Cellular Respiration and Glycolysis

Student Instructions: You and your partner will do a "Pairs Read". **Student 'A'** will read one paragraph as **student 'B'** listens. Afterward, student 'B' will paraphrase and briefly describe the main points, or will ask Student 'A' to repeat information. Roles are then reversed until the reading is complete.

When you are finished, summarize (in your own words) the most important steps and end products of glycolysis in your "flap book".

Pairs Read: Cellular Respiration and Glycolysis

All living things require energy. Just as a radio needs a battery or another source of electricity in order to work, your cells need a source of energy to carry out important tasks. Autotrophs, such as plants, can absorb energy from the sun for use in their cells. Heterotrophs, such as animals, take in foods from which they extract energy. The most efficient way for cells to harvest energy stored in food is through cellular respiration, a biochemical pathway for the production of ATP, or adenosine triphosphate. Cellular respiration occurs in both eukaryotic and prokaryotic cells and has three main stages: glycolysis, the citric acid cycle (Krebs cycle), and electron transport.

Glycolysis literally means "sugar splitting" and that is exactly what happens. During this process, glucose, a six-carbon sugar, is split into two three-carbon sugars. Glycolysis consists of two phases. The first is an energy investment stage during which the cell must actually spend two ATP molecules to begin the process. This investment is repaid when four ATP molecules and two high energy NADH molecules are generated. Also gained, are the two molecules of pyruvate, a three-carbon sugar.

Glycolysis can occur with or without oxygen. In the presence of oxygen, glycolysis is the first stage of aerobic cellular respiration. During the stages of aerobic respiration the two molecules of pyruvate will be broken down to generate more ATP and other energy carriers. Without oxygen, glycolysis proceeds to the process called fermentation.

Examine the glycolysis flow chart on the right.