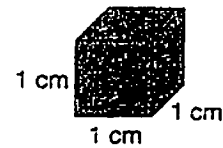# SKILL 17: Volume of Rectangular Prisms

The **volume** is the number of cubic units in a solid. The volume of this solid is 1 cm^3.

The volume of a rectangular prism is found by multiplying the area of the base (B) times the height (h) of the prism. Remember that the area of the base is length × width.

1 cm 1 cm
1 cm

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

Example 1

Find the volume of the rectangular prism shown.
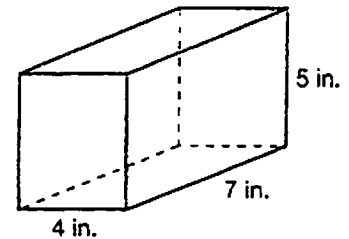
Step 1: Find the area of the rectangular base.
$B = 4 \times 7 = 28$ in^2

Step 2: Find the volume.
$V = B \times h = 28 \times 5 = 140$ in^3

So, the volume of the rectangular prism is 140 in^3.

5 in.
7 in.
4 in.

Example 2

Find the height of the rectangular prism with volume 225 cm^3 and base dimensions 5 cm by 5 cm.
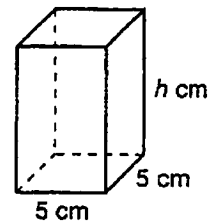
Step 1: Find the area of the rectangular base.
$B = 5 \times 5 = 25$ cm^2

Step 2: Substitute in the volume formula to find the height.
$V = B \times h \quad 225 = 25 \times h$
$\qquad\qquad\qquad 9 = h$
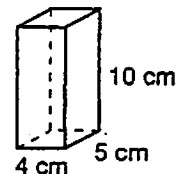
So, the height of the rectangular prism is 9 cm.

h cm
5 cm
5 cm

Guided Practice

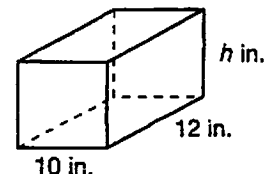1. Find the volume of the rectangular prism.

   a. Find the area of the base. _____

   b. Find the volume. _____

   10 cm
   4 cm   5 cm

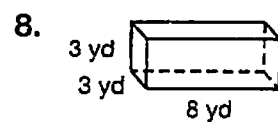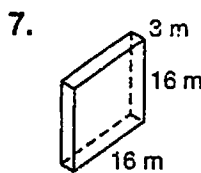2. Find the height of the figure. The volume is 960 in^3.

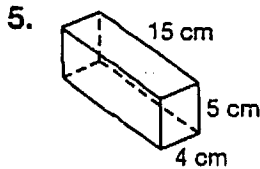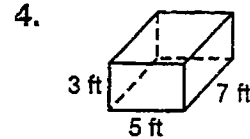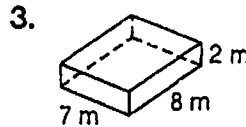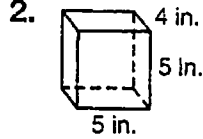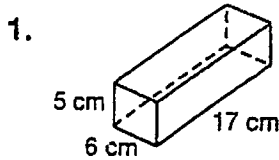   a. Find the area of the base. _____

   b. Substitute in the volume formula to find the height. _____

   h in.
   12 in.
   10 in.

SKILL 17: Practice
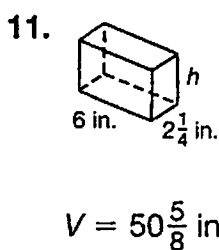
Find the volume of each rectangular prism.

1.
5 cm
6 cm
17 cm

2.
4 in.
5 in.
5 in.

3.
2 m
7 m
8 m

4.
3 ft
7 ft
5 ft

_____

5.
15 cm
5 cm
4 cm

6.
8 in.
8 in.
8 in.

7.
3 m
16 m
16 m

8.
3 yd
3 yd
8 yd

_____
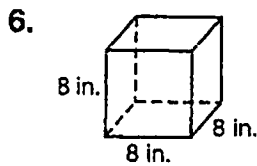
Find the length, width, or height of the rectangular prism with the given volume.

9.
h
12 mm
9 mm
$V = 3,024 \text{ mm}^3$

h = _____

10.
11 yd
7 yd
ℓ
$V = 1,540 \text{ yd}^3$

ℓ = _____

11.
6 in.
$2\frac{1}{4}$ in.
h
$V = 50\frac{5}{8} \text{ in}^3$

h = _____

12.
8.2 cm
31.4 cm
w
$V = 1,338.896 \text{ cm}^3$
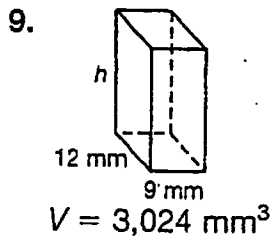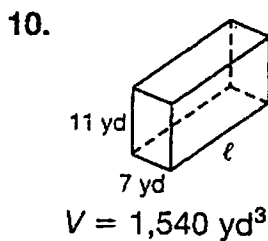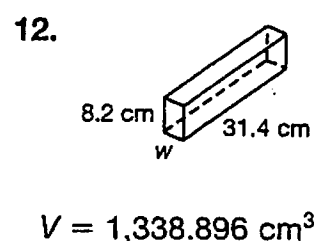
w = _____

Solve.

13. The Panama Canal has a length of 89,200 yd, a width of 37 yd, and a depth of 14 yd. Estimate the volume of water in the canal by assuming it has the shape of a rectangular prism.

_____

14. The freezer compartment in a refrigerator is 20 in. long, 16 in. wide, and 11 in. deep. What is the volume of the freezer compartment?

_____

TEST PREP

15. What is the volume of a cube that has sides of length 7 cm?

Skill 17

A 343 cm^3 C 98 cm^3
B 294 cm^3 D 49 cm^3

16. What is the surface area of the cylinder? Use 3.14 for π.

10 ft
2 ft

Skill 16

F 94.2 ft^2 H 188.4 ft^2
G 219.8 ft^2 J 753.6 ft^2