

Length 2

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Stage 3 Outcome		
<p>A student:</p> <ul style="list-style-type: none"> › describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions MA3-1WM › selects and applies appropriate problem-solving strategies, including the use of digital technologies, in undertaking investigations MA3-2WM › gives a valid reason for supporting one possible solution over another MA3-3WM › selects and uses the appropriate unit and device to measure lengths and distances, calculates perimeters, and converts between units of length MA3-9MG 	<p>Language: Students should be able to communicate using the following language: length, distance, kilometre, metre, centimetre, millimetre, perimeter, dimensions, width.</p>	
Teaching and Learning Activities	Notes/ Future Directions/Evaluation	Date LAC Icons
<p><u>Ignition Activity</u> Three Decimal Places Students choose a distance of less than one kilometre and write their distances in metres on a card. On the back of the card students record the distance in kilometres e.g. 276 m = 0.276 km. The teacher asks:</p> <ul style="list-style-type: none"> ■ 'Who has the shortest distance?' This student stands at the front of the room. ■ 'Who has the longest distance?' This student stands at the back of the room. <p>The remainder of the class sort themselves between these two students in order. Students compare the two ways of recording the distances.</p>		
<p><u>Explicit Mathematical Teaching</u> When the students are able to measure efficiently and effectively using formal units, they should be encouraged to apply their knowledge and skills in a variety of contexts. Following this they should be encouraged to generalise their method for calculating the perimeter of squares, rectangles and triangles. Review the units of measurement - mm, cm, m, km and converting between them. Discuss the devices you would use to measure the above units. Explain the relationship between the size of a unit and the number of units needed e.g. more metres than kilometres will be needed to measure the same distance. Discuss the need for universal units of measurement.</p>		

Students will need to recognise the equivalence of whole-number and decimal representations of measurements of length, eg 165 cm is the same as 1.65 m

and interpret decimal notation for lengths and distances, eg 13.5 cm is 13 centimetres and 5 millimetres. Students should be able to record lengths and distances using decimal notation to three decimal places, eg 2.753 km.

Recognise the need for a unit longer than a metre for measuring distance (class discussion). Recognise that $1000 \text{ m} = 1 \text{ km}$ and that 1 m is $\frac{1}{1000}$ of a km.

Discuss places known to students that are standard lengths e.g. 25m pool, 50m pool, 100m sprint, 400m track, distance from school to Toronto. Measure 1 km around the back flat using trundle wheels or 100m lengths of string.

LENGTHS CONVERSIONS (PART 1)

The base unit for length is the metre (m).

$$1 \text{ km} = 1000 \text{ m}$$

$$\textit{kilo} = 1000$$

$$1 \text{ m} = 100 \text{ cm}$$

$$1 \text{ cm} = 10 \text{ mm}$$

$$\textit{milli} = \frac{1}{1000}$$

***BIG* \Rightarrow *SMALL*, we multiply**

***SMALL* \Rightarrow *BIG*, we divide**

Examples

Complete the conversions:

$$(a) 4 \text{ km} = \overset{\times 1000}{\underline{\underline{4000}}} \text{ m}$$

.....

$$(b) 7.5 \text{ m} = \overset{\times 100}{\underline{\underline{750}}} \text{ cm}$$

.....

$$(c) 19.6 \text{ cm} = \overset{\times 10}{\underline{\underline{196}}} \text{ mm}$$

.....

$$(d) 0.25 \text{ m} = \overset{\times 100}{\underline{\underline{25}}} \text{ cm} \overset{\times 10}{\underline{\underline{250}}} \text{ mm}$$

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Teachers will need to model and demonstrate how to convert between common metric units of length eg metres and kilometres, millimetres, centimetres and metres.

Students require multiple opportunities to solve problems involving the comparison of lengths using appropriate units.

Converting Between Millimetres, Centimetres and Metres

Students find, measure and record the lengths of three things:

- smaller than 1 cm
- bigger than 1 cm and smaller than 10 cm
- bigger than 10 cm and smaller than 1 m.

Students record measurements in metres, centimetres and millimetres using decimal notation.

Measurement	In metres	In centimetres	In millimetres
Watch band width	0.018 m	1.8 cm	18 mm

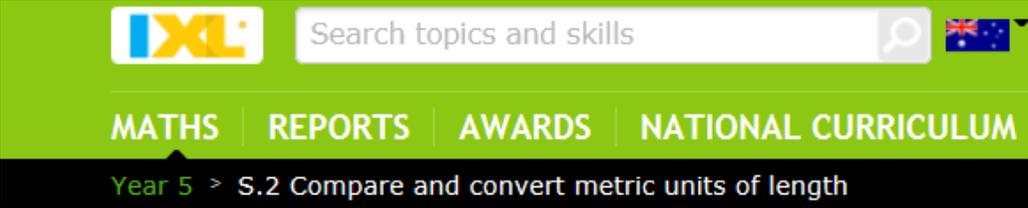
Possible questions include:

- can you estimate and measure the perimeter of six different objects in the classroom?
- what measuring device did you use? Why? What unit did you use to record your measurement initially?
- how did you convert your measurements to millimetres? Centimetres? Metres?

Conversion Table

Complete a conversion table using mm, cm, m, km. (standard abbreviations)

mm	cm
10	1
100	10

<p>Tyres Students use a piece of string (or similar) to measure the circumference of a bike or car wheel. They then measure the string to determine the distance travelled in one revolution of the tyre and record the measurement in millimetres and centimetres. They calculate the distance travelled in 5 revolutions, 10 revolutions, 100 revolutions and 1000 revolutions, recording the distances using combinations of millimetres, centimetres, metres and kilometres, and using decimal notation to three decimal places.</p>		 Literacy  Critical and creative thinking
<p>Adding Lengths Students measure dimensions of three items, each involving a different unit of length e.g. thickness of an eraser, length of a pencil and length of a desk. They add these three measurements e.g. 5 mm, 20 cm and 1.2 m together to find the total length. Students choose three other items and measure and add their lengths.</p>		 Critical and creative thinking
<p>Problem Solving http://au.ixl.com/math/year-5/compare-and-convert-metric-units-of-length</p> 		 Literacy  Information and communication technology capability
<p>Problem Solving Teachers will need to develop a wide range of problem solving situations for their class. Students should be encouraged to write problems for their peers.</p>		 Literacy  Critical and creative thinking