- Chemistry of Life
- Matter – Anything that takes up space and has weight/mass.
- Element- basis of all substances – made up of only one atom.
- Atom – Smallest unit of an element that retains the chemical and physical properties of that element.
- Diagram of an Atom
- Nucleus
    - Protons
        - + charge
        - Number of Atomic #
    - Neutrons
        - No charge
        - Add to protons for Atomic mass
- Shells-energy level
    - Electrons
        - - charge
        - Shells-energy level
    - Electrons
        - - charge
- 1^{st} shell – 2 electrons
- 2^{nd} shell – 8 electrons
- 3^{rd} shell – 8 electrons
- The Periodic Table
- Carbon and its Isotopes
- Isotopes
    - Atoms of the same kind that differ in the number of neutrons. Protons stay the same

- Carbon 12
- Carbon 13
- Carbon 14
- Molecules and Compounds
- Molecules – two or more atoms bond with each other (same or different)
- Compound – two or more different atoms bond together.
- Types of Bonds
- Ionic bonds – chemical bonds in which ions (+ or -) are attracted to one another by opposite charges. Important in many body functions.
- Covalent bonds – Atoms share electrons in their outer shells
- Water
- The most abundant molecule in living things
- Makes up about 60-70% of total body weight
- It's a polar molecule
    - O2 has a slight – charge
    - H2 has a slight + charge
- Electrons spend more time circling the oxygen
- Hydrogen bond
    - + charged hydrogen is attracted to a – charged atom some distance away
    - Relatively weak and can be broken easily
- Properties of Water
- Because of polarity and hydrogen bonding
- Water molecules tend to be cohesive and stick together
- Blood in our body is 92% water
- Solid
- Freezes below 0° C

- Less dense water
    - floats
- Expands when it freezes
- Lakes freeze from top down protecting life below by insulating the top
- Liquid
- Stays liquid at room temperature
- Temperature rises and lowers slowly
- Gas
- Vaporizes at 100° C
- Takes a huge amount of heat to change to a gas
    - Sweat to cool body
- The Universal Solvent
- For polar (charged) molecules
    - O^- attracted to Na^+
    - H^+ attracted to Cl^-
- Hydrophilic – interacts with water
- Hydrophobic – does not interact with water