Chapter 2 Review
CHEM 1301

Basic Skills:

- **Go back and forth between writing a number in long form and scientific notation**
  - Convert the decimal numbers below into scientific notation:

1. 2,365.005		6. 7,680,000	
2. 0.0000647		7. 7,400.1	
3. 265,000,000.0		8. 0.00000000098	
4. 23.1		9. 0.15	
5. .00985		10. 698,563	

  - Convert the numbers below from scientific notation back to decimal form:

1. 5.786×10^{3}		6. 7.43×10^{-2}	
2. 2.09×10^{6}		7. 1.23×10^{1}	
3. 7.809×10^{-8}		8. 3.45×10^{-4}	
4. 1.99×10^{2}		9. 6.02×10^{23}	
5. 2.34×10^{-10}		10. 3.0×10^{8}	

- **Multiply/Divide powers of 10 (without a calculator)**
  - Solve the following expressions (leave answer as 10^{n})

1. $\frac{10^{34}}{10^{12}}$	
2. $10^{5} \times 10^{-9} \times 10^{6}$	
3. $\frac{10^{23}\times10^{8}}{10^{5}}$	
4. $(10^{6})^{2}$	
5. $10^{12} \times 10^{-2} \times (10^{9})^{-2}$	

- **Count the number of sig figs in a reported number**
  - How many sig figs do the following numbers have?

1. 0.0000543		6. 7.043×10^{-2}	
2. 23000856		7. 24 atoms	
3. 29000		8. 2.900	
4. 0.002300		9. 290050	
5. 0.00500200		10. 900.02	

- **Estimate a number to a given number of sig figs**
  - Round each of the following to 4 sig figs (some you will have to write in Scientific Notation):

1. 0.00023097		6. 7.0098×10^{-2}	
2. 230856		7. 590.09	
3. 29000		8. 2.900670	
4. 0.1002300		9. 290000	
5. 0.00500200		10. 9000.02	

- **Do math with correct sig figs**
  - Evaluate the following:

1. $203.659 + 23.0569 - 145.08 =$	
2. $0.0023 * 60.05 =$	
3. $(236.098 - 234.0267) \times 100.5 =$	
4. $52.06 \div 23 + 55.68 =$	
5. $29.06 \div 45.98 =$	

Multistep Conversions:

1. Convert 14 centuries to days :
2. Convert 9 wk to hr :
3. Convert 14 gal to cups :
4. Convert 6 cm to ft :
5. Convert 15 pt to fl oz :
6. Convert 5 m to in :
7. Convert 10 km to ft :
8. Convert 3 wk to min :
9. Convert 9 km to in :
10. Convert 6 gal to pt :

Metric Prefix Conversions:

1. 4.3×10^{34} nm = _____ m

2. 8.5×10^{8} kg = _____ g

3. 100.0 cm = _____ µm

4. 238.02 ps = _____ ns

5. 685.3 Mg = _____ kg

6. 3.0×10^{14} mL = _____ dL

Conversions:

- **Convert between metric prefixes (without Table 2.2)**

1. 2.4×10^{12} nm = _____ m

2. 2.4×10^{-3} kg = _____ g

3. 2.4×10^{-12} s = _____ μs

4. 2400000 ps = _____ s

5. 0.000000024 Mmol = _____ kmol

☐ **Convert volume or area units (units raised to a power)**

1. 34.6 cm^3 = _____ m^3

2. 983.5 mm^2 = _____ cm^2

3. 13.2 L = _____ dm^3 (don't forget: 1 cm^3=1mL)

☐ **Convert from one unit to another (English ↔ Metric) in single and multi-step conversions**

1. 10.43 in = _____ ft

2. 65.32 gallons = _____ L

3. 1.000 miles = _____ cm

☐ **Calculate Density**

1. A piece of metal has a volume of 45.01 cm^3 and a mass of 429.789 g. Calculate the density.

2. A 1.5 L sample of a liquid has a mass of 2.98×10^3g. What is the density of the liquid in g/L and g/cm^3?

☐ **Use density as a conversion factor**

1. What is the volume in mL of 345.8 g of a liquid with a density of 1.15 g/mL?

2. What is the mass of 20L of ethanol given that the density of ethanol is 0.789 g/cm^3?