



NQ Verification 2014–15

Key Messages Round 1

01

Section 1: Verification group information

Verification group name:	Biology
Verification event/visiting information	Verification event
Date published:	March 2015

National Courses/Units verified:

Biology (National 3, National 4, National 5 and new Higher) Unit assessments
Human Biology (new Higher) Unit assessments

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Section 2: Comments on assessment

Assessment approaches

Most centres used the published Unit assessment support packs which meant that there were generally few problems concerning the approach to assessment. The Unit by Unit approach was the one most used.

Most centres were aware that the Unit assessment support packs were updated in June 2014. Therefore, their instruments of assessment included accurate information on the number of opportunities to make accurate statements in each question, and included updated questions and marking guidance.

It is important that all centres take account of Unit assessment support pack updates. In some cases the wording or emphasis of questions in the Unit assessment support packs had been significantly changed. Problems arose where centres had not taken cognisance of these updates and used updated questions but did not update the marking guidance, or vice versa.

Only a small number of centres used the portfolio approach. Issues that arose with centres using this approach included failing to give candidates the opportunity to make accurate statements on all key areas, or over-assessing one key area in comparison to others. In this instance a candidate could potentially pass the whole Unit with very little knowledge of other key areas. The Unit

assessment support packs state that the number of opportunities to make statements should be appropriate to the size of the key area, and that it would be unusual to require more than five opportunities to make accurate statements per key area.

Some material submitted for verification had not been prior verified and was not fit for purpose, either in its level of demand or in its appropriateness and accuracy in assessing mandatory content. Centres are reminded that they should make use of SQA's prior verification service where significant changes are made to the Unit assessment support packs, or if they choose to use centre-devised assessments.

[Further information on SQA's Prior Verification service](#)

Assessment judgements

As stated previously in this report, it is important that centres take account of updates to marking guidance contained in the Unit assessment support packs. Particular problems arose in cases where centres applying old marking guidance often marked incorrect responses as correct, or correct responses as incorrect.

As stated in the [Biology NQ Verification 2013–14 Verification Key Messages](#), the marking guidance provided in the Unit assessment support packs is not intended to be exhaustive of all possibilities and can be modified. Centres are reminded that any modifications must be noted and are subject to the same level of internal quality assurance processes as assessment judgements. Good practice from a number of centres in this round of verification included the annotation of marking guidance, detailing acceptable alternative answers and also unacceptable answers.

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

Centres are reminded that the Unit assessment support packs contain additional information in the judging evidence tables to assist with the judging of evidence for the assessment of Outcome 1, Assessment Standards 2.1, 2.2, 2.3 and 2.4. These tables were clearly used and applied by many centres. Other centres seemed only to be using summary checklists; for example, candidate assessment records, as exemplified in the appendices of the Unit assessment support packs. Such checklists are useful for administrative purposes however the information in them is necessarily condensed; therefore, they must be used in conjunction with the full list of judging criteria contained in the judging evidence tables.

The following guidance relates to individual Outcomes and Assessment Standards.

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.

Assessment Standard 1.1 Planning an experiment/practical investigation

Candidates must be actively involved in planning their own experiment/practical investigation. As stated in the Biology 2013–14 Verification Key Messages, centres are expected to ensure that contexts that allow active planning by all candidates are chosen. Where a report suggests that all candidates from a class have been provided with both the protocol and materials to carry out an experiment/practical investigation, and there is no evidence to suggest that they have individually been involved in the planning of the investigation, then they cannot meet Assessment Standard 1.1.

Almost every centre verified seemed to be aware of the need for candidates at National 5 to explicitly state the dependent and independent variables, as stated in the Biology 2013–14 Verification Key Messages; however, not all centres seem to be aware of the progression in this respect for Higher level. At Higher level, if a candidate identifies an indirect measure for the dependent variable, then they must link this specifically to the dependent variable at some stage of their report. At Higher it is important that the candidate shows an understanding of the overall output of the experiment; for example, a candidate could be measuring enzyme activity (the dependent variable) by measuring the time taken for paper discs soaked in potato extract to rise to the top of a hydrogen peroxide solution, while altering the concentration of the hydrogen peroxide (the independent variable). If they state that the dependent variable is ‘the time taken for the paper discs to float to the top of the hydrogen peroxide’ there is a potential lack of understanding. They must make it clear at some point in their report that, in measuring the time taken for discs to rise, they are actually measuring enzyme activity. If so, they should be credited with identifying the dependent variable. They have correctly identified an indirect measure (time for discs to rise) and linked this specifically to the dependent variable (enzyme activity) in their report.

Further guidance is provided in the Common Questions about National 3, National 4, National 5 Biology, Higher Biology and Higher Human Biology, located on the [Biology subject page on SQA’s website](#). The recently published Understanding Standards exemplar material contains examples of candidate evidence and commentaries explaining why the evidence does or does not meet national standard for assessment. Further exemplification is provided on the Biology Understanding Standards pages on SQA’s secure site: www.sqa.org.uk/sqasecure

Assessment Standard 1.4 Presenting results in an appropriate format

A common error arising in candidate evidence concerns calculations of averages, or other manipulations of raw data, in which there is a greater degree of implied accuracy quoted than that which can be supported by the raw data. For example, catalase activity may be investigated by measuring the height of froth produced when enzyme-containing tissue is added to hydrogen peroxide solution. If this froth height is measured with a ruler, then it is likely that this will be measured to

the nearest mm. Repetition and then calculations of average values would make the result more reliable, but it is important that the averages are expressed to the same number of decimal points as the raw data. Using this method, average values which are quoted to one decimal place suggest a degree of accuracy which cannot be supported by the means of measurement in use (a ruler cannot be used to measure to the nearest 0.1 mm). Candidates would therefore be incorrect if they did not round any calculated average values to the nearest whole number.

Centres are reminded of the advice regarding graphs and tables provided in the General Assessment Information documents for the [assignment components of the National 5 Biology](#) and [Higher Biology](#) Courses.

The following criteria should be applied when candidates are presenting their experimental results for Outcome 1.

Graphs

- ◆ The scale on any axis must have a number at the origin, a number equal to or above the highest plot, and at least one other number in between.
- ◆ Each axis needs its own number at the origin. However, if that number is zero for both scales a common zero is acceptable.
- ◆ Scale breaks are not acceptable.
- ◆ Any graph must use at least 50% of the axis.
- ◆ The full axis label(s) must be copied exactly from the table of results with no deviations or abbreviations.
- ◆ The plot for a line graph must have no 'extensions' above or below the first and last points and a straight line should go through the centre of each plotted point.
- ◆ The bars of a bar graph must have clear tops, with straight lines (not just shading to give an approximation of the top).
- ◆ The bars of a bar graph can be of any/variable width, except for single lines which are not considered to be bars.
- ◆ Lines from a pie chart must originate from the centre.
- ◆ Segment lines from a pie chart should match up with the 'tick' marks given, ie no 'daylight' should be seen between them.

Tables

- ◆ Every column in a table should have a clear heading.
- ◆ Units should be indicated in brackets below the column heading but accept units in the column as long as they are given after every entry.

In instances where candidates fail to meet the Assessment Standard, they can be provided with an opportunity to redraft their table or graph. This should provide excellent training for candidates in preparation for the assignment and for the question paper.

Section 3: General comments

A significant number of centres selected for verification failed to provide the expected sample of candidates. Centres are reminded that, if selected for verification, they should submit evidence for a sample of 12 candidates in line with the sampling guidance provided in *Delivering National Qualifications: Guide for SQA Co-ordinators*, available from SQA's [Delivery Processes and Information for Centres web page](#). The centre can choose which Unit (or Units, in the case of a combined approach to assessment) to select for each level. It must choose the same Unit for all candidates at any one level, but it can choose different Units for different levels.

If presenting at all levels (National 3–5 and new Higher) the sample must cover the new Higher and two other levels and, where possible, be evenly split between the levels. If presenting at three or fewer levels, the sample should, where possible, be evenly split between the levels.

The centre must also select Units and levels where it has sufficient candidates (ie four). Where it does not have sufficient candidates at one or more levels, it must increase the sample size from a different level, to ensure the total sample is still 12. Evidence can be interim in nature.

At each level, the sample should include assessed candidate evidence that exemplifies a range of candidate performance and assessment judgements of both pass and fail, where possible. This will support the process of giving clear and detailed feedback on the application of national standards.