Chem 10, Fall 2006
Quiz 1 (Chp 1 & 2)

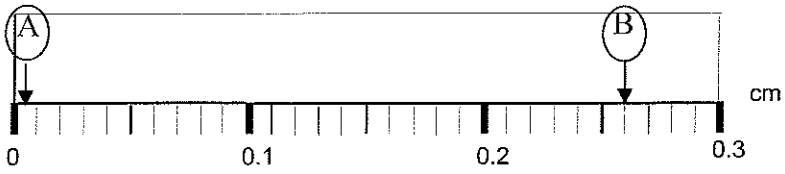
Name KEY

20 pt

1. (2 pt) Write values for the measurements indicated by the arrows on the following scale using the correct number of significant figures.

A: 0.005

B: 0.260



2. (1.5 pt) What is the most important step in the scientific method and why? Explain in a few words.

Experimentation - it provides data that confirms or rejects hypotheses and supports theories.

3. (2 pt) Fill in the correct unit name (using the correct metric prefix) or the correct numerical value for the metric prefix, for each of the following:

Numerical value	Unit name	Numerical value	Unit name
0.000001 L	micro liter	0.01 m	Centimeter
1000 g	kilogram	1×10^{-3} g	milligram

4. (1.5 pt) Solve each of the following (be sure to round the answer to the correct number of significant figures):

A. $x = \frac{212-32}{1.800} = \frac{180}{1.800} = 100.$ or 1.00×10^{2} 3 sig. fig.

B. $(6.022 \times 10^{23}) / 3000 = y$ 2×10^{20} 1 sig. fig.

5. The speed of light is 180,000 m/s . What is the speed of light in ~~m~~/s? mi/s

A) (2 pt) Write the unit path for the conversion of the speed of light from m/s to miles/s (must be at least 2 steps) . For example the 2 step unit path for pound (lb) to gram (g) could be lb→kg→g .

$\frac{m}{s} \rightarrow \frac{km}{s} \rightarrow \frac{mi}{s}$

B) (2 pt) Write the conversion factors using UNITS ONLY (do not include numbers) and show how the units cancel. (Do not calculate the answer.) Include at least two conversion factors.

$\frac{m}{s} \times \frac{km}{m} \times \frac{mi}{km} = \frac{mi}{s}$

6. (2 pt) Convert the decimal numbers into scientific notation and convert the scientific notation numbers into decimal numbers.

A) 3.89×10^9 m 3,890,000,000 m

C) 0.00000143 s 1.43×10^{-6} s

B) 5.9×10^{-4} L 0.00059 L

D) 36,458,000 mi 3.6458×10^7 mi

7. (2 pt) In Question 6, above, how many significant figures are in each value?

A) 3 B) 2 C) 3 D) 5

8. (2.5 pt) The average US farm is 435 acres. How many square miles is this? (1 acre = 43560 ft^2 and 1 mile = 5280 ft)

$$435 \text{ acres} \times \frac{43560 \text{ ft}^2}{1 \text{ acre}} \times \left(\frac{1 \text{ mi}}{5280 \text{ ft}}\right)^2$$

$$435 \times 43560 \times \frac{1}{5280^2} \text{ mi}^2 = 0.680 \text{ mi}^2$$

9. (2.5 pt) A bag of sand has a volume of 1.75 L and sand has a density of 3.00 g/L. What is the mass of the sand in pounds (lb)? 1 lb = 454 g

$$1.75 \text{ L} \times \frac{3.00 \text{ g}}{1 \text{ L}} \times \frac{1 \text{ lb}}{454 \text{ g}} = 0.0116 \text{ lb}$$