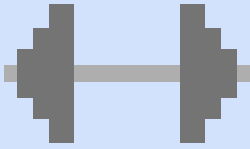# Metric Units

The **metric system** is used to measure the **length, mass** or **volume** of an object.

length

Length and distance is measured in **millimetres** (mm), **centimetres** (cm), **metres** (m) and **kilometres** (km).

Mass is measured in **grams** (g) and **kilograms** (kg).

mass | volume

Volume is measured in **millilitres** (ml) and **litres** (l).

You will need to know how to **convert** between each of the metric units. The main conversions that you need to **remember** are:

Length and distance	**Mass**	**Volume**
1 centimetre = 10 millimetres 1 metre = 100 centimetres 1 kilometre = 1,000 metres	1 kilogram = 1,000 grams	1 litre = 1,000 millilitres

Any measurement that starts with **milli-** is a **1000th** of the measurement without the prefix. For example, **1 millimetre** is $\frac{1}{1000}$ of a metre.

Method

Let's look at how to convert metric units using **powers of 10**.

1 Identify the **conversion factor** between the units. This is how much 1 of the larger unit is **equal to** in the smaller unit.

Let's say we want to convert **kilograms into grams**. We know that 1 of the larger unit (kilograms) is equal to 1,000 of the smaller unit (grams).

1 kg = 1,000 g

Our conversion factor is **1,000**.

The prefix **kilo- means a thousand**. Use this to help you remember that a **kilogram** is a thousand grams and a **kilometre** is a thousand metres.

2 **Multiply** or **divide** by the conversion factor**.**

To convert from a larger unit to a smaller unit, **multiply the larger unit by the conversion factor**.

5 kilograms in grams: 5 x 1,000 = **5,000 g**

To convert from a smaller unit to a larger unit, **divide the smaller unit by the conversion factor**.

5000 grams in kilograms: 5,000 ÷ 1,000 = **5 kg**

Any measurement that starts with the prefix **centi-** is a **100th** of the measurement without the prefix. For example, **1 centimetre** is $\frac{1}{100}$ of a metre.

Example Question

Ato is practising for a swimming competition and swims 5.4 km in one day.

How far did Ato swim in metres?

A	540 m	B	5,400 m	C	5,040 m	D	54 m	E	0.54 m

1 Identify the **conversion factor** between kilometres and metres.

1 kilometre = 1,000 metres so the conversion factor is **1,000**.

2 **Multiply 5.4 km by 1,000.**

When we multiply a number by 1,000, we move all the digits **three place value columns to the left**!

Thousands	Hundreds	Tens	Ones	Tenths
			5	4
5	4	0	0	

Because our digits enter the **thousands** and **hundreds** columns, we add **two zeros** onto the end of the number in the **tens** and **ones** columns.

The correct answer is **B**. Ato swam **5,400 metres**!