Section 2.9 ( Unequal Electron Sharing Creates Polar Molecules)

* Water molecule consists of two hydrogen atoms in covalently bonded molecules and are in a constant tug of war for the shared electrons
* Electronegativity: Attraction for shared electrons
  + More electronegative an atom, the more strongly pulls towards it nucleus
* Non-polar covalent bonds: Electrons are shared equally between the atoms. Some atoms such as CH4, have nonpolar bands
  + Carbon and Hydrogen are not different in terms of electronegativity
* Polar Covalent Bond: Pulling of shared, negatively charged electrons closer to the more electronegative atom makes it partially negative and positive
  + In h20, O is the most electronegative. Attraction goes towards Oxygen then of the hYDROGEN.
* Polar Molecule: Unequal distribution of charges. Slightly negative at the oxygen end of the molecule, slightly positive at hydrogen ends.\

Section 2.10 ( Hydrogen Bonds are weak bonds important in the chemistry of life)

* Most strongest chemical bonds are covalent, linking atoms to form a cell’s molecules
  + Weaker bonds still imp
* When hydrogen bond is part of a polar covalent bond its partial positive charge allows it to share attractions with other electronegative atoms such as oxygen or nitrogen
  + Though weak still important.
  + Charged regions of each water are chemically attracted to oppositely charged regions
* H-BONDS:

Section 2.11: Hydrogen bonds make liquid water cohesive:

* Hydrogen bonds between molecules of liquid water last for a trillionth second
  + Still hydrogen bonded to others
* Cohesion: Tendency of molecules to stick together
  + Trees: Transport water from roots to leaves
  + Evaporation of water from leaf exerts a force on water within the veins of the leaf.
* Adhesion: Clinging of one substance to another
* Surface tension: Measure of how difficult it is to stretch or break the surface of a liquid.
  + Hydrogen bonds give water unusually high surface tension

Section 2.12:

* Hydrogen bonding, water has a better ability to resist temperature change than most other substances.
  + Moderatres temperatures, helping to keep them within limits that permit life.
* Heat: Amount of energy associated with the movement of atoms and molecules in a body of matter
* Temperature: Measures the intensity of heat the average speed of molecules rather than total.
* Heat must be absorbed to break H-Bonds
  + Must disrupt hydrogen bonds before water molecules move fast.
* Water moderates in a form of evaporative cooling
  + Surface of the liquid remaining behind cools
  + Ten, best track runners leaving team.
  + PREVENTS OVERHEATING

Section 2.13: Ice is less dense than liquid water:

* Water exists as liquid, solid, and a gas. Water is less dense as solid than as a liquid. Due to hydrogen bonds
* As water freezes, molecule forms stable hydrogen bonds with four neighbors
* Ice crystal has fewer molecules than an equal volume of liquid water. Therefore, ice is less dense
* IF ice was more dense, then everything would freeze solid.
  + Instead, deep body of water cools due to insulation of water from colder bear above. This insulation prevents water below from freezing

Section 2.14: Water is the solvent of life:

* Solution: Liquid consisting of a uniform mixture of two or more substances
* Dissolving agent is solvent
* Dissolved is solute
* Aqueous solution is one in which water is the solvent
* Water is versatile due to its polarity
* A compound doesn’t need to be ionic to dissolve in water
  + Sugar will dissolve in a glass of water
  + Polar molecules dissolve in polar water molecules “Like dissolves like”

Section 2.15: The Chemistry of Life is Sensitive to Acidic and Basic conditions

* In aqueous solutions, a very small percentage of the water molecules actually break apart into ions
  + Ions formed are called Hydrogen Iions and Hydroxide ions
* Some chemical compoudns contribute additional H+ to an aqueous solution whereas other remove
* Acid: Donates Hydrogen ions to solution
* Base: Compound that accepts hydrogen ions and removes them from solution
  + Basic solutions are also called alkaline
* pH scale describes how acidic or basic a solution is
* Pure water and aqueous solutions can be neutral iff they have a pH of 7.
* Buffers, substances that minimize changes in pH

Section 2.16:

* Acidic Preciptation: pH lower trhan 5.6 or lower.