1. Differentiate between the following:

a. observation and interpretation

b. theory and law

c. hypothesis and theory

d. substance and mixture

e. homogeneous and heterogeneous

f. chemical and physical

g. intensive and extensive

h. weight and mass

i. accuracy and precision

2. Classify the following as element, compound, homogeneous mixture, or heterogeneous mixture.

a. ranch dressing

b. solder

c. a gold nugget

d. an iceberg

e. iron ore

3. Describe the following processes and discuss what kinds of mixtures they would separate.

a. distillation

b. filtration

4. Classify the following properties as intensive, extensive, or chemical.

a. boiling point

b. density

c. flammability

d. solubility

e. mass

5. Solve the density problems:

a. What is the density of a 27.0 g metal cube with sides 2.0 cm long?

b. What is the mass of 50.0 mL of mercury (density = 13.6 g/mL)?

c. What volume of gold (density = 19.3 g/mL) is needed to make 15.0 g?

6. Convert the following temperatures.

a. 16.0oF to oC

b. 85 oC to oF

c. 192 K to oC and oF

d. 75 oF to K

7. Using the temperature conversion equations given in the Powerpoint, derive an equation for

a. converting from Fahrenheit to Celsius.

b. converting directly from Kelvin to Fahrenheit.

8. Perform the operations and give answers to proper significant figures.

a. 17.2 + 94.15 =

b. 18 x 6.13 =

c. (0.01734)(2.63) / (10.5 - 3.72) =

d. (1.02 x 109) - (3.78 x 107) =

e. (6.43 x 10-14) / (4.194 x 108) =

9. Convert the following.

a. 28 700 nm to m

b. 1.5 x 10-4 m3 to mL

c. 2.70 g/mL to kg/m3

d. 343 m/s to mi/hr

e. 4.3 light years to miles

10. Estimates:

a. Estimate to total mass of humans on Earth.

b. Approximately how many seconds old is the Earth?

c. If I had a mole of donuts, and lined them up end to end, how long would the chain be, measured in light years?

d. Estimate the number of atoms in your body.