

## Mass in the Système International

# 4.3

### NEW SKILLS: WORKING WITH SI UNITS OF MASS

In the Système International (SI), the **kilogram** is the basic unit of mass, but it is commonly used for weight as well.

$$1000 \text{ grams (g)} = 1 \text{ kilogram (kg)}$$

$$1000 \text{ milligrams (mg)} = 1 \text{ gram}$$

$$1 \text{ tonne (t)} = 1000 \text{ kilograms}$$

For more details, see page 154 of *MathWorks 10*.

**kilogram:** the mass of one litre of water at 4°C

Note that a tonne (t) is not the same as a ton (tn). A tonne is sometimes referred to as a metric ton.

### Example 1

A recipe for cornbread calls for 120 g of flour, 170 g of cornmeal, and 50 g of sugar. If you double the recipe, what is the total weight of the dry ingredients?

#### SOLUTION

You can either add the weights together and then double the sum, or double the weights and then add them together.

Flour:

Cornmeal:

Sugar:

Add the weights of all the ingredients.

There are \_\_\_\_\_ of dry ingredients in the doubled recipe.



## NEW SKILLS: WORKING WITH MASS/ WEIGHT CONVERSION BETWEEN IMPERIAL AND SI

In this section, you will need to work with the relationship between the SI and the imperial units of weight. One kilogram weighs about 2.2 lb. You can also use this information to convert from grams to ounces and tonnes to tons.

For more details, see page 157 of *MathWorks 10*.

### Example 2

Lorinda is baking apple pies. According to her recipe, she needs 6 pounds of apples. The bag of apples she bought only shows the weight in kilograms. How many kilograms of apples does she need?

#### SOLUTION

$$2.2 \text{ lb} = 1 \text{ kg}$$

She will need approximately \_\_\_\_\_ kg of apples.

### BUILD YOUR SKILL

- A recipe calls for 180 g of flour. How much is this in ounces?
- A baby weighed 7 pounds 12 ounces at birth. How much did it weigh in grams?

To estimate a conversion from pounds to kilograms, you can think of a pound as being about  $\frac{1}{2}$  kg.

6. Chen weighs 68 kg. How much does he weigh in pounds?

**Example 3**

The cost of bananas is \$0.49/lb at one store, but you see an advertisement for bananas on sale at another store for \$1.05/kg. Which is the better buy?

**SOLUTION**

Convert the price of bananas at the first store to kilograms.

1 kg costs \_\_\_\_\_ times the cost of 1 lb.

$$\text{_____} \times 0.49 = \text{_____}$$

One kilogram of bananas at the first store costs about \_\_\_\_\_. The sale at the \_\_\_\_\_ store is a better buy.

**BUILD YOUR SKILLS**

7. How much does 1 pound of beef cost if the butcher shop sells it for \$9.74/kg?

8. Which is the better buy: 200 g of coffee beans at \$3.85 or 1 pound at \$9.60?

9. The dosage of a certain medicine is 0.05 mg/kg of weight. Tom weighs 185 lbs.

a) How many milligrams of the medicine should he take?

b) If the medicine costs \$1.95/mg, what will his dosage cost?

**PRACTISE YOUR SKILL**

1. Convert the following weights.

a) 2.5 t = \_\_\_\_\_ kg

b) 2.8 kg = \_\_\_\_\_ g

c) 125 g = \_\_\_\_\_ kg

d) 2.4 g = \_\_\_\_\_ kg



5. Karen is making a batch of potato soup. She needs 8 potatoes, and each potato weighs about 375 g.

How many pounds of potatoes does she need?

6. If a 10-lb bag of grass seed costs \$75.45, how much does the seed cost per kilogram?

7. How many  $\frac{1}{4}$  pound hamburgers can you make out of 1.9kg of ground beef?

