

The following examples of student work illustrate achievement at the mathematics standards for years 3, 4, and 5.

Multiple Measures

The task used in this illustration relates to achievement objectives for Number and for Geometry and Measurement from the mathematics and statistics learning area in *The New Zealand Curriculum*.

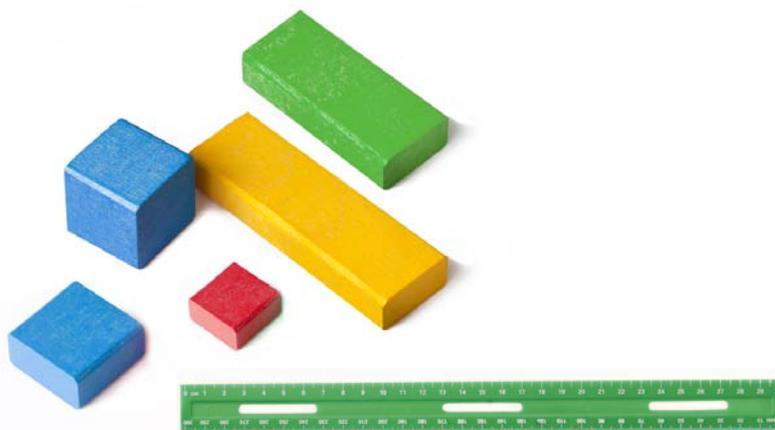
Multiple Measures

Give the students five oblong-shaped blocks of varying sizes (including a cube). They will need a standard 30 centimetre ruler with 1 centimetre markings. Ask them to carry out the following tasks:

1. Measure the length, width, and height of your blocks.
2. Choose one of your blocks and imagine that four of them are stacked on top of each other. How high would they be?

For year 4 and above:

3. Design a net for one of your blocks (so that if you cut out and fold up the net, it makes the block). On your net, label the lengths of the sides.



Some features of students' work used to make judgments in relation to the mathematics standards are described below.

Multiple Measures

New Zealand Curriculum: Level 2

In solving problems and modelling situations, students will:

Number and Algebra

- use simple additive strategies with whole numbers ... (number strategies)

Geometry and Measurement

- ... use appropriate units and devices to measure length ...
- partition and/or combine like measures and communicate them, using numbers and units (measurement)

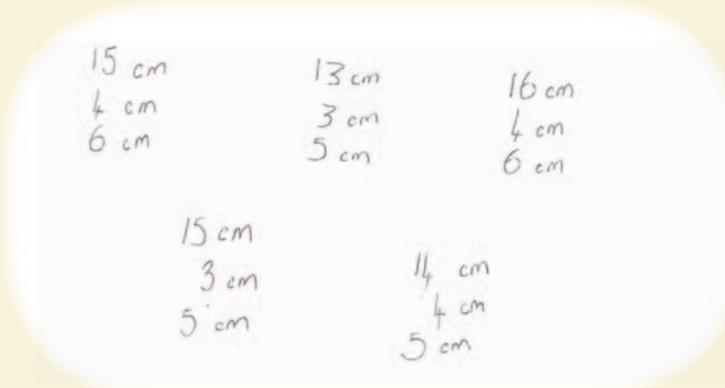
Mathematics Standard: After three years at school

Number and Algebra

- apply basic addition facts and knowledge of place value ... to:
 - combine or partition whole numbers

Geometry and Measurement

- measure the lengths ... of objects ..., using linear whole-number scales and applying basic addition facts to standard units



The teacher noted that Kelly correctly lined up one end of each block with zero on the ruler.



$$5 + 5 + 5 + 5 = 20 \text{ cm}$$

Kelly used basic addition facts and doubling to work out the height of four identical blocks.

I know it is $5 + 5 + 5 + 5$.
 $5 + 5 = 10$, and $10 + 10 = 20$, so the stack is 20 centimetres high.

Discussion

This task provides some of the evidence needed to show that Kelly is achieving at early curriculum level 2 and the year 3 standard in Number and Measurement. She has demonstrated that she can measure the dimensions of an object and add up standard units (centimetres). She also used basic addition facts to calculate the height of four blocks, which suggests she is at the Early Additive stage of the Number Framework.

Multiple Measures

New Zealand Curriculum: Level 2

In solving problems and modelling situations, students will:

Number and Algebra

- use simple additive strategies with whole numbers ... (number strategies)

Geometry and Measurement

- ... use appropriate units and devices to measure length ...
- partition and/or combine like measures and communicate them, using numbers and units (measurement)
- identify and describe the plane shapes found in objects (shape)

Mathematics Standard: By the end of year 4

Number and Algebra

- apply basic addition ... facts, simple multiplication facts, and knowledge of place value ... to:
 - combine or partition whole numbers

Geometry and Measurement

- measure the lengths ... of objects ..., reading scales to the nearest whole number and applying addition and ... simple multiplication to standard units
- create nets for cubes



The teacher noted that Andrew measured his 5 blocks correctly, lining up one end of each block with zero on the ruler and appropriately rounding up or down to the nearest centimetre.

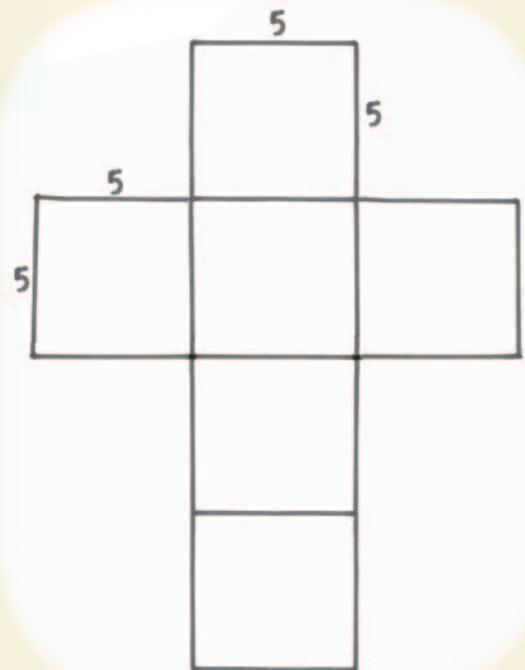
13 cm long
5 cm high
3 cm wide

Andrew used his basic facts knowledge to work out the height of a stack of four identical blocks.

$$4 \times 5 = 20 \text{ cm high}$$

That's easy, it's 4×5 because there are 4 blocks and each one is 5 centimetres high. So it's 20 centimetres.

One of Andrew's blocks was a cube with sides of 5 centimetres. He made a net for this block.



Discussion

This task provides some of the evidence needed to show that Andrew is achieving at curriculum level 2 and the year 4 standard in Number, Geometry, and Measurement. He has demonstrated that he can accurately measure an object to the nearest centimetre and is able to create a net for a cube. His appropriate use of simple multiplication facts suggests that he is achieving at the Early Additive stage of the Number Framework.

Multiple Measures

New Zealand Curriculum: Level 3

In solving problems and modelling situations, students will:

Geometry and Measurement

- use linear scales and whole numbers of metric units for length ... (measurement)
- represent objects with drawings and models (shape)

Mathematics Standard: By the end of year 5

Geometry and Measurement

- measure ... the attributes of objects, choosing appropriate standard units and working with them to the nearest tenth
- create nets for rectangular prisms

The teacher noted that Ana measured her 5 blocks to the nearest millimetre and expressed the measurements in centimetres.

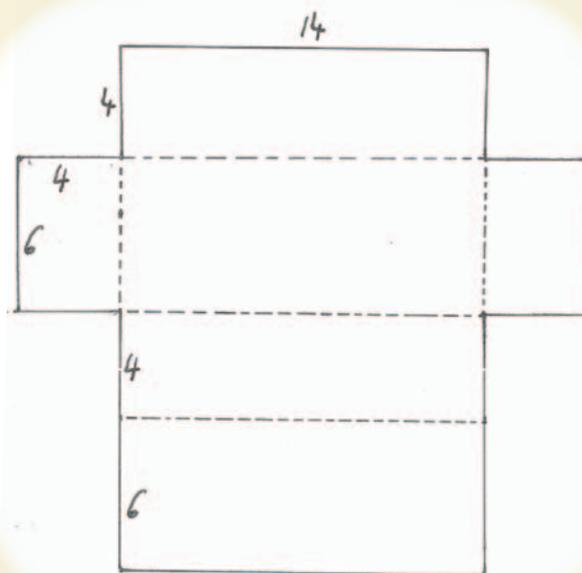
13.4 cm long
3.2 cm wide
5.7 cm high

14.0 cm
4.0 cm
6.0 cm

15.0 cm
3.3 cm
5.2 cm



Ana decided to make a net for the 14 x 4 x 6 block.



Discussion

This task provides some of the evidence needed to show that Ana is achieving at early curriculum level 3 and the year 5 standard in Geometry and Measurement. She has demonstrated that she can measure an object to the nearest tenth, using an appropriate unit. She was also able to create a net for a rectangular prism.