

Learning Modules outline the tasks that should be completed to master the biology outcomes from each chapter or group of chapters. Some of the tasks are optional, but highly recommended. Mandatory tasks must be completed by the specified deadlines. Mandatory tasks will consist of a short on-line quiz over the reading, and a short on-line critical thinking question. Sometimes, there will also be group assignments that will be assigned during class.

Learning Module 7

Learning Outcomes for Chapter 9 - CELLULAR RESPIRATION

1. Explain why enzymes are required for life.
2. Explain the role that electrons and electron carriers, such as NADH, play in energy metabolism.
3. Describe how our cells extract energy from glucose.
4. Illustrate the processes that make up the electron transport chain.
5. Interpret a metabolic pathway, such as glycolysis or the Krebs's cycle, and be able to identify reactants, products, enzymes, and phosphorylation or redox reactions.

Learning Tasks

- 1) Review chapter 9. Pay special attention to enzymes, reading chemical pathways, and the exchange of energy from glucose to electrons to ATP.
- 2) The figures in chapter 9 are very important. Pay particular attention to figures: 9.6, 9.9, 9.10, 9.12, 9.16.
- 3) Go to this link ><http://www.stolaf.edu/people/giannini/flashanimat/metabolism/mido%20e%20transport.swf>< for a quick animation of the electron transport chain (ETS or Electron Transfer Phosphorylation). Make sure you can describe in words what is happening with the NADH, H⁺, electrons, ATP synthase and ADP + P.
- 6) Define the following, important biological terms.
 - A. Enzyme, catabolic pathways, anabolic pathways
 - B. ATP, Phosphorylation
 - C. Electron, NADH, NADPH, Oxidation-reduction reactions, redox
 - D. Aerobic respiration, glycolysis, citric acid cycle, Electron transport chain, Oxygen
 - E. Chemiosmosis
 - F. ATP synthase, proton gradient
 - G. Fermentation, anaerobic respiration
- 7) **Critical Thinking Question #7 will be posted on the website - proferickson.com/ami and will be due Thursday, March 26th.**