Chapter 8
Bonding…General concepts

1. Distinguish between the **3 types of bonding,** including the electrostatic attraction between ions and ionic bonding

2. Use the positions of atoms on the periodic table to estimate their **electronegativities** and predict relative bond polarities and dipole moments

3. Write the **electronic configuration** of monatomic ions and predict the relative sizes of isoelectronic ions.

4. Describe the different energy steps involved when elements react to form ionic compounds. These changes include phase changes, ionization, electron affinity, and **lattice energy**

5. Describe the **nature of a model** ass it pertains to bonding, including the limitations inherent in such a model.

6. Calculate the heat of reaction given the respective **bond energies** in the molecules that are broken down or formed.

7. Draw the **lewis structures** of a variety of covalently bonded molecules. Show bonding pairs as dashes and lone pairs as dots. Describe the geometry of such molecules using the VSEPR model

8. Draw Lewis structures for molecular compounds whose central atom does **not obey the octet** rule. Describe the geometry of such molecules using VSEPR

9. Using the concept of forma charge, determine the possible **resonance structures** as shown in Lewis structures.

Chapter 9
Bonding-Orbitals

1. Describe the bonding in a variety of molecules utilizing the Localized Electron (LE), or **hybridization model**
   a. State hybridization (sp^3 etc.) from VSEPR
   b. Determine # of sigma and pi bonds
   c. Draw 3 dimensional orbital overlap diagram
2. State the major ideas of the **MO theory**
   a. all valence electrons in M.O.
   b. orbital consist of bonding and anti bonding orbitals
   c. bond order=1/2(#b-#b*)
   d. greater the bond order the more stable the molecule
3. Determine the **MO configuration** and **bond order** of homo and heteronuclear molecules
4. Establish **paramagnetic** and **diamagnetic** properties of molecules from MO configuration
5. Compare the various bonding models in terms of strengths and weaknesses