



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Qualifications Framework Levels 1–3, 2005

Biology

National Moderator's Report

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General Guidance for Assessors of Achievement and Unit Standards

The purpose of external moderation is to provide reassurance that assessor judgments are at the national standard and are made on the basis of assessment materials that are fair and valid.

All assessment materials are expected to:

- give the learner the opportunity to meet the requirements of the standard
- have an assessment schedule that gives evidence of appropriate learner responses and clear judgments at all levels.

The Ministry of Education contracted subject experts to write assessment resources for achievement standards. These are not pre-moderated. The intention is that they are modified to suit teaching programmes and learner needs. They do not provide 'rules' but suggest different ways of assessing to the nationally registered standard.

General Overall Comment

Moderators report an improvement in the general interpretation of the standards and the confidence that assessors have in implementing changes suggested in previous moderation rounds.

An increasing number of schools are using annotated photocopies of previous or current learners' work as examples of what is expected at Achievement, Merit and Excellence levels. The annotations and their position on the script clearly indicate to the moderator that the assessor is using an appropriate interpretation of the standard.

AS 90713: Carry out an investigation into an aspect of the ecological niche of an organism with guidance

The assessment activities submitted for moderation have been valid. A few more schools are developing their own activities and field trips to cover this standard.

The assessment activity is to be carried out "*with guidance*" (Explanatory Note 4). A number of activities have milestones built into them. These need to be used fully to ensure any investigation that is not up to level 8, or is not relevant to the ecological niche of the organism, is modified **before** it is carried out.

Learners have difficulty in developing investigations that are suitable for level 8 of the curriculum (Explanatory Note 1). It is acceptable for the investigation to **begin** from a year 12 Biology investigation, eg rate of photosynthesis, but it must be linked to the ecological niche of the organism and go **beyond** investigations typical of year 9, 10 and 11 Science and year 11 and 12 Biology. The content of the animal behaviours and plant responses section of the curriculum has many opportunities for possible investigations. More examples of original specific case studies were seen this year, eg the roosting behaviour of a bird species, feeding relationships in a herd of horses, grooming behaviour of a cat and kittens, spatial relationships between birds feeding on a beech.

A number of students showed poor data processing skills with individual trial results being graphed, rather than using the average results to clearly show the pattern or trend.

Moderation of the discussion section of the investigation showed assessors are now looking for discussion of the biological significance of the results, using appropriate biological concepts and processes rather than just a restatement of the findings.

Evaluations were much improved this year with more and more students focusing on what it was they did in their investigation to ensure the method was valid and the results reliable. A huge improvement in the use of statistics was seen this year, especially the increased use of linear and non-linear regression, which are more appropriate tests for the type of data most investigations are producing.

Assessors have been more aware of the “*animal ethics guidelines*” (Explanatory Note 2) with this achievement standard. As a result, moderators have seen fewer examples of investigations outside the tolerance limits of the organism.

Logbooks do not need to be submitted for moderation unless they contain evidence that has been used to award an Achieved grade.

AS 90714: Research a contemporary biological issue

Explanatory Note 4 states that “*students are expected to produce referenced information ...*”. This means that if a written format is used, eg essay or report, the researched information and ideas must be written in the learner’s own words and their source referenced within the body of the text, using names in brackets or footnotes. A reference list or bibliography is also needed. The referencing in the texts also helps to clarify if the **integration**, required for Merit, is present or not.

Guidance needs to be given to ensure that, when a choice of topics is given, the topic chosen is a **biological issue**, eg opinions on different water purification options, and not just an information topic, eg how water is purified for drinking.

Moderators have identified that some topics provide more or fewer opportunities for the learner to discuss the biological concepts and processes. For example, a topic such as xenotransplantation will provide less opportunity and assessors need to consider this when setting choices and marking the result.

Moderators have also identified a significant number of extensive ‘cut and paste’ reports in which learners have copied large chunks of text from a source. This does not meet the requirements of this achievement standard. Learners are expected to internalise the information and then present it in an original ordering of ideas and words.

AS 90457: Carry out a practical biological investigation with supervision

Learners’ work showed a variation in the specification of the range of the independent variable and how the other significant variables were controlled. This lack of control of variables often limited a number of learners to Non-achieved and Achieved.

This standard is done “*with supervision*” which means the assessor can, during the planning stage, discuss the possible method with the learner. It is also important to discuss or provide feedback on the learners’ “purpose” to ensure they can reach a conclusion that will allow them to achieve the standard.

Some learners did not achieve this standard, as they did not use a **valid range for the independent variable**. To be valid the range must be appropriate to the **purpose**. For example, for an investigation to find the highest activity of an enzyme it should cover a moderate range of

temperatures including above and below the optimum. It should have at least four points, eg four temperatures, so it gives opportunity to identify unreliable results.

Assessors also have to make a judgment on the appropriateness of the **processing of data**.

This year the “*discussion*” given by students was more in-depth which is appropriate for level 2 biology and their “*evaluation*” better identified what it was they had done in their investigation to ensure the method was valid and the results reliable.

A limited range of investigations are being used for assessment of this standard. *Making Chips* was used extensively and a range of enzyme investigations are being used.

AS 90769: Research the interaction between humans and an aspect of biology

Explanatory Note 2 states that “*students will carry out their own research and reference their material*”. This means that if a written format is used, eg essay or report, the researched information and ideas must have their source referenced within the body of the text, using names in brackets or footnotes. All copied diagrams are expected to be referenced and a reference list or bibliography is needed. This is expected at Achieved, Merit and Excellence level.

At level 2, it is expected learners will have internalised the researched information and have the understanding to be able to present the key ideas in original wording. Some learners did not achieve because they had used extensive ‘cut and paste’ of material from the Internet or had copied blocks of text from other written sources. Often this was not identified by the assessor but was clearly evident to moderators in the sample of eight scripts. Providers that have overcome this problem ask learners to submit all research material before the report is written. While assessors and moderators can quickly scan this material to identify blocks of copied text, the most common way of identification is when the same wording is read in two students’ work.

A “*discussion*” involves descriptions and explanations linked together, therefore bullet points are not an appropriate format for a discussion.

Explanatory Note 3 has been interpreted to mean that the topic **must be** either “*impact of a human activity on an ecosystem OR use of an applied biology technique*”.

AS 90460: Investigate an interrelationship or pattern in an ecological population or community

Moderators have identified that the discussion of the biology of the organisms in relation to environmental factors is better this year but some assessors are still accepting explanations that are incorrect, eg the lower boundary of a rocky shore zonation pattern.

This year an improvement has been noted in learners’ development of the method for collecting valid field data. However, a number of activities and reports showed that too much direction had been given to learners, either written or verbally. Some old field trip activities still have not been updated to match the achievement standard.

Incomplete processing of data was an area that resulted in a lower level of achievement. Also, with the community pattern, learners are often processing too much data and their identification of the pattern is rushed or getting lost in the volume of processing. Activities should limit the number of species considered, by asking learners to collect data on a wide range of species but only process data for three or four species.

Schools should be aware that they can modify the assessment activities on the TKI website to get an activity that is appropriate and valid for their situation.

A number of activities incorrectly asked the learner to use the environmental data and the information about the biology of the organism to describe the distribution pattern. It is the processed data that has to be used to do this.

Moderators noted that assessors who used tick-box templates were often not marking to the national standard. Those who had access to annotated scripts were more likely to make judgments at the national standard.

The term “distribution” has caused inconsistencies in assessor judgments. The term “distribution of species” in relation to a population pattern, can mean distribution across an area in relation to age, the population boundaries over the habitat, or simple distribution as clumped, random or regularly spaced. It is important that the meaning the assessor is using is made clear to learners and the assessment schedule is consistent over the whole of the activity.

AS 90161: Carry out a practical biology investigation with direction

At times learners completed investigations that were not valid. As this standard is done with direction, assessors can give more direction on the purpose and method to ensure a valid investigation is carried out.

Individual and group work requirements were outlined in *Assessment Matters*, A2005/005, 15 July 2005, available on the NZQA website <http://www.nzqa.govt.nz/publications/circulars/matters/index.html>.