Name:_____ Student/Lobo ID: _____
Course/Sec: _____ TA Name: _____

Metric Conversions and Scientific Notation
Essential Academic Skill Enhancement (EASE) workshop series

This workshop reviews the basics of conversions between measurement systems and proper scientific notation that is fundamental to accurate problem solving in STEM fields.

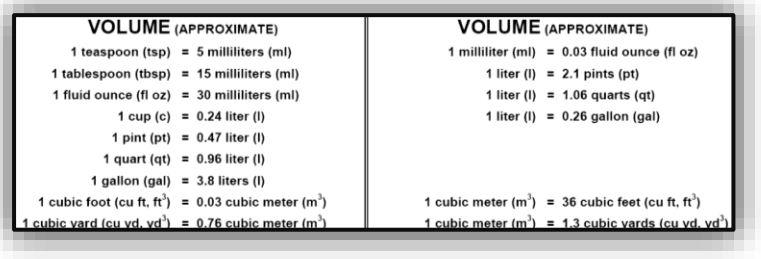
Science is often conducted in a number of different measurement systems depending on discipline or geographic region. In order to effectively communicate scientific findings, scientists often must convert between different systems of measurement using conversion factors. This workshop will give an overview of common conversion factors between the English and metric systems, and will go over the method behind accurate conversions in the biological sciences. Scientific notation is the way of writing and manipulating numbers that are too large or small to be written in the decimal form. We will discuss normalized notation or exponential notation (e.g., $ax10^b$) and how to use scientific notation effectively without losing precision, how to estimate ending digits in calculations, and *briefly discuss common bases (e.g., base 10 is normally used in scientific notation, can also use base 2).*

We will discuss:

- fundamental units of the two measuring systems
- use of integers in scientific notation
- significant figures
- estimation of final digits
- base forms
- precision, accuracy, and uncertainty

Assessment:

1. How many liters are in 2.64 pints?



VOLUME (APPROXIMATE)		VOLUME (APPROXIMATE)	
1 teaspoon (tsp)	= 5 milliliters (ml)	1 milliliter (ml)	= 0.03 fluid ounce (fl oz)
1 tablespoon (tbsp)	= 15 milliliters (ml)	1 liter (l)	= 2.1 pints (pt)
1 fluid ounce (fl oz)	= 30 milliliters (ml)	1 liter (l)	= 1.06 quarts (qt)
1 cup (c)	= 0.24 liter (l)	1 liter (l)	= 0.26 gallon (gal)
1 pint (pt)	= 0.47 liter (l)		
1 quart (qt)	= 0.96 liter (l)		
1 gallon (gal)	= 3.8 liters (l)		
1 cubic foot (cu ft, ft^3)	= 0.03 cubic meter (m^3)	1 cubic meter (m^3)	= 36 cubic feet (cu ft, ft^3)
1 cubic yard (cu yd, yd^3)	= 0.76 cubic meter (m^3)	1 cubic meter (m^3)	= 1.3 cubic yards (cu yd, yd^3)

2. Convert: 4.79 kl = ? ml.

3. Scientific notation:
   a. Approximate number of cells in the human body is 37,000,000,000,000 cells
   b. Approximate size of a human skin cell is 0.00003 meters

4. Accuracy, Precision, and Uncertainty:
   a. Precision: are the values 12.01 in, 12.00 in, 11.99 in, and 12.00 in precise?
   b. What is the uncertainty of the above values – both average and range?

$$\frac{\sum_{i=1}^{n} |x_i - \bar{x}|}{n}$$

$$(x_{max} - x_{min})/2$$

   c. Accuracy: are the values above accurate if the known length is 30 cm (11.81 in)?

5. Significant Figures, uncertain figures, and rounding:
   a. 13.214 + 234.6 + 7.0350 + 6.38
   b. 0.00435 x 4.6
   c. 4503.67 + 34.90 x 5.724
   d. 6.1625 x 2.00

SURVEY

Case sensitive
http://goo.gl/4AD3OC