LESSON MAKER PRO

Shape to Space

Model everyday objects to find volume.

HIGH SCHOOL · GDA.GM.J.36

GDA.GM.J.36 "Use geometric shapes, their measures, and their properties to model objects and use those models to solve problems."

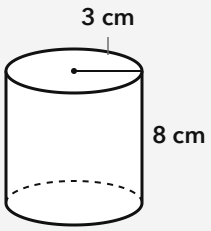
NAME _____ DATE _____

CHOOSE A SOLID

Model a box with a rectangular prism and a round container with a cylinder. For a prism, $V = l \times w \times h$. For a cylinder, $V = \pi \times r^2 \times h$, where r is the radius.

WORKED EXAMPLE

The solid models the inside of a round pencil cup. What is its capacity?

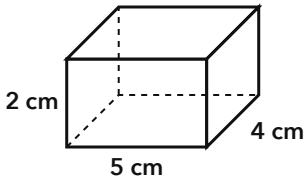


1. Use the cylinder formula: $V = \pi \times r^2 \times h$.
2. Substitute: $V = \pi \times 3^2 \times 8$.
3. Multiply: $V = 72\pi$ cm^3.

Answer: 72π cm^3

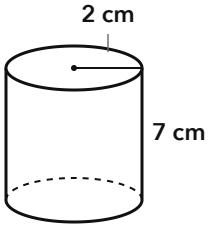
PRACTICE 6 problems

1 A storage crate is modeled by the solid. What is its volume?



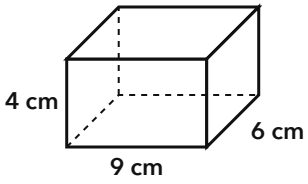
ANSWER _____

2 A round candle is modeled by the solid. What is its volume?



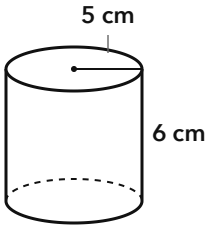
ANSWER _____

3 A package is modeled by the solid. What is its volume?



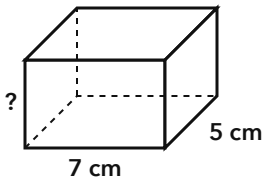
ANSWER _____

4 The solid models the inside of a round snack container. What is its capacity?



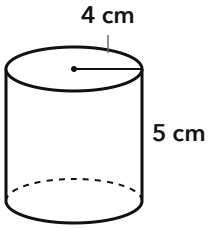
ANSWER _____

5 A box has a volume of 210 cm^3. Use the model to find its height.



ANSWER _____

6 Find the volume of the cylinder. Then find its volume if its height doubles while its radius stays the same.

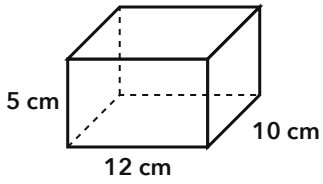


ANSWER _____

_____

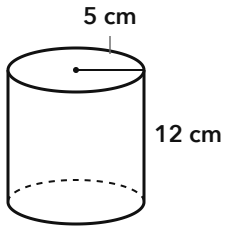
APPLY IT Show your work

1 The solid models the inside of a storage bin for gaming gear. If the bin is filled halfway, what volume of space is filled?



ANSWER _____

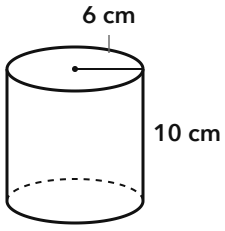
2 The solid models the inside of a reusable water bottle. After a workout, 100π cm^3 of water has been poured out of a full bottle. What volume remains?



ANSWER _____

CHALLENGE One step up

The solid models the inside of a cylindrical jar. It contains 108π cm^3 of syrup. How deep is the syrup, and how much more syrup would fill the jar?



WORK SPACE AND ANSWER

Shape to Space

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A storage crate is modeled by the solid. What is its volume?	**40 cm^3**
2	A round candle is modeled by the solid. What is its volume?	**28π cm^3**
3	A package is modeled by the solid. What is its volume?	**216 cm^3**
4	The solid models the inside of a round snack container. What is its capacity?	**150π cm^3**
5	A box has a volume of 210 cm^3. Use the model to find its height.	**6 cm**
6	Find the volume of the cylinder. Then find its volume if its height doubles while its radius stays the same.	**Original: 80π cm^3; doubled height: 160π cm^3**

PART 2 · APPLY IT

1. **300 cm^3** The bin holds 12 × 10 × 5 = 600 cm^3. Half of 600 cm^3 is 300 cm^3.
2. **200π cm^3** The full bottle holds π × 5^2 × 12 = 300π cm^3. Subtract 100π cm^3 to get 200π cm^3.

CHALLENGE

Depth: 3 cm; additional syrup: 252π cm^3

Accept equivalent exact expressions with correct cubic units. For the challenge, 108π ÷ (π × 6^2) = 3 cm, and the unfilled volume is 360π − 108π = 252π cm^3.