



The following report gives feedback to assist assessors with general issues and trends that have been identified during external moderation of the internally assessed standards in 2023. It also provides further insights from moderation material viewed throughout the year and outlines the Assessor Support available for Mathematics and Statistics.

## Insights

### **91574: Apply linear programming methods in solving problems**

#### **Performance overview:**

This standard requires selecting and using linear programming methods in solving problems. This process needs to include demonstrating a knowledge of concepts and terms relevant to the methods being applied. Access to appropriate technology that allows for the development and communication of thinking can contribute to more fluency in the problem-solving process.

#### **Practices that need strengthening:**

Where grades were changed in moderation, further development in solving problems relevant to the context was needed. The application of contextually relevant methods was sometimes not visible in the representations provided as evidence. Adequate communication around what the solution represents and how the methods are used to find the solution were other reasons for some evidence provided not meeting the standard.

### **91587: Apply systems of simultaneous equations in solving problems**

#### **Performance overview:**

This standard requires applying systems of simultaneous equations in solving problems. Appropriate representations need to be included as part of the evidence for the standard to be achieved. Access to technology can contribute to achieving success in solving problems and allow for a more cohesive communication of the process used to solve problems. Appropriately communicating the solutions in the context of the problem is another factor that resulted in the standard being achieved.

#### **Practices that need strengthening:**

Grade changes occurred in moderation when situations were set in contexts that were unfamiliar or resulted in non-whole number solutions. The opportunity for evidence of applying knowledge or understanding of mathematical concepts was therefore hindered. In some cases, this led to the requirements of the standard not met. Misinterpreting the nature of solutions of systems is another reason that the evidence provided did not meet the standard.

## **91581: Investigate bivariate measurement data**

### **Performance overview:**

Investigating bivariate measurement data involves showing evidence of using each component of the statistical enquiry cycle. This requires using a given multivariate data set to pose an appropriate relationship question to investigate, selecting and using appropriate displays, identifying features in the data, describing the nature and strength of the relationship in context, using the model to make a prediction in context, and communicating findings in a conclusion. The report needs to demonstrate evidence of relevant contextual knowledge and statistical understanding appropriate to investigating bivariate measurement data. This involves the use of appropriate statistical language.

### **Practices that need strengthening:**

Grades were changed in moderation due to a lack of understanding of the statistical enquiry cycle required for this standard. Posing questions at level 8 of the curriculum is one area that needed improvement. Ensuring that the contextual knowledge used supported the purpose statement made is another. In some instances, the depth of understanding needed to discuss the patterns evident in the scatter graph at the level required resulted in some evidence not meeting the standard.

## **91580: Investigate time series data**

### **Performance overview:**

This standard requires the investigation of time series data and involves showing evidence of using each component of the statistical enquiry cycle. This means selecting and using appropriate displays, identifying features in the data, finding an appropriate model, using the model to make a forecast, and communicating findings in a conclusion. The report needs to demonstrate evidence of relevant contextual knowledge and statistical understanding applicable to investigating time series data. This involves the use of appropriate statistical language.

### **Practices that need strengthening:**

Grade changes occurred in moderation when the components of the statistical enquiry cycle needed more evidence of the contextual and statistical understanding at level 8 of the curriculum. In some instances, the statistical discussion was not consistent with the variable being investigated and contextual reasoning lacked coherence. A more comprehensive understanding of the context of the investigation needed to be evident to meet the standard.

### **Assessor Support:**

#### **Online**

NZQA's learning management system (Pūtake) offers 150+ easy to access courses, materials and products. These are designed to support teachers, as assessors, to improve their assessment of NCEA standards.

Online, subject-specific or generic, bite-sized learning modules and short courses are now available to complement the traditional face-to-face workshops that NZQA offers. These online courses can be accessed using your Education Sector Logon.

Subject-specific course/workshops available for Mathematics and Statistics include:

- Developing Levels of Thinking (Mathematics)
- Using Technology during Assessments
- Level 3 Understanding Variables and Displays
- Level 3 Statistical Investigations
- 91582: Inferential Reasoning

Online Making Assessor Judgements workshops are also available throughout the year. These workshops are structured to guide teachers to improve their understanding of each grade level by examining several full samples of student work. The following standards are available for enrolment in 2024:

- 91257: Apply graphical methods in solving problems
- 91575: Apply trigonometric methods in solving problems
- 91264: Use statistical methods to make an inference
- 91582: Use statistical methods to make a formal inference

Feedback from teachers for these workshops indicates that more than 74% of participants agreed or strongly agreed that the content in the module was beneficial:

*“Although I was a bit skeptical that this was going to provide me with better understanding of the standard (and marking it), I found I’ve picked up more certainty about making judgements about the work my students might produce. I’m also more secure about guiding them through the selection of their topic and setting it up so that they are able to complete a successful investigation.”*

Exemplars of student evidence for all standards at each level of achievement are available on the NZQA subject page for Mathematics and Statistics.

NZQA will continue to provide generic modules and workshops designed to improve general assessment practice. The following modules and workshops will be available in 2024:

- Assessment Approaches, an online workshop exploring different methods of assessment
- Culturally Responsive Assessment
- Assessment Guidance – Reviewing Your Practice
- Tāku Reo, Tāku Mahi – My voice, My work, a guide to managing authenticity
- Why Less is More, a guide to reducing volumes of student evidence
- Integrated Assessment
- Modes of Assessment
- Alternative Assessment
- Acknowledging Sources

*“This was great! I liked that I could choose from different scenarios, see how sources are used and the way the student answered the question.”*

*“Reassuring and very thorough. Easy to use/follow.”*

We will also continue to offer the Transforming Assessment Praxis programme, an online workshop relevant to all subjects which helps assessors learn about re-contextualising assessment resources and collecting evidence in different ways, in order to better meet the needs of students.

Check the NCEA subject pages on the NZQA website regularly, as more online modules, workshops and courses will be added throughout 2024.

### **Assessor Practice Tool**

The Assessor Practice Tool (APT) will be used to support assessors with the new NCEA standards from 2024 onwards. The purpose of the APT is to allow assessors to practice making assessment judgements and immediately receive feedback on their judgements from a moderation panel. The APT will initially have material for some existing Level 3 standards, with moderated samples for the new Level 1 NCEA standard subjects being added as material becomes available. Material for the new Level 2 and Level 3 standards will be added over time, and all material for the old NCEA standards will be archived.

Material is currently available for:

- 91580: Investigate time series data
- 91582: Use statistical methods to make a formal inference

### **Workshops and Presentations**

The Best Practice Workshops offered by Assessment and Moderation continue to be viewed by the sector as significantly contributing to improved assessor practice:

*“I thought the workshop was very clear and helpful, there were a lot of varied examples of ākonga work discussed and opportunity for participants to discuss and ask questions.”*

We offer several options of online workshops and presentations for events to support assessors with the assessment of internally assessed standards. These can be subject-specific, or general assessment support, and tailored to the audience. Virtual presentation slots, online workshops or webinars can be requested to provide targeted support to local, regional or national audiences.

**To give feedback on this report click on [this link](#).**