LESSON MAKER PRO

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."

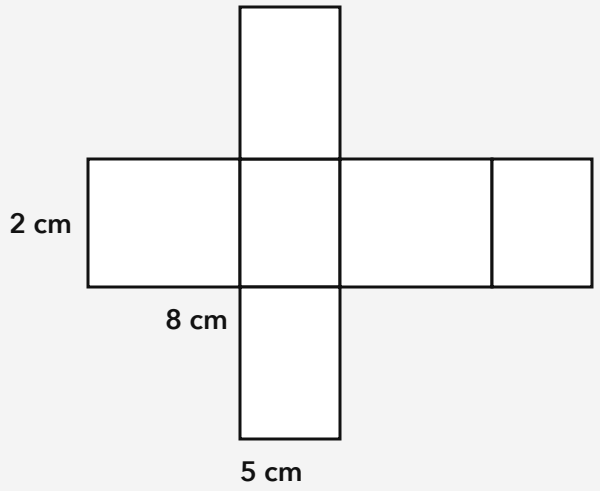
NAME _____ DATE _____

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

Use the unfolded net of a rectangular prism with length 8 cm, width 5 cm, and height 2 cm. Identify the two faces of each size and find its surface area. The net is schematic, not drawn to those measurements.



1. Face areas: 8 × 5 = 40, 8 × 2 = 16, and 5 × 2 = 10.
2. Each face area appears twice in the net.
3. 2 × (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.

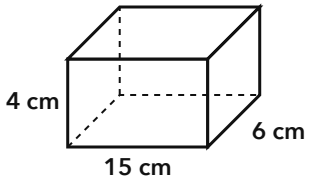
ANSWER _____

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 a rectangular box 15 cm long, 6 cm wide, and 4 cm high 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 _____

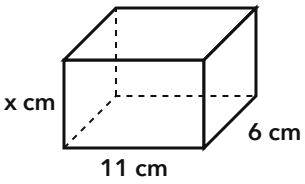
3 Draw a connected net for a cube with side length 3 cm. Include six square faces, and label each face 3 cm by 3 cm. Mark the edges that fold, then use every face in your drawing to find the surface area. Explain why your net folds into a cube without overlapping faces. Your sketch may use a scale.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The rectangular prism has length 11 cm, width 6 cm, height x cm, and surface area 438 cm². Find x. Sketch a net and label its face dimensions to explain your equation.



WORK SPACE AND ANSWER

ANSWER KEY # Net Surface Sleuth

GRADE 6 · NY-6.G.4

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 cm^2**
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 cm^2**
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 cm^2**
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 cm^2**

PART 2 · APPLY IT

1. **348 cm^2** Find the three face areas, 90, 60, and 24. Double their sum: 2 × (90 + 60 + 24) = 348.
2. **1,064 cm^2** The rectangles total 896 cm^2. The two triangles total 168 cm^2, so the total is 1,064 cm^2.
3. **54 cm^2; a valid connected six-square cube net.** One valid net has four squares in a row, with one square above and one below the second square. Each square is 3 cm by 3 cm and has area 9 cm^2; six faces total 54 cm^2. Check all six faces, matching fold edges and a valid nonoverlapping folded cube. A sum alone is incomplete.

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. Apply 3 requires an actual valid six-square learner net and area calculation. Accept any valid cube-net layout, not only the teacher example. For the challenge check two 11-by-6 faces, two 11-by-x faces and two 6-by-x faces in a valid sketch.

Apply 3: valid cube net; each of six faces is 3 cm by 3 cm, total area 54 cm².

