Name _____

The Great Density Challenge

Concept Reminder - Remember the key relationships between **mass (m)**, **volume (V)**, and **density (D):** $D = \frac{m}{V}, m = D \times V, V = \frac{m}{D}$

Water's density: 1.0 g/mL = 1000 kg/m³

1. A sample of metal has a mass of **540 g** and a volume of **200 cm³**. _____
What is its density?

2. A block has a **density of 2.5 g/cm³** and a **volume of 40 cm³**. _____
Find its mass.

3. A rock has a **mass of 150 g** and a **density of 3.0 g/cm³**. _____
Find its volume.

4. A cube of silver has a side length of **4 cm** and a mass of **1680 g**. _____
Find its density.

5. A gas occupies **2500 mL** and has a mass of **3.25 g**. _____
Find its density in **g/mL**.

6. Which material will float in water? _____

A: density = 0.75 g/mL B: density = 1.15 g/mL C: density = 0.99 g/mL

7. A scientist compresses a gas, halving its volume while keeping mass constant.
What happens to its density? _____

8. A student has two samples of the same metal:

Sample 1: 60 g, 20 cm³, Sample 2: 180 g, 60 cm³

Do they have the same density? Explain. _____

_____

9. The density of aluminum is **2.7 g/cm³**. _____
What is this in **kg/m³**?

10. Challenge Question: A mixture contains 100 mL of oil (density = 0.9 g/mL) floating on 200 mL of water (density = 1.0 g/mL).
What is the **average density** of the combined system? _____