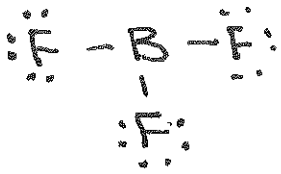
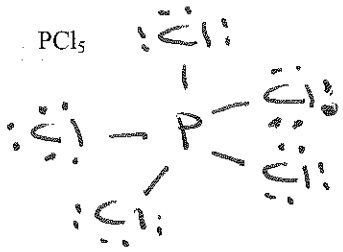
Homework:

1. Name four elements that follow the octet rule.
   Carbon, Nitrogen, Oxygen & Fluorine
2. Name two elements that have fewer than eight electrons around them in their compounds.
   Hydrogen, Boron & Beryllium
3. Why is it that elements in the third row and greater can exceed their octet?
   They have empty d orbitals.
4. When writing Lewis structures and the octet must be exceeded, where should the additional electrons be placed?
   Extra electrons will be placed on the central atom.
5. What term is used to describe substances in which all the electrons are paired?
   Diamagnetic
6. What effect does an external magnet have on a diamagnetic substance?
   It repels a diamagnetic substance.
7. What term is used to describe substances in which not all the electrons are paired?
   Paramagnetic
8. What effect does an external magnet have on a paramagnetic substance?
   It attracts a paramagnetic substance
9. Identify each of the following elements as being either paramagnetic or diamagnetic.
   a. Magnesium - **diamagnetic**
   b. Argon - **diamagnetic**
   c. Cobalt - **paramagnetic**
   d. Phosphorus - **paramagnetic**
   e. Mercury - **diamagnetic**
   f. Potassium - **paramagnetic**
10. Experimental evidence has shown that oxygen molecules are paramagnetic. With this in mind, draw the irregular Lewis structure for the oxygen (O_2) molecule.
    Single bond with 5 dots on each.
11. **Draw structural formulas** for the following covalent compounds that do not follow the octet rule and write how they do not follow the octet rule. **Determine the formal charge** for each element in the molecule.

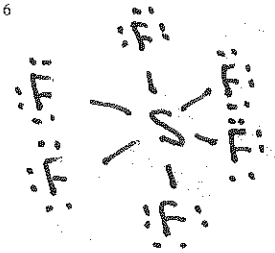
BF_3



PCl_5

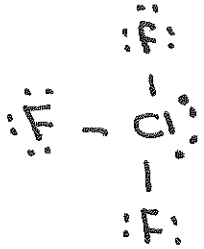


SF_6



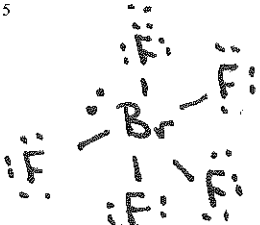
$BeCl_2$

ClF_3

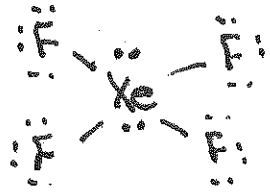


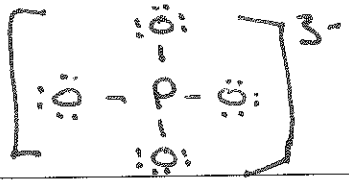
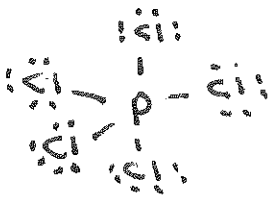
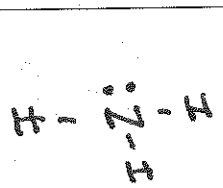
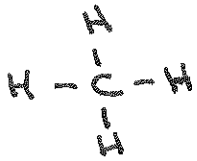
$RnCl_2$

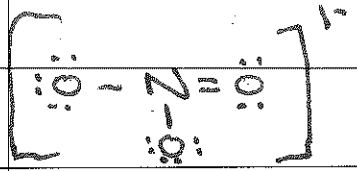
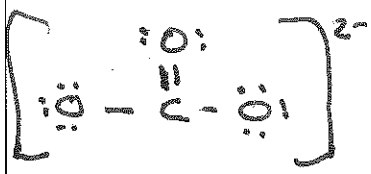
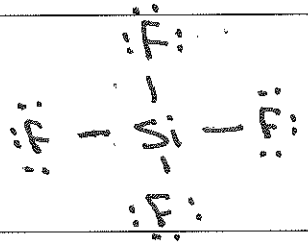
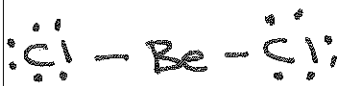
BrF_5



XeF_4



Name	Formula	Lewis Structure	Hybridization of central element	# sigma bonds	# pi bonds
phosphate ion	$(PO_4)^{3-}$		sp^3	4	0
boron trifluoride	BF_3		sp^2	3	0
phosphorus pentachloride	PCl_5		dsp^3	5	0
carbon dioxide	CO_2		sp	2	2
ammonia	NH_3		sp^3	3	0
methane	CH_4		sp^3	4	0
diatomic nitrogen	N_2			1	2
sulfur dioxide	SO_2		sp^2	2	1

Name	Formula	Lewis Structure	Hybridization of central element	# sigma bond	# pi bonds
chlorine trifluoride	ClF_3		dsp^3	3	0
nitrate ion	NO_3^{1-}		sp^2	3	1
carbonate ion	CO_3^{2-}		sp^2	3	1
hydrocyanic acid	HCN		sp	2	2
dihydrogen monoxide	H_2O		sp^3	2	0
silicon tetrafluoride	SiF_4		sp^3	4	0
beryllium dichloride	$BeCl_2$		sp	2	0

At the completion of this assignment you will be prepared to take the following Chapter 5 on-line quizzes:

- diamagnetic or paramagnetic quiz
- elemental diamagnetic or paramagnetic quiz
- formal charge quiz 1
- hybridization quiz 1
- hybridization quiz 2
- sigma and pi bonds quiz 1
- sigma and pi bonds quiz 2
- sigma and pi bonds quiz 3
- sigma and pi bonds quiz 4
- sigma and pi bonds quiz 5