

ACS Biology  
Semester 2 Final Exam  
Study Guide  
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**Note:** This study guide lists the MAIN topics studied in each chapter. This is meant to be a reminder to help you study, not an exhaustive list of what you should know for the final exam. You should also study using your book, notes, and assignments from the semester.

Chapter 2: The Chemistry of Life

Main topics:

- Protons, Neutrons, Electrons
- Ionic and Covalent Bonds
- Molecules
- Van der Waals Forces
- Water as a Molecule—properties
- Acids, Bases, and pH
- Monomers and Polymers
- Carbohydrates
- Lipids
- Nucleic Acids
- Proteins
- Chemical Reactions
- Energy Changes in Reactions
- Activation Energy
- Enzymes

Chapter 7: Cell Structure and Function

Main topics:

- Cell Theory and scientists who made contributions to it
- Prokaryotes and Eukaryotes—similarities and differences
- Cell Structures and Organelles
- Function of Cell Structures and Organelles
- Organelle DNA
- Cell Membrane: Diffusion, Osmosis, Facilitated Diffusion, Active Transport
- Unicellular vs. Multicellular Organisms—cell specialization, levels of organization

Chapter 8: Photosynthesis

Main topics:

- Autotrophs/ Heterotrophs
- ATP and Glucose
- Experiments on Photosynthesis: Van Helmont, Priestley, Ingenhousz
- Photosynthesis Equation
- Light and Pigments
- Chloroplast structure and function
- Light-Dependent Reaction
- Light-Independent Reaction
- Factors Affecting Photosynthesis

Chapter 9: Cellular Respiration

Main topics:

- Calories
- Glycolysis
- Lactic Acid Fermentation
- Alcohol Fermentation
- The Krebs Cycle
- Electron Transport Chain
- Energy and Exercise— Which pathways are used for short-term and long-term energy?
- Comparison of Photosynthesis and Respiration