Name _____

Mystery Metals and Hidden Materials

Every substance has its **own characteristic density**, which can be used as an **identifying property** - like a fingerprint. Use the density formula to find the density, then compare it to known reference values.

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

Reference Densities (g/cm³): Aluminum - 2.7 | Zinc - 7.1 | Iron - 7.9
Copper - 8.9 | Silver - 10.5 | Lead - 11.3 | Gold - 19.3

1. An unknown metal sample has a mass of **27 g** and a volume of **10 cm³**. _____
Calculate its density and identify the most likely metal.

2. A gray metal cube has a side length of **3 cm** and a mass of **243 g**. _____
Find its density and possible identity.

3. A student measures the mass of a metal cylinder as **355 g** and its volume as **50 cm³**.

What is its density? Which metal could it be? _____

4. A golden-colored ring has a **mass of 38.6 g** and **volume of 3.68 cm³**._____
Is it made of pure gold?

5. An unknown coin displaces **4.0 mL** of water and has a **mass of 35.6 g**. _____
Identify the metal.

6. A rectangular sample measures **2 cm × 3 cm × 4 cm** and has a mass of **192 g**.

What is its density, and what might the metal be? _____

7. A scientist finds that an unknown sample has a **density of 7.2 g/cm³**. _____
Which two metals is it most likely between?

8. If a 100 g piece of copper is cut in half, what is the density of each half?

What does this show about density as a property? _____

9. A metal sample weighs **227 g** in air but only **202 g** when submerged in water. The loss in apparent weight equals the volume of displaced water (in cm³).

Find the metal's density and identify it. _____