Layer Logic

Check whether each volume calculation counts base layers correctly.

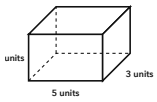
5.6 "Geometry and measurement. The student applies mathematical process standards to understand, recognize, and quantify volume. The student is expected to: recognize a cube with side length of one unit as a unit cube having one cubic unit of..."

NAME _____ DATE _____

CORRECT VOLUME

Find the number of unit cubes in one base layer. Multiply that number by the number of layers.

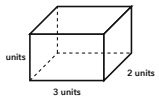
One base layer has 15 unit cubes, and there are 4 layers. 15 × 4 = 60 cubic units.



INCORRECT VOLUME

The calculation does not multiply the unit cubes in one base layer by the number of layers. It will not find the prism's volume.

One base layer has 6 unit cubes, and there are 6 layers. 6 + 6 = 12 cubic units.



1 SORT

8 items

Circle CORRECT or INCORRECT for each figure, then choose two figures and explain how the base area and layers support your choices.

1.

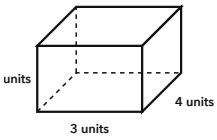


Figure 1: 12 × 2 = 24 cubic units

CORRECT INCORRECT

2.

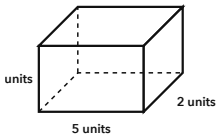


Figure 2: 10 + 3 = 13 cubic units

CORRECT INCORRECT

3.

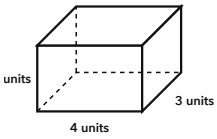


Figure 3: 4 × 3 + 2 = 14 cubic units

CORRECT INCORRECT

4.

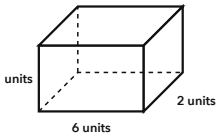


Figure 4: 12 × 4 = 48 cubic units

CORRECT INCORRECT

5.

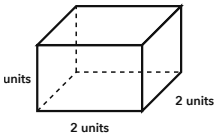


Figure 5: 4 × 5 = 20 cubic units

CORRECT INCORRECT

6.

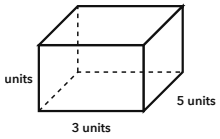


Figure 6: 15 × 3 = 45 cubic units

CORRECT INCORRECT

7.

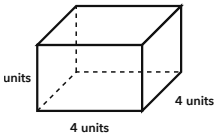


Figure 7: 16 × 3 = 48 cubic units

CORRECT INCORRECT

8.

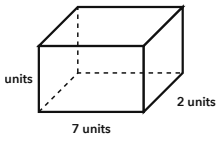


Figure 8: 14 + 2 = 16 cubic units

CORRECT INCORRECT

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Draw and label one new rectangular prism calculation for CORRECT and one for INCORRECT.

CORRECT

INCORRECT

CHALLENGE

Draw two different rectangular prisms with a volume of 48 cubic units. Label each prism and show base area × layers for each one.

Layer Logic

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1: 12 × 2 = 24 cubic units (prism)	**CORRECT**	The base has 3 × 4 = 12 unit cubes, and 2 layers make 24 cubic units.
2	Figure 2: 10 + 3 = 13 cubic units (prism)	**INCORRECT**	The base has 10 unit cubes and there are 3 layers, so the calculation should be 10 × 3.
3	Figure 3: 4 × 3 + 2 = 14 cubic units (prism)	**INCORRECT**	The base has 12 unit cubes and 2 layers, so the volume is 12 × 2 = 24 cubic units.
4	Figure 4: 12 × 4 = 48 cubic units (prism)	**CORRECT**	The base has 6 × 2 = 12 unit cubes, and 4 layers make 48 cubic units.
5	Figure 5: 4 × 5 = 20 cubic units (prism)	**CORRECT**	The base has 2 × 2 = 4 unit cubes, and 5 layers make 20 cubic units.
6	Figure 6: 15 × 3 = 45 cubic units (prism)	**INCORRECT**	The base has 15 unit cubes, but there are 2 layers, not 3. The volume is 15 × 2 = 30 cubic units.
7	Figure 7: 16 × 3 = 48 cubic units (prism)	**CORRECT**	The base has 4 × 4 = 16 unit cubes, and 3 layers make 48 cubic units.
8	Figure 8: 14 + 2 = 16 cubic units (prism)	**INCORRECT**	The base has 14 unit cubes and there are 2 layers, so the volume is 14 × 2 = 28 cubic units.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **CORRECT**: A prism has a 2-unit by 6-unit base and 3 layers. 12 × 3 = 36 cubic units.
- **INCORRECT**: A prism has a 4-unit by 2-unit base and 5 layers. 8 + 5 = 13 cubic units.

Challenge: Prism 1: a 3-unit by 4-unit base with 4 layers. 12 × 4 = 48 cubic units. Prism 2: a 2-unit by 8-unit base with 3 layers. 16 × 3 = 48 cubic units.

Sort key: 1 CORRECT, 2 INCORRECT, 3 INCORRECT, 4 CORRECT, 5 CORRECT, 6 INCORRECT, 7 CORRECT, 8 INCORRECT. For the proof explanations, students should identify the base area and multiply it by the number of layers.