

# 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<sup>3</sup>. The chart on the right lists the densities of some common materials.

Densities of Substances

Substance	Density (g/cm <sup>3</sup> )
Gold	19.3
Mercury	13.5
Lead	11.4
Iron	7.87
Aluminum	2.7
Bone	1.7–2.0
Gasoline	0.66–0.69
Air (dry)	0.00119

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

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

**SAMPLE PROBLEM:** What is the density of a billiard ball that has a volume of 100 cm<sup>3</sup> and a mass of 250 g?

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

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

## Your Turn!

- A loaf of bread has a volume of 2270 cm<sup>3</sup> and a mass of 454 g. What is the density of the bread?  
\_\_\_\_\_
- A liter of water has a mass of 1000 g. What is the density of water? (Hint: 1 mL = 1 cm<sup>3</sup>)  
\_\_\_\_\_
- A block of wood has a density of 0.6 g/cm<sup>3</sup> and a volume of 1.2 cm<sup>3</sup>. What is the mass of the block of wood? Be careful!  
\_\_\_\_\_
- 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 <sup>3</sup> )	Density (g/cm <sup>3</sup> )	Substance
	Example: 4725	350	$\frac{4725}{350} = 13.5$	mercury
a.	171	15	_____	_____
b.	108	40	_____	_____
c.	475	250	_____	_____
d.	680	1000	_____	_____

## WORKSHEET

32

## MATH IN SCIENCE: INTEGRATED SCIENCE

## MATH SKILLS USED

Multiplication  
Division  
Decimals*Density*

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**Your Turn!**

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

$$454 \text{ g} \div 2270 \text{ cm}^3 = 0.2 \text{ g/cm}^3$$

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

$$1000 \text{ g} \div 1000 \text{ cm}^3 = 1 \text{ g/cm}^3$$

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!

$$0.6 \text{ g/cm}^3 \times 1.2 \text{ cm}^3 = 0.72 \text{ g}$$

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.

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c.	475	250	$475 \div 250 = 1.9$	bone
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