

Intro

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Density

Ch 3

Objectives

- Calculate the density of a material from experimental data.
- Describe how density varies with temperature.

Density

- Which is heavier– a pound of lead or a pound of feathers?
- The relationship here between mass and volume is called Density

Density

- The formula for density is:

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

- Common units are: **g/mL**, or possibly **g/cm³**, (or **g/L** for gas)
- Density is a physical property, and does not depend upon sample size

Density Activity

- ▶ Discuss how to determine the densities of each material.
- ▶ Gather data and calculate densities.

Density Activity

- ▶ Discuss how to determine the densities of each material.
- ▶ Gather data and calculate densities.
- ▶ Compare your densities with another group.

Density and Temperature

- What happens to the density as the temperature of an object increases?
 - Mass remains the same
 - Most substances increase in volume as temperature increases

Float/sink

- ▶ Why does ice float in water?
- ▶ Why does a marble sink in water?
- ▶ What else?
- ▶ How is this useful? Research.

Density problem #1

- ▶ A copper penny has a mass of 5.76 g and a volume of 0.65 cm³.
- ▶ What is the density of copper?

Density problem #2

- ▶ What is the volume of a pure silver coin that has a mass of 25 g? The density of silver is 10.5 g/cm³.

Density problem #3

- ▶ A sample of dogwood has a mass of 65 g and a volume of 82 mL. Will this wood sink or float in water ($d=1.0$ g/mL)? Will this wood sink or float in gasoline ($d=0.69$ g/mL)?