

Check that you can:

- ◆ divide numbers by 10, 100 and 1000
- ◆ understand the meaning of the terms length, mass and capacity
- ◆ work with decimal numbers
- ◆ read scales.

Metric units

There are two systems of measurement that are widely used - the metric system and the Imperial system. Even though we still use the older Imperial system in a number of situations, it is the more modern and simpler metric system that is more widely used across the world. This is the system that you will be expected to know in GCSE Mathematics.

Metric length units

In the metric system, the metre (m) is the base metric unit of length. However, for lengths that are much bigger or smaller than a metre, we also use other units that are powers of ten larger or smaller than a metre:

Kilometre (km): equal to 1000m

Centimetre (cm): equal to $\frac{1}{100}$ m

Millimetre (mm): equal to $\frac{1}{1000}$ m

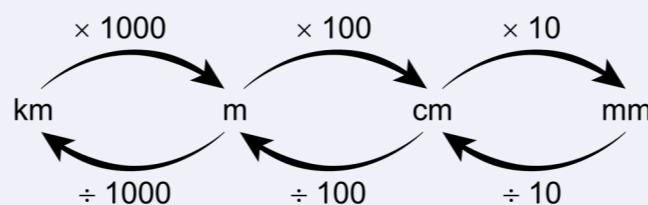
The prefixes kilo-, centi- and milli- are used throughout the metric system, e.g. a kilogram (kg) is equal to 1000g.

Metric mass and metric capacity units

Metric units for mass		Metric volume units for capacity	
Base unit:	gram (g)	Base unit:	litre(l)
Other units:	kilogram (kg)	Other units:	kilolitre (kl)
	centigram (cg)		centilitre (cl)
	milligram (mg)		millilitre(ml)

Metric conversions

Sometimes we need to convert from one metric unit into another, e.g. from km to m. Once we have learned how to do this for all the metric length units, then the conversions for the mass and capacity units will be the same. The following diagram can be used to convert between all the metric units of length:



Example 1

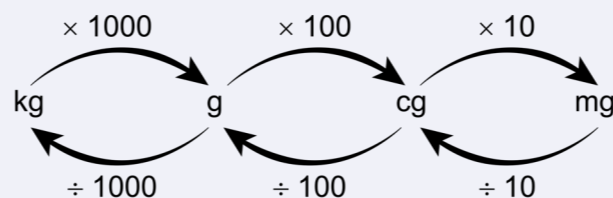
Convert 3.6km into m.

Answer

Find the arrow that goes from km to m. Therefore, $3.6 \times 1000 = 3600\text{m}$.



A similar diagram can be used for metric mass conversions:

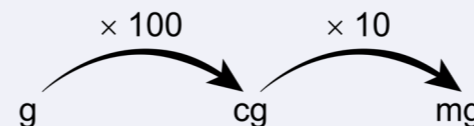


Example 2

Convert 5.9g into mg.

Answer

$5.9 \times 100 \times 10 = 5900\text{mg}$

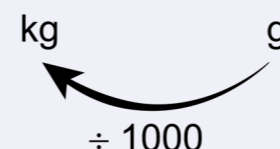


Example 3

Convert 37400g into kg.

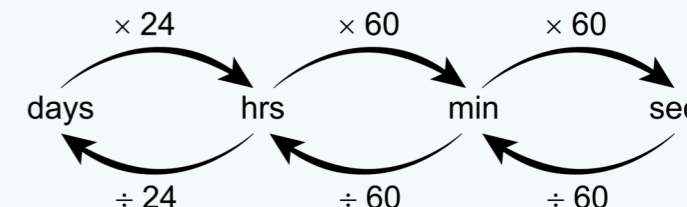
Answer

$37400 \div 1000 = 37.4\text{kg}$



Time conversions

When performing calculations that involve time measurements, we sometimes need to convert between the different units of time, e.g., hours, minutes, seconds. The following diagram can be used to convert between the different units of time:

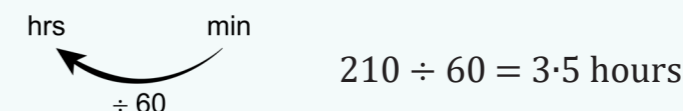


These conversions work provided you are starting with a measurement that is purely in one of the units.

Example 1

Convert 210 minutes into hours.

Answer



The difficulty arises when we start either with a measurement that has a mixture of units, or we need an answer with a mixture of units.

Example 2

Convert 3 hours 24 minutes into hours.

Answer

We need to convert the 24 minutes into hours. $24 \div 60 = 0.4\text{hrs}$

Therefore, the final answer is $3\text{hrs} + 0.4\text{hrs} = 3.4\text{hrs}$.

REMEMBER!

Be careful when working with hours expressed as decimal numbers. 0.5 hours = 30 minutes, and 0.3 hours = 18 minutes!