



# Essential Mathematics 2025 v1.2

## IA1: Sample assessment instrument

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

|                       |             |
|-----------------------|-------------|
| <b>Student name</b>   | sample only |
| <b>Student number</b> | sample only |
| <b>Teacher</b>        | sample only |
| <b>Issued</b>         | sample only |
| <b>Due date</b>       | sample only |

## Marking summary

| Criterion |
|-----------|
|-----------|

|               |
|---------------|
| Overall grade |
|---------------|

# Conditions

|                           |  |
|---------------------------|--|
| <b>Technique</b>          | Problem-solving and modelling task   |
| <b>Unit</b>               | Unit 3: Measurement, scales and chance   |
| <b>Topic/s</b>            | Unit 3 — Fundamental topic: Calculations<br>Unit 3 — Topic 1: Measurement<br>Unit 3 — Topic 2: Scales, plans and models  |
| <b>Duration</b>           | Students will use 8 hours of class time and their own time out of class to develop their response.   |
| <b>Mode / length</b>      | Written: up to 8 A4 pages, up to 1000 words.   |
| <b>Individual / group</b> | This is an individual task.  |
| <b>Other</b>              | Appendixes can include raw data, repeated calculations, evidence of authentication and student notes (appendixes are not marked).<br>Use of technology is required and must go beyond simple computation or word processing. |
| <b>Resources</b>          | Your teacher will provide you with a unique set of data.   |

## Context

Whether we live in a city, in a small town, on a farm, or in a remote community, water availability affects us all. With uncertain rainfall during periods of drought, many householders try to minimise water wastage and supplement their council's water supply with rainwater. The Queensland Government encourages this through its *Using water wisely* campaign, which shows how to save water and gives advice on using rainwater tanks.

Tanks are available in shapes and sizes to fit even the smallest spaces. It is becoming more common to have a rainwater tank in the backyard of a suburban house, but, as space is often limited, certain restrictions must be placed on the tank size and design.

## Task

You are to develop a report recommending a suitable rainwater tank for Alyssa and Preston to install at their home, to supplement their family's water needs. Their single-storey home has gutters 2.4 m above the ground.

Your teacher will give you information about the couple and the 'Careful water use' table, which shows how much water certain activities use.

Your response will be in the form of a report. It should outline options and considerations for the couple's goals, so they can decide on an appropriate rainwater tank.

To complete this task, you must:

- consider the stimulus information
- use your knowledge of the subject matter in Unit 3 — Topics 1 and 2 to investigate the problem
- ensure you cover both simple and complex subject matter
- ensure your response demonstrates characteristics in the instrument-specific standards
- develop a unique response in a coherent and concise written format that is appropriate to the genre
- show all calculations to support your response
- use a spreadsheet to demonstrate relevant calculations.

# Stimulus

Current information about Alyssa and Preston

- Location of home:
- Number of children:
- Flow-off rate (from roof):

## Careful water use

| Use      | Amount per person per month (litres)          |
|----------|---|
| Kitchen  | 450   |
| Bathroom | 2500  |
| Laundry  | 200   |
| Outdoors | A garden hose uses about 700 litres per hour. |

**Source:** Queensland Government. n.d. *Using water wisely*.  
[www.qld.gov.au/environment/water/use](http://www.qld.gov.au/environment/water/use)

## Checkpoints

- Week 2: Teacher sights evidence of student progress in class and records progress
- Week 3: Students email a draft for feedback.
- Week 4: Teacher interviews each student to ensure authorship and provides individual feedback to student based on submitted draft
- Week 5: Student submits their final response

## Authentication strategies

- You will be provided class time for task completion.
- Your teacher will observe you completing work in class.
- Your teacher will collect copies of your response and monitor at key junctures.
- Your teacher will collect and annotate a draft.
- You must acknowledge all sources.
- You must submit a declaration of authenticity.

### Instrument-specific standards (IA1): Problem-solving and modelling task

| Formulate   | Solve  | Evaluate  | Communicate  | Grade |
|---|--|---|--|-------|
| <b>The student response has the following characteristics:</b>  |  |   |  |       |
| <ul style="list-style-type: none"> <li>justified statements of important assumptions</li> <li>justified statements of important observations</li> <li>justified mathematical translation of important simple and important complex aspects of the task</li> </ul> | <ul style="list-style-type: none"> <li>accurate use of simple and complex mathematical knowledge for important aspects of the task</li> <li>efficient use of technology</li> <li>a complete solution</li> </ul>    | <ul style="list-style-type: none"> <li>verified results</li> <li>justified statements about the reasonableness of the solution by considering the assumptions</li> <li>justified statements about the reasonableness of the solution by considering the observations</li> <li>justified statements of relevant strengths of the solution</li> <li>justified statements of relevant limitations of the solution</li> </ul> | <ul style="list-style-type: none"> <li>correct use of appropriate mathematical language</li> <li>logical organisation of the response, which can be read independently of the task sheet</li> <li>justification of decisions using mathematical reasoning</li> </ul> | A     |
| <ul style="list-style-type: none"> <li>statements of important assumptions</li> <li>statements of important observations</li> <li>mathematical translation of important simple and important complex aspects of the task</li> </ul>                               | <ul style="list-style-type: none"> <li>use of simple and complex mathematical knowledge for an important aspect of the task</li> <li>use of technology</li> <li>substantial progress towards a solution</li> </ul> | <ul style="list-style-type: none"> <li>a verified result</li> <li>statements about the reasonableness of the solution by considering the assumptions</li> <li>statements about the reasonableness of the solution by considering the observations</li> <li>statements of relevant strengths of the solution</li> <li>statements of relevant limitations of the solution</li> </ul>  | <ul style="list-style-type: none"> <li>use of appropriate mathematical language</li> <li>logical organisation of the response</li> <li>statements of relevant decisions</li> </ul>   | B     |
| <ul style="list-style-type: none"> <li>statement of a relevant assumption</li> <li>statement of a relevant observation</li> <li>mathematical translation of a simple or complex aspect of the task</li> </ul>   | <ul style="list-style-type: none"> <li>use of simple mathematical knowledge relevant to the task</li> <li>simplistic use of technology</li> <li>progress towards a solution</li> </ul>                             | <ul style="list-style-type: none"> <li>progress towards a verified result</li> <li>statement about the reasonableness of the solution by considering an assumption or observation</li> <li>statement of a relevant strength or relevant limitation of the solution</li> </ul>   | <ul style="list-style-type: none"> <li>use of some appropriate mathematical language</li> <li>adequate organisation of the response</li> <li>statement of a relevant decision</li> </ul>   | C     |
| <ul style="list-style-type: none"> <li>statement of an assumption or observation</li> <li>mathematical translation of an aspect of the task.</li> </ul>   | <ul style="list-style-type: none"> <li>simplistic use of mathematical knowledge</li> <li>inappropriate use of technology.</li> </ul>   | <ul style="list-style-type: none"> <li>statement about the reasonableness of a result or the solution</li> <li>statement of a strength or limitation.</li> </ul>  | <ul style="list-style-type: none"> <li>use of everyday language</li> <li>basic organisation of the response.</li> </ul>  | D     |
| The student response does not match any of the descriptors above.   | The student response does not match any of the descriptors above.  | The student response does not match any of the descriptors above.   | The student response does not match any of the descriptors above.  | E     |

 © State of Queensland (QCAA) 2025

**Licence:** <https://creativecommons.org/licenses/by/4.0> | **Copyright notice:** [www.qcaa.qld.edu.au/copyright](http://www.qcaa.qld.edu.au/copyright) — lists the full terms and conditions, which specify certain exceptions to the licence. |

**Attribution:** '© State of Queensland (QCAA) 2025' — please include the link to our copyright notice.