

# Density

Calculate density, and identify substances using a density chart.

**Density** is a measure of the amount of mass in a certain volume. This physical property is often used to identify and classify substances. It is usually expressed in grams per cubic centimeters, or  $g/cm^3$ . The chart on the right lists the densities of some common materials.

Densities of Substances

Substance	Density ( $g/cm^3$ )
Gold	19.3
Mercury	13.5
Lead	11.4
Iron	7.87
Aluminum	3.7
Bone	1.7–2.0
Gasoline	0.66–0.69
Air (dry)	0.00119

**EQUATION:**  $density = \frac{mass}{volume}$

$$D = \frac{m}{V}$$

**SAMPLE PROBLEM:** What is the density of a billiard ball that has a volume of  $100\text{ cm}^3$  and a mass of 250 g?

$$D = \frac{250\text{ g}}{100\text{ cm}^3}$$

$$D = 2.5\text{ g/cm}^3$$

## Your Turn!

1. A loaf of bread has a volume of  $2270\text{ cm}^3$  and a mass of 454 g. What is the density of the bread?

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2. A liter of water has a mass of 1000 g. What is the density of water?  
(Hint:  $1\text{ mL} = 1\text{ cm}^3$ )

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3. A block of wood has a density of  $0.6\text{ g/cm}^3$  and a volume of  $1.2\text{ cm}^3$ . What is the mass of the block of wood? Be careful!

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4. Use the data below to calculate the density of each unknown substance. Then use the density chart above to determine the identity of each substance.

Mass (g)	Volume ( $cm^3$ )	Density ( $g/cm^3$ )	Substance
<i>Example:</i> 4725	350	$4725 \div 350 = 13.5$	mercury
a. 171	15	_____	_____
b. 148	40	_____	_____
c. 475	250	_____	_____
d. 680	1000	_____	_____