**2.3 Carbon Based Molecules: Organic Compounds**

*Key Concept: Carbon based Molecules are the foundation of Life*

* **Organic** means Carbon
  + Sugar is organic
* Carbon atoms have unique bonding properties.
  + Carbon forms covalent bonds with up to four other atoms, including other carbon atoms.
  + Carbon based molecules have three general types of structures.
    - Straight chain
    - Branched chain
    - Ring
  + Many carbon based molecules are made of small subunits bonded together
    - **Monomers** are the individual subunits (mono- one)
    - **Polymers** are made of many monomers (poly- many)
* Four types of Carbon-based molecules are found in living things.
  + **Carbohydrates** are made of carbon, hydrogen, and oxygen.
    - Carbohydrates includes sugars and starches
    - Monosaccharides are simple sugars
    - Polysaccharides include starches, cellulose and glycogen.
    - Carbohydrates can be broken down opt provide energy for cells.
    - Some carbohydrates are part of the cell structure.
  + **Lipids:** non-polar molecules that include fats, oils, and cholesterol
    - Many contain carbon chains called fatty acids.
    - Fats and oils contain fatty acids bounded to glucose
    - Lipids have several other functions
      * Broken down as a source of energy (stores energy)
      * Make up cell membranes
      * Used to make hormones
* Fats and oils have different types of fatty acids
* Saturated fatty acids (solid)
* Unsaturated fatty acids (liquids)
* Phospholipids maker up call membranes
  + Polar Phosphate “head”
  + Non-polar fatty “tail”
* **Proteins**: polymers of amino acid monomers
  + Many amino acids put together make proteins.
  + Twenty different amino acids are used to build proteins in organisms.
  + Amino acids differ in side groups , or R groups.
  + Amino acids are linked by peptide bonds ( peptide means protein)
    - Proteins are going to differ in the number and order of the amino acids.
      * DNA codes for proteins to be made.
    - Amino acids give a protein it’s shape.
    - Incorrect amino acids change and proteins structure and function.
* **Nucleic Acids:** DNA and RNA
  + Made of monomers called Nucleotides
    - Each nucleotide consist of a sugar, a phosphate group, and a nitrogen base
    - The nitrogen base of DNA are adenine, cytosine, guanine and Thymine
    - The nitrogen base of RNA is adenine, cytosine, guanine, and Uracil (replaces Thymine)
  + DNA contains all of our genetic information
  + Stored in the nucleus
  + RNA leaves the nucleus to work carry information to the ribosomes to make proteins.