



Math Virtual Learning

6th Grade Math

Solve Volume Problems with Rectangular Prisms

May 4, 2020



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Lesson: May 4, 2020

Objective/Learning Target:

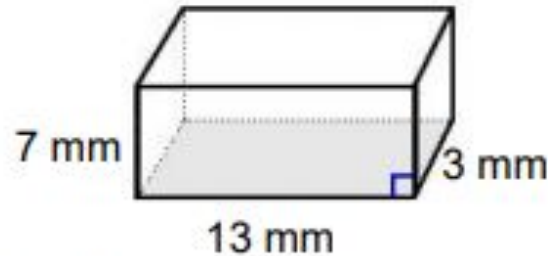
Students will solve problems involving volume of right rectangular prisms.

Bell Ringer:

Let's Get Started!

Watch This Video: [Volume of Rectangular Prisms](#)

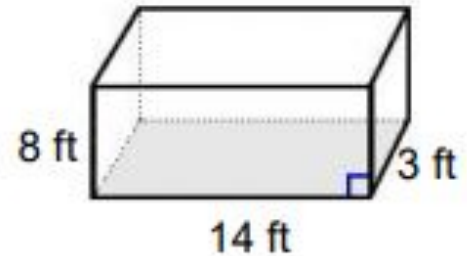
1)



Surface Area: _____

Volume: _____

2)

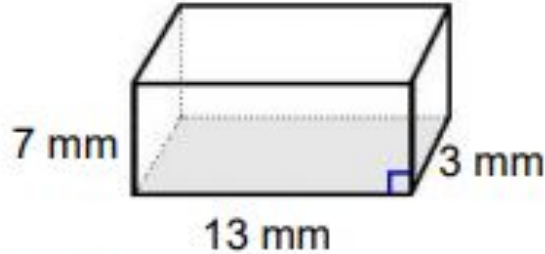


Surface Area: _____

Volume: _____

Bell Ringer: (Answer Key)

1)



Surface Area: 302 square mm

Volume: 273 cubic mm

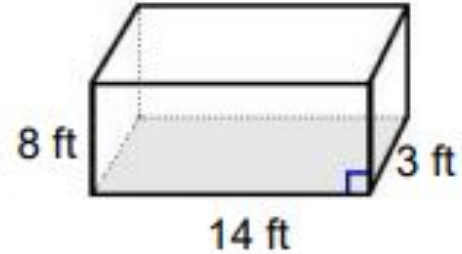
Find the area of each face and its opposite:

$$\begin{array}{ll} 7 \times 13 = 91 & 91 \times 2 = 182 \\ 13 \times 3 = 39 & 39 \times 2 = 78 \\ 7 \times 3 = 21 & 21 \times 2 = 42 \end{array}$$

Add the area of all the faces together:

$$182 + 78 + 42 = 302 \text{ square mm}$$

2)



Surface Area: 356 square ft.

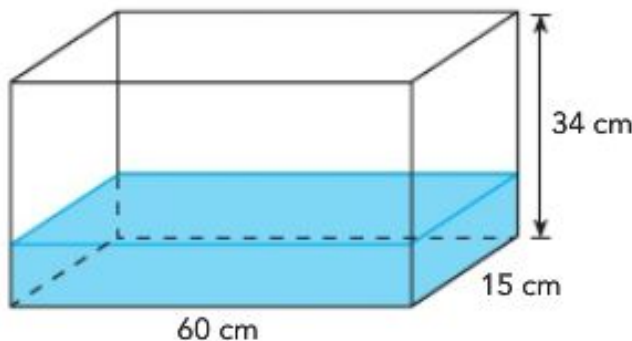
Volume: 336 cubic ft.

Find the volume by multiplying length by width by height:

$$8 \times 14 \times 3 = 336 \text{ cubic ft.}$$

Learn:

A rectangular fish tank 60 centimeters by 15 centimeters by 34 centimeters is $\frac{1}{3}$ full of water. Find the volume of water need to fill the tank completely.



Volume of water needed = Volume of empty space in the tank.

$$\text{The height of **empty space**} = \frac{2}{3} \times 34 = \frac{68}{3} \text{ cm}$$

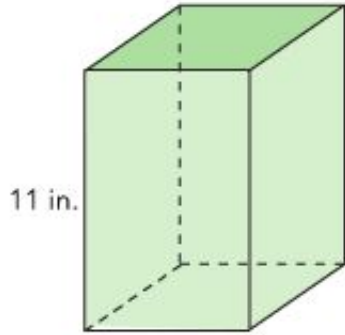
$$\begin{aligned} \text{Volume of **water needed** to fill the tank} &= 60 \times 15 \times \frac{68}{3} \text{ cm} \\ &= \frac{60 \times 15 \times 68}{3} \\ &= \frac{61,200}{3} = 20,400 \text{ cubic cm} \end{aligned}$$

To fill the tank, 20,400 cubic centimeters more water are needed.

Remember: The formula for finding volume of any prism is $V = Bh$. The B in the formula stands for area of the base and h stands for the height. You can also use $V = \ell wh$ to find the volume of a rectangular prism.

Learn:

A square prism of height 11 inches has a volume of 539 cubic inches. Find the length of the square base.



To find the length of the square base, you can first find the area of the square base.

$$V=Bh$$

Write the formula.

$$539 = B \times 11$$

Substitute.

$$\frac{539}{11} = B \times \frac{11}{11}$$

Divide each side by 11.

$$49 = B$$

Simplify.

The area of the square base is 49 square inches.

To find the length of each side of the base find the square root of 49.

$$\sqrt{49} = 7 \text{ in}$$

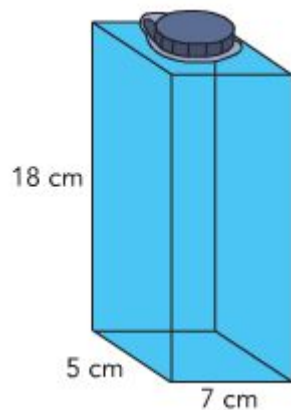
The length of each side of the square base is 7 inches.

Remember: the capital B in the formula $V=Bh$ represents the area of the base.

Practice:

Solve.

- 1** Savannah has a water bottle that is a rectangular prism. The bottle measures 7 centimeters by 5 centimeters by 18 centimeters and she filled it completely with water. Then, she drank $\frac{1}{4}$ of the volume of water in her water bottle. How many cubic centimeters of water were left in the water bottle?

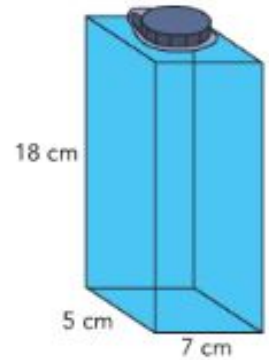


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- 2** A rectangular prism has a square base with edges measuring 8 inches each. Its volume is 768 cubic inches.
- a) Find the height of the prism.

Practice: (Answer Key)

Solve.

- 1 Savannah has a water bottle that is a rectangular prism. The bottle measures 7 centimeters by 5 centimeters by 18 centimeters and she filled it completely with water. Then, she drank $\frac{1}{4}$ of the volume of water in her water bottle. How many cubic centimeters of water were left in the water bottle? **472.5 cubic centimeters**



$$\frac{18 \times 5 \times 7}{4} = 472.5$$

- 2 A rectangular prism has a square base with edges measuring 8 inches each. Its volume is 768 cubic inches.

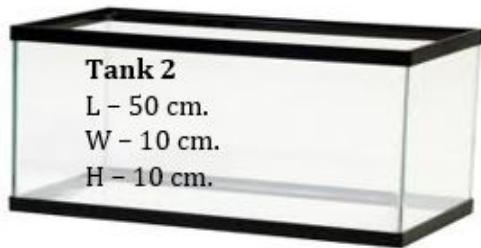
a) Find the height of the prism.

Height = 12 inches

Base is $8 \times 8 = 64$ sq. in.
Divide the volume by the base to get height.
 768 divided by $64 = 12$ inches

Additional Practice:

1) You are trying to choose between 2 fish tanks. The dimensions of the tanks are listed below. Which tank is the largest?



2) If 1 mL of water fills 1 cubic centimeter of space, how many mL of water are needed to fill each tank?

Tank 1 _____

Tank 2 _____

4) You only had enough money to buy three goldfish. When you added them to the tank you noticed that the water level rose 1 cm. What is the total volume of the 3 goldfish?

3) Congratulations! You bought the largest tank! Now you want to stock it with goldfish. Each goldfish needs 2,000 mL of water. How many goldfish can you fit in the tank?

5) For your birthday you bought a tunnel for the fish to swim through. When you added this to the tank the water level rose 2 cm. What is the total volume of the tunnel?

Additional Practice: (Answer Key)

1) You are trying to choose between 2 fish tanks. The dimensions of the tanks are listed below. Which tank is the largest?



Tank 1 - $30 \times 20 \times 15 = 9,000$ cubic cm.

Tank 2 - $50 \times 10 \times 10 = 5,000$ cubic cm. Tank 1 is the largest

2) If 1 mL of water fills 1 cubic centimeter of space, how many mL of water are needed to fill each tank?

Tank 1 Tank 1 - 9,000 mL of water

Tank 2 Tank 2 - 5,000 mL of water

4) You only had enough money to buy three goldfish. When you added them to the tank you noticed that the water level rose 1 cm. What is the total volume of the 3 goldfish?

Answer: The rise in water level created a rectangular prism that is $30 \times 20 \times 1$. This equals 600 cubic cm, so the volume of the 3 goldfish is 600 cubic cm.

3) Congratulations! You bought the largest tank! Now you want to stock it with goldfish. Each goldfish needs 2,000 mL of water. How many goldfish can you fit in the tank?

You bought tank 1, which holds 9,000 mL this is enough water for 4 goldfish.

5) For your birthday you bought a tunnel for the fish to swim through. When you added this to the tank the water level rose 2 cm. What is the total volume of the tunnel?

Answer: The rise in the water level created a rectangular prism $30 \times 20 \times 2$. This equals 1,200 cubic cm, so the volume of the tunnel is 1,200

Additional Resources:

Click on the links below to get additional practice and to check your understanding!

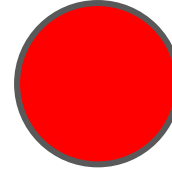
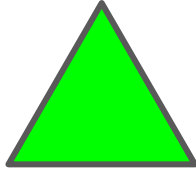
[Mario Mission](#): Use your volume and surface area skills to rescue Princess Peach!

[Find the Volume of the Rectangular Prism](#)

[Rectangular Prism Volume Practice](#)

Reflection:

Complete the triangle-square-circle reflection for today's lesson.



**What were the
three main
points of today's
lesson?**

**What squared
(made sense)
with you from
today's lesson?**

**What questions
do you still have
circling around
in your head?**