

## Unit 9 Lesson 3

### From Metric to Imperial or Vice Versa

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#### Minds On:

Take your height that you measured yesterday. Express the measurement in both cm and in mm. 1 foot = 30.48 cm

In some situations, it is important to be able to convert between metric units and imperial units. For example, a North American manufacturer would probably specify dimensions for a product in imperial units. However, key components for the product might be ordered from a European supplier that works in metric units.

When converting between different systems, you need to remember which set of measurements is in which system. The U.S. probe Mars Climate Orbiter burned up in the atmosphere of Mars in 1999, just because onboard computer software mixed up feet and metres in its orbital calculations.



- To convert between metric and imperial systems of measurement, multiply by an appropriate factor equal to 1. Set up the factor so that the correct units cancel.
- Common conversions between the metric and imperial systems are given in the table. All of the equivalent measures shown are approximate.

#### Imperial to Metric Conversion Factors

Length	Area	Volume
1 in. = 25.4 mm or 2.54 cm	1 in. <sup>2</sup> = 6.45 cm <sup>2</sup>	1 in. <sup>3</sup> = 16.39 cm <sup>3</sup>
1 ft. = 0.3048 m	1 ft <sup>2</sup> = 0.0929 m <sup>2</sup>	1 ft <sup>3</sup> = 28.32 dm <sup>3</sup> or 28.32 L
1 yd = 0.9144 m	1 yd <sup>2</sup> = 0.84 m <sup>2</sup>	1 yd <sup>3</sup> = 0.76 m <sup>3</sup>
1 mi = 1.609 km	1 acre = 4047 m <sup>2</sup>	

Capacity	Mass	Speed
1 fl oz = 29.6 mL	1 oz = 28.35 g	1 m.p.h. = 1.609 km/h
1 qt = 0.947 L	1 lb = 0.454 kg	
(U.S.) 1 gal = 3.785 L	1 T = 0.91 t	

### Example 1:. Converting Length Measures

Farad is 5 ft 10 in. tall. Express his height in centimeters. Round your answer to the nearest centimeter.

### Example 2:. Recipe

A family chili recipe measures the ingredients in imperial units. Convert the recipe to metric measures.

4 lb ground beef = \_\_\_\_\_ kg

8 oz tomato paste = \_\_\_\_\_ g

28 fl oz baked beans = \_\_\_\_\_ ml

48 fl oz tomato juice = \_\_\_\_\_ ml

$\frac{1}{4}$  lb chopped onion = \_\_\_\_\_ g

14 fl oz kidney beans = \_\_\_\_\_ ml

**Example 3: Floor dimensions.**

A rectangular room measures 10.5 ft by 11 ft. What is the floor area

a) in  $\text{ft}^2$ ?

b) in  $\text{m}^2$ ?

**POP QUIZ**

Try the following conversions using your conversion chart:

<b>If you bought a 24 foot ladder, how many meters would it be?</b>	<b>How many squared feet is a house that measures 42 squared meters?</b>
<b>If a bag of salt holds 150 cubic inches, how many cubic centimetres does it hold?</b>	<b>The length of a CFL football field is 160 yards from end-zone to end-zone. How many meters long is the field?</b>
<b>Joe is 1.75 meters tall. How many feet tall is Joe?</b>	<b>One can of paint is enough to paint 500 squared feet. How many squared meters can you paint with this one can?</b>