

Net Area Detectives

Find the total area of every face in a 3D figure's net.

GRADE 6 • 6.GSR.5.2

6.GSR.5.2 "Given the net of three-dimensional figures with rectangular and triangular faces, determine the surface area of these figures."

NAME _____

DATE _____

ADD EVERY FACE

A net shows every outside face of a solid laid flat. Find the area of each face, then add the areas. In a rectangular prism, matching rectangles come in pairs. In a triangular prism, add the two triangular bases and the three rectangular side faces.

WORKED EXAMPLE

A rectangular prism net has length 14 units, width 16 units, and height 18 units. Find its surface area.

1. The three different face areas are $14 \times 16 = 224$, $14 \times 18 = 252$, and $16 \times 18 = 288$.
2. Each face area appears twice in the net.
3. $2 \times (224 + 252 + 288) = 1,528$.

Answer: 1,528 square units

PRACTICE 6 problems

- 1** A rectangular prism net has two 2 by 5 rectangles, two 2 by 7 rectangles, and two 5 by 7 rectangles. What is the surface area?

ANSWER _____

- 2** A rectangular prism net has length 1 unit, width 8 units, and height 9 units. What is the surface area?

ANSWER _____

- 3** A triangular prism net has two triangles with base 12 units and height 8 units. Its three rectangles are 5 by 10, 5 by 10, and 5 by 12. What is the surface area?

ANSWER _____

- 4** A triangular prism net has two right triangles with legs 9 units and 12 units. Its three rectangles are 2 by 9, 2 by 12, and 2 by 15. What is the surface area?

ANSWER _____

- 5** A rectangular prism net has length 11 units, width 2 units, and height 8 units. What is the surface area?

ANSWER _____

- 6** A triangular prism net has two triangles with side lengths 13 units, 13 units, and 10 units. Each triangle has a height of 12 units to the 10-unit side. The three rectangles are 9 by 13, 9 by 13, and 9 by 10. What is the surface area?

ANSWER _____

APPLY IT Show your work

- 1** Maya is making a cardboard net for a rectangular-prism phone charging station. The station will be 12 cm long, 5 cm wide, and 2 cm high. How much cardboard is needed to cover all six faces?

WORK SPACE

ANSWER _____

- 2** The drama club is making a closed triangular-prism prize box for a gaming tournament. Each triangular end has side lengths 10 cm, 10 cm, and 12 cm, and a height of 8 cm to the 12-cm side. The box is 11 cm long. How much cardstock is needed for the entire net?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A rectangular prism net shows two 9 by 8 rectangles, two 9 by 5 rectangles, and one 8 by 5 rectangle. One rectangle is missing from the net. What is the surface area of the prism? Explain how you know the missing rectangle's size.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A rectangular prism net has two 2 by 5 rectangles, two 2 by 7 rectangles, and two 5 by 7 rectangles. What is the surface area?	118 square units
2	A rectangular prism net has length 1 unit, width 8 units, and height 9 units. What is the surface area?	178 square units
3	A triangular prism net has two triangles with base 12 units and height 8 units. Its three rectangles are 5 by 10, 5 by 10, and 5 by 12. What is the surface area?	256 square units
4	A triangular prism net has two right triangles with legs 9 units and 12 units. Its three rectangles are 2 by 9, 2 by 12, and 2 by 15. What is the surface area?	180 square units
5	A rectangular prism net has length 11 units, width 2 units, and height 8 units. What is the surface area?	252 square units
6	A triangular prism net has two triangles with side lengths 13 units, 13 units, and 10 units. Each triangle has a height of 12 units to the 10-unit side. The three rectangles are 9 by 13, 9 by 13, and 9 by 10. What is the surface area?	444 square units

PART 2 • APPLY IT

- 188 square centimeters** Find the areas of the three pairs of faces: 12×5 , 12×2 , and 5×2 . Double their sum: $2 \times (60 + 24 + 10) = 188$.
- 448 square centimeters** The two triangle areas total $2 \times (1/2 \times 12 \times 8) = 96$ square centimeters. The three rectangles total $11 \times (10 + 10 + 12) = 352$ square centimeters, so the total is 448 square centimeters.

CHALLENGE

314 square units. The missing rectangle is 8 by 5 because each face of a rectangular prism has a matching opposite face. The total is $2 \times (9 \times 8 + 9 \times 5 + 8 \times 5) = 314$.

Accept correct addition of all six faces, whether students use paired-face formulas or add each face separately. Require square units or square centimeters when the problem gives units.