

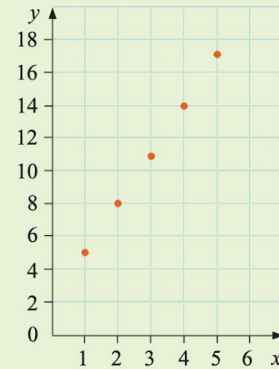
**Walt** understand the relationship between the number of matchsticks and the pattern number

**Success criteria:** I know-how to develop a pattern.

### ● EXAMPLE 3

The graph shows the relationship between the number of shapes ( $x$ ) in the matchstick pattern, and the number of matches for a particular matchstick pattern ( $y$ ).

- a** Construct a table of data for this information.
- b** Write a rule linking  $x$  and  $y$ .

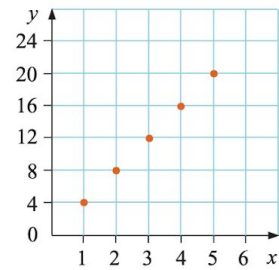


<b>a</b>	<b>x-value</b>	1	2	3	4	5
	<b>y-value</b>	5	8	11	14	17

- b** The  $x$ -values go up by 1 and the  $y$ -values go up by 3. So  $y = 3x$  must be part of the equation. The  $y$ -values for  $y = 3x$  would give 3, 6, 9, 12 and 15, but the table values are 2 more, so the equation must be  $y = 3x + 2$ .

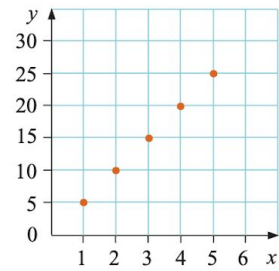
- 9** The graph shows the relationship between  $x$ , the number of shapes in the matchstick pattern, and  $y$ , the number of matches for a particular matchstick pattern.

- a** Construct a table of data for this information.  
**b** Write a rule linking  $x$  and  $y$ .



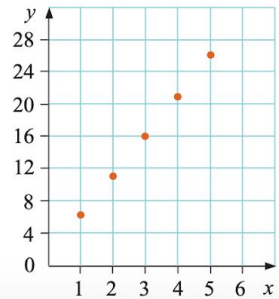
- 10** The graph shows the relationship between  $x$ , the number of shapes in the matchstick pattern, and  $y$ , the number of matches for a particular matchstick pattern.

- a** Construct a table of data for this information.  
**b** Write a rule linking  $x$  and  $y$ .



- 11** The graph shows the relationship between  $x$ , the number of shapes in the matchstick pattern, and  $y$ , the number of matches for a particular matchstick pattern.

- a** Construct a table of data for this information.  
**b** Write a rule linking  $x$  and  $y$ .



Now its time to take the challenge

## EXAMPLE 1

Bulk washing powder is sold for \$2.00 per kilogram. The following table shows weight versus cost for various quantities of washing powder.

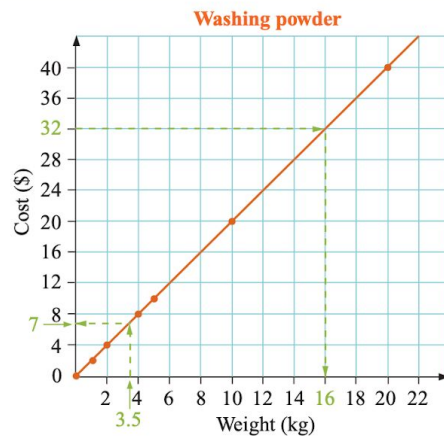
Weight (kg)	0	1	2	4	5	10	20
Cost (\$)	0	2	4	8	10	20	40

The number of kilograms is not going up in ones!

- Using  $x$  to represent the number of kilograms and  $y$  to represent the cost in dollars, write a set of points describing this information.
- Graph these points on the number plane. Draw a straight line through them.
- Use the graph to find how much 3.5 kg of washing powder would cost.
- Use the graph to find how much washing powder could be purchased for \$32.

Label the axis using equal divisions.

- $(0, 0), (1, 2), (2, 4), (4, 8), (5, 10), (10, 20), (20, 40)$
- Note:* The line may be extended past the final point.
- Draw a line up from 3.5 on the  $x$ -axis to the graph. Draw a line across to the  $y$ -axis. From the graph, the cost is \$7.00.
- Draw a line across at 32 on the  $y$ -axis to the graph. Draw a line down from the graph to the  $x$ -axis. From the graph, 16 kg can be purchased for \$32.

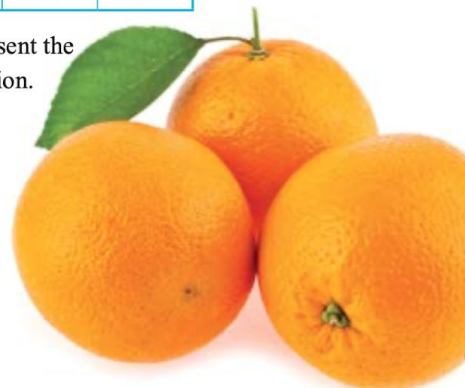


- Oranges are sold for \$3.00 per kilogram. The following table shows weight versus cost for various quantities of oranges.

Weight (kg)	0	1	2	4	5	10	20
Cost (\$)	0	3	6	12	15	30	60

Give the graph a heading.

- Using  $x$  to represent the number of kilograms and  $y$  to represent the cost in dollars, write a set of points describing this information.
- Graph these points on the number plane and draw a straight line through them.
- Use the graph to find the cost of 15 kg of oranges.
- Use the graph to find how many kilogram of oranges could be purchased for \$24.



- 2** Watermelon is sold for \$2.50 per kilogram. The following table shows weight versus cost for various quantities of watermelon.

<b>Weight (kg)</b>	0	1	2	4	5	10	20
<b>Cost (\$)</b>	0	2.5	5	10	12.5	25	50

- a** Using  $x$  to represent the number of kilograms and  $y$  to represent the cost in dollars, write a set of points describing this information.
- b** Graph these points on the number plane and draw a straight line through them.
- c** Use the graph to find the cost of 8.5 kg of watermelon.
- d** Use the graph to find how much watermelon could be purchased for \$37.50.



- 3** Cashew nuts are sold for \$24.00 per kilogram. The following table shows weight versus cost for various quantities of cashew nuts.

<b>Weight (kg)</b>	0	1	2	5
<b>Cost (\$)</b>	0	24	48	120

- a** Using  $x$  to represent the number of kilograms and  $y$  to represent the cost in dollars, write a set of points describing this information.
- b** Graph these points on the number plane and draw a straight line through them.
- c** Use the graph to find the cost of 4.5 kg of cashews.
- d** Use the graph to find how many kilograms of cashews could be purchased for \$84.
- 4** Chocolate freckles are sold for \$11.00 per kilogram. The following table shows weight versus cost for various quantities of chocolate freckles.

<b>Weight (kg)</b>	0	1	2	5
<b>Cost (\$)</b>	0	11	22	55

- a** Using  $x$  to represent the number of kilograms and  $y$  to represent the cost in dollars, write a set of points describing this information.
- b** Graph these points on the number plane and draw a straight line through them.
- c** Use the graph to find the cost of 3.5 kg of chocolate freckles.
- d** Use the graph to find how many kilograms of chocolate freckles could be purchased for \$30.



**5** Mobile telephone calls cost \$1.00 per minute.

**a** Complete this table of values for the cost of mobile calls.

<b>Time (min)</b>	0	1	2	3	4	5	10
<b>Cost (\$)</b>	0						

**b** Write a set of points describing this information.

**c** Graph these points on the number plane and draw a straight line through them.

**d** Use the graph to find the cost of 7.5 minutes of calls.

**e** Use the graph to find how long someone could talk for \$6.50.

**6** Mobile telephone calls on another plan cost \$1.20 per minute.

**a** Complete this table of values for the cost of mobile calls on this plan.

<b>Time (min)</b>	0	1	2	3	4	5	10
<b>Cost (\$)</b>	0						

**b** Graph these points on the number plane and draw a straight line through them.

**c** Use the graph to find the cost of 6.5 minutes of calls.

**d** Use the graph to find how long someone could talk for \$10.