

## 4.2 - Converting Measurements

$$1 \text{ mi} = 1.6093 \text{ km}$$

### Make Connections

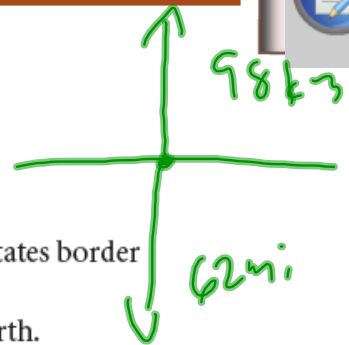
Two cars are driven in opposite directions from a Canada/United States border crossing.

In one hour, Hana drove 62 mi. south while Farrin drove 98 km north.

How could you determine which vehicle travelled farther from the border?

$$98 \text{ km} \times \frac{1 \text{ mi}}{1.6093 \text{ km}} = 60.9 \text{ mi}$$

$$62 \text{ mi} \times \frac{1.6093 \text{ km}}{1 \text{ mi}} = 99.8 \text{ km}$$



Each measurement in the imperial system relates to a corresponding measurement in the SI system.

*m → yd. → ft*

This table shows some approximate relationships between imperial units and SI units.

*1 m ×  $\frac{1.0936 \text{ yd}}{1 \text{ m}} \times \frac{3 \text{ ft}}{1 \text{ yd}} =$*

SI Units to Imperial Units	Imperial Units to SI Units
1 mm ≐ 0.039 in.	1 in. ≐ ? 2.54 cm
1 cm ≐ 0.394 in.	1 ft. ≐ ? 30.5 cm
	1 ft. ≐ 0.305 m
1 m ≐ 1.0936 yd.	1 yd. ≐ ? 91.44 cm
1 m ≐ 3.28 ft.	1 yd. ≐ 0.91 m
1 km ≐ 0.62 mi	1 mi. ≐ 1.6093 km



Some conversions are exact; for example,  
 1 in. = 2.54 cm  
 1 yd. = 91.44 cm

We can use the data in the table above to convert between SI and imperial units of measure.

## THE CONVERSION FACTORS BETWEEN SI AND IMPERIAL UNITS

<i>SI to Imperial</i>	<i>Imperial to SI</i>
1 mm = 0.0394 in	1 in = 25.4 mm
1 cm = 0.3937 in	1 inch = 2.54 cm *
1 m = 3.2808 ft	1 ft = 0.3048 m
1 m = 1.0936 yd *	1 yd = 0.9144 m
1 km = 0.6214 mi	1 mi = 1.6093 km *

## IMPORTANT CONVERSIONS...

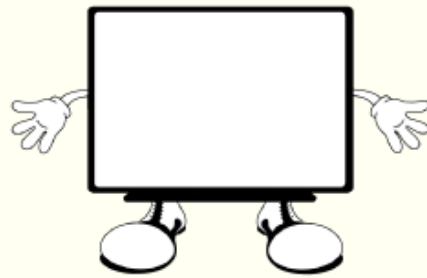
$$1 \text{ m} = 1.0936 \text{ yd}$$

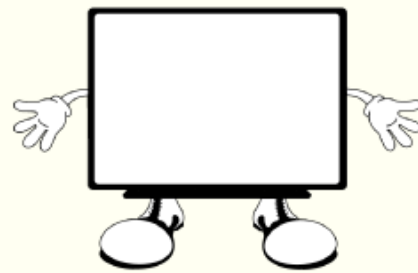
$$1 \text{ mi.} = 1.6093 \text{ km}$$

$$1 \text{ in.} = 2.54 \text{ cm}$$

Interface for a unit conversion tool with buttons: Edit, Check, Reset, Solve, and a help icon (?).

Word	Description
<input type="text"/>	3 feet <span style="float: right;">Yard</span>
<input type="text"/>	39 1/2 centimeters <span style="float: right;">Foot</span>
<input type="text"/>	2 1/2 <del>centimeters</del> <i>inches</i> <span style="float: right;">Meter</span>
<input type="text"/>	36 inches <span style="float: right;">Inch</span>
<input type="text"/>	12 inches <span style="float: right;">Yard</span>





**PRACTICE:** Converting IMPERIAL to METRIC

4. Convert each measurement. Answer to the nearest tenth.

a) 16 in. to centimetres

$$16 \text{ in.} \times \frac{2.54 \text{ cm}}{1 \text{ in.}} = 40.6 \text{ cm}$$

b) 4 ft. to metres

$$4 \text{ ft} \times \frac{1 \text{ yd.}}{3 \text{ ft}} \times \frac{1 \text{ m}}{1.0936 \text{ yd}} = 1.2 \text{ m}$$

c) 5 yd. to metres

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

d) 1650 yd. to kilometres

$$1650 \text{ yd.} \times \frac{1 \text{ m}}{1.0936 \text{ yd}} \times \frac{1 \text{ km}}{1000 \text{ m}} = 1.5$$

e) 6 mi. to kilometres ← 

Answers will vary depending on the conversion ratios used.

- |               |            |
|---------------|------------|
| 4. a) 40.6 cm | b) 1.2 m   |
| c) 4.6 m      | d) 1.5 km  |
| e) 9.7 km     | f) 50.8 mm |

f) 2 in. to millimetres



**PRACTICE: Converting METRIC to IMPERIAL**

Convert each measurement.

a) 25 mm to the nearest inch

$$25 \cancel{\text{mm}} \times \frac{1 \cancel{\text{cm}}}{10 \cancel{\text{mm}}} \times \frac{1 \text{in.}}{2.54 \cancel{\text{cm}}} = 1 \text{in.}$$

b) 2.5 m to the nearest foot

c) 10 m to the nearest yard

d) 150 km to the nearest mile



Answers will vary depending on the conversion r

5. a) 1 in.

b) 8 ft.

c) 11 yd.

d) 93 mi.