# Mathematics and Statistics Assessment Schedule: Assessment Activity 1.2c

##### Activity Title: The local community garden

##### Achievement Standard: 91945 Use mathematical methods to explore problems that relate to life in Aotearoa New Zealand or the Pacific

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| Achievement | Achievement with Merit | Achievement with Excellence |
| Achievement Criteria |
| At the Achieved level, the student is able to use mathematical methods to explore problems that relate to life in Aotearoa New Zealand or the Pacific | At the Merit level, the student is able to use mathematical methods to explore problems that relate to life in Aotearoa New Zealand or the Pacific by applying relational thinking | At the Excellence level, the student is able to use mathematical methods to explore problems that relate to life in Aotearoa New Zealand or the Pacific by applying extended abstract thinking |
| Teacher Judgement |
| At the Achieved level, the student is able to:* use mathematical methods with at least four processes that are appropriate to the problems that relate to life in Aotearoa New Zealand and the Pacific — these processes will come from at least two of Number, Algebra, Measurement, and Space
* show appropriate working or expressions/formulas/ graphs in the majority of responses
* communicate numerically correct solutions with correct corresponding units
* identify what their working represents in relation to the problem.
 | At the Merit level, the student is able to:* apply mathematical methods with at least four processes, that are appropriate to the problems that relate to life in Aotearoa New Zealand and the Pacific, making logical connections between processes in exploring or solving problems
* use appropriate models such as graphs, expressions, and formulae within their working
* communicate accurate mathematical statements in the majority of their working that:
* follow mathematical conventions
* contain correct solutions with appropriately rounded values and correct corresponding units
* are linked to the context of the problem.
 | At the Excellence level, the student is able to:* extend mathematical methods with at least four processes, that are appropriate to the problems that relate to life in Aotearoa New Zealand and the Pacific, making logical connections between processes to explore or solve a problem, and consider one or more of the following:
* underlying assumptions made throughout an exploration/investigation
* mathematical explanation of limitations of models or solutions
* mathematical generalisations or predictions, including recommendations or best models where appropriate.
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Overall level of achievement will be based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.

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| For example (description of possible student evidence for this activity) |
| Achievement | Achievement with Merit | Achievement with Excellence |
| At the Achieved level, the student has:* correctly applied four different, appropriate processes towards solving the problems that relate to life in Aotearoa New Zealand and the Pacific. *For example*:
* *volumes of composite shapes including prisms to determine the volume of garden mix*
* *trigonometric ratios in right-angled triangles for mitred corners*
* *inverse percentage change*
* *parabolic graphs.*
* shown working or expressions/formulas
* given numerically correct solutions with correct corresponding units in their solutions
* used headings and annotations to identify and explain what they have worked out.
 | At the Merit level, the student has:* correctly applied four different, appropriate processes towards solving the problems that relate to life in Aotearoa New Zealand and the Pacific, and demonstrated at least two logical connections in exploring or solving problems*. For example:*
* *finding the number of bags of garden mix required*
* *used trigonometric ratios to find the lengths associated with the inside of the shape with mitred corners and used these measurements to find a volume (for a shape other than a rectangular box)*
* *linked a table, equation, and graph for the common model in finding the maximum area.*
* clearly communicated what was calculated at each step
* mostly followed correct mathematical conventions in the working
* rounded the answers sensibly within the context of the problems. *For example, the student has:*
* *considered the practical nature of the resources required as part of rounding*
* *made sense of purchasing decisions/suggestions.*
 | At the Excellence level, the student has:* followed a logical, well-explained process to cover most parts of the problems that relate to life in Aotearoa New Zealand and the Pacific
* explored one or more assumption, limitation, generalisation or prediction. *For example, one of:*
* *discussed the limitations of the materials available and items unaccounted for (including fixings), showing appropriate calculations*
* *explored other methods to construct shapes for the garden, and made recommendations and generalisations about maximum area (both mathematical and practical)*
* *researched other common garden materials and made suggestions based on calculations for replacing the macrocarpa sleepers with more cost-effective materials.*
* clearly communicated what was calculated at each step
* followed correct mathematical conventions in their working
* rounded the answers sensibly within the context of the problems. *For example:*
* *considered the practical nature of the resources required as part of rounding*
* *made sense of purchasing decisions/suggestions.*
* given numerically correct solutions with correct corresponding units in their solutions.
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Overall level of achievement will be based on a holistic examination of the evidence provided against the criteria in the Achievement Standard.