Bio I
Study Guide: Cellular Respiration

1. Explain the difference between an autotroph and a heterotroph. How do these terms relate to the processes of photosynthesis and cellular respiration.
2. Briefly explain cellular respiration.
3. Fill in the table with the appropriate information pertaining to Glycolysis.

Where does the reaction take place?	
What reactants are required?	
Brief summary of process	
What are the products?	
Is this process anaerobic or aerobic?	

4. Fill in the diagram below with the process of Glycolysis. Be sure to include where energy is gained and lost using ATP, ADP, NADH, and NAD^+.

5. Explain what is happening in the diagram above. We discussed five steps in class.
6. Pyruvate is a product of Glycolysis. Depending on the type of organism, pyruvate has two possible "fates". Explain this statement and how it relates to aerobic respiration and fermentation.
7. What is the difference between aerobic respiration and anaerobic respiration?
8. Fill in the table with the appropriate information:

Reaction	Organisms	Equation	Explanation
Lactic acid fermentation			
Alcohol fermentation			

9. Diagram a mitochondria. Include the following components: outer membrane, matrix, cristae, and inner membrane.
10. Why is the inner membrane of mitochondria highly folded?
11. Fill in the table with the appropriate information for the Pre-Kreb reaction.

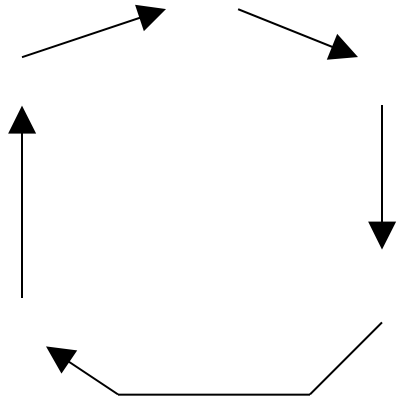
Where does the reaction take place?	
What reactants are required?	
Brief summary of process	
What are the products?	
Is this process anaerobic or aerobic?	

12. Fill in the diagram below with the process of Pre-Kreb reaction. Be sure to include where energy is gained and lost using ATP, ADP, NADH, and NAD^+.

13. Explain each step in the diagram above. Five were discussed in class.
14. Fill in the table with the appropriate information for the Kreb cycle.

Where does the reaction take place?	
What reactants are required?	
Brief summary of process	
What are the products?	
Is this process anaerobic or aerobic?	

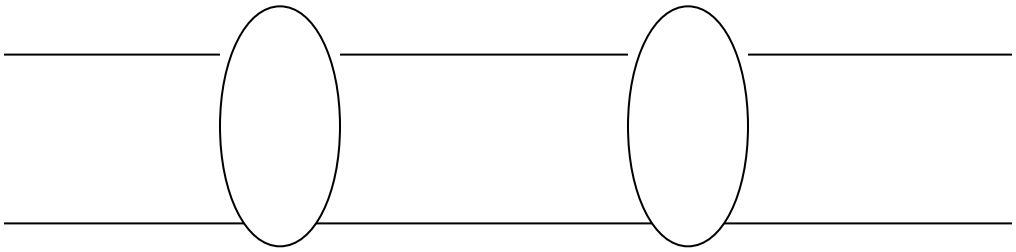
15. Fill in the diagram below with the process of Kreb cycle. Be sure to include where energy is gained and lost using ATP, ADP, NADH, and NAD^+.



16. Explain the steps of the Kreb cycle. Six steps were discussed in class.
17. Fill in the table with the appropriate information for the Electron transport chain

Where does the reaction take place?	
What reactants are required?	
Brief summary of process	
What are the products?	
Is this process anaerobic or aerobic?	

18. Fill in the diagram below with the process of Electron transport chain. Be sure to include where energy is gained and lost using ATP, ADP, NADH, and NAD^+.



19. Explain the steps of the Electron transport chain. Four steps were discussed in class.
20. Why is oxygen such an important component of cell respiration?
21. How many ATP are produced per glucose molecule in cellular respiration?
22. What is the summative formula for cellular respiration?
23. Fill in the chart with the appropriate information:

Components	Reaction found	Purpose/Explanation
$C_6H_{12}O_6$		
O_2		
CO_2		
H_2O		
Energy		

24. How does the summative formula for cellular respiration compare to the formula for photosynthesis?
25. What is the difference between ATP, NADPH, NADH, and $FADH_2$?
26. Which reaction in cellular respiration produces the most ATP?