Cellular Respiration Web Quest

**Directions:**

1) Go to the class website and under “Cellular Respiration Videos” click on “Video 1.”

(<http://www.mhhe.com/biosci/bio_animations/MH01_CellularRespiration_Web/index.html>)

2) Once the animation is open, go to Options > Captions ON, Breakpoints ON before beginning.

3) Answer the following questions, which follow the order of the video.

1. To utilize the energy in cells, food must be broken down into its chemical compounds and then those compounds brought into your cells. This process is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Digestion results in carbs, lipids, and proteins being removed from the food and being transported to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. From there, nutrients such as the carbohydrate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will leave the blood stream through a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wall, and enter a tissue cell.
4. The overall goal of cellular respiration is to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, a storage form of energy for cells.
5. The first stage of cellular respiration is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which literally means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Glycolysis occurs in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the cell.
7. In the energy investment phase, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ATP molecules transfer energy to the glucose molecule to start the process.
8. The energy-harvesting phase begins with the 6-carbon sugar molecule splitting into two \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-carbon sugar molecules.
9. During this phase, the carbon molecules are converted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (pyruvate) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ATP) is formed.
10. Glycolysis is technically a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-step reaction that involves multiple \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. (You do not have to learn all the steps!)
11. By the end of glycolysis, what is produced?
12. A net of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
15. When oxygen is present, the pyruvate molecules and NADH enter the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the next stage of cellular respiration begins.

**Directions:**
1) Go to the class website and under “Cellular Respiration Videos” click on “Video 2”

(<http://www.sumanasinc.com/webcontent/animations/content/cellularrespiration.html>)

2) Once the animation is open, go to Subtitles > English before watching THE BIG PICTURE.

3) Answer the following questions, which follow the order of the video.

Watch: THE BIG PICTURE

1. What are the inputs and outputs of cellular respiration?

|  |  |  |  |
| --- | --- | --- | --- |
| INPUTS: |  🡪 | Outputs: |  |

1. How are cellular respiration and photosynthesis similar?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Watch: GLYCOLYSIS

1. Glycolysis is a series of chemical reactions in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a cell, in which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is split into two molecules.
2. When ATP donates a phosphate group (in this case, to glucose), it becomes \_\_\_\_\_\_\_\_\_\_\_\_\_, because instead of having three phosphates, it now has two (adenosine-**di**-phosphate).
3. What is the difference between NAD+ and NADH?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the outcome of glycolysis?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. At the end of glycolysis, there is a net yield of: 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and then 2 pyruvate molecules that still contain energy to be harnessed in the next step.

**END OF GLYCOLYSIS NOTES FOR THIS VIDEO**

During our next class we will learn about the two remaining steps of cellular respiration.

(They are: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

Cellular Respiration Continued

**Directions:**

1) Go to the class website and under “Cellular Respiration Videos” click on “Video 1”

(<http://www.mhhe.com/biosci/bio_animations/MH01_CellularRespiration_Web/index.html>)

2) Once the animation is open, go to Options > Captions ON, Breakpoints ON before beginning.

3) Click on the 4th light blue marker labeled “4: The Citric Acid Cycle,” and begin playing there.

1. The next stage of cellular respiration involves the movement of pyruvate into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Each pyruvate molecule is converted into a compound called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. When electrons are transferred to NAD, they become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are is produced.
4. The several components of pyruvate ultimately end up as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. By the end of the pathway, after two pyruvate molecules have gone through, a net of \_\_\_\_\_\_\_\_\_ NADH \_\_\_\_\_\_\_\_\_FADH2 \_\_\_\_\_\_\_\_\_\_\_ATP and \_\_\_\_\_\_\_\_\_\_ CO2 are produced.
6. The electron transport chain takes place in the mitochondrial \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. As the electrons are transferred between the membrane proteins, the cell is able to capture \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and use it to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. Proteins in the chain pump \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions across a membrane.
9. When the protons return and go through ATP synthase, \_\_\_\_\_\_\_\_\_\_\_\_\_ is produced.
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ acts as the terminal electron acceptor, which is then reduced to form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
11. All the high energy electron carriers from the previous stages (such as NADH and FADH2) send their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into the chain, which allows a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to be produced.
12. A net of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ATP is produced.
13. Oxygen is brought in as a final electron acceptor, and the byproduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is released.

END OF CELLULAR RESPIRATION NOTES

Make sure to hold onto this sheet, as you are responsible for knowing this information!

STUDY STUDY STUDY!