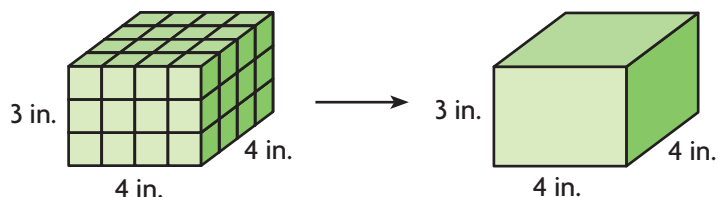## Apply Volume Formulas

Essential Question How can you use a formula to find the volume of a rectangular prism?

Measurement and Data—5.MD.5a, 5.MD.5b
MATHEMATICAL PRACTICES
MP.1, MP.6

CONNECT Both prisms show the same dimensions and have the same volume.

3 in.
4 in.
4 in.

3 in.
4 in.
4 in.

🔑 Unlock the Problem Real World

Mike is making a box to hold his favorite DVDs. The length of the box is 7 inches, the width is 5 inches and the height is 3 inches. What is the volume of the box Mike is making?

- Underline what you are asked to find.
- Circle the numbers you need to use to solve the problem.

🔑 One Way Use length, width, and height.

You can use a formula to find the volume of a rectangular prism.
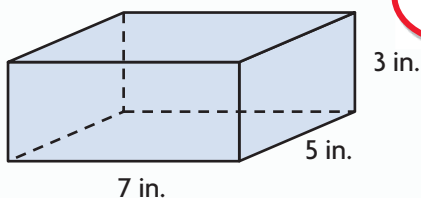
$$Volume = length \times width \times height$$
$$V = l \times w \times h$$

STEP 1 Identify the length, width, and height of the rectangular prism.

length = _____ in.

width = _____ in.

height = _____ in.

3 in.
5 in.
7 in.

Math Talk **Mathematical Practices**

Explain how you can use the Associative Property to group the part of the formula that represents area.

STEP 2 Multiply the length by the width.

_____ × _____ = _____

STEP 3 Multiply the product of the length and width by the height.

35 × _____ = _____

So, the volume of Mike's DVD box is _____ cubic inches.

You have learned one formula for finding the volume of a rectangular prism.
You can also use another formula.

> *Volume = Base area × height*
>   *V = B × h*
> *B* = area of the base shape,
> *h* = height of the solid figure.

🔑 Another Way Use the area of the base shape and height.

Emilio's family has a sand castle kit. The kit includes molds for several
solid figures that can be used to make sand castles. One of the molds is a
rectangular prism like the one shown at the right. How much sand will it
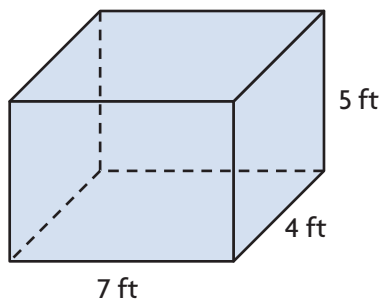take to fill the mold?
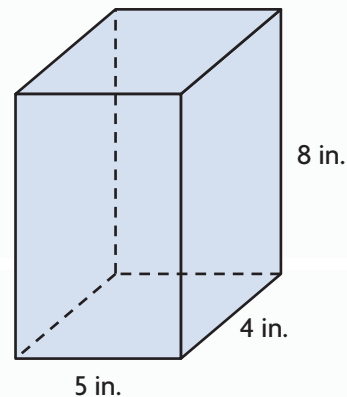
$V = \underline{} B \underline{} \times h$ Replace *B* with an expression for the area of the base shape. Replace *h* with the height of the solid figure.

$V = (\underline{} \times \underline{}) \times \underline{}$ Multiply.

$V = \underline{} \times \underline{}$

$V = \underline{}$ cu in.

8 in.

4 in.

5 in.

So, it will take _____ cubic inches of sand to fill the
rectangular prism mold.

Try This!

Ⓐ Find the volume.

5 ft

4 ft

7 ft

$V = l \times w \times h$

$V = \underline{} \times \underline{} \times \underline{}$

$V = \underline{} \times \underline{}$

$V = \underline{}$ cu ft

Ⓑ Find the unknown measurement.

■ cm

4 cm

5 cm

$V = 60$ cu cm
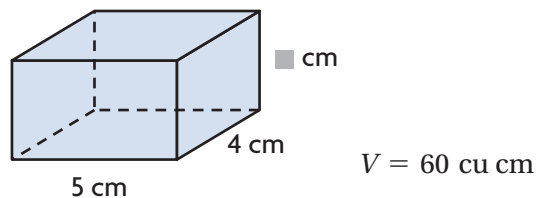
$V = l \times w \times h$

$60 = \underline{} \times \underline{} \times ■$

$60 = \underline{} \times ■$

Think: If I filled this prism with centimeter
cubes, each layer would have 20 cubes. How
many layers of 20 cubes are equal to 60?
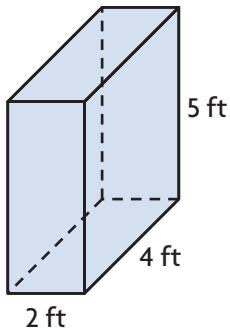
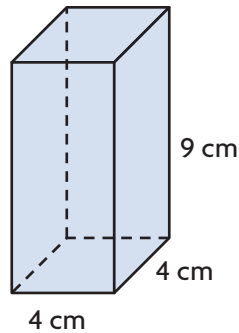So, the unknown measurement is _____ cm.

Name _____

Find the volume.

✔ **1.**

5 ft
4 ft
2 ft

V = _____

✔ **2.**

9 cm
4 cm
4 cm

V = _____

On Your Own

Find the volume.

3.

6 in.
6 in.
6 in.

V = _____

4.

4 ft
4 ft
12 ft

V = _____

5.

4 cm
6 cm
10 cm

V = _____

6.

12 in.
6 in.
14 in.
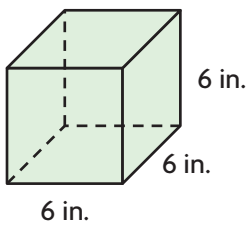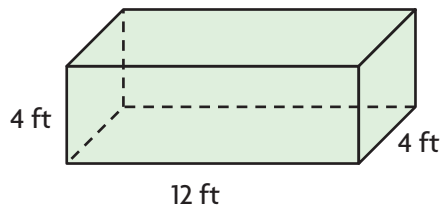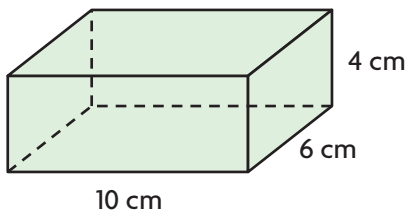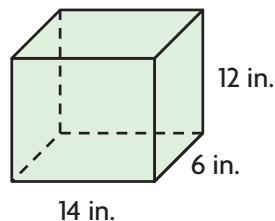
V = _____

MATHEMATICAL PRACTICE ② **Use Reasoning** **Algebra** Find the unknown measurement.

7.

■ ft
6 ft
7 ft

V = 420 cu ft   ■ = _____ ft

8.

■ cm
15 cm
6 cm

V = 900 cu cm   ■ = _____ cm