

**Molecular Biology
Cellular Respiration.**

Cellular respiration is the harvesting of energy from glucose. We would not be able to do any "work" if it were not for this process. The process is divided into three stages. The big picture of respiration looks like this:



Chapter 7 goes into **great detail** on this process. It would be easy to get too bogged down on all this detail. As you read through chapter 7 (Pages 138 – 147) answer the following questions and try not to get swamped by all the detail, just keep the big picture in mind and keep track of what is needed and what is produced at each step.

Glycolysis - Takes place in the _____ of the cell.

1. What chemicals are necessary for the beginning of glycolysis?
2. How many ATP molecules does it take to get started? _____
3. What is the H "carrier" in this stage? How many are made?
4. How many ATP molecules are made? _____

What is the net gain in energy? _____

Where in the cell does glycolysis take place?
All cells whether they have mitochondria or not have glycolysis in the cytosol of the cell. Only those cells that utilize oxygen continue to extract energy from the pyruvate formed from glycolysis.

5. How much ATP is required to split a glucose molecule in half? An initial input of two (2) ATP molecules is required to start glycolysis.
6. What is the net gain in ATP at the end of glycolysis? At the end of glycolysis there are four ATP molecules formed, but two were used in the energy investment stage of glycolysis. So the net gain is two (2) ATP molecules.
7. What is the difference between fermentation and aerobic cellular respiration? "One catabolic process, fermentation, is a partial degradation of sugars that occurs without the use of oxygen. However, the most prominent catabolic pathway is cellular respiration, which is an aerobic process."

Glycolysis occurring within the cytosol and continues to extract energy from the pyruvate.

How much ATP is required to split a glucose molecule in half? Part of the process of glycolysis is an energy investment stage.

At the end of glycolysis there are four ATP molecules formed, but two were used in the energy investment stage of glycolysis.

What is the difference between fermentation and aerobic cellular respiration? Fermentation is a partial degradation of sugars that occurs without the use of oxygen. However, the most prominent catabolic pathway is cellular respiration, which is an aerobic process.

