Name: _____ **Date:** _____

Chemistry *~ Ms. Hart* **Class:** Anions or Cations

4.5 Classwork

Directions: For each element, write down their location on the periodic table by group and period and then classify them as metal, metalloid, or non-metal.

Element	Group	Period	Metal, metalloid, nonmetal
Silicon			
Selenium			
Na			
Barium			
I			

Partner Work:

Directions: A student conducts a series of tests to determine the properties of 8 unknown elements labeled a-h. The student fills out the following data table. Based on data collected, determine whether each element is a metal, metalloid, or a non-metal.

Element	Malleable or Brittle?	Conducts?	Shiny or Dull?	Color or other characteristics?
a	**Brittle**	**Yes**	**Dull**	**Dark gray**
b	**Malleable**	**Yes**	**Sort of shiny**	**Sort of silver**
c	**Brittle**	**Yes**	**Dull or shiny**	**Dark color**
d	**Malleable**	**Yes**	**Shiny**	**Silvery**
e	**Brittle**	**No**	**Dull**	**Yellow**
f	**Malleable**	**Yes**	**Dull or shiny**	**Gray**
g	**Malleable**	**Yes**	**Shiny**	**Silvery**
h	**Brittle**	**No**	**Dull**	**Black/ Purple**

1. Based on the data above, what procedure do you think the student did to figure out whether the element was brittle or malleable?

2. Using the properties you discussed in class, identify each element as being a metal, non-metal, or metalloid.

Element	A	B	C	D	E	F	G	H
Classification								

4.5 HOMEWORK

Directions: Answer all questions based on your knowledge of chemistry.

1. Which list of elements contains a metal, a metalloid, and a nonmetal?
   (1) Zn, Ga, Ge (3) Si, Ge, Sn
   (2) Cd, Sb, I (4) F, Cl, Br

2. Which element is malleable and conducts electricity?
   (1) Iron (3) Iodine
   (2) Sulfur (4) Phosphorous

3. Elements on the modern periodic table are arranged in order of increasing
   (1) Atomic mass
   (2) Atomic number
   (3) Number of neutrons
   (4) Number of valence electrons

4. Which element has both metallic and nonmetallic properties?
   (1) Rb (3) Rn
   (2) Si (4) Sr

5. Which element is a solid at STP and a good conductor of electricity?
   (1) Iodine (3) Mercury
   (2) Nickel (4) Sulfur

6. Which element is classified as a non-metal?
   (1) Be (3) Al
   (2) Si (4) Cl

7. Which element is a metal that is in the liquid phase at STP?
   (1) Bromine
   (2) Cobalt
   (3) Hydrogen
   (4) Mercury

8. Which list of elements consists of a metal, a metalloid, and a nonmetal?
   (1) Li, Na, Rb (3) Sn, Si, C
   (2) Cr, Mo, W (4) O, S, T

9. Describe one appropriate laboratory test that can be used to determine the malleability of a solid sample of an element at room temperature.

10. Base your answer to this question on the information below.

    Two sources of copper are cuprite, which has the IUPAC name copper (I) oxide, and malachite, which has the formula $Cu_2CO_3(OH)_2$. Copper is used in home wiring and electric motors because it has good electrical conductivity. Other uses of copper not related to its electrical conductivity include coins, plumbing, roofing, and cooking pans. Aluminum is also used for cooking pans.

    At room temperature, the electrical conductivity of a copper wire is 1.6 times greater than an aluminum wire with the same length and cross-sectional area. At room temperature, the heat conductivity of copper is 1.8 times greater than the heat conductivity of aluminum. At STP, the density of copper is 3.3 times greater than the density of aluminum.

Identify *one* physical property of copper that makes it a good choice for uses that are *not* related to electrical conductivity.

11. Base your answer to this question on the information below.

Densities of Group 14 Elements

Element	Density at STP (g/cm^3)
C	3.51
Si	2.33
Ge	5.32
Sn	7.31
Pb	11.35

Identify *one* element from this table for *each* type of element: metal, metalloid, and nonmetal.

Metal: _____

Metalloid: _____

Non-metal: _____