# Lewis Structures

1) **Activity – As students are drawing bonds and learning about bonds they are in groups at the lab tables actually building these with the molecular model sets.**
2) Lewis Dot structures – representation of a covalent compounds. Movement of electrons MUST use a pencil here. Structural formula.
    - Used to share electrons to make a stable noble gas like element.
    - Only for one central atom.
3) Diatomic (2) molecule – 7 of them H, N, O, F, Cl, Br, I These are naturally found together in couplets. Never found alone. Remember the happiness rule.
    - Know which have which type of bonds.
4) Bonds
    - Single bond – 2 shared electrons
    - Double bond – 4 shared electrons
    - Triple bond – 6 shared electrons
    - Coordinate bond – one atom shares more (both) electrons
5) Bond strength
    - Bond dissociation energy – amount of energy to break a bond single<double<triple These energies are given in tables. Larger the energy the stronger the bond.
    - Resonance – ability to write a Lewis structure in more than one way. Usually just moving a double or triple bond. This gives stability and strength.
6) Exceptions to the octet rule. $BH_3$, $PCl_5$, $SF_6$

Rd: pg 217-244
HW: #1

# VSEPR

1) **Activity – use molecular model sets to show angles.**
2) VSEPR (Valence Shell Electron Pair Repulsion) Theory – repulsion between electrons cause molecular shapes where electrons adjust to be as far apart from each other as possible.
    - Linear (180°, 2/3 atoms) HCl, HF
    - Bent (104.5°, 3 atoms) $H_2O$
    - Trigonal Planar (120°, 4 atoms) $BH_3$
    - Trigonal Pyramidal (107°, 4 atoms) $NH_3$
    - Tetrahedral (109°, 5 atoms) $CH_4$
        - These assume single bonds. Double/Triple bonds alter the angles.
        - Lone pair electrons distort the normal shape.
3) Polarity – the uneven spread of charge in a molecule.
    - Non-polar – even distributed
    - Polar – uneven distribution of electrons. (-/+ ends) This is shown from the difference in electronegativities.
    - Solubility. Like dissolves like.
    - **Lab: Soap Making**
4) Intermolecular forces.
    - Dipole/Dipole Interactions – attractions between polar molecules.
    - London Dispersion forces (Van der Waals) – electrons of one molecule attracted to the nucleus of another molecule.
        - i.e. liquefied inert gases
    - Hydrogen bonds – most common, caused by the attraction of H in a molecule to a very electronegative element. (N, O, F) This causes many unique properties.
    - H>dipole>London/Van der Waals
5) Macromolecules and Network Solids
    - Unique patterns
    - Water (ice), graphite/diamond, polymers (PVC, nylon), proteins (hair/DNA).

Rd: covered in previous section
HW: #2, #3