Surface Area of a Cube

Let's write a formula to find the surface area of a cube.

18.1 Math Talk: Expressions and Their Values

Decide mentally which expression has a greater value.

- $12 + 12 + 12 + 12 + 12$ or $4 \cdot 12$
- $15 \cdot 3$ or 15^3
- 19^2 or $18 \cdot 18$
- $5 \cdot 21^2$ or $(5 \cdot 21) \cdot (5 \cdot 21)$

18.2 The Net of a Cube

1. A cube has an edge length of 5 units.
   a. Draw a net for this cube on graph paper. Label its sides with measurements.
   b. What is the shape of each face?
   c. What is the area of each face?
   d. What is the surface area of this cube?
   e. What is the volume of this cube?

2. A second cube has an edge length of 17 units.
   a. Sketch a net for this cube. Label its sides with measurements.

   b. Explain why the area of each face of this cube is 17^2 square units.

   c. Write an expression for the surface area, in square units.
   d. Write an expression for the volume, in cubic units.

18.3 Every Cube in the Whole World

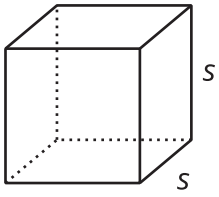
A cube has an edge length of s.

1. Draw a net for the cube.

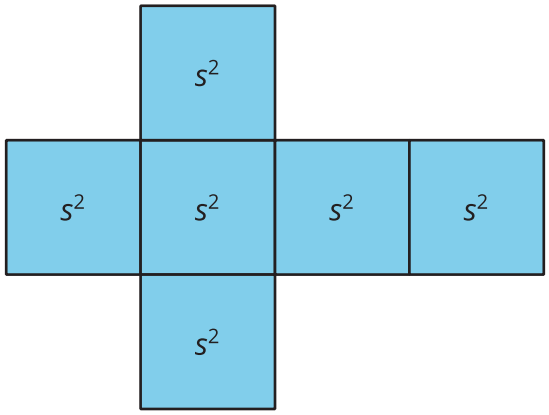
2. Write an expression for the area of each face. Label each face with its area.
3. Write an expression for the surface area.
4. Write an expression for the volume.

Lesson 18 Summary

The volume of a cube with an edge length of s is s^3.



A cube has 6 faces that are all identical squares. For a cube with an edge length of s, the area of each square face is s^2. This means that the surface area of the cube is $6 \cdot s^2$.



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