

How to Study for the Anatomy and Physiology Prerequisite Exam:

1. Borrow: **Biology by Sylvia S. Mader** from the library.
2. Check out the following websites:
 - http://highered.mheducation.com/sites/0072919345/student_view0/chapter1/index.html
This site is for the 8th edition Mader text. You can select the chapter on the left hand margin and try the practice quizzes.
 - http://highered.mheducation.com/sites/0035456775/student_view0/chapter1/index.html
This site is for the 10th edition Mader text. You can select the chapter on the left hand margin and try the post-tests.
 - www.biologyjunction.com/chapteroutlines_final.doc
This site contains detailed chapter outlines for the 10th edition Mader text.
3. Use the attached Study Guide to review the chapters and topics specific to the Anatomy & Physiology Exam (APE).
4. If you need help reviewing material make an appointment with the Science Tutors.

Science Tutors Contact Information

978 656 3369 (Lowell LC406B) or 781 280 3726 (Bedford HH202)

Make an appointment online: <https://www.middlesex.mass.edu/ace/science.aspx>

Please note: Science Tutors have not seen the exam

The Test:

- Multiple choice
- 65 questions (need 47 correct to pass)
- 2-hour limit

Topics in Biology to Prepare for APE (Anatomy & Physiology Prerequisite Exam) based on Mader's biology text

Chapter 1: Introduction

- Levels of Organization
- Prokaryote vs Eukaryote Characteristics

Chapter 2: Basic Chemistry

- Elements most common in living organisms
- Atomic Structure
- Bonding: Octet Rule, Ionic, Covalent (polar and non-polar), Hydrogen
- Characteristics of water: Solvent properties, Cohesion/Adhesion, Heat Capacity, Thermal Inertia
- Acids and Bases (definitions, examples)
- pH: definition, ranges
- Buffer systems: including bicarbonate system

Chapter 3: Organic Chemistry

- Organic Compounds vs inorganic
- Macromolecules of the cell
- Hydrolysis/Dehydration Reactions
- Carbohydrates, Lipids, Proteins, Nucleic Acids (DNA, RNA) ATP
- For all types: monomers, polymers, structures, functions

Carbohydrates:

- glucose as primary energy source
- glycogen as animal's carbohydrate storage molecule

Lipids:

- saturated vs unsaturated triglycerides
- amphipathic nature of phospholipids

Proteins:

- peptide bonds
- levels of organization (shapes)

Nucleic Acids:

- DNA vs RNA structure
- ATP as energy currency

Chapter 4: Cell Structure and Function

- Animal Cell organelles - structures & functions

Chapter 5: Cell Membrane

- Fluid-mosaic model
- Plasma Membrane Structure and Function
- Membrane Protein Functions
- Membrane Permeability
- Membrane Transport
- Passive Transport:
 - Diffusion
 - Osmosis & Tonicity
 - Facilitated Transport
 - Active Transport: Sodium/Potassium Pump
 - Membrane –Assisted Transport

Chapter 6: Metabolism (Students should have general sense of this.)

- Metabolic Reactions
- ATP coupling and Metabolic Reactions
- Enzymes
 - Energy of Activation
 - Enzyme-Substrate Complex
 - Factors Affecting Enzyme Activity
 - Cofactors
 - Inhibition

Chapter 8: Cellular Respiration (major steps)

- Glycolysis
- Transition (Preparatory) Reaction
- Citric Acid Cycle
- Electron Transfer System
- Aerobic vs anaerobic respiration in general

Chapter 9: Cell Cycle

- The Cell Cycle
- Mitosis and Cytokinesis in Animals

Mader's 9th edition	Mader's 10th or 11th edition
Chapter 13: DNA Structure and Replication Basic DNA structure & Nucleotide Pairing Process of DNA replication Chapter 14: Gene Activity Function of Genes RNA structure & types The Genetic Code Transcription & Translation	Chapter 12: Molecular Biology of the Gene Basic DNA structure and Nucleotide Pairing Process of DNA replication Function of Genes RNA structure & types The Genetic Code Transcription & Translation