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Unit 1, Lesson 18: Surface Area of a Cube

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

18.1: Exponent Review

Select the greater expression of each pair without calculating the value of each expression. Be prepared to explain your choices.

a. $10 \cdot 3$ or 10^3 b. 13^2 or $12 \cdot 12$ c. $97 + 97 + 97 + 97 + 97 + 97$ or $5 \cdot 97$

18.2: The Net of a Cube

1. A cube has edge length 5 inches.

   a. Draw a net for this cube, and 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 edge length 17 units.

   a. Draw a net for this cube, and 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.

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18.3: Every Cube in the Whole World

A cube has edge length s.

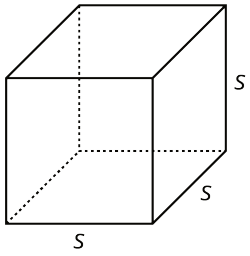
1. Draw a net for the cube.

2. Write an expression for the area of each face. Label each face with its area.

3. Write an expression for the surface area.

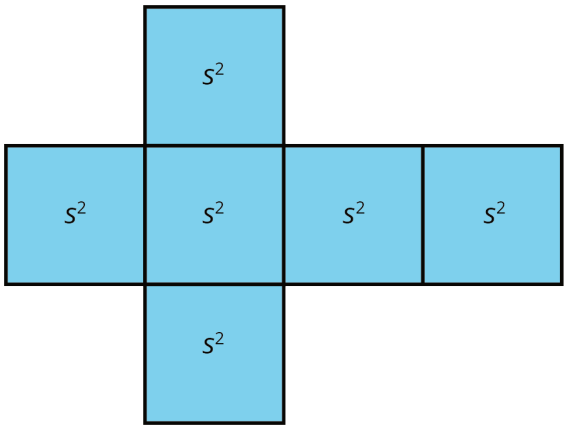
4. Write an expression for the volume.

Lesson 18 Summary



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

A cube has 6 faces that are all identical squares. The surface area of a cube with edge length s is $6 \cdot s^2$.



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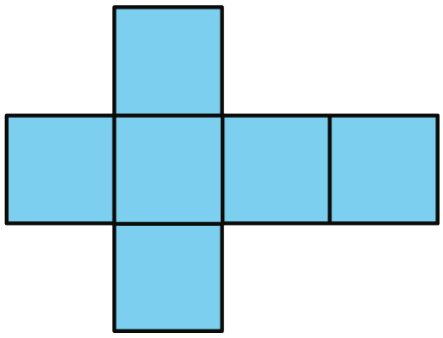
Unit 1, Lesson 18: Surface Area of a Cube

1. a. What is the volume of a cube with edge length 8 in?

   b. What is the volume of a cube with edge length $\frac{1}{3}$ cm?

   c. A cube has a volume of 8 ft^3. What is its edge length?

2. a. What three-dimensional figure can be assembled from this net?



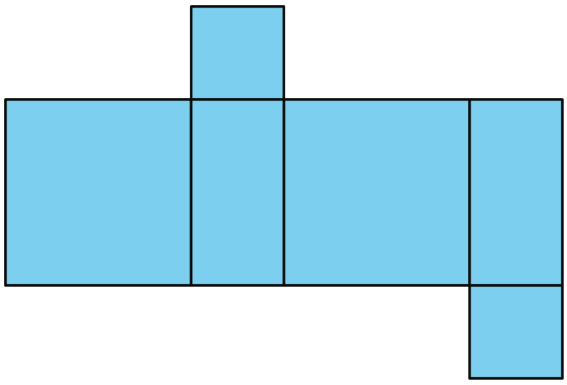
   b. If each square has a side length of 61 cm, write an expression for the surface area and another for the volume of the figure.

3. a. Draw a net for a cube with edge length x cm.

   b. What is the surface area of this cube?

   c. What is the volume of this cube?

4. Here is a net for a rectangular prism that was not drawn accurately.



   a. Explain what is wrong with the net.

   b. Draw a net that can be assembled into a rectangular prism.

   c. Create another net for the same prism.

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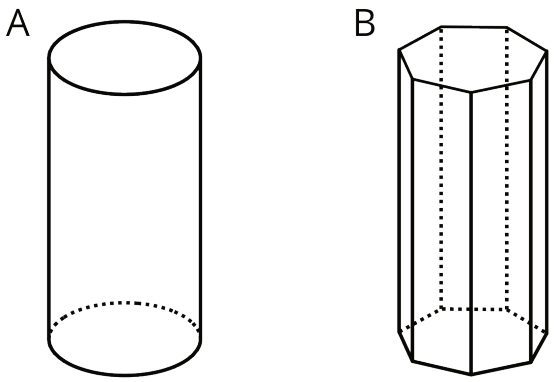
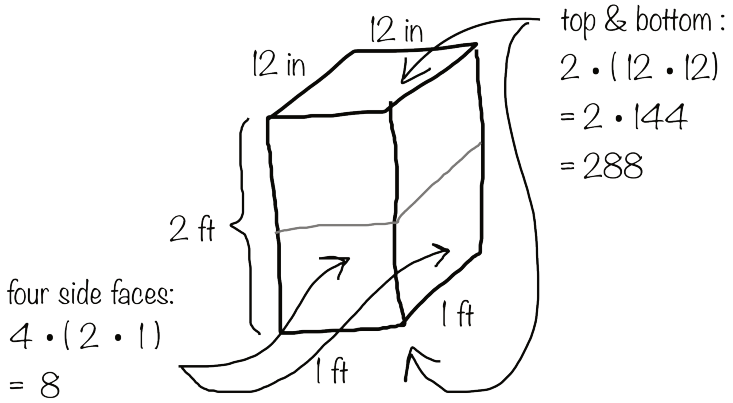
(from Unit 1, Lesson 14)

5. State whether each figure is a polyhedron. Explain how you know.



(from Unit 1, Lesson 13)

6. Here is Elena's work for finding the surface area of a rectangular prism that is 1 foot by 1 foot by 2 feet.



She concluded that the surface area of the prism is 296 square feet. Do you agree with her conclusion? Explain your reasoning.

(from Unit 1, Lesson 12)