### 1.6 DENSITY

Density: $\qquad$

Density depends on $\qquad$ , not how much there is.

Is density an intensive or extensive property?
Density of 1 gram of iron $=$ density of 10 grams of iron
INTENSIVE property: a measurable property of a sample of matter $\qquad$
$\qquad$ of the matter is being considered.
Ex:
EXTENSIVE property: a measure able property of a sample of matter that $\qquad$
$\qquad$ of the matter that is being considered.

Ex:
Formula for density:
Density $=$

KNOW HOW TO
USE FORMULA!

Common units for density: $\mathrm{g} / \mathrm{cm}^{3}$ or $\mathrm{g} / \mathrm{mL}$ or $\mathrm{kg} / \mathrm{m}^{3}$
Density depends on two things:

1. How tightly packed the atoms are
2. What kind of atoms they are

Need to know information for density:
-density of water $=1 \mathrm{~g} / \mathrm{mL}$
-objects with a density GREATER than $1 \mathrm{~g} / \mathrm{mL}$ will sink in water
-objects with a density LESS than $1 \mathrm{~g} / \mathrm{mL}$ will float in water
Example 1. A certain mineral has a mass of 17.8 g and a volume of $2.35 \mathrm{~cm}^{3}$. What is the density of this mineral?

Example 2. What is the mass of a 49.6 mL sample of a liquid, which has a density of $0.85 \mathrm{~g} / \mathrm{mL}$ ?

Example 3. Copper has a density of $8.96 \mathrm{~g} / \mathrm{cm}^{3}$. If 75.0 g of copper is added to 50.0 mL of water in a graduated cylinder, to what volume reading will the water level in the cylinder rise?

## HOMEWORK: DENSITY

Show all work, INCLUDING UNITS. Do not forget to perform any necessary conversions.

1. A flask that weighs 345.8 g is filled with 225.0 mL of carbon tetrachloride (a liquid solvent). The weight of the flask and the carbon tetrachloride together is found to be 703.6 g . From this information, calculate the density of carbon tetrachloride in $\mathrm{kg} / \mathrm{cL}$.
2. Table salt has a density of $2.16 \mathrm{~g} / \mathrm{cm}^{3}$. A cylindrical box holds 4.25 kg of salt. What is the volume, in $\mathrm{cm}^{3}$, occupied by the salt in the box?
3. What is the weight, in grams, of ethyl alcohol that exactly fills a 0.200 L container? The density of ethyl alcohol is $0.789 \mathrm{~g} / \mathrm{mL}$.
