

Section 9.1- Chemical Pathways

Standards

1g. The role of the mitochondria in making stored chemical-bond energy (ATP) available to cells by completing the breakdown of glucose to carbon dioxide.

At the end of this lecture you should know:

Review Questions

1. In what area of the cell does the process glycolysis take place?

2. What is the chemical formula of glucose?

3. List the reactants and products of Cellular Respiration.

Reactants:

Products:

4. What molecule is broken down in glycolysis?

Fill In Notes

_____ provides living things with the chemical building blocks they need to grow and reproduce.

I. Chemical Energy and Food

A. List 3 types of food molecules that cells use as energy.

B. One gram of sugar (glucose), when burned in the presence of oxygen, releases _____ calories of heat energy.

1. A _____ is the amount of energy needed to raise the temperature of 1 gram of water 1° C.

2. Cells gradually release _____ from _____ and other food compounds.

a. The beginning process of the breakdown of glucose is called _____.

II. Overview of Cellular Respiration

A. List the 3 reactions that make up the process Cellular Respiration.

B. What is the function of Cellular Respiration?

C. Write the equation for Cellular Respiration.

D. What gas is required for Cellular respiration to take place?

E. The overall goal of cellular respiration is to make the energy molecule _____.

III. Glycolysis

A. What is the function of glycolysis?

B. ATP Production

1. How many ATP are used to begin glycolysis? _____

2. How many ATP are produced at the end of glycolysis?

3. How many net ATP are produced at the end of glycolysis? _____

Lecture Notes

C. NADH Production

1. 4 high-energy electrons are passed on to an electron carrier called _____.
 - a. How many NADH molecules are produced after glycolysis? _____
2. Where are the NADH molecules transported to?

D. What is the final product of glycolysis?

5. List the 3 main products and quantities of glycolysis.

IV. Fermentation

A. Fermentation occurs when _____ gas is not present.

1. Define anaerobic.
2. List the 2 types of fermentation.

B. Alcoholic Fermentation

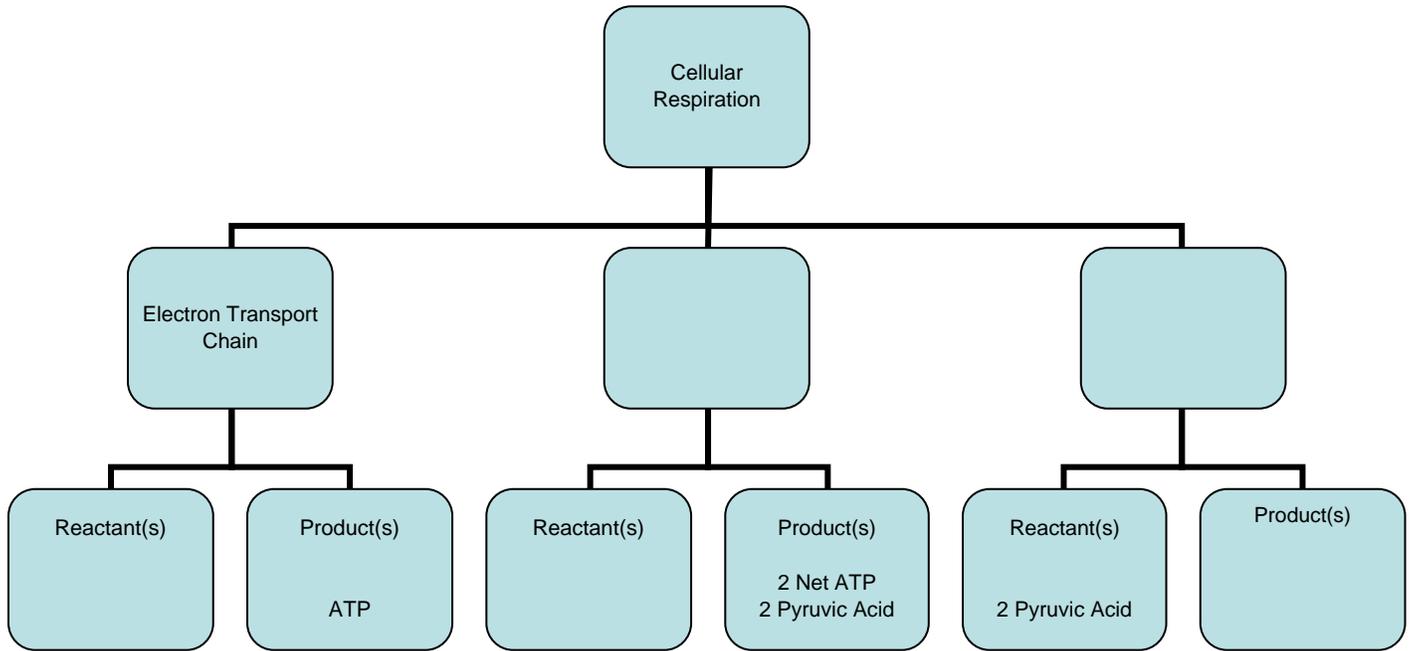
1. What organisms use alcoholic fermentation to produce their energy?
2. What are the main products of alcoholic fermentation?

C. Lactic Acid Fermentation

1. What cells of the body undergo lactic acid fermentation to produce their energy?
2. The build up of lactic acid in muscles causes a _____.
3. What is the main product of lactic acid fermentation?

Summary/Thinking Map

Complete the following tree map of Cellular Respiration.



Key Vocabulary

Define the Key Vocabulary for this section. Be sure to number and underline your Key Vocabulary word.