Name: KEY Date: 2021-2022

Mass, Volume, and Density (Science 8)

MASS is: the quantity of matter in a sample; measured with a scale

Mass is expressed in units of: g (grams), kg (kilograms), lb (pounds), t (tonnes)

VOLUME is: the amount of space that a material takes up; measured with a graduated cylinder

Volume is expressed in different units depending on if it is a liquid or solid.

Volumes of **liquids** are expressed in mL (millilitres).

Other units also exist, such as L (liters), oz (ounces), cups, teaspoons, etc.

Volumes of **solids** are expressed in cubic units, such as cm^3 (centimeters cubed) and m^3 (meters cubed).

DENSITY is: the mass of a material that occupies a certain volume.

It tells us whether a substance will float or sink in another substance.

Density Units

The formula to calculate density is:

density = mass ÷ volume

Therefore, the units for density are ***any mass unit divided by any volume unit***:

e.g. $\frac{g}{mL}$, $\frac{g}{cm^3}$ are the ones most commonly used, but you could also see $\frac{kg}{L}$, $\frac{lb}{m^3}$, etc.

Density of solids is given in units of $\frac{g}{cm^3}$ (grams per centimeter cubed).

Density of liquids is given in units of $\frac{g}{mL}$ (grams per millilitre cubed).

PRACTICE

1. A gold ring sinks in water. Therefore, gold is (more/less) dense than water.
2. If oil floats on top of water, that means that oil must be (more/less) dense than water.
3. Based on their units, classify the following quantities as **masses**, **volumes**, **densities**, or **none** of these.

a. 15kg	m	h. 2.4 g/cm³	d
b. 3.25g	m	i. 13.582 g/kg	none
c. 2L	V	j. 12.8 g	m
d. 11.5 cm³	V	k. 21 cm³	V
e. 1.2 g/mL	d	l. 2.7 mL/g	none
f. 32 g	m	m. 3.8 kg/mL	d
g. 6.3 cm²	none	n. 150 mL	V