Process ideas

- In the Numeracy assessment you will need to be able to solve mathematical problems in a range of meaningful situations using three process ideas.

You will need to:

1 **Formulate** approaches to solving problems. This means working out how to solve a problem.
2 **Use** mathematics and statistics in a range of situations.
3 **Explain** whether answers and statements are reasonable.

1 Formulate approaches to solving problems

- These questions will require you to work out **how** to solve the problem.
- Usually there are several steps needed to find the answer.

Example:
Amanda's letterbox is 900 m from her house. It takes her 12 minutes to walk to it.
Explain how you could calculate her speed in km/hour.
You could do this in two ways:

i Show the calculation with speech bubbles:

Convert metres to kilometres by dividing by 1000.

Convert minutes to hours by dividing by 60.

$$\text{Speed} = \frac{900}{1000} \text{ km in } \frac{12}{60} \text{ hours}$$
$$= 0.9 \text{ km in } 0.2 \text{ hours}$$
$$= 4.5 \text{ km in } 1 \text{ hour}$$
$$\text{Speed} = 4.5 \text{ km/hour}$$

Multiply both figures by 5 to convert 0.2 hours to 1 hour.

ii Explain each stage of the calculation in sentences:
1 kilometre = 1000 m so divide 900 m by 1000 to convert it to kilometres: 0.9 km
1 hour = 60 minutes so divide 12 minutes by 60 to convert it to hours: 0.2 hours
To convert 0.9 km in 0.2 hours to distance walked in 1 hour, multiply both values by 5.
Her speed was 4.5 km/hour.

Answer the following questions.

1   Josephine went shopping for four house plants. Single plants cost $12.95.
    However, the shop has two deals:
        Deal 1: Two plants for $22.50.
        Deal 2: 20% off if you buy three plants or more.
    Which is the best deal for four plants?

_____

_____

2 Miru visited a cave where a stalactite is growing at an average rate of 0.02 mm per month.
She calculated that, to the nearest year, it would take 4167 years for it grow a metre. Explain how she could have reached this conclusion.

_____

_____

_____

3 Sarah celebrated Matariki by baking some cookies.
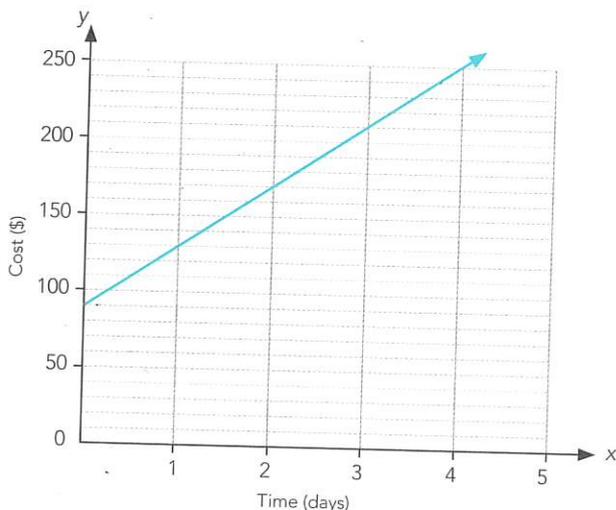These quantities of ingredients will make 30 cookies:

- 225 g butter
- 225 g caster sugar
- 1 egg
- 450 g flour
- 1 tsp baking powder
- 2 tsp vanilla essence

How much butter will she need to make 72 cookies? _____ g

4 It takes a cruise ship four and a half days to cover the 2160 km from Auckland to Fiji. Explain how you could calculate the cruise ship's average speed in kilometres per hour.

_____

_____

_____

5 The graph shows the cost of hiring a small digger for up to five days.

Complete the following statement:

The cost of hiring the digger is $_____

plus $_____ for each day.