In this activity you will use line graphs to convert money from one currency to another.

You will also use a graph to convert distances from one unit to another.

After this activity, you should be able to use a conversion graph to:

- display a relationship that you already know between two sets of figures
- find out what the relationship is between two sets of figures.

Information sheet: Conversion graphs

Suppose the exchange rate between pounds and US dollars is £1 = $1.50
Check the values in the table below:

Pounds (£)	1	2	3	4	5	6	7	8	9	10
Dollars ($)	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00

Note that if you double the pounds, you double the dollars:

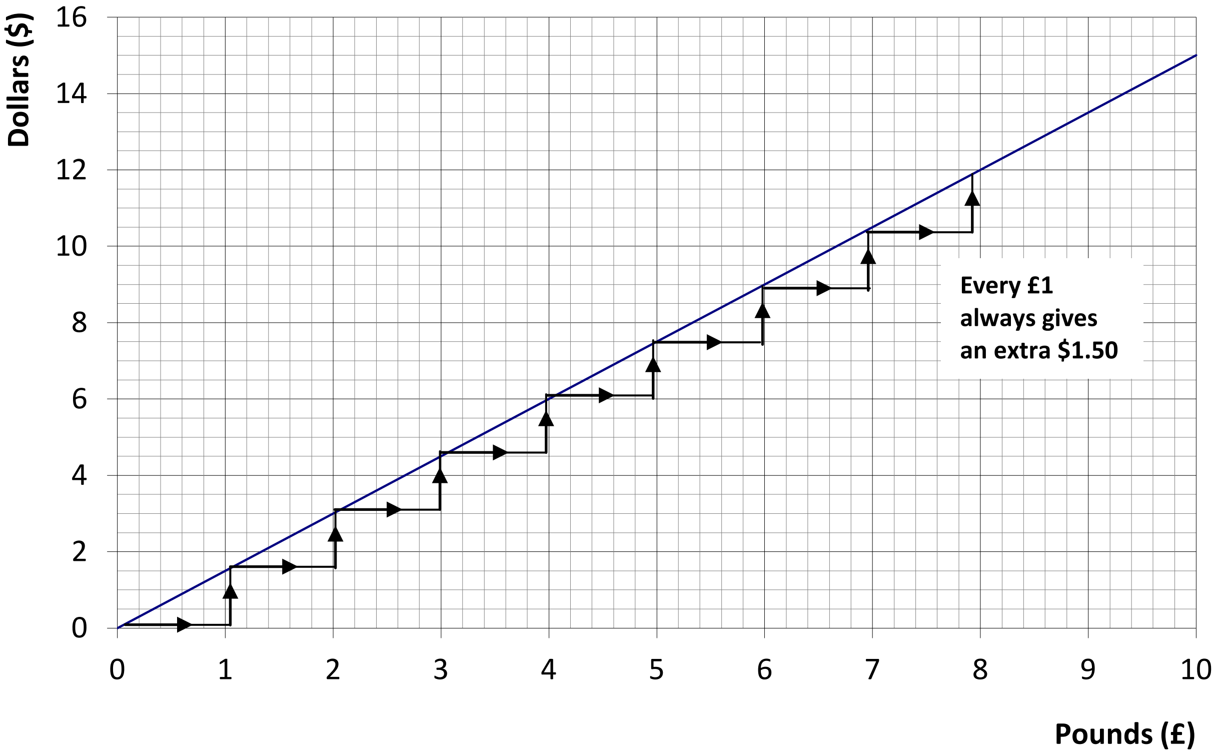
£2 gives you $3 and £4 gives you $6.

£5 gives you $7.50 and £10 gives you $15.

Think about…

Does the same thing happen if you multiply by 3 or 4?

Conversion graph for pounds (£) and US dollars ($)

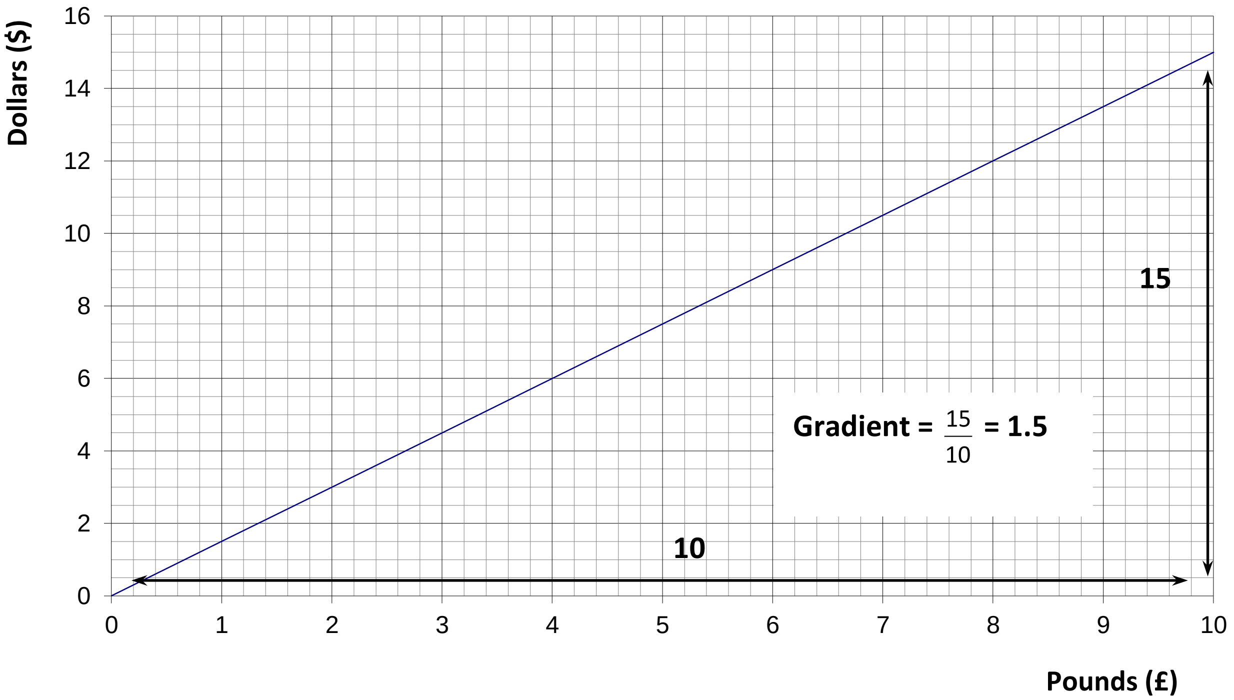


Think about…

What is the scale on each axis? Why must the graph go through (0, 0)?

How can you use the graph to find out what \$8 is in £s?

Conversion graph for pounds (£) and US dollars (\$)



Gradient = $\dfrac{\text{up}}{\text{across}} = \dfrac{15}{10} = 1.5$

The graph of these values is a straight line. It goes through (0, 0).

Because the graph has **both** of these things, you can say:

- As the pounds go up in equal steps, so do the dollars.
- The number of dollars is **directly proportional** to the number of pounds.
- From the gradient: the number of dollars = 1.5 $\times$ the number of £s.
- 1.5 is the **conversion factor** for this graph.

Think about…

Do you prefer to use a graph or a conversion factor to change between dollars and pounds?

How do you decide on the scale for the axes when you have to draw a graph yourself?

Try these

1a Use the conversion graph on the information sheet to convert roughly:

i £ 3.40 to dollars **ii** $10 to £s

b Use a calculator to check your answers.

2 This table gives approximate conversions between miles and km

miles	10	20	30	40	50	60	70	80	90	100
km	16	32	48	64	80	96	112	128	144	160

a Draw a line graph to show this data.

b Use your graph to find out what 63 miles is in km.

c Use your graph to change 70 km to miles.

d Work out the gradient and use it to complete this statement: 1 mile = … km.

3 This table gives the exchange rates for £1 in various currencies:

Australia	$1.4 (dollars)	New Zealand	$2.0 (dollars)
Canada	$1.48 (dollars)	Saudi Arabia	5.8 riyal
India	63 rupees	South Africa	10.2 rand
Japan	128 yen	Eurozone	1.08 euros

a Choose a currency and draw a conversion graph for £0 – £500.

b Use your graph to find out what you would get if you changed £220.

c Work out the gradient of your graph. Check that it is the same as the conversion factor.

4 This table gives the price of various bags of pre-packed potatoes.

Weight (kg)	2	5	8	12
Price (£)	1.04	2.60	4.16	6.24

a Draw a line graph by hand.

b How much would you expect to pay for a 3 kg bag?

c Work out the gradient to give the price per kilogram

d Enter the same data into a spreadsheet and compare the printouts of a **line graph** and a **scatter diagram** drawn using this data. Which gives a correct graph?

e Do supermarkets usually price their bags of potatoes so that doubling the quantity doubles the price?

At the end of the activity

Do you prefer to use a graph or a conversion factor to convert quantities from one unit to another?

If you have a direct proportion graph, doubling one quantity doubles the other. Does the same rule work if you multiply by 3 or by 5?

Have you ever used line graphs in other situations, such as science experiments, to find a relationship?