Glycolysis

by Sophia

WHAT'S COVERED

In this lesson, you will focus on the processes that occur in the glycolysis phase of cellular respiration. Specifically, you will learn about:

1. Cellular Respiration

Glycolysis is the first step in cellular respiration.

Cellular respiration is a process in which ATP, or adenosine triphosphate, is produced for the cell. ATP is an energy storage molecule that cells use.

TERM TO KNOW

Glycolysis

The first stage of cellular respiration which breaks a molecule of glucose into two molecules of pyruvate.

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2. Glycolysis Process

In glycolysis, the main occurrence is that one **glucose** molecule is transformed into two molecules of **pyruvate**. Glycolysis is an anaerobic process, meaning it does not require oxygen to happen. You'll notice later stages of cellular respiration occur within the mitochondria; however, glycolysis occurs in the cytoplasm.

Glucose is a six-carbon sugar. When glucose enters the process of glycolysis, two ATPs will donate their phosphate groups to this glucose molecule. This donation of a phosphate from ATP is called **phosphorylation**.

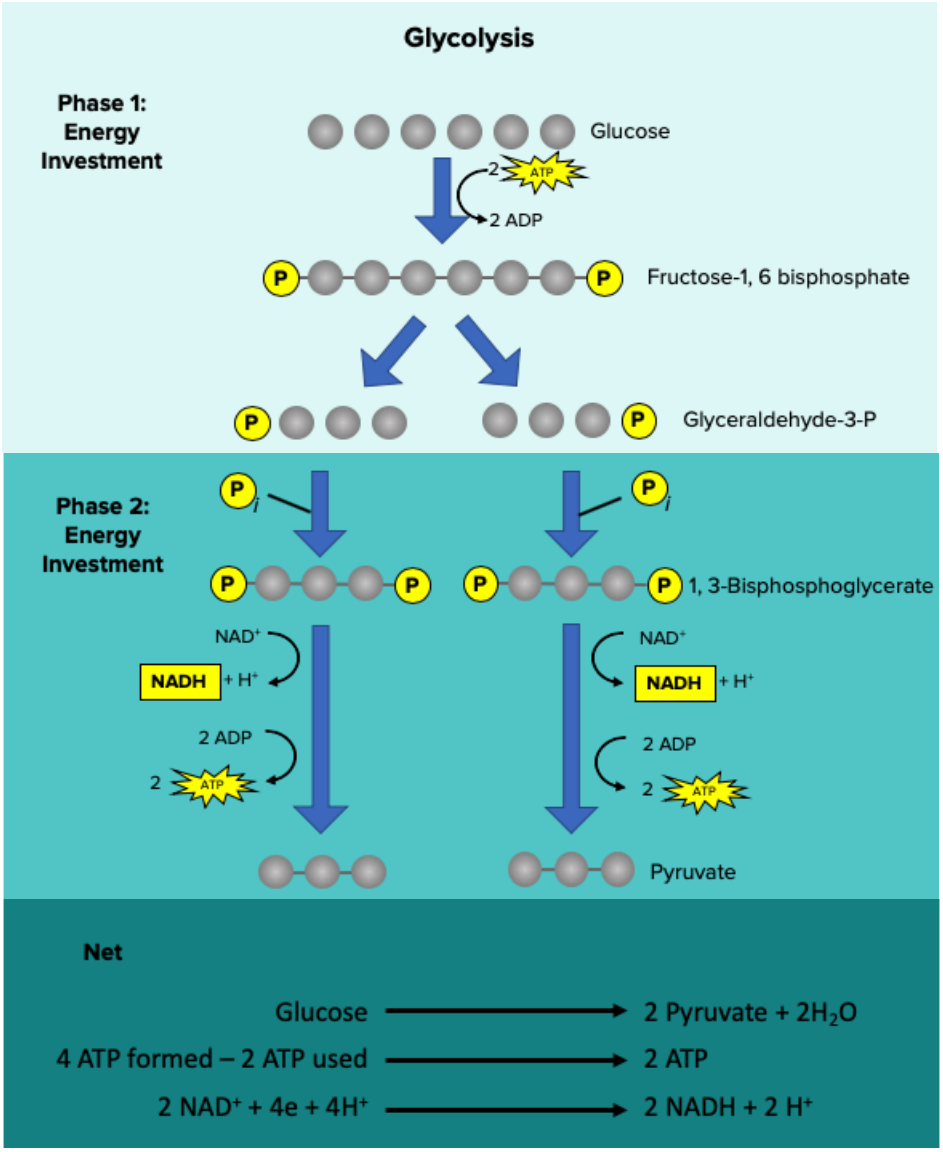
The purpose of this is to transfer energy. ATPs are transferring their energy to the glucose molecule so that glycolysis can be carried out.

ATP stands for adenosine triphosphate; the prefix *tri* means three, so it has three phosphate groups attached to it. When an ATP gets rid of one of its phosphates, it becomes ADP; this stands for adenosine diphosphate, meaning it has two phosphates.

Next, the molecule is going to break down in half so that two three-carbon molecules are remaining with this phosphate group attached. Then the phosphates are going to be donated back to ATP. After it donates its

phosphate, ATP becomes ADP. When it gains its phosphate back, it becomes ATP again.

Then you're left with two three-carbon molecules; each of these is a molecule of pyruvate. Four molecules of ATP are being produced, but since ATP was used for the process to occur, there is only a net gain of two ATP.



BIG IDEA

In glycolysis, glucose is being broken down into pyruvate. Then pyruvate will move into the next phase of cellular respiration to produce more ATP.

TERMS TO KNOW

Glucose

A type of monosaccharide sugar used in glycolysis to produce ATP; is broken down in the first stage of cellular respiration.

Pyruvate

A three-carbon sugar produced when glucose is broken down in the glycolysis phase of cellular respiration.

Phosphorylation

The transfer of a phosphate group from an ATP molecule to another molecule, thus the transfer of

energy to that molecule.

SUMMARY

Today you learned about the first stage of **cellular respiration**, which is the **process of glycolysis**. For glycolysis to happen, two molecules of ATP have to enter the process. Those two molecules of ATP are being used in glycolysis and two molecules of ATP are being produced.

Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND AND NATHAN LAMPSON

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Glycolysis
The first stage of cellular respiration which breaks a molecule of glucose into two molecules of pyruvate.

Phopshorylation
The transfer of a phosphate group from an ATP molecule to another molecule, thus the transfer of energy to that molecule.

Pyruvate
A three-carbon sugar produced when glucose is broken down in the glycolysis phase of cellular respiration.