

Surface Area Using Nets

Lesson 10-3

Name: _____

Date: _____

Class: _____

Key Vocabulary

Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

*A box $6 \times 4 \times 2$: $SA = 2(24) + 2(12) + 2(8) = 88 \text{ in}^2$
— like wrapping paper needed*

Surface area

The total area of all the flat sides of a solid.

*Cut along the edges of a cereal box and unfold it
flat — you see all 6 faces*

Net

A flat shape that folds up into a solid.

*A rectangular prism has 6 faces: top, bottom, front,
back, left, right*

Face

One flat side of a solid shape.

*A rectangle drawn on paper is 2D — it has length
and width but no depth*

Two-dimensional

A flat shape with length and width, but no thickness.

*A cube has 12 edges — the lines where two flat faces
connect*

Edge

The line where two flat sides of a solid meet.

Key Ideas & Notes

- Your class is designing custom wrapping paper for time capsule boxes.
- To figure out how much paper you need, you have to find the total surface area of each box.
- The trick?
- Unfold the box into a net so you can see every face laid flat!
- Identify each face of the rectangular time capsule box ($l = 8$ in, $w = 5$ in, $h = 3$ in). Find the area of each face pair, then calculate the total surface area.

Think About It

- How many faces does a rectangular prism have?
- What shapes do you see when the box is unfolded?
- Are all the faces the same size?

My Notes

Guided Examples

Example 1

A rectangular prism has $l = 6$ in, $w = 4$ in, $h = 2$ in. What is its surface area?

Solution: $SA = 2(6 \times 4) + 2(6 \times 2) + 2(4 \times 2) = 48 + 24 + 16 = 88 \text{ in}^2$.

Answer: A. 88 in^2

Example 2

How many faces does a rectangular prism have?

Solution: A rectangular prism has 6 faces: top, bottom, front, back, left, and right.

Answer: A. 6

Example 3

Surface area is measured in which type of unit?

Solution: Surface area measures flat surfaces, so it uses square units. Volume uses cubic units.

Answer: A. Square units (in^2 , cm^2 , ft^2)

Write About the Math

The Writing Revolution

I can explain my work using the words surface area, net, face, and two-dimensional.

1. Kernel Sentence subject + verb

Model: Surface area is the total area of all the flat sides of a solid.

Área de superficie es el área total de todos los lados planos de un sólido.

Write a kernel sentence about surface area. Use a subject and a verb.

Escribe una oración base sobre área de superficie. Usa un sujeto y un verbo.

2. Sentence Expansion because · but · so

Kernel: Surface area matters in math

Área de superficie importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because
porque

Surface area matters in math because ____.

Área de superficie importa en matemáticas porque ____.

but
pero

Surface area matters in math, but ____.

Área de superficie importa en matemáticas, pero ____.

so
entonces

Surface area matters in math, so ____.

Área de superficie importa en matemáticas, entonces ____.

3. Sentence Types 4 ways to write a math idea

Statement
Afirmación

Tell one true fact about surface area.
Di un hecho verdadero sobre surface area.

Surface area ____.

Question
Pregunta

Ask a question about surface area.
Haz una pregunta sobre surface area.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about surface area.
Muestra entusiasmo sobre surface area.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with surface area.
Dile a un compañero qué hacer con surface area.

First, ____ .
Primero, ____ .

4. Explain Your Reasoning use a sentence starter

The net shows ____ **faces.**
La red muestra ____ *caras.*

I added the areas to get ____ .
Sumé las áreas para obtener ____ .

This helps with ____ .
Esto ayuda con ____ .

Try It

Solve on your own. Check the answer key when you are done.

1. Surface area is measured in which type of unit?

- A. Square units (in^2 , cm^2 , ft^2)
- B. Cubic units (in^3 , cm^3 , ft^3)
- C. Linear units (in, cm, ft)
- D. No units needed

Show your work:

2. A cube has edges of 5 cm. What is its surface area?

- A. 150 cm^2
- B. 125 cm^2
- C. 150 cm^3
- D. 30 cm^2

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

Two boxes have the same volume of 60 in^3 . Box A is $5 \times 4 \times 3$. Box B is $10 \times 6 \times 1$. Which box uses less wrapping paper (has less surface area)? Show your calculations and explain why a more cube-like shape might use less material.

Sentence starter: Box A: $SA = 2(\text{---}) + 2(\text{---}) + 2(\text{---}) = \text{---} \text{ in}^2$. Box B: $SA = 2(\text{---}) + 2(\text{---}) + 2(\text{---}) = \text{---} \text{ in}^2$. Box --- uses less wrapping paper because --- .

Show your work:

Reflect — Exit Ticket

A rectangular prism has $l = 9 \text{ in}$, $w = 5 \text{ in}$, $h = 3 \text{ in}$. What is the surface area?

- A. 174 in^2
- B. 135 in^2
- C. 174 in^3
- D. 87 in^2

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Square units (in^2 , cm^2 , ft^2) — *Surface area measures flat surfaces, so it uses square units. Volume uses cubic units.*
2. **Try It 2:** A. 150 cm^2 — *A cube has 6 identical faces. Each face: $5 \times 5 = 25 \text{ cm}^2$. Total SA = $6 \times 25 = 150 \text{ cm}^2$.*
3. **Exit Ticket:** A. 174 in^2 — *SA = $2(9 \times 5) + 2(9 \times 3) + 2(5 \times 3) = 90 + 54 + 30 = 174 \text{ in}^2$. Surface area uses square units (in^2).*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Surface area is the total area of all the flat sides of a solid.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).