Unit 1, Lesson 4

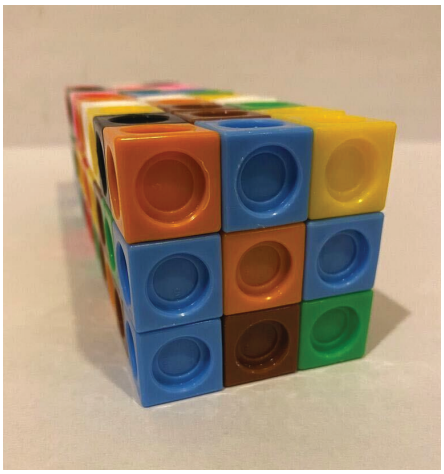
# Use Layers to Determine Volume

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.

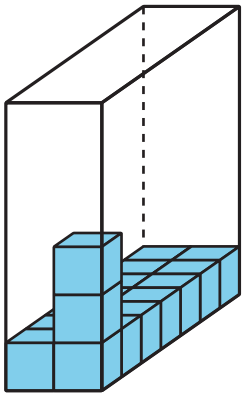


Record an estimate that is:

| too low | about right | too high |
|---|---|---|
| | | |

Activity 1

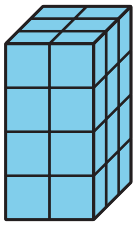
# Layers in Rectangular Prisms



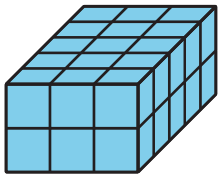
1. Complete the table.

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

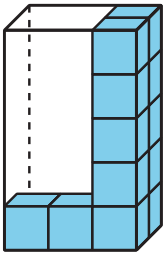
**Prism A**



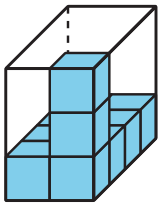
**Prism B**



**Prism C**

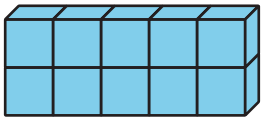


**Prism D**

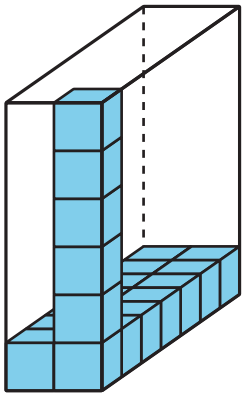


2. Find the volume of each prism. Explain or show your reasoning.

**Prism E**



**Prism F**

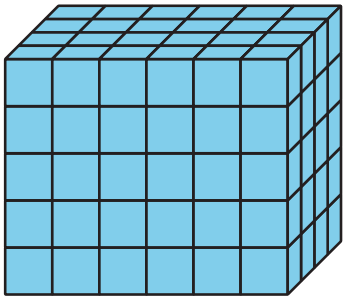


3. How can you find the volume of any rectangular prism?

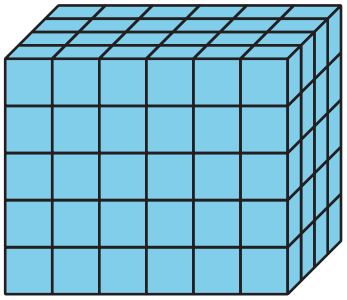
Activity 2

## Finding Volume in Different Ways

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



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

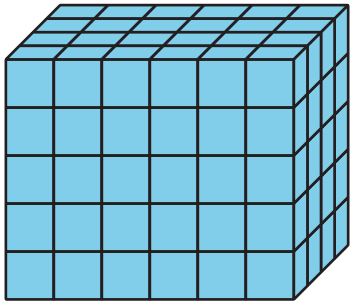


3. Find a different way to calculate the volume of this rectangular prism. Write an expression to represent the way that you calculated the volume. Explain or show your reasoning.

## 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:

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

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

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