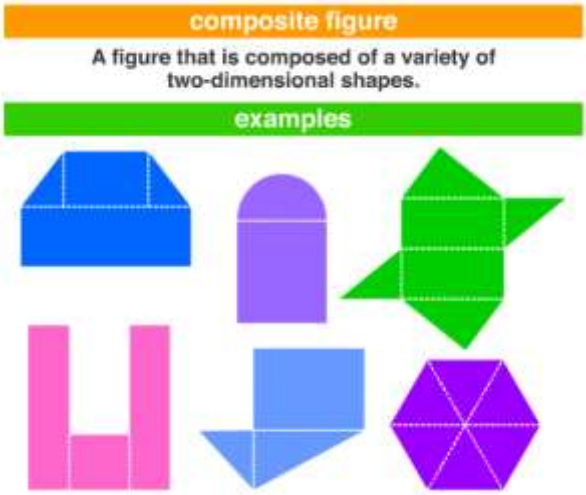
VOLUME: COMPOSITE FIGURES



Unit Overview

In this unit, students will identify the volume of composite figures.

Key Vocabulary

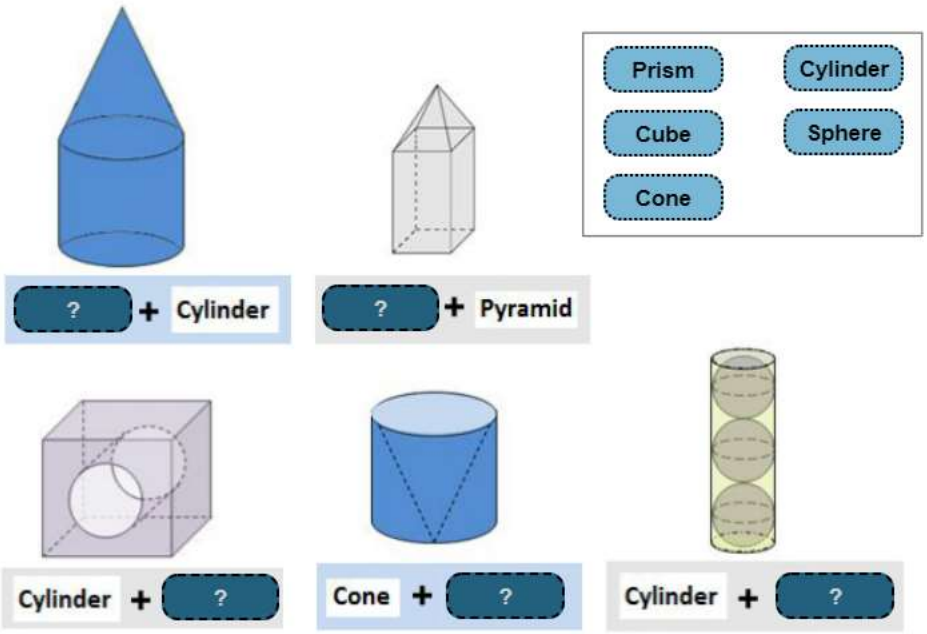
Volume	Number of cubic units inside a three-dimensional figure
Composite figure	Composed of several geometric shapes and are three-dimensional shapes.
Volume of a Cone	Formula → $1/3\ \pi\ r^2\ h$
Volume of a Sphere	Formula → $4/3\ \pi\ r^3$
Volume of a Prism	Formula → $V=Bh$
Volume of a Cube	Formula → volume = s^3
Volume of a Cylinder	Formula → $V=\pi r^2 h$

Composite Figures

A composite figure is a three-dimensional figure that is the combination of two or more similar figures. Solid figures such as prisms, cylinders, pyramids, cones, and spheres are used to make 3-dimensional solids called a composite of multiple shape or composite figures.

Let's Practice – Composite Figures

1. For each of the composite figures below, identify the 3-dimensional figures that are used to create the composite figure.



(answers from left to right: cone, prism, cube, cylinder, sphere)

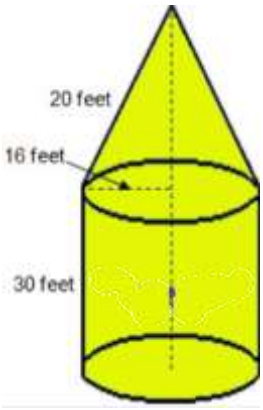
Volume of Composite Figures

Finding the volume of a composites figure is like finding the volume of each solid figure. These individual solid figures such as prisms, cylinders, pyramids, cones, and spheres are combined with make three-dimensional solids called composites figures. There are two ways to find the volume of a composite figure:

- Composite Figure: Stacked → one figure is stacked on top of each other
  - You need to find the volume of each figure and add them together
- Composite Figure: Inside → one figure is inside the other figure
  - You need to find the volume of each figure and subtract them

Example A – Composite Figure – Stacked

Find the volume of the composite figure below.



Step 1 → Identify the three-dimensional solids in the figure above

- The figure is a cone and a cylinder

Step 2 → Determine the volume of the cone and identify the formula of a volume of the cone.

- V = 1/3 $\pi r^2 h$
- Volume of a cone → 3215 ft^3

Step 3 → Determine the volume of the cylinder and identify the formula of a volume of a cylinder

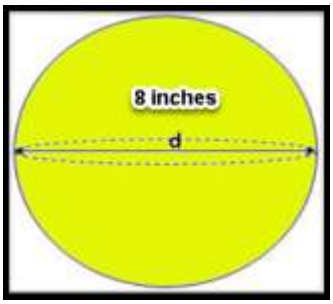
- V = $\pi r^2 h$
- Volume of a cylinder → 24,115 ft^3

Step 4 → Find the sum of the cylinders

- *V cone + V cylinder*
- 3215 ft^3 + 24,115 ft^3 = **27,330 ft^3**

Example B – Composite Figure: Inside

Find the volume of the composite figure.



The sphere is inside the cube.

Step 1 → Identify the three-dimensional solids in the figure above

- The figure is a sphere and a cube

Step 2 → Determine the volume of the sphere and identify the formula of a volume of the sphere. (Remember that the radius is half of the diameter)

- $V = 4/3\ \pi r^3$
- 268 in^3

Step 3 → Determine the volume of the cube and identify the formula of a volume of a cube.

- $V = s^3$
- $(8 \text{ inches})^3 = 512\ in^3$

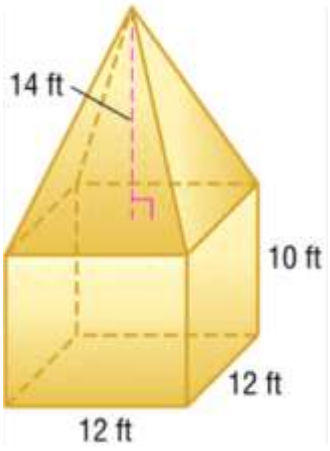
Step 4 → Find the differences in the volumes of both three-dimensional figures.

- *V sphere – V cube*
- $512\ in^3 - 268\ in^3 =$ **$244\ in^3$**

Click on the word **volume** to watch a presentation of composite figures.

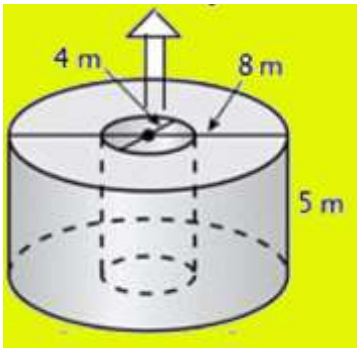
Let's Practice – Volume of Composite Figures

1. Find the volume of the composite figure. (Stacked)



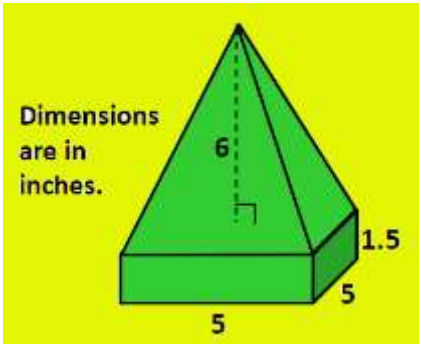
(2112 ft^3)

2. Find the volume of the composite figure. (Inside)



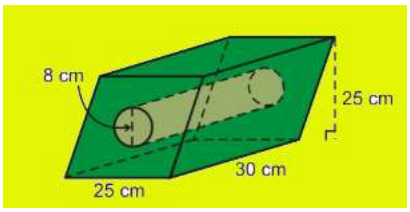
(188.4 m^3)

3. Find the volume of the composite figure. (Stacked)



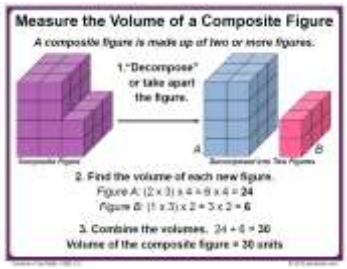
(87.5 in^3)

4. Find the volume of the composite figure. (Inside)



(17,242.04 cm^3)

Below are additional educational resources and activities for this unit.



Click on the icon to the left to view the steps of measuring the Volume of a Composite Figure.

[Practice 1: Volume of a Composite Figure]

[Practice 2: Volume of a Composite Shape]