WS 6.5 *Name:*_____ *p.*_____

1. Conversions! (You must show all unit factors to receive credit!!!)

a. Convert 0.7 seconds to milliseconds (ms)

$(0.7\ s)\left(\frac{1000\ ms}{1\ s}\right) = 700\ ms$

b. Convert 50000 cm to km

$(50000\ cm)\left(\frac{1\ Km}{10^5 cm}\right) = 0.5\ Km$

c. Convert a speed of 0.020 meters per minute into inches per second.

$\left(\frac{0.020\ m}{min}\right)\left(\frac{100\ cm}{1\ m}\right)\left(\frac{1\ in}{2.54\ cm}\right)\left(\frac{1\ min}{60\ s}\right) = 0.013\ in/s$

d. Convert a rate of 450 micrograms per minute to milligrams per hour.

$\left(\frac{450\ \mu g}{min}\right)\left(\frac{1\ mg}{10^3\ \mu g}\right)\left(\frac{60\ min}{1\ hr}\right) = 27\ mg/hr$

e. Convert 4.6×10^5 nanograms into kilograms.

$(4.6\times10^5\ ng)\left(\frac{1\ kg}{10^{12}\ ng}\right) = 4.6\times10^{-7}\ kg$ $(.000000046\ kg)$

f. Convert 77 kilograms into centigrams.

$(77\ kg)\left(\frac{10^5\ cg}{1\ kg}\right) = 7{,}700{,}000\ cg$ or $7.7\times10^6\ cg$

g. Convert the area of 0.110 ft^2 into square inches.

$(0.110\ ft^2)\left(\frac{12\ in}{1\ ft}\right)^2 = 15.84 \rightarrow 15.8\ in^2$

h. Convert a volume of 3300 cubic centimeters into cubic feet.

$(3300\ cm^3)\left(\frac{1\ in}{2.54\ cm}\right)^3\left(\frac{1\ ft}{12\ in}\right)^3 = 0.1165 \rightarrow 0.12\ ft^3$

i. Convert 4.0 minutes to milliseconds.

$(4.0\ min)\left(\frac{60\ s}{1\ min}\right)\left(\frac{1000\ ms}{1\ s}\right) = 240{,}000\ ms$ $(2.4\times10^5\ ms)$

j. A patient is prescribed 180. mg / day of a drug. Convert this into grams per week.

$\left(\frac{180.\ mg}{day}\right)\left(\frac{1\ g}{1000\ mg}\right)\left(\frac{7\ day}{1\ week}\right) = 1.26\ g/week$

k. Convert the volume of 2000 cm^3 into cubic meters.

$(2000\ cm^3)\left(\frac{1\ m}{100\ cm}\right)^3 = 0.002\ m^3$

2a. How many molecules are in 0.156 moles of carbon dioxide?

$(0.156 \text{ moles})\left(\frac{6.02\times10^{23} \text{ molecules}}{1 \text{ mole}}\right) = 9.39\times10^{22} \text{ molecules}$

b. If you have 2.49×10^{24} molecules of sugar, how many moles do you have? (moles of sugar! not like moles on your body!)

$(2.49\times10^{24} \text{ molecules})\left(\frac{1 \text{ mole}}{6.02\times10^{23} \text{ molecules}}\right) = 4.14 \text{ moles}$

3. Perform the following operations, and then report the answer to the correct number of significant figures. Use scientific notation only when necessary for expressing the correct number of significant figures.

	Calculator Answer:	Correct sig. fig. answer:
126.2 + 4.41	130.61	130.6
146.72 *7.96	1167.8912	1170
364.8 / 4.56	80	80.0
36480 / 4.56	8000	8.00×10^3
230.2 – 7.2	223	223.0
50.9 + 80.7	131.6	131.6
14.181 – 3.12	11.061	11.06
14.181 + 3.12	17.301	17.30
14.18 / 13.21	1.07343	1.073
14.18 * 13.21	187.3178	187.3
3.42 – 2.62	0.8	0.80
12621 / 42.07	300	300.0
62100 / 1.5525	40,000	4.00×10^4

4. Round or rewrite the given number so that it has 3 sig. figs., and so it has 2 sig. figs. Use scientific notation only when necessary for expressing the correct number of significant figures.

Number	with 3 s.f.	with 2 s.f.
80000	8.00×10^4	8.0×10^4
0.0031833	.00318	.0032
729.12812	729	730
71000	7.10×10^4	71000
30401	30400	3.0×10^4
3333.33	3330	3300
6.1819	6.18	6.2
60	60.0	60.
0.01898	.0190	.019
90072	90100	9.0×10^4