**Density Problems** **Name: _____**

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

**D = Density (g/mL)**
**M = Mass (g)** **V = Volume (mL)**

A. Solve the following equations. Then, keeping the volume the same at 4.0 mL, adjust the mass (increase or decrease, it's your choice) and create three more problems and solve them. Show your work and give units.

Mass = 2.0g
Volume = 4.0mL
Density = ?

1.

2.

3.

According to your calculations, how would changing ONLY the mass (if that could happen) affect the density of an object? Provide evidence in your reasoning.

B. Solve the following equation. Then keeping the mass the same and 5.0g, adjust the volume (increase or decrease, it's your choice) and create three more problems and solve them. Show your work and give units.

Mass = 5.0g
Volume = 20.0mL
Density = ?

1.

2.

3.

According to the problems you developed and your calculations, how would changing the volume ONLY (if that could happen) affect density? Provide evidence in your reasoning.

**Density Problems**

1. You have a rock with a volume of 15mL and a mass of 45g. What is its density? Show all of your work and give units.

2. You have a different rock with a volume of 30mL and a mass of 60g. What is its density? Show all of your work and give units.

3. You decide you want to carry a boulder home from the beach. It is 30 centimeters on each side, and so has a volume of 27,000mL. It is made of granite, which has a typical density of 2.8 g/mL. How much is the mass of the boulder? M = D x V

4. Rocks are sometimes used along coasts to prevent erosion. If a rock needs to weigh 2,000 kg in order not to be shifted by waves, how big (what volume) does it need to be? You are using basalt, which has a typical density of 3200 kg/$m^3$. V = M/D

5. A golden-colored cube is handed to you. The person wants you to buy it for $100, saying that is a gold nugget. You pull out your old geology text and look up gold in the mineral table, and read that its density is 19.3 g/mL. You use water displacement and find that it has a volume of 84mL, and weighs 40 g. What is its density? Is it gold? Should you buy it?