

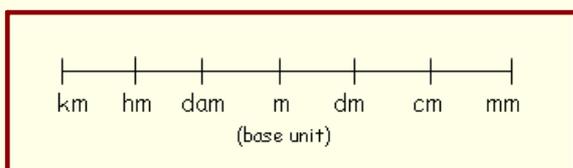
S&S C2 - Conversions

Use proportional reasoning / unit analysis to convert measurements within or between the SI and Imperial systems of linear measurement

Solving problems involving the conversion of linear measurements

Conversions within the SI system

The SI system makes conversions easy because all units are based on multiples of 10.



Each of the above units are separated by a factor of 10.

Example:

a) Convert 45 cm into meters.

b) Convert 0.27 km into meters.

$$45\text{cm} \times \left(\frac{1\text{m}}{100\text{cm}}\right) = 0.45\text{m} \quad 0.27\text{km} \times \left(\frac{1000\text{m}}{1\text{km}}\right) = 270\text{m}$$

Practice - SI Conversions

Consider each measurement. State whether it is reported in the most appropriate unit. If it is not, explain why and convert to a more appropriate unit.

- (a) The highest mountain in Canada, Mount Logan, has a height of 595 900 cm.

$$5959 \text{ m} \quad \text{or} \quad 5.959 \text{ km}$$

- (b) The diameter of a water bottle is 0.064 m.

$$64 \text{ mm} \quad \text{or} \quad 6.4 \text{ cm}$$

- (c) The world's tallest bear was 4200 mm.

$$4.2 \text{ m}$$

- (d) A whooping crane's wingspan is 0.001 95 km.

$$1.95 \text{ m}$$

Conversions within the Imperial system

See formula sheet for conversion factors.

Example:

If 1 yd = 3 ft, then

$$2 \text{ yds} = \underline{6} \text{ ft}$$

$$3 \text{ yds} = \underline{9} \text{ ft}$$

$$20 \text{ yds} = \underline{60} \text{ ft}$$

$$22.5 \text{ yds} = \underline{67.5} \text{ ft}$$

To convert from yards to feet \longrightarrow $\underline{\hspace{1cm}} \text{ yds} \times \left(\frac{3 \text{ ft}}{1 \text{ yd}} \right) = \underline{\hspace{1cm}} \text{ ft}$

Conversions within the Imperial system

Example:

If 12 in = 1 ft, then

$$24 \text{ in} = \underline{2} \text{ ft}$$

$$36 \text{ in} = \underline{3} \text{ ft}$$

$$120 \text{ in} = \underline{10} \text{ ft}$$

$$150 \text{ in} = \underline{12.5} \text{ ft}$$

To convert from inches to feet \longrightarrow $\underline{\hspace{1cm}} \text{ in} \times \left(\frac{1 \text{ ft}}{12 \text{ in}} \right) = \underline{\hspace{1cm}} \text{ ft}$

Conversion Examples

a) 4 ft = _____ in

$$4 \text{ ft} \times \left(\frac{12 \text{ in}}{1 \text{ ft}} \right) = 48 \text{ in}$$

b) 12 ft = _____ yd

$$12 \text{ ft} \times \left(\frac{1 \text{ yd}}{3 \text{ ft}} \right) = 4 \text{ yd}$$

c) 3 mi = _____ ft

$$3 \text{ mi} \times \left(\frac{5280 \text{ ft}}{1 \text{ mi}} \right) = 15840 \text{ ft}$$

d) 8 in = _____ cm

$$8 \text{ in} \times \left(\frac{2.54 \text{ cm}}{1 \text{ in}} \right) = 20.32 \text{ cm}$$

e) $2\frac{5}{8}$ in = _____ cm

$$2.625 \text{ in} \times \left(\frac{2.54 \text{ cm}}{1 \text{ in}} \right) = 6.67 \text{ cm}$$

f) 1.4 mile = _____ m

$$1.4 \text{ mi} \times \left(\frac{1609 \text{ m}}{1 \text{ mi}} \right) = 2252.6 \text{ m}$$

Practice (Board Work)

Alex is on his way home to Moosomin, SK. He was visiting friends in Mohall, North Dakota. As soon as he gets on the highway, he sees the sign to the right.



As Alex passes the Canada-U.S. border, he sees this sign. What is the driving distance between Mohall and Moosomin, in SI units?



Practice

Try: Janice needs to tighten a nut on her bicycle. She finds two wrenches.

- The $\frac{1}{4}$ in. wrench is too small.
- The $\frac{3}{8}$ in. wrench is too large.

Janice's neighbour suggests that the nut might be an SI size. Assume that the sizes of SI wrenches are only in whole millimetres. What SI wrench sizes are between the two imperial sizes Janice tried?

Text: pg. 3: 3, 4
pg. 6: 2, 7
pg. 11: 4 - 6, 11

Quick Check