

## Measuring Matter (pages 44–48)

### Weight and Mass (pages 44–45)

**Key Concept:** Unlike weight, mass does not change with location, even when the force of gravity on an object changes.

- **Weight** measures the pull of gravity on an object. Weight changes in different places. You would weigh less on the moon than on Earth.
- **Mass** is the amount of matter in an object. The amount of matter in an object does not change in different places. Your body would have the same mass on both the moon and Earth.
- Mass is measured in grams or kilograms.

*Answer the following question. Use your textbook and the ideas above.*

1. Read each word in the box. In each sentence below, fill in one of the words.

weight	mass	grams
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- a. The amount of matter in an object is the object's \_\_\_\_\_.
- b. The measure of the pull of gravity on an object is the object's \_\_\_\_\_.

**Introduction to Matter** ▪ *Adapted Reading and Study***Volume** (page 46)

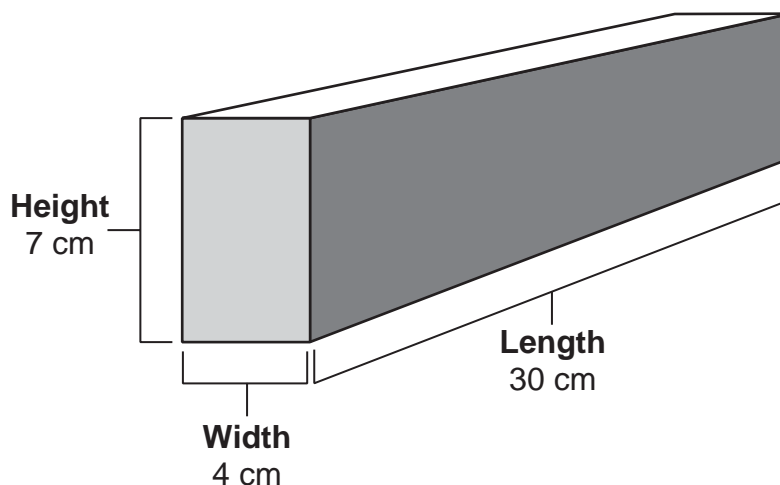
**Key Concept:** Common units of volume include the liter (L), milliliter (mL), and cubic centimeter (cm<sup>3</sup>).

- **Volume** is how much space matter takes up.
- The volume of a liquid is measured in liters and milliliters. The volume of a solid is measured in cubic centimeters. One cubic centimeter is equal to one milliliter.
- You can find the volume of some solids by measuring their length, width, and height. Then you multiply these measurements.

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

*Answer the following questions. Use your textbook and the ideas above.*

2. Which units are used to measure volume?
  - a. grams
  - b. cubic centimeters
  - c. mass
3. The picture shows the length, width, and height of a block of wood. Use these measurements to find the volume of the block of wood. The volume is \_\_\_\_\_.



**Introduction to Matter** ▪ *Adapted Reading and Study***Density** (pages 47–48)

**Key Concept:** You can determine the density of a sample of matter by dividing its mass by its volume.

- **Density** relates the mass of an object to its volume. Density can be described as grams per cubic centimeter or  $\text{g/cm}^3$ .
- You can find the density of an object by measuring the object's mass and volume. Then you divide the mass of the object by its volume.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

- Objects that have a lot of mass in a small volume are very dense. Objects with a small amount of mass in a large volume are less dense.
- Water has a density of  $1 \text{ g/cm}^3$ . Objects with a greater density than water will sink. Objects with a lesser density than water will float.
- Density is a physical property of matter.

*Answer the following questions. Use your textbook and the ideas above.*

4. Circle the letter of each sentence that is true about density.
  - a. Density is equal to the mass of an object.
  - b. Objects with a lesser density than water will float.
  - c. Density is a physical property.
5. An object has a mass of 25 g and a volume of  $10 \text{ cm}^3$ . What is the object's density? Circle the letter of the correct answer.
  - a.  $250 \text{ g/cm}^3$
  - b.  $0.4 \text{ g/cm}^3$
  - c.  $2.5 \text{ g/cm}^3$