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

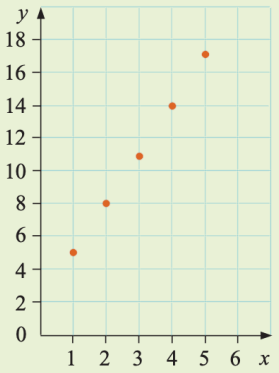
Success criteria: I know-how to develop a pattern. Write coordinates in the order of (x,y) pairs

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.



a

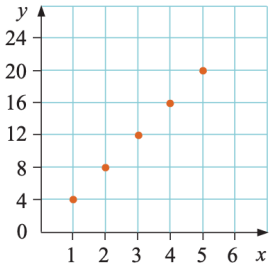
x-value	1	2	3	4	5
y-value	5	8	11	14	17

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.

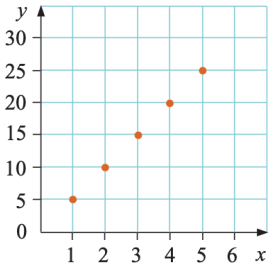
b Write a rule linking x and y.



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.

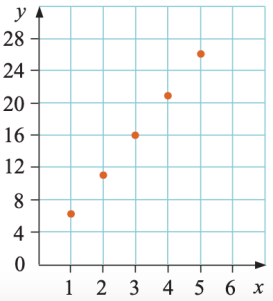
b Write a rule linking x and y.



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!

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. Draw a straight line through them.

Label the axis using equal divisions.

c Use the graph to find how much 3.5 kg of washing powder would cost.

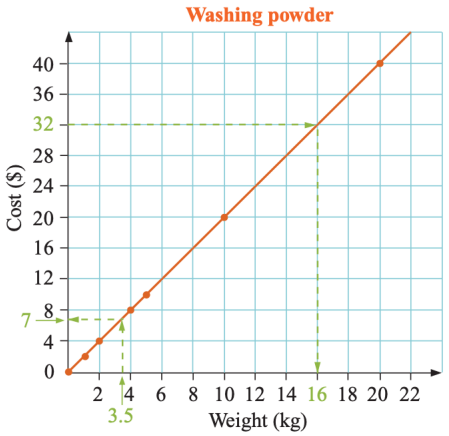
d Use the graph to find how much washing powder could be purchased for $32.

a (0, 0), (1, 2), (2, 4), (4, 8), (5, 10), (10, 20), (20, 40)

b *Note:* The line may be extended past the final point.

c 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.

d 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.



1 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

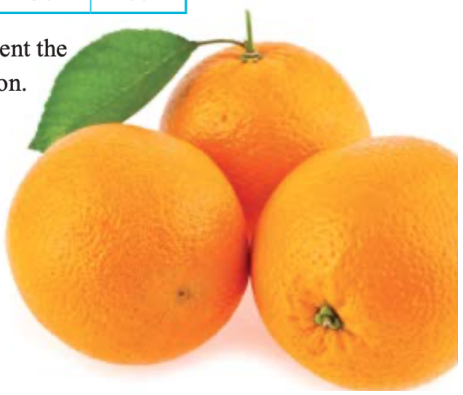
Give the graph a heading.

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 15 kg of oranges.

d 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.

Weight (kg)	0	1	2	4	5	10	20
Cost ($)	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.

Weight (kg)	0	1	2	5
Cost ($)	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.

Weight (kg)	0	1	2	5
Cost ($)	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.

Time (min)	0	1	2	3	4	5	10
Cost ($)	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.

Time (min)	0	1	2	3	4	5	10
Cost ($)	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.