Unit Conversions Refresher

Name - _____

1.) Solve the following using the method of unit conversions.

a.) If one mole of a gas has a volume of $22.4\ L$, how many moles are there in $2.50\ L$?

b.) How many seconds must an electrical current of $35\ \frac{coulombs}{second}$ flow in order to deliver $200.0\ coulombs$?

c.) A quiet sound exerts a pressure of $4 \times 10^{-8}\ kPa$ (kPa is kilopascals, a unit of pressure). What is the pressure in atmospheres if $1\ atmosphere$ is $101.325\ kPa$?

d.) If concentrated hydrochloric acid has a concentration of $11.7\ \frac{mol}{L}$, what volume of hydrochloric acid is required in order to have $0.0358\ mol$ of hydrochloric acid?

2.) It requires $334\ kJ$ of heat to melt $1\ kg$ of ice.

a.) The largest known iceberg had a volume of about $3.1 \times 10^{13}\ m^3$. How much heat was required to melt the iceberg if $1\ m^3$ of ice has a mass of $971\ kg$?

b.) The explosive T.N.T. releases $1.51 \times 10^4\ kJ$ of energy for every kilogram of T.N.T which explodes. Provided that all of the energy of an explosion is converted into heat energy to melt the ices, how many kilograms of T.N.T. would be needed to melt the iceberg in part a.) of this question?

3.) Sugar costs $\frac{\$0.98}{kg}$. $1\ tonne\ =\ 1000\ kg$. How many tonnes (t) of sugar can you buy for $\$350$?

4a.) How many kilometres will a car travelling at $120\frac{km}{h}$ go in $0.25\ hours$?

b.) How far in $12\ min$?

5.) Write conversion statements for the following. Ex. – $1\ ms\ =\ 10^{-3}\ s$

a.) kg and g b.) Mm and m c.) µL and L d.) mmol and mol

6a.) If $1\ mg\ =\ 10^{-3}\ g$ and $1\ Mg\ =\ 10^{6}\ g$, how many milligrams are there in $0.25\ Mg$?

b.) If $1\ \mu s\ =\ 10^{-6}\ s$ and $1\ cs\ =\ 10^{-2}\ s$ how many centiseconds are there in $10\ \mu s$?

c.) If $1\ mm\ =\ 10^{-3}\ m$ and $1\ cm\ =\ 10^{-2}\ m$ how many millimetres are there in $15.8\ cm$?

7.) Convert the following.

a.) $3\ s$ into milliseconds c.) $2\ L$ into decilitres e.) $1\frac{mg}{dL}$ into $\frac{grams}{litre}$

b.) $3\ Mm$ into metres d.) $1.7\ \mu g$ into centigrams f.) $1\frac{cm}{\mu s}$ into $\frac{kilometres}{second}$

8.) Light travels at $3.00 \times 10^{8}\frac{m}{s}$. It takes light $8.3\ minutes$ to travel from the surface of the sun to the earth. What is the distance of the earth from the sun?

9.) A measurement is given as $9.0\frac{lb}{in^3}$. If $1\ kg\ =\ 2.2\ lb$, and $1\ m\ =\ 39\ in$, convert the measurement into $\frac{kg}{m^3}$.