



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Qualifications Framework Levels 1–3, 2004

Biology

National Moderator's Report

National Moderator's Report

General Guidance for Assessors of Achievement and Unit Standards

The purpose of external moderation is to provide reassurance that assessor judgements 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 student the opportunity to meet the requirements of the standard
- have an assessment schedule that gives evidence of appropriate student responses and clear judgements 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

The moderation of internally assessed achievement standards and unit standards in Biology has proved to be very effective in establishing national consistency in the validity of assessment materials and the standard of assessor judgements. At Level 3, most providers are using the exemplars from the TKI website, but at Levels 1 and 2 more providers are using their own activities or modified versions of TKI activities. The trend of using their own activities is seen as increasing assessor confidence in the interpretation of the achievement standard.

Some providers have developed their own sets of annotated student examples to use with the assessment schedule, and this is encouraged. The use of current year annotated examples has the effect of raising the quality of assessor understanding of the standard and consistency of assessor judgement with the national standard.

Level 3

AS 90713: *Carry out an investigation into an aspect of the ecological niche*

Requirements of the standard

Most providers were able to clearly interpret the criteria. This may be due to experience with the Levels 1 and 2 investigation standards.

Explanatory note 1 – The key issue with the assessment of this standard is the level of investigation that the learner carries out. Explanatory note 1 states that the standard is derived from Level 8 of the curriculum, therefore the level of investigation must be appropriate for Level 8, ie higher than the investigations done at Level 1 or Level 2. For example, an investigation of a negative phototoxic response over a range of light intensities is appropriate, but a simple investigation into growth in different substrates is NOT appropriate for Level 8.

At Level 8, investigations are expected to be carried out individually, not in groups.

Investigations must, where appropriate:

- investigate an aspect of the ecological niche of a **named species** – this must be something that is appropriate for the named species and not outside its normal environment. For example, growth under different coloured light is NOT appropriate as it is outside the normal environment of plants. The range of the independent variable must be within the range of tolerance of the organism
- have a range for the independent variable of more than two points. Qualitative reading, such as hot, warm and cold, are not appropriate at Level 8. It is acceptable, for example, to investigate two temperatures against humidity over a range of 5 humidities.
- measure 'growth' by more than change in height alone – increase in dry matter is more appropriate and has implications for sampling
- have an appropriate sample size; five seedlings at each treatment are not enough
- ensure that the organisms are in a similar physiological state at the beginning of each trial; for example, slaters should have been in the same conditions for a length of time before they are introduced into a set humidity.

Explanatory note 2 – Some investigations submitted for moderation did not comply with animal ethics guidelines and therefore should not have been carried out. If carried out they should not be assessed. Students require direction on the animal ethic requirements of their investigations. Even if the animal used does not require Ethics Committee approval, organisms should not die as a result of being measured for excessive amounts of time or in conditions well outside their tolerance range or natural environment.

Explanatory note 3 – There appears to be some confusion about the difference between a 'fair test' and investigation of an 'interaction or pattern'. A fair test investigation is usually a laboratory investigation with strict control of variables. A fair test may investigate an interaction or pattern. An 'interaction or pattern' investigation is one where the control of variables is not possible. For example, an investigation of competition between plants in a garden, coexistence of crab species in an estuary or response of beech forest seedlings to removal of the canopy.

Explanatory note 4 – 'with guidance' means that the teacher is **interacting with the student throughout** the investigation. Interacting involves the teacher in discussing with students what they are investigating and how they are investigating it. The TKI web activities have milestone points built in so that appropriate discussions can take place. For example, at milestone 1 it is important for the assessor to give guidance to the student as to whether the hypothesis is valid, ie related to the niche. At milestone 3 or 4, the appropriate handling/processing/presenting of data would be discussed. The student can not be 'directed' as to which graph or statistical analysis method to use, but the teacher can make a comment that challenges the student's thinking about what they have used and they can then be guided to a source, such as their learning notes, where information can be found on how to handle the particular type of data they have collected.

Explanatory note 5 - Some student examples contain large amounts of information about the ecological niche of the organisms. A few providers are still assessing the ecological information in the way it was in the past. The only requirement in the achievement standard is for a short introduction of about one page 'with a **focus on** the aspect being investigated and **why it is significant** to the way of life' of the named species. The majority of the student's time should be spent on the practical investigation and not research into the ecological niche of the organism.

It is appropriate to include only information about the species being investigated unless a comparison of two species is being made. With much of the information coming from the Internet, students need guidance on the identification of species that occur in New Zealand.

Explanatory note 6 – This is being well done by most providers.

Explanatory note 7 – A significant number of students used bar graphs when line graphs were appropriate or line graphs when bar graphs should have been used. Teacher guidance can help students to avoid these mistakes.

The most appropriate statistical test for most investigations is a regression analysis. Linear regression, non-linear regression, means and standard deviations were all used well by students.

Explanatory note 8 – As mentioned above under explanatory note 5, the introduction needs to focus on why the aspect being investigated is significant to the way of life of the organism.

A critical evaluation focuses on the positive, ie what was done to ensure the investigation was valid. For example, how sources of error, limitations and bias were dealt with to ensure the investigation was valid.

Additional notes

A number of providers submitted, for moderation, activities that related to an unregistered draft of the achievement standard.

While submission of the resource material used by students is helpful to the assessor when determining authenticity, it is NOT required for submission with the moderation materials.

A number of providers are successfully using annotated photocopies of examples from current students as learner evidence included with the assessment schedule. Doing this has allowed the provider to have the grading on up to 11 current year scripts checked by the moderation process.

AS 90714: *Research a contemporary biological issue*

Requirements of the standard

There were few issues with this achievement standard. The main issue was the interpretation of explanatory note 4. The statement in explanatory note 4 'produce referenced information' has been interpreted to mean that the students are expected to show, **within the body of the text**, the sources of information they have used in the text. This can be through the use of footnotes or other acceptable referencing method, eg (Smith, 2004). A reference list/bibliography is also required but is not sufficient by itself.

The evaluation of sources for Excellence requires specific analysis and comment on the individual sources used. General comments over all sources, or in relation to the main sources, is not appropriate for Excellence. Explanatory note 6 gives ideas on what aspects of the validity and bias of the source should be analysed.

Naming of specific groups and individuals is required when dealing with opinions and viewpoints. The statement 'Some people think that....' is not appropriate.

Additional notes

Submission of the resource material used by students is helpful, as it allows the moderator to evaluate the students' ability to integrate relevant information and opinions from a range of sources.

Level 1 and 2 Achievement Standards

During 2004 all the Level 2 biology achievement standards (now version 2) and the Level 1 standards 90161 and 90162 (now version 3) were reviewed and significant changes were made. In many cases, the changes made clarify the interpretations that had already been made through the moderation process. The changes made to a number of the achievement standards have been significant. Therefore it is important that providers access the appropriate version 2 or 3 of the standards on the NZQA website and then check the updated version of the activities on the TKI website to get an indication of how the latest version of each standard is being interpreted.

Providers appear to have readily been able to use the version 2 standards for AS 90164 and 90165.