Chapter 3   Newton's First Law of Motion—Inertia

Making Unit Conversions   / 15

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   (5 pts each)

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.)