

Density Worksheet

Name _____ Period _____

Density is the **ratio** of the **mass** of the substance to the **volume** of the substance at a given temperature. $D = \text{mass}/\text{volume}$. Density has units of **g/cm³** or **g/ml**, or any mass over volume unit. **In science we usually use g/mL** for liquids and solids, and **g/L** for gases. Density is an **intensive physical** property. It remains the same no matter the sample size. But it will **vary** with change in **temperature**. Most substances when object get hotter, their volume gets larger. With the same mass being divided by a larger volume, the density will drop. As they cool, the density will rise.

1. A gold-colored ring has a mass of 18.9 grams and a volume of 1.12 mL. Is the ring pure gold? (The density of gold is 19.3 g/mL.)
2. Pumice is volcanic rock that contains many trapped air bubbles. A 225 gram sample occupied 236.6 mL. What is the density of pumice? Will pumice float on water? The density of water is 1.0 g/mL @ room temp. Will it float in gasoline? The density of gasoline is 0.66 g/mL
3. What volume (in Liters) would a 0.871 gram sample of air occupy if the density of air is 1.29 g/L?
4. A cup of sugar has a volume of 237 mL. What is the mass of the cup of sugar if the density is 1.59 g/mL?
5. A crumpet recipe calls for 175 grams of flour. According to Julia Child's data, the density of flour is 0.620 g/mL. How many mL of flour are needed for this recipe?
6. From their density values, decide whether each of the following substances will sink or float when placed in sea water, which has a density of 1.03 g/mL. (The more dissolved particles in the water, the more dense the water becomes.)
Gasoline 0.66 g/mL
Asphalt 1.2 g/mL
Mercury 13.6 g/mL
Cork 0.26 g/mL
Distilled water 1.00 g/mL
Rubbing alcohol 0.78 g/mL
7. A sample of lead is found to have a mass of 32.6 g. A graduated cylinder contains 2.8 mL of water. The water displacement method allows you to find the volume of a solid sample. When you drop the solid into the water it will displace the amount of water that is equal to the volume of the solid. After the lead sample is added to the cylinder the water level reads 5.7 mL. Calculate the density of the lead sample in grams/mL.
8. A piece of magnesium is in the shape of a rectangle & has a height of 2.62 cm a width of 1.34 cm and a length of 5.22 cm. What is the volume of the Mg to the correct number of significant digits?
If the magnesium sample has a mass of 32.6 g, what is the density of the sample?