

Name: Key
Blk: _____ Date:

Chemistry 11 MULTIPLE UNIT CONVERSIONS

In our last lesson we learned how to do SIMPLE UNIT CONVERSIONS, today we are going to investigate more complicated problems.

Ex.1 If Tim Hortons® donuts are \$5.35/doz, and there are 12 donuts/doz, how many individual donuts can be bought for \$21.40?

C = # donuts

A = \$21.40

B = this time there are multiple conversion factors:

\$5.35 / 1 doz ; 12 donuts / 1 doz

PUT IT ALL TOGETHER

$$\# \text{ donuts} = \$21.40 \times \frac{1 \text{ doz}}{\$5.35} \times \frac{12 \text{ donuts}}{1 \text{ doz}} = \boxed{48 \text{ donuts}}$$

Ex 2. How many seconds are there in a 365 day calendar year?

C = # s

A = 365 day

B = this time there are multiple conversion factors:

24 hr / 1 day ; $\frac{24 \text{ hr}}{1 \text{ day}}$; 60 min / 1 hr ; 60 s / 1 min

PUT IT ALL TOGETHER

$$\# \text{ s} = 365 \text{ day} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = \boxed{3,153,600 \text{ sec}}$$

Ex. 3. The gas tank of a Canadian car holds 39.5 L of gasoline. If 1 L of gasoline is equal to 0.264 gal (gallons) and the price of gas at the pump in Blaine, Washington is \$2.65 US/gal. What is the cost of filling up an empty Canadian Car if \$1US = \$1.30 CDN?

$$C = \# \text{ \$ CDN}$$

$$A = 39.5 \text{ L}$$

B = this time there are multiple conversion factors:

$$1 \text{ L} / 0.264 \text{ gal} / \$2.65 \text{ US} / 1 \text{ gal} / \$1 \text{ US} / 1.30 \text{ CDN}$$

PUT IT ALL TOGETHER

$$\# \text{ \$ CDN} = 39.5 \text{ L} \times \frac{0.264 \text{ gal}}{1 \text{ L}} \times \frac{\$2.65 \text{ US}}{1 \text{ gal}} \times \frac{\$1.30 \text{ CDN}}{\$1 \text{ US}} =$$

$$\boxed{\$35.92}$$

Seatwork/Homework: Exercises 3 – 10

Multiple Conversions Key # 3-10

$$3. \# \text{ kPa} = 27.0 \text{ inches} \times \frac{0.0334 \text{ atm}}{1 \text{ inch}} \times \frac{101.3 \text{ kPa}}{1 \text{ atm}} = \boxed{91.4 \text{ kPa}}$$

$$4. \text{ a) } \# \text{ kJ} = 3.1 \times 10^{13} \text{ m}^3 \times \frac{917 \text{ kg}}{1 \text{ m}^3} \times \frac{334 \text{ kJ}}{1 \text{ kg}} = \boxed{9.5 \times 10^{18} \text{ kJ}}$$

$$\text{ b) } \# \text{ Kg} = 9.5 \times 10^{18} \text{ kJ} \times \frac{1 \text{ kg}}{1.51 \times 10^4 \text{ kJ}} = \boxed{6.3 \times 10^{14} \text{ kg}}$$

$$5. \# \text{ t} = \$350 \times \frac{1 \text{ kg}}{\$0.980} \times \frac{1 \text{ t}}{1000 \text{ kg}} = \boxed{0.357 \text{ t}}$$

$$6. \# \text{ carats} = 177 \text{ mL} \times \frac{3.51 \text{ g}}{1 \text{ mL}} \times \frac{1 \text{ carat}}{0.200 \text{ g}} = \boxed{3106 \text{ carats}}$$

$\hookrightarrow \boxed{3.11 \times 10^3 \text{ carats}}$

$$7. \text{ a) } \# \text{ km} = 0.25 \text{ h} \times \frac{120 \text{ km}}{1 \text{ h}} = \boxed{3.0 \times 10^1 \text{ km}}$$

$$\text{ b) } \# \text{ km} = 12 \text{ min} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{120 \text{ km}}{1 \text{ hr}} = \boxed{24 \text{ km}}$$

$$8. \text{ a) } \# \$ = 3 \text{ doz} \times \frac{\$8.40}{1 \text{ doz}} = \boxed{\$25.20}$$

$$\text{ b) } \# \text{ hb} = 5 \text{ doz} \times \frac{\$8.40}{1 \text{ doz}} \times \frac{1 \text{ hamburger}}{\$1.50} = \boxed{28 \text{ hamburgers}}$$

$$\text{ c) } \# \text{ beakers} = \$13.30 \times \frac{1 \text{ doz}}{\$8.40} \times \frac{12 \text{ beakers}}{1 \text{ doz}} = \boxed{19 \text{ beakers}}$$

$$9. \# \text{ chickens} = 1 \text{ gift} \times \frac{2 \text{ horses}}{1 \text{ gift}} \times \frac{5 \text{ cows}}{3 \text{ horses}} \times \frac{4 \text{ hogs}}{1 \text{ cow}} \times \frac{4 \text{ goats}}{3 \text{ hogs}} \times \frac{9 \text{ chickens}}{1 \text{ goat}}$$

$= \boxed{160 \text{ chickens}}$