Chemistry

Math and Measurement

**Numbers in Science**

1. What are the two parts of a measurement?
2. Give an example of a measurement and label the two parts.

**Metric System**

1. List the base unit of measurement in the SI system for each of the following:
   1. Distance or length
   2. Volume
   3. Mass
   4. Temperature
   5. Amount
2. List at least one lab instrument that you could use to measure each of the following:
   1. Distance or length
   2. Volume
   3. Mass
   4. Temperature
3. Be able to convert between metric units

Practice by completing the following:

* 1. 7.2 cm of magnesium ribbon in millimeters = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  2. 0.049 kg of sulfur in grams = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  3. 7.32 mL of ethanol in dL = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  4. 0.0025 µg of Vitamin A in mg = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  5. 150 mg of aspirin in grams = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  6. 209 meters in kilometers = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Significant Figures**

1. List the three types of zeros.
2. Write the significant figure rule that applies to each one.
3. Determine the number of significant figures in each of the following numbers:
   1. 158000
   2. .010995
   3. 5.515
   4. 2.290
   5. 1.01
   6. 590
   7. 0.0012
   8. .0.020700

**Calculations Using Significant Figures**

1. Complete the following calculations and answer using the appropriate number of significant figures
   1. 312.0 – 31.2 – 3.12
   2. 34.95 / 11.169
   3. .003 X 32.4
   4. 22.0 +5.28+15.5
   5. 14.75 / 1.20
   6. .0012 – 0.00045 – 0.00011

**Scientific Notation**

1. Explain when the value of exponent of 10 will be positive and when it will be negative in scientific notation.
2. Convert the following to scientific notation:
   1. 0.00067890
   2. 678020
   3. 7350000000
   4. .00006500
   5. 723000
   6. .00008203
   7. 98060000
3. Write the following numbers in expanded form
4. 1.54 X 10-3
5. 5.277 X 107
6. 6.353 X 10-7
7. 3.53 X 104
8. Complete the following calculations using scientific notation
   1. 1.67 X 1012 / 5.26 x 104
   2. 9.35 x 1014 x 9.35 x 10-8
   3. 3.67 X 1012 / 9.26 x 10-4

**Density**

1. Write a definition for density in your own words (without using the terms mass or volume).
2. Explain why density does not change even when mass and volume do.
3. Complete the following problems involving density:
   1. Determine the mass of butter if 394 g occupies 312 mL of space.
   2. Determine the mass of a lump of gold that measures 15.0 cm X 6.50 cm X 5.00 cm. The density of gold is 19.3 g/cm^3.
   3. What is the density of a sample of alcohol that weighs 1.70 g and has a volume of 2 mL?

**Percent Error**

1. Write the formula for percent error.
2. Complete the following problems concerning percent error:
   1. Jack measures the density of water to be 1.2 g/mL. What is his percent error?
   2. Jill measures the density of her gold ring to be 23.2 g/mL (find the actual density of gold above). What is her percent error?

**Density Lab**

1. Write in your own words how we determined the **density** of the block in the lab.
2. Write in your own words how we found the **density** of water in lab.
3. Name a mistake that you could have/did make in lab that would have led to an incorrect density.

**Unit RERUN**

**Reflect** on what we did in this unit, what did you learn?

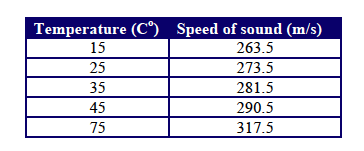
**Explain** the purpose of this unit. How do you think this unit will fit in with our learning in the future?

Results—What **results** do you expect on this test and why?

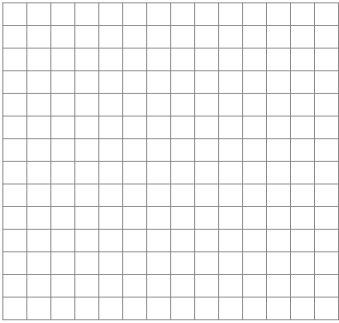
Uncertain—What portions of this unit are you still **uncertain** or uncomfortable with?

New—What portions of this unit were **new** to you? How did you feel about them and why?

**Graphing Skills**

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1. Graph the above data



1. What is the slope of the line?
2. What is the speed of sound at 20 C?