

## 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](http://highered.mheducation.com/sites/0072919345/student_view0/chapter1/index.html)  
This site is for the 8<sup>th</sup> 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](http://highered.mheducation.com/sites/0035456775/student_view0/chapter1/index.html)  
This site is for the 10<sup>th</sup> edition Mader text. You can select the chapter on the left hand margin and try the post-tests.
  - [www.biologyjunction.com/chapteroutlines\\_final.doc](http://www.biologyjunction.com/chapteroutlines_final.doc)  
This site contains detailed chapter outlines for the 10<sup>th</sup> 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

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