

Measurement: Conversion Graphs

Aim: Convert between miles and kilometres. I can use a conversion graph to convert between miles and kilometres.	Success Criteria: I can construct a line graph for conversion between miles and kilometres. I can use a line graph to convert from miles to kilometres. I can use a line graph to convert from kilometres to miles.	Resources: Lesson Pack Individual whiteboards and pens – class set Graph paper
	Key/New Words: Conversion, miles, kilometres, line graph, speed.	Preparation: Differentiated Conversion Graphs to Convert Miles and Kilometres Activity Sheet – one per child Extra Challenge Activity Sheet – as needed

Prior Learning: It will be helpful if children have learned how to convert between miles and kilometres (covered in Converting Miles and Kilometres (Lesson 1): Road Trip).

Learning Sequence

	Convert It: Children convert between metric units of length shown on the Lesson Presentation . Work through the answers and clear any misconceptions.	
	Why Do We Need Conversion Graphs? Use the Lesson Presentation to explain the uses of line conversion graphs.	
	Constructing Conversion Graphs: Use the Lesson Presentation to show how to construct a line graph. Children follow the instructions to construct their own line graphs to show conversions between miles and kilometres.	
	How Conversion Graphs Work: Use the Lesson Presentation to demonstrate how to read a conversion graph.	
	Reading and Constructing Conversion Graphs: Children will use the graph they have constructed to convert from miles to kilometres and vice versa.	
	<p>Using Conversion Graphs to Convert Miles and Kilometres: Children complete the Conversion Graphs to Convert Miles and Kilometres Activity Sheet, using a conversion graph to convert between miles and kilometres. A pre-prepared graph is available on the activity sheet for any children who may have found it difficult to construct a line graph, so that they are able to interpret the graph.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Children use a conversion graph drawn for them to convert between miles and kilometres. The unit measurements are multiples of five. They use the graph to compare two measurements.</p> </div> <div style="text-align: center;"> <p>Children use their own conversion graph to convert between miles and kilometres. The unit measurements are multiples of five. They use the graph to order a set of three measurements.</p> </div> <div style="text-align: center;"> <p>Children use their own conversion graph to convert between miles and kilometres. The unit measurements are multiples of one. They use the graph to order a set of four measurements. An Extra Challenge Activity Sheet is also included.</p> </div> </div>	
	Comparing Speed: Children use their conversion graphs to convert speed between miles per hour and kilometres per hour.	

Explore it

Create it: Children create their own conversion graphs between other imperial and metric units of measurement, for example kilograms and pounds.

Write it: Children write their own problems with answers to accompany their line conversion graphs, both the graph used in the lesson and ones they have created themselves.



Maths

Measurement

Conversion Graphs



Aim

I can use a conversion graph to convert between miles and kilometres.

Success Criteria

- I can construct a line graph for conversion between miles and kilometres
- I can use a line graph to convert from miles to kilometres.
- I can use a line graph to convert from kilometres to miles.

Convert It



Convert between metres and kilometres.



Convert It



Convert between millimetres, centimetres and metres.



Why Do We Need Conversion Graphs?

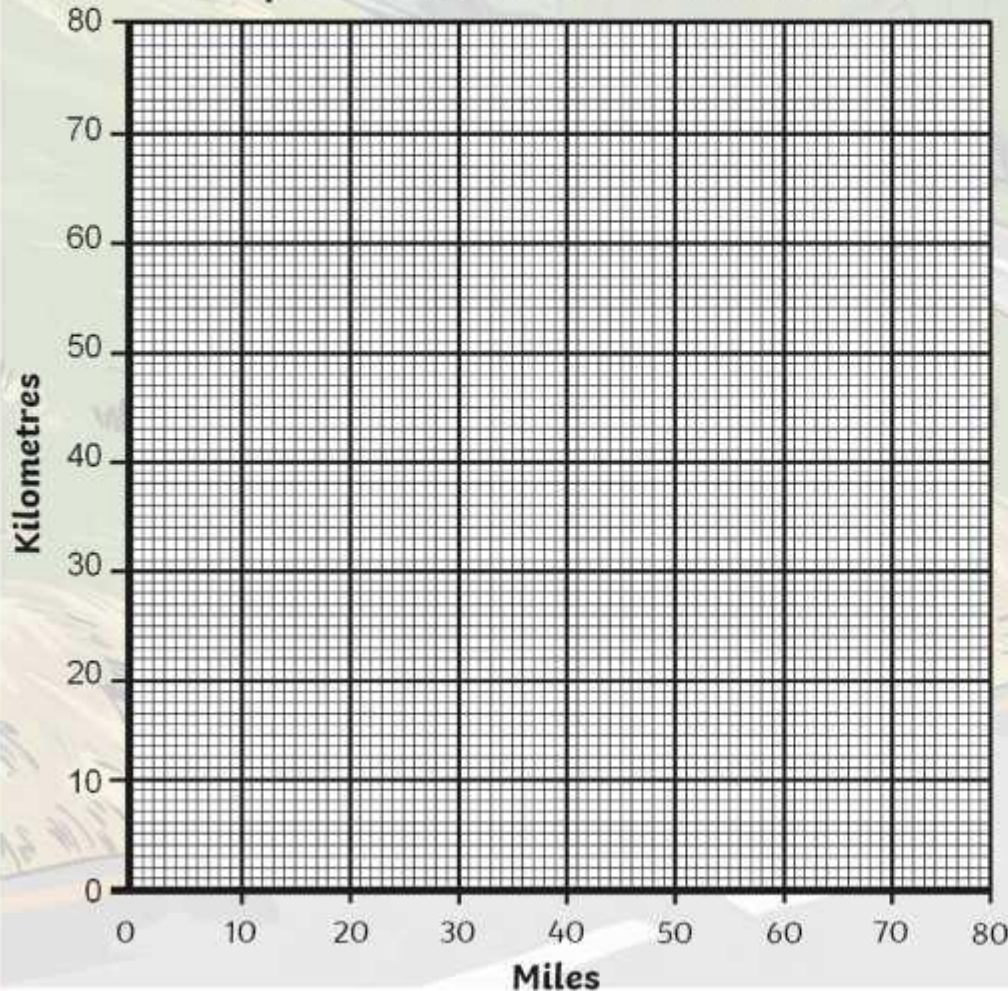


We often need to convert between measurements because in the UK we regularly use a mix of imperial and metric measurements such as pints, centimetres, miles, kilometres, stones and grams. Also, the rest of the world uses a range of measurements, so we need to be able to convert between these.

Constructing Conversion Graphs



Graph to Convert Miles and Kilometres

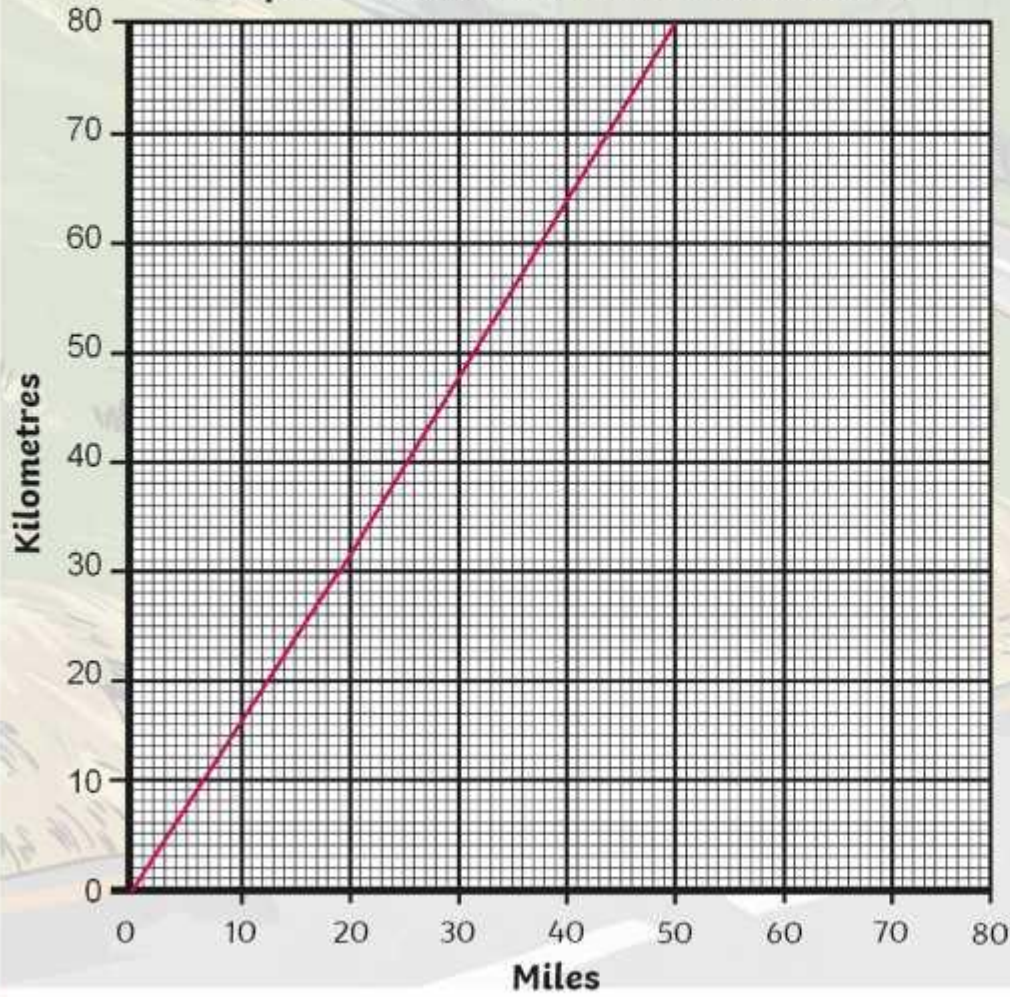


1. Draw two axes and label them with the two units of measurement. Don't forget the title for your graph.
2. Number each axis making sure that all numbers are on thicker lines (not in the gaps) and the spaces between numbers are consistent along each axis.

Constructing Conversion Graphs



Graph to Convert Miles and Kilometres



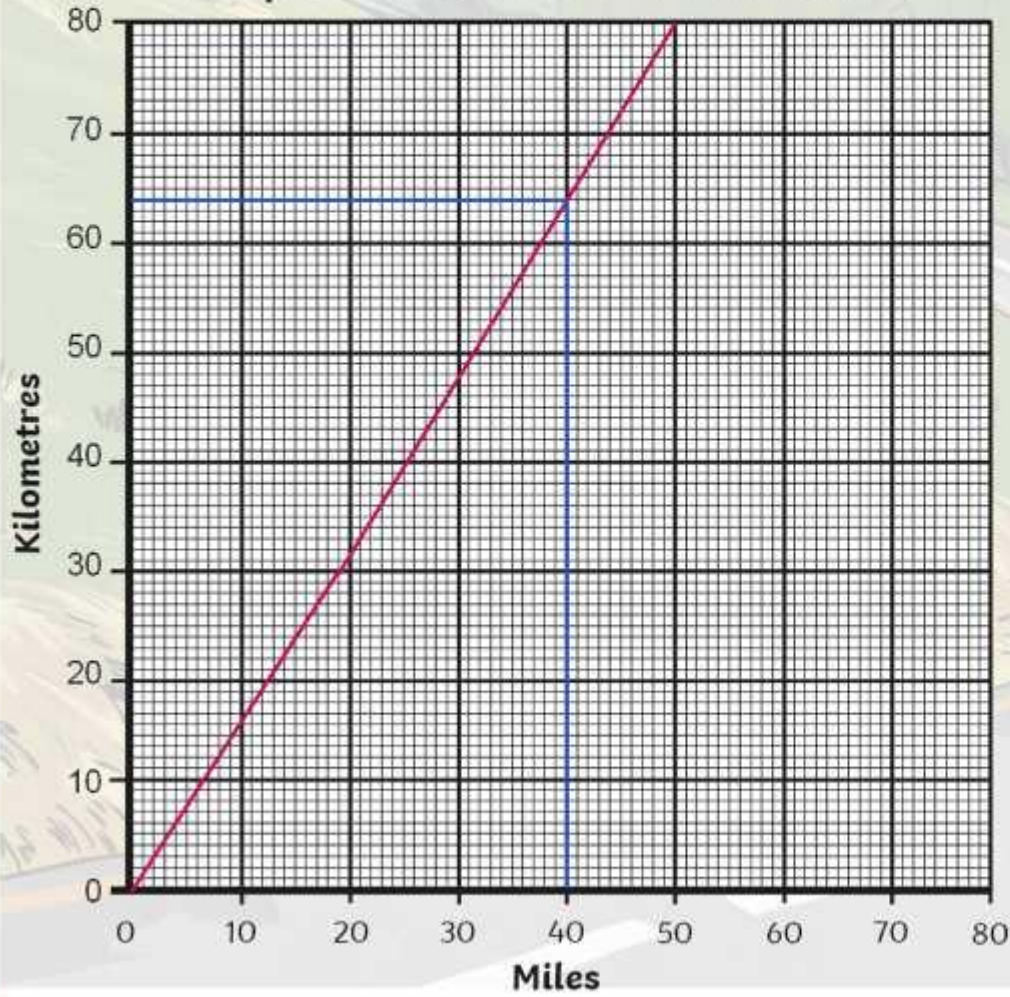
Use a ruler and a sharp pencil and join this point to (0,0).

Now, you can use your conversion graph to convert between miles and kilometres.

Constructing Conversion Graphs



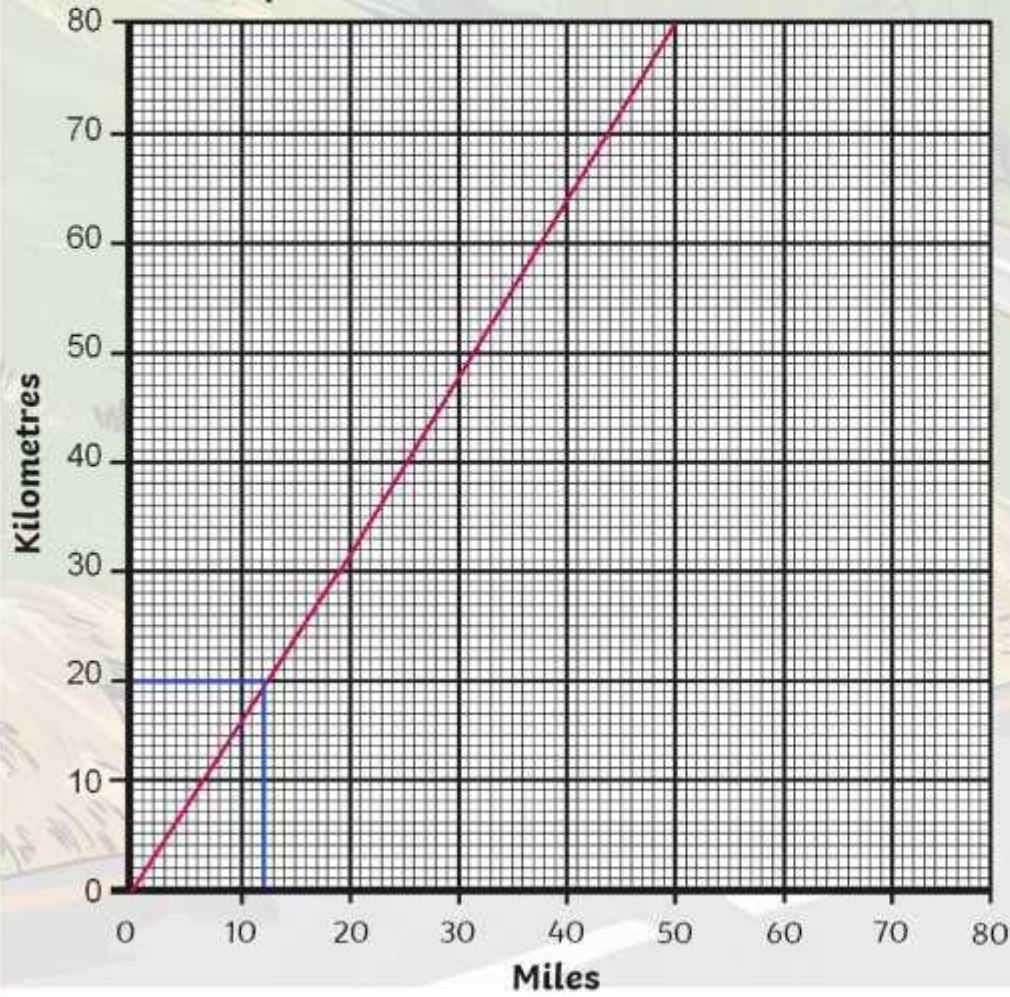
Graph to Convert Miles and Kilometres



Constructing Conversion Graphs



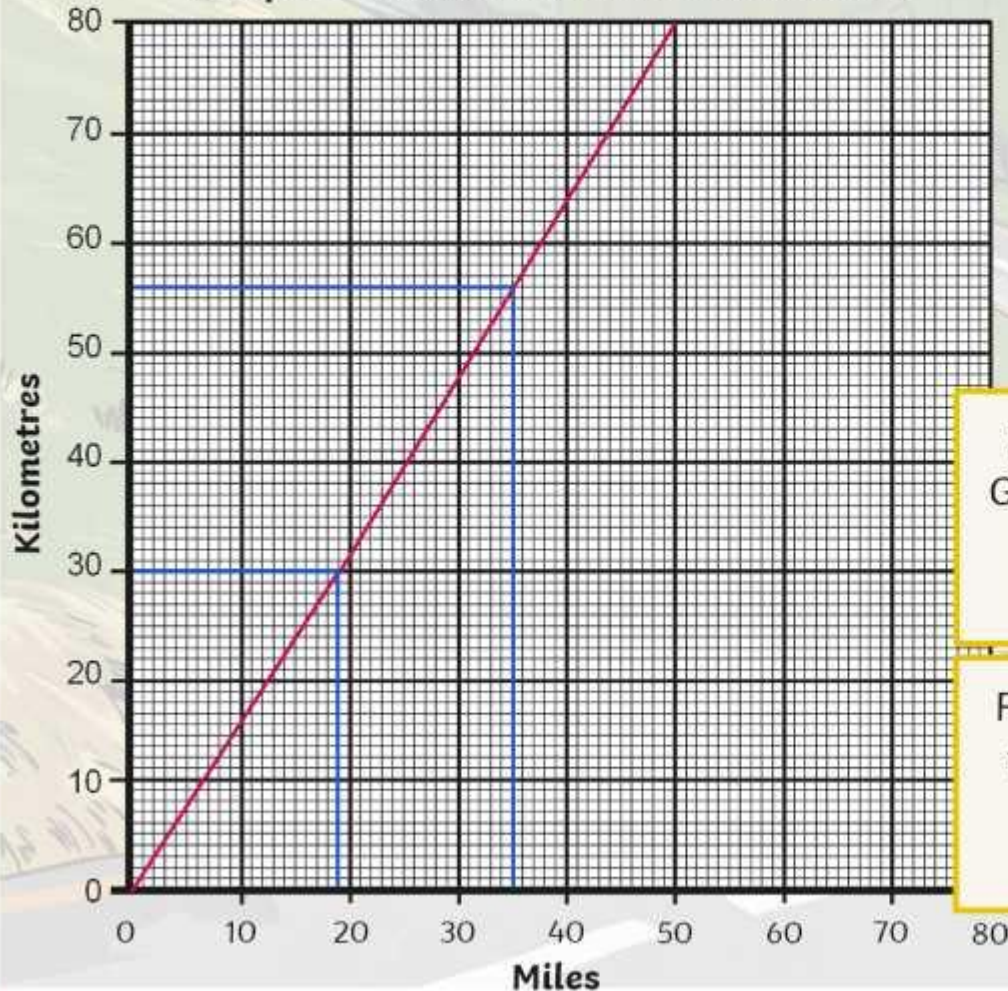
Graph to Convert Miles and Kilometres



Constructing Conversion Graphs



Graph to Convert Miles and Kilometres



Find 30 kilometres on the y-axis. Go across to the line, then find the number of miles on the x-axis.
30 kilometres \approx **19 miles**

Find 35 miles on the x-axis. Go up to the line, then find the number of kilometres on the y-axis..
35 miles \approx **56 kilometres**

Constructing Conversion Graphs



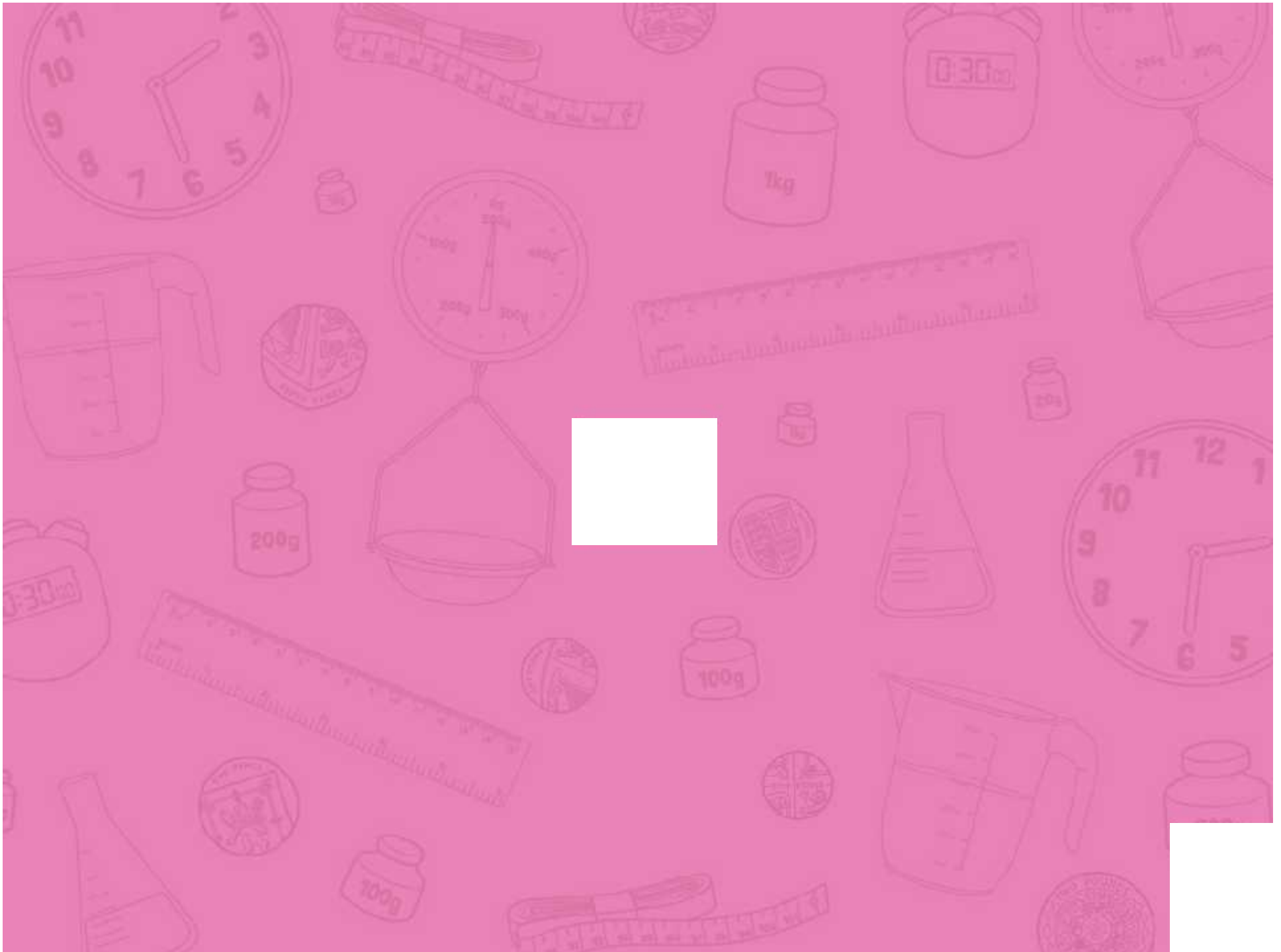
Aim



I can use a conversion graph to convert between miles and kilometres.

Success Criteria

- I can construct a line graph for conversion between miles and kilometres
- I can use a line graph to convert from miles to kilometres.
- I can use a line graph to convert from kilometres to miles.



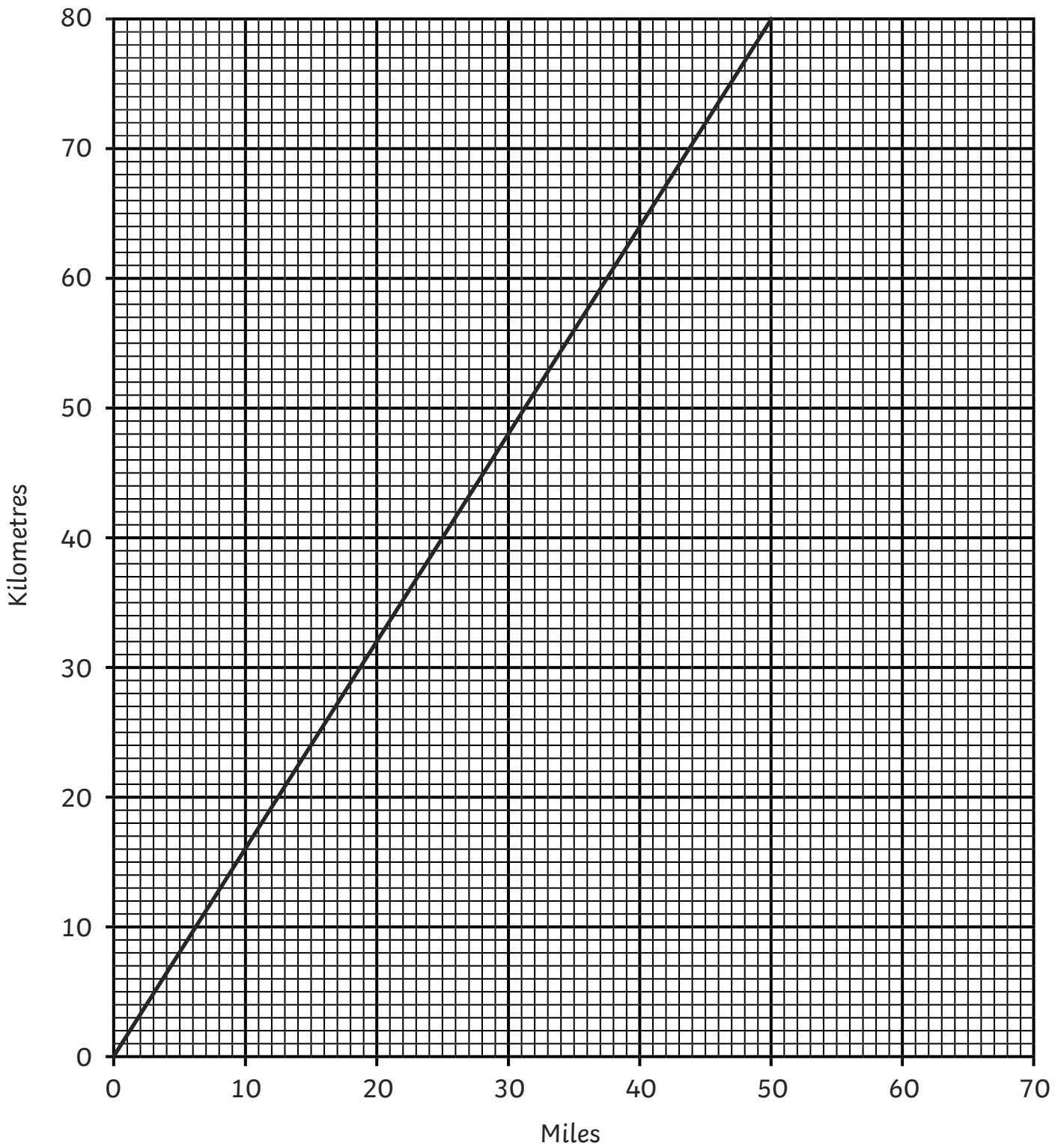
Aim: I can use a conversion graph to convert between miles and kilometres.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can construct a line graph for conversion between miles and kilometres.				Notes/Evidence					
I can use a line graph to convert from miles to kilometres.									
I can use a line graph to convert from kilometres to miles.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

Aim: I can use a conversion graph to convert between miles and kilometres.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can construct a line graph for conversion between miles and kilometres.				Notes/Evidence					
I can use a line graph to convert from miles to kilometres.									
I can use a line graph to convert from kilometres to miles.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

Graph to Convert Miles and Kilometres





Using Conversion Graphs to Convert Miles and Kilometres

I can use a conversion graph to convert between miles and kilometres.



1. Use your conversion graph to convert these measurements from miles to kilometres.

Miles	Kilometres
40 miles	km
10 miles	km
20 miles	km
35 miles	km
45 miles	km
15 miles	km

2. Use your conversion graph to convert these measurements from kilometres to miles.

Kilometres	Miles
60km	miles
45km	miles
20km	miles
55km	miles
50km	miles
35km	miles



3. Use your conversion graph to order these measurements from smallest to greatest.

a)

30km	15 miles	20 miles
smallest		greatest

b)

50km	50 miles	45km
smallest		greatest

c)

55km	30 miles	20 miles
smallest		greatest



Using Conversion Graphs to Convert Miles and Kilometres

I can use a conversion graph to convert between miles and kilometres.



1. Use your conversion graph to convert these measurements from miles to kilometres.

Miles	Kilometres
43 miles	km
28 miles	km
21 miles	km
36 miles	km
39 miles	km
17 miles	km

2. Use your conversion graph to convert these measurements from kilometres to miles.

Kilometres	Miles
13km	miles
48km	miles
23km	miles
54km	miles
59km	miles
31km	miles



3. Use your conversion graph to order these measurements from smallest to greatest.

a)

20km	16 miles	30km	25 miles
smallest			greatest

b)

55km	28 miles	38 miles	49km
smallest			greatest

c)

53km	26 miles	47km	20 miles
smallest			greatest



Answers

Accept 1 more/less than the answer shown.

1. Use the conversion graph to convert these measurements from miles to kilometres.

Miles	Kilometres
20 miles	<i>32km</i>
45 miles	<i>72km</i>
15 miles	<i>24km</i>
30 miles	<i>48km</i>
35 miles	<i>56km</i>
25 miles	<i>40km</i>

2. Use the conversion graph to convert these measurements from kilometres to miles.

Kilometres	Miles
20km	<i>12.5 miles</i>
30km	<i>19 miles</i>
25km	<i>15.5 miles</i>
50km	<i>31 miles</i>
60km	<i>37.5 miles</i>
35km	<i>22 miles</i>

3. Use the conversion graph to say which measurement is the greater. Draw a circle around the greater measurement.

a) 40km

30 miles

b) 15 miles

30km

c) **25km**

10 miles



Answers

Accept 1 more/less than the answer shown.

1. Use your conversion graph to convert these measurements from miles to kilometres.

Miles	Kilometres
40 miles	<i>64km</i>
10 miles	<i>16km</i>
20 miles	<i>32km</i>
35 miles	<i>56km</i>
45 miles	<i>72km</i>
15 miles	<i>24km</i>

2. Use your conversion graph to convert these measurements from kilometres to miles.

Kilometres	Miles
60km	<i>37.5 miles</i>
45km	<i>28 miles</i>
20km	<i>12.5 miles</i>
55km	<i>34.5 miles</i>
50km	<i>31 miles</i>
35km	<i>22 miles</i>



3. Use your conversion graph to order these measurements from smallest to greatest.

a)

30km	15 miles	20 miles
smallest		greatest
<i>15 miles</i>	<i>30km</i>	<i>20 miles</i>

b)

50km	50 miles	45km
smallest		greatest
<i>45km</i>	<i>50km</i>	<i>50 miles</i>

c)

55km	30 miles	20 miles
smallest		greatest
<i>20 miles</i>	<i>30 miles</i>	<i>55km</i>



Answers

Accept 1 more/less than the answer shown.

1. Use your conversion graph to convert these measurements from miles to kilometres.

Miles	Kilometres
43 miles	<i>69km</i>
28 miles	<i>45km</i>
21 miles	<i>33.5km</i>
36 miles	<i>57.5km</i>
39 miles	<i>62.5km</i>
17 miles	<i>27km</i>

2. Use your conversion graph to convert these measurements from kilometres to miles.

Kilometres	Miles
13km	<i>8 miles</i>
48km	<i>30 miles</i>
23km	<i>14.5 miles</i>
54km	<i>34 miles</i>
59km	<i>37 miles</i>
31km	<i>19.5 miles</i>



3. Use your conversion graph to order these measurements from smallest to greatest.

a)

20km	16 miles	30km	25 miles
smallest			greatest
20km	16 miles	30km	25 miles

b)

55km	28 miles	38 miles	49km
smallest			greatest
28 miles	49km	55km	38 miles

c)

53km	26 miles	47km	20 miles
smallest			greatest
20 miles	26 miles	47km	53km

Converting Square Miles and Square Kilometres

I can use a conversion graph to convert between miles and kilometres.



Plot these two conversions and draw a line graph to convert between square miles (mi^2) and square kilometres (km^2).

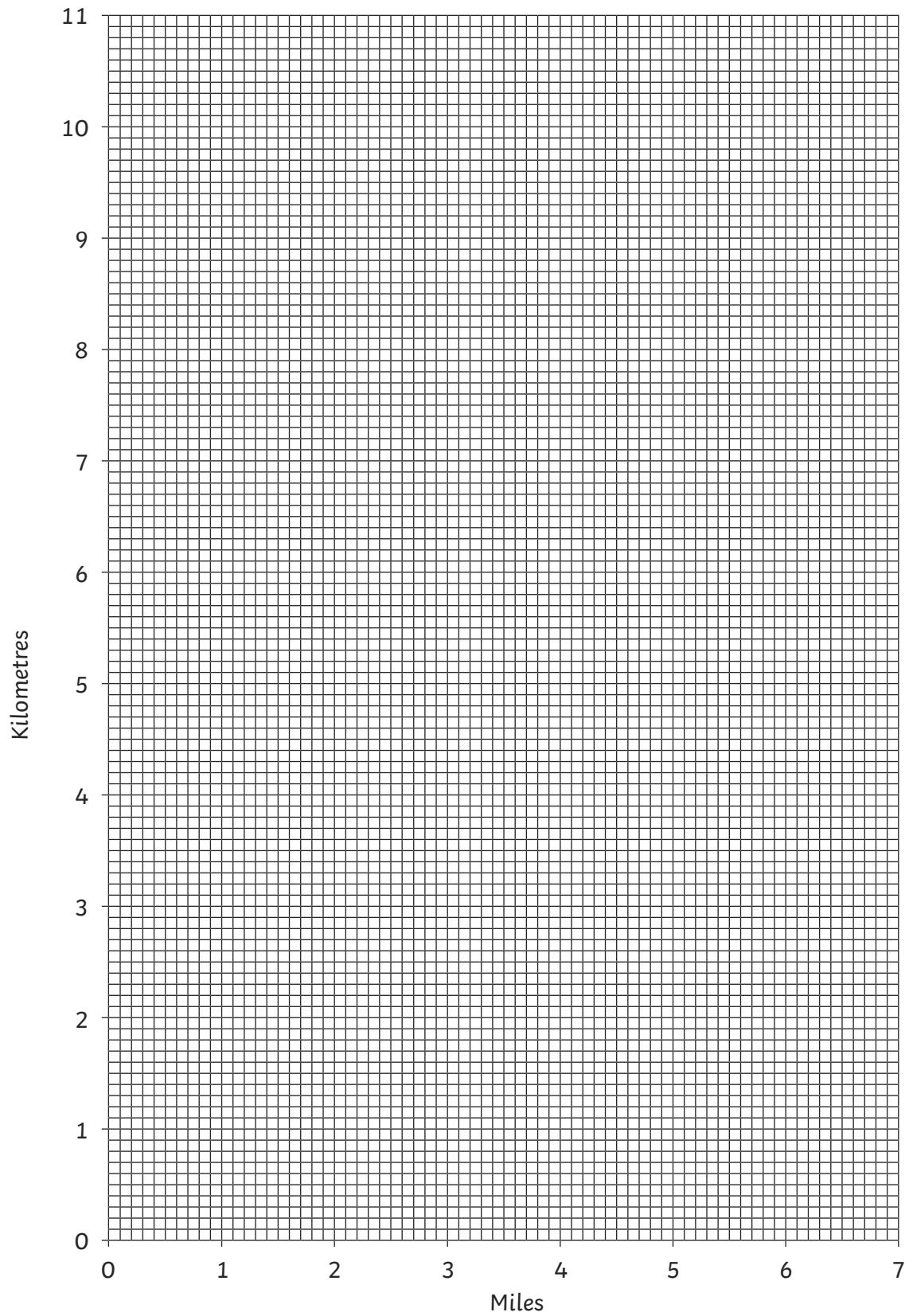
$$1\text{mi}^2 \approx 2.6\text{km}^2$$

$$4\text{mi}^2 \approx 10.4\text{km}^2$$

Use the line graph to convert the following.

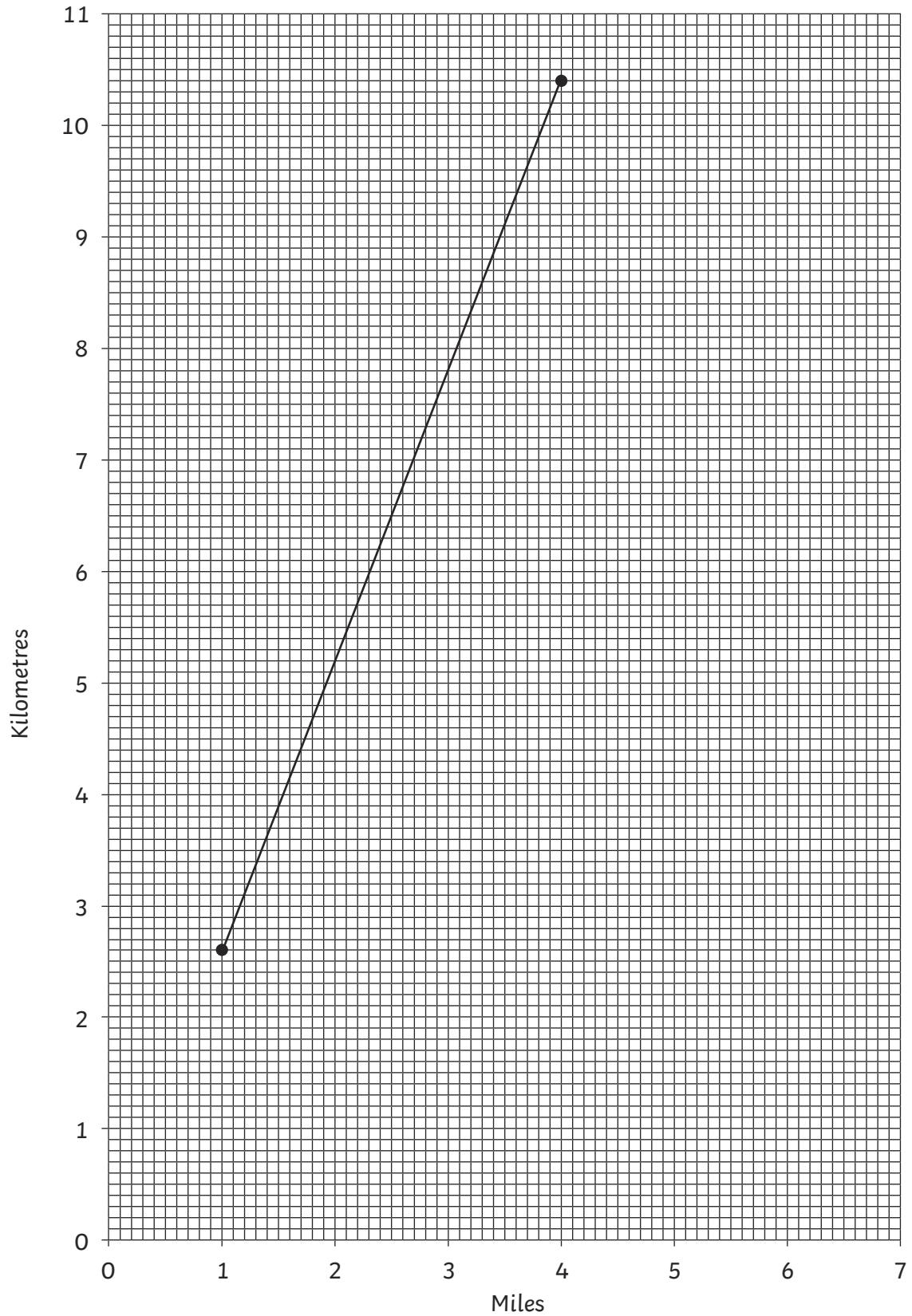
$3\text{mi}^2 =$		km^2
$1.5\text{mi}^2 =$		km^2
$7\text{km}^2 =$		mi^2
$8.4\text{km}^2 =$		mi^2
$2\text{mi}^2 =$		km^2
$9\text{km}^2 =$		mi^2

A Graph to Convert Miles and Kilmetres



Answers

A Graph to Convert Miles and Kilmetres



Use the line graph to convert the following.

$3\text{mi}^2 =$	Accept any answer between 7.6km^2 and 8km^2
$1.5\text{mi}^2 =$	Accept any answer between 3.5km^2 and 4km^2
$7\text{km}^2 =$	Accept any answer between 2.5mi^2 and 2.9mi^2
$8.4\text{km}^2 =$	Accept any answer between 3.1mi^2 and 3.5mi^2
$2\text{mi}^2 =$	Accept any answer between 5km^2 and 5.4km^2
$9\text{km}^2 =$	Accept any answer between 3.3mi^2 and 3.6mi^2

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		

Measurement | Conversion Graphs

I can use a conversion graph to convert between miles and kilometres.		
I can construct a line graph for conversion between miles and kilometres.		
I can use a line graph to convert from miles to kilometres.		
I can use a line graph to convert from kilometres to miles.		