Find Volume of Composed Figures

Essential Question How can you find the volume of rectangular prisms that are combined?
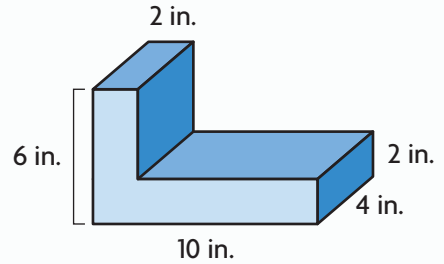
**Measurement and Data—
5.MD.5c**
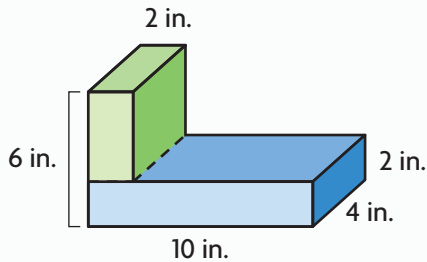*Also 5.MD.5b*
MATHEMATICAL PRACTICES
MP.3, MP.5

🔑 Unlock the Problem Real World

The shape at the right is a composite figure. It is made up of two rectangular prisms that are combined. How can you find the volume of the figure?
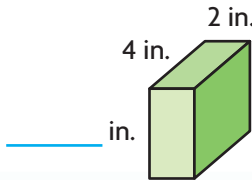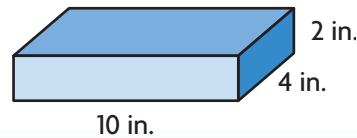
2 in.

6 in.

2 in.

2 in.

4 in.

10 in.

🔑 One Way   Use addition.

STEP 1   Break apart the solid figure into two rectangular prisms.

2 in.

6 in.

2 in.

4 in.

10 in.

STEP 2   Find the length, width, and height of each prism.

2 in.
4 in.

_____ in.

Think: The total height of both prisms is 6 inches. Subtract the given heights to find the unknown height. $6 - 2 = 4$

2 in.
4 in.
10 in.

STEP 3   Find the volume of each prism.

$V = l \times w \times h$

$V = $ _____ $\times$ _____ $\times$ _____

$V = $ _____ in.³

$V = l \times w \times h$

$V = $ _____ $\times$ _____ $\times$ _____

$V = $ _____ in.³

STEP 4   Add the volumes of the rectangular prisms.

_____ + _____ = _____

So, the volume of the composite figure is _____ cubic inches.

- **MATHEMATICAL PRACTICE ③** **Compare Strategies** What is another way you could divide the composite figure into two rectangular prisms?

_____

_____

🔑 **Another Way** Use subtraction.

You can subtract the volumes of prisms formed in empty spaces from the greatest possible volume to find the volume of a composite figure.
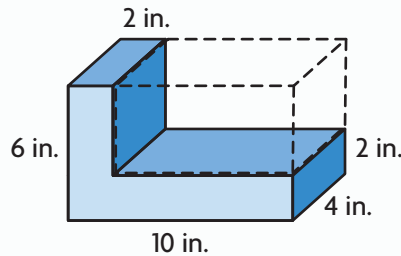
STEP 1

Find the greatest possible volume.

length = _____ in.

width = _____ in.

height = _____ in.

V = _____ cubic inches
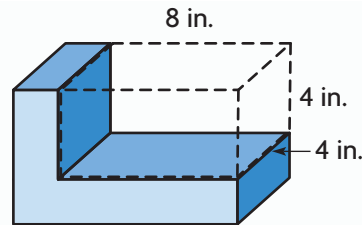
2 in.

6 in.   2 in.

4 in.

10 in.

STEP 2

Find the volume of the prism in the empty space.

length = _____ in.   **Think:** 10 − 2 = 8

width = _____ in.

height = _____ in.   **Think:** 6 − 2 = 4

$V = 8 \times 4 \times 4 =$ _____ cubic inches

8 in.

4 in.

4 in.

STEP 3

Subtract the volume of the empty space from the greatest possible volume.

_____ − _____ = _____ cubic inches

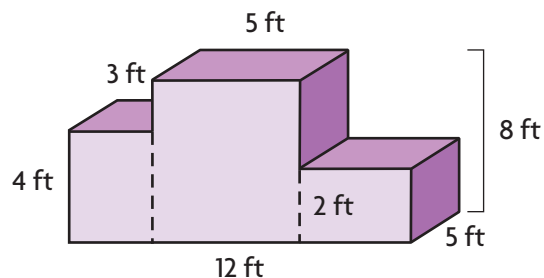So, the volume of the composite figure is _____ cubic inches.

Try This!

Find the volume of a composite figure made by putting together three rectangular prisms.

$V =$ _____ × _____ × _____ = _____ cu ft

$V =$ _____ × _____ × _____ = _____ cu ft

$V =$ _____ × _____ × _____ = _____ cu ft

Total volume = _____ + _____ + _____ = _____ cubic feet

5 ft

3 ft

8 ft

4 ft

2 ft

5 ft

12 ft

Name _____

Find the volume of the composite figure.

☑ **1.**

2 in.

5 in.

2 in.

4 in.

8 in.

$V =$ _____

☑ **2.**

7 cm

1 cm

6 cm

2 cm

3 cm
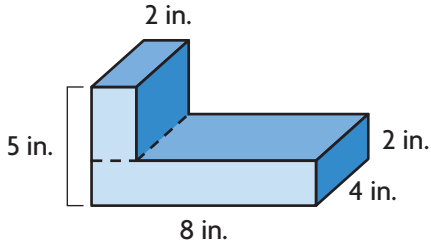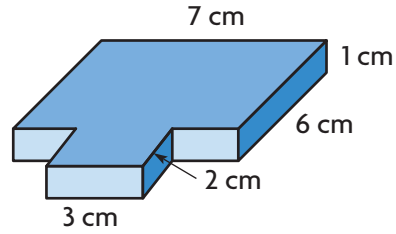
$V =$ _____

On Your Own

Find the volume of the composite figure.

3.

3 ft

2 ft

2 ft

6 ft

4 ft

$V =$ _____

4.
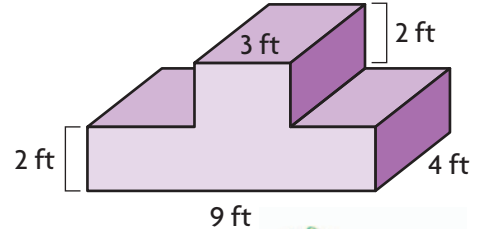
10 cm

3 cm

6 cm

3 cm

4 cm

2 cm

2 cm

$V =$ _____
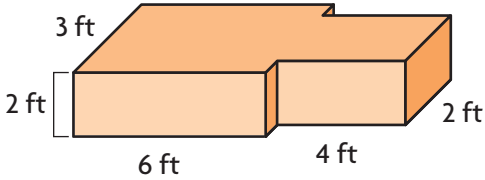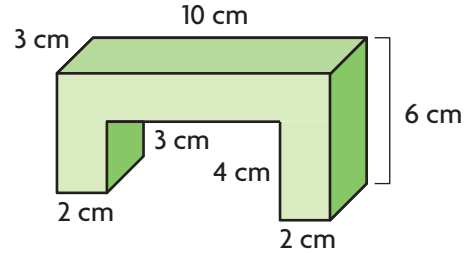
5. **GO DEEPER** Mr. Williams' class built this platform for a school event. They also built a model of the platform in which 1 foot was represented by 2 inches. What is the volume of the platform? What is the volume of the model?
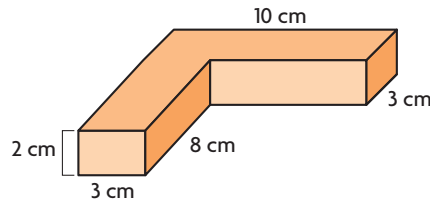
3 ft

2 ft

2 ft

9 ft

4 ft

_____

6. **THINK SMARTER** Patty added the values of the expressions $2 \times 3 \times 11$ and $2 \times 3 \times 10$ to find the volume of the composite figure. Describe her error. What is the correct volume of the composite figure?

10 cm

3 cm

2 cm

8 cm

3 cm

Math on the Spot

_____

_____

_____