



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Qualifications Framework Levels 1-3, 2003

Mathematics

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 activities 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 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

Some original assessment tasks were moderated this year although the majority of assessors are choosing to use the tasks from the web. When developing assessment tasks, the focus must be on assessing the criteria of the specific standard.

Judgements need to be made that are consistent with the schedule. If the schedule inappropriately prohibits the award of the grade, then the schedule should be modified to match the standard. The grade to be allocated to a learner must be made holistically on the basis of evidence provided.

Unit standard assessments have mainly been centred around the alternative courses with many of the assessment tasks submitted for moderation coming from the NZAMT website. Most assessors who have been using the unit standards for some time are assessing consistently to a national standard. The recently published NZQA guidelines for writing assessment tasks provide helpful interpretations of the unit standards for assessors.

Level One

90149 *Solve problems involving measurement of everyday objects*

The main issues with this standard arise from the requirement to:

- take and use measurements of real objects
- define acceptable answers in the assessment schedule
- expect that the students will know to give units in their answers to measurement problems.

For Achievement

- Assessment schedules need to give an acceptable range of answers to practical activities linked to what the learner is given to measure.
- Because the standard requires the learners to measure real everyday objects in order to solve a problem, the use of scale drawings is not acceptable. The intention of the standard is to enhance the learner's concept of measurements which can only be achieved by measuring the 'real' object.
- Measurements used in the calculations must be those made by the learners.
- A 'representative sample' requires a range of problems.

For Achievement with Excellence

- The calculation required in solving the problem(s) must involve multiple steps.
- Limitations of the model given by the learner must be specific to the measurement activity in the question that elicits evidence for Achievement with Excellence.
- While no mention is made in the standard of spheres, pyramids etc, they are not excluded. Assessors need to be aware that their inclusion does not necessarily make the problem an opportunity for demonstrating Achievement with Excellence. Achievement with Excellence involves demonstrating the skills necessary to plan and implement a practical measuring task.

90150 Use geometric techniques to produce a pattern or object

This standard is generally well assessed.

For Achievement with Merit/Achievement with Excellence

- The learner must describe the aspects of the technique used, and to demonstrate Achievement with Excellence, the instructions for producing the actual object or pattern are necessary.
- The learner given the instructions for Achievement with Excellence will often provide evidence for the descriptions required in Achievement with Merit. These learners are eligible for consideration for Achievement with Excellence irrespective of where they provide the appropriate evidence.
- Most successful learners keep their designs simple although they must include at least two constructions and at least two transformations.

For transformations the learner must specify the:

- distance and the direction of the movement (for translations)
- mirror line (for reflection)
- centre, angle of rotation and the direction (for rotation)
- centre and scale factor (for enlargement).

For constructions the learner must specify the:

- type of construction
- position
- any direction if appropriate.

90193 Use straightforward statistical methods to explore data

This standard is generally well assessed.

- The assessor only needs to supply two sets of data for the learners to analyse.
- Quartiles are acceptable as indicators of spread.
- A question that has a one-word answer is acceptable, provided there is sufficient material to be able to answer the question posed. The judgement of the learner's response is based on their analysis of their data, and their use of this in justifying their answer to the question.
- It is not necessary for the sample to be the same size in order to compare two variables or to make valid statements in comparing the data sets.

Level Two

90288 *Select a sample and make inferences from the data*

While the learners must use their sample in their calculations, the assessor does not need to individually check each calculation. However, the stated statistic must be within the ballpark of the correct statistical value.

Estimates are not guesses but inferences generated from the learner's statistical analysis.

For Achievement

- The appropriate use of statistics may include the range, although at Level 2 the learner is expected to calculate the standard deviation.
- Calculation of statistics must be from the learner's selected sample.
- Learners are required to make an inference about the population from their analysis of their sample.
- Systematic sampling within stratified sampling is a valid method of obtaining a random sample. However, care must be taken in calculating population statistics from the statistics obtained for each strata.
- Some assessors rejected samples of less than 30 where a sample of say 25 was just as valid. This is one of the situations where it is necessary to refer back to the intention of the standard.

For Achievement with Merit

- The learner must describe their sampling method, but this does not require the description of how to use their tool in selecting their sample, ie the learner is not required to explain how to generate random numbers using their calculator or computer.
- Learners should randomly choose a starting point for systematic random sampling.

For Achievement with Merit/Achievement with Excellence

- The distinction between Achievement with Merit and Achievement with Excellence comes from the requirement of the critical evaluation of the sampling process and the need for the learner to consider the implication of any limitations on the inference they have made.
- Schedules must include examples of statements that are valid for evaluations, the statements must relate to the investigation and the learner's analysis or results rather than rote responses.

90289 *Simulate probability situations, and apply the normal distribution*

This standard has been relatively easy to follow. Assessors have a clear understanding of the national standard, tasks are appropriate and judgements are accurate.

It is important to recognise that the standard has two criteria and the learners need to demonstrate their ability to reach the standard in both.

90291 Solve practical trigonometry problems

Some assessors did not require their learners to take practical measurements, and to use these values in their calculations. The reading of scale diagrams or drawings is not sufficient.

- The range of acceptable answers/measurements must be provided in the schedule. These vary from situation to situation.
- General Explanatory Note 3 requires the student to relate their answer to the context and apply appropriate rounding.

Unit Standards**8492 Use standard units of measurement**

- The assessment schedule needs to specify the acceptable range of measurement and solutions for practical problems.
- Units must not be stated, indicated in the question or asked for. Learners are required to know that units form part of the solution to a measurement problem.

8491 Read and interpret information presented in tables and graphs

- For **element 1**, the learners are only required to convert between the forms of numbers.
- For **element 2**, in the latest version of this standard, the problems only need to involve three different forms of conversion out of the possible six.

12331 Investigate and report on the mathematics of a given project

- This is a Level 2 standard referring to level 7 of the curriculum, while the measurement and number strands stop at level 6. This assessment must therefore involve a project that draws together aspects from the number and measurement strands, and involving sequences of calculations and possibly measurements.