LESSON MAKER PRO

Inside or Outside?

Choose volume or surface area for each job.

GRADE 7 · 7.MG.1.c

7.MG.1.c "Determine if a problem in context, involving a rectangular prism or right cylinder, represents the application of volume or surface area."

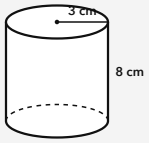
NAME _____ DATE _____

PICK THE RIGHT MEASURE

Volume measures the space inside a solid. Surface area measures the outside faces or curved surface. Think about whether an object is being filled or covered.

WORKED EXAMPLE

The cylinder shown is a storage can. It will be filled with rice. Decide whether to find volume or surface area, then find the amount of rice it holds.



1. Rice fills the inside, so find volume.
2. $V = pi\ r^2h$
3. $V = pi(3)^2(8) = 72pi\ cm^3$

Answer: Volume, $72pi\ cm^3$

PRACTICE 4 problems

1 A gift box is 5 cm long, 4 cm wide, and 2 cm high. Find the amount of paper needed to wrap all six faces.

ANSWER _____

2 A fish tank is 7 cm long, 6 cm wide, and 9 cm high. Find how much water it can hold.

ANSWER _____

3 A cylinder has a radius of 2 cm and a height of 5 cm. Find the area to paint its entire outside, including both circular ends.

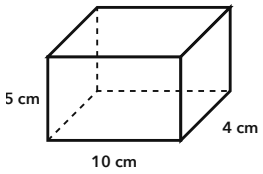
ANSWER _____

4 A storage crate is 11 cm long, 2 cm wide, and 6 cm high. Find the space inside the crate.

ANSWER _____

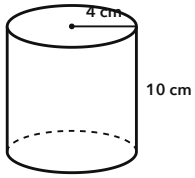
APPLY IT Show your work

1 The snack box shown will be covered with a new design on all six faces. Decide whether to use volume or surface area, then find the amount of cardboard covered.



ANSWER _____

2 The rain barrel shown will collect water for a school garden. Decide whether to use volume or surface area, then find how much water it can hold.



ANSWER _____

CHALLENGE One step up

A rectangular prize box is 12 cm long, 5 cm wide, and 4 cm high. Find the space inside for prizes and the cardboard needed for all six faces. Explain which result is volume and which is surface area.

WORK SPACE AND ANSWER

ANSWER KEY

Inside or Outside?

GRADE 7 · 7.MG.1.c

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A gift box is 5 cm long, 4 cm wide, and 2 cm high. Find the amount of paper needed to wrap all six faces.	**Surface area, 76 cm^2**
2	A fish tank is 7 cm long, 6 cm wide, and 9 cm high. Find how much water it can hold.	**Volume, 378 cm^3**
3	A cylinder has a radius of 2 cm and a height of 5 cm. Find the area to paint its entire outside, including both circular ends.	**Surface area, 28pi cm^2**
4	A storage crate is 11 cm long, 2 cm wide, and 6 cm high. Find the space inside the crate.	**Volume, 132 cm^3**

PART 2 · APPLY IT

1. **Surface area, 220 cm^2** Covering all six faces requires surface area. $2(10 \times 4 + 10 \times 5 + 4 \times 5) = 220$ cm^2.
2. **Volume, 160pi cm^3** Water fills the inside, so use volume. $pi(4)^2(10) = 160pi$ cm^3.

CHALLENGE

Volume = 240 cm^3; surface area = 256 cm^2. The inside space is volume, and cardboard covering the outside is surface area.

Accept equivalent exact forms using pi. Students should identify volume for capacity or inside space and surface area for covering all outside faces.