Carbohydrates

Elements
Made of carbon, hydrogen and oxygen

Carbon to oxygen ratio is always 1:1

Monomer

The monomer of carbohydrates are monosaccharides/

Examples of monosaccharides are glucose and fructose. They are simple sugars found in fruits and other plants.

- 2 monosaccharides bonded together make a disaccharide.
  - Example is sucrose (glucose + fructose)

Function
Provide the body with energy!
Provide structure for plant cell walls and exoskeletons of insects.
Additional Facts

Polysaccharides- polymers composed of many monosaccharide subunits

- polysaccharides are the hardest ones for our bodies to digest

-Examples: Starch, Glycogen, and Cellulose
  -Starch- made and stored by plants, used for energy by plant cells and as food reservoirs in seeds and bulbs.
  -Glycogen- made and stored in animals (example: mammals store energy in the liver this way)
  -Cellulose- forms all cell walls of plants/gives plants structural support and makes up the exoskeleton of insects. (It’s the stringy fibers in celery)

-Foods loaded with Carbs include: pasta, white flour, white rice, bananas, potatoes, French fries, soft drinks, corn
-What happens when we eat them???
-Once they are eaten and digested, or broken down, they can be taken up by the blood stream, becoming blood glucose. Insulin usually transports these simple sugars across the walls of body cells where it can then be used for energy. However, diabetics insulin does not work properly and so the carbohydrates start to build up in the blood stream which causes sugar levels to rise.
Lipids

Elements
Made of carbon, hydrogen and oxygen
Ratio of carbons to oxygen—very high C, little O

- insoluble (cannot dissolve) in water because their molecules are non-polar and are not attracted to water molecules.

Types: Oils, Fats, Waxes and Steroids

Building Blocks (monomers kind of)
Made of a glycerol and fatty acid tails

- two types: saturated and unsaturated
  - saturated fatty acids: contain only single bonds, they are solid at room temperature, examples: butter, lard
  - unsaturated fatty acids: contain double bonds which causes a bend in the tail, liquid at room temperature, examples: canola oil, olive oil
Function
- Provide energy storage
- Used for energy
- Insulation
- Protective covering for internal organs
All cell membranes are made up of a lipid called a **phospholipid**, made up of a glycerol, two fatty acids, and phosphate group.

- they have a **polar head** and a **nonpolar tail**
- this helps **move** things in and out of the cell

**Cholesterol**

- your body **needs** some cholesterol in order to **function** correctly
  - part of the **cell membrane**
  - help produce steroid hormones

**BUT** too much will **accumulate** in blood vessel walls and begin to narrow them - could lead to **heart attacks** and **strokes**.
Trans fats
-chemically altered vegetable oils

-produced artificially in a process called hydrogenation (turns liquid oil into solid fat)

-found in thousands of processed foods (sweets, to ready-made meals)

-used because they are cheap, add bulk to products, have a neutral flavor and give the product a longer shelf life

-no nutritional value

-have been linked to high cholesterol