

**SI Measurement**

The modern version of the metric system is the International System of Units (SI, abbreviated from *Système International d'Unités*). It was established in 1960 and is currently used by most countries in the world.

In the SI unit system, the base unit of length is the metre.

Other length units are obtained by attaching prefixes to the base unit. To tell how large or small a unit is, you look at the prefix.

The metric system is a base 10 system; each successive unit is 10 times larger than the previous one. This makes converting easier as all you have to do is multiply or divide by some multiple of 10.

*move decimal place!*

**Metric Length Units**

<b>unit</b>	millimetre	centimetre	decimetre	<b>metre</b>	decametre	hectometre	kilometre
<b>prefix</b>	milli-	centi-	deci-		deca-	hecto-	kilo-
<b>abbreviation</b>	<u>mm</u>	<u>cm</u>	dm	<u>m</u>	dam	hm	<u>km</u>
	1000 times smaller than base unit	100 times smaller than base unit	10 times smaller than base unit	<b>base unit</b>	10 times larger than base unit	100 times larger than base unit	1000 times larger than base unit

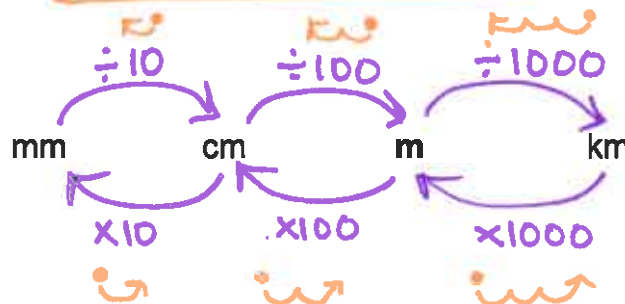
The most commonly used length units are related as follows:

1 cm = 10 mm

1 m = 100 cm

1 m = 1000 mm

1 km = 1000 m



*÷ move decimal to left ←*

*x move decimal to right →*

Any length unit can be used to express a given length, but some units are preferred over others depending on what is being measured.

Give an appropriate SI unit for each of the following lengths:

- desktop cm
- room length m
- height of school m
- pencil length cm
- school length m
- student's height cm or m
- pencil diameter mm
- distance to Beverly km

### Converting between SI length units

Multiply by a conversion factor, use unit analysis, or set up a proportion to convert between units. You may need more than one step.

recommended if you are not sure whether to  $\times$  or  $\div$

a) Convert 0.467 m to cm.

$$\frac{1\text{m}}{100\text{cm}} = \frac{0.467\text{m}}{x} \quad x = 100 \times 0.467$$

$$x = 100 \times 0.467$$

$$= \boxed{46.7\text{cm}}$$

b) Convert 57.2 mm to cm.

$$\text{mm} \rightarrow \text{cm} \quad \div 10$$

$$57.2 \div 10 = \boxed{5.72\text{cm}}$$

c) Convert 0.0023 km to cm.

$$\text{km} \rightarrow \text{m} \quad \times 1000$$

$$0.0023 \times 1000 = 2.3\text{m}$$

$$\text{m} \rightarrow \text{cm} \quad \times 100$$

$$2.3 \times 100 = \boxed{230\text{cm}}$$

d) Convert 499000 mm to km.

$$\text{mm} \rightarrow \text{m}$$

$$\frac{1\text{m}}{1000\text{mm}} = \frac{x}{499000\text{mm}} \quad x = \frac{1 \times 499000}{1000}$$

$$x = 499\text{m}$$

$$\text{m} \rightarrow \text{km}$$

$$\frac{1\text{km}}{1000\text{m}} = \frac{x}{499\text{m}} \quad x = \frac{1 \times 499}{1000}$$

$$x = \boxed{0.499\text{km}}$$