

# Cellular Respiration

## Worksheet

Name **KEY**  
Date \_\_\_\_\_

1. What are the 3 phases of the cellular respiration process?  
**Glycolysis, Krebs Cycle, Electron Transport**
2. Where in the cell does the glycolysis part of cellular respiration occur?  
**in the cytoplasm**
3. Where in the cell does the Krebs (Citric Acid) cycle part of cellular respiration occur?  
**in the mitochondria**
4. Where in the cell does the electron transport part of cellular respiration occur?  
**in the mitochondria**
5. How many ATP (net) are made in the glycolysis part of cellular respiration?  
**2 (net)**
6. How many ATP are made in the Krebs cycle part of cellular respiration?  
**2**
7. How many ATP are made in the electron transport part of cellular respiration?  
**32 – 34**
8. In which phase of cellular respiration is carbon dioxide made?  
**Krebs Cycle**
9. In which phase of cellular respiration is water made?  
**Electron Transport**
10. In which phase of cellular respiration is oxygen a substrate?  
**Electron Transport**
11. In which phase of cellular respiration is glucose a substrate?  
**Glycolysis**
12. On average, how many ATP can be made from each NADH during the electron transport process?  
**3**
13. On average, how many ATP can be made from each FADH<sub>2</sub> during the electron transport process?  
**2**
14. What would happen to the cellular respiration process if the enzyme for one step of the process were missing or defective?  
**The entire process beyond that point could not happen.**
15. What happens to the high-energy electrons (and hydrogen) held by NADH if there is no O<sub>2</sub> present? **If no oxygen is present, the pyruvic acid must take the electrons (and their hydrogens) back.**
16. Explain why this happens.  
**This happens because there are only a small number of NAD<sup>+</sup> molecules in the cell. They must be reused to keep glycolysis going with additional glucose molecules. This means they need to "unload" the electrons from NADH by giving them to some other molecule. Since the pyruvic acid cannot continue on to the Krebs cycle when there is no oxygen present, it receives the electrons. This allows the glycolysis portion of cellular respiration to continue even when O<sub>2</sub> is not present. This process of making ATP in the absence of O<sub>2</sub> is called fermentation**
17. What is the overall reaction for fermentation in yeast?  
**Glucose → 2 Ethyl alcohol + 2 CO<sub>2</sub> + 2 ATP + Heat**
18. What is the overall reaction for lactic acid fermentation?  
**Glucose → 2 Lactic Acid + 2 ATP + Heat**
19. Only a small part of the energy released from the glucose molecule during glycolysis is stored in ATP. How is the rest of the energy released? (HINT: It is a product in the overall reaction for cellular respiration.)  
**It is released as heat.**