

# W-GC General Chemistry 9/29

SI unit

length → meter

mass → kilogram

time → second

temperature → kelvin

"amount of substance" → mole

$10^{-1}$  deci d

$10^3$  kilo

$10^{-2}$  centi c

$10^6$  Mega

$10^{-3}$  milli m

$10^9$  Giga

$10^{-6}$  micro  $\mu$

$10^{12}$  Tera

$10^{-9}$  nano n

$10^{-12}$  pico p

$$D = \frac{\text{mass}}{\text{volume}} \quad \boxed{\text{g/cm}^3}$$

$$D = \frac{M}{V} \quad V(D) = \left(\frac{M}{D}\right)V$$

1.) Thing -  $38 \text{ g}$   $8.2 \text{ cm}^3$  density?

$$D = \frac{38 \text{ g}}{8.2 \text{ cm}^3} = 4.6 \text{ g/cm}^3$$

2. Thing B  $23.1 \text{ g/cm}^3$   $7.8 \text{ cm}^3$  mass?  $M = VD$

$$(23.1 \text{ g/cm}^3)(7.8 \text{ cm}^3) = 180 \text{ g}$$

3. Thing C  $48 \text{ g}$   $9.25 \text{ g/cm}^3$

$$\frac{48 \text{ g}}{9.25 \text{ g/cm}^3} = \boxed{5.2 \text{ cm}^3}$$

Volume  $D = \frac{M}{V}$   
 $V = \frac{M}{D}$

# Temperature Scales

$$^{\circ}\text{C} \rightarrow \text{K}$$

$$^{\circ}\text{C} + 273 \rightarrow \text{K}$$

$$\text{K} - 273 \rightarrow ^{\circ}\text{C}$$

$$325\text{K} \rightarrow \underline{52^{\circ}\text{C}}$$

$$\begin{array}{r} 325 \\ -273 \\ \hline 52 \end{array} \quad 127^{\circ}\text{C} \rightarrow \boxed{400\text{K}}$$

$127 + 273$

$$^{\circ}\text{C} \rightarrow ^{\circ}\text{F}$$

$$\frac{9}{5} \times ^{\circ}\text{C} + 32 = \frac{\quad}{\text{F}}$$

$$\frac{4}{20 \left(\frac{1}{5}\right) + 32}$$

$36 + 32 = \boxed{68^{\circ}\text{F}}$

$$^{\circ}\text{F} \rightarrow ^{\circ}\text{C}$$

$$\frac{5}{9} (F - 32) = \frac{\quad}{\text{C}}$$

$$20^{\circ}\text{C} \rightarrow \underline{\quad^{\circ}\text{F}}$$

$$\frac{5}{9} (77 - 32) = \frac{5}{9} (45) = \boxed{25^{\circ}\text{C}}$$

$$77^{\circ}\text{F} \rightarrow \underline{\quad^{\circ}\text{C}}$$

celsius temperature scale

0°  
freezing  
pt  
water

100°  
boiling  
pt  
water

kelvin temperature scale  
movement  $\rightarrow$  absolute zero

$$0\text{K} \rightarrow -273^{\circ}\text{C}$$

1.)  $47800000$   
 $4.78 \times 10^7$

2.)  $6825000$   
 $6.825 \times 10^6$

3.)  $950100000000$   
 $9.501 \times 10^{11}$

4.)  $800000$   
 $8 \times 10^5$

5.)  $0.00000253$   
 $2.53 \times 10^{-6}$

6.)  $0.001028$   
 $1.028 \times 10^{-3}$

7.)  $0.000006$   
 $6 \times 10^{-6}$

8.)  $0.000789$   
 $7.89 \times 10^{-4}$

## Dimensional Analysis

- 1.) Burritos are amazing. The standard burrito is 6 inches long and delicious. The moon is, at any given time, 238,900 miles from the earth. How many burritos away is the moon from the earth?

12 inches = 1 foot    5,280 feet = 1 mile    1 supreme = beans, guac and queso

Write in scientific notation.

$$\begin{array}{l} \textcircled{4} \downarrow \downarrow \downarrow \\ 238,900 \text{ mi} \times \frac{5,280 \text{ ft}}{1 \text{ mi}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ burrito}}{6 \text{ in}} \\ 2.522 \times 10^9 \text{ burritos} \end{array}$$

- 2.) Craters be thirsty. A Big Gulp soft drink at 7-11 is 30 ounces. The Grand Canyon is big. Seriously. It has a volume of 5,450,000,000,000 cubic yards.

1 ounce = 1.805 cubic feet    1 cubic yard = 27 cubic feet

Write in scientific notation.