Name Class Date

**Chapter 6 Test Review**

*Review all of your notes, read the textbook, and know your vocabulary words*.

1. **Reading the Periodic Table** An element’s square has the element’s symbol and name, atomic number and mass, and electron configuration.
   1. **arrow**The elements are grouped into alkali metals, alkaline earth metals, and halogens.
2. **Electron Configurations in Groups** The properties of elements are largely determined by the arrangement of electrons, or electron configuration, in each atom.
   1. **arrow**Based on their electron configurations, elements are classified as noble gases,  
      representative elements, transition metals, or inner transition metals.
   2. The representative elements are elements found in the **s block & p block –except for group 8A (18)**
   3. The transition metals are found in the **d block**
   4. The inner transition metals are found in the **f block**
3. Atomic size generally **decreases** as you move from left to right across a period.
   1. Ex: Lithium is the element in the second period with the largest atomic radius.
4. Atomic size generally **increases** as you move from top to bottom within a group.
   1. Ex: Chlorine has the smallest atomic radius when compared to bromine & iodine. It is also smaller then sulfur and Selenium.
5. **Ions** Ions form when atoms gain or lose electrons.
   1. Positive ions ***(cations) form when atoms loses electrons***
      1. Ex: The ***metals*** in Groups 1A, 2A, and 3A lose electrons when they form ions.
      2. The charges of these ions are +1, +2, +3, respectively.
      3. Cations have a smaller radius than do the atoms form which they form.
   2. Negative ions ***(anions) form when atoms gain electron***
      1. When an anion forms, more electrons are transferred to it.
      2. Elements is Groups 17A (-1), 16A (-2), 15A (-3) gain electrons to form anions.
      3. Anions have a larger radius than do the atoms form which they from.
6. **Searching for an Organizing Principle** As more and more elements were discovered scientists needed a way to classify them.
   1. **arrow**Elements were first classified according to their properties.
7. **Mendeleev’s Periodic Table** Mendeleev developed the first periodic table, arranging  
   elements according to a set of repeating, or periodic, properties.
   1. **arrow**Elements were also placed in order, according to increasing atomic mass.
   2. **arrow**Mendeleev used his table to predict the properties of yet undiscovered elements.
8. **Today’s Periodic Table** Today’s periodic table is a modification of Mendeleev’s periodic table.
   1. **arrow**The ***modern periodic table arranges elements by increasing atomic number.***
   2. ***arrowPeriodic law states that when elements are ordered by increasing atomic number, their chemical and physical properties repeat in a pattern***.
9. **Metals, Nonmetals, and Metalloids** Within the periodic table, elements are classified into three large groups based on their properties.
   1. arrowMetals are good conductors and many are ductile and malleable.
   2. arrowNonmetals are mostly gases whose properties are opposite to those of metals.
   3. arrowMetalloids can behave like metals or nonmetals, depending on the condition
10. **Trends in Atomic Size** Atomic size is an atom’s atomic radius, or one-half the distance between two like atoms when they are joined together.
    1. ***arrowAtomic size generally increases from top to bottom within a group*** because the number of energy levels increases.
    2. ***arrowAtomic size decreases from left to right across a period*** because electrons are added to the same energy level and are pulled closer to the nucleus by increasing numbers of protons.
       1. An electron in an the closest **s subshell** (level) experiences the greatest effective nuclear charge in a many-electron atom
       2. The further from a nucleus an electon is, the lower effective nuclear charge that electron.
          1. For example, tin’s 5p electrons would experience the least effective nuclear charge out of its 50 electrons. For phosphorous, it’s 3p electrons would experience the least effective nuclear charge of its 15 electrons.
11. **Trends in Ionization Energy** Ionization energy is a measure of how much energy is required to remove an electron from an atom.
    1. arrowFirst ionization energy is the amount of energy required to remove one electron from a neutral atom.
    2. ***arrowIonization energy tends to decrease from top to bottom within a group*** and ***increase from left to right across a period.***
    3. Ionization energy decreases with increasing atomic number within a group.
    4. An increase in the number of protons contributes to the increase in ionization energy from left to right across a period
    5. An increase in atomic size contributes to the decrease in ionization energy within a group in the periodic table as the atomic number increases
12. **Trends in Ionic Size** Trends in ionic size are based on the fact that metals tend to lose electrons, and nonmetals tend to gain electrons.
    1. ***arrowA cation is smaller than the atom that formed*** it; an anion is larger than the atom that formed it.
       1. The radius of an anion is greater than the radius of its neutral atom.
       2. The radius of a cation is smaller than the radius of its neutral atom.
    2. ***arrowIonic size generally increases from top to bottom within a group*** and ***decreases from left to right across a period***.
13. **Trends in Electronegativity** Electronegativity is a measure of an atom’s ability to attract an electron when the atom is bonded to another atom.
    1. ***arrowThe trends in electronegativity are similar to the trends in ionization energy.***
    2. ***arrowElectronegativity tends to decrease from top to bottom within a group*** and to ***increase from left to right across a period***.

