Visual Learning Animation
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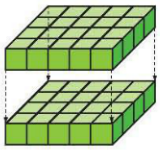
Direct students' attention to the model shown in the box. Make sure students understand that this drawing shows only the bottom layer of the prism shown in the first box. *Why is only one layer shown?* [If you find the number of cubes in one layer, you can multiply to find the total number of cubes.]

There are two layers.



20 cubes × 2 layers = 40 cubic units

The measures are in inches, so the volume of the rectangular prism is 40 cubic inches (in^3).

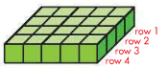
What does a volume of 40 cubic inches mean? [It means that the prism takes up the same amount of space as forty 1-inch cubes.]

Prevent Misconceptions

Some students may think that volume can only be measured in cubic inches. Build a prism out of base ten cubes using each cube as 1 cubic unit. Emphasize that volume can be measured in units other than cubic inches. Ask students to suggest other cubic units of measure for volume.

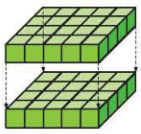
Count cubes to find volume.

If the cubic units are shown, you can count the cubes inside the rectangular prism. Begin with the base layer of the prism. It has 5 cubes each in 4 rows.



There are 20 cubic units in the base layer of the prism.

There are two layers.



20 cubes × 2 layers = 40 cubic units

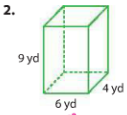
The measures are in inches, so the volume of the rectangular prism is 40 cubic inches (in^3).

Guided Practice*

Do you know HOW?

In **1** through **3**, find the volume of each rectangular prism.

1. 
27 $units^3$

2. 

216 yd^3

3. Base area: 26 m^2
height: 4 m
104 m^3

Do you UNDERSTAND?

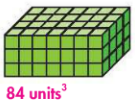
4. In the example above, how do you know both of the layers are the same?
See margin.

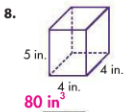
5. A cereal box measures 6 in. by 10 in. by 2 in. Draw a rectangular prism and label it. What is the volume of the figure you drew?
Check students' drawings; 120 in^3

6. **Writing to Explain** How can you use different methods to find the volumes of the prisms in Exercises 1–3?
See margin.

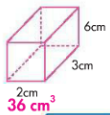
Independent Practice

In **7** through **12**, find the volume of each rectangular prism.

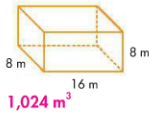
7. 
84 $units^3$

8. 

80 in^3

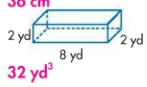
9. 

36 cm^3

10. 

1,024 m^3

11. 
18 $units^3$

12. 

32 yd^3

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*For another example, see Set D on page 345.

2 Guided Practice

Formative Assessment

Remind students that depending on what type of information is given, they will use either $V = \ell \times w \times h$ or $V = B \times h$ to find volume.

Exercise 5

Error Intervention

If students cannot find the volume of a prism when three dimensions are given,

then have students build the prism with cubes. Draw the prism on the board. Label the length 6 in., the width 2 in., and the height 10 in. Write the equation 6 in. × 2 in. × 10 in. = 120 in^3. Have a volunteer label the numbers with the letters ℓ, w, h, and V. *How many cubes make up the base?* [12] *If you could not count cubes, how could you tell?* [Multiply the number along one side by the number along the other side.] *How many cubes high is the prism?* [10] *How do you find the volume?* [Multiply the base area by the height.]

Reteaching For another example and more practice, assign **Reteaching** Set D on p. 345.

3 Independent Practice

Remind students to label their answers with the appropriate unit. Use Exercise 12 as an example. *What is the unit measure for the length?* [Yards] *What is the unit measure for the height?* [Yards] *What do you get when you multiply yards × yards × yards?* [Yards^3 or cubic yards] *Make certain that volume is always expressed in cubic units.*

See **Extensions** on page 345A.

4. One layer of cubes fits on top of the other exactly.

6. Sample answer: I can count the cubic units in Exercise 1. In Exercise 2 and 3, I can use different formulas depending on whether the ℓ and w or B is given.