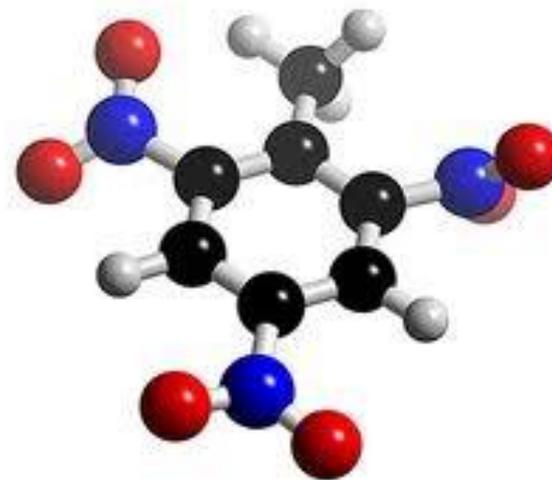
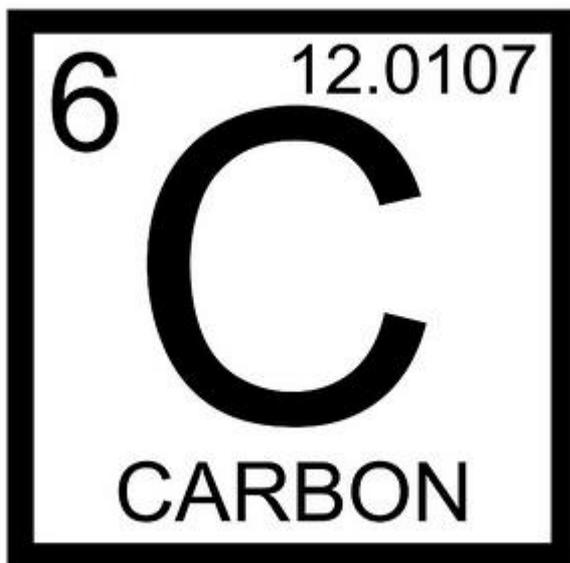
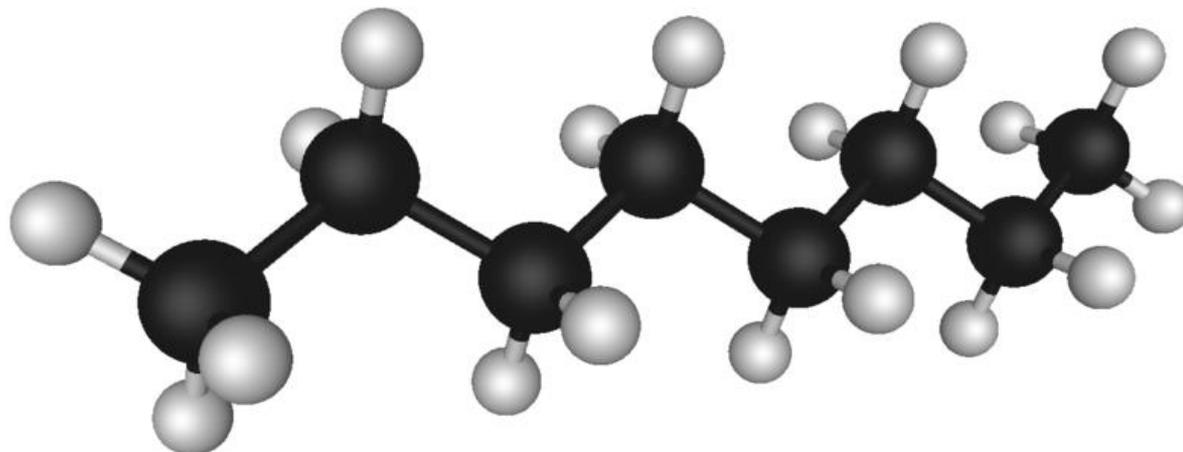


# 2-3 Carbon Compounds

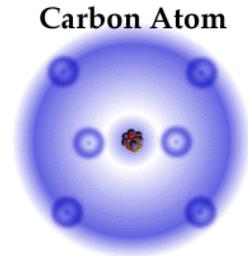


# The Chemistry of Carbon

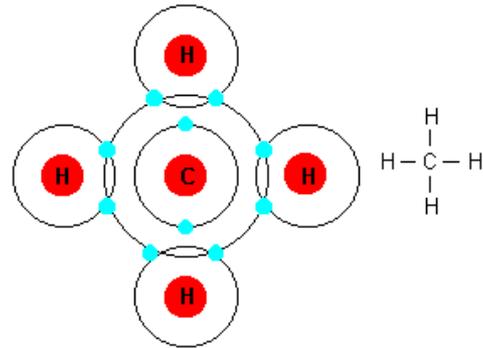
Organic chemistry- the study of carbon compounds.

## Carbon atoms: pg. 44

1. have four valence electrons

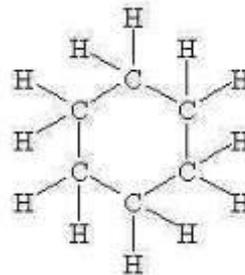
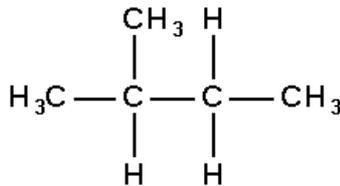
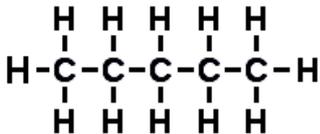


2. form strong covalent bonds  
(share electrons).



3. can bond to other carbon atoms

4. can form chains, branches, or rings



All living organisms are made of carbon (C).

Living things are also made of H, O, N, P

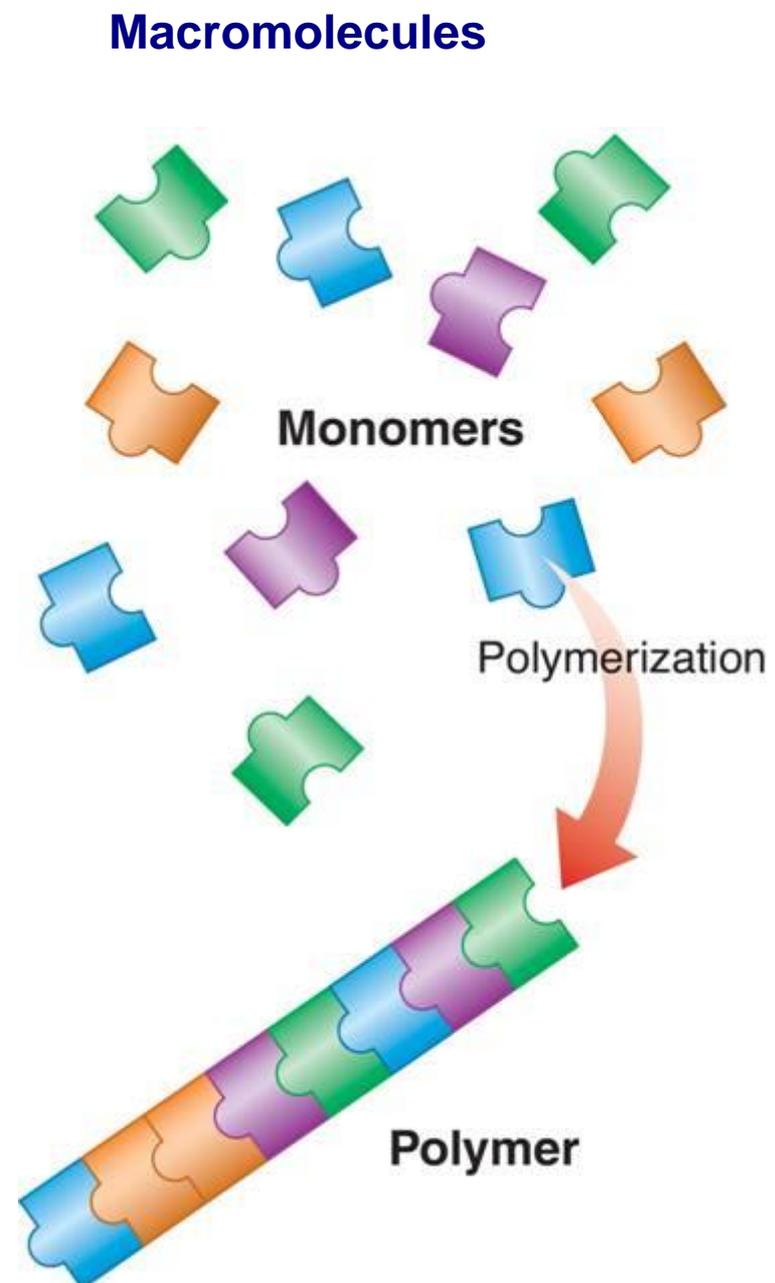
(hydrogen, oxygen, nitrogen, phosphorous)

# Macromolecules

Pg. 45

Macromolecules are formed by a process known as polymerization.

The smaller units, or **monomers**, join together to form **polymers**.



**Four major macromolecules (organic compounds) found in living things are:**

- **carbohydrates**
- **lipids**
- **nucleic acids**
- **proteins**

# Carbohydrates

**Carbohydrates**- compounds made up of C, H, and O, usually in a ratio of 1 : 2 : 1.

**Monomer:** monosaccharide

**Common monosaccharides:** glucose pg. 45, fructose

**Polymer:** polysaccharide

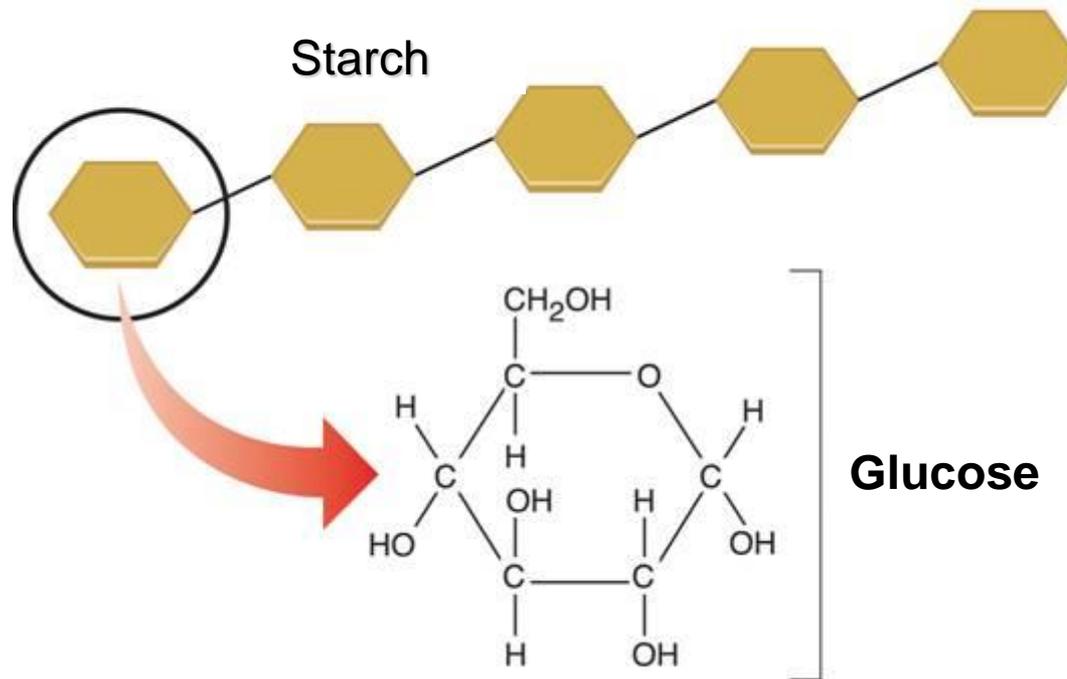
**Common polysaccharides:** sucrose, lactose, starch, glycogen, cellulose

## What is the function of carbohydrates?

1. **Main source of energy**
2. **Used to build structures**



**Starches and sugars- used by living things as a source of energy (pg. 45)**



## Lipids pg. 46

Lipids-not soluble in water, made mostly of C and H.

**Monomer:** fatty acids and glycerol

**Polymers:** fats, oils, waxes, and steroids

## What is the function of lipids?

1. **store energy**
2. **parts of membranes**
3. **waterproof coverings**

## Lipids

Many lipids are formed when a glycerol molecule combines with fatty acids.

**Saturated fat-** single bonds between C atoms; each C is bonded to the maximum number of H atoms; solid at room temperature

**Unsaturated fat-** at least one double bond between C atoms, at least one C atom is not bonded to maximum number of H; liquid at room temperature

# Nucleic Acids

**Nucleic acids-** made of C, H, O, N, P.

Monomer: nucleotide pg. 47

Polymer: nucleic acids

Common nucleic acids: DNA and RNA

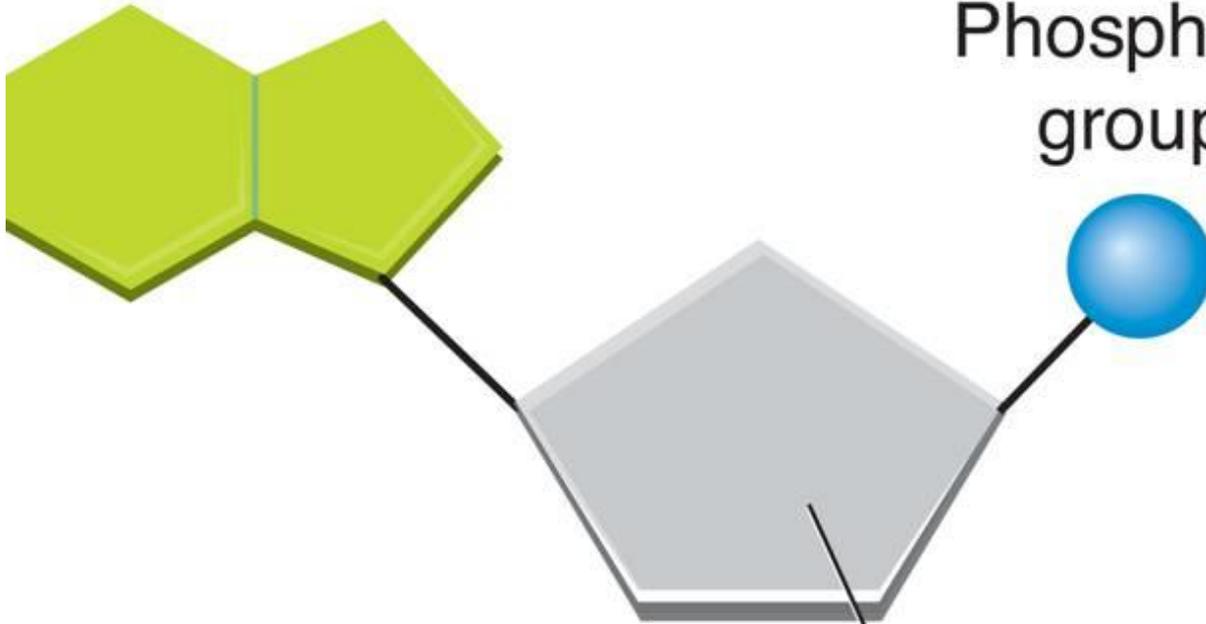
**Nucleotides** consist of three parts:

- a 5-carbon sugar (ribose and deoxyribose)
- a phosphate group
- a nitrogenous base- adenine, guanine, thymine, cytosine, uracil (RNA)

Nitrogenous  
base

Phosphate  
group

5-carbon sugar



**What is the function of nucleic acids?**

- 1. Transmits heredity**
- 2. Stores genetic information**

# Proteins

**Proteins** are made of C, H, O, N. held together by peptide bonds

Monomer: amino acids (20 essential) pg. 47

Common monomers: alanine, serine

Polymers: polypeptides

Common polymers: enzymes, ion channels

## What is the function of proteins?

1. **Control the rate of reactions**
2. **Regulate cell processes**
3. **Form bones and muscles**
4. **Transport substances into and out of cells**
5. **Fight disease**