



NQ verification 2023–24 round 1

Qualification verification summary report

Section 1: verification group information

Verification group name:	Chemistry
Verification activity:	Mixed
Date published:	June 2024

National Units verified

Unit code	Unit level	Unit title
H21G 73	National 3	Chemical Changes and Structure
H21J 73	National 3	Nature's Chemistry
H21L 73	National 3	Chemistry in Society
H21G 74	National 4	Chemical Changes and Structure
H21J 74	National 4	Nature's Chemistry
H21L 74	National 4	Chemistry in Society
J204 76	SCQF level 6	Researching Chemistry
J2BH 77	SCQF level 7	Researching Chemistry

Section 2: comments on assessment

Assessment approaches

National 3 units

All centres verified used the SQA unit assessment support (UAS) packs. There were no issues with the approach to assessment. All centres verified used a test with a 50% cut-off score to assess outcome 2. None of the centres verified submitted outcome 1 evidence for verification.

National 4 units

All centres verified used the SQA UAS packs. There were few issues with the approach to assessment. Most centres verified used a test with a 50% cut-off score to assess outcome 2.

A small number of centres used the portfolio approach to assess assessment standards 2.1 and 2.2 separately. To pass outcome 2, candidates must have the opportunity to attempt questions on all key areas. Centres must take care when recording the marks assigned to candidate evidence to ensure that candidates achieve each of the problem-solving skills. Some centres produced their own record sheets to record this information, which was helpful for verification.

Some centres did not include outcome 1 evidence but indicated that the evidence they submitted was complete. In these cases, the evidence is interim, as only outcome 2 could be verified. Candidates cannot achieve a pass in a unit until they pass both outcome 1 and outcome 2.

Some centres used outdated versions of the SQA UAS packs. Centres using SQA UAS packs must ensure they use the most up-to-date versions from SQA's secure website.

If a centre accepts responses that are not in the marking guidance, they should annotate the marking guidance to reflect the additional correct responses. Some centres annotated the marking guidance, which was helpful during verification. However, in a few cases, the additional responses recorded on the marking guidance were incorrect. Centres must ensure that any additional responses they add to the marking guidance are appropriate.

SCQF levels 6 and 7 units

SCQF level 6 Researching Chemistry

Both of the outcomes in this unit are verified through centre visits.

Assessment standard 1.1 in outcome 1 involves candidates gathering and recording information from two sources related to their research topic. Outcome 2 (assessment standards 2.1 and 2.2) involves candidates planning and carrying out practical research.

All centres verified this session for the Researching Chemistry unit used the SQA UAS packs. There were no issues with the approach to assessment.

The chosen research topic should draw on one or more key area(s). This session's research topics included determining the concentration of vitamin C and measuring gas molar volume. All topics verified were appropriate to SCQF level 6 Chemistry.

SCQF level 7 Researching Chemistry

There are two outcomes in this unit. Outcome 1, which has three assessment standards (1.1, 1.2 and 1.3), is verified through centre visits.

All centres verified this session for the Researching Chemistry unit used the SQA UAS packs. There were no issues with the approach to assessment.

All topics verified were appropriate to SCQF level 7 Chemistry.

Assessment judgements

National 3 units

All centres verified made reliable assessment judgements and applied the marking guidance consistently throughout.

National 4 units

Most centres verified made reliable assessment judgements and applied the marking guidance consistently throughout.

For outcome 1, candidates produced reports on topics appropriate to National 4 Chemistry, such as rates of reaction. Some candidates produced reports that did not have a logical structure. Assessors can award credit for evidence that meets the assessment standards regardless of where it appears in the candidate's report.

All centres verified knew that candidates only needed to achieve five out of six assessment standards to pass outcome 1. Assessors annotated candidate evidence and completed log sheets to record their assessment judgements.

For outcome 2, some assessors awarded marks for responses that included incorrect units, incorrect chemical symbols, and incorrect specific chemical terms. If a response does not require a unit, but a candidate states an incorrect unit, assessors should not award a mark. If a candidate states a chemical symbol, they must use the correct format, for example Li, not LI for lithium. Candidates must state chemical terms correctly. When writing chemical formulae, including general formulae for families of organic compounds, candidates must use subscript numbers, when appropriate, for their response to be correct.

There were some issues with the correct use of SI units. Seconds or s is an appropriate unit for time. 'Secs' is not a correct SI unit. The correct unit for temperature is °C, not °. Some assessors and internal verifiers incorrectly awarded marks for responses containing incorrect units.

SCQF level 6 Researching Chemistry

All centres verified made reliable assessment judgements and applied the marking guidance consistently throughout.

For SCQF level 6, candidates must keep a regular record of work for assessment standards 1.1 and 2.1. This should include the dates that they carried out the work. Some candidates did not include dates on their record of work.

Assessment standard 1.1 requires candidates to research chemistry at an appropriate level and in sufficient detail. Some candidates lacked the detail expected at SCQF level 6. All candidates recorded sources of information in enough detail to allow retrieval. However, some candidates did not include the date they accessed URLs. Candidates should include dates when they record their sources.

Assessment standard 2.1 requires candidates to record the roles and responsibilities of group members as part of their report. Some candidates did not include this, and it was not clear from the evidence whether they had worked individually or as part of a group. It is good

practice for assessors to include a statement indicating whether practical work was carried out individually or as a group.

For assessment standard 2.1, assessors made effective use of checklists to record that candidates carried out practical work safely. Annotations on candidate evidence also indicated that candidates played an active role in practical work.

For assessment standard 2.2, most candidates accurately recorded experimental data using correct SI units and tabulation, as appropriate. A few candidates did not record all raw data, for example masses when weighing by difference, or an indication that the balance was tared.

SCQF level 7 Researching Chemistry

All centres verified made reliable assessment judgements and applied the marking guidance consistently throughout.

Section 3: general comments

Almost all centres verified in round 1 had a good understanding of national standards. All centres provided candidate evidence that was internally verified by cross-marking.

Most centres clearly showed the assessor's judgements and the internal verifier's judgements by using different colours of pen. Some centres used a centre-devised log sheet to record information about assessment judgements and dialogue between the assessor and internal verifier. Internal verification activity like this is helpful to external verifiers and provides centres with a clear overview of when candidates achieve assessment standards. Many centres also included comments and notes on professional dialogue between assessors and internal verifiers, which was very helpful.

In some centres, the process of internal verification was not entirely effective. In some cases, there was a discrepancy between the assessor and internal verifier, and it was not clear what the final assessment judgement was. In some cases, both the assessor and internal verifier awarded marks incorrectly. Where assessment judgements differ, it is helpful to clearly mark the final judgement on candidate evidence or on a log sheet.



NQ verification 2023–24 round 2

Qualification verification summary report

Section 1: verification group information

Verification group name:	Chemistry
Verification activity:	Event
Date published:	June 2024

National Units verified

Unit code	Unit level	Unit title
H21M 74	National 4	Chemistry Assignment (added value unit)
J239 75	SCQF level 5	Chemical Changes and Structure
J23B 75	SCQF level 5	Nature's Chemistry
J1YK 76	SCQF level 6	Chemical Changes and Structure
J23C 76	SCQF level 6	Nature's Chemistry
J2BF 77	SCQF level 7	Inorganic and Physical Chemistry

Section 2: comments on assessment

Assessment approaches

National 4, SCQF levels 5, 6, and 7 units

Almost all centres verified used the SQA unit assessment support (UAS) packs, which meant that there were few issues with the approach to assessment. A few centres used centre-devised assessments. Centres that devise their own unit assessments should submit them for prior verification before they use them with candidates. This ensures that they are of the correct level of demand and have appropriate coverage of all the key areas in a unit.

Most centres used the unit-by-unit approach or the outcome 2 tests from SQA's secure site. Some centres did not use the most up-to-date versions of the SQA UAS packs. A few centres used assessments that are no longer available on SQA's secure site. Centres using SQA UAS packs must ensure they use the most up-to-date versions from SQA's secure website.

Almost all centres verified used a single test with marks and a 50% cut-off score to assess outcome 2, rather than assessing assessment standards 2.1 and 2.2 separately. A few centres used the portfolio approach. This is a valid approach if candidates have the opportunity to attempt all key areas and the problem-solving skills appropriate to the level.

If a centre accepts responses that are not in the marking guidance, they should annotate the marking guidance to reflect the additional correct responses. Some centres annotated the marking guidance, which was helpful during verification. However, in a few cases the additional responses recorded on the marking guidance were incorrect or increased the level of demand. Centres must ensure that any additional responses they add to the marking guidance are appropriate.

Centres should refer to the general marking principles for National 5, Higher and Advanced Higher for additional guidance when using unit assessments at SCQF levels 5, 6 and 7.

H21M 74 Chemistry Assignment (added value unit)

All centres assessed the National 4 added value unit using the UAS pack, Chemistry Assignment (National 4) Added Value Unit (published April 2018). This assessment allocates a total of 14 marks across the five assessment standards. Candidates must achieve 7 marks or more to pass. Energy from fuels, rates of reaction, and electrochemical cells were common topics of the centres verified this year.

Centres can use evidence from the National 5 assignment as evidence for the added value unit. If a centre uses a National 5 assignment as evidence for the added value unit, then the assessor must judge this evidence using the marking criteria for the added value unit, applying marks out of 14. If a candidate does not achieve 7 marks or more, they can redraft their report.

Some centres allowed candidates to redraft or modify National 5 assignments to ensure that they could access all the marks available, while other centres did not. This meant that some candidates could not access all the marks, particularly those relating to the effect of their chosen issue on the environment and/or society. This increased the level of demand for these candidates.

Centres must not assess evidence from the National 5 assignment against the marking criteria for the National 4 added value unit until they have submitted the National 5 assignment to SQA for marking. This ensures that the centre meets the National 5 conditions of assessment in terms of no teacher or lecturer feedback on the report and no redrafting.

Assessment judgements

Most centres verified submitted evidence with clear marking annotations and clear judgements, showing where candidates had achieved the assessment standards. Often, assessors and internal verifiers annotated the evidence.

Most assessment judgements were accurate and reliable. Most centres submitted candidate record sheets to record the assessment decisions, which helped the external verification process.

H21M 74 Chemistry Assignment (added value unit)

Assessment standard 1.1 requires candidates to clearly state what they are investigating and why the issue is relevant to the environment and/or society. Assessment judgements for this assessment standard were generally reliable.

Assessment standard 1.2 requires candidates to select at least two relevant sources and record at least two sources in a way that a third party can retrieve them. Assessors should ensure that information is relevant to the issue before awarding a mark for a source. Although candidates do not have to use a formal referencing system, assessors should only award a mark for being able to retrieve information or data when candidates include the full URL. If candidates use a textbook, they do not have to include an ISBN or edition number at this level. If one of the sources is an experiment, then candidates should record the title and aim. This must be separate to the overall title and aim for the investigations. There is no requirement for one of the sources to be an experiment; candidates can provide two other relevant sources.

Assessment standard 1.3 requires candidates to present information or data from one of their sources in a different way. Candidates must include the correct headings, labels, and units. In addition, almost all (90%) of the processing must be correct to achieve all 3 marks for this assessment standard. Some candidates incorrectly received all 3 marks for this assessment standard. Common errors included candidates receiving marks for omitting units and incorrectly plotting one or more bars out of four on a graph. To gain marks, candidates should plot points or bars on graphs to within plus or minus a half box tolerance. If a graph requires a line of best fit, assessors should treat joining the points as an incorrect processing point. If candidates calculate averages for their data, assessors should check these as part of the processing. Some candidates received marks for correct headings, labels and units even when they had not presented one of the sources in a different format.

Assessment standard 1.4 requires candidates to explain or describe underlying chemistry that relates to the issue. In addition, candidates should explain or describe at least one impact on the environment and/or society using some underlying chemistry. There were several examples of candidate evidence that had little or no underlying chemistry, meaning that candidates could not access marks allocated to this assessment standard. However, some centres still awarded marks to candidates for this assessment standard when there was no chemistry at an appropriate level. Some centres used the same evidence to award candidates marks for assessment standards 1.1 and 1.4.

Assessment standard 1.5 requires candidates to communicate their findings clearly and concisely, using an appropriate structure. There were examples of reports and posters. Assessors must only award a mark for summing up findings when the candidate backs up their findings with evidence from their investigation. This conclusion does not have to relate to all the data in the investigation. Some centres awarded marks for this assessment standard to candidates who did not link their findings to the issue they were investigating.

Assessors should only award a mark for structure for an investigation with clear sections. There is no requirement for these sections to have subheadings.

SCQF levels 5, 6 and 7 freestanding units

Some centres submitted outcome 1 reports with outcome 2 assessments as complete evidence for a unit. Other centres submitted outcome 2 assessments as interim evidence.

Centres generally made reliable assessment judgements, although there were some common issues.

Outcome 1

The centres verified this year submitted outcome 1 reports for SCQF levels 5 and 6 only. The comments below relate to SCQF levels 5 and 6.

Candidates completed a range of experiments, including various rates of reaction and titrations.

There are six assessment standards for outcome 1. Candidates must achieve five out of six to achieve outcome 1.

Assessment standard 1.1 requires candidates to plan an experiment. The plan should include an aim, dependent and independent variable, key variables, measurements to be made, equipment, and detailed method, including safety. Some candidates did not identify key safety measures specific to their experiment, but assessors awarded them assessment standard 1.1. If experiments require additional safety measures, beyond general laboratory safety, candidates should include these in their plans. This particularly relates to the use of flammable chemicals or chemicals requiring additional ventilation.

Assessment standard 1.2 requires candidates to carry out their experiment safely. Centres made effective use of checklists or candidate record sheets to indicate that candidates had achieved this assessment standard.

Assessment standard 1.3 requires candidates to record measured data correctly, with repeats where appropriate. Candidates should record data using correct SI units. For time, the correct abbreviation for seconds is 's'. 'Secs' is not a correct SI unit. The correct abbreviation for minutes is 'min', not 'mins'.

Some candidates included units in both column or row headings, and after every entry in the table. This is not correct, and these candidates should not achieve assessment standard 1.3. Assessors should not check averages as part of this assessment standard. Incorrect averages do not prevent candidates from achieving assessment standard 1.3.

Assessment standard 1.4 requires candidates to process their data into at least one appropriate form. This does not need to be a graph — calculations in an extended table are sufficient. Assessors should check averages as part of this assessment standard. Averages are required for repeated measurements. At SCQF level 6, averages alone are not sufficient to achieve this assessment standard — a further calculation or processing step is required. Candidates should include a sample calculation to help the assessor check the processing step. If a candidate processes their data into more than one format, then only one of the formats needs to be correct to achieve this assessment standard. Some assessors incorrectly awarded this assessment standard to candidates who used incorrect averages or incorrectly calculated values. Assessors should check all processed data.

Assessment standard 1.5 requires candidates to draw a valid conclusion from their data and link this to their aim. Most candidates achieved this assessment standard.

Assessment standard 1.6 requires candidates to evaluate their experiment and give an evaluative comment with justification at SCQF level 5, or two comments with justification at SCQF level 6. This could relate to an improvement in the procedure, a limitation of equipment, control of variables, or sources of error.

Many centres were lenient in awarding this assessment standard. Candidates often did not provide suitable justification. For example, they commented on how increasing repeats would increase reliability, when their data was already precise or concordant. Some candidates described inappropriate methods of carrying out practical work and then evaluated by describing how it should have been carried out. This is not acceptable for this assessment standard. Centres should ensure that they have the correct resources to enable candidates to carry out outcome 1 experiments appropriately. If they do not, they should consider a different choice of topic for the outcome to allow candidates to achieve the assessment standards.

Outcome 2

The comments below relate to SCQF levels 5, 6 and 7.

There were some instances of candidates providing incorrect units but gaining full marks for a question. Most questions do not require candidates to state units, but if candidates provide units, they must be correct. Assessors must not award marks for incorrect units. Assessors must only apply this marking instruction once per assessment. The general marking principles for National 5, Higher and Advanced Higher provide guidance on this.

A few candidates incorrectly rounded final answers but received marks. If candidates round answers, the rounding must be correct for the assessor to award a mark.

Some assessors awarded marks for responses that included incorrect units, incorrect chemical symbols, and incorrect specific chemical terms. If a response does not require a unit, but a candidate states an incorrect one, assessors should not award a mark. If a candidate states a chemical symbol, they must use the correct format, for example Br, not BR for bromine. Candidates must state chemical terms correctly. For most questions, unless specified in the marking guidance, a symbol is acceptable in place of a name. When writing chemical formulae, candidates must use subscript numbers, when appropriate, for their answer to be chemically correct.

Section 3: general comments

Most centres verified in round 2 had a good understanding of national standards. Almost all centres provided candidate evidence that was internally verified by cross-marking.

Most centres clearly showed the assessor's judgements and the internal verifier's judgements by using different colours of pen. Internal verification activity like this is helpful to external verifiers. Most centres also included comments and notes on professional dialogue between assessors and internal verifiers, which was very helpful. However, in a few centres,

it was not clear what the final mark or judgement was. Where cross-marking leads to a difference of judgement between assessors and internal verifiers, it should be clear what the final assessment judgement was.

In some centres, the process of internal verification was not entirely effective. In some cases, the original assessor and the internal verifier awarded marks incorrectly to candidates. This was particularly true for assessment standards where candidates' data processing needed checked.

The marking guidance provided in the UAS packs is not intended to be exhaustive and centres can modify it. However, centres must ensure that any modifications they make are of an equivalent standard to the existing guidance.