

# ***Chapter 3 (Carbon Compounds in Cells)***

## ***Student Notes for Honors Biology***

- What is the difference between organic and inorganic chemistry with examples from each?
- Why is the element carbon the backbone for all organic life of the planet earth?
- How many electrons does it take to complete carbon's second energy level?
- In the formation of carbon dioxide how does carbon bond with oxygen?
- What would be the chemical formula for the formation of carbon and chlorine atoms?
- What are the variety of ways carbon can bond with other substances?
- What defines a substance as a hydrocarbon and why are there so many different hydrocarbons?
- List some unique characteristics of hydrocarbons:
- What is the definition of a functional group and what the types of functional groups?
- Notes on 'Understanding Functional Groups':

- What causes the flexible rings within carbon chains?
- What are the starting points for three-dimensional shapes and functions of organic compounds?
- Why are some carbon bonds flexible while others are rigid?
- How do cells use carbohydrates, fats, proteins, and nucleotides for building all the organic compounds?
- What are three organic compounds that are found within the human body?
- Define the 5 classes of chemical reactions in biochemistry:
  1. Functional-group transfer –
  2. Electron transfer –
  3. Rearrangement –
  4. Condensation –
  5. Cleavage –
- Why is the creation of sucrose a Condensation Reaction?
- Why are glucose and fructose classified as monosaccharides?
- Why is sucrose classified as a disaccharide?
- What 2 sugars chemically bonded together create the sugar sucrose?
- What is hydrolysis?
- Why is a cleavage reaction known as hydrolysis?
- What is a polymer and give an example?

- How do plants and animals store energy?
  - What is lysis?
  - Why is it so important for you to drink water throughout the day, especially when exercising?
  - What is  $C_6H_{12}O_6$ ?
  - What is the name of the process where water is used to break large complex molecules (polymers) into smaller less complicated?
  - What is the name of the process where water is released in a chemical reaction during which small molecules are joined to form a larger more complex molecule?
  - Why when running a marathon do athletes very seldom have to urinate during the race?
  - What is a macromolecule?
  - What are the 4 carbon-based macromolecules found in living organisms and give examples of each?
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- What are the 2 monosaccharides that are the building blocks for DNA?
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- What are some important characteristics of carbohydrates:
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- What type of carbon ring makes up carbohydrates?
  - What is the ratio of hydrogen to oxygen in a carbohydrate molecule?
  - What do cells use carbohydrates for?
  - What are the 3 types of carbohydrates and why are they different?

- Where do you find cellulose, why is it unique, and can humans digest cellulose?
- What is amylose classified as and what is it used for?
- How is glycogen used by the human body?
- Name 2 monosaccharides:
- What does 'saccharide' stand for?
- How are the carbon atoms arranged in monosaccharides?
- What is a 6 carbon sugar called?
- How are glucose and fructose different?
- What are some important characteristics of disaccharides?
- What is the most plentiful sugar in nature?
- Why do plants transport carbo's as sucrose?
- What type of reaction creates disaccharides from monosaccharides?
- Define oligosaccharide:
- What are lactose and maltose classified as?
- What are long chains of monosaccharides called? Give some examples:
- What are some properties of polysaccharides: