Matter, Properties and Change

1. What is the difference between a compound and a mixture? Give an example of each.

2. What is the difference between a homogeneous mixture and a heterogeneous mixture? Give an example of each.

3. Which of the following mixtures are homogeneous and which are heterogeneous?
   a. muddy water   b. concrete   c. housepaint   d. a soft drink

4. Classify each of the following as a mixture or pure substance.
   a. water   b. blood   c. the ocean   d. iron   e. brass   f. uranium
   g. wine   h. leather   i. sodium chloride

5. Of the pure substances in #4 which are compounds?

6. Decide whether each of the following processes is primarily a physical or a chemical change.
   a. Frost forms as the temperature drops on a humid winter night.
   b. A cornstalk grows from a seed that is watered and fertilized.
   c. A match ignites to form ash and a mixture of gases.
   d. Perspiration evaporates as you relax after jogging.
   e. A silver fork slowly tarnishes in air.

7. Describe the essential features of a well-designed experiment. *Be sure you look at the power point information provided.*

8. Describe the essential features of a scientific model. *Be sure you look at the power point information provided.*

SI Prefix Worksheet

In the space provided on the right, indicate the identity of the quantity given at the left.

Example: 10^{-6} phones __micro-phones__

1. 10^1 cards _____

2. 10^{-3} pedes _____

3. 10^9 los _____

4. 10^6 phones _____

5. 10^{-12} boos _____

6. 10^{12} dactyls _____

7. 10^{-3} tary _____

8. 2×10^3 mockingbirds _____

9. 10^{12} bull _____

10. 10^{-18} boys _____

11. 10^{12} pins _____

12. 10^{-3} vanillis _____

13. 10^{-12} los _____

14. 10^{-1} mates _____

15. 10^{-2} ments _____

Chem 2

UNIT 1 – Measurement, Uncertainty, and Unit Conversion

1. What is meant by the precision of a measurement? How is it indicated?

2. How many significant figures are there in each of the following measurements?
    a. 73.0000 g   b. 0.0503 kg   c. 6.300 cm

    d. 0.80090 m   e. 5.10×10^{-7} m   f. 2.001 s

3. Use scientific notation to write each of the following in terms of the SI base unit.
    a. 1.07 ps   b. 5.8 μm

    c. 319 nm   d. 15.3 ms

4. Write the following measurements, without scientific notation, using the appropriate SI prefix.
    a. 5.89×10^{-12} s   b. 2.130×10^{-9} m

    c. 0.00721 g   d. 6.05×10^{3} m

5. Convert:
    a.   8.45 kg to milligrams   b.   318 μs to milliseconds

    c.   93 km to nanometers   d.   37.1 mm to centimeters

    e.   239 Å to micrometers   f.   19.6 kg to milligrams

    g.   24.8 cm to millimeters   h.   4.3 ns to microseconds.

6. Platinum is a metal used in jewelry and in catalytic converters. The density of Pt is 21.4 g/mL. What is the mass of a cube of platinum that is 4.40 cm on an edge?

7. Do the indicated arithmetic and give the answer to the correct number of significant figures.

    a.   0.871 x 0.23/5.871   b.   8.937 – 8.930

    c.   8.937 + 8.930   d.   0.00015 x 54.6 + 1.002

8. A graduated cylinder weighed 68.1 g. To the cylinder was added 48.7 g of water and 5.318 g of sodium chloride. What was the total mass of the cylinder and the solution? Express the answer to the correct number of significant figures.

9. Obtain the difference in volume between two spheres, one of radius 5.61 cm, the other of radius 5.85 cm. The volume of a sphere is equal to $4/3 \, \pi r^3$. Express the answer to the correct number of significant figures.

10. Describe two things which would cause systematic error and two things which would result in random error.

11. Three students measured the volume of a liquid, obtaining the following values: 15.6 mL, 16.2 mL, and 16.5 mL. Express the mean value including average, percent average, and standard deviation.

12. A student determined the density of a substance in 4 different experiments. The student obtained the following values: 12.91 g/mL; 13.55 g/mL; 13.87g/mL; 13.93 g/mL. Express the mean value including average, percent average, and standard deviation.

13. Ethanol has a density of 0.789 g/cm^3. What volume must be poured into a graduated cylinder to give 19.8 g of alcohol?

14. The first measurement of sea depth was made in 1840 in the central South Atlantic, where a plummet was lowered 2425 fathoms. What is this depth in meters? Note that 1 fathom = 6 feet, 1 ft = 12 in, both exact, and 1 in = 2.54 cm.

15. The calorie, the Btu (British thermal unit), and the joule are units of energy; 1 cal = 4.184 J and 1 Btu = 252.0 cal. Convert 2.45 Btu to joules.

Chem 2

Unit 1 Worksheet – Inorganic Nomenclature

For each formula give the name of the compound and write the correct formula for each compound named

1. Ammonium phosphate

2. $K_2C_2O_4$

3. Hydrosulfuric acid

4. P_4O_{10}

5. Sodium bicarbonate

6. $Sr(ClO_4)_2$

7. Potassium permanganate

8. CH_3COOH

9. Magnesium sulfate heptahydrate

10. HNO_2

11. Silver oxide

12. $Fe_2(CO_3)_3$

13. Calcium hypochlorite

14. $Ba(OH)_2 \cdot 8 H_2O$

15. HCN

Unit 1 Create – A – Compound Worksheet

Select one of the following cations and anions and create your own compound (note: the charges have been left off). Be sure to balance the charges using the appropriate subscripts. Use all of the ions and use each ion only once.

NH_4 Al H_2PO_4 NO_3 CN   H

$Cl \cdot 5H_2O$ Cr $C_2H_3O_2$ MnO_4

Mg   O   K

ClO_2 Hg_2 Zn   H

OH   SCN   Ag
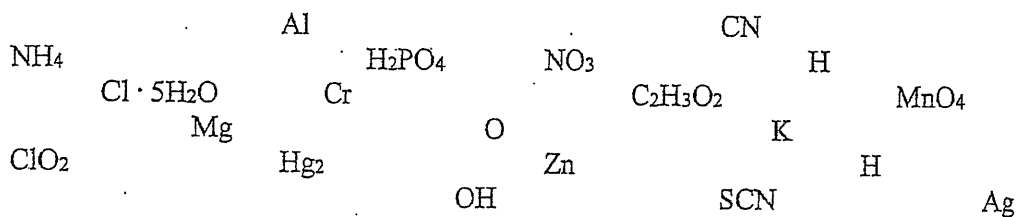
	Formula		Name
1.	_____	1.	_____
2.	_____	2.	_____
3.	_____	3.	_____
4.	_____	4.	_____
5.	_____	5.	_____
6.	_____	6.	_____
7.	_____	7.	_____
8.	_____	8.	_____
9.	_____	9.	_____
10.	_____	10.	_____