

Net Area Lab

Add every face in a 3D figure's net.

GRADE 6 • 6.G.A.4

CCSS.Math.Content.6.G.A.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 _____

SURFACE AREA FROM NETS

A net shows every outside face of a solid. Find the area of each rectangle or triangle, then add all the face areas, including faces that appear twice.

WORKED EXAMPLE

A rectangular prism net has two 17 by 19 rectangles, two 17 by 23 rectangles, and two 19 by 23 rectangles. Find its surface area.

1. $17 \times 19 = 323$, $17 \times 23 = 391$, and $19 \times 23 = 437$.

2. Add the three pairs: $2(323 + 391 + 437) = 2(1151)$.

3. $2 \times 1151 = 2302$.

Answer: 2302 square units

PRACTICE 5 problems

- 1** A net has two 5 by 6 rectangles, two 5 by 10 rectangles, and two 6 by 10 rectangles. Find the surface area.

ANSWER _____

- 2** A triangular prism net has two 3-4-5 right triangles and rectangles measuring 3 by 11, 4 by 11, and 5 by 11. Find the surface area.

ANSWER _____

- 3** A rectangular prism net has pairs of rectangles measuring 12 by 13, 12 by 14, and 13 by 14. Find the surface area.

ANSWER _____

- 4** A triangular prism has 6-8-10 triangular bases and a length of 15. Find the surface area from its net.

ANSWER _____

- 5** A net has face areas of 16, 16, 24, 24, 30, and 30 square inches. Find the surface area.

ANSWER _____

APPLY IT Show your work

- 1** A box for gaming gear is a rectangular prism that measures 14 cm by 16 cm by 18 cm. How much cardboard covers the outside of the closed box?

WORK SPACE

ANSWER _____

- 2** A robotics club makes a closed triangular-prism display. Each triangular end has a base of 12 cm, a height of 5 cm, and two other sides of 13 cm. The display is 20 cm long. How much material covers its outside?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A triangular-prism net has two right triangles with legs 9 and 12 and hypotenuse 15. The prism length is 21. A student adds only the three rectangles and gets 756 square units. Find the actual surface area and explain what was missed.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A net has two 5 by 6 rectangles, two 5 by 10 rectangles, and two 6 by 10 rectangles. Find the surface area.	280 square units
2	A triangular prism net has two 3-4-5 right triangles and rectangles measuring 3 by 11, 4 by 11, and 5 by 11. Find the surface area.	144 square units
3	A rectangular prism net has pairs of rectangles measuring 12 by 13, 12 by 14, and 13 by 14. Find the surface area.	1012 square units
4	A triangular prism has 6-8-10 triangular bases and a length of 15. Find the surface area from its net.	408 square units
5	A net has face areas of 16, 16, 24, 24, 30, and 30 square inches. Find the surface area.	140 square inches

PART 2 • APPLY IT

- 1528 square centimeters** Find the areas of the three face pairs: 14×16 , 14×18 , and 16×18 . Double their sum: $2(224 + 252 + 288) = 1528$.
- 820 square centimeters** The two triangular ends have total area $2(1/2 \times 12 \times 5) = 60$. The three rectangles have total area $20(12 + 13 + 13) = 760$, so the total is 820.

CHALLENGE

864 square units; 756 square units covers the three rectangles, and the two triangular ends add $2(1/2 \times 9 \times 12) = 108$ square units.

Accept correct numerical work with equivalent unit wording. For the challenge, accept an explanation that the two triangular faces must be included.