



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TĀEA

Internal Assessment Resource Mathematics and Statistics Level 1

This resource supports assessment against:

Achievement Standard 91026 version 3

Apply numeric reasoning in solving problems

Resource title: Mike and Huia's Trip to England

4 credits

This resource:

- Clarifies the requirements of the standard
- Supports good assessment practice
- Should be subjected to the school's usual assessment quality assurance process
- Should be modified to make the context relevant to students in their school environment and ensure that submitted evidence is authentic

Date version published by Ministry of Education	February 2015 Version 3 To support internal assessment from 2015
Quality assurance status	These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91026-02-4514
Authenticity of evidence	Teachers must manage authenticity for any assessment from a public source, because students may have access to the assessment schedule or student exemplar material. Using this assessment resource without modification may mean that students' work is not authentic. The teacher may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform.

Internal Assessment Resource

Achievement Standard Mathematics and Statistics 91026: Apply numeric reasoning in solving problems

Resource reference: Mathematics and Statistics 1.1A v3

Resource title: Mike and Huia's Trip to England

Credits: 4

Teacher guidelines

The following guidelines are designed to ensure that teachers can carry out valid and consistent assessment using this internal assessment resource.

Teachers need to be very familiar with the outcome being assessed by Achievement Standard Mathematics and Statistics 91026. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing students against it.

Context/setting

This assessment activity requires students to perform operations with fractions, decimals, percentages, and rates.

The context for this assessment is a couple who are planning to go to England for a three-month trip, and who wish to find out how long it will take them to save sufficient money to cover the expenses for the trip.

Note: This activity could be adapted to other contexts that present similar opportunities to meet the standard, for example, visiting different destinations, different incomes, and so on.

Conditions

Students need to work independently to complete this activity. Confirm the time frame with your students.

Resource requirements

Students should have access to appropriate technology.

Additional Information

None.

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Achievement	Achievement with Merit	Achievement with Excellence
Apply numeric reasoning in solving problems.	Apply numeric reasoning, using relational thinking, in solving problems.	Apply numeric reasoning, using extended abstract thinking, in solving problems.

Student instructions

Introduction

Mike and Huia are planning to travel to England for a holiday. They plan to be in England for three months, and during that time take a three-week bus tour through France and Spain.

This activity requires you to calculate the amount of money Mike and Huia will need to save for their trip and how long it will take them to save it.

You will work independently to complete this activity.

Show your calculations. Use correct mathematical statements. Clearly communicate your strategy and method at each stage of the solution. You will be assessed on the quality of your discussion and reasoning, and how well you link this to the context.

Task

Use the following information to find out how much money Mike and Huia will need to save and how long it will take them to save it.

- Mike and Huia estimate that for each day they are in England, between them they will need on average NZ\$250 (to the nearest \$50) when they are not on the bus trip.
- Huia earns \$850 each week. Mike earns \$790 each week. Huia is able to save two fifths of her income and Mike 35% of his income to put towards the trip.
- The cost for the return air tickets is \$2500 each.
- The cost of travel insurance is \$385 plus GST (15%) for the two of them.
- The three-week bus trip costs 2000 Great Britain pounds per person.
- Great Britain pounds are used as currency in England.
- The Exchange rate is: 1 NZ Dollar = 0.5091 GB Pound (April 2012).

Assessment schedule: Mathematics and Statistics 91026 Mike and Huia's Trip to England

Teacher note: You will need to adapt this assessment schedule to include examples of the types of responses that can be expected.

Evidence/Judgements for Achievement	Evidence/Judgements for Achievement with Merit	Evidence/Judgements for Achievement with Excellence
<p>Applying numeric reasoning in solving problems will involve:</p> <ul style="list-style-type: none"> • selecting and using a range of methods in solving problems • demonstrating knowledge of number concepts and terms • communicating solutions which usually require only one or two steps. <p>At least three different numeric methods need to be selected and correctly used in solving problems.</p> <p>For example, the student:</p> <ul style="list-style-type: none"> • uses percentages to calculate Mike's weekly savings • uses fractions to calculate Huia's weekly savings • uses rates to find the cost of the bus trip in \$NZ. <p>The student has communicated what is being calculated at each step.</p>	<p>Applying numeric reasoning, using relational thinking, in solving problems will involve one or more of:</p> <ul style="list-style-type: none"> • selecting and carrying out a logical sequence of steps • connecting different concepts and representations • demonstrating understanding of concepts. <p>And also relating findings to the context, or communicating thinking using appropriate mathematical statements.</p> <p>The student links the different holiday costs to get a total cost for the holiday, linking the individual savings to get the total weekly savings and then uses these to determine how long it will take to save for the holiday.</p> <p>The student has clearly shown a logical sequence of steps and has communicated using appropriate mathematical statements.</p>	<p>Applying numeric reasoning, using extended abstract thinking, in solving problems will involve one or more of:</p> <ul style="list-style-type: none"> • devising a strategy to investigate or solve a problem • identifying relevant concepts in context • developing a chain of logical reasoning <p>And also using correct mathematical statements, or communicating mathematical insight.</p> <p>The student calculates the minimum amount of time (in whole numbers of weeks) required to save for the holiday, identifying and discussing how this is affected by aspects such as:</p> <ul style="list-style-type: none"> • rounding of costs provided • additional spending on the bus trip • variation in the exchange rate • the fairness of them contributing different amounts to the saving for the trip. <p>The student has clearly communicated their solution using correct mathematical statements.</p>

Final grades will be decided using professional judgement based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.