates achieved at least partial marks for naming and describing the application of another biotic index.
Question 6(a)(iii)	Suggesting an advantage of using geothermal district heating schemes compared to conventional domestic heating systems.

	Many candidates were able to suggest an appropriate advantage of the geothermal district heating scheme.
Question 7(a)(i)	Completing the table to show comparative soil formation factors for a podzol and a brown earth. Many candidates were able to provide valid comparative soil formation factors.
Question 7(c)(ii)	Stating a commercial use of a brown earth. Most candidates were able to state an appropriate use of a brown earth.
Essays	The mean mark for 8A was slightly lower than 8B. The mean mark for 9A was slightly lower than 9B. A few candidates did not attempt one or both essays. Responses appear to have been noticeably more focused on the specific topics than in previous years, and a higher standard of literacy and knowledge commensurate with Higher level was noted by markers.
Question 8	More candidates selected option B (habitat fragmentation, habitat destruction, rewilding, conservation practices) than option A (moorland succession), but the mean marks were broadly comparable. Option A — Most candidates could describe the sequence of succession shown in the diagram and the characteristic features of a climax community.

Frequent omissions that prevented candidates achieving full marks were reference to bare rock (that is, primary succession), and the site being moorland (and therefore a plagioclimax/managed landscape).

Option B — Most candidates provided a good account of species reduction — or increase as a consequence of habitat fragmentation, habitat destruction, and rewilding.

There appears to be some confusion regarding rewilding and conservation practices. Although many online sources do regard rewilding as a conservation approach, there is a significant difference between the two practices; conservation involves the protection and preservation of an existing resource (for example, landscape, ecosystem, or species), whereas rewilding aims to return a landscape or ecosystem to what it was before human intervention.

Where candidates discussed rewilding in both parts (a) and (b), they were credited for valid points in either section but were not double-credited.

As rewilding and conservation practices are listed separately in the course specification, teachers and lecturers are advised to follow this practice to avoid causing confusion.

Question 9

More candidates selected option B (human impacts on air and water quality) than option A (using hydrogen as a fuel), but the mean marks were broadly similar.

Option A — Most candidates provided a good account of the advantages and disadvantages of using hydrogen as a fuel. There is still a tendency to present these as brief bullet points without further discussion, which may limit the marks awarded.

Option B — Most candidates demonstrated a good understanding of named human activities that can impact significantly on the quality of air and water. A wide range of both positive and negative impacts were discussed.

Assignment

1 An aim that describes clearly the purpose of the investigation

Most candidates provided an aim that described the purpose of the investigation clearly. Where aims were clear and simplistic, candidates often performed well in dependent sections such as analysis and conclusion.

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

Most candidates provided sufficient raw data from their experiments/field work, 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.

Most candidates provided relevant data/information from an internet or literature source, or a second experiment/field work investigation.

Some candidates' secondary sources were not directly relevant to their investigation, for example, a table of data or graph showing a trend for a different species or another country, which potentially ignores ecological and/or environmental differences and may not be comparable. Where directly comparable data cannot be

found, candidates should be advised to rethink their aim. In addition, if the secondary source uses a different unit, candidates should find a way of converting this so that the two data sets are comparable.

Although much improved on previous years, some candidates still appear unsure about what counts as a second experiment/field work investigation. See the 'Areas that candidates found demanding' section for more information on suggested approaches.

A few candidates did not include a second source of data, instead just providing a URL. This is not appropriate, and candidates must include the secondary data in their report. With the data from the second source missing, this has an impact on dependent marks, such as analysis and conclusion.

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 were able to use an appropriate graph format to display their data. Most graphs were hand drawn, which is acceptable as long as they are drawn on suitable graph paper.

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

Most candidates were able to produce a graph with suitable axis/axes scale(s).

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

Most candidates were able to produce a graph with suitable labels and units.

4(d) Accurately plotted data points and a line (line graph) or clear bar tops (bar graph) or angles (pie chart) or a line of best fit (scatter graph)

Many candidates were able to produce a graph with data points plotted accurately, though a significant proportion of candidates made avoidable plotting errors. Candidates must ensure that the graph paper they use has both major and minor gridlines. This includes triangular graph paper typically used for soil texture analysis.

8 A clear and concise report with an informative title

Most candidates were able to produce a clear and concise report with an appropriate title.

Areas that candidates found demanding

The following comments identify questions and assignment areas in which candidates did not perform well, or areas requiring improvement.

Question paper 1

Question 1(b)(ii) Stating what is mean by net primary productivity.

Few candidates were able to provide an acceptable definition of net primary productivity. Most candidates omitted reference to respiration, confusing it with gross primary productivity.

Question 2(a) Stating what is meant by an ocean gyre.

Few candidates were able to give a valid definition. Most did not indicate the scale of an ocean gyre.

Question 2(c)(i) Explaining why the process of drawing up nutrient-rich water will continue once the pump is removed.

The pump acted as a syphon, drawing up cold water that would warm and become less dense as it rose up the pipe to the surface. Few candidates were able to successfully explain the convection process that would take over once the pump was removed.

Many candidates referred to changes in salinity — in this situation, this would be invalid as information in the question stem indicates that the surface water was already highly saline.

Question 4 The decision-making question.

This question was intended to be challenging, requiring candidates to draw together multiple strands of information and to apply their own knowledge, and it functioned as expected.

While many candidates provided valid justification for their selected option, a significant proportion of candidates overlooked the aim of the aquafarm project (carbon sequestration) and instead focused on possible pros and cons should Sargassum escape the aquafarm and South Atlantic gyre. This is believed to be an unlikely occurrence in the South Atlantic gyre (question 2(b)).

Question paper 2

Question 1(a)	Naming stage X in the diagram. Few candidates were able to name stage X, frequently stating flocculation in place of sedimentation.
Question 1(e)(ii)	Describing what is meant by biological oxygen demand (BOD). Most candidates were unable to provide a basic definition of BOD.
Question 2(a)(ii)	Stating two factors associated with the formation of aluminium ore. Few candidates were awarded both marks, and many did not achieve 1 mark.
Question 2(d)(i)	Naming the type of recycling model. Many candidates were unable to name the recycling model as closed loop.

Question 2(d)(ii)	Determining the percentage of energy saved by recycling aluminium rather than processing it from its ore. This question was not intended to be challenging as it was largely based on mandatory content: ‘recycling aluminium requires approximately 5% of the energy needed to produce it from bauxite’ (Sustainability — open and closed loop recycling). However, few candidates successfully determined that this must therefore mean 95% of energy is saved by recycling.
Question 2(e)(i)	Stating the type of environmental assessment required for building an aluminium processing and recycling plant. Most candidates did not name the correct type of environmental assessment required.
Questions 2(e)(ii)(A) and (B)	Explaining the need for monitoring and mitigation in an environmental assessment. Few candidates were able to explain the need for monitoring. The most frequent omission was reference to change over time. Many candidates did not explain the need for mitigation.
Question 3(a)(i)	Stating the process that generates biogas through decomposition of organic matter in an oxygen-free environment. Most candidates did not recognise the definition of anaerobic digestion, with many instead stating either fermentation or anaerobic respiration. While

	all three processes take place in low or anoxic conditions, there are differences between them: • anaerobic digestion produces biogas (carbon dioxide and methane) • fermentation is part of the anaerobic digestion process, converting sugars into carbon dioxide and ethanol • anaerobic respiration breaks down sugars to generate energy
Question 3(b)(ii)	Determining the mass of packaging used to protect the new bottle. This calculation was designed to be challenging and operated as such. Although a few candidates achieved 1 or 2 marks, most were awarded 0 marks.
Question 3(c)(i)	Stating one other type of water conservation measure that could be used by the whisky industry to reduce water consumption. This was not intended to be a challenging question, but few candidates achieved the mark. Many referred to water conservation methods more likely to be used in a domestic setting than industrial.
Question 4(a)(i)	Describing what is meant by a sunspot. Few candidates were able to provide a basic description of a sunspot.
Question 4(b)(ii)	Describing how long-term changes in the shape of Earth's orbit affect average global temperatures.

	Some candidates achieved at least 1 mark, but many were not awarded any marks. Most did not refer to the change in average global temperature as the orbit moved from elliptical to circular (or vice versa).
Question 4(c)	Explaining why smaller angles of tilt result in ice ages. This was intended to be a challenging question and operated as such. Some candidates achieved 1 or 2 marks, but few achieved all 3 marks.
Question 4(d)	Describing the cause of changes in the orientation of Earth's axis of rotation. Few candidates were able to describe the role of tidal change driven by gravitational influences of the Sun and Moon.
Question 4(e)	Stating the name given to long-term cyclical changes in Earth-Sun geometry. Some candidates were able to name these as Milankovitch cycles. Many variations in the spelling of the name were accepted.
Question 5(b)	Explaining why use of paired statement keys increases the validity of the design of an investigation. Many candidates did not explain why the use of paired statement keys increases validity. The most common error was describing how keys are used

	rather than why, and/or omitting reference to validity.
Question 5(c)(iii)	Suggesting a benefit of using a biotic index when analysing data collected from multiple sample sites. Many candidates did not suggest a valid benefit.
Question 5(d)	Suggesting how the reliability of the investigation could be improved. Most candidates correctly referred to repeating the investigation, but many then omitted ‘and calculate a mean’. This should be standard practice when discussing how to improve reliability of an investigation.
Question 6(a)(i)	Stating a source of Earth’s internal heat. Many candidates did not state a valid source.
Question 6(a)(ii) and (a)(iv)	District heating schemes. Few candidates were able to provide a basic description of a district heating scheme. Many candidates were unable to suggest a disadvantage to an individual household of the use of district heating (compared to conventional domestic heating systems).
Question 7(a)(ii)	Explaining how precipitation influences the formation of either podzol or a brown earth. This was intended to be a challenging question and operated as such.

	Most candidates opted to discuss the influence of precipitation on podzol formation. A few candidates achieved 3 marks, and some were awarded 1 or 2 marks. However, many candidates were awarded 0 marks.
Question 7(b)(i)	Describing one named form of weathering. Most candidates were able to name a form of weathering, but few described the process involved; the mark was awarded for a valid description of the named weathering process.
Question 7(b)(ii)	Describing what is meant by humification. Few candidates achieved both marks for describing what is meant by humification, but some candidates provided only a partial description and were awarded 1 mark.

Assignment

It should be noted that many of the following issues recur year on year and require attention to help candidate marks improve.

2 An account of environmental science relevant to the aim of the investigation

Many candidates did not provide a sufficient and/or relevant account of the environmental science underlying the aim of their investigation, with many achieving 0 or 1 mark.

Key issues mirror those reported in 2024, including the following:

- Much of the underlying environmental science was irrelevant to the aim and/or subsequent investigation.
- The account was far too brief.

- The language and terminology used was not commensurate with Higher level.
- The topic was not directly relevant to the Higher Environmental Science course and candidates did not attempt to link it to an aspect of the course. For example, it would be relatively straightforward to link an experiment investigating the rate of photosynthesis or energy from wind (both National 5 key areas) to an impact of climate change (Higher key area).

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. For example, a couple of sentences stating what is being measured and how it is being measured (that is, the equipment and/or chemicals being used).

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

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. Common errors included inappropriate column headings, omission of an appropriate unit or units, and/or incorrect rounding of values.

Candidates should be reminded that where abbreviations are used, such as CO_2, these must be correct; pH was frequently presented as PH or Ph or ph, none of which are accurate or acceptable. Candidates were not awarded the tabulation mark where they included incorrect abbreviations in a table or tables.

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 secondary data relevant to the investigation, from either an internet source or a literature source, or from a second

experiment/field work investigation, there continues to be some confusion over what counts as a second experiment/field work investigation.

A second experiment/field work investigation could be one that relates to the first experiment/field work investigation, but would also operate as an independent investigation. For example, sand dune transects is a common field work investigation and offers opportunities for several independent investigations along the length of the transect, such as measuring changes in vegetation, soil pH, soil moisture or wind velocity. Measuring any two of these would count as two investigations.

Where candidates attempted to link, for example, changes in vegetation with a named abiotic factor (the impact of X on Y), which would be one investigation, they often found it problematic to analyse their data and/or draw a conclusion. There could be many confounding factors in such a situation, and candidates should be advised to think carefully about this approach. Although the option of conducting two experiments or investigations negates the requirement to find secondary data from an internet or literature source, candidates should consider carefully whether what they are doing constitutes two experiments.

Markers commented that many candidates undertaking sand dune transects presented overly large data sets; for example, data collected at 1 m intervals along a >30 m transect. As the candidate must tabulate their raw data and any mean and/or derived values correctly, a single error prevents access to the tabulation mark. It would be acceptable for candidates to reduce their sampling to a more manageable data set for use in their report, for example, to present at 5 m intervals (taking care not to avoid significant change(s) in vegetation or abiotic factor in the process).

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

Many candidates did not achieve the citation and reference mark. This was most commonly due to including the full reference (such as a full URL) within the body of the report in place of a citation, or not including a citation or reference at all.

Omission of an access date for an internet reference was common. The format of the reference must match the examples laid out in the Higher Environmental Science

Coursework Assessment Task, available on the Higher Environmental Science subject page of our website.

5(a) and 6 Analysis of experimental/field work data and a valid conclusion that relates to the aim and is supported by all the data in the report

Many candidates did not achieve marks for analysis but were more successful in drawing a conclusion.

Confusion between the two terms is an ongoing issue that merits attention to reduce the likelihood of candidates losing marks.

An analysis should be a detailed discussion of the data, including numerical values where appropriate — for example, comparison of the candidate's data with their second source of data or information.

The analysis should include reference to the outcome of the extended or statistical calculation.

Where the secondary source of data is not directly comparable with the candidate's data (for example, the units differed between the two data sets), candidates often struggle to analyse the data.

The findings from the analysis (including the value(s) from the extended or statistical calculation) support the drawing of a conclusion, which should refer to the aim and **all** the data included in the report.

Some candidates based their conclusion on only one set of data, without considering the other, and/or not referring back to the aim.

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

Few candidates were able to provide a correctly completed calculation.

Key issues included:

- Omission of an extended or statistical calculation.

- Omission of a worked example demonstrating how the calculated values were obtained. This must include the formula used for the calculation, including relationships within it (for example, where x =), otherwise markers cannot check the calculated value is correct.
- An error or errors in the calculated result(s), especially rounding errors.

A mean or simple percentage calculation does not count as an extended or statistical calculation.

The extended or statistical calculation should be appropriate to the investigation. Many candidates appeared unsure about what counts as an appropriate calculation and opted to include a percentage change. While this calculation is appropriate in some cases, it may produce a correct but meaningless value that then compromises the ability to gain the analysis and conclusion marks, since these must take account of the calculated value(s). In many cases, a standard deviation, interquartile range, or other investigation-specific calculation would be more appropriate.

7 Evaluation

Three evaluative statements, supported by justification, are required. These may relate to the experiment/field work investigation methods, results and/or data from a secondary source.

Most candidates achieved 0 or 1 mark, and few were awarded 2 or 3 marks.

Candidates continue to comment on aspects that should be standard practice at Higher, such as repeating and calculating an average. Such statements are not awarded a mark. Some evaluative statements were too brief, lacking sufficient justification.

Candidates should be encouraged to pay close attention to the ‘Instructions for candidates’ section in the Coursework Assessment Task, where detailed information is provided on how this section could be approached. This includes guidance on use of reliability, accuracy, and precision. Candidates do not have to use these terms. However, if they do, they must use them correctly.

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 field work. Candidates **must** be given the opportunity to undertake a wide range of practical work and field work in order to develop the knowledge and skills detailed in the Higher Environmental Science course specification.

Centres are encouraged to provide candidates with the following materials at an early stage:

- the Higher Environmental Science course specification, particularly the mandatory content section and the glossary
- past papers, marking instructions and associated course reports
- the Coursework Assessment Task

Question papers

Reading the mandatory content section and glossary will enable candidates to familiarise themselves with the phrasing and terminology used in Higher Environmental Science question papers, including command words. Headings and sub-headings in the course content section often form part of the question stems and extended-response questions.

Candidates should be encouraged to read the annual course reports. These highlight areas in which previous candidates performed well or had difficulty, and why. Markers noted that marks are often not awarded because responses provided are too brief and/or vague. 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 for a mark(s) to be awarded.

Teachers and lecturers are encouraged to incorporate command words used in the Higher Environmental Science question papers into teaching at an early stage, so

that candidates understand what is meant by, for example, ‘describe’, ‘explain’, ‘determine’, ‘analyse’, ‘conclude’, and ‘evaluate’.

The standard of candidate handwriting can disadvantage candidates if markers are unable to understand illegible words or phrases. Candidates should be encouraged to work on improving their 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 essence of the definition. Responses falling outwith the expected response are checked by markers and the mark awarded, if found to be a valid alternative.
- Living environment:
    - key terms (net primary productivity, biological oxygen demand, validity, reliability, rewilding)
    - types of environmental assessment, including the need for monitoring and mitigation
    - types of biotic index, including the method and purpose of each
- Earth’s resources:
    - key terms (ocean gyre)
    - the convection process
    - factors associated with the formation of aluminium ore
    - natural climate change (long term: Milankovitch cycles, and short term: sunspot activity)
    - geothermal energy (district heating schemes)
    - soils (weathering processes, humification, formation of brown earth and podzol soil profiles)
- Sustainability:
    - key terms (anaerobic digestion)
    - key components of sustainability (environmental, social, and economic)

- methods used to improve water quality
- water conservation methods used in industry

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 candidates, teachers and lecturers.

Candidates are only permitted to take the 'Instructions for candidates' section into their report stage, rather than the entire Coursework Assessment Task document. However, it is in their interest to familiarise themselves with the assignment requirements and how marks are awarded. At the outset of the assignment, centres should encourage candidates to access the Coursework Assessment Task document, and ensure at an early stage that candidates understand fully what they are being asked to do. Centres must issue candidates with a copy of the 'Instructions for candidates'. Centres are reminded that the content of the 'Instructions for candidates' cannot be altered and cannot be supplemented with centre-devised guides and/or proforma.

It is important that candidates are provided with a choice of assignment topics. These should be relevant to the Higher Environmental Science course content and have an associated experimental or field work investigation(s). It is not acceptable for entire classes or cohorts to do the same assignment. Candidates are permitted to work either individually or in a small group (maximum of four candidates) for the investigation, and centres must limit how many individuals and groups select any given topic. For example, in a class of 20 with candidates working in five groups of four, teachers and lecturers must ensure each group is carrying out a different investigation.

Candidates may share data within their group, but not outside the group. Once they have collected their experimental or field work data, each candidate must carry out their **own** internet and/or literature research and then produce their report independently. Candidates are not permitted to share internet and/or literature information or data, and they are not permitted to work in groups to find this

information or data. Teachers and lecturers must ensure there is no collusion between candidates in this part of the research.

The following are areas in which gaps in candidate understanding of the assignment report requirements were especially noticeable. Please note that these are similar to gaps identified in the 2024 course report.

1 Aim

Candidates must indicate clearly if they are collecting data from two experiments or field work investigations. See the 'Areas that candidates found demanding' section for advice on what counts as a single or a double investigation. This is important as 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 available to candidates are appropriate to Higher, linking either directly or indirectly to an aspect of the Higher Environmental Science course content. The 3 marks available in this section indicate that the candidate's 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 approach. The summary must be brief, containing only sufficient detail for the marker to be able to visualise the experiment/field work 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

A table containing only the raw data can be taken into the report stage. Candidates may paste or copy this table into the report, and then add additional columns and column headings, and units. Candidates must not take in a table that also includes pre-prepared columns (and headings) for mean and/or derived values. In addition, 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. Both are required.

If conducting a single experiment or field work investigation, the candidate must find comparative data from an internet or literature source. The source of this 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 may, for example, take the form of a (1) or similar, which should then be repeated alongside the reference at the end of the report, to indicate the link.

If conducting two experiments or field work investigations, the candidate must cite and reference a source of information supporting the description of the underlying science and place the citation within that section and the reference at the end of the report.

5(a) and 6 Analysis of experimental/field work data and a valid conclusion that relates to the aim and is supported by all the data in the report

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 or statistical calculation that would be most appropriate to their experiment or field work investigation. The calculation should provide a meaningful value that augments the analysis and conclusion. A number of examples are listed in the Coursework Assessment Task.

7 Evaluation

Evaluative statements, with accompanying justification, could relate to the data collection method, results, and/or data from the internet or literature source. The 'Instructions for candidates' section in the Coursework Assessment Task document provides a range of examples relating to accuracy, precision, adequacy, limitations, and reliability. Candidates should be aware that they do not have to use these terms, 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, but teachers and lecturers should be aware that these may differ significantly from the requirements of other subjects.

Appendix: general commentary on grade boundaries

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

For most National Courses, we aim 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, we hold 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 our 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. We 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.

For full details of the approach, please refer to the Awarding and Grading for National Courses Policy.