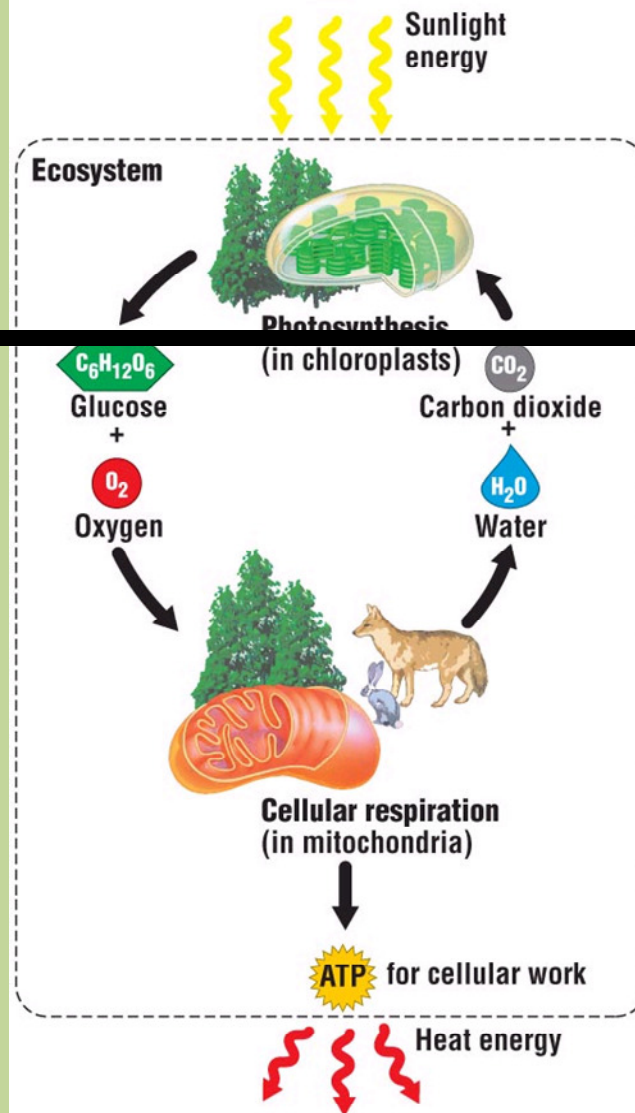
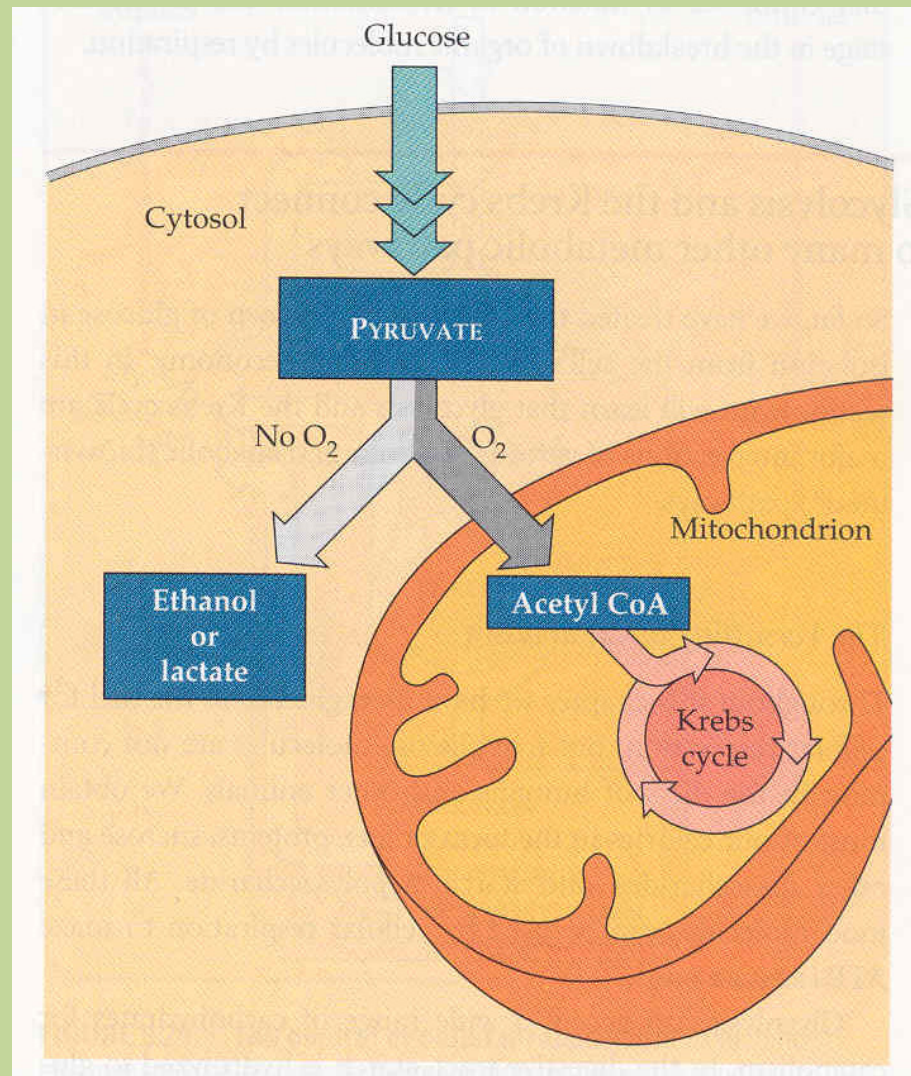


Anaerobic Cellular Respiration

The Details



Process of Cellular Respiration



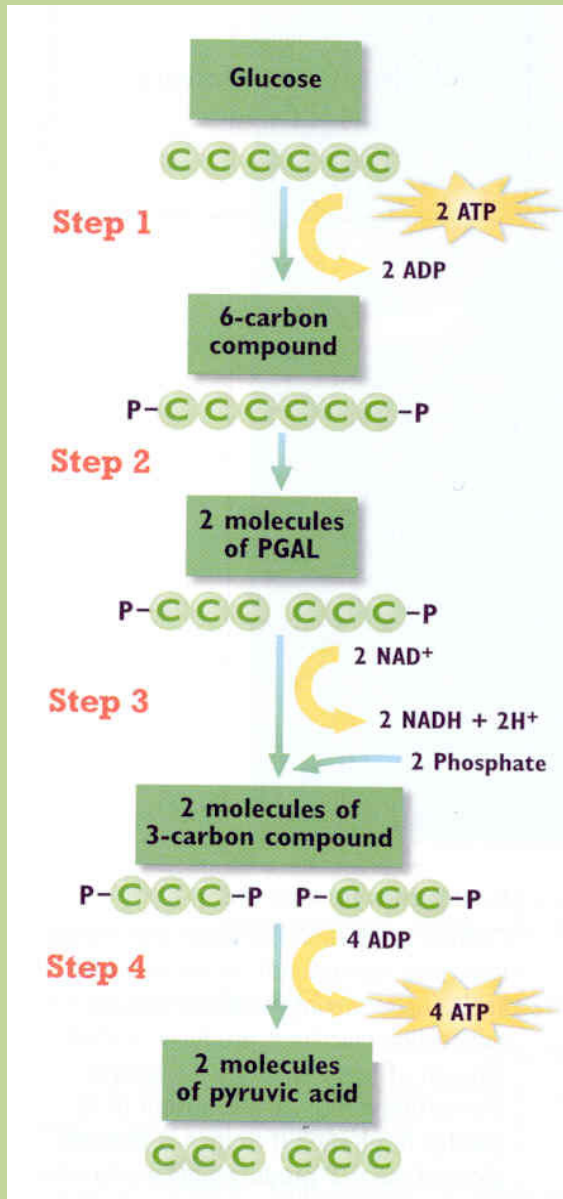
2 different types of “Respiration” make up all of Cellular Respiration

- **Aerobic** = using oxygen.
- Occurs in the Mitochondria
- Produces 38 ATP molecules from 1 sugar.
- Some single-celled and ALL multicelled organisms perform.

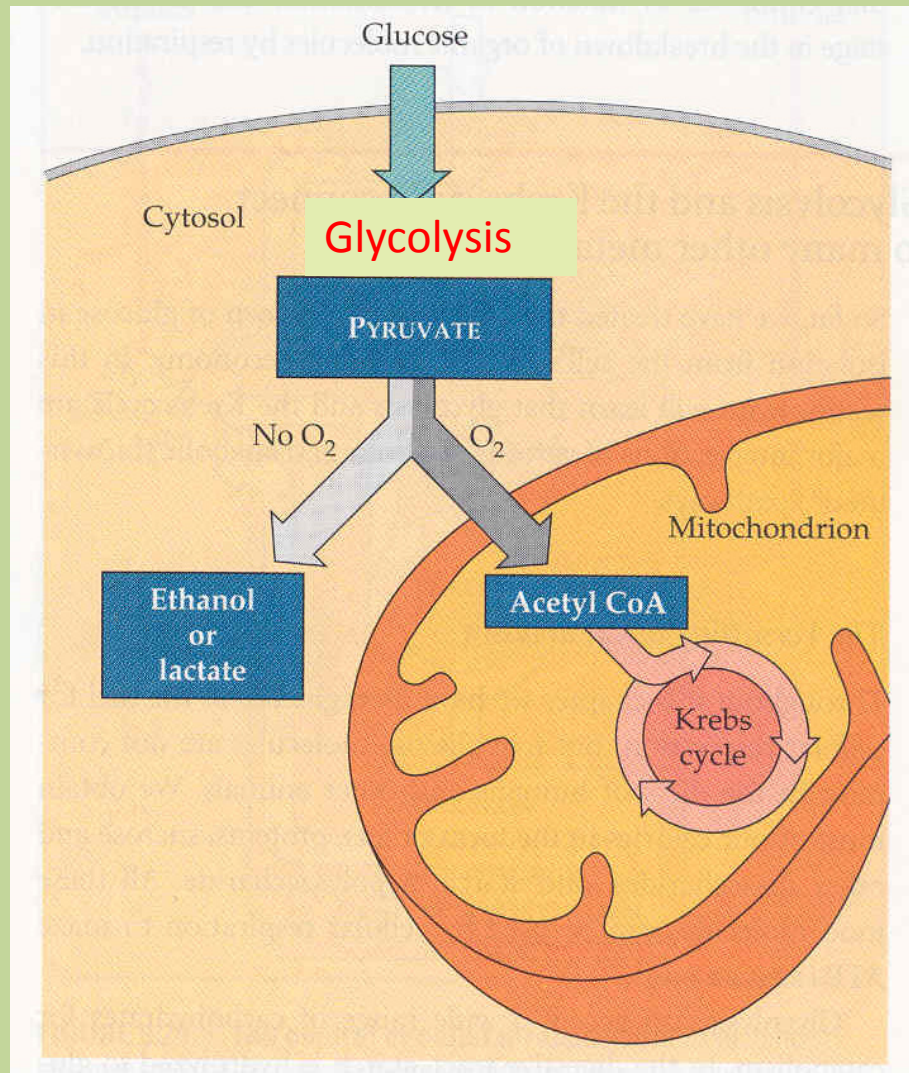
- **Anaerobic** = **NOT** using oxygen.
- Occurs in the Cytosol.
- Produces 2 ATP molecules from 1 sugar.
- Only some single-celled organisms only perform.

1st step: GLYCOLYSIS

(in both aerobic & anaerobic respiration)



- Glucose enters cells from blood through Facilitated Diffusion
- Glycolysis = breaking sugar into 2 halves.
 - Called Pyruvic Acid or Pyruvate
 - occurs in cytosol of cell
 - anaerobic (will occur if O₂ is present or not!)
- Produces 2 ATP
- All organisms do glycolysis



2nd Step of Anaerobic Respiration: Fermentation

- Fermentation occurs when there is NO oxygen!!!

Two types:

- Lactic Acid Fermentation

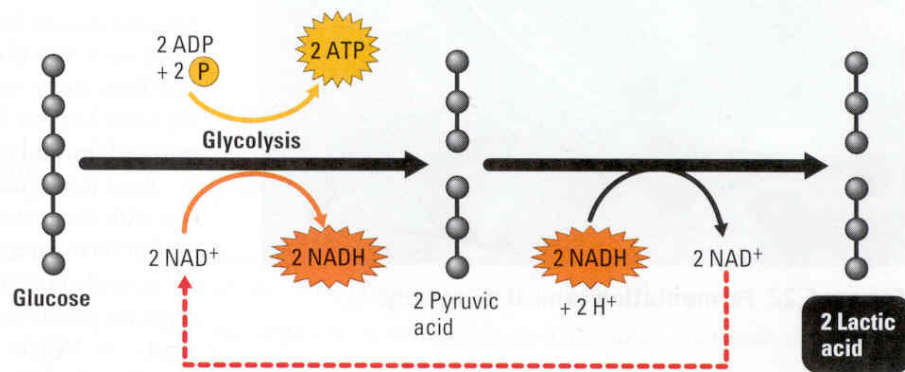
- 2 Pyruvic Acid molecules are changed into two **Lactic Acid** Molecules in human muscle cells and some bacteria.

- Alcohol Fermentation = 2 Pyruvic Acid molecules are changed into 2 **Ethyl Alcohol** molecules and CO₂ is released

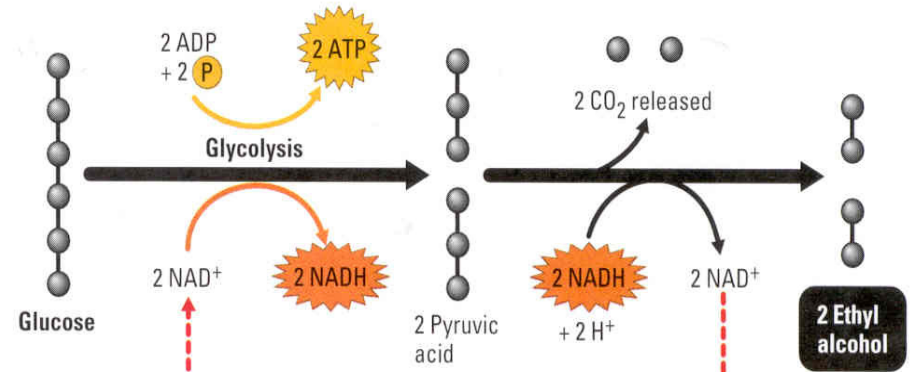
- Some bacteria and yeast perform.
- Used in baking and brewing.

“Feel the burn!!!?”

It makes your bread light and fluffy
and your root beer fizzy!!!

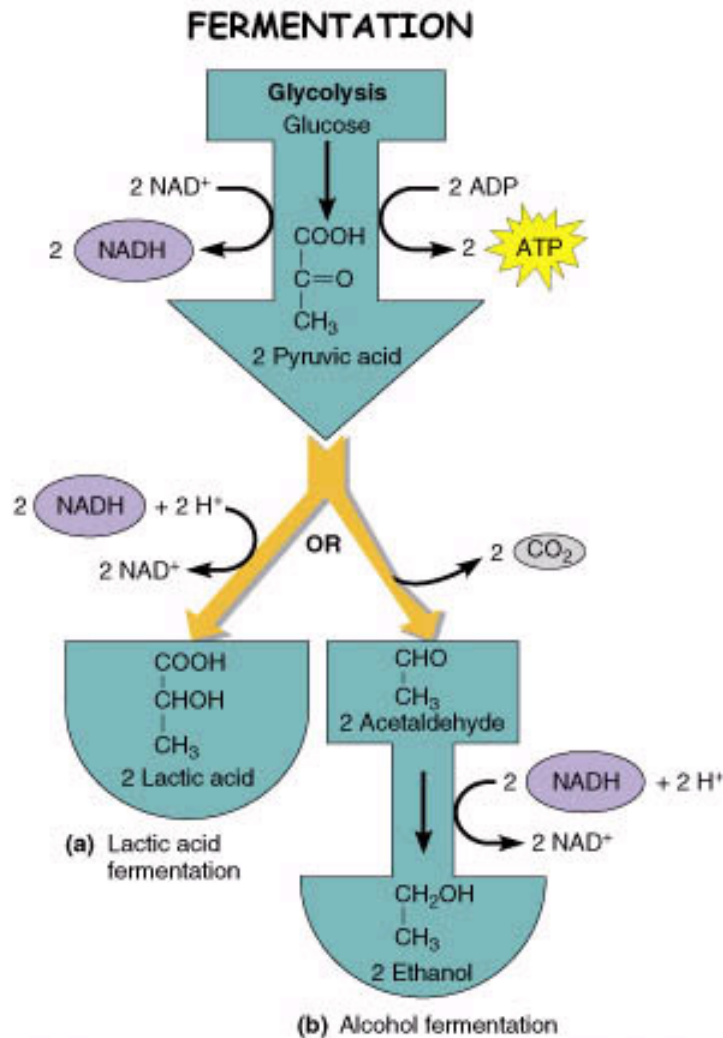


(a) Lactic acid fermentation



(b) Alcoholic fermentation

In Both Types of Fermentation



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- Only **two ATP** molecules are made out of each glucose molecule when Pyruvate is made
- **Very inefficient**

Essential Questions

1. Describe the process of glycolysis and how much ATP is produced.

Cellular Respiration Summary

so far

- Two types of Cellular Respiration
 - Aerobic (with O_2 present)
 - Anaerobic (no O_2 present)
- Two types of Anaerobic Respiration
 - Lactic Acid Fermentation
 - Creates 2 ATP molecules from one Glucose
 - Creates Lactic Acid
 - Occurs in Animals and some bacteria
 - Alcohol Fermentation
 - Creates 2 ATP molecules from one Glucose
 - Creates ethyl alcohol and CO_2
 - Occurs in some bacteria and yeast

Respiration and your muscles

- You are going to exercise a group of muscles in your body. In order for your muscle cells (or any cell) to function properly they must have energy, ATP, which is provided by a series of complex chemical reactions. You should already have some knowledge of these energy releasing pathways.
- How will your muscles respond to exercise over two trials?

Time Holding Chairs

Trial Number	Person 1	Person 2
1		
2		

Competition!!!

- Everybody grab your chair.
- Everybody get ONE partner
- Partner number one hold chair by two legs. Keep back of chair closest to you. Keep those arms as straight as possible!!!!!!
- Wait for teacher to say START
- Hold as long as possible, partner 2 record time
- Trial two, repeat with PARTNER NUMBER ONE!!!!
- After Number one has gone twice, partner number two will begin their trials.

- WHAT IS ACTUALLY HAPPENING IN YOUR CELLS!?!?!?

Analysis questions after next set of notes

Analysis Questions

1. During this activity were you using aerobic or anaerobic respiration? How do you know?
2. What caused the decrease in your exercise rate?
3. Why does your heart rate and breathing rate increase during exercise? Be scientific (think in terms of energy and what is needed).
4. If you performed this exercise everyday for 4 weeks, how would you expect your results to change? Explain why.
5. What caused the burning sensation in the muscles? Be scientific. What is the name of the process?