

mass density $\rho_m = \frac{m}{Vol}$; specific $y = \nu/m$; milli ~ .001 (centi ~ .01), kilo ~ 1000

1. a) A large unbroken egg is a { compound | element | heterogeneous mixture | homogeneous mixture }
 b) that occupies which volume? { 60 kL | 0.50 L | 45 mL | 4.0 mL | 0.35 mL } . ←choose 1
 c) That egg contains about { 6 grams | 60 grams | 600 grams | 6000 grams }
 d) When that egg is broken, its Volume will { decrease | increase | not change }
 e) while its mass will { decrease | increase | not change } ,
 f) so its mass density will { decrease | increase | not change } .
 g) The egg's interior (not shell) is a { gas | liquid | solid | plasma | none of these } ,
 h) that will { dissolve | hover | float | sink } in liquid water .
 i) Explain your choice for 1.h) briefly, *including numbers*:

$\rho_{egg} = \frac{60 \text{ gram}}{45 \text{ mL}} = 1.33 \frac{\text{g}}{\text{mL}}$; more than liquid water (denser)

- j) convert your choice for 1.c) to a metric unit with a *different prefix* : 0.060 Kg ←number unit

$0.060 \text{ kg} \times \frac{1000}{1000} \text{ g} = 60 \text{ g}$ (or $60,000 \text{ mg}$)

2. Hershey's Chocolate Syrup label claims a serving size is 15 mL (19 grams), which includes 10 g sugar.

- a) How much material in this serving is something other than sugar? 09 g (← number unit) Show all steps below:

19 g
 $- 10 \text{ g}$

- b) Hershey's Syrup is what percent sugar? 53 % { by Count | by mass | by Volume } Show all steps below:

$\frac{10 \text{ g sugar}}{19 \text{ g total}} \times 100 \% = 53 \%$

- c) compute the syrup's mass density:

$\rho_{mass} = \frac{m}{Vol} = \frac{19 \text{ g}}{15 \text{ mL}} = 1.27 \frac{\text{g}}{\text{mL}}$

3. Brianna measures an empty cylinder's mass,

empty cylinder mass 91.6 g

pours gun pellets into it, to the 20.0 mL mark;

cylinder + 20 mL pellets 116.1 g

then pours water into the cylinder to the 20 mL mark.

cylinder + pellets + water 123.3 g

The pellets stayed below the water surface

- a) compute the (original air-mixture's) mass density. Show all your steps!

$\rho_{mix} = \frac{m_{mix}}{Vol_{mix}} = \frac{(116.1 \text{ g} - 91.6 \text{ g})}{20 \text{ mL}} = \frac{24.5 \text{ g}}{20 \text{ mL}} = 1.225 \frac{\text{g}}{\text{mL}}$

- b) compute the pellet material's mass density. Show all your steps!

$\rho_p = \frac{m_{plastic}}{V_{plastic}} = \frac{24.5 \text{ g}}{20 \text{ mL} - V_{water}} = \frac{24.5 \text{ g}}{20 \text{ mL} - \frac{123.3 \text{ g} - 116.1 \text{ g}}{1 \frac{\text{g}}{\text{mL}}}} = 12.8 \text{ mL} \dots = 1.92 \frac{\text{g}}{\text{mL}}$

(-7.2 mL)

P.S.121 Quiz 1 statistics

$$\frac{\text{class avg (raw)}}{\text{total possible}} = \frac{12.8 \pm 4.7}{29} \xrightarrow[\text{first 9 raw @ .6 scaled}]{\text{next 15 @ .3 scaled}} \frac{\text{gradebook avg (scaled)} \downarrow 6.4 \pm 1.6}{10}$$

example for scaling into gradebook (out of 10 gradebook points)

$$13 \text{ raw points} = 9 \times 0.6 + (13-9) \times 0.3 = 5.4 + 1.2 = \frac{6.6}{10}$$