Worksheet 1  Building Solids Using Unit Cubes

How many unit cubes are used to build each solid?

1. __________ unit cubes
2. __________ unit cubes

This is a unit cube.

3. __________ unit cubes
4. __________ unit cubes
5. __________ unit cubes

6. __________ unit cubes

7. __________ unit cubes

8. __________ unit cubes

9. __________ unit cubes

10. __________ unit cubes
Worksheet 2  Drawing Cubes and Rectangular Prisms

Draw these cubes or rectangular prisms on the dot paper without showing the unit cubes.

Example

1.
2. [Diagram of a cube]

3. [Diagram of a rectangular solid]

Name: ___________________________ Date: ____________
4. Complete the drawing of each cube or rectangular prism.

5. Complete the drawing of each cube or rectangular prism.
6. Draw a rectangular prism that has edges 3 times as long as this prism.

7. Draw a rectangular prism that has edges 3 times as long as this prism.
Worksheet 3  Prisms and Pyramids

Complete.

**Example**

In the figures, circle two vertices and shade two faces gray.

One of the **faces** of the square **pyramid** is a square.

1. In the figures, circle three vertices and color three edges gray.

The **triangular pyramid** has 6 **edges**.
Circle the shape(s) that can be found in the figure.

Example

The base of the pentagonal prism is a pentagon. The other faces are rectangles.

Triangle       Square       Rectangle
Parallelogram  Pentagon     Hexagon

2. Triangle       Square       Rectangle
Parallelogram  Pentagon     Hexagon

Shade each solid shape if it has two identical and parallel faces.

3. 

Put a check in the box if the solid figure is a prism.

4. 

Match the names to the solid figures.

5. Rectangular prism
   Pentagonal prism
   Triangular prism
   Octagonal prism
   Hexagonal prism

Complete the table.

<table>
<thead>
<tr>
<th>Type of Prism</th>
<th>Number of Faces</th>
<th>Number of Edges</th>
<th>Number of Vertices</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Rectangular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Pentagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Triangular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Octagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Hexagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Put a check in the box if the solid figure is a pyramid. Shade the base of each pyramid.

11.

Match the names to the solid figures.

12.

Triangular pyramid

Rectangular pyramid

Pentagonal pyramid

Hexagonal pyramid

Octagonal pyramid
Complete the table.

<table>
<thead>
<tr>
<th>Type of Pyramid</th>
<th>Number of Faces</th>
<th>Number of Edges</th>
<th>Number of Vertices</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Triangular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Rectangular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Pentagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Hexagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Octagonal</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These are the nets of some pyramids. Shade the base of each pyramid.

18. More than one net may form the same solid figure.
These are the nets of some prisms. Shade the identical and parallel edges of each prism using different colors.

19.

Match the nets with the solid figure they form.

20.
21. Explain the statements.

a. A cube is a rectangular prism.

b. A cone is not a prism.
22. For each figure, identify whether or not it is a prism. Explain your reasoning.

- [Figure 1]
- [Figure 2]
- [Figure 3]
- [Figure 4]
Worksheet 4  Nets and Surface Area

Find the surface area of each cube.

**Example**

Area of one square face = $4 \times 4 = 16$ in.$^2$

Surface area of the cube = $6 \times 16 = 96$ in.$^2$

The **surface area** is equal to the sum of the areas of the 6 square faces.

1. 

   ![Diagram of a cube with dimensions 7 cm, 7 cm, and 7 cm]

2. 

   ![Diagram of a cube with dimensions 14 in., 14 in., and 14 in.]
Find the surface area of each rectangular prism.

**Example**

Area of 2 gray rectangles = \( \frac{(7 \times 4)}{2} + \frac{(7 \times 4)}{2} \)

\[ = 2 \times (7 \times 4) \]

\[ = 56 \text{ cm}^2 \]

Area of 2 white rectangles = \( \frac{(7 \times 5)}{2} + \frac{(7 \times 5)}{2} \)

\[ = 2 \times (7 \times 5) \]

\[ = 70 \text{ cm}^2 \]

Area of 2 black rectangles = \( \frac{(5 \times 4)}{2} + \frac{(5 \times 4)}{2} \)

\[ = 2 \times (5 \times 4) \]

\[ = 40 \text{ cm}^2 \]

Surface area of the rectangular prism = 56 + 70 + 40

\[ = 166 \text{ cm}^2 \]
3. 

8 in.

13 in.

6 in.

4. 

17 in.

17 in.

8 in.

5. 

2 m

9 m

11 m
Find the surface area of each triangular prism.

Example

Area of triangles = \[
\frac{2}{1} \times \left(\frac{1}{2} \times 3 \times 4\right)
\]

\[= 2 \times 6\]

\[= 12 \text{ cm}^2\]

Area of white rectangle = \[
8 \times 3\]

\[= 24 \text{ cm}^2\]

Area of black rectangle = \[
8 \times 4\]

\[= 32 \text{ cm}^2\]

Area of gray rectangle = \[
8 \times 5\]

\[= 40 \text{ cm}^2\]

Surface area of the triangular prism = \[12 + 24 + 32 + 40\]

\[= 108 \text{ cm}^2\]
6. The base of this triangular prism is a right triangle.

7. The base of this triangular prism is a right triangle.
Solve. Show your work.

8. A rectangular cupboard measures 110 centimeters by 85 centimeters by 40 centimeters. What is the surface area of the cupboard?

9. A rectangular display cabinet measures 96 centimeters by 78 centimeters by 34 centimeters. What is the surface area of the outside of the cabinet if it does not have a cover?

10. A rectangular bedroom measures 12 feet by $8\frac{1}{2}$ feet by 7 feet. The rectangular door in the bedroom measures 2 feet by $6\frac{1}{2}$ feet. Joanne decides to paint the walls of the room pink. Find the surface area of the walls in the room.
Worksheet 5  Understanding and Measuring Volume

These solids are formed by stacking 1-centimeter cubes. Find the volume of each solid.

1. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

2. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

3. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

4. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

5. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

6. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

7. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³

8. 
   ![Diagram of a solid made of cubes]
   Volume = _______ cm³
These solids are built using unit cubes. Find the volume of each solid. Then compare the volumes and fill in the blanks.

**Example**

![Solid A](image1.png)  ![Solid B](image2.png)

Volume = 17 cubic units  Volume = 10 cubic units
Solid A has a larger volume than solid B.

These solids are built using 1-inch cubes. Find the volume of each solid. Then compare their volumes and fill in the blanks.

9.

![Solid C](image3.png)  ![Solid D](image4.png)

Volume = in.³  Volume = in.³
Solid __________ has a lesser volume than solid __________.
These solids are built using 1-foot cubes. Find the volume of each solid. Then compare their volumes and fill in the blanks.

10.

Volume = _________ ft³  Volume = _________ ft³
Solid _________ has a larger volume than solid _________.

These solids are built using 1-centimeter cubes. Find the volume of each solid. Then compare their volumes and fill in the blanks.

11.

Length = _________ cm  Length = _________ cm
Width = _________ cm  Width = _________ cm
Height = _________ cm  Height = _________ cm
Volume = _________ cm³  Volume = _________ cm³
Solid _________ has a larger volume than solid _________.
These solids are built using 1-meter cubes. Find the volume of each solid. Then compare their volumes and fill in the blanks.

12.

Length = _________ m
Width = _________ m
Height = _________ m
Volume = _________ m³

Solid _________ has a smaller volume than solid _________.
Worksheet 6  Volume of a Rectangular Prism and Liquid

Find the volume of each rectangular prism or cube.

Example

[Diagram of a cube with dimensions 8 cm x 8 cm x 8 cm]

Length = 8 cm
Width = 8 cm
Height = 8 cm

Volume = length × width × height
= edge × edge × edge
= 8 × 8 × 8
= 512 cm³

1.

[Diagram of a rectangular prism with dimensions 18 cm x 27 cm x 35 cm]

Volume = ________
2. 

Volume = 

3. 

Volume = 

4.

Volume = 

5.

Volume = 

6. 

Volume = __________

7. 

Volume = __________
Solve. Show your work.

Example

Steven fills a rectangular container measuring 17 centimeters by 14.5 centimeters by 12 centimeters with orange juice. How many liters and milliliters of orange juice are in the container?

Volume of orange juice in the container
= 17 cm × 14.5 cm × 12 cm
= 2,958 cm³
= 2,958 mL
= 2 L 958 mL

Remember that 1 cm³ = 1 mL.

8. The base of a miniature rectangular fish tank measures 8 centimeters by 4.5 centimeters. The height of the tank is 6 centimeters. Find the capacity of the tank in liters and milliliters.
9. A rectangular container measures 6 centimeters by 3.5 centimeters by 12 centimeters. It is completely filled with water. How many liters and milliliters of water are in the container?

10. A rectangular box measures 15 centimeters by 9 centimeters by 13 centimeters. Shannon uses the box to mix glue for her project. She fills the entire box with glue. How many liters and milliliters of glue are in the box?
11. A rectangular container is \( \frac{1}{2} \)-filled with water. How much water is needed to fill the container? After the container is filled, how much water must be poured out so that the container is \( \frac{1}{3} \) full?

12. A tank is \( \frac{1}{2} \)-filled with water. Some of the water is then poured into 8 small containers each with a capacity of 27 cubic centimeters. The tank is now \( \frac{1}{4} \) full. What is the capacity of the tank?
13. A swimming pool, 25 meters wide, 50 meters long, and 12 meters deep, is \( \frac{2}{3} \)-filled with water. Its cross section is as shown below. How much water must be drained off so that the water level falls to 5 meters?

![Diagram of the swimming pool](image)

14. Complete the statements.

a. Volume of a rectangular prism = length \( \times \) __________ \( \times \) __________

b. Volume of a cube = __________ \( \times \) width \( \times \) __________
15. Label the two rectangular prisms.
   Fill in the blanks with length, width and height.

16. In the diagram, the base $= 63 \text{ m}^2$ and height $= 8 \text{ m}$. Find the volume of the rectangular prism.

   $B = 63 \text{ m}^2$

   Volume $= \underline{\hspace{2cm}} \text{ cubic meters}$. 
17. Find the volume of the prism.

Volume = ________
Complete.

**Example**

A solid is made from two rectangular prisms. Find the volume of the solid.

![Diagram of two rectangular prisms](image)

- a. Volume of prism A = \(3 \times 4 \times 7\) = \(84\) cm\(^3\)
- b. Volume of prism B = \(3 \times 6 \times 9\) = \(162\) cm\(^3\)
- c. Volume of the solid = \(84 + 162\) = \(246\) cm\(^3\)

1. A solid is made from two rectangular prisms. Find the total volume of the solid.

![Diagram of two rectangular prisms](image)

- a. Volume of prism A = \(\_\_\_\_\_ \times \_\_\_\_\_ \times \_\_\_\_\_\) = \(\_\_\_\_\_\) cm\(^3\)
- b. Volume of prism B = \(\_\_\_\_\_ \times \_\_\_\_\_ \times \_\_\_\_\_\) = \(\_\_\_\_\_\) cm\(^3\)
- c. Volume of the solid = \(\_\_\_\_\_ \+ \_\_\_\_\_\) = \(\_\_\_\_\) cm\(^3\)
Solve. Show your work.

2. Find the volume of the rectangular prism after a cube is removed from it.

3. Find the volume of the solid which is made up of two prisms.