

# Biology I - Unit 3b Study Guide

bio1u3bsg (Cell Metabolism)

**Big Idea: "All living things require energy."**

## Study Objectives (things to learn)

1. Describe the process of **photosynthesis**. (pages 113-124)
  - a. Define the terms autotrophs and heterotrophs and give examples.
  - b. Describe what chloroplasts are and their role in photosynthesis.
  - c. Write a chemical and word equation for photosynthesis including all reactants and products
  - d. What is the significance of glucose?
2. Compare and contrast lactic acid **fermentation** and alcoholic fermentation. (pages 131-136)
  - a. Define anaerobic respiration. Who does it?
  - b. What is the significance of ATP?
  - c. Write a word equation for both types of fermentation.
  - d. What is the efficiency of glycolysis in making ATP?
  - e. Describe historical significance of fermentation in the last century. (fermentation article)
3. Describe the process of aerobic **respiration**. (pages 137-144)
  - a. List and describe the three stages of aerobic respiration required for the breakdown of glucose.
  - b. Summarize the steps in glycolysis and aerobic respiration.
  - c. Read the article on "Mitochondria – many roles in disease" (page 141) and answer questions 1-3

## Terms to be familiar with:

ATP autotroph heterotroph glycolysis oxidation reduction chlorophyll light reaction  
Calvin cycle Krebs cycle electron transport chain photosynthesis fermentation  
aerobic respiration kilocalorie anaerobic respiration metabolic pathway

## Things to do:

- Readings: from Modern Biology (see above); fermentation article; "The Fire Within" article
- Notebook: **10pts**
  - Notes on study objectives (right side)
  - Reflections/summaries/reactions (left side)
  - Fermentation Article
  - Create a Digital Cmap (use the above vocabulary and any other terms you think you need)
- Photosynthesis Quiz **10pts**
- Fermentation Quiz **10pts**
- Aerobic Respiration Quiz **10pts**
- 3b Unit Exam **20pts**
- Activity: "Fermentation of Rootbeer"

## Misconceptions

- Plants are green because they use green light in photosynthesis.
- The "dark reaction" (Calvin Cycle) only takes place at night.
- The "calories" on a food label represents one calorie of energy.