STEPS TO OBTAIN LEWIS DOT STRUCTURES

1. Determine the correct formula of the compound or ion.

2. Count the total number of valence electrons available in the compound or ion (# available).

3. Draw a trial structure connecting atoms with a single bond (2 electrons/bond).

4. Complete octets on all atoms. Note: there are some exceptions to this, most notably H, Li, B and Be.

5. Count the number of electrons used (# used).

6. if (# available - # used) is > 0 then:
   a. add the remaining electrons to the central atom, else
      if (# available - # used) is < 0 then:
   b. remove 2 unshared electron pairs from adjacent atoms and form an additional bond between these atoms. Continue this until all electrons are used. (This becomes a little more complicated if the number of unused electrons is not 0 or an even # -- you will have to use your Chemical Intuition to address this problem.)

7. Choose a structure which minimizes formal charges if there is more than one choice of structure. Again, you will want to use your Chemical Intuition here.

For example let's consider the nitrite ion.

1. The formula is NO$_2$$^-$.

2. Electron count is $5 + (2 \times 6) + 1 = 18$ electrons. Therefore:

   $\begin{array}{c}
   \text{[O=N=O]} \\
   \end{array}$

3 & 4. $\begin{array}{c}
   \text{[O=N=O]} \\
   \end{array}$

5 & 6. Too many electrons (# available - # used) = - 2!! This gives us two possible structures which are:

   $\begin{array}{c}
   \text{[O=N=O]} \quad \text{and} \quad \text{[O=N=O]} \\
   \end{array}$

These are two resonance forms so we are done (with Lewis).

You-all try H$_2$O, CO$_2$, HNO$_3$ and OPCl$_3$ (what are the names of these compounds?)