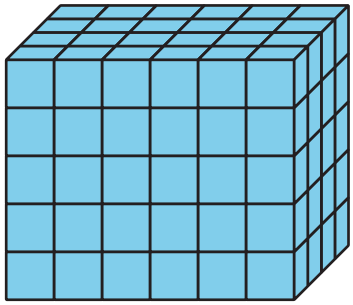
Unit 1 Family Support Materials

Finding Volume

In this unit, students find the volumes of rectangular prisms and figures composed of two prisms.

Section A: Unit Cubes and Volume

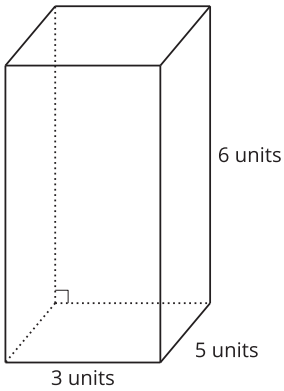
In this section, students learn to call the amount of space an object takes up volume. Volume is measured in unit cubes. For example, this prism has a volume of 120 unit cubes.



To find the volume of any prism, students can count the number of unit cubes in one layer and multiply that number by the number of layers. In this example, students might describe this prism as having 5 layers of 24 unit cubes.
They can find the number of cubes by multiplying 5 and 24. So $5 \times 24 = 120$.

Section B: Expressions for Finding Volume

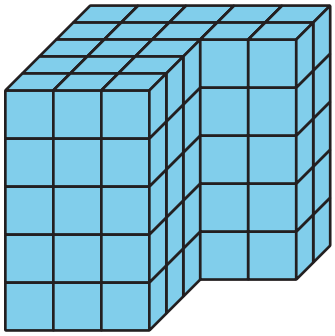
In this section, students find the volume of a rectangular prism by multiplying the side lengths or by multiplying the area of the base by the height.



For example, they can multiply the length by the width by the height, or $3 \times 5 \times 6$, or they can find the base (bottom) area by multiplying 3×5 to get 15 and then multiply 15 by 6. The volume of this rectangular prism is 90 cubic units.

Section C: Volume of Solid Figures

In this section, students learn that some figures are made from two rectangular prisms. They break apart these figures and find the volume of each prism. Then they add the volumes of the two prisms to find the total volume of the figure.

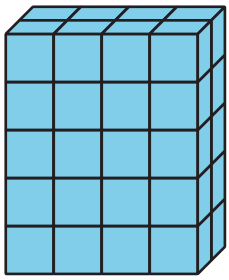


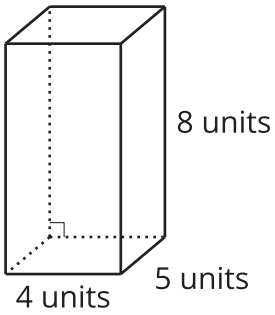
Depending on how they break it apart, students can find the volume in different ways. They could multiply in these ways to find the volume of the figure:

$(3 \times 3 \times 5) + (5 \times 2 \times 5)$
$(3 \times 5 \times 5) + (2 \times 2 \times 5)$

Try it at home!

Near the end of the unit, ask your fifth grader to find the volume of each figure.





Questions that may be helpful as they work:

- How are the 2 problems alike? How are they different?
- Can you explain or show me how you found the volume?
- How did you know you needed that number or piece of information?

Solution:

- 40 cubic units
- 160 cubic units

Sample response:

- Both figures have a length of 4 units. Both figures have one dimension that is 5 units. The first figure is made up of unit cubes, which means I need to count to help me find

the volume. In the second figure, the dimensions are given to us.

- For the first figure, I counted that there are 8 cubes in each layer and that there are 5 layers. I multiplied 8 by 5 to get a volume of 40 cubic units. In the second figure, I multiplied 4 by 5 to get 20 square units, which is the area of the base. Then I multiplied 20 by the height of 8 units to get the volume of 160 cubic units.
- In figures for which the dimensions are not shown, I know that I need to count to find the length, the width, and the height to help me find the volume. I also know that I can find volume by multiplying the area of the base by the height. I can find the area of the base by multiplying the length and the width of a figure.