Name_____ Date_____ Hour_____

Chemistry Worksheet – Factor Labeling I

1. Express each of the following as a 3 significant digit number in scientific notation.

a. 9,454,500,500 km

9.45×10^{9} Km

b. 22.4126 L

2.24×10^{1} L

c. 0.0032416 m

3.24×10^{-3} m

d. 0.0000000140 cm

1.40×10^{-8} cm

e. 2,210,000,000 cm^3

2.21×10^{9} cm^3

2. Convert the following using a factor label table.

K H D B D C M
1000 100 10 10 100 1000

a. 30 cm to m

$\frac{1\ m}{100\ cm} \left| \frac{30\ cm}{} \right. = 0.3\ m$ or $3 \times 10^{-1}\ m$

b. 50.5 kg to cg

$\frac{100\ cg}{1\ g} \left| \frac{1000\ g}{1\ Kg} \right| 50.5\ Kg = 5,050,000\ cg$ or $5.05 \times 10^{5}\ cg$

c. 1350 mm to km

$\frac{1\ Km}{1000\ m} \left| \frac{1\ m}{1000\ mm} \right| 1350\ mm = 0.00135\ Km$ or $1.35 \times 10^{-3}\ Km$

d. 15.2 kL to cm^3

$\frac{1\ cm^3}{1\ mL} \left| \frac{1000\ mL}{1\ L} \right| \frac{1000\ L}{1\ KL} \left| 15.2\ KL \right. = 15,200,000\ cm^3$ or $1.52 \times 10^{7}\ cm^3$

e. 450 mL to L

$\frac{1\ L}{1000\ mL} \left| \frac{450\ mL}{} \right. = 0.45\ L$ or $4.5 \times 10^{-1}\ L$

3. Conversion Table:

Weight/Mass	Volume	Length
1kg = 2.2 lb	1 L = 1.06 qt	1 m = 39.37 in

a. A relay race is run for a distance of 100 m. What distance in this in yards?

$$\frac{1\text{ yd}}{36\text{ in}} \left| \frac{39.37\text{ in}}{1\text{ m}} \right| \frac{100\text{ m}}{} = 109\text{ yd} \text{ or } 1.09 \times 10^2\text{ yd}$$

b. A car can travel 25 mi per gallon of gasoline. Express this quantity in kilometers per liter.

$$\frac{25\text{ mi}}{\text{gal}} \rightarrow \frac{\text{Km}}{\text{L}}$$

$$\frac{1\text{ Km}}{1000\text{ m}} \left| \frac{1\text{ m}}{39.37\text{ in}} \right| \frac{12\text{ in}}{1\text{ ft}} \left| \frac{5280\text{ ft}}{1\text{ mi}} \right| \frac{25\text{ mi}}{1\text{ gal}} \left| \frac{1\text{ gal}}{4\text{ qt}} \right| \frac{1.06\text{ qt}}{1\text{ L}} = 11\ \frac{\text{Km}}{\text{L}} \text{ or } 1.1 \times 10^1\ \frac{\text{Km}}{\text{L}}$$

c. If gasoline cost 97 cents per gallon, what is the cost of 5 liters of gasoline?

* To nearest cent

$$\frac{\$0.97}{1\text{ gal}} \left| \frac{1\text{ gal}}{4\text{ qt}} \right| \frac{1.06\text{ qt}}{1\text{ L}} \left| \frac{5\text{ L}}{} \right. = \$1.29$$

d. If a man can move 35 lbs of dirt per minute, how many kilograms can he move per hour?

$$\frac{35\text{ lb}}{1\text{ min}} \rightarrow \frac{\text{kg}}{\text{hr}}$$

$$\frac{1\text{ Kg}}{2.2\text{ lb}} \left| \frac{35\text{ lb}}{1\text{ min}} \right| \frac{60\text{ min}}{1\text{ hr}} = 950\ \frac{\text{Kg}}{\text{hr}} \text{ or } 9.5 \times 10^2\ \text{Kg/hr}$$

e. A car travels 65 km/h. How fast is this in cm/s?

$$\frac{65\text{ Km}}{\text{hr}} \rightarrow \frac{\text{Cm}}{\text{s}}$$

$$\frac{100\text{ cm}}{1\text{ m}} \left| \frac{1000\text{ m}}{1\text{ Km}} \right| \frac{65\text{ Km}}{1\text{ hr}} \left| \frac{1\text{ hr}}{60\text{ min}} \right| \frac{1\text{ min}}{60\text{ sec}} = 1800\text{ cm/sec} \text{ or } 1.8 \times 10^3\text{ cm/sec}$$