

Name _____

Date _____

Period _____

Biology Homework 2-4.1: Cellular Respiration

Photosynthesis- carried out in the chloroplasts of plants; uses carbon dioxide to store energy in the form of glucose (organic molecules); produces oxygen.



The glucose made in photosynthesis is the starting point for **cellular respiration**. Do not confuse cellular respiration with breathing. Breathing simply involves taking in oxygen and eliminating carbon dioxide, but cellular respiration is a series of chemical reactions that change glucose into a usable form of chemical energy (ATP).

Cellular (aerobic) respiration- occurs in mitochondria; uses oxygen to release energy (ATP) from food molecules; produces carbon dioxide.

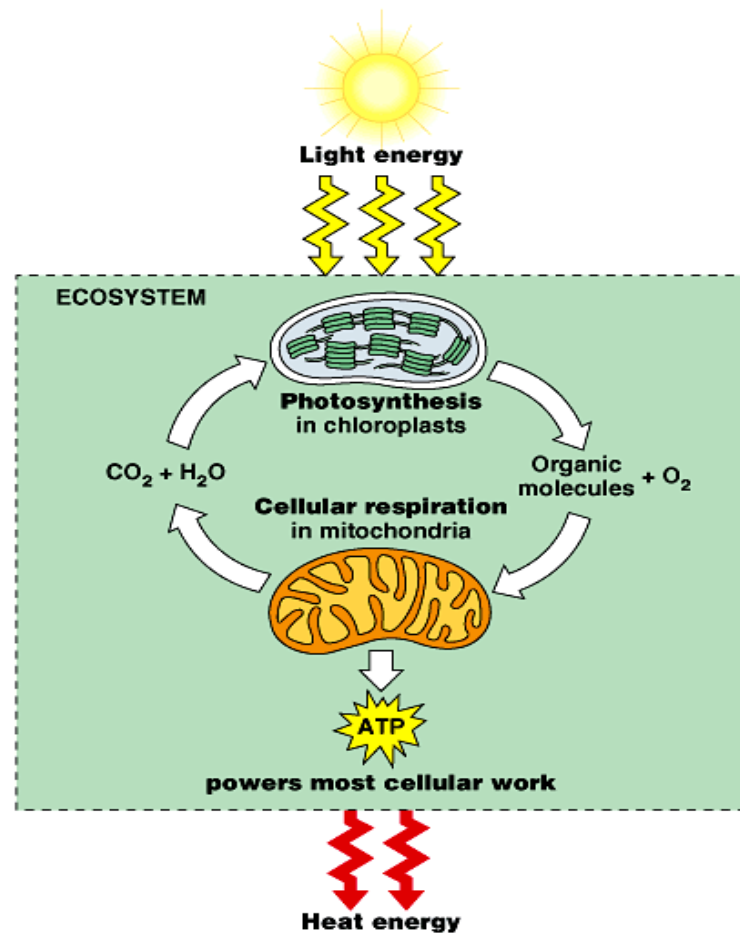


ATP is energy that drives chemical reactions in cells.

Cellular respiration begins with a series of steps called **glycolysis**, which converts glucose into pyruvate. If oxygen is present, pyruvate enters *aerobic respiration*, and a great deal of ATP is produced.

If there is no oxygen present, some cells can undergo **anaerobic** (*without oxygen*) **respiration** to make ATP. Some microorganisms, such as yeast, carry out alcohol fermentation, which produces ATP and alcohol. In humans, however, muscle cells carry out lactic acid fermentation. For example, if your muscles are fatigued and run out of oxygen they will produce lactic acid, which causes muscle cramps. Only a small amount of ATP is produced in *anaerobic respiration*.

Mitochondria- in **both plants and animals**, breaks down food molecules and transforms food into energy (ATP)= **the “powerhouse” of the cell**.



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1. Complete the chart below.

Process	Reactants	Products
Photosynthesis		
Cellular Respiration		36 ATP

2. Cellular respiration involves an energy conversion. Which of the following represents the energy conversion that occurs during cellular respiration?

- a. light energy to glucose
- b. ATP to light energy
- c. ATP to glucose
- d. Glucose to ATP

3. What do both aerobic and anaerobic respiration have in common?

- a. They require oxygen.
- b. They produce lactic acid and ethyl alcohol
- c. They require light energy.
- d. They produce ATP.

4. Cellular respiration occurs in the mitochondria. Which of the following contains an organelle for cellular respiration?

- a. prokaryote
- b. eukaryote
- c. bacterial cell
- d. cell without a nucleus

5. Explain the difference between aerobic and anaerobic respiration.
