\[
\frac{1 \text{ kg}}{1 \text{ kg}} = 1 = \frac{2.205 \text{ lb}}{1 \text{ kg}}
\]

The expression 2.205 lb/1 kg is a **conversion factor** that changes kilograms to pounds or vice versa. The “1 kg” quantity in this conversion factor is **exactly** 1 kilogram. Therefore when you use this conversion factor, the number of significant figures is determined by the number of significant figures in 2.205 lb.

**Dimensional Analysis in Three Simple Steps**

You can use the following three-step process to convert any given unit to the unit you need:

1. Write a conversion factor that relates the given unit to the wanted unit. If you cannot relate the two units directly with a single conversion factor, write a conversion factor that relates the given unit to an intermediate unit.

2. Multiply the given unit by the conversion factor from Step 1. Follow the algebraic rules from multiplication of fractions.

3. If the result of Step 2 is the wanted unit, the conversion is finished. If not, you must convert the intermediate unit. If another conversion is necessary, repeat Steps 1 and 2 until you arrive at the wanted unit.

Here is an example of a conversion that requires two steps:

Convert 3.00 feet to centimeters. 1 foot = 12 inches; 1 inch = 2.54 centimeters.

\[
3.00 \text{ ft} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} = 91.4 \text{ cm}
\]

**Workshop: Dimensional Analysis**

**Questions**

*Use dimensional analysis to answer each question. Record your solutions and notes in the spaces provided.*

1. Find the number of centimeters in 1.00 \times 10^2 yards.

\[
1.00 \times 10^2 \text{yd} \left(\frac{3 \text{ ft}}{1 \text{ yd}}\right) \left(\frac{12 \text{ in}}{1 \text{ ft}}\right) \left(\frac{2.54 \text{ cm}}{1 \text{ in}}\right) = \boxed{9.14 \times 10^3 \text{ cm}}
\]