

**Lecture Worksheet  
(Chapter 9, Part 2)**

**Name** \_\_\_\_\_  
**Chem 6 Section #** \_\_\_\_\_

1. According to valence bond theory, what causes a covalent bond?
2. Mixing 3 atomic orbitals produces how many hybrid orbitals? \_\_\_\_\_
3. If one s atomic orbital and two p atomic orbitals are mixed to form hybrid orbitals, what is the name of the hybrid orbitals which form? \_\_\_\_\_
4. Does the geometry of the hybrid orbitals of an atom parallel its molecular geometry or its electron domain geometry? \_\_\_\_\_
5. What are the names of the hybrid orbitals used by atoms that have expanded octets?
6. (a) What are the three steps used to predict the hybrid orbitals used by an atom in bonding?  
  
(b) Illustrate these steps by showing how you would determine the hybridization of N in NH<sub>3</sub>?
6. (a) What is a sigma bond? (How is a sigma bond formed?)  
  
(b) What is a pi bond? (How is a pi bond formed?)
7. What are delocalized bonds? (Which kind of bonds (sigma or pi) are used in forming delocalized bonds?)
9. In the given molecules: (a) draw Lewis structures; (b) indicate electron pair (EPG) and molecular (MG) geometries; (c) show bond dipoles (BDP) (using arrows) ; and (d) determine whether the molecule is polar or nonpolar.  

	Lewis structure	EPG	MG	BDP	Polarity
(a) CO <sub>2</sub>					
(b) H <sub>2</sub> O					