



**National Qualifications 2015
Internal Assessment Report**

Chemistry: Revised (H)

The purpose of this report is to provide feedback to centres on verification in National Qualifications in this subject.

National Qualifications (NQ) Units

Titles/levels of NQ Units verified:

Chemistry: Revised (Higher)

FE4J 12 Researching Chemistry (visiting verification)

General comments

All centres that were verified used the SSERC investigation brief on alcohols from the Education Scotland website. The brief contains five investigations and each investigation contains a number of focus questions. Outcomes 1 (the focus questions) and 3 (the scientific communication) are individual tasks, Outcome 2 (the investigation) may be carried out in groups.

Outcome 1: all centres encouraged candidates to produce answers which were clear, accurate and related directly to the focus questions. Redrafting was used to improve accuracy and improve the standard of English. Staff in most centres were checking handwritten URLs; they found that it was time consuming and difficult to check all internet references cited in the focus question report, however, if the references were sent to the class teacher via the internet it would have been much easier to check their validity. All centres that were verified checked all the references. Assessment of work done online requires a checklist which can be initialled and, preferably, dated when the PC has been overtaken. The majority of centres downloaded and adapted the record sheet from either page 87 of the *Chemistry (Revised) Higher Course Specification (December 2010)* or from page 14 of the NAB document FE4J 12/001 V1 (March 2012) to include a column for the date and further columns to record evidence of internal verification.

Outcome 2: each SSERC brief contains an experimental procedure so O2PC(a) 'planning' means distributing tasks amongst the group, collecting apparatus and deciding how and when to take and record results. In all centres a pro forma was used to allow each candidate to state what their own and their partner's contribution would be to the practical work that was being planned. It is important to have procedures in place to record the date on which each individual candidate overtakes this Outcome.

Outcome 3: The majority of centres made use of the support material from the Education Scotland website, often customising the documents and using them as teaching aids before starting work on Outcome 3. The majority of O3 evidence was in the form of a lab report and, although there is no need to include a procedure as SSERC have provided one, the majority of centres preferred to use the traditional format and included a procedure directly after the aim. All centres encouraged candidates to use correct English and all insisted on redrafting if the English was poor. It is essential that the conclusion (PC(c)) is clearly stated and is related to the aim (PC(a)).

Unit specifications, instruments of assessment and exemplification materials

Assessors in all centres were familiar with the Unit specification, found on pages 76 to 88 of the Arrangements document (December 2010) on the SQA website (*Chemistry (Revised) Higher Course Specification (December 2010)*) and with the instrument of assessment consisting of three Outcomes and eight Performance Criteria exemplified in the Unit Specification. All centres were using the National Assessment Bank pack, Revised Chemistry (Higher), Researching Chemistry FE4J 12/NAB001 available on the SQA secure site.

Several centres had created more user-friendly material by summarising documents from the Education Scotland site, eg Preparing a Scientific Communication, and focusing on the sections needed by candidates as they tackled Outcome 3.

Evidence Requirements

There is a clear understanding of the requirements for Outcomes 1 and 2, but the evidence requirements for O3 are less clear.

Administration of assessments

The assessment instruments for FE4J/12 are provided by SQA along with advice on how to administer them. All centres that were verified used their intelligence, initiative and professional judgement in interpreting this advice. In all centres there was evidence of a continual discussion between class teachers/lecturers about the standards required. Standards were agreed by a variety of methods and, as departmental procedural expectations were frequently discussed, they were consistently applied.

In all centres verified, rigorous procedures for internal verification were in place and internal verification had picked up the fact that some candidates needed to re-draft the O3 report in order to overtake all four PCs; in some cases two re-drafts had been necessary. In these centres, 20% of candidates had been cross-marked. In each case the candidate evidence was initialled and dated by the internal verifier who had, in most cases, also provided feedback for the candidates.

Areas of good practice

- ◆ In 100% of centres verified, procedures were in place to prepare candidates for the Researching Chemistry Unit. Support materials from the Education Scotland website were customised and used to teach methods of 'Planning and carrying out an investigation', 'Communicating scientific information', and 'Processing and analysing results'.
- ◆ Outcome 2 may involve group work and, to overtake this Outcome, each member of the group must contribute towards planning and carrying out the experiment. In all centres a pro-forma was used to allow each candidate to state what their own and their partners' contribution would be to the practical

work that was being planned. The O2 evidence was marked (with initials and dates) and there was ample evidence of advice designed to improve the quality of the O3 communication being given by class teachers.

- ◆ Very good procedures for internal verification had been set up by a small presenting centre. Members of staff from other departments had spent many hours cross-marking and internally verifying candidate evidence.
- ◆ All centres encouraged candidates to thoroughly research their focus question (for Outcome 1) on the internet and to write their responses in their own words. A wide range of websites were referenced and their urls showed that reliable sites had been accessed and that candidates were aware of bias.
- ◆ Several centres used the assessment sheet from page 6 of the NAB document to assess Outcome 1. This has the advantage of keeping the focus question in front of the candidates as they record their answers.
- ◆ In the majority of centres, rigorous procedures for internal verification were in place and internal verification had picked up the fact that some candidates needed to re-draft the O3 report in order to overtake all four PCs; in some cases two re-drafts had been necessary. In these centres, 20% of candidates had been cross-marked. In each case the candidate evidence was initialled and dated by the internal verifier who had, in most cases, also provided feedback for the candidates.

Specific areas for improvement

- ◆ FE4J 12/001 is the NAB for the Higher half-Unit Researching Chemistry and, as such, it should be marked as the NAB tests for the other three Units are marked. This means there should be an indication, in the candidate evidence, of where each PC has been deemed to be overtaken. It is good practice to date any entry in a candidate's daybook.
- ◆ Best practice is for O2 evidence for each candidate to be dated to show when the individual overtook each PC. This can be achieved by dating, rather than ticking, each box on the Assessor observation checklist from either page 87 of the *Chemistry (Revised) Higher Course Specification (December 2010)* or from page 14 of the NAB document FE4J 12/001 V1 (March 2012)
- ◆ O3PC(b): Titration results should include initial and final burette readings so that the titre calculation can be checked. Raw results should be recorded and, where they are presented in a table, suitable headings and correct units should be used. Graph axes should be correctly labelled and have units.
- ◆ Outcome 3 PC (b) & (c): All centres used the SSERC Alcopops brief and several of the graphs seen used a scale that meant the candidate struggled to correctly analyse the results obtained. Some of the calibration lines were only a few degrees from the horizontal which made it very difficult to use the calibration graph to draw a valid conclusion from the results of the investigation. This Unit is a good opportunity for formative assessment; teaching candidates to construct a graph with appropriate scales will advantage them in the Course exam.