

Imperial Units of Measure

So far we have looked at metric units of measure, but you may have spotted that these are not the only units of measurement that we use. For example, you might buy your milk in pints, or measure a journey in miles. These are some examples of imperial units of measure, which we need to be familiar with.

What is the imperial system?

Take a look at this video to start your investigation.

<https://www.bbc.co.uk/bitesize/topics/z4nsgk7/articles/zwbndxs>

See if you can find these units of measure being used anywhere around your house.

Do not panic! You will not be expected to remember the measurements needed to convert between metric and imperial units. You will always be given the numbers you need to convert.

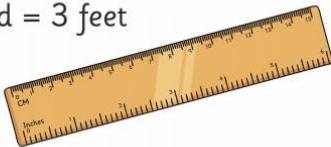
Measurement conversions

length

1 centimetre = 0.39 inches

1 foot = 12 inches

1 yard = 3 feet



cm
in
ft
yd

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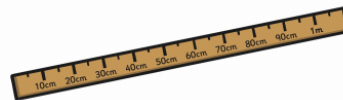
Measurement conversions

Distance

1 kilometre = 0.62 miles

1 metre = 1.09 yards

1 metre = 3.28 feet



km
m
yd
ft

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Measurement conversions

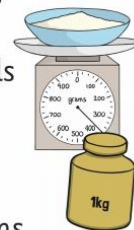
Mass

1 gram = 0.035 ounces

1 kilogram = 2.2 pounds

1 stone = 14 pounds

1 stone = 6.35 kilograms



g
oz
kg
lb
s

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Measurement conversions

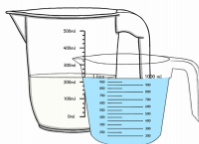
Volume

1 litre = 35.19 fluid ounces

1 litre = 1.75 pints

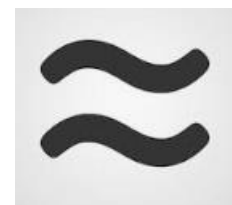
1 litre = 0.21 gallons

1 gallon = 8 pints



l
fl oz
pt
gal

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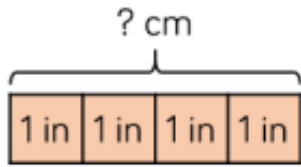


You will spot this symbol being used when looking at imperial and metric measures. This symbol means 'approximately' or 'approximately equal to'. It is hard to be exact when using two different systems of measurement and we often use rounding to make the calculations easier.

Using Imperial Units of Measure

Let's start by looking at length

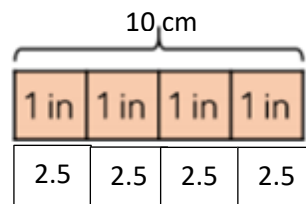
One inch is approximately 2.5 centimetres
1 inch \approx 2.5 cm



16in \approx cm

15in \approx cm

I'm going to use a bar model to help me solve these conversions. If I know that 1 inch is approximately 2.5 centimetres, I think I'm going to need to be counting up in 2.5



I have used the conversion given to me, to work out that 4 inches is approximately 10cm.

I know that 16 is 4 lots of 4 (4×4)

So, I need to know what 4 lots of 10 is (4×10)

16 inches is approximately 40cm

15 inches is 1 inch less than 16. Therefore I would have to take 2.5 cm away.

$$40 - 2.5 = 37.5$$

15 inches is approximately 37.5cm

Using the conversion above, try some of the problems below. You will need to use both bar models and multiplication to find your answers.

? in

A bar model consisting of a single orange rectangle labeled '5 cm'. A bracket above the bar is labeled '? in'.

10cm \approx in

1cm \approx in

5.5m \approx in

Here are the heights of two children.



1 inch \approx approximately 2.5cm

I think that Mia is the tallest.

Is the statement correct? Explain your answer.

Mass

It is common to see imperial units of measure in cookbooks. It is also often used when we are talking about the mass of a person. Let's see how we can convert these weights.

1 kilogram is approximately 2 pounds
 $1 \text{ kg} \approx 2 \text{ lbs}$

$2 \text{ kg} \approx \boxed{} \text{ lbs}$
 $\boxed{} \text{ kg} \approx 22 \text{ lbs}$

The conversion tells me that 1kg is approximately 2lbs. To find 2kg I will need to double this.

$$2 \text{ lbs} \times 2 = 4 \text{ lbs}$$

2kg is approximately 4lbs

The next part has given me the weight in pounds but not kilograms. I think I may have to do the inverse.

$$22 \div 2 = 11$$

11kg is approximately 22lbs

Now it's your turn, using the conversion above try the problems below.

$5 \text{ kg} \approx \boxed{} \text{ lbs}$
 $55 \text{ kg} \approx \boxed{} \text{ lbs}$



A new born baby weighed 8lbs. How many Kilograms did the baby weigh?



- Dora weighed 7.8 lbs when she was born.
- Amir weighed 3.5 kg when he was born.

Who was heavier, Dora or Amir?
Explain your answer.

Another common conversion:

1kg is approximately 2.2lbs

It is important that you always check the conversion that you have been given before answering a question.

Volume/Capacity

I am sure you have also heard of imperial measures being used for liquids. We still buy our milk in pints rather than litres. Let's see how we convert them.



There are 568 millilitres in a pint.

2 pints

If there are 568ml in 1 pint, I will need to multiply this by 2 to find out how many ml are in 2 pints.

	5	6	8
X			2
	1	1	3
	1	3	6

There are 1,136 ml in 2 pints

I could also say there are 1.136l in 2 pints.

Now try some for yourself using the conversion above. Think carefully about the calculations that you will need to do.



$1\frac{1}{2}$ pints

5 pints

0.5 pints

2.5 pints

Your Task

We will be setting some work on Mathletics for this topic, however we would also like you to have a go at the questions below. You can record this working out in you Unexpected Adventure Trail book. Remember to show your working out carefully.

- 1) Convert these measurements from **imperial to metric** using the approximate conversion table.



Imperial Measure	Metric Measure
1 inch	$2\frac{1}{2}$ cm
1lb	454g
1 pint	570 millilitres



7 inches



4lbs



$2\frac{1}{2}$ pints

- 2) Convert these measurements from **metric to imperial** using the approximate conversion table.

Metric Measure	Imperial Measure
1cm	0.4 inch
1kg	2.2lbs
1 litre	$1\frac{3}{4}$ pints



21cm



$4\frac{1}{2}$ kg



3 litres

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- 1) Here are the heights of two children.



William is the tallest.

Do you agree with this statement?
Explain your answer.

1 inch = approximately 2.5cm





William	Chen
54 inches	1.34 metres

- 2) Here are the prices of bananas at two different shops.

At which shop are the bananas better value for money?

Explain how you know.

1lb = approximately 454g

Shop A	Shop B
 1.9kg = £2.20	 4lbs = £2.50

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