

Unit 8 - It's All about Carbon: Organic Basics

Content Area: **Science**
Course(s): **Chemistry Honors**
Time Period: **March**
Length: **6 weeks**
Status: **Published**

Transfer Skills

There is an entire branch of chemistry based on the element carbon. A foundation in classification and naming hydrocarbons, functional groups, isomers and elementary organic reactions will aid in the understanding of the properties of these compounds.

Enduring Understandings

Many molecules pertaining to life have carbon rings, chains and networks at their core.

The ability of carbon to form long chains has produced the element of all life.

Carbon always produces four covalent bonds.

Hydrocarbons with the same molecular formula but different molecular structures have different properties.

The addition of functional groups to carbon chains affects the intermolecular forces present and the properties of molecules.

Chemical reactions can be used to change the structure of organic compounds.

Essential Questions

Why are carbon based molecules versatile as chemical building blocks?

What are the general properties of hydrocarbons?

How do isomers differ from one another?

How will the addition of a functional group affect a molecule?

How are organic reactions used in chemistry?

Content

Organic, catenation, isomer, structural formula, structural isomer, skeletal isomer, positional isomer,

functional isomer, optical isomer, stereo isomer, chiral, geometric isomer, alkane, alkene, alkyne, aromatic, saturated hydrocarbon, alcohol, ester, ether, carboxylic acid, halocarbon, amine, amide, aldehyde, ketone, substitution reaction, addition reaction, elimination reaction, esterification reaction, condensation reactions, polymer

Skills

Explain how the structure and bonding of carbon lead to the diversity and number of organic compounds.

Distinguish among the structure and properties of alkanes, alkenes, alkynes and aromatic hydrocarbons.

Identify and name molecules containing functional groups.

Explain the relationships between the properties and structures of compounds with various functional groups.

Describe and distinguish between the organic reactions.

Draw, name and classify various types of isomers.

Resources

Standards

SCI.9-12.5.1.12.A.1	Refine interrelationships among concepts and patterns of evidence found in different central scientific explanations.
SCI.9-12.5.1.12.B.1	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.
SCI.9-12.5.1.12.D.3	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.
SCI.9-12.5.2.12.B.3	Balance chemical equations by applying the law of conservation of mass.
SCI.9-12.5.2.12.C.2	Account for any trends in the melting points and boiling points of various compounds.
SCI.9-12.5.3.12.A.1	Represent and explain the relationship between the structure and function of each class of complex molecules using a variety of models.