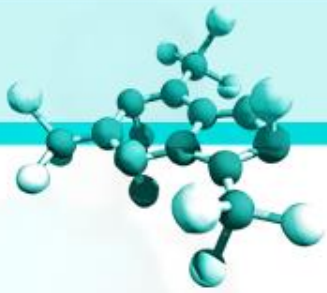


Ch. 2 "The Chemical Level of Organization"

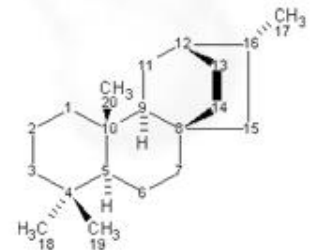
Class 2.3

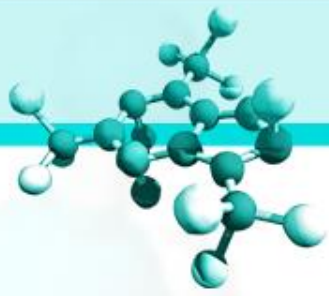


Warm-up

Let's read "The Truth About Carbohydrates" together.

<http://www.learningseed.com/p-170-carbs-elements-of-human-nutrition.aspx>

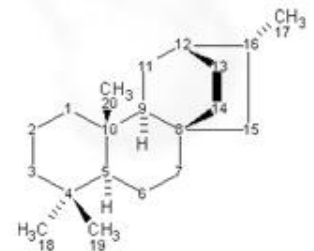


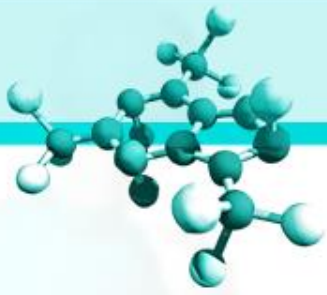


The Building Blocks of Life

MAIN IDEA

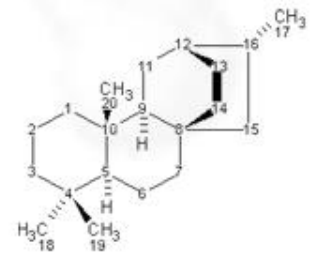
Organisms are made up of carbon-based molecules.

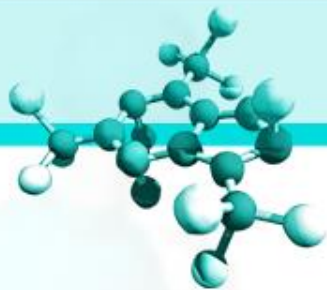




Origin of Life

<http://youtube.com/watch?v=Vgh2E-b8E2g&feature=related>



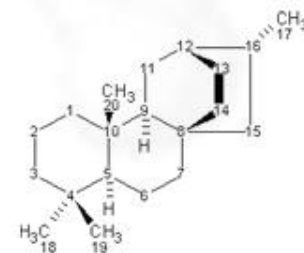


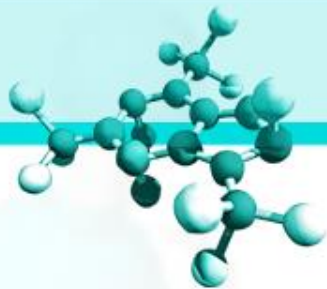
Organic Chemistry

The element carbon is a component of almost all biological molecules.

For this reason, life on Earth is considered carbon-based.

Organic chemistry is the study of organic compounds – those compounds containing carbon.





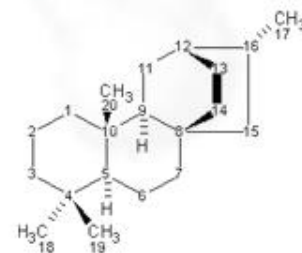
Organic Chemistry

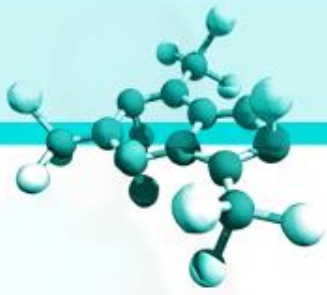
Carbon has 4 electrons in its outermost energy level.

1 carbon atom can form 4 covalent bonds with other atoms to form compounds.

These compounds can be in the shape of straight chains, branched chains, and rings.

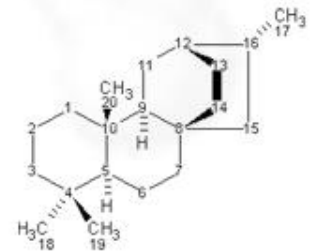
Together carbon compounds lead to the diversity of life on Earth.

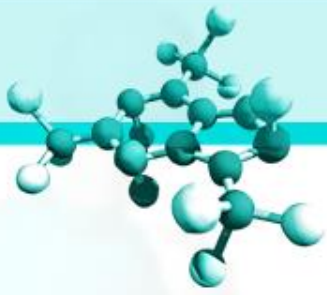




Origin of Life

<http://youtube.com/watch?v=5-XWAXe4xJg&feature=related>



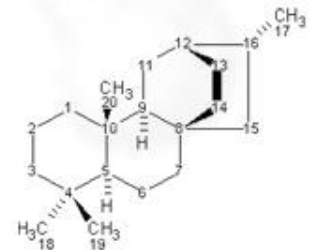


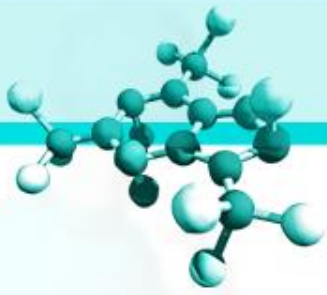
Macromolecules

Carbon atoms join to form carbon molecules.

Most cells store small carbon compounds that serve as building blocks for large molecules.

Macromolecules are large molecules that are formed by joining smaller organic molecules together.



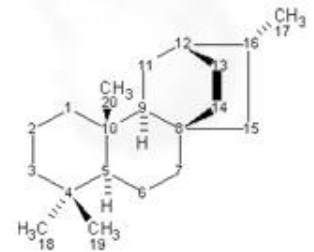


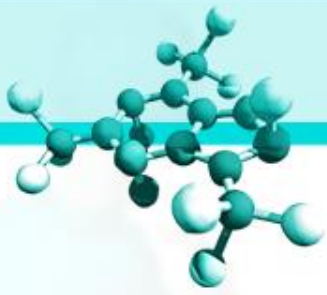
Macromolecules

These large molecules are called polymers.

Polymers are molecules made from repeating units of identical or nearly identical compounds called monomers that are linked together by a series of covalent bonds.

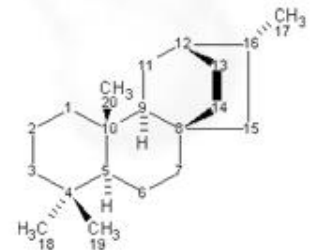
Macromolecules are organized into 4 major categories: carbohydrates, lipids, proteins, and nucleic acids.

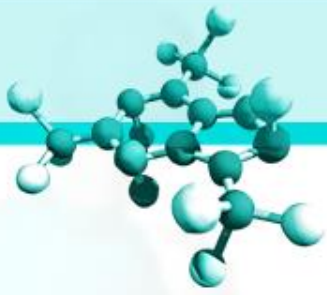




Macromolecules

[http://www.hippocampus.org/hippocampus.php/course_locator.php?course=AP Biology
I&lesson=6&topic=1&width=600&height=350&topicTitle=Macromolecules
%3A%20Overview&skinPath=http://www.hippocampus.org/hippocampus.skins/default](http://www.hippocampus.org/hippocampus.php/course_locator.php?course=AP%20Biology&lesson=6&topic=1&width=600&height=350&topicTitle=Macromolecules%3A%20Overview&skinPath=http://www.hippocampus.org/hippocampus.skins/default)

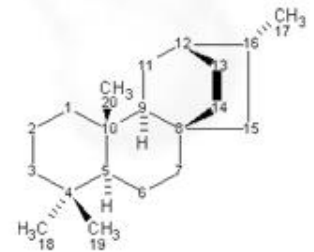


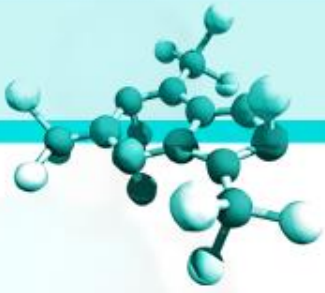


Carbohydrates

Carbohydrates are compounds composed of carbon, hydrogen, and oxygen in a ratio of 1 oxygen and 2 hydrogen atoms for each carbon atom.

A general formula for carbohydrates is written as $(\text{CH}_2\text{O})_n$



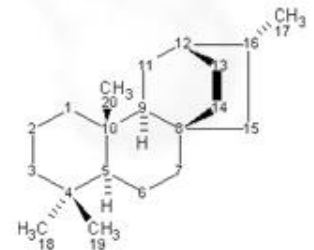


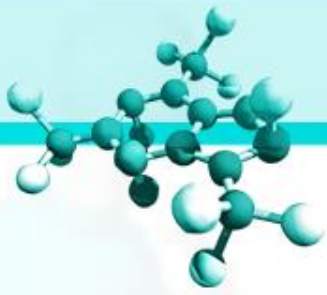
Carbohydrates

Carbohydrates that have values of n ranging from 3 to 7 are called simple sugars, or monosaccharides.

The monosaccharide glucose plays a central role as an energy source for organisms.

Monosaccharides can be linked to form larger molecules.
2 monosaccharides joined together form a disaccharide.





Carbohydrates

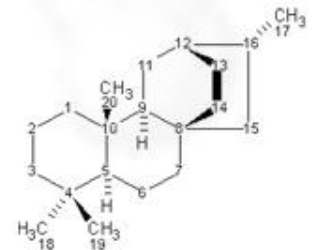
Disaccharides serve as energy sources.

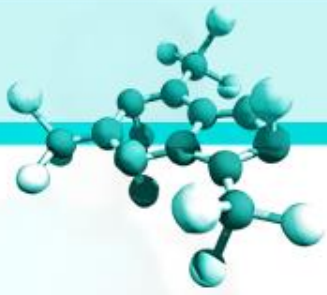
Sucrose and lactose are both disaccharides.

Longer carbohydrate molecules are called polysaccharides.

One important polysaccharide is glycogen.

Glycogen is an energy storage form of glucose that is found in the liver and skeletal muscle.



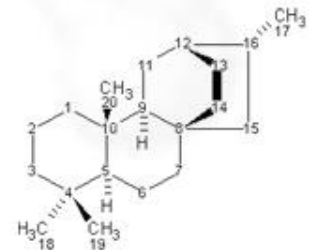


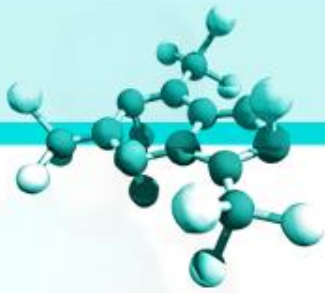
Carbohydrates

In addition to their roles as energy sources, carbohydrates have other important functions in biology.

In plants, a carbohydrate called cellulose provides structural support in cell walls.

Chitin is a nitrogen-containing polysaccharide that is the main component in the hard outer shell of shrimp, lobsters, and some insects, as well as the cell wall of some fungi.

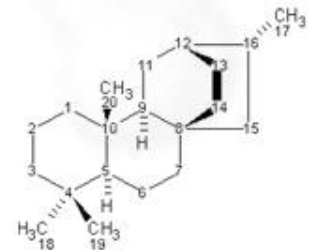


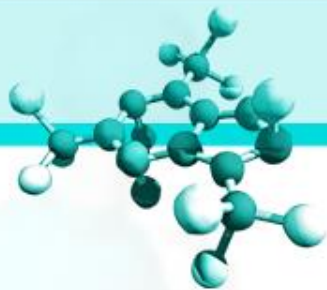


Carbohydrates

<http://youtube.com/watch?v=j1i68NlrP1A>

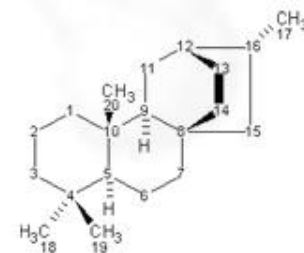
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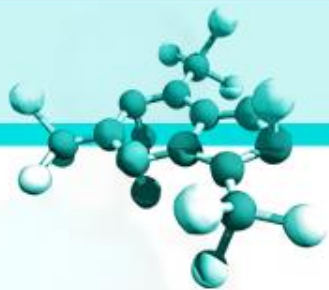




Lab Time

With a partner begin working on the paper lab “Chemistry of Carbohydrates”





HW

Finish the Lab

