1. Label how the following increase: atomic radius, electronegativity, ionization energy, metal reactivity and nonmetal reactivity.

2. Determine the period the following elements are located in?
   a) Sulfur
   b) Barium

3. Put the following in order of increasing atomic radius:
   a. Cu, As, Fe, Ti
   b. K, Na, Rb, Fr
   c. Au, Ag, Cu,
4. State the group name and describe their properties for group 1, group 2, group 18 and group 17.

<table>
<thead>
<tr>
<th>Group Number</th>
<th>Group Name</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Identify the elements below as metals, non-metals or metalloids
   a. Silicon     d. Strontium
   b. Sulfur      e. Antimony
   c. Palladium   f. Arsenic

7. Identify the charges (oxidation number) with the positive or negative sign for the following.
   a. Calcium     c. Neon
   b. Iodine      d. Oxygen

8. Put the following elements in order of decreasing electronegativity
   a. F, Be, Li, C
   b. Mg, Ra, Sr, Ba

9. What is electronegativity?
10. Put the following elements in order of increasing ionization energy.
   a) Kr, Ca, K, Br
   b) C, Ge, Pb, Sn

11. Periods on the periodic table represent the number of ___________ _________.

12. Name how many electrons can be held in the following sublevels?
   a. s
   b. p
   c. d

13. List an example for each of the following (just use symbols):
    metalloid:                         transition metal:
                                      
    very reactive metal:              stable nonmetal:
                                      
    group 16:                         actinides:
                                      
    p-block element:                  alkaline earth metal:
14. Write the full, orbital, noble gas electron configurations and Lewis dot diagram for the following substances:

<table>
<thead>
<tr>
<th>Element</th>
<th>Electron Configuration</th>
<th>Noble gas Configuration</th>
<th>Orbital Diagram</th>
<th>Lewis Dot Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

15. Which type of wave has more energy than infrared but less energy than x-rays?

16. How are wavelength and frequency related?
17. In each of the following pairs, circle the one with a longer wavelength:
   a. Violet or green       b. Infrared or visible
   c. Ultraviolet or gamma  d. Radio or x-rays
   e. Green or microwaves

18. Using the Bohr model, predict the color of light emitted when the following drop occurs:
   a. $n = 6$ to $n = 2$       b. $n = 3$ to $n = 2$

19. Using the Bohr model, determine the wavelength and type of energy released when the following drop occurs:

<table>
<thead>
<tr>
<th>Type of Energy</th>
<th>Wavelength</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. $n = 2$ to $n = 1$</td>
<td></td>
</tr>
<tr>
<td>b. $n = 3$ to $n = 2$</td>
<td></td>
</tr>
<tr>
<td>c. $n = 6$ to $n = 3$</td>
<td></td>
</tr>
</tbody>
</table>