

### Circles

Recall that the radius is half the diameter.

2. Find the volume of a cylinder with a diameter of 16 inches and a height of 20 inches. Round to the nearest tenth.

$$V = \pi r^2 h \quad \text{Volume of a cylinder}$$

$$V = \pi(8)^2(20) \quad \text{The diameter is 16 so the radius is 8. Replace } h \text{ with 20.}$$

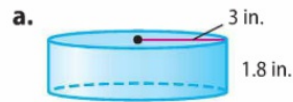
$$V \approx 4,021.2 \quad \text{Use a calculator.}$$

The volume is about 4,021.2 cubic inches.

DO FIRST!  
 $(16)(8)^2(3.14)$   
 $V = h \cdot r^2 \cdot \pi$

Got It? Do these problems to find out.

Find the volume of each cylinder. Round to the nearest tenth.



b. diameter: 12 mm  
height: 5 mm

a.  $50.9 \text{ in}^3$

b.  $565.5 \text{ mm}^3$

Show your work.

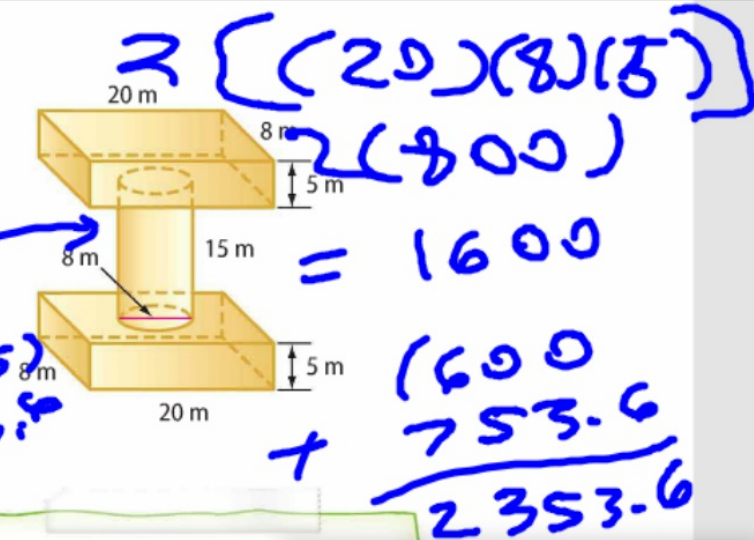
$r = 6$   
 $V = \pi r^2 h$   
 $= (3.14)(6)^2(5)$   
 $B = \pi r^2$

PEMDAS  
① ②



3. A platform like the one shown was built to hold a sculpture for an art exhibit. What is the volume of the figure? (Example 4)

2,354.0 m<sup>3</sup>



4. A scented candle is in the shape of a cylinder. The radius is 4 centimeters and the height is 12 centimeters. Find the mass of the wax needed to make the candle if 1 cubic centimeter of wax has a mass of 3.5 grams. Round to the nearest tenth. (Example 3)

2,111.2 g

### Rate Yourself!

How confident are you about finding the volume of cylinders? Circle the box that applies.

Calculator

753.6 + 1600 = 2353.6

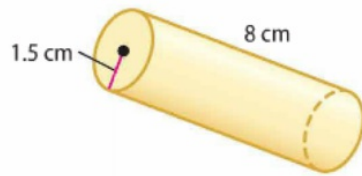
2353.6

CE

C

Find the volume of each cylinder. Round to the nearest tenth. (Examples 1 and 2)

1. 56.5 cm<sup>3</sup>



2. 402.1 in<sup>3</sup>


diameter: 8 in.  
height: 8 in.

3. A platform like the one shown was built to hold a sculpture for an art exhibit. What is the volume of the figure? (Example 4)

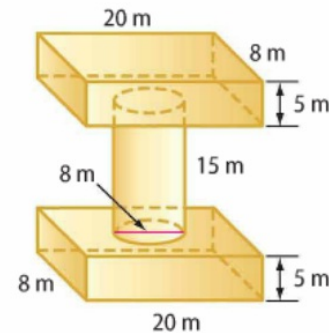
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5.  **Building on the Essential Question** How is the formula for the volume of a cylinder similar to the formula for the volume of a rectangular prism?

Sample answer: In both, the volume equals the area of the base times the height.



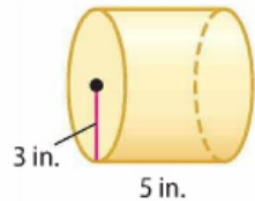
# Independent Practice

Go online for Step-by-Step Solutions



Find the volume of each cylinder. Round to the nearest tenth. (Examples 1 and 2)

1.  $141.4 \text{ in}^3$

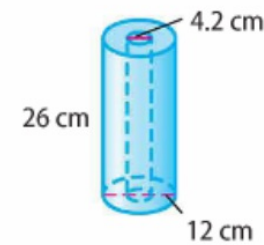


2.  $103.4 \text{ m}^3$

diameter 4.5 m  
height 6.5 m

3. Mia's parents have a cylindrical oak tree stump that has a diameter of 3 feet and a height of 2 feet. How much does the stump weigh if the average weight of oak is 59 pounds per cubic foot? Round to the nearest tenth. (Example 3)  $831.9 \text{ lb}$

4. An unused roll of paper towels is shown. What is the volume of the unused roll? (Example 4)  $2,580.3 \text{ cm}^3$



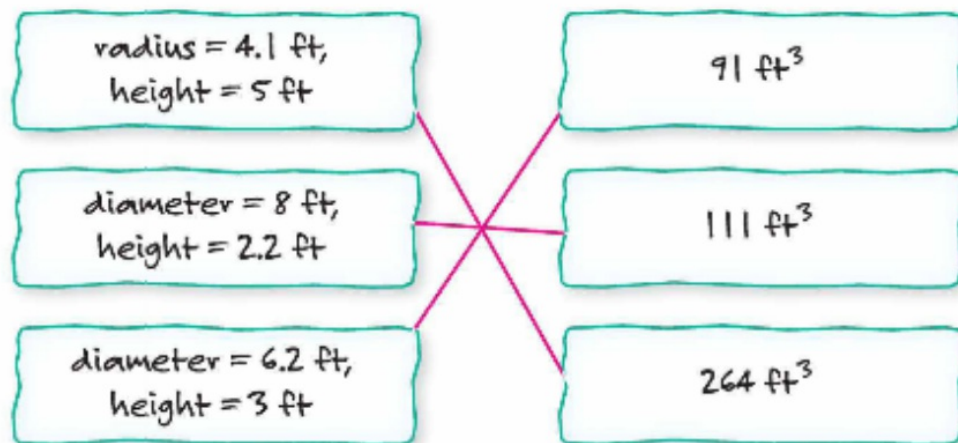
5.  **Model with Mathematics** Refer to the graphic novel frame

5. **CCSS Model with Mathematics** Refer to the graphic novel frame below for Exercises a–c.



- a. Find the volume of the bag and candle. Round to the nearest tenth.  
**bag:  $132 \text{ in}^3$ ; candle:  $29.5 \text{ in}^3$**
- 
- b. How much packing material is needed to fill the empty space in the bag after the candle is placed in the bag?  **$102.5 \text{ in}^3$**
- 
- c. There are 70 teachers in the school. If each package of packing material contains 575 cubic inches of material, how many packages do they need to buy to fill all of the gift bags? **13 packages**
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6. **CCSS Use Math Tools** Match each cylinder with its approximate volume.



### H.O.T. Problems Higher Order Thinking

7. **CCSS Persevere with Problems** Two equally-sized sheets of construction paper are rolled; one along the length and the other along the width, as shown. Which cylinder has the greater volume? Explain.



**Sample answer: The shorter cylinder, because the radius is larger and that is the squared value in the formula.**



## H.O.T. Problems Higher Order Thinking

7. **CCSS Persevere with Problems** Two equally-sized sheets of construction paper are rolled; one along the length and the other along the width, as shown. Which cylinder has the greater volume? Explain.



**Sample answer:** The shorter cylinder, because the radius is larger and that is the squared value in the formula.

8. **CCSS Model with Mathematics** Draw and label a cylinder that has a larger radius but less volume than the cylinder shown below.



9. **CCSS Reason Abstractly** Find the ratios of the volume of cylinder A to cylinder B.
- Cylinder A has the same radius but twice the height of cylinder B. **2:1**
  - Cylinder A has the same height but twice the radius of cylinder B. **4:1**