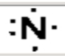
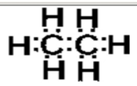
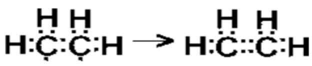
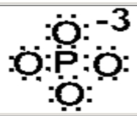
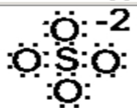
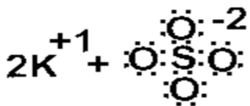
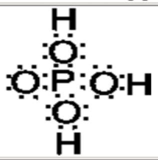
Lewis Dot Structure Flow Chart

Given the following structures to be drawn: N, Be^{+2} , F^{-1} , CaF_2 , CH_3CH_3, CH_2CH_2, PO_4^{-3}, K_2SO_4, H_3PO_4

	1. Look for isolated atoms: [N] is an atom in group 5. Place its 5 electrons in the 4 orbitals, maximizing the number of unpaired electrons.
Be^{+2} **F^{-1}**	2. Look for simple ions: [Be^{+2},F^{-1}] :Since atoms become ions by losing or gaining electrons to achieve full rings, ions have no dots. The questions and answers are the same.
	3. Look for substances with no radicals: [CaF_2, CH_3CH_3, CH_2CH_2]
Ca^{+2} + 2 F^{-1}	• a. Are any ionic (one atom from groups 1-3, the other from groups 4-7 including H)? Using the periodic table, determine the charges of the ions and write their dot structures as in part 2, above.
 	• b. The others must be covalent, with both atoms in groups 4-7 including H. [CH_3CH_3, CH_2CH_2] Draw the single bond structures making covalent bonds: Are single bonds sufficient, that is, do they conform to the 8 electron rule? If yes, as in CH_3CH_3, the structure is finished. • If no, as in CH_2CH_2, where each "C" has only 7 electrons, make multiple bonds to give each atom (except H) 8 electrons.
	4. We are left with radicals and compounds involving radicals. [PO_4^{-3}, K_2SO_4, H_3PO_4] Always draw the radicals first. Do not make O-O bonds in radicals.
	When drawing PO_4^{-3}, we draw the P first, attach the 4 oxygens around it (one bond is a coordinate covalent bond) and then add three additional electrons, one to each of three oxygens to account for the -3 charge.
 	When drawing the SO_4 from K_2SO_4, we draw SO_4^{-2}, either because we know it normally has a -2 charge, or because we know it must bond ionically with K and each K must lose 1 electron to become charged +1. Thus, SO_4 must be charged -2.
	The PO_4 in H_3PO_4, is not charged since it will bond covalently with the 3 H atoms. (See conditions for ionic and covalent bonding in part 3, above.