

Name: _____

Section: _____

More Density Practice Problems

Directions: Use the skills you have acquired over the past few class periods to solve the problems below. Please show all work on a separate sheet of paper!

	Substance	Density
Liquid	Rubbing Alcohol	0.79 g/mL
	Corn Oil	0.93 g/mL
	Water	1.00 g/mL
	Corn Syrup	1.38 g/mL
	Mercury	13.55 g/mL
Solid	Aluminum	2.70 g/cm ³
	Copper	8.96 g/cm ³
	Silver	10.50 g/cm ³
	Lead	11.35 g/cm ³
	Gold	19.32 g/cm ³

$$1 \text{ cm}^3 = 1 \text{ mL}$$

1. Suppose you have a lead ball with a mass of 454 grams. What is its volume?
2. What is the mass of a 15 mL sample of mercury?
3. A sample of metal has a mass of 4,059 grams and a volume of 453 cm³. What metal is it?
4. A cube has a length of 6 cm on one side. What would be the cube's density if it has a mass of 4,169 grams? What substance is it?
5. The density of a sheet of computer paper is 0.8 g/cm³. What is the mass of a sheet of paper that is 0.1 mm thick, 217 mm wide, and 280 mm long? **Hint: be sure to convert your lengths from millimeters to centimeters.**
6. A jar contains 20 mL of liquid that has a mass of 27.6 grams and 40 mL of another liquid that has a mass of 31.6 grams.
 - a. What is the identity of each liquid?
 - b. Which liquid is on the top? Explain your reasoning.

7. Sydney and Peter were responsible for determining the identity of a metal sphere. Instead of working together on the task as instructed by the teacher, they decided to split up the work and just share what they got - Sydney would determine the mass and Peter would determine the volume. Sydney used a triple beam balance and determined that the mass of a metal sphere was 33 grams. The only problem was that the sphere was placed into a plastic cup so it would not roll off of the pan and even though she thought she was getting the mass of the sphere, she actually got the mass of the sphere and the cup. After glancing over at Sydney using the triple beam balance Peter asked her if she had gotten the mass of the cup alone. Sydney acknowledged that she did not, so she placed the cup on the scale and got a measurement of 1.5 grams.

After putting water into a graduated cylinder and then dropping in the metal sphere, Peter recorded a volume of 57 milliliters. Unfortunately, Peter forgot to write down his initial volume measurement. Unsure of what to do, he carefully removed the object from the graduated cylinder (without losing/removing any water). He then stumbled toward the sink and the sphere flew out of his hand and down the drain. He approached Sydney for assistance and she informed him that they should still be able to figure out the volume measurement. Even though it was no longer possible to use the sphere, they decided to look back at the volume of water left in the graduated cylinder and they noticed there were 54 milliliters of water.

Although Sydney and Peter encountered some difficulties along the way, they were able to successfully identify the metal sphere. The most important lesson they learned was not how to determine density, but the power of working collaboratively with peers. What did they determine the sphere's identity to be?

8. A hot air balloon contained a large volume of air with a density of 0.0013 g/mL. After opening up the burner for an extended period of time, the air began to substantially heat up. Consequently, the spaces between the air particles became greater and the volume of the air in the balloon increased by 5%. If the mass of the air stayed pretty-much the same, what would be the density of the heated air in the balloon?