**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.