

Grade 6 - Nets and Surface Area - Lesson

Common Core 6.G.A.4 · maths-pdf.fr/en/

A net is a flat pattern that folds into a solid, and surface area is the sum of the areas of all its faces. For a rectangular prism, add the areas of the six rectangles: $2(lw + lh + wh)$. For a pyramid, add the base and the triangular faces. Surface area is measured in square units.

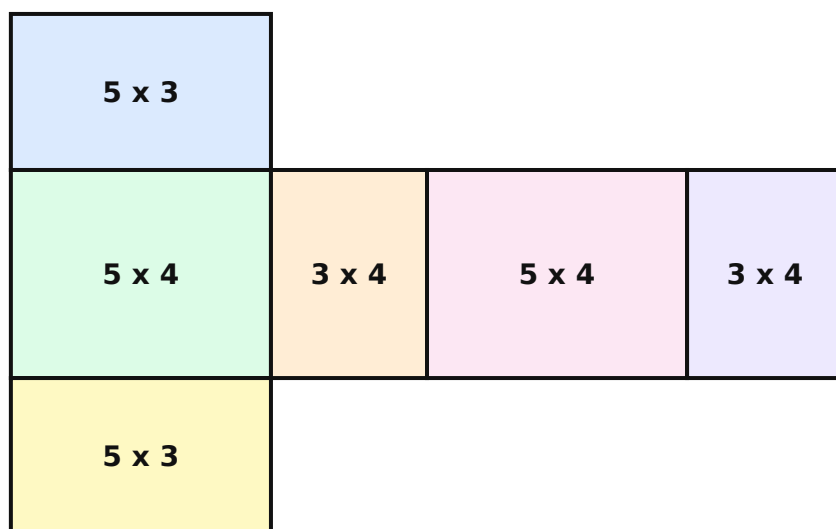
Grade 6 · Common Core State Standards: **6.G.A.4**

Key facts

- A net shows all faces of a solid laid flat.
- Surface area is the total area of all faces, in square units.
- Rectangular prism: $SA = 2(lw + lh + wh)$.
- Pyramid: base area plus the areas of the triangular faces.
- Triangular prism: two triangles plus three rectangles.

What is a net?

A **net** is a flat pattern that folds into a solid. Each shape in the net is one face of the solid. A rectangular prism has a net of 6 rectangles, a square pyramid has a net of 1 square and 4 triangles, and a triangular prism has 2 triangles and 3 rectangles.



A net unfolds a solid into flat faces.

Surface area

The **surface area** of a solid is the sum of the areas of all its faces. It is measured in square units.

How do you find the surface area of a prism?

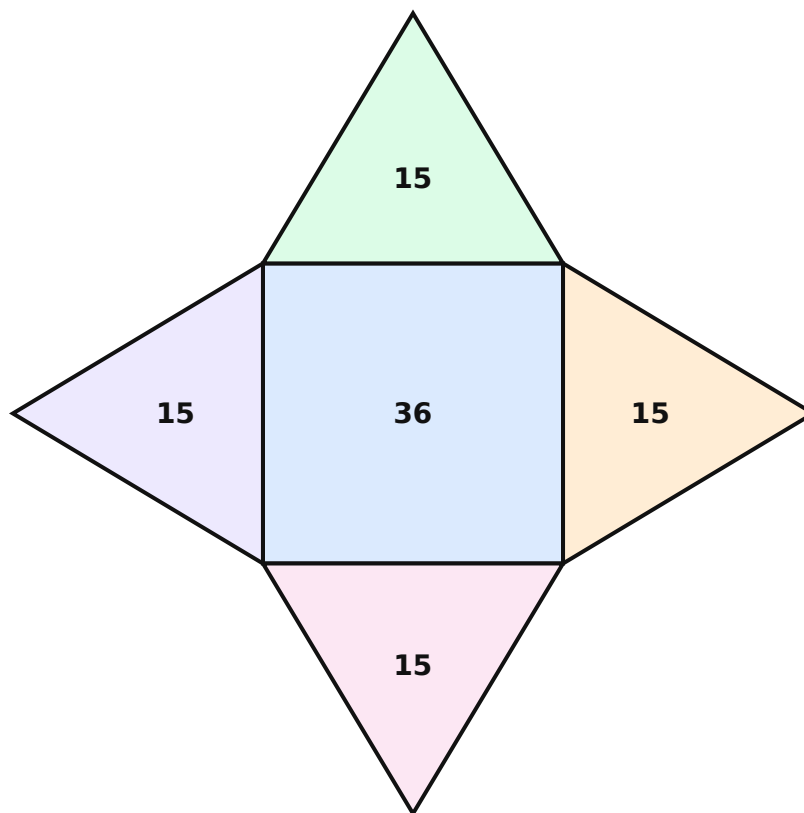
Find the area of each face and add. For a rectangular prism with length 5, width 3, and height 4, opposite faces match. $2(5 \cdot 3 + 5 \cdot 4 + 3 \cdot 4) = 2(15 + 20 + 12) = 94$ square units.

Faces	Area each	Total
Top, bottom	15	30
Front, back	20	40
Left, right	12	24

The total is $30 + 40 + 24 = 94$.

How do you find the surface area of a pyramid?

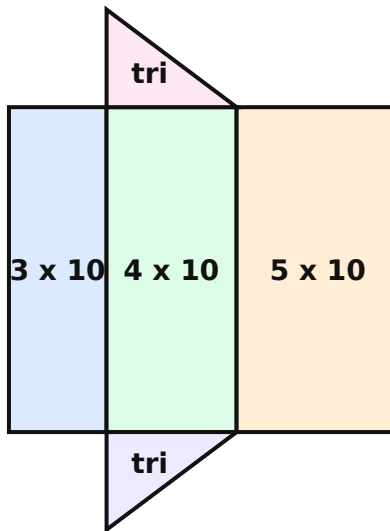
Add the area of the base and the areas of the triangular faces. A square pyramid with base 6 and triangle height 5 has $36 + 4 \cdot \frac{1}{2} \cdot 6 \cdot 5 = 36 + 60 = 96$ square units.



A square pyramid: one square and four triangles.

How do you handle a triangular prism?

Add the two triangles and the three rectangles. For triangle sides 3, 4, 5 and length 10, the triangles total $2 \cdot \frac{1}{2} \cdot 3 \cdot 4 = 12$ and the rectangles total $(3+4+5) \cdot 10 = 120$, so the surface area is 132 square units.



A triangular prism: two triangles and three rectangles.

1. Draw or picture the net and label each face.
2. Find the area of each face with rectangle or triangle formulas.
3. Add all the areas, using symmetry to save time.
4. Write the answer in square units, and ask whether a face is missing (such as a top).

Example: A gift box is 12 by 8 by 5 inches. Its wrapping paper area is $2(96+60+40) = 392$ square inches. Surface area problems appear in painting, wrapping, and building, so label each face carefully.

Questions about nets and surface area

What is a net in geometry?

A net is a two-dimensional pattern that folds up to form a three-dimensional solid. Each shape in the net is a face.

How do you find the surface area of a rectangular prism?

Add the areas of all six faces. Because opposite faces match, $SA = 2(lw + lh + wh)$.

How do you find the surface area of a square pyramid?

Add the area of the square base and four times the area of one triangular face, which is $(1/2)$ times base times slant height.

Why is surface area measured in square units?

It is made of flat faces whose areas are measured in squares, such as square inches.

What is the difference between surface area and volume?

Surface area measures the outside covering in square units. Volume measures the space inside in cubic units.