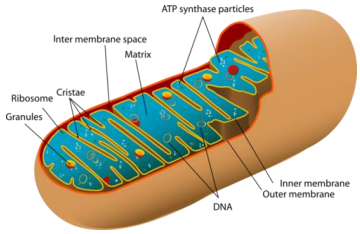
CELLULAR RESPIRATION

https://www.youtube.com/watch?v=Fcu_8URp4Ac
https://www.youtube.com/watch?v=oojbG_cfGuQ

Respiration **occurs in the mitochondria**



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- The process that uses oxygen to break down sugar into chemical energy, with the leftovers of carbon dioxide and water.

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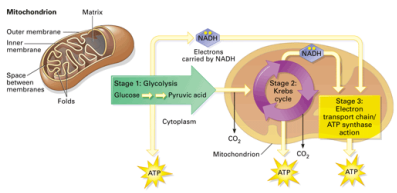
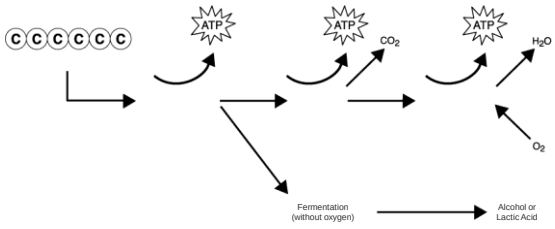
$$6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2 + 6H_2O + 36\ ATP$$

Respiration Three Stages

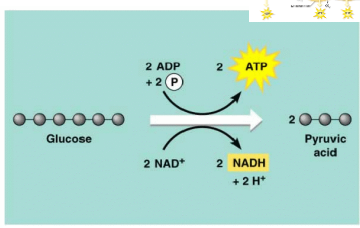
1. Glycolysis
2. Kreb's Cycle
3. Electron Transport Chain





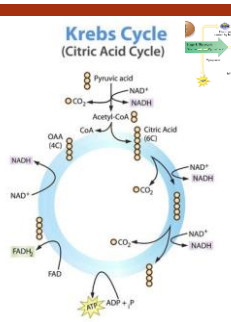
Stage 1 - Glycolysis

- 1 glucose = 2 pyruvic acid
- Makes 2 ATP and 2 NADH



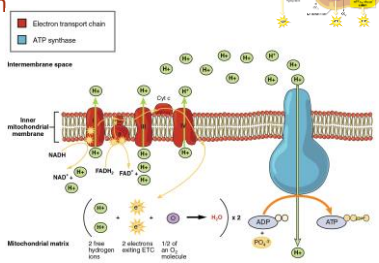
Stage 2 – Kreb's Cycle

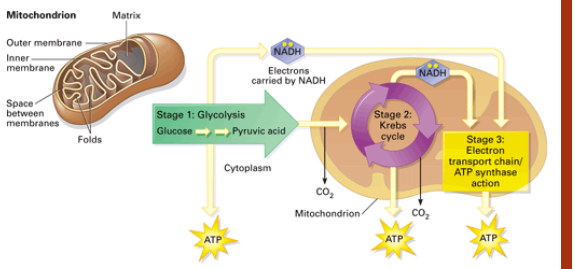
- Proceeds if only is O_2 is present
- Pyruvic acid = Acetyl-CoA
  - Produces 1 CO_2
- Acetyl-CoA = Citric Acid
  - Produces 2 CO_2, 3 NADH, 1 ATP, 1 $FADH_2$
- Whole processes uses a lot of water

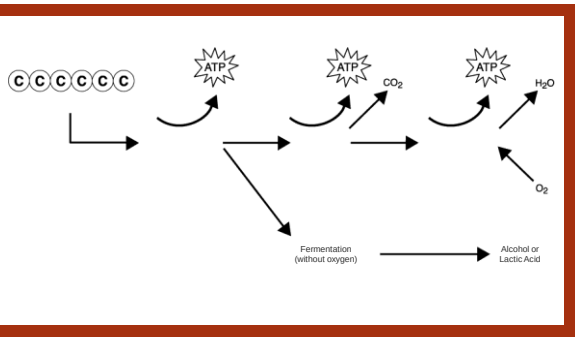


Stage 3 – Electron Transport Phosphorylation

- Main way to produce H
- Makes 32 ATPs





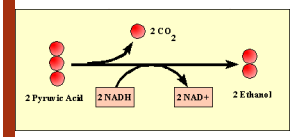


Anaerobic Respiration

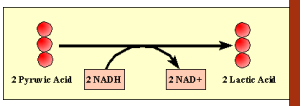
- In the absence of O_2, the cell can still generate NAD and ADP to use in glycolysis
- Produces 2 ATP total
- Two types:
  - Alcohol Fermentation (yeast and bacteria)
  - Lactic Acid Fermentation (people and other mammals)

Anaerobic Respiration

Alcohol Fermentation



Lactic Acid Fermentation



Both are results are toxic to the organism