LESSON 5

LAB

All That Glitters

Density

Name _____

Date _____ Period _____

Purpose

Materials

- balance
- gold-colored penny

Part 1: Calculating Density

1. Density is mass divided by volume. Use the mass and volume measurements in this table to calculate the density of each object.

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

Density

Object	Mass	Volume (mL)	Density (g/mL)
5 cm gold-colored rod	55.4 g	6.6 mL	
5 cm silver-colored rod	17.8 g	6.6 mL	
10 cm silver-colored rod	35.6 g	13.2 mL	
10 cm crayon	3.2 g	13.3 mL	

2. Which object has the highest density?

3. Which object has the lowest density?

4. What does it mean to say that a substance has a high density?

5. Two of the objects have the same density. Explain how two objects with different masses and volumes can have the same density.

6. If you had a 1 cm^3 cube of the gold-colored metal, what would its mass be? How do you know?

7. The densities of several metals are given in the table on the next page. Based on your calculations, what are the identities of the gold-colored and silver-colored metals from your activity?

Densities of Metals

Copper	Zinc	Gold	Aluminum	Brass
9.0 g/mL	7.1 g/mL	19.3 g/mL	2.7 g/mL	8.4 g/mL

8. The density of an iron nail is the same as the density of an iron frying pan. Explain how this can be true.

Part 2: Comparing Densities

9. Find the mass of your gold-colored penny, then calculate the density. The volume of a penny is 0.36 mL.

10. Can you use the density value you just calculated to determine whether the gold-colored penny you made in class is gold? Explain.

11. You have a piece of metal with volume 30.0 mL and mass 81.0 g. What is its density? What kind of metal do you think it is?

12. Making Sense How can determining the density of an object help you figure out what it is made of?

13. If You Finish Early How much would 1 cubic meter of solid gold weigh in pounds? Here are some conversion factors:

$1\ \text{lb} = 454\ \text{g} \qquad 1\ \text{mL} = 1\ \text{cm}^3 \qquad 1\ \text{m}^3 = 1{,}000{,}000\ \text{cm}^3$