

Biomolecules

- _____-based molecules are called BIOMOLECULES
 - By sharing electrons, carbon can bond to **four** other atoms
 - Atoms that often bond to Carbon: _____, _____, _____, _____
- Usually forms **rings** or **long chains**
 - _____ determines **function** (what it does)
 - Found in or produced by _____
- There are four important biological molecules:
 - _____
 - _____
 - _____
 - _____
 - They are often called **macromolecules** because of their large size
- **Three out of the 4** types of biochemical macromolecules can be found on food nutrition labels
- Each of the 4 biological molecules is made of a
 - _____: a molecule that can be bonded to identical molecules to form a polymer [**“building blocks”**]
 - _____: a substance that is built of 2 or more monomers bonded together [**ex: carbs, lipids, proteins, and nucleic acids**]

Building Blocks monomer	Macromolecule polymer
monosaccharide or simple sugar	Polysaccharides or carbohydrate
Fatty acids	Fats and Lipids
Amino Acids	Proteins
Nucleotides	Nucleic Acids

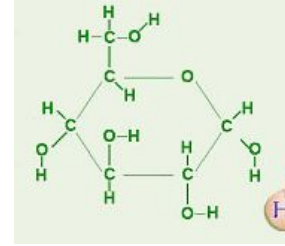
- When studying these biomolecules, we are interested in finding out:
 - What they do for _____
 - What they generally look like
 - What their _____ are
 - How they may help the body _____

CARBOHYDRATES

- What do they do?
 - They are the _____ for the body to _____. They are our fuel!
 - They _____, which allow them to grow tall. Without this carbohydrate, a plant would be a mushy mess! This type of carbohydrate is called _____

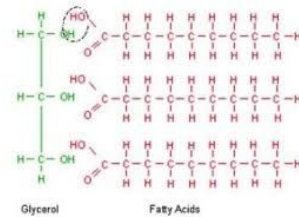
■ **THINK: CARBS = ENERGY + CELL WALLS**

- Where are they found?
 - In plant foods: _____
 - In animal products: _____
- Types: Simple and Complex
 - Simple sugars are carbohydrates, made up of _____ monomers. They also taste sweet.
 - Ex: _____
 - Complex carbohydrates are polymers, made up of many monomers. Most also taste _____.
 - Ex: _____
- Made up of:
 - Carbohydrates are chains (polymers) made of monomers. The most common monomer of carbohydrates is _____
 - The shape of glucose is a _____
- At the atomic level:
 - Each carbohydrate is made up of _____, _____, and _____.
 - **THINK: "CHO"**



LIPIDS

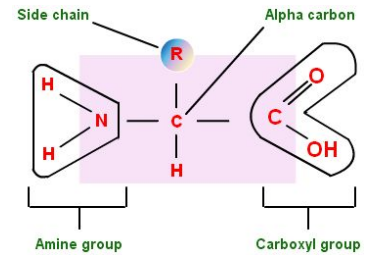
- What do they do?
 - They are a great source of _____ so we have it in the future.
 - They _____ the body to maintain normal body temperature and they _____ the internal organs for protection.
 - They produce hormones for the body called _____
 - They _____ surfaces of animals, plants, and fruits--these are waxes!
 - **THINK: Waterproof, insulate, steroids, energy, cushion "WISE C"**
- Where are they found?
 - In plants: _____
 - In animals: _____
 - Lipids make up the **cell membrane** of all cells.
- Made up of:
 - Lipids are chains (polymers) made of monomers. The most common monomer of lipids are _____ and _____
 - The shape of a triglyceride is like the letter **E**
- At the atom level:
 - Each lipid is made up of _____, _____, and _____.
 - **THINK: "CHO"**
- Lipids versus Carbohydrates:



Lipids	BOTH	Carbs

PROTEINS

- What do they do?
 - They are the major _____ in living things for growth and repair: muscles, ligaments, tendons, bones, hair, skin, nails...IN FACT, ALL _____ have protein in them
 - They make up _____ in the immune system
 - They make up _____ for helping chemical reactions
 - They make up _____
 - **THINK: Proteins = membranes, enzymes, antibodies, non-steroid hormones, structural molecules, "MEANS"**
- What are they made of?
 - _____
 - _____
 - _____; the cell membrane is mostly made of proteins AND lipids.
 - _____
 - _____; enzymes are proteins that speed up chemical reactions.
 - _____; in thyroid
- Where are they found?
 - In plant foods: _____
 - In animal products: _____
- Made up of:
 - Proteins are made of long chains (polymers) made of monomers. All proteins are made of the monomer _____
 - The shape of amino acids kind of looks like a star.
 - The shapes of proteins are like a balled up piece of string.
- At the atom level:
 - Each protein is made up of _____, _____, _____, _____, and sometimes _____.
 - **THINK: "CHONS"**



NUCLEIC ACIDS

- Your DNA is made of 4 bases (nucleotides):
 - _____ - T
 - _____ - A
 - _____ - G
 - _____ - C
- At the atom level:
 - Each nucleic acid is made of _____, _____, _____, _____, and _____
 - **THINK: "CHONP"**
- What is a gene? _____
- What is a trait? _____