

LESSON

15-2

Volume of Rectangular Prisms**Reteach**

The volume of a rectangular prism is found by multiplying its length, width, and height. In some cases, instead of the length and width, the area of one of the bases of the prism will be known.

Length, width, height, and volume

A rectangular prism has dimensions of 2.5 meters, 4.3 meters, and 5.1 meters. What is its volume to two significant figures?

Solution

$$V = l \times w \times h$$

$$V = 2.5 \times 4.3 \times 5.1$$

$$= 54.825$$

To two significant figures, the volume of the prism is 55 cubic meters.

Base area, height, and volume

A rectangular prism has a base area of $\frac{2}{3}$ of a square foot. Its height is $\frac{1}{2}$ foot.

What is its volume?

Solution

$$V = A_{\text{base}} \times h$$

$$V = \frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$$

The volume of the prism is $\frac{1}{3}$ cubic foot.

Find the volume of a rectangular prism with the given dimensions.

- length: $\frac{2}{3}$ yd; width: $\frac{5}{6}$ yd; height: $\frac{4}{5}$ yd _____
- base area: 12.5 m^2 ; height: 1.2 m _____

The density of a metal in a sample is the mass of the sample divided by the volume of the sample. The units are mass per unit volume.

Problem The mass of a sample of metal is 2,800 grams. The sample is in the shape of a rectangular prism that measures 5 centimeters by 7 centimeters by 8 centimeters. What is the volume of the sample?

$$V = 5 \times 7 \times 8$$

$$= 280 \text{ cm}^3$$

What is the density of the sample?

$$2,800 \div 280 = 10 \text{ g/cm}^3$$

- A sample of metal has a mass of 3,600 grams. The sample is in the shape of a rectangular prism that has dimensions of 2 centimeters by 3 centimeters by 4 centimeters. What is the density of the sample?