DENSITY

NAME _____ SECTION _____

1. When a marble is dropped into a beaker of water, it sinks to the bottom. Which is the best explanation?

   a. The surface area of the marble is not large enough to be held up by the surface tension of the water.

   b. The mass of the marble is greater than that of the water.

   c. The marble weighs more than the equivalent volume of the water.

   d. The force from dropping the marble breaks the surface tension of the water.

   e. The marble has greater mass and volume than the water.

   Justify your choice. For the choices you did not pick, explain what is wrong with each statement.

2. Consider the following compounds and their densities.

Substance	Density (g/mL)	Substance	Density (g/mL)
Isopropyl alcohol	0.785	Toluene	0.866
n-Butyl alcohol	0.810	Ethylene glycol	1.114

   100 mL of each liquid is placed in its own graduated cylinder.

   a. If the label on each graduated cylinder got lost, how would you be able to identify which graduated cylinder contains which chemical?

   b. Is density an intensive or an extensive property of matter?

3. You have a 1.000 cubic centimeter sample of lead (density = 11.34 g/cm^3), a 1.000 cubic centimeter sample of glass (density = 2500 kg/m^3), and a 1.00 cm^3 sample of ebony wood (density = 960 kg/m^3) and balsa wood (density = 170 kg/m^3). You drop each in separate beakers of water each containing 250 mL of water.

   How do the volumes of water displaced by each sample compare? Explain.

4. Gold can be hammered into thin sheets called gold leaf. You have 2 gold leaves that your grandmother gave you as a gift.

   a. Your grandmother told you that the first one was made from a 305 mg piece of gold that has been hammered into a sheet measuring 2.44 ft × 1.12 ft. What is the average thickness of the sheet in meters, using scientific notation? (Density = 19.32 g/cm^3)

   b. The other gold leaf was made from a 650 mg piece of gold leaf that has been hammered into a sheet measuring 3 cm × 3 cm × 0.00374 cm. What is the density of this gold leaf?

   c. If you were to sell these two sheets of gold on e-Bay, what would you expect to sell it for? (Google the current cost of gold per ounce.)