**In your textbook, READ about cellular respiration and glycolysis on pages 228-229.** *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 (and on page 229). Label the steps in the description to match the diagram.*

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

**Step 1**

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

**Step 2**

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.

**Step 3**

16. **Interpret** how many total ATP molecules are produced from the glycolysis of one six-carbon glucose. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Step 4**

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

**In your textbook, read about the Krebs cycle, electron transport, and anaerobic respiration on pages  *229-232.*** *For each statement below, write* true *or* false*. If the statement is false, correct the italicized word.*

\_\_\_\_\_\_\_\_\_\_18. The anaerobic pathway that follows glycolysis in the absence of oxygen is *fermentation*.

\_\_\_\_\_\_\_\_\_\_19. The hydrogen necessary in the electron transport chain comes from the splitting of *carbon dioxide* molecules.

\_\_\_\_\_\_\_\_\_\_20. Cellular respiration in eukaryotes is slightly *more* efficient than in prokaryotes.

\_\_\_\_\_\_\_\_\_\_21. The Krebs cycle is sometimes called the TCA or *citric acid* cycle.

\_\_\_\_\_\_\_\_\_\_22. Fermentation occurs in the *mitochondria.*

\_\_\_\_\_\_\_\_\_\_23. Skeletal muscle produces *lactic acid* when the body cannot supply enough oxygen.

\_\_\_\_\_\_\_\_\_\_24. Alcohol fermentation is found in some bacteria and in *humans.*

\_\_\_\_\_\_\_\_\_\_25. The two pyruvate molecules formed during glycolysis result in *two* Krebs cycles.

\_\_\_\_\_\_\_\_\_\_26. Electron transport is the *first* step in the breakdown of glucose.

*For questions 27 – 33 (1/2 pt. each), Create a flow chart of cellular respiration using the following words:*

**Electron transport chain (ETC) 2 ATP Pyruvate Anaerobic Aerobic**

 **Acetyl-CoA Glucose 2 ATP 32 ATP Krebs Cycle**

 **Carbon dioxide (CO2) oxygen (O2) water (H2O)**



Glycolysis

34. **Calculate** the total net yield of ATP from one molecule of glucose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

35. Based on the diagram and your calculations **specify** which process produces more energy – the anaerobic pathway or the aerobic pathway. Give evidence for your answer. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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36. Using the above diagram, **infer** why after you have been exercising for a while, why do you start breathing hard? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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37. **Express** the process of cellular respiration as a chemical equation.