

## Chapter 3 Newton's First Law of Motion—Inertia

**Making Unit Conversions**

Foods manufactured and packaged outside the United States state the amount in the package in mass units. If a package of cookies manufactured in England contains 0.68 kg, what is the weight in pounds (lb) in the package?

**1. Read and Understand**

*What information are you given?*

Mass of the cookies = 0.68 kg

**2. Plan and Solve**

*What unknown are you trying to calculate?*

Weight of the cookies

*What is the relationship between kilograms and pounds?*

1 kilogram = 2.2 pounds

*Use this relationship as conversion factors.*

$$\frac{1 \text{ kg}}{2.2 \text{ lb}} \text{ or } \frac{2.2 \text{ lb}}{1 \text{ kg}}$$

*Use the value that you know and choose the correct conversion factor.*

$$0.68 \text{ kg} \times \frac{2.2 \text{ lb}}{1 \text{ kg}} = 1.5 \text{ lb}$$

**3. Look Back and Check**

*Is your answer reasonable?*

Yes, the cookies have a mass of less than 1 kg and the calculated number is less than 2.2 pounds. Also, the units canceled correctly, so the correct conversion factor was used.

**Math Practice**

*On a separate sheet of paper, solve the following problems.*

1. A large package of chocolate from Switzerland contains 1.8 kilograms. What is the weight of the chocolate in pounds (lb)?
2. A canned meat product manufactured in the United States contains 0.75 pound. If the product were sold in Europe, how many kilograms would the label show?
3. A large instrument used by astronauts weighs 2.50 pounds on Earth. What is the mass of the instrument on the moon? (*Hint:* On the surface of the moon, the object would have only one sixth the weight it has on Earth.)