Name Date Class



***Study Guide***

**CHAPTER 8**

**Section 3: Cellular Respiration**

**In your textbook, read about cellular respiration and glycolysis.**

*Use each of the terms below only once to complete the passage.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **aerobic** | **anaerobic** | **ATP** | **cellular respiration** | **cytoplasm** | **energy** |
| **glucose** | **glycolysis** | **mitochondria** | **NADH** | **oxygen** |  |

Organisms obtain energy in a process called **(1)**  . This process harvests
electrons from carbon compounds, such as **(2)**  , and uses that energy to
make **(3)**  . ATP is used to provide **(4)**  for cells to do work. In **(5)**  , glucose is broken down into pyruvate.
Glycolysis is a(n) **(6)**  process because it does not require oxygen. Glycolysis
takes place in the **(7)**  . Two molecules of ATP and two molecules of
**(8)**  are formed for every glucose molecule that is broken down.
**(9)**  respiration takes place in the **(10)**  .
It is aerobic because the process requires **(11)** .

*Refer to the diagram of glycolysis. Label the steps in the
description to match the diagram.*

**12.** Step . Each three-carbon compound is
converted into a three-carbon pyruvate.

**13.** Step . A six-carbon compound is broken down
into two three-carbon compounds.

**14.** Step . Phosphate groups from two ATP
molecules are transferred to a glucose molecule.

**15.** Step . Two NADH molecules and four ATP
molecules are produced.

*Respond to each question.*

**16. Interpret** How many total ATP molecules
are produced from the glycolysis of one
six-carbon glucose?

**17. Explain** Why is there a net gain of only two ATP
molecules in the glycolysis of one six-carbon glucose?

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***Study Guide,* Section 3: Cellular Respiration** continued

**In your textbook, read about the Krebs cycle, electron
transport, and anaerobic respiration.**

**Cellular Respiration**

*Refer to the diagram of cellular respiration. Respond to
each question and statement.*

Glucose

with oxygen

**18. Recall** What is the net yield of ATP produced by
each of the circled processes in the diagram?

Glycolysis

**2 ATP**

Glycolysis = ATP

Krebs cycle = ATP

with oxygen

Pyruvate

Electron transport chain = ATP

Acetyl-CoA

**19. Find** the total net yield of ATP from one
molecule of glucose.

Krebs cycle

**2 ATP**

**20. Specify** Based on the diagram and your
calculations, which process produces more
energy—the anaerobic pathway or the
aerobic pathway?

**32 ATP**

Electron
transport chain

*For each statement below, write* true *or* false.

  **21.** The anaerobic pathway that follows glycolysis in the absence of oxygen
is fermentation.

  **22.** The hydrogen necessary in the electron transport chain comes from the
splitting of carbon dioxide molecules.

  **23.** Cellular respiration in eukaryotes is slightly more efficient than in prokaryotes.

  **24.** The Krebs cycle is sometimes called the TCA cycle or the citric acid cycle.

  **25.** Fermentation occurs in the mitochondria.

  **26.** Skeletal muscle produces lactic acid when the body cannot supply
enough oxygen.

  **27.** Alcohol fermentation is found in some bacteria and in humans.

  **28.** The two pyruvate molecules formed during glycolysis result in two Krebs cycles.

  **29.** Electron transport is the first step in the breakdown of glucose.

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