

Cellular Respiration Worksheet

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Part 1: Building a Foundation
What is the primary purpose of cellular respiration?
Hint: Think about the main energy currency of the cell.
○ To produce glucose○ To generate ATP
○ To store oxygen○ To create proteins
Which of the following are stages of cellular respiration? (Select all that apply)
Hint: Consider the processes involved in breaking down glucose.
☐ Glycolysis ☐ Photosynthesis
☐ Krebs Cycle☐ Electron Transport Chain
Describe the role of oxygen in cellular respiration.
Hint: Think about its function in the final stages of energy production.

List the main products of the Krebs Cycle.



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Hint: Consider the molecules produced that are used in the Electron Transport Chain.
1. What is the first product of the Krebs Cycle?
2. What is released as a waste product?
3. What energy carriers are produced?
Where does glycolysis occur within the cell?
Hint: Consider the location of the cytoplasm and mitochondria.
_ mitochondrial matrix
Cytoplasm
Inner mitochondrial membraneNucleus
Nacious
Part 2: Understanding and Interpretation
Why is the Electron Transport Chain important in cellular respiration?
Hint: Think about the amount of ATP produced.
O It breaks down glucose
It generates a large amount of ATP
It produces carbon dioxide
O It stores energy as fat
Which molecules are primarily responsible for carrying electrons to the Electron Transport Chain?
(Select all that apply)
Hint: Consider the molecules produced in earlier stages of respiration.
☐ ATP
NADH
FADH2
Oxygen

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Explain how the absence of oxygen affects cellular respiration.	
Hint: Think about the difference between aerobic and anaerobic processes.	
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Part 3: Application and Analysis	
In which scenario would a cell most likely undergo fermentation?	
Hint: Consider the availability of oxygen.	
When oxygen is abundant	
○ When glucose is scarce ○ When oxygen is absent	
○ When ATP levels are high	
During intense exercise, muscle cells may switch to lactic acid fermentation. What are the consequences of this switch? (Select all that apply)	
Hint: Think about the effects on energy production and byproducts.	
☐ Increased ATP production	
Accumulation of lactic acid	
Decreased oxygen consumption Production of ethanol	

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Describe a real-world situation where understanding cellular respiration could be beneficial.

Hint: Consider fields like medicine, sports, or environmental science.

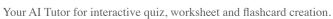


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The Krebs Cycle produces ATP used by the Electron Transport Chain The Krebs Cycle generates electron carriers for the Electron Transport Chain The Electron Transport Chain initiates the Krebs Cycle The Krebs Cycle and Electron Transport Chain are independent processes Analyze the following statement: "Anaerobic respiration is less efficient than aerobic respiration." Which reasons support this statement? (Select all that apply) Hint: Consider the energy yield of both processes. Anaerobic respiration produces less ATP Anaerobic respiration does not use the Electron Transport Chain Anaerobic respiration requires more glucose Anaerobic respiration produces more NADH Compare and contrast the processes of lactic acid fermentation and alcoholic fermentation.	
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Hint: Think about the end products and the organisms that perform these processes.	npare and contrast the processes of lactic acid fermentation and alcoholic fermentation.
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Part 4: Evaluation and Creation





be the most likely outcome?
Hint: Consider the impact on ATP production.
○ Increased ATP production
O Decreased oxygen consumption
Reduced ATP production
○ Enhanced glucose breakdown
Evaluate the following scenarios and identify which would likely lead to increased cellular respiration rates. (Select all that apply)
Hint: Consider factors that stimulate or inhibit respiration.
☐ High levels of ADP
Low levels of oxygen
Abundant glucose supply
High levels of ATP
Propose a hypothetical experiment to test the effects of a new drug on cellular respiration efficiency include your experimental design and expected outcomes.
Hint: Consider the variables you would measure and the expected impact of the drug.

If a mutation occurred in the mitochondrial DNA affecting the Electron Transport Chain, what would