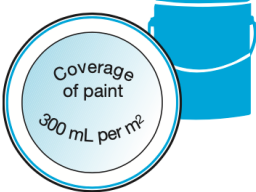WALT calculate rates per single unit when many units are given
Success Criteria I know
- First I need to calculate the value for one unit
- I also need to read the problem properly.

1 A goat eats 110 kg of grass in 50 days. Calculate the rate at which the goat is eating per day.

2 The steel tracks on a railway line weigh 43 kg/m. Calculate the weight of 5 m of railway track.

3 When helping her mother wash the dishes, Kelly can dry 30 plates in 2 minutes. How many dishes can she dry per minute?

4 An automatic letter-sorter at NZ Post can sort 3000 letters in 8 minutes. Express this as a rate per minute.

5 The Far North District Council charge rates of $1.62 per kilolitre for supplying treated water. There is also a standard "line" fee of $50 every 6 months for a metered connection.

a Calculate the charge for a property that uses 78.39 kL in a 6-month period.

b A property is charged $256.45 for water use in a 6-month period. How much water was supplied, to the nearest 0.1 kilolitres?

6 An athlete runs at a steady speed, covering a distance of 270 m in 45 seconds. Calculate the rate at which they are running in m/s.

7 Junior has a job packing bags at his local supermarket. He is paid at the rate of $7.50 per hour.

a How much would Junior be paid for 8 hours work?

b If Junior was paid $45, how long did he work for?

8 Geraldine and Whetu are both employed on their local race-track at the weekend. Geraldine earns $90 for 6 hours work, and Whetu is paid $110 for 7 hours work. Which one is paid at the higher rate, and what is this rate?

9 Over a 15-minute period Hemi counts a total of 120 cars passing his house. Express this figure as:
a a rate per minute
b a rate per hour.

10 The premium for house insurance can either be paid as an annual sum of $859.72 or in six 2-monthly payments of $149.38.
a Express each choice of payment as a rate per month.
b Which way of paying the premium is cheaper?

11 A customer pays $142.09 for 1737 units of electricity. Calculate the rate per unit, to the nearest cent.

12 The instructions on the cover of a tin of fence paint say:

Coverage of paint
300 mL per m²

a How much paint is needed for 4 m² of fence?
b What area of fence would a 10-litre bucket of paint cover?

13 A car-owner is charged $133 by a garage for $3\frac{1}{2}$ hours labour. Calculate the rate that the garage charges per hour for labour.

14 Which is better value for money:
• a 600-mL bottle of dishwashing detergent for $1.29, or
• a 2-litre bottle for $4.15?

15 The instructions for sowing lawn seed state: "Apply seed at a rate of 40 g/m²." Lawn seed is sold in 1-kg packets. How many packets would be needed for a rectangular lawn measuring 6 m by 10 m?

16 Water flows from a tap into a bath at a rate of 800 mL per second. How long will it take to fill a bath with 250 litres of water?

17 The instructions for worming a cat are:

For every kg of body-weight give 15 cc of worming paste

How much worming paste is needed for a cat that weighs 2.5 kg?

18 A caterpillar eats a cabbage leaf at a rate of 2 mm² per second. What area of leaf will the caterpillar eat in 3 minutes?

19 It takes Gary 1 hour to dig a hole that is 2 m wide, 2 m long and 2 m deep. How much longer would it take him to enlarge the hole so that it is 3 m wide, 3 m long and 3 m deep? Assume Gary digs at the same rate throughout.

20 Helga, an exchange student staying in New Zealand, makes a phone-call home to Denmark. The total cost for 8 minutes 30 seconds is $16.07. Calculate the rate per minute charged for the call.

21 Foodcity supermarket, open seven days a week, sells 1420 litres of ice-cream per week.
  a What are their average sales of ice-cream in litres/day?
  b How much ice-cream could they expect to sell over a four-day period?
  c The supermarket orders 2500 litres. Explain whether this will be enough to last 10 days.

22 Jim has a job mowing lawns. He can mow a lawn which is rectangular in shape, measuring 18 m by 25 m, in 20 minutes. Calculate the rate at which Jim can mow a lawn in m²/h.

23 The exchange rate for the Euro is 0.4756. This means NZ$1 buys 0.4756 Euros, or €0.4756.
  a How many Euros does NZ$150 buy?
  b How many NZ dollars will 160 Euros buy?

Check your answers

1	2.2 kg per day	**10 a**	$71.64, $74.69	**18**	360 mm²
2	215 kg	**b**	One annual sum	**19**	2 hours $22\frac{1}{2}$ minutes
3	15	**11**	8 cents per unit	**20**	$1.89
4	375 letters per minute	**12 a**	1200 mL **b** 33.3 m²	**21 a**	203 litres per day
5 a	$176.99 **b** 127.4 kL	**13**	$38 per hour	**b**	811 litres
6	6 m/s	**14**	2-litre bottle for $4.15	**c**	Yes – in 10 days they would sell 2030 litres, which is less than the 2500 litres ordered.
7 a	$60 **b** 6 hours	**15**	3 packets (have to round up from 2.4)		
8	Whetu, $15.71 an hour	**16**	5 minutes 13 seconds	**22**	1350 m²/h
9 a	8 cars per minute	**17**	37.5 cc	**23 a**	€71.34 **b** $336.42
b	480 cars per hour				