

## TEKS

**9A** Compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids

**9C** Identify and investigate the role of enzymes

## instructional content:

- ✦ Properties of Water
  - Structure of water molecule
  - Solutions
  - Acids and bases
- ✦ Biomolecules
  - Basic chemistry of carbon
  - Carbohydrates
  - Lipids
  - Proteins
  - Nucleic acids
- ✦ Enzymes
  - Chemical reactions
  - Energy in chemical reactions
  - Role of catalysts in chemical reactions
  - Enzyme structure
  - Enzyme-substrate complex

## learning outcomes students will:

- Use all content and scientific process skills learned earlier in the course
- Differentiate between an inorganic and an organic compound
- Describe how the structure of water relates to its properties
- Explain how the bonding properties of carbon result in a variety of biomolecules
- List the four most common elements found in living organisms
- Explain what is meant by a macromolecule
- Differentiate between monomers and polymers and provide examples of each
- Describe the basic composition and general formula of carbohydrates
- Explain the main roles of carbohydrates in living organisms
- Identify the monomer of carbohydrates
- Using a diagram, describe the basic structure of a triglyceride
- Distinguish between saturated and unsaturated fatty acids
- Explain the main roles of lipids in living organisms
- List the elements that make up proteins
- Describe the general structure of an amino acid
- Distinguish between essential and nonessential amino acids
- Explain the roles of proteins in living organisms
- List the elements that make up nucleic acids
- Identify the monomer of nucleic acids
- Differentiate between DNA and RNA
- Explain the roles of nucleic acids in living organisms
- Demonstrate an understanding of some basic tests for organic compounds
- Explain what happens to chemical bonds during chemical reactions
- Describe the role of energy in chemical reactions
- Define enzyme, catalyst, active site, and substrate
- Explain how catalysts affect the activation energy of a chemical reaction
- Explain how enzymes work as catalysts to bring about chemical reactions in cells
- Describe the lock and key model of enzyme function
- Explain how enzymes are important to living organisms
- Identify applications of enzymes in industry



Incorporate scientific process skills during the instruction of all Biology concepts.  
Look for this icon at [wardsci.com/TEKS](http://wardsci.com/TEKS) for more information on scientific process skills.

## Recommended Ward's Science products with item numbers for easy online searching:

### science tools:

[Albumin \(Egg\) 9443804](#)  
[D-Glucose Monohydrate 9456505](#)  
[Starch 9468103](#)  
[Biuret Reagent Solution 9701204](#)  
[Bromothymol Blue 9446700](#)  
[Iodine Solution 9704803](#)  
[Amylase 9444602](#)  
[Lipid Test Strips Pkg/75 2991131](#)

[Indicator Bottles 6504801](#)  
[Volumetric Transfer Pipets 182971](#)  
[Pyrex® Test Tubes with Rims 170630](#)  
[Test Tube Rack 176591](#)  
[VWR Standard-Grade Beakers 173500](#)  
[Utility Tongs 140960](#)  
[Hot Plates 158070](#)  
[Wax Marking Pencils 6264502](#)

### instructional resources:

[3-D Water Kit 4567503](#)  
[Minit™ Biochemistry Student Set 817120](#)  
[Ward's Molecules of Life Lab Activity 361204](#)  
[Biochemistry Manipulative 4662300](#)  
[VirtMac™ Magnetic Protein Folding / Enzyme Structure and Function Manipulatives 148392](#)  
[Ward's Biochemistry of Life's Macromolecules Lab Activity 361236](#)  
[Introduction to Biochemistry Lab Activity 363000](#)  
[Food Chemistry Module Lab Activity 362041](#)

[Ward's Testing for Nutrients in Food Lab Activity 366206](#)  
[Ward's Key to Understanding Enzymes Activity Model 148322](#)  
[Enzymes: Two Wet Labs and One Dry Lab 4593900](#)  
[Ward's Quantifying Enzyme Activity with Amylase Lab Activity 366078](#)  
[Ward's What Influences Enzyme Activity? Lab Activity 361216](#)  
[Enzyme Catalysis Lab Activity 367112](#)  
[Enzyme Analysis Activity Kit 368996](#)  
[Ward's Cheesemaking Your Whey Lab Activity 366227](#)  
[Science Take-Out Experiments: Just Add Students! 367335](#)