Unit 1, Lesson 4

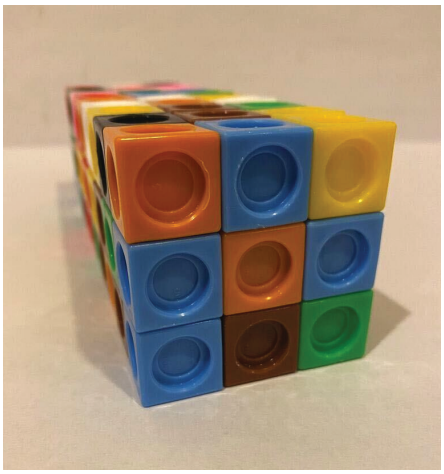
Use Layers to Determine Volume

Let's relate multiplication to how we use layers to find volume.

Warm-up

Estimation Exploration: How Many Cubes?

Estimate the number of cubes used to build this prism.

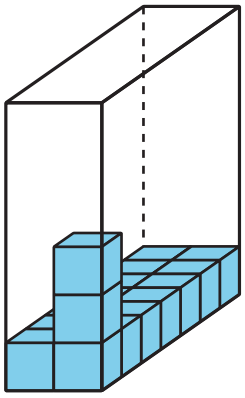


Record an estimate that is:

too low	about right	too high

Activity 1

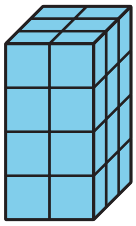
Layers in Rectangular Prisms



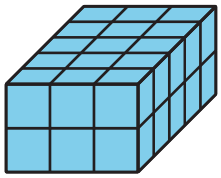
1. Complete the table.

prism	number of cubes in one layer	number of layers	volume
A			
B			
C			
D			

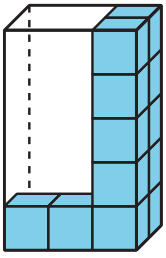
Prism A



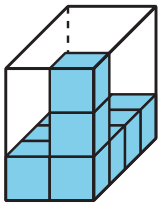
Prism B



Prism C

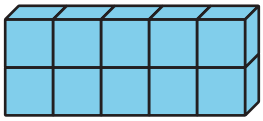


Prism D

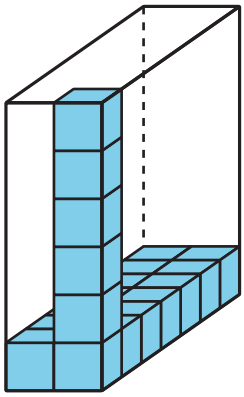


2. Find the volume of each prism. Explain or show your reasoning.

Prism E



Prism F

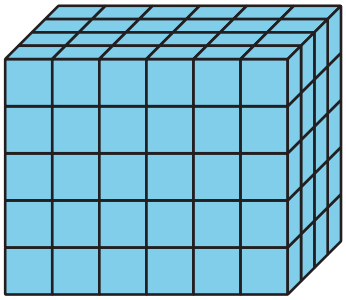


3. How can you find the volume of any rectangular prism?

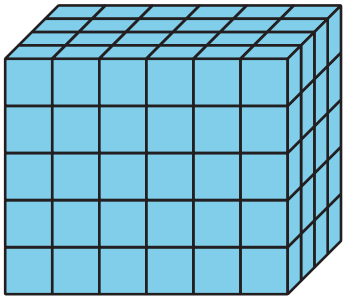
Activity 2

Finding Volume in Different Ways

1. How does the expression 5×24 represent the volume of this rectangular prism? Explain or show your reasoning.



2. How does the expression 6×20 represent the volume of this rectangular prism? Explain or show your reasoning.

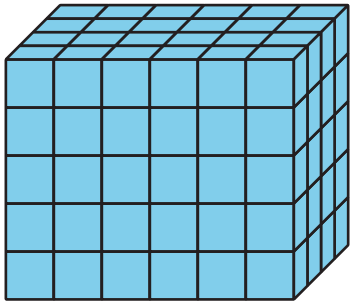


3. Find a different way to calculate the volume of this rectangular prism. Write an expression to represent the way that you calculated the volume. Explain or show your reasoning.

Section A Summary

We learned the amount of space an object takes up is **volume**.

This prism has a volume of 120 **unit cubes**.



We learned to calculate the volume of any prism by finding the number of cubes in one layer and multiplying that number by the number of layers. We can describe this **rectangular prism** as having 6 layers of 20 cubes, 4 layers of 30 cubes, or 5 layers of 24 cubes. All of these expressions represent the volume of the prism:

$$5 \times 24 \text{ or } 5 \times (6 \times 4)$$

$$6 \times 20 \text{ or } 6 \times (5 \times 4)$$

$$4 \times 30 \text{ or } 4 \times (5 \times 6)$$