**AP Biology Unit 3 – Bioenergetics**

# AP Biology Standards:

2A1: All living system require constant input of free energy

4B1: Interactions between molecules affect their structure and function

2A2: Organisms capture free energy and store free energy for use in biological processes.

# Objectives:

1. Be able to discuss the use of energy in living things (autotrophs and heterotrophs) and their environment.
2. Discuss the products and reactants in the light dependent reactions of photosynthesis.
3. Discuss the products and reactants in the light independent reactions of photosynthesis.
4. Discuss factors that affect the rate of reactions in photosynthesis.
5. Be able to discuss adaptations plants have to survive including CAM plants, C4 plants, and C3 plants (compare and contrast)
6. Identify the products and reactants in glycolysis, Krebs cycle, and electron transport chain.
7. Be able to discuss fermentation including the differences between fermentation and cell respiration.
8. Be able to discuss the relationship between photosynthesis and cell respiration.

Essential Questions:

▼ How do biological systems utilize free energy to grow, to reproduce, and to maintain homeostasis?

▼ How do organisms capture, use, and store free energy?

Major Topics and Textbook Correlations:

Metabolism and ATP (8.1, 8.2, 8.3)

Cellular Respiration and Fermentation (all of chapter 9 except 9.6)

Photosynthesis (all of chapter 10 except 10.4)

Helpful Resources:

Interactive tutoring:

<http://www.phschool.com/science/biology_place/biocoach/cellresp/intro.html>

<http://www.phschool.com/science/biology_place/biocoach/photosynth/intro.html>

Videos:

<http://www.bozemanscience.com/012-life-requires-free-energy>

http://www.bozemanscience.com/gibbs-free-energy/

<http://www.bozemanscience.com/atp-adenosine-triphosphate/>

<http://www.bozemanscience.com/coupled-reactions-2/>

<http://www.bozemanscience.com/cellular-respiration/>

http://www.bozemanscience.com/photosynthesis/

<http://www.bozemanscience.com/013-photosynthesis-and-respiration>

<https://www.youtube.com/watch?v=3y1dO4nNaKY> (ATP Synthase)

<http://vcell.ndsu.nodak.edu/animations/etc/movie-flash.htm> (electron transport chain)