



NQ Verification 2013–14

Key Message Reports

Verification group name:	Environmental Science
Levels	N3 to N5
Date published:	July 2014

This Report combines all Verification Key Messages for the academic session 2013-14.



NQ Verification 2013–14

Key Messages Round 1

01

Section 1: Verification group information

Verification group name:	Environmental Science
Verification event/visiting information	Event
Date published:	January 2014

National Courses/Units/Awards verified:

Code: 73, 74, 75 National 3, 4, 5 Environmental Science

02

Section 2: Comments on assessment

Assessment approaches

The verification sample was small therefore there are limited comments for this round of verification.

Some centres have chosen to use the published SQA Unit assessment support packs. Other centres have made minor modifications to aspects of the Unit assessment support packs. Provided this modified instrument of assessment still relates to the key areas of the Course, and is of an appropriate standard, such an approach is encouraged.

Any centre-devised instruments of assessment must be at a standard and level appropriate to Unit assessment, and questions must relate to a key area of the Course. The questions should not be more demanding than necessary.

Assessment judgements

For each candidate, centres should ensure that they clearly document the Assessment Standards and problem solving skills that they have achieved. Centres should ensure that their assessment decisions are accurate; in some cases candidates were failed by the centre when they had passed.

Assessment Standard Assessment Standard 2.1

At least half of the statements made by the candidate should be correct for each Unit.

Candidates should be given credit for each response. In some cases where questions required four correct responses, candidates were not awarded any marks if they got three out of the four correct.

Where centres have misunderstood the meaning of the assessment grid in the Unit assessment support packs and required candidates to achieve complete mastery of a key area to gain credit for it (ie they have totalled the number of Xs on the assessment grid and divided by two) they may have disadvantaged some of their candidates.

Centres that have misunderstood the meaning of the assessment grid may choose to apply revised marking criteria in order to not disadvantage their candidates.

Assessment Standard 2.4 Solving problems

Centres are reminded that, where Unit assessment support packs are modified or where centre-devised instruments of assessments are used, individual problem solving skills should be easily identifiable. This is necessary to ensure that candidates are provided with the opportunity to demonstrate all four of the problem solving skills at National 5 (make generalisations/predictions, selecting information, processing information, including calculations, and analysing information) and all three of the problem solving skills at National 3 and National 4 (make generalisations/predictions, selecting information, processing information, including calculations as appropriate).

At least one correct response from each problem solving skill is required; they do not all need to be from the same Unit. If a candidate is given more than one opportunity in a Unit assessment to provide a response for a problem solving skill, then they must answer at least 50% correct.

Problem solving skills can be achieved independently. Once a candidate has achieved a problem solving skill then this is effectively banked; there may be further questions of that problem solving skill throughout the Course but they would not count towards assessment.

03

Section 3: General comments

Centre staff are reminded that all centres offering SQA qualifications must have an effective internal quality assurance system that ensures that all candidates are assessed accurately, fairly and consistently to national standards. Centres selected for external verification are expected to provide details of their quality assurance policies and processes.

Centres should ensure that accurate details are entered on the verification sample form and candidate evidence flyleaf, and on the centre's candidate assessment record or equivalent. Before submitting evidence for external verification, centres should ensure that they have referred to the guidance documents. Guidance on evidence required for external verification of Units and internally-assessed components of Course assessment is provided on our quality assurance web page (www.sqa.org.uk/cfega).

After each round of verification activity, SQA will publish common key messages that have been identified by the verification teams. Common key messages from Round 1 of NQ Verification 2013–14 are located on the website at:

www.sqa.org.uk/files_ccc/NQ_Verification_2013-14_Key_Messages_Round_1.pdf



NQ Verification 2013–14 Key Messages Round 2

01

Section 1: Verification group information

Verification group name:	Environmental Science
Verification event/visiting information	Event
Date published:	March 2014

National Courses/Units verified:

Code: 73, 74, 75

National 3, 4, 5 Environmental Science

02

Section 2: Comments on assessment

Assessment approaches

Outcome 1: The candidate will apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of the Unit to carry out an experiment/practical investigation.

The degree of support provided to candidates should not restrict their active planning of a procedure. Class or group discussion to set the scene may be appropriate; however, a detailed list of questions or instructions would not be appropriate. The level of support provided should be in line with the candidate guide provided in *Unit Assessment Support Pack 1: Appendix 1* (available for download from SQA's secure website: www.sqa.org.uk/sqasecure).

In some cases, this was a failing of material submitted for verification, particularly at National 3 level.

A detailed proforma (eg of the type used in Standard Grade investigations) is not appropriate for National 4 or National 5 candidates.

Outcome 2: The candidate will draw on knowledge and understanding of the key areas of the Unit and apply scientific skills by:

Assessment Standard 2.1 Making accurate statements

Centres are reminded that, where Unit assessment support packs are modified, or where centre-devised instruments of assessment are used, the individual key areas being assessed should be easily identifiable. This is necessary to ensure that candidates are provided with the opportunity to make accurate statements for all of the key areas of the Course.

The number of opportunities to make accurate statements should be appropriate to the size of the key area.

Centres are reminded that they must include any modified or centre-devised instruments of assessment and the associated marking instructions with their verification materials.

Centres should make use of SQA's prior verification service where significant changes are made to the Unit assessment support packs, or for centre-devised assessments. Further information on SQA's prior verification service is located on the website via the following link: <http://www.sqa.org.uk/sqa/63004.html>

Assessment Standard 2.2 Describing an application

Assessors are encouraged to check that an appropriate title is selected before allowing candidates to proceed with an assessment task and produce their report.

An application of environmental science must be a deliberate act of humans in which environmental science is used to effect change in the world or the environment. For example, climate change, in its normal sense, is not an application of environmental science. The process of combating human-induced climate change may be a consequence of a deliberate act of humans, eg the use of renewable sources of energy; however, unless a candidate describes how these energy sources are used to achieve this, it would not be a suitable topic for Assessment Standard 2.2. Similarly, global warming would not be considered a suitable topic.

Some suggested topics are provided in the Unit assessment support packs.

The level of support provided to candidates should be in line with the candidate guide provided in *Unit Assessment Support Pack 1: Appendix 1*. Class or group discussion to set the scene may be appropriate; however, a detailed list of questions or instructions would not be appropriate.

Assessment Standard 2.3 Describing an environmental science issue in terms of the effect on the environment/society

Assessors are encouraged to check that an appropriate title is selected before allowing candidates to proceed with the assessment task and produce their report.

The level of support provided to candidates should be in line with the candidate guide provided in *Unit Assessment Support Pack 1: Appendix 1*. Class or group discussion to set the scene may be appropriate; however, a detailed list of questions or instructions would not be appropriate.

Assessment Standard 2.4 Solving problems

Many centres have chosen to use the published SQA Unit assessment support packs. Other centres have made minor modifications to aspects of the Unit assessment support packs. Provided a modified instrument of assessment still covers the relevant problem solving skills, and is of an appropriate standard, such an approach is encouraged.

Centres are reminded that, where Unit assessment support packs are modified or where centre-devised instruments of assessment are used, individual problem solving skills should be easily identifiable. This is necessary to ensure that candidates are provided with the opportunity to demonstrate all four of the problem solving skills at National 5 (making generalisations/predictions, selecting information, processing information and analysing information) and all three of the problem solving skills at National 3 and National 4 (making generalisations/predictions, selecting information, processing information).

Centres are reminded that they must include any modified or centre-devised instruments of assessment and the associated marking instructions with their verification materials.

Assessment judgements

Outcome 1 The candidate will apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of the Unit to carry out an experiment/practical investigation.

Centres are reminded that Assessment Standards 1.1 to 1.6 can be achieved independently of each other in separate experiments/practical investigations, or altogether in one single experiment/practical investigation.

Assessment Standard 1.1 Planning an experiment/practical investigation (National 4 and National 5 only)

At National 4, there are five separate Evidence Requirements for Assessment Standard 1.1:

- ◆ an aim
- ◆ a variable to be kept constant

- ◆ measurements/observations to be made
- ◆ the resources
- ◆ the method, including safety considerations

In order to achieve Assessment Standard 1.1, all five of these Evidence Requirements should be described in one experimental/investigation plan.

At National 5, there are six separate Evidence Requirements for Assessment Standard 1.1:

- ◆ an aim
- ◆ a dependent and independent variable
- ◆ key variables to be kept constant
- ◆ measurements/observations to be made
- ◆ the resources
- ◆ the method, including safety considerations

In order to achieve Assessment Standard 1.1, all six of these Evidence Requirements should be described in one experimental/investigation plan.

As stated in the candidate guide (*Unit Assessment Support Pack 1: Appendix 1*), candidates are encouraged to ensure that their plan is checked by their assessor before starting practical work.

Identifying and stating a valid aim is key to a successful experimental/investigation procedure. In many cases within reports submitted for verification, candidates have attempted to carry out an experiment/practical activity without a clear aim being stated. Achieving any of the Assessment Standards thereafter is problematic.

Assessors are therefore encouraged to check that a valid aim is stated before allowing candidates to proceed with their experiment/investigation plan. Re-drafting of the aim, as required, is to be encouraged. This would be considered as a re-assessment opportunity.

Re-drafting of a report, after necessary supportive criticism, is to be encouraged. This would be considered as a re-assessment opportunity.

Candidates should be encouraged to consider aspects of safety specifically associated with their procedure, rather than simply stating, for example, that safety goggles should be worn.

Assessment Standard 1.4 Drawing valid conclusions (National 3)

Assessment Standard 1.5 Drawing valid conclusions (National 4 and National 5)

Valid conclusions can only relate specifically to the aim of the investigation. If an invalid aim is stated (see previous guidance for 1.1) then it is very difficult for candidates to produce a valid or meaningful conclusion.

Assessment Standard 1.5 Evaluating experimental procedures (National 3)
Assessment Standard 1.6 Evaluating experimental procedures (National 4 and National 5)

In order to overtake this Assessment Standard, candidates are required to suggest an improvement to their experiment (National 3 and 4) or suggest an improvement to their experiment with justification (National 5).

Candidates should be encouraged to consider specific aspects of their experiment/practical investigation, and to ensure that a meaningful improvement is suggested.

Outcome 2: The candidate will draw on knowledge and understanding of the key areas of the Unit and apply scientific skills by

Assessment Standard 2.1 Making accurate statements

At least half of the statements made by the candidate should be correct for each Unit. Where centres have misunderstood the meaning of the assessment grid and have required candidates to achieve complete mastery of a key area to gain credit for it (ie they have totalled the number of Xs on the assessment grid and divided by two) they may have disadvantaged some of their candidates.

Rigorous, accurate and consistent application of a marking scheme is essential. This can be facilitated by effective internal verification procedures within a centre.

Marking guidance provided in the Unit assessment support packs is not intended to be exhaustive of all possibilities and can be modified. Modifications, where made, should be noted and should be subject to effective internal quality assurance processes.

Assessment Standard 2.2 Describing an application

Appropriate environmental science knowledge should be used in the description of the application, at a level appropriate to National 3, 4 or 5.

Many centres had indicated that candidates had overtaken this Assessment Standard, despite candidates' failing to describe a suitable application in their reports.

Re-drafting of aspects of a report, after necessary supportive criticism, is to be encouraged. This would be considered as a re-assessment opportunity.

Assessment Standard 2.3 Describing an environmental science issue in terms of the effect on the environment/society

Many centres had indicated that candidates had overtaken this Assessment Standard, despite candidates failing to provide sufficient detail of the impact of the application on the environment or society in their reports.

Re-drafting of aspects of a report, after necessary supportive criticism, is to be encouraged. This would be considered as a re-assessment opportunity.

Assessment Standard 2.4 Solving problems

Where candidates have more than one opportunity to demonstrate a specific problem solving skill in any given assessment, they must do so on at least half of those occasions. Where a specific problem solving skill has successfully been achieved in any given assessment, this problem solving skill can be 'banked', and there is no need to continually recalculate whether or not the candidate has achieved 50% of all further attempts.

Centres are reminded that it may be possible to reduce the assessment burden on candidates by achieving some aspects of Assessment Standard 2.4 (solving problems) via a carefully designed experiment/practical investigation.

The presentation of graphical information should not be classified as one of the types of problem solving skill, but it could be used to show evidence of Assessment Standard 1.4 (1.3 at National 3): Presenting results in an appropriate format.

03

Section 3: General comments

Centre staff are reminded that all centres offering SQA qualifications must have an effective internal quality assurance system which ensures that all candidates are assessed accurately, fairly and consistently to national standards. Centres selected for external verification are expected to provide details of their quality assurance policies and processes.



NQ Verification 2013–14 Key Messages Round 3

01 Section 1: Verification group information

Verification group name:	Environmental Science
Verification event/visiting information	Event
Date published:	June 2014

National Courses/Units/Awards verified:

National 4 Environmental Science Assignment (H24T 74) Added Value Unit

02 Section 2: Comments on assessment

Assessment approaches

All candidate evidence submitted for verification took the form of written reports. Some candidate material consisted of both a presentation and a written report. Although not necessary, it was seen to be a good strategy for overtaking all the Assessment Standards.

Assessment judgements

Centres should ensure that candidate scripts are annotated by the assessor to show where a particular Assessment Standard has been achieved. This is helpful

for candidates and for verifiers. Centres should also record reasons for judgements in a clear manner for verification purposes.

Candidates are allowed to redraft their report to ensure that all Assessment Standards have been met, but this would count as a re-assessment opportunity.

03

Section 3: General comments

Assessment Standard 1.1 Choosing, with justification, a relevant issue in environmental science

This Assessment Standard proved largely straightforward for centres and candidates; issues arose where the issue chosen by the candidate was very broad in nature, as this then made it difficult to meet Assessment Standards 1.4 and 1.5. Other issues arose where there was misunderstanding of ‘with justification’. The judging evidence table for Environmental Science Assignment (National 4) Added Value Unit (contained in the Unit assessment support pack found on the SQA secure website) provides the following guidance for making assessment judgements:

The candidate must:

- ◆ state clearly the issue to be investigated
- ◆ state briefly in what way the issue is relevant to the environment/society

The justification for choosing the issue must therefore include a statement explaining the relevance of the issue to the environment/society. There is no need for the issue to be an application of environmental science, ie it does not need to be a deliberate use of environmental science by humans.

Some centres submitted evidence for Assessment Standard 1.1, and for Assessment Standard 1.2, in the form of a candidate’s log or journal. This is acceptable.

Assessment Standard 1.2 Researching the issue

The candidate is required to record at least two relevant sources of information/data in such a way that they could be retrieved by a third party (there is no need to follow a formal referencing system) — if one of the sources is an experiment/practical activity, then the title and the aim should be recorded.

Verifiers had difficulty following the referencing system used by candidates in some reports. If a website is used as the original source of information, then a full URL should be supplied.

The candidate is also required to gather appropriate and sufficient information/data from at least **two** relevant sources.

Some candidates used an experiment/practical activity (which may have been used for the assessment of Outcome 1) as one of the two sources of data. This is good practice, and may reduce the assessment burden on candidates. If this approach is adopted, it is important to ensure that the experiment/practical activity is clearly linked to an issue that satisfies the criteria for Assessment Standard 1.1, ie the candidate should be able to see and explain the relevance of their experiment/practical activity to the environment/society. The candidate will also have to find another source of information that links to this issue. Good practice was seen where candidates linked a source to the information/data gathered from it.

Assessment Standard 1.3 Presenting appropriate information/data

Copied and pasted graphs, tables, etc do not overtake all of Assessment Standard 1.3, since candidates must present some of their information/data in their own way. Hand-drawn graphs and tables are often of a much higher standard than computer-generated tables and graphs produced by candidates and should be encouraged. The correct use of title, labels and units (where appropriate) is essential; although candidates should not be penalised if there are only minor omissions/errors to the presentation and there is sufficient detail to convey the information/data. Where an omission/error of this type impacts upon the understanding/analysis of the data it cannot be deemed as minor.

The production of a report is not, in itself, sufficient to overtake Assessment Standard 1.3. If a candidate is aiming to overtake Assessment Standard 1.3 by summarising information from two sources into a single report, there must be clear signposting to show what the original text is and how it has been summarised. This could be achieved by including the original raw data (preferably annotated) in the final report, alongside the summary that the candidate has produced.

Assessment Standard 1.4 Explaining the impact, in terms of the biology involved

Guidance should be given to candidates in the initial stages of choosing a topic to ensure that this is an Assessment Standard that they can meet. As stated, there is no requirement for the issue to be an application of biology. The impact can be positive and/or negative. Candidates must also make some reference to their processed data/information in order to achieve this Assessment Standard.

Assessment Standard 1.5 Communicating the findings of the investigation

In order to achieve Assessment Standard 1.5, there must be some flow and coherence to the communication. A series of separate pieces of information, selected from an external source or sources, simply presented one after another without any coherence or clarity would not be sufficient to meet the Evidence Requirements of Assessment Standard 1.5. As stated in the Unit Specification, the communication must be clear, concise, relevant and appropriately structured.

A summary paragraph, or conclusion, at the end of the report was often seen to be an effective means of ensuring that the candidate sums up the ideas, issues,

findings or conclusions in response to the topical issue **and** its impact on the environment/society.