Warm Up (10/17-10/18)

****Take out your homework to be stamped****

1. Take out your 9.1 and 9.2 notes
2. Take out your laptop
3. Log in to Google Classroom and wait for me to post the quick quiz

Agenda

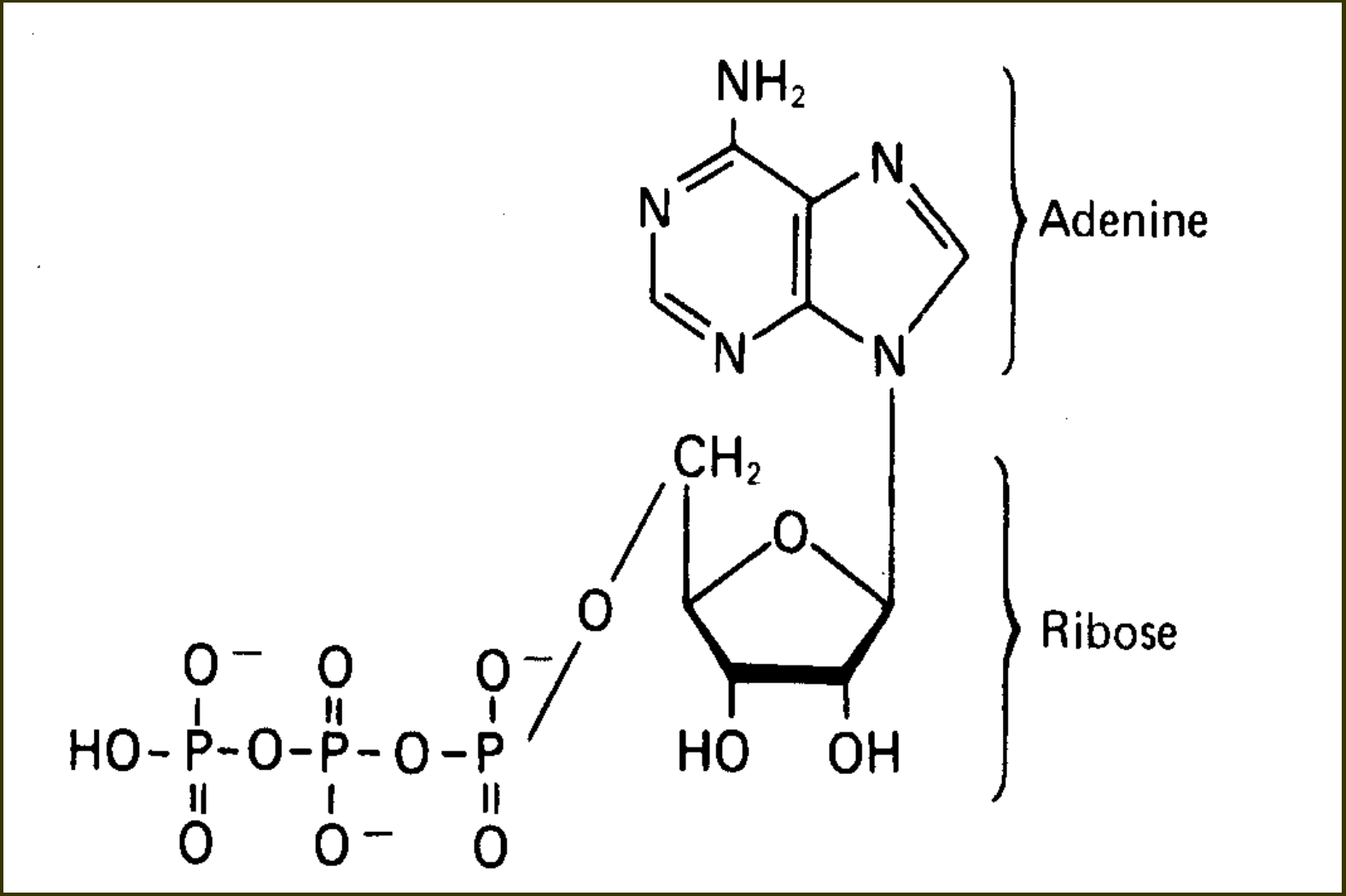
- Warm up- Quick quiz
- Grade HW
- 9.3 Notes: Cellular Respiration
- Energy diagram coloring and questions

- **Homework: 9.3 Section Assessment (pg. 237 #1-5) Due Friday**
  - ****Ch 8/9 Exam on Monday/Tuesday****

9.3 Cellular Respiration

How Cells Harvest Chemical Energy

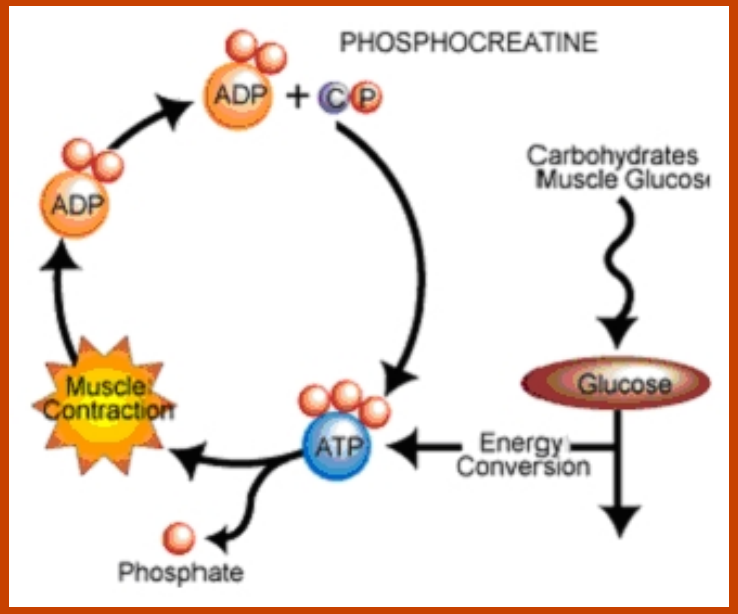
Review



What is Cellular Respiration?

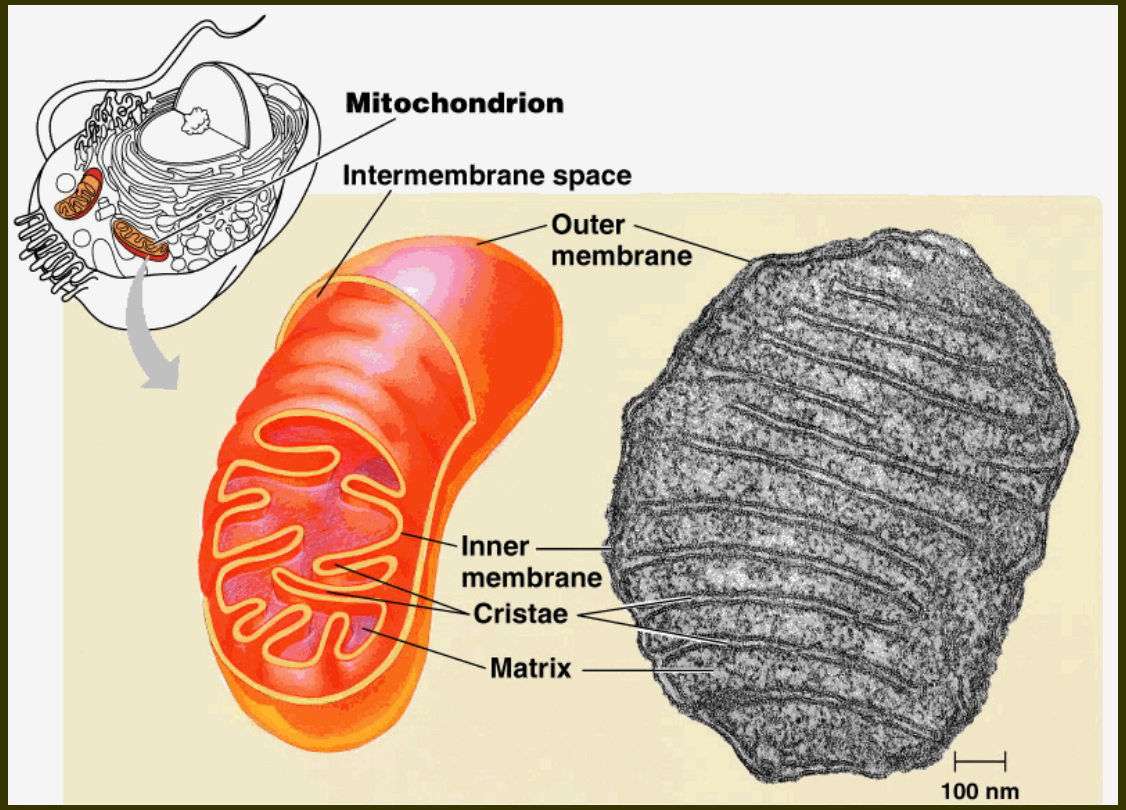
- The process of converting food energy into ATP energy

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



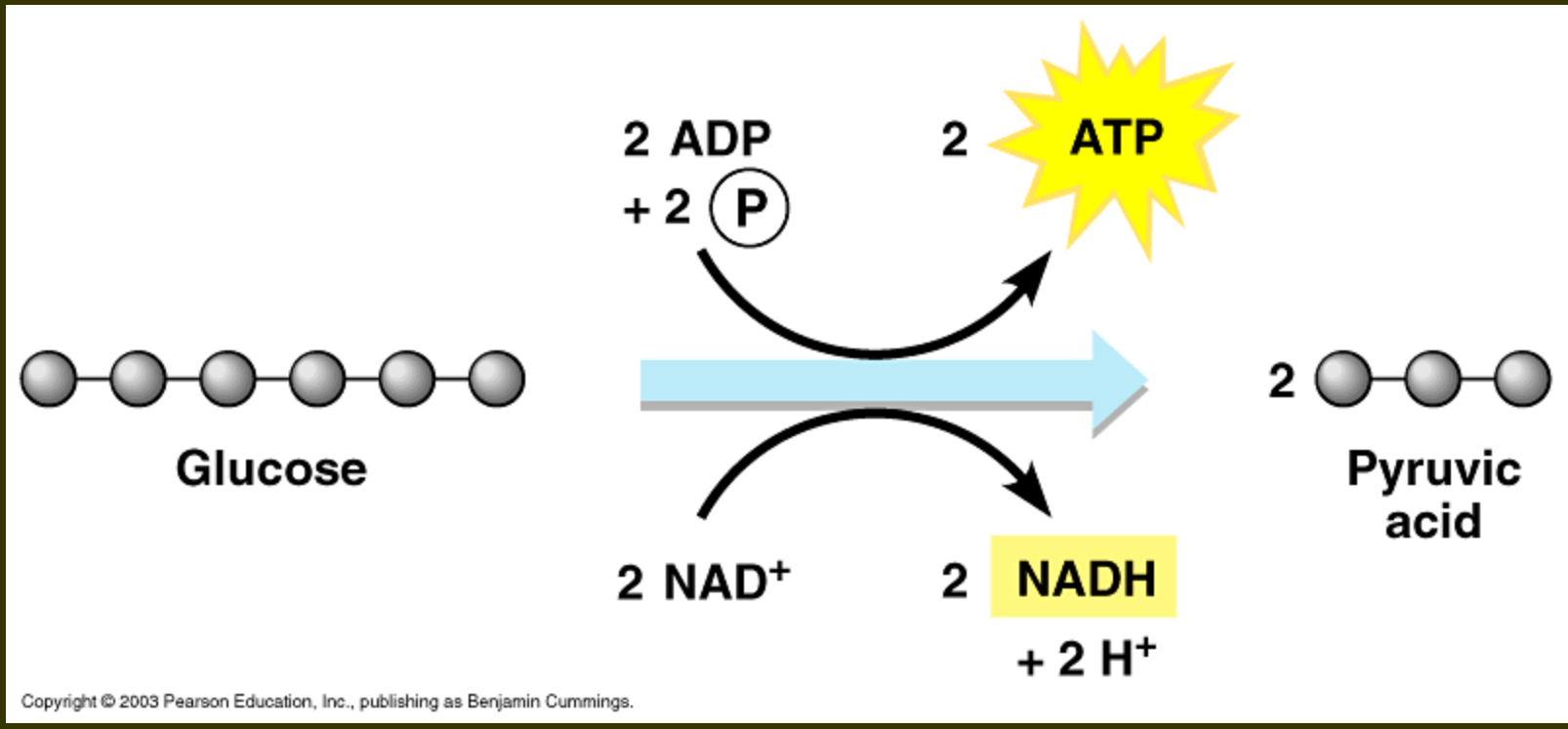
Steps of Cellular Respiration

- Glycolysis:
  - Cytoplasm
- The Krebs Cycle:
  - Matrix
- Electron Transport Chain
  - Cristae

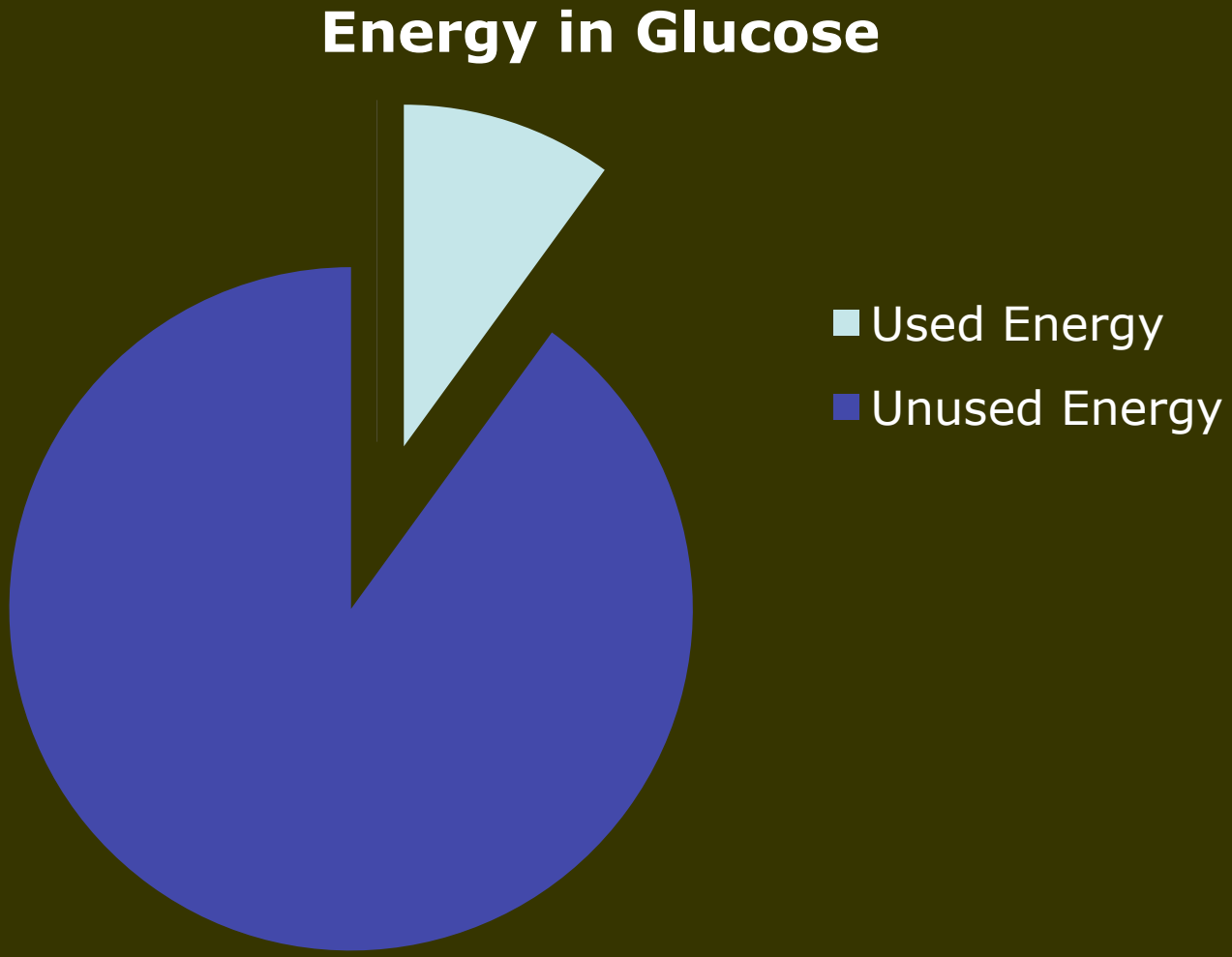


Glycolysis Summary

- Series of reactions that break down glucose (6C) into two molecules of Pyruvate (3C)
  - Takes place in the Cytoplasm
  - Anaerobic (Doesn't Use Oxygen)
  - Requires input of 2 ATP
  - Also produces 2 NADH and 4 ATP.
    - ATP net total = 2 ATP

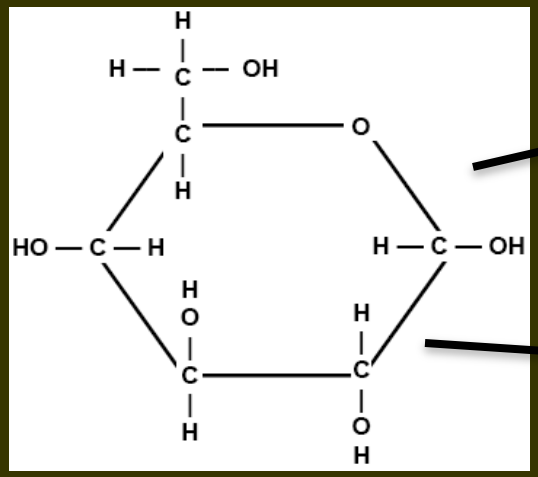


After finishing glycolysis the cell has only taken out 10% of one glucose molecule!

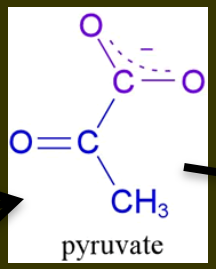


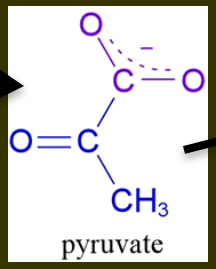
Therefore, the process must continue!!!

Aerobic Respiration

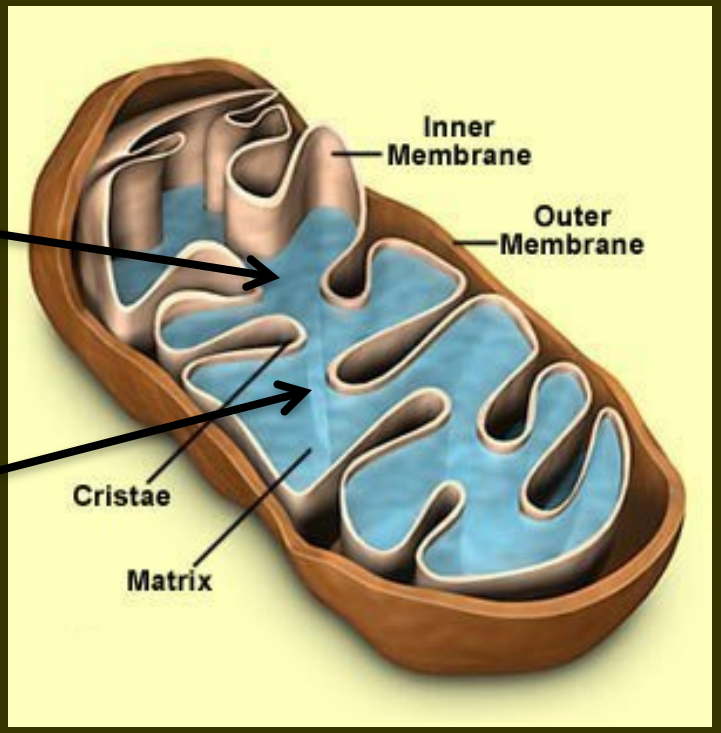


(1 Glucose)





(2 Pyruvates)



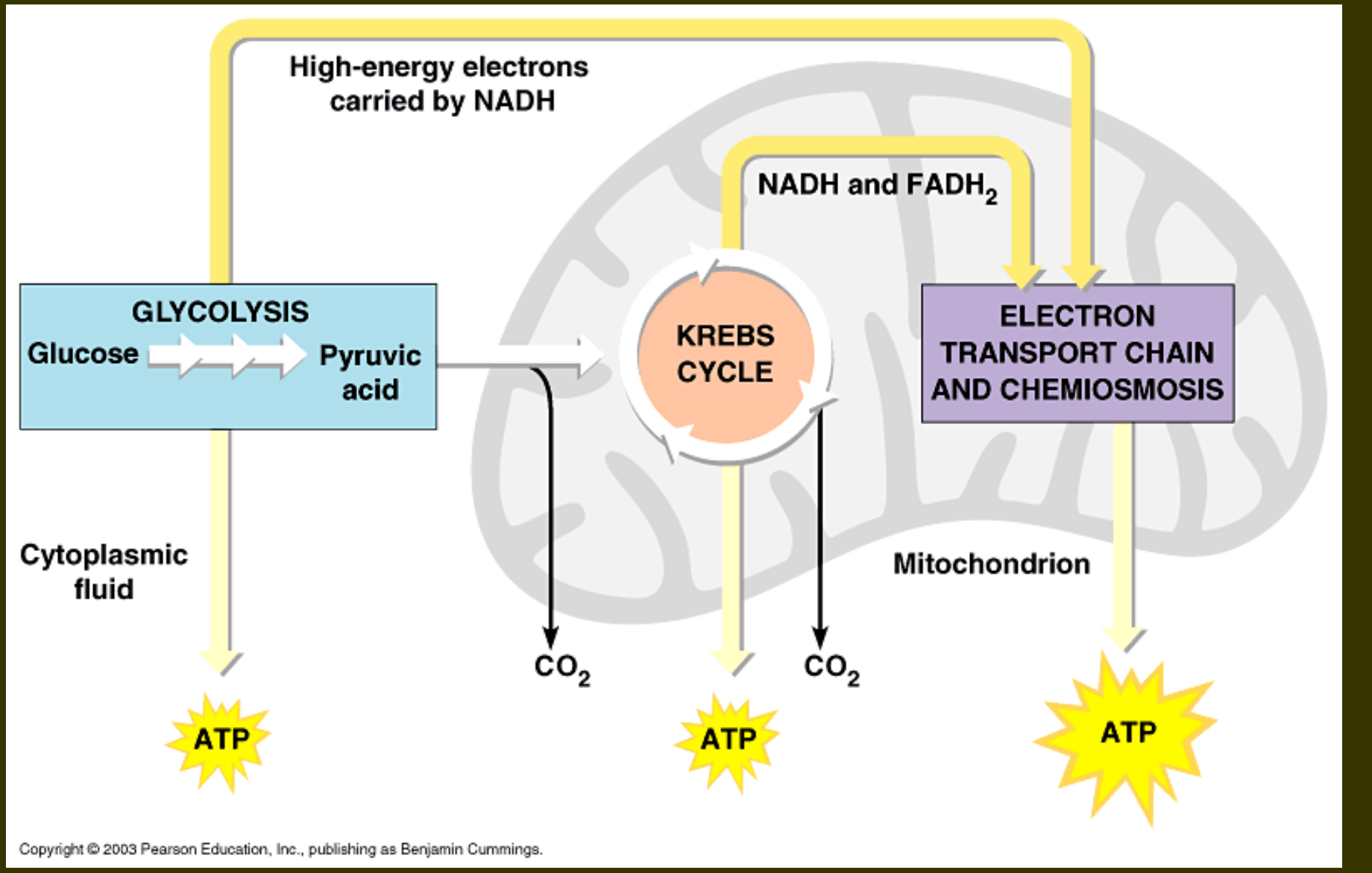
The products of glycolysis move into the mitochondria where they are used for aerobic respiration.

Krebs Cycle

AKA Citric Acid Cycle

- Series of reactions that makes some electron carriers and ATP.
  - Requires Oxygen (Aerobic)
  - Takes place in matrix of mitochondria
  - Give off CO_2 and produces one ATP per cycle
  - Turns **twice** per glucose molecule=
    - Produces two ATP total
    - 6 NADH
    - 2 $FADH_2$

NADH and $FADH_2$ are just electron carriers. They carry electrons that store energy for making ATP



Electron Transport Chain

- Electrons get passed along chain of proteins. Energy from electrons causes pumping of Hydrogen ions (H+) which flow down "ATP syntase" to make ATP
  - Located in the **inner membrane** of the **mitochondria**.
  - Process produces **34 ATP or 90%** of the ATP in the body.

***38 TOTAL** ATP AFTER CELLULAR RESPIRATION*

https://youtu.be/3y1dO4nNaKY

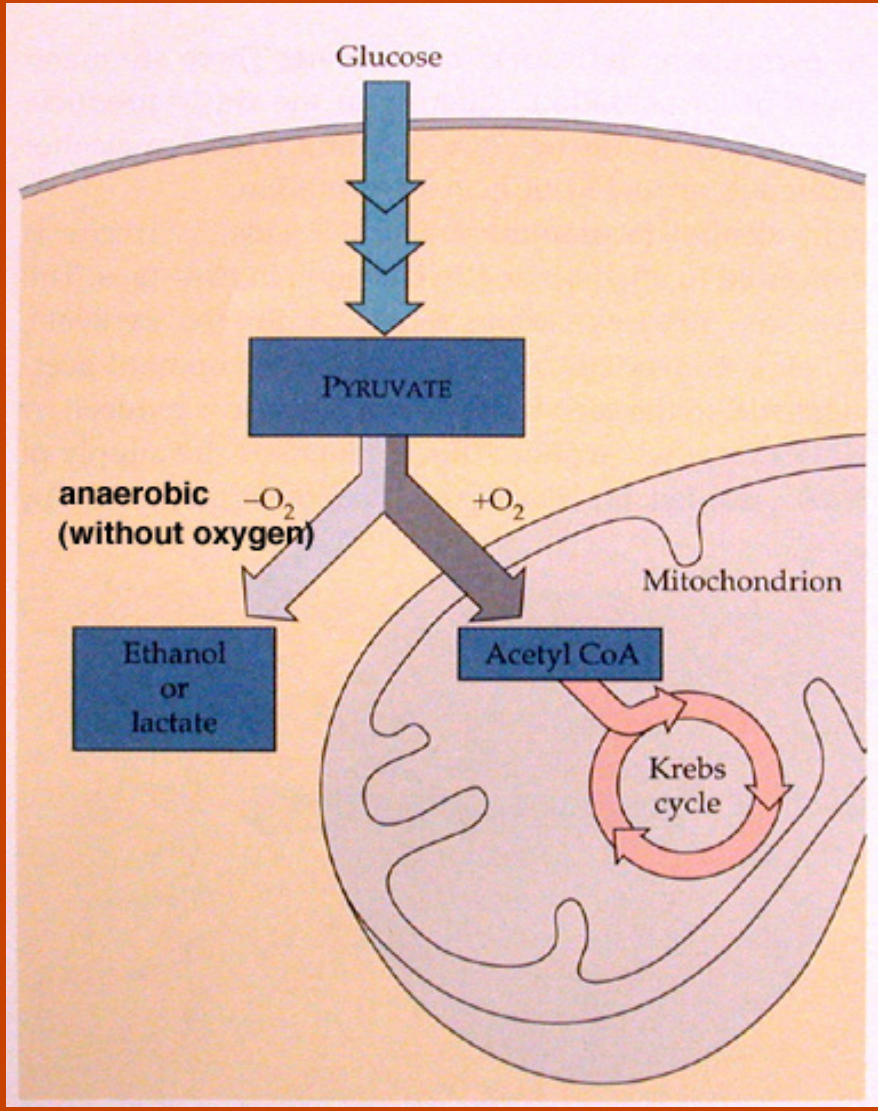
Anaerobic Respiration: Fermentation

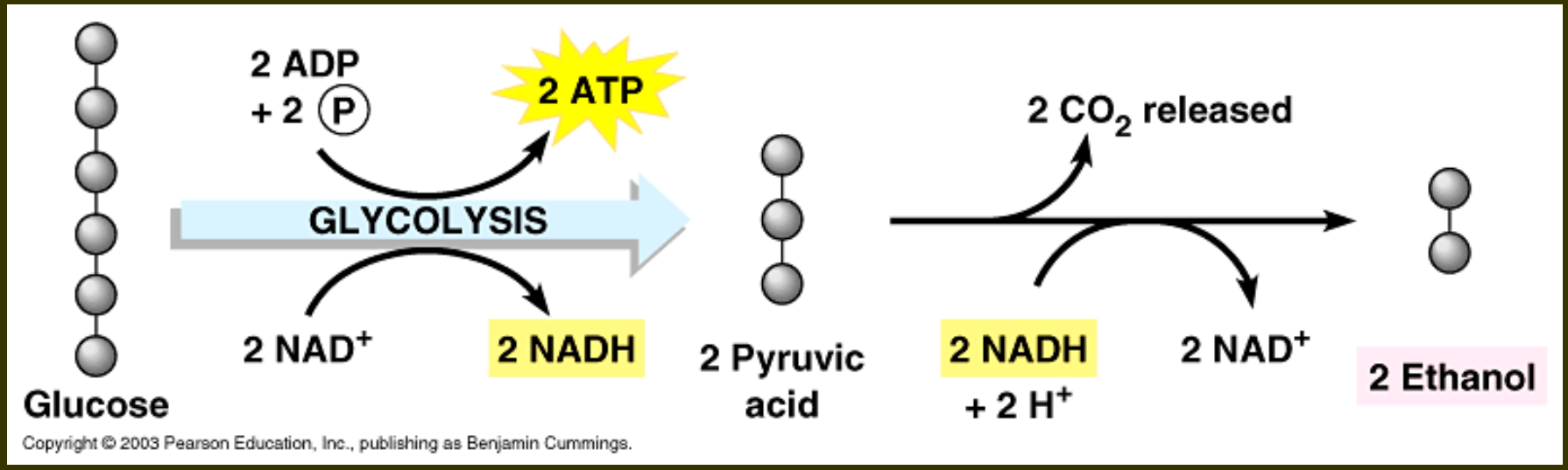
- If there is NO oxygen, then cells can make ATP by *Fermentation*
- Without oxygen, only glycolysis occurs

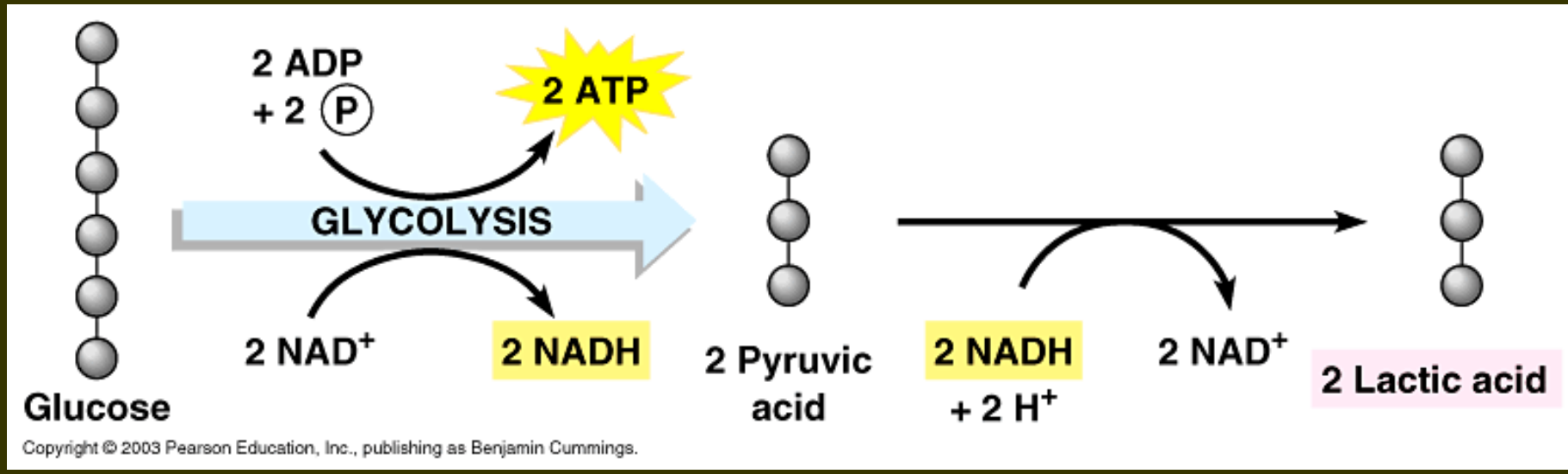
Fermentation gives 2 ATP

Two Forms of Fermentation:

- Lactic Acid Fermentation (animals)
- Alcohol Fermentation (yeast)







Why are both Photosynthesis and Cell Respiration important to Ecosystems?

- Light is the ultimate source of energy for all ecosystems
- Chemicals cycle and Energy flows
- Photosynthesis and cellular respiration are opposite reactions