

Net Surface Sleuth

Use nets to find the outside area of solids.

GRADE 6 • NY-6.G.4

NY-6.G.4 "Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems."

NAME _____

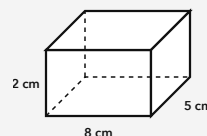
DATE _____

OPEN IT UP

A net lays every face of a solid flat. Find the area of each rectangle or triangle in the net, then add the areas. For a rectangular prism, there are three pairs of matching rectangles.

WORKED EXAMPLE

The rectangular prism shown is opened into a net. Find its surface area.



1. Face areas: $8 \times 5 = 40$, $8 \times 2 = 16$, and $5 \times 2 = 10$.
2. Each face area appears twice in the net.
3. $2 \times (40 + 16 + 10) = 132$.

Answer: 132 cm²

PRACTICE 4 problems

- 1** A rectangular prism net has two 9 cm by 4 cm rectangles, two 9 cm by 6 cm rectangles, and two 4 cm by 6 cm rectangles. Find the surface area.

ANSWER _____

- 2** A triangular prism net has rectangles measuring 11 cm by 9 cm, 11 cm by 12 cm, and 11 cm by 15 cm. It also has two right triangles with legs 9 cm and 12 cm. Find the surface area.

ANSWER _____

- 3** A cube net has six squares. Each square has a side length of 13 cm. Find the surface area of the cube.

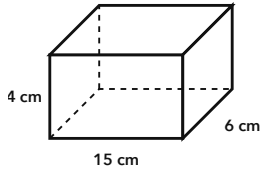
ANSWER _____

- 4** A box net has two 14 cm by 3 cm rectangles, two 14 cm by 9 cm rectangles, and two 3 cm by 9 cm rectangles. Find the surface area.

ANSWER _____

APPLY IT Show your work

- 1** A game store covers the outside of the box shown with paper. How much paper is needed, not including overlap?



ANSWER _____

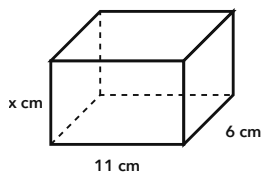
- 2** An art club covers a triangular-prism pencil case with fabric. Its net has rectangles measuring 16 cm by 7 cm, 16 cm by 24 cm, and 16 cm by 25 cm. It also has two right triangles with legs 7 cm and 24 cm. How much fabric is needed?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The rectangular prism shown has a surface area of 438 cm^2 . Find x . Explain how the net helps you make your equation.



WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A rectangular prism net has two 9 cm by 4 cm rectangles, two 9 cm by 6 cm rectangles, and two 4 cm by 6 cm rectangles. Find the surface area.	228 cm²
2	A triangular prism net has rectangles measuring 11 cm by 9 cm, 11 cm by 12 cm, and 11 cm by 15 cm. It also has two right triangles with legs 9 cm and 12 cm. Find the surface area.	504 cm²
3	A cube net has six squares. Each square has a side length of 13 cm. Find the surface area of the cube.	1,014 cm²
4	A box net has two 14 cm by 3 cm rectangles, two 14 cm by 9 cm rectangles, and two 3 cm by 9 cm rectangles. Find the surface area.	390 cm²

PART 2 • APPLY IT

- 348 cm²** Find the three face areas, 90, 60, and 24. Double their sum: $2 \times (90 + 60 + 24) = 348$.
- 1,064 cm²** The rectangles total 896 cm². The two triangles total 168 cm², so the total is 1,064 cm².

CHALLENGE

$x = 9$ cm. The net has two 11 by 6 faces, two 11 by x faces, and two 6 by x faces, so $2(66 + 11x + 6x) = 438$.

Accept equivalent addition equations and correct units. For the challenge, accept $132 + 34x = 438$ or an equivalent equation and a clear reference to the three pairs of faces.