Name _____

Date _____ Pd ____

Chemistry – Unit 1 - Worksheet 6

Dimensional Analysis

Use the factor-label method to make the following conversions. Remember to use the appropriate number of sf's in your answer.

Part 1

1. 74 cm x $\frac{1\ m}{10^{+2}\ cm}$ = 7.4×10^{-1} meters

2. 8.32×10^{-2} kg x $\frac{10^{3}\ g}{1\ kg}$ = 8.32×10^{1} grams

3. 55.5 mL x $\frac{1\ cm^{3}}{1\ mL}$ = 55.5 cm^3

4. 0.00527 cal x $\frac{1\ kcal}{10^{3}\ cal}$ = 5.27×10^{-6} kilocalories

5. 9.52×10^{-4} m x $\frac{10^{6}\ um}{1\ m}$ = 9.52×10^{2} micrometers

6. 41.0 mL x $\frac{1\ L}{10^{3}\ mL}$ = 4.10×10^{-2} liters

7. 6.0×10^{-1} g x $\frac{10^{3}\ mg}{1\ g}$ = 6.0×10^{2} mg

8. 8.34×10^{-9} cg x $\frac{1\ g}{10^{3}\ cg}$ = 8.34×10^{-11} g

9. 5.0×10^{3} mm x $\frac{1\ m}{10^{3}\ mm}$ = 5.0 m

10. 1 day x $\frac{24\ hrs}{1\ day}$ x $\frac{60\ min}{1\ hr}$ x $\frac{60\ sec}{1\ min}$ = 8.64×10^{4} seconds

11. 5×10^{4} mm x $\frac{1\ m}{10^{3}\ mm}$ x $\frac{1\ Km}{10^{3}\ m}$ = $5. \times 10^{-2}$ km

12. 9.1×10^{-13} kg x $\frac{10^{3}\ g}{1\ kg}$ x $\frac{10^{9}\ ng}{1\ g}$ = 9.1×10^{-1} ng

13. 1 year x $\frac{365\ days}{yr}$ x $\frac{24\ hr}{1\ day}$ = 8.76×10^{3} hours (approximately)

14. 4.22 cL x $\frac{1\ L}{10^2\ cL}$ x $\frac{10^3\ ml}{1\ L}$ = 4.22×10^1 mL

15. 1 mile x $\frac{5280\ ft}{1\ mi}$ x $\frac{12\ in}{1\ ft}$ = 6.336×10^4 inches

Part 2

1. How many nickels could you trade for 250 yen? \$1 = 150 yen.

$250\ yen \times \frac{\$1}{150\ yen} \times \frac{20\ nickels}{1\ \$1} \sim 3.3 \times 10^1$ or 33 nickels

2. Your school club sold 600 tickets to a chili supper. The chili recipe for 10 persons requires 2 teaspoons of chili powder? How many teaspoons of chili powder will you need altogether?

$600\ tickets \times \frac{1\ person}{1\ ticket} \times \frac{2\ teaspoons}{10\ people} = 1.2 \times 10^2\ tsp$

3. How many cups of chili powder will you need? Three teaspoons (tsp) equal one tablespoon (TBS) and 16 tablespoons equal 1 cup.

$1.2 \times 10^2\ tsp \times \frac{1\ T}{3\ tsp} \times \frac{1\ cup}{16\ T}$ 2.5 cups

4. How many seconds in a year? (assume 30 days in an average month)

3.1536×10^7 sec

$1\ year \times \frac{365\ days}{year} \times \frac{24\ hrs}{1\ day} \times \frac{60\ min}{hr} \times \frac{60\ sec}{1\ min}$

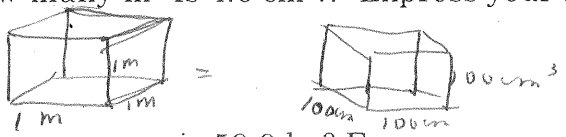
5. Chloroform is a liquid once used for anesthetic. What is the volume of 5.0 g of chloroform.
The density of chloroform 1.49 g/mL

$5.0\ g \times \frac{1\ mL}{1.49\ g} = 3.4\ mL$

6. How many inches long is a football field?

$100\ yds \times \frac{3\ ft}{yd} \times \frac{12\ in}{ft} = 3.6 \times 10^3\ in$

7. How many m^3 is 4.6 cm^3.? Express your answer in scientific notation.



so $1\ m^3 = 1 \times 10^6\ cm^3$

$4.6\ cm^3 \times \frac{1\ m^3}{1 \times 10^6\ cm^3}$

$4.6 \times 10^{-6}\ m^3$

8. How many mg is 59.0 kg? Express your answer in scientific notation.

$59.0\ kg \times \frac{10^3\ g}{1\ kg} \times \frac{10^3\ mg}{1\ g}$

$5.90 \times 10^7\ mg$