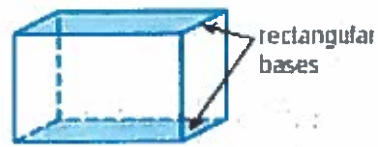


$V = lwh$
Chapter 10 Lesson 1

Volume of Rectangular Prisms

A **three-dimensional figure** has length, width, and height. A **prism** is a three-dimensional figure with two parallel bases that are congruent polygons. In a **rectangular prism**, the bases are congruent rectangles.



Volume is the amount of space inside a three-dimensional figure. It is measured in **cubic units**, which can be written using abbreviations and an exponent of 3, such as units³ or in³.

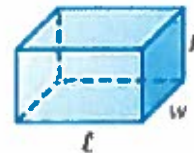


VOLUME OF A RECTANGULAR PRISM:

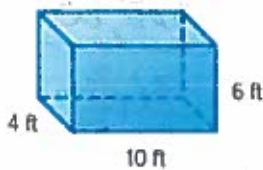
Words The volume V of a rectangular prism is the product of its length l , width w , and height h .

Symbols $V = lwh$ or $V = Bh$

Model



EXAMPLES:

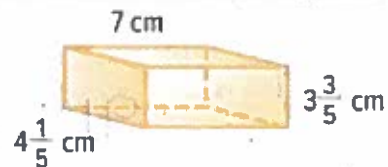


$$V = lwh$$

$$V = 10 \cdot 4 \cdot 6$$

$$V = 40 \cdot 6$$

$$V = 240 \text{ ft}^3$$



$$V = lwh$$

$$V = 7 \cdot 4\frac{1}{5} \cdot 3\frac{3}{5}$$

$$V = 29\frac{2}{5} \cdot 3\frac{3}{5}$$

$$V = 105\frac{21}{25} \text{ cm}^3$$

Find the volume of a container that measures 4 inches long, 5 inches high, and $8\frac{1}{2}$ inches wide.

$$V = lwh$$

$$V = 4 \cdot 8\frac{1}{2} \cdot 5$$

$$V = 34 \cdot 5$$

$$V = 170 \text{ in}^3$$

Find the Missing Dimensions of a Rectangular Prism: replace the variables with known measurements. Then solve for the unknown measurement.

$$V = 94.5 \text{ km}^3, \ell = 7 \text{ km}, h = 3 \text{ km}, w = ?$$

$$V = lwh$$

$$94.5 = \underline{7} \cdot w \cdot \underline{3}$$

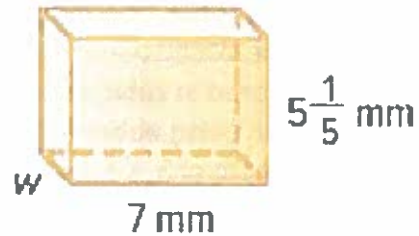
$$\frac{94.5}{21} = \frac{21w}{21}$$

$$4.5 = w$$

$$4.5 \text{ km} = w$$

$$\frac{7}{1} \times \frac{26}{5} = \frac{182}{5}$$

$$5 \overline{) 182} \begin{array}{r} 36 \frac{2}{5} \\ -15 \\ \hline 32 \\ -30 \\ \hline 2 \end{array}$$



$$V = 109 \frac{1}{5} \text{ mm}^3$$

$$V = lwh$$

$$109 \frac{1}{5} = \underline{7} \cdot w \cdot \underline{5 \frac{1}{5}}$$

$$\frac{109 \frac{1}{5}}{36 \frac{2}{5}} = \frac{36 \frac{2}{5} w}{36 \frac{2}{5}}$$

$$3 = w$$

$$3 \text{ mm} = w$$

$$\frac{546}{5} \div \frac{182}{5}$$

$$\frac{546}{5} \times \frac{5}{182}$$

$$91 \overline{) 273} \begin{array}{r} 3 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \overline{) 546} \quad 182 \\ \underline{273} \quad / 91 \end{array}$$

$$\begin{array}{r} 91 \\ \times 2 \\ \hline 182 \end{array}$$

$$\begin{array}{r} 91 \\ \times 3 \\ \hline 273 \end{array}$$