Chapter 6 Outline
The Periodic Table

- **Section 6.1 – Organizing the Periodic Table**
- _____ used the _____ of elements to sort them into _____.
- _____ is credited with creating the first _____ periodic table.
- He _____ the elements in order of increasing _____.
- He also put elements with _____ in the same _____.
- When he finished, there were _____ in his periodic table.
- Since he _____ his periodic table based on _____, he _____ the properties of elements that had not been _____.
- When the elements were _____, his predictions were _____.
- The _____ is arranged in order of increasing _____.
- Elements in the same _____ have similar _____.
- Elements in the same _____ have a _____ set of properties. This is referred to as the _____.
- The periodic table can be broken up into _____ _____.
- Properties of metals include:

_____ – can be pulled into wires
_____ – can be hammered into sheets

- Properties of nonmetals include:

_____ generally have some of the properties of _____ and _____.

- **Section 6.1 Assessment**

1. What property did Mendeleev use to organize his periodic table?

2. How are elements arranged in the modern periodic table?

3. Name the three broad classes of elements.

4. Which of these sets of elements have similar physical and chemical properties?
   a. oxygen, nitrogen, carbon, boron
   b. strontium, magnesium, calcium, beryllium
   c. nitrogen, neon, nickel, niobium

5. Identify each element as a metal, metalloid, or nonmetal.
   a. gold
   b. silicon
   c. sulfur
   d. barium
6. Name two elements that have properties similar to those of the element sodium.

- **Section 6.2 – Classifying the Elements**
- Elements in the _____ have similar properties because they have similar _____
- _____.
- **Section 6.2 Assessment**

1. Into what four classes can elements be sorted based on their electron configuration?

2. Why do the elements potassium and sodium have similar chemical properties?

3. Which of the following elements are transition metals: Cu, Sr, Cd, Au, Al, Ge, Co?

4. How many electrons are in the highest occupied energy level of a Group 15 element?

- **Section 6.3 – Periodic Trends**
- _____– the radius of an atom.
- In general, the atomic radius _____ as you move down a _____ and _____ as you move across a _____.
- The atomic radius _____ going down a _____ because _____ are added with each row.
- The atomic radius _____ going across a _____ because electrons are added to the same _____, but protons are added to the _____ which pull the electron in closer.
- An _____ is an atom with a _____. An atom has a charge when it _____ electrons.
- An _____ is a _____ ion (_____ electrons).
- A _____ is a _____ ion (_____ electrons).
- You can tell the _____ of an element based on which _____ it is in on the periodic table (except for _____).
- _____ is the energy needed to _____ an electron from an atom.
- In general, ionization energy _____ as you move down a _____ and _____ as you move across a _____.
- Ionization energy _____ as you move down a _____ because _____ are

added which are farther from the nucleus. Since the _____ are far from the nucleus, it takes _____

- _____ to remove one.
- Ionization energy _____ as you move across a _____ because the nucleus gets _____, so it takes _____to remove an electron.
- _____is the radius of an ion.
- Cations are _____ than the parent atom.
- Anions are _____ than the parent atom.
- In general, ionic size _____ as you move down a _____ because _____ are added.
- Ionic size generally _____ across the _____, then increases as you move to the anions. As you move across the _____ the size _____ again. This is due to the increased _____ of the nucleus and the lost or gain of _____.
- _____ is the ability of an atom to attract more _____.
- In general, electronegativity _____ as you move down a _____ and _____ as you move across a _____.
- Electronegativity _____ as you move down a _____ because _____are added that are farther from the nucleus so the atom cannot _____ electrons as well.
- Electronegativity _____ as you move across a _____ because the nucleus is _____ and can _____ more electrons.
- **Section 6.3 Assessment**

1. How does atomic size change within groups and across periods?

2. When do ions form?

3. What happens to first ionization energy within groups and across periods?

4. Compare the size of ions to the size of the atoms from which they form.

5. How does electronegativity vary within groups and across periods?

6. Arrange these elements in order of decreasing atomic size: sulfur, chlorine, aluminum, and sodium. Does your arrangement demonstrate a periodic trend of a group trend?

7. Which element is each pair has the larger first ionization energy?
   a. sodium, potassium
   b. magnesium, phosphorus