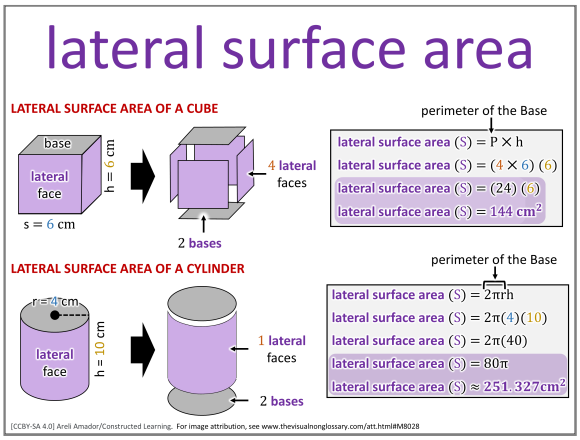
Teacher Guide for the Lesson on **lateral surface area**



Standard:
8.7(B)

Content Objective:
We can use the formulas for **lateral surface area** to solve problems involving rectangular prisms, triangular prisms, and cylinders.

Language Objective: Answer the following question in complete sentences using the sentence stem and the key vocabulary of the lesson:

> Why do you think the **perimeter of the base** is used in the **lateral surface area** formula for a prism or cylinder?
>
> *I think the **perimeter of the base** is used in **lateral surface area** formula for a prism or cylinder because...*

Other key vocabularies: total surface area, perimeter of the base

By studying this visual, students might:

Notice	Wonder
• There is a cube and a cylinder	• Why are some sides purple and others gray?
• Some parts of the shapes are purple and some are gray	• What do the letters in the formula mean?
• There are numbers next to the shapes, like 6 cm and 4 cm	• Why does the cylinder have a circle on top?

• There are math formulas with letters and numbers	• Why is one answer a whole number and the other has a decimal?
• The final answers have cm^2 next to them	• What are h and r supposed to stand for?

EXTENDING THE DISCUSSION

- After randomly calling on students, if there is anything from this list that was not mentioned, then ask the class, "Did anyone notice...?"
- After students have shared what they notice, ask the class, "Did anyone wonder...?" using the suggestions above or anything else you might think is interesting or relevant to the lesson.

Structured Conversation Prompts

OBSERVATIONAL	RELATIONAL	INFERENTIAL
What is **lateral surface area**? **Lateral surface area** is...	How is **lateral surface area** different from **total surface area**? **Lateral surface area** is different from **total surface area** because...	Why do you think the **perimeter of the base** is used in the **lateral surface area** formula for a prism or cylinder? I think the **perimeter of the base** is used in **lateral surface area** formula for a prism or cylinder because...

Example Student Responses to the Observational Question

Low-Level	High-Level
Lateral surface area is the area of the sides of a shape.	**Lateral surface area** is the total area of the side faces of a three-dimensional shape, not including the top and bottom **bases**, and it can be found by multiplying the perimeter of the base by the height of the figure.

RESPONDING TO RESPONSES

Emphasize and celebrate each student's use of the key vocabulary to support a culture of "no wrong answers."

STRUCTURING STUDENT CONVERSATIONS

Have students list observations from the visual as a warm-up, then use the Q-SSS-A process to guide small-group conversations. In the slide decks, brackets can be moved to prepare the structured conversation. In the example to the right, students will be instructed: Q-SSS-A.

- To put a thumb up, then lower their hand when they are ready to answer the question
- To share with their elbow/shoulder partner, and that the student with the darkest shoe will share first
- That they will be randomly called on after the conversation

Here is an example of structuring a conversation with Q-SSS-A.

Note: the inferential question is the same as the language objective. It is recommended that students answer the inferential question in a small-group discussion before answering it individually as the closure or exit ticket of the lesson.

Structured Reading

READING PURPOSE	PAT LIST	POST-READING DISCUSSION
The purpose for reading is to learn what **lateral surface area** is and how to solve it so I can apply it to a real-world problem.	• Why only the side faces are measured and not the top or bottom • The formula used to find lateral surface area and what each part represents • The steps used to solve for lateral surface area in the example	How would you solve for the **lateral surface area** of the oatmeal container to determine how much label paper is needed? *To solve for the **lateral surface area** of the oatmeal container and determine how much label paper is needed, I would...*

STRUCTURING THE READING

Communicate the purpose of reading to the students and instruct them to make a note every time they see something on the PAT ("Pay Attention To") list. How you have students note items on the PAT list is up to you. This could include:

- Putting an asterisk in the margin
- Underlining text that supports the PAT list
- Putting a comment in the margin

Follow the reading with the post-reading discussion. Structure this discussion using the Q-SSS-A process just like the structured conversations in this lesson.

Note: you might find the relational question is better discussed before or after the reading. This depends on whether the relational question is directly related to the reading or might make connections across units.

DIFFERENTIATING THE READING

You will notice that three different reading passages are provided with this lesson. Look at the shapes in the top-left of each passage to determine the grade level.

BELOW GRADE LEVEL	ON GRADE LEVEL	ABOVE GRADE LEVEL
		
Triangle is bottom-left	*Square is bottom-left*	*Circle is bottom-left*

In a class with students at diverse reading level proficiencies, you can give the appropriate reading passage to different students, while having all students follow the same PAT list and post-reading discussion.