

# Biology I

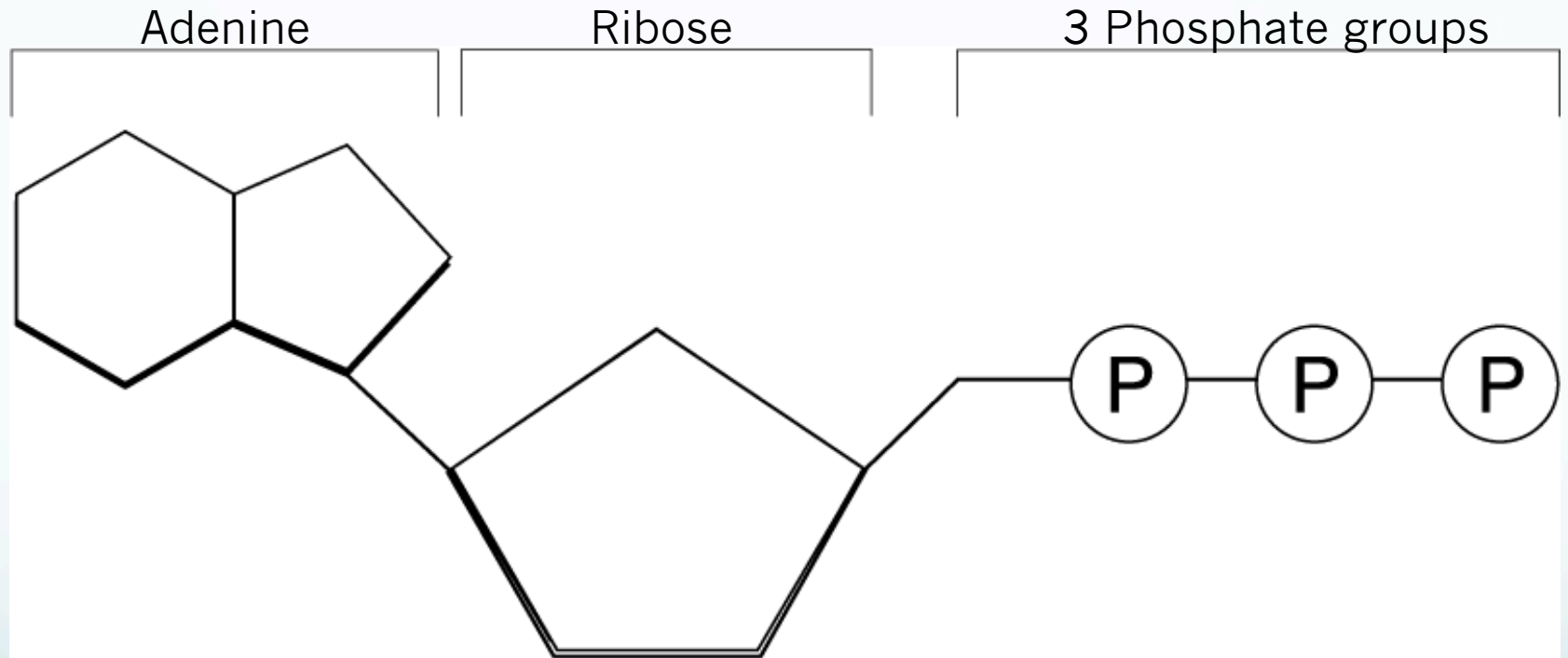
Chapter 8/9

# Interest Grabber

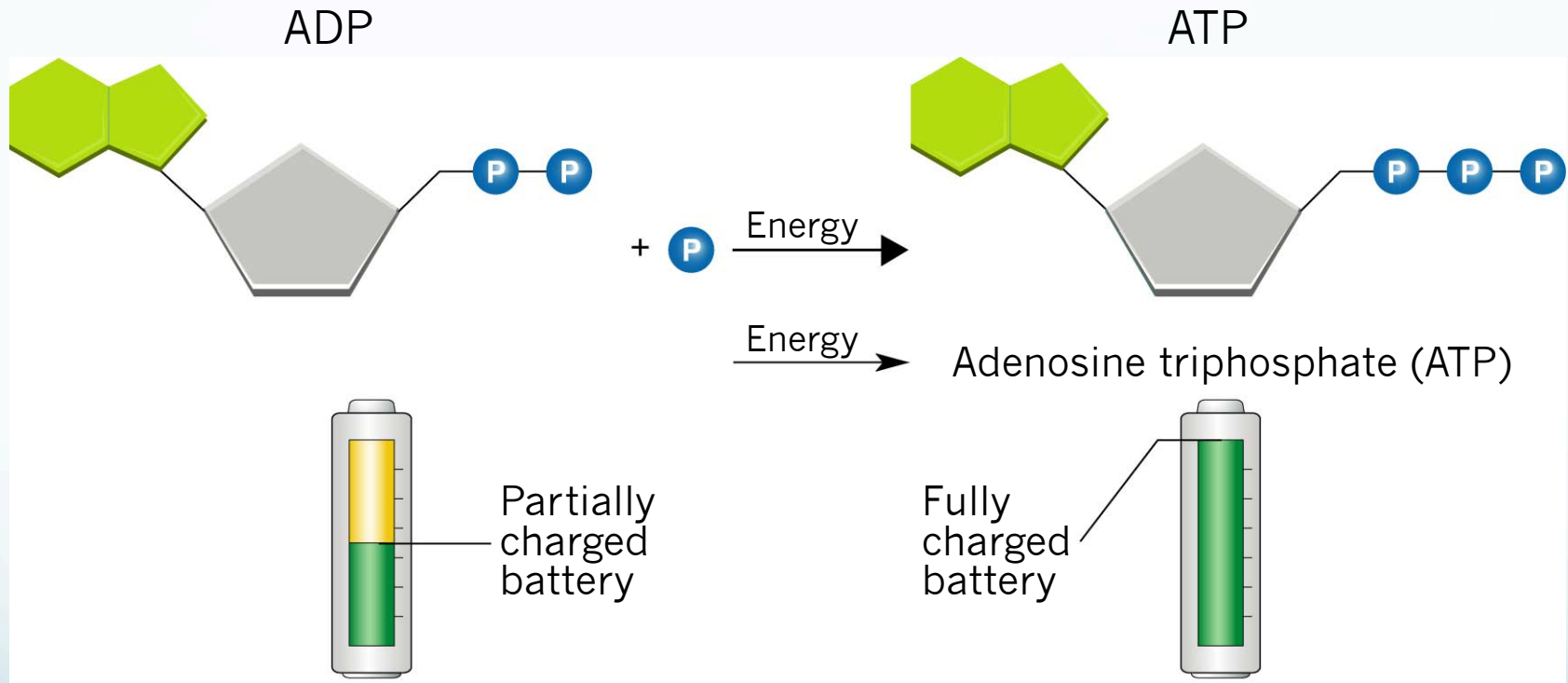
## NOTEBOOK #1

- Suppose you earned extra money by having a part-time job. At first, you might be tempted to spend all of the money, but then you decide to open a bank account.
  1. What are the benefits of having a bank account?
  2. What do you have to do if you need some of this money?
  3. What might your body do when it has more energy than it needs to carry out its activities?
  4. What does your body do when it needs energy?

# ATP



# Comparison of ADP and ATP to a battery



# Interest Grabber

## NOTEBOOK #2

### Trapping Energy

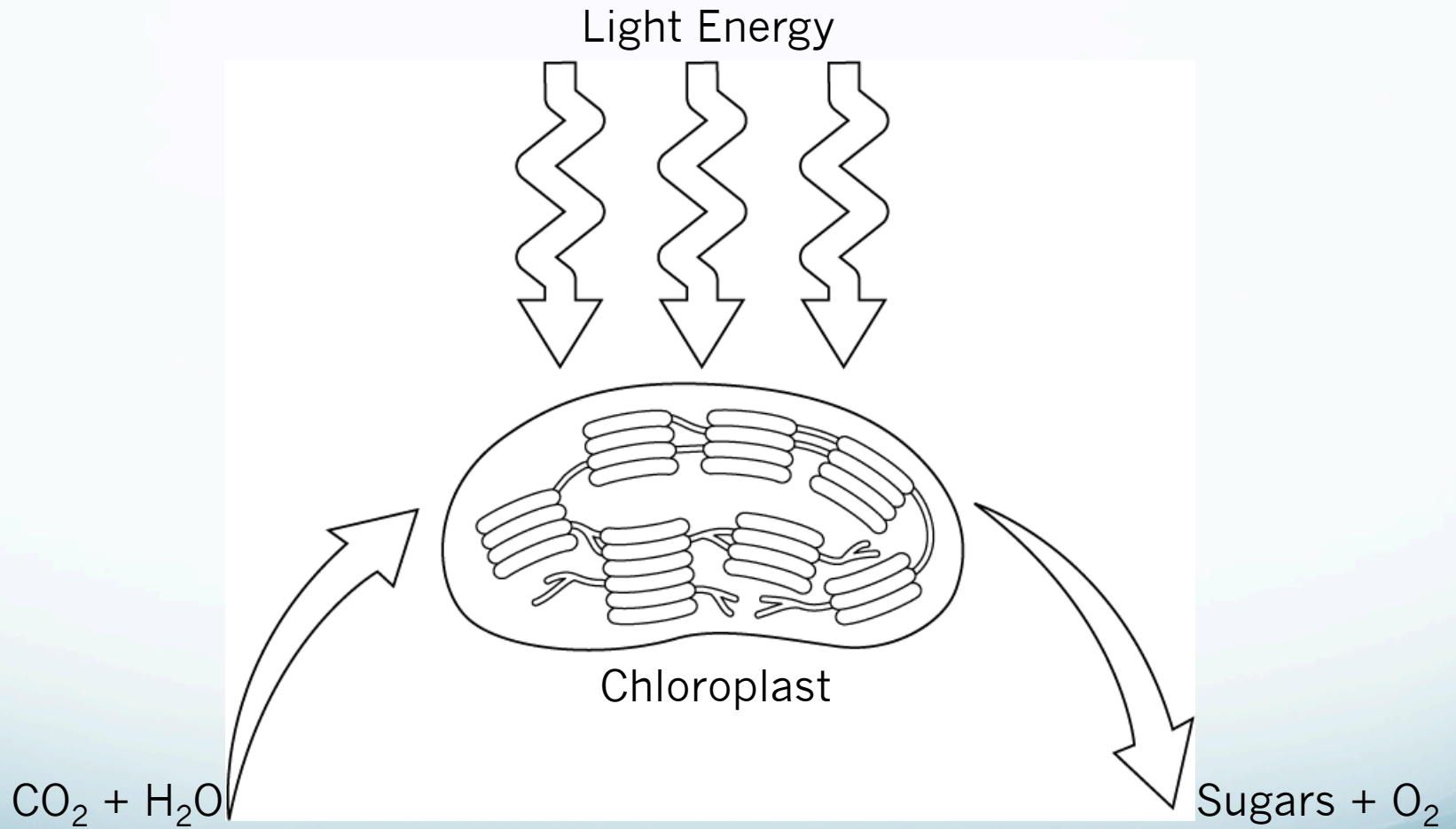
- Have you ever used a solar-powered calculator? No matter where you go, as long as you have a light source, the calculator works. You never have to put batteries in it.

# Interest Grabber Cont.

## NOTEBOOK #2

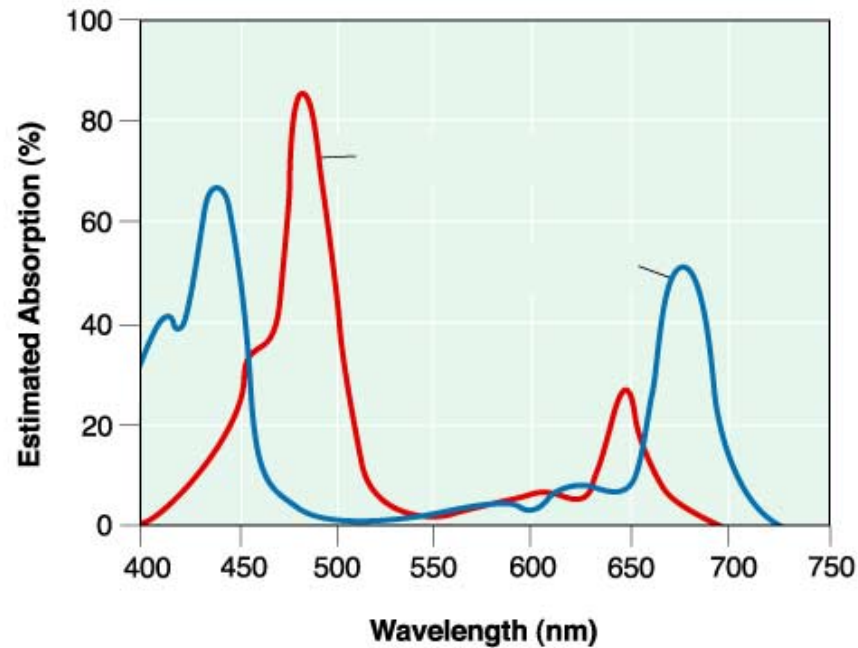
- 1. A solar-powered calculator uses solar cells that are found in rows along the top of the calculator. **Into what kind of energy is the light energy converted so that the calculator works?**
- 2. Recall that plants use light energy from the sun to make food. **Into what kind of energy is the light energy converted by plants?**
- 3. Most plants, no matter what size or shape they are, have some parts that are green. **Which parts of a plant are usually green?**
- 4. **What does the green color have to do with the plant's ability to convert light energy into the energy found in the food it makes?**

# Photosynthesis: Reactants and Products



# Chlorophyll Light Absorption

Absorption of Light by Chlorophyll *a* and Chlorophyll *b*





# NOTEBOOK #3

1. What three things make up an ATP molecule?
2. What is the difference between ADP and ATP?
3. What are the products of photosynthesis?
4. In what organelle does photosynthesis take place?

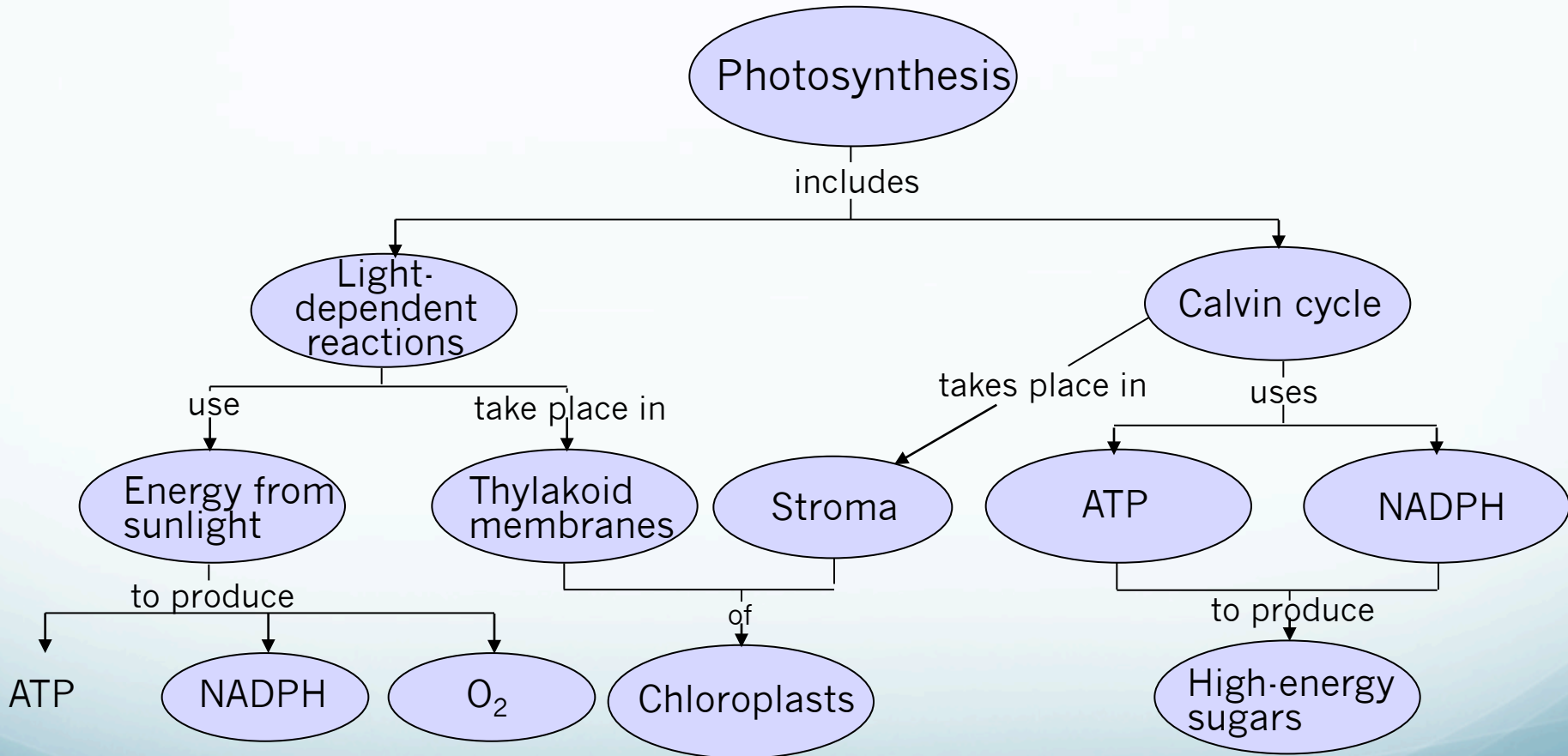
# Interest Grabber

## A Look Into the Future

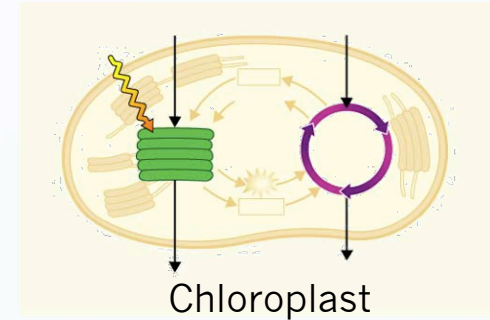
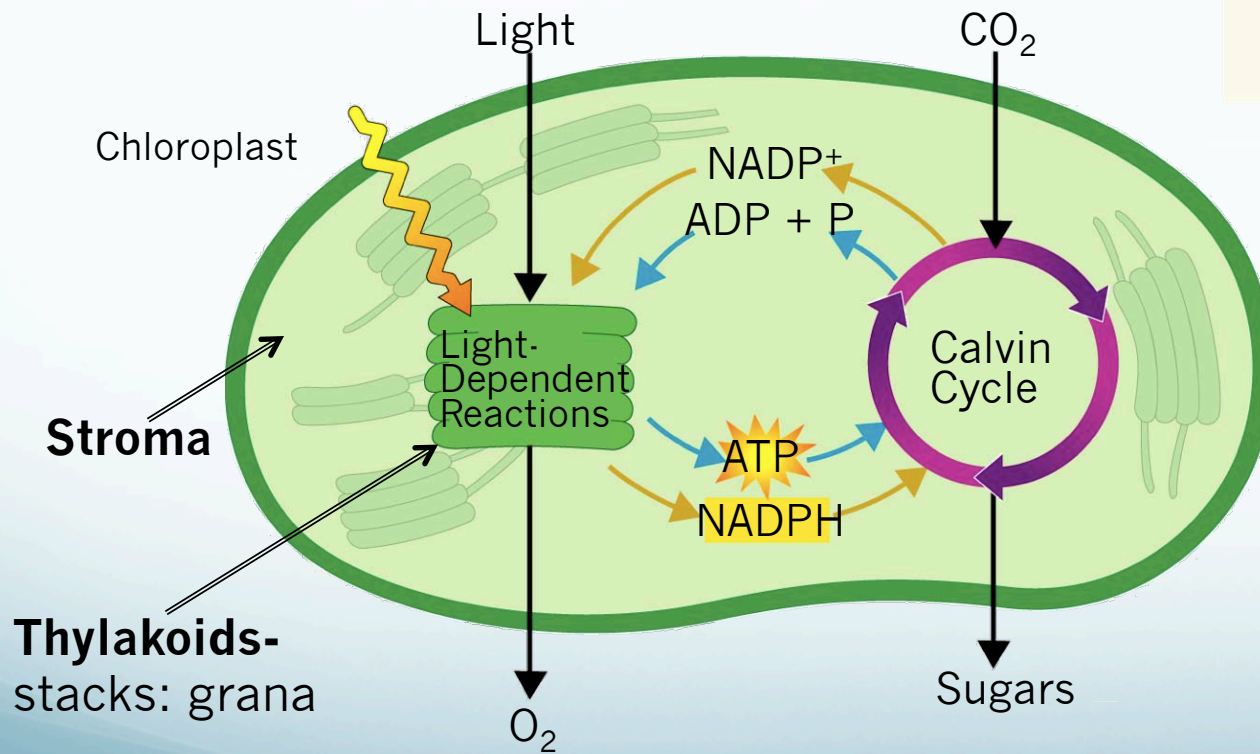
### NOTEBOOK #4

- It is 100 years in the future and you are a research scientist. An enormous volcanic eruption has recently sent huge quantities of dust and ash into the atmosphere.
- Working with a partner, make a list of how this event will affect each of the following:
  - 1. photosynthesis
  - 2. plant life
  - 3. animal life
  - 4. human societies

# Concept Map

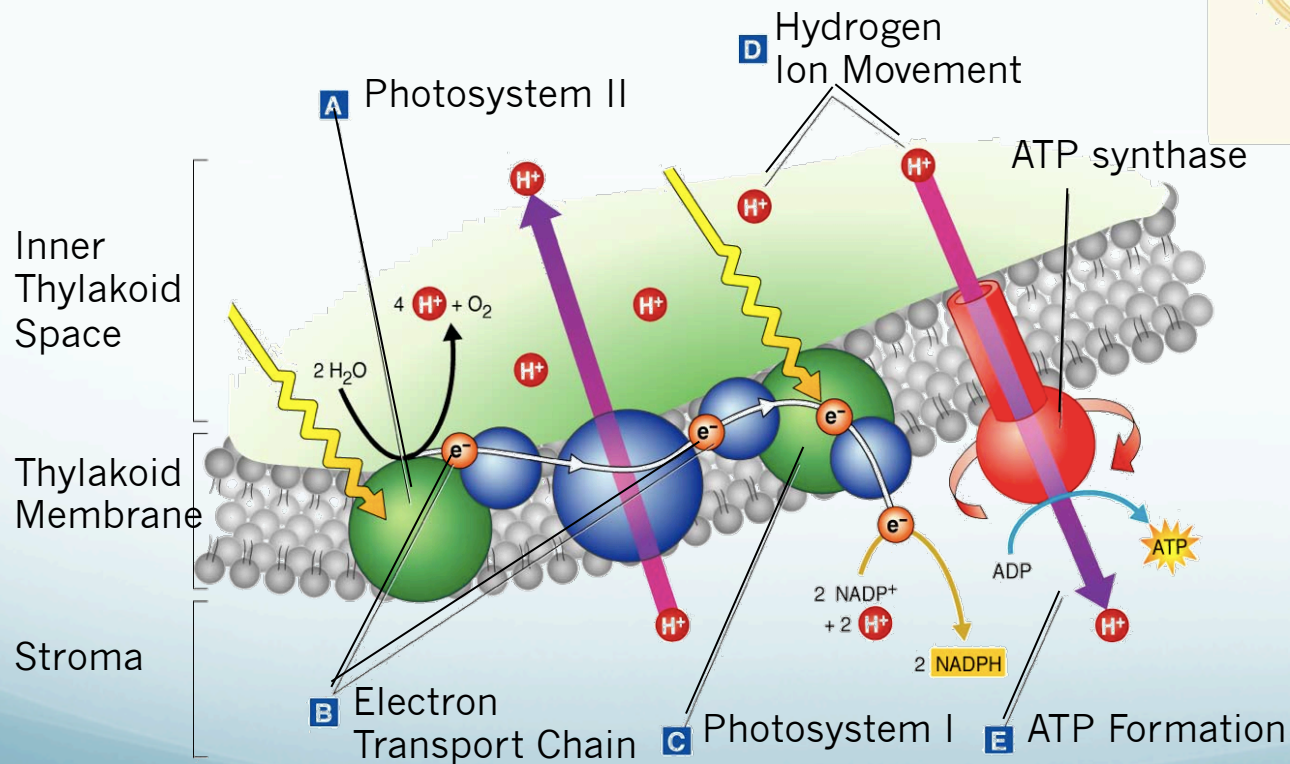
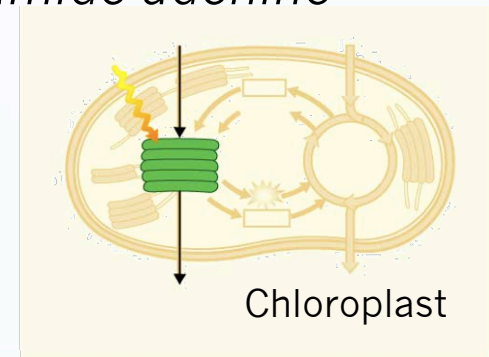


# Photosynthesis: An Overview



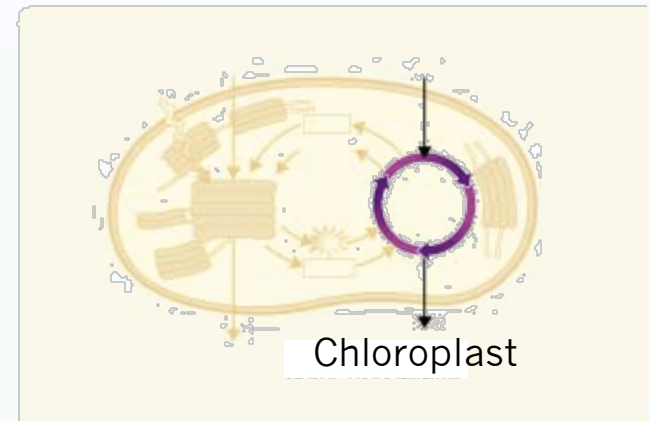
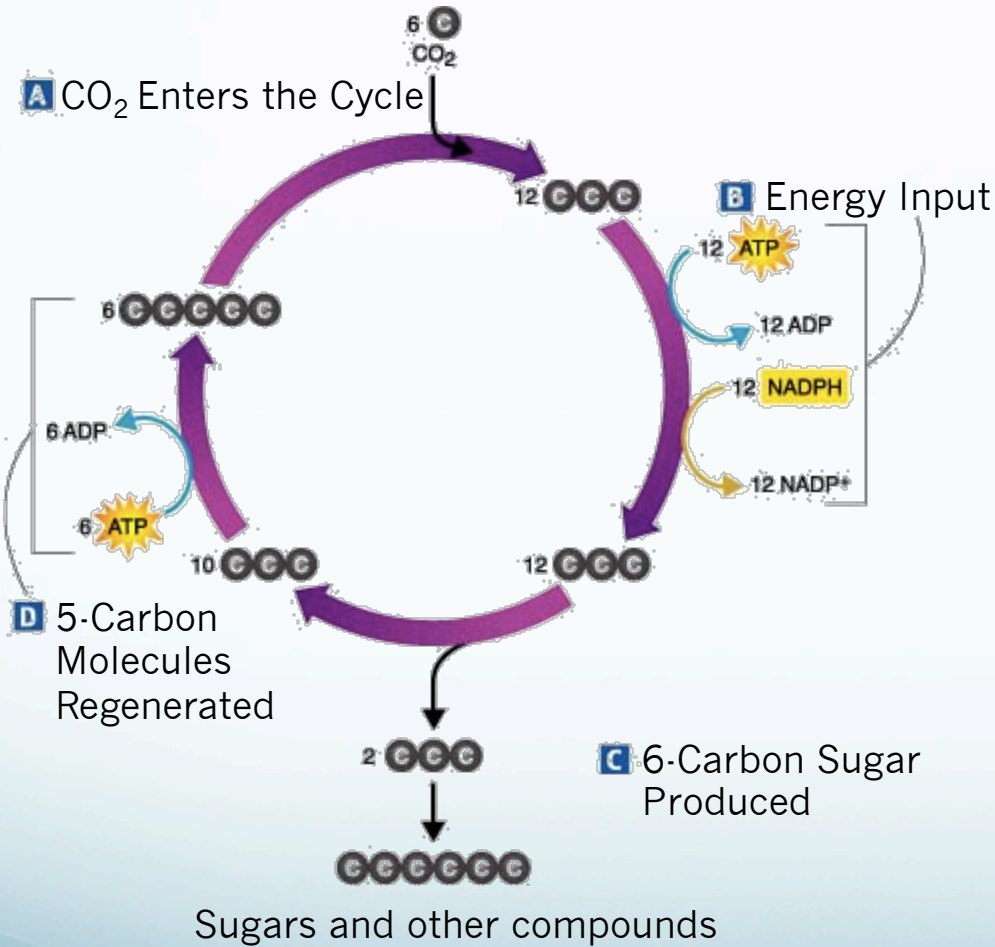
# Light-Dependent Reaction

- produces oxygen gas and converts ADP and NADP into the energy carriers ATP and NADPH (*nicotinamide adenine dinucleotide phosphate*)



# Calvin Cycle

-uses ATP and NADPH from the light-dependent reactions to produce high-energy sugars



# NOTEBOOK #5

1. What two reactions are included in photosynthesis?
2. What is the stroma?
3. What is a thylakoid?
4. What do you call stacks of thylakoids?
5. What are the light-dependent reactions?
6. What is the Calvin Cycle?



# Interest Grabber

## NOTEBOOK #6

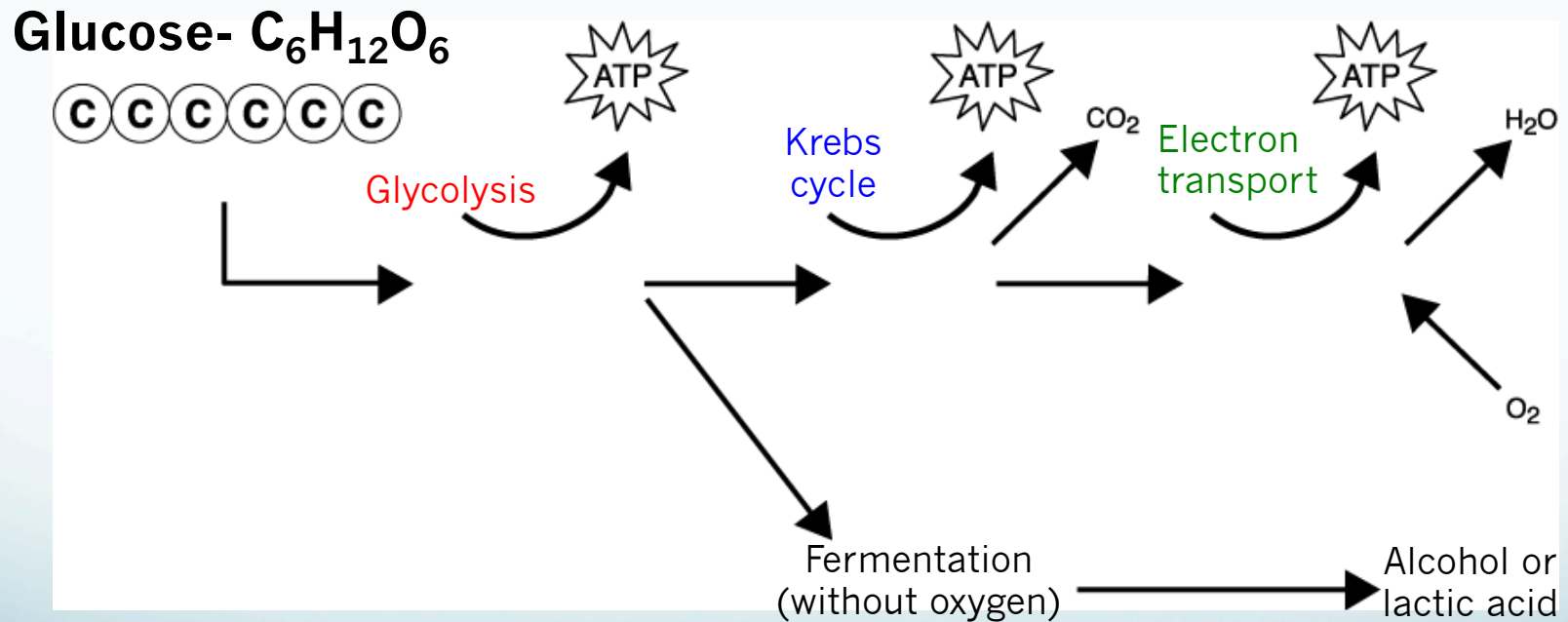
- **Feel the Burn**

- Do you like to run, bike, or swim? These all are good ways to exercise. When you exercise, your body uses oxygen to get energy from glucose, a six-carbon sugar.

1. How does your body feel at the start of exercise, such as a long, slow run? How do you feel 1 minute into the run; 10 minutes into the run?
2. What do you think is happening in your cells to cause the changes in how you feel?
3. Think about running as fast as you can for 100 meters. Could you keep up this pace for a much longer distance? Explain your answer.

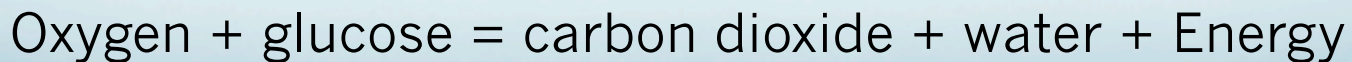
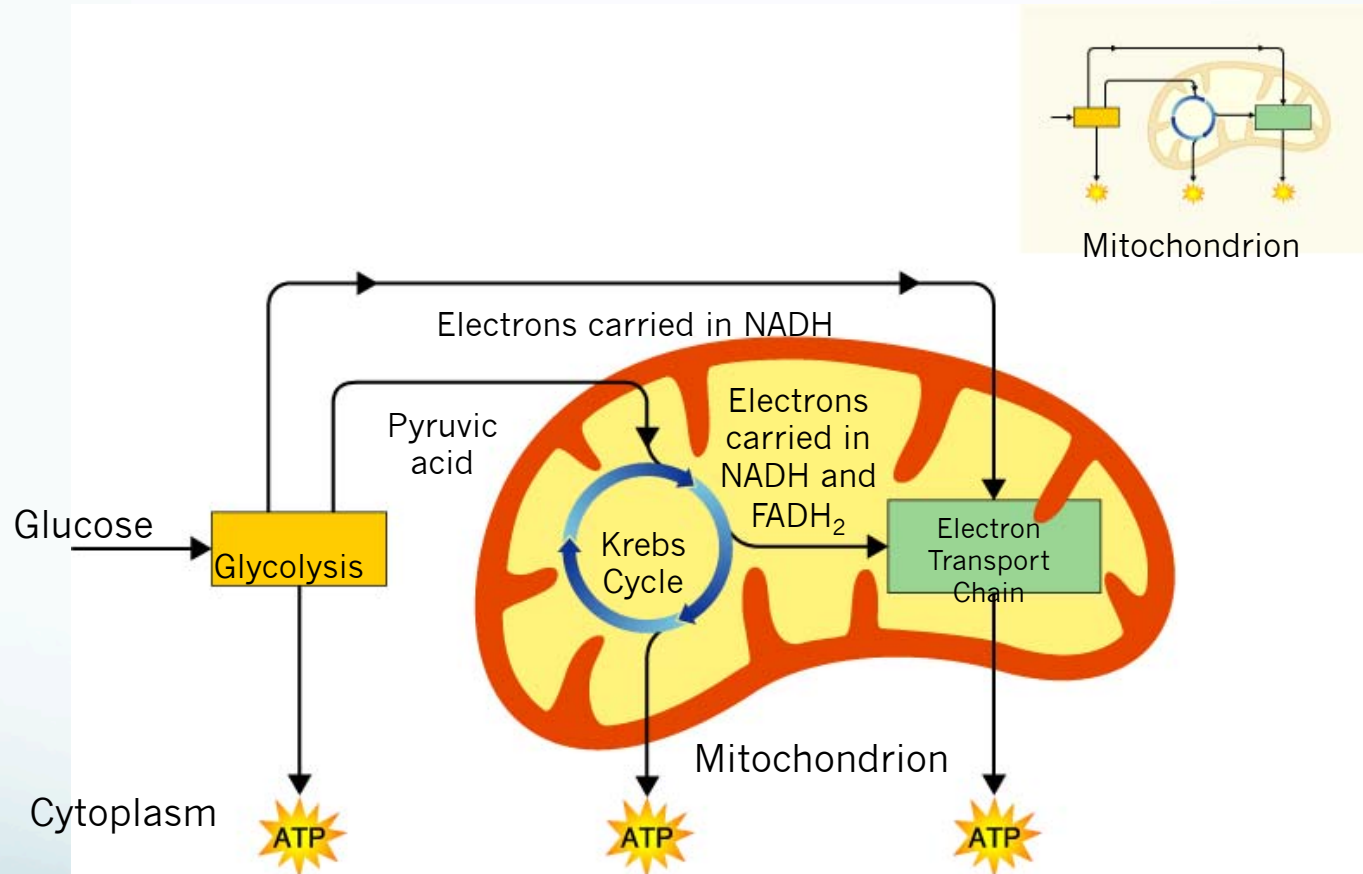


# Chemical Pathways



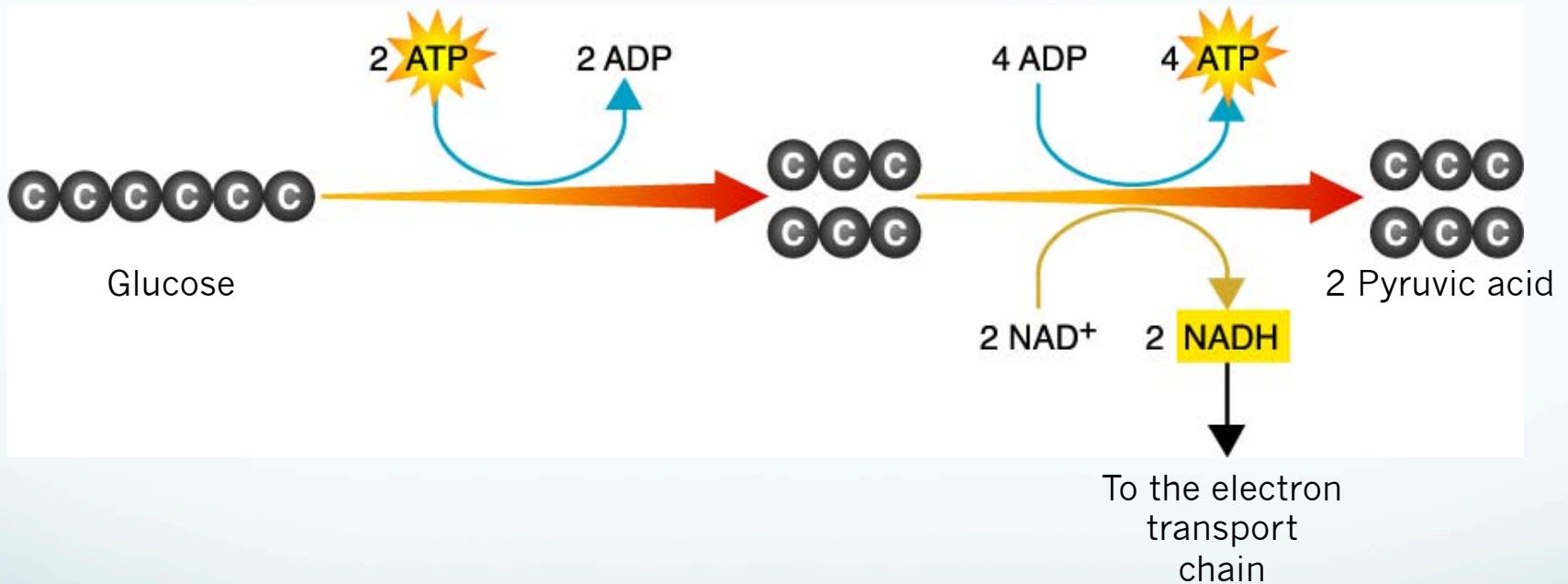
# Cellular Respiration –

the process that releases energy by breaking down glucose and other food molecules in the presence of oxygen



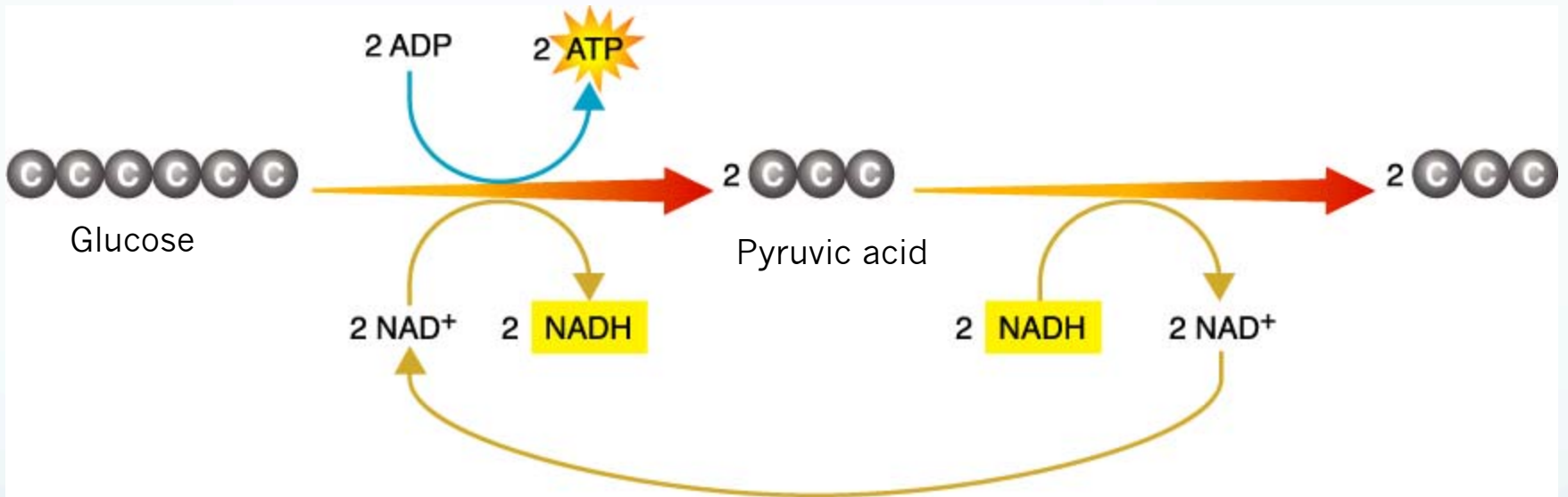
# Glycolysis

-the process in which one molecule of glucose is broken in half, producing two molecules of pyruvic acid, a 3-carbon compound



# Lactic Acid Fermentation

-converts glucose into lactic acid



# NOTEBOOK #7

1. What is cellular respiration?
2. What are the products of cellular respiration?
3. What organelle does cellular respiration take place in?
4. What is glycolysis?
5. What is glucose converted into?

# Interest Grabber

## NOTEBOOK #8

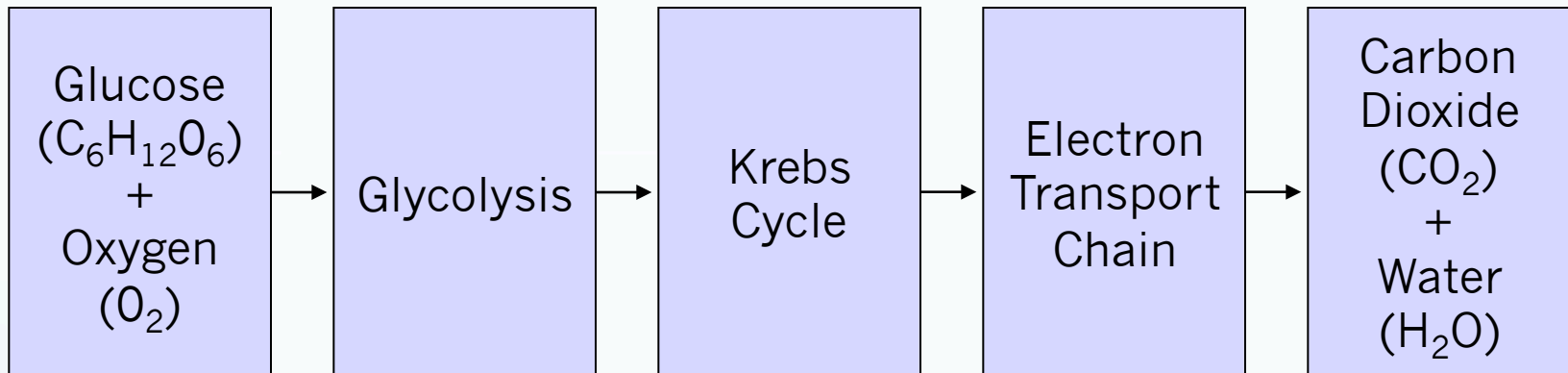
- **Rolling and Folding**
- Some of the steps in cellular respiration take place in the membrane inside the cell structure called the mitochondrion, which has a folded inner membrane. What purpose do these folds serve?
- To find out the answer to this question, perform this activity.

# Interest Grabber Cont.

- 1. Obtain two sheets of paper and a metric ruler.  
**What is the surface area of the paper?**
- 2. Roll one sheet of paper into a tube lengthwise.  
**What is the surface area of the rolled paper?**
- 3. Fold the second sheet of paper into a fan. Then, roll the first sheet of paper around the folded paper so it is inside the rolled paper.  
**What has happened to the surface area of the inside of the rolled paper?**
- 4. **What would be the value of increasing the surface area of the membrane inside a mitochondrion?**

# Cellular Respiration

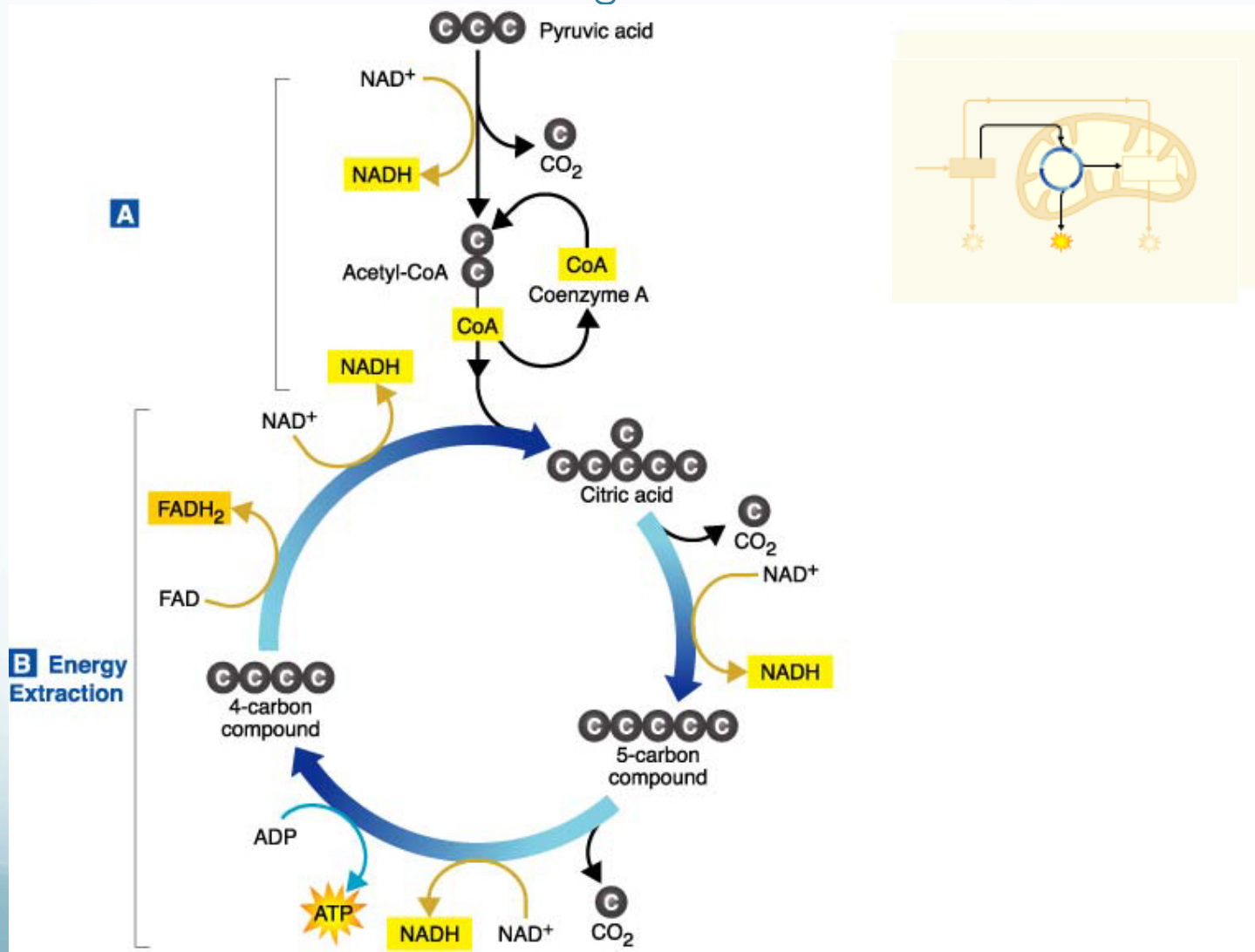
process that releases energy by breaking down glucose and other food molecules in the presence of oxygen





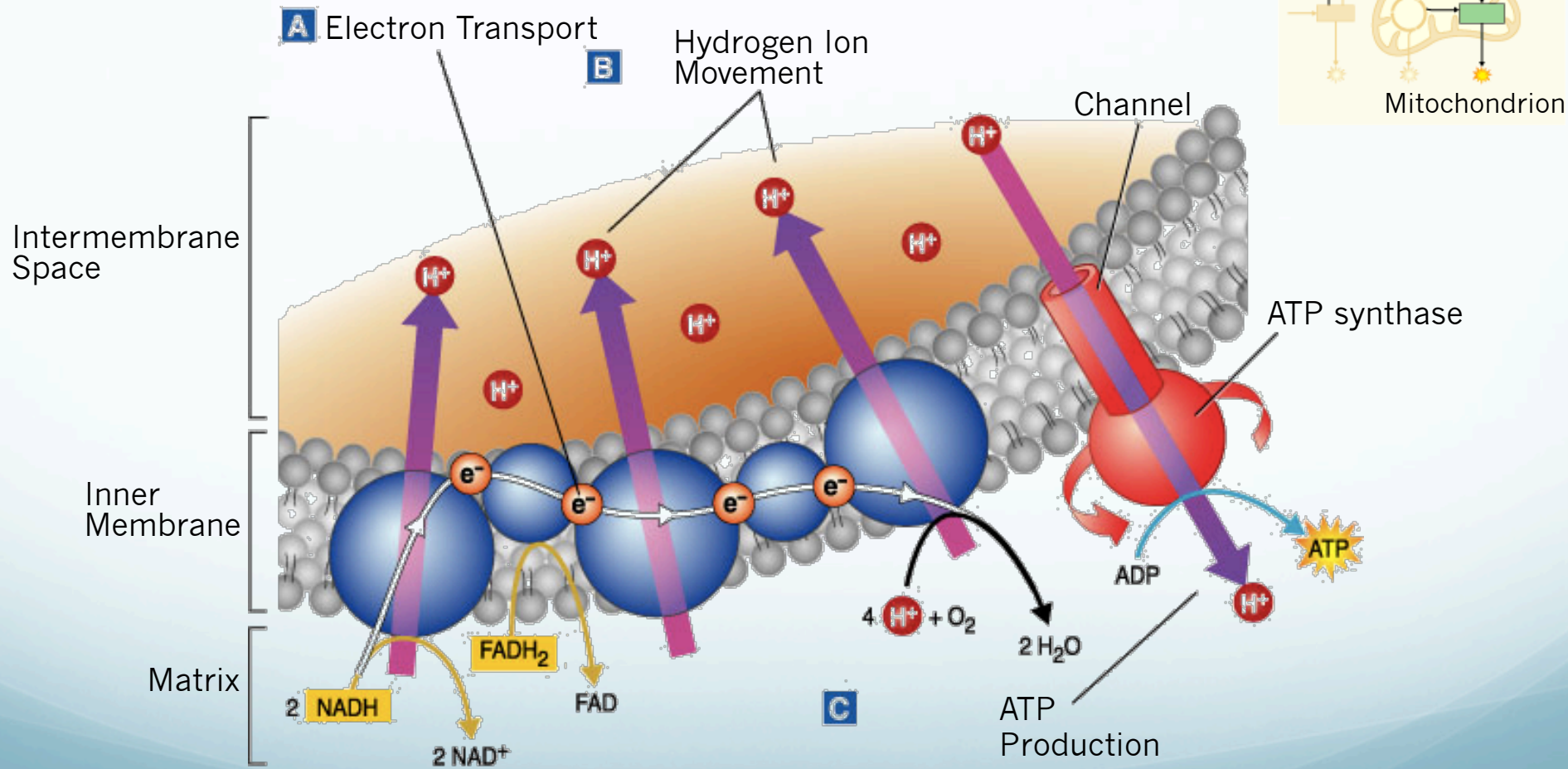
# The Krebs Cycle

pyruvic acid is broken down into carbon dioxide in a series of energy-extracting reactions

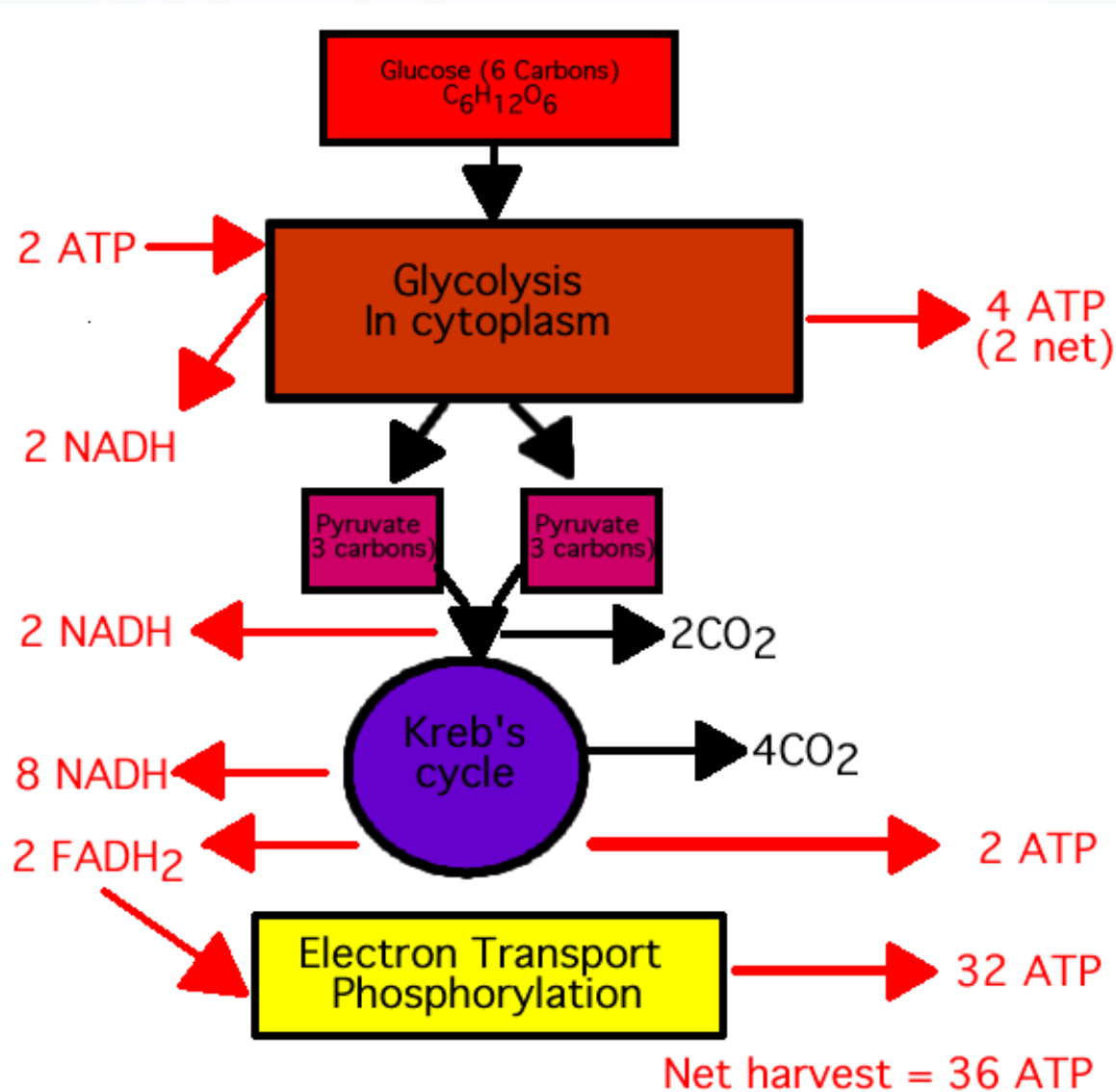


# Electron Transport Chain

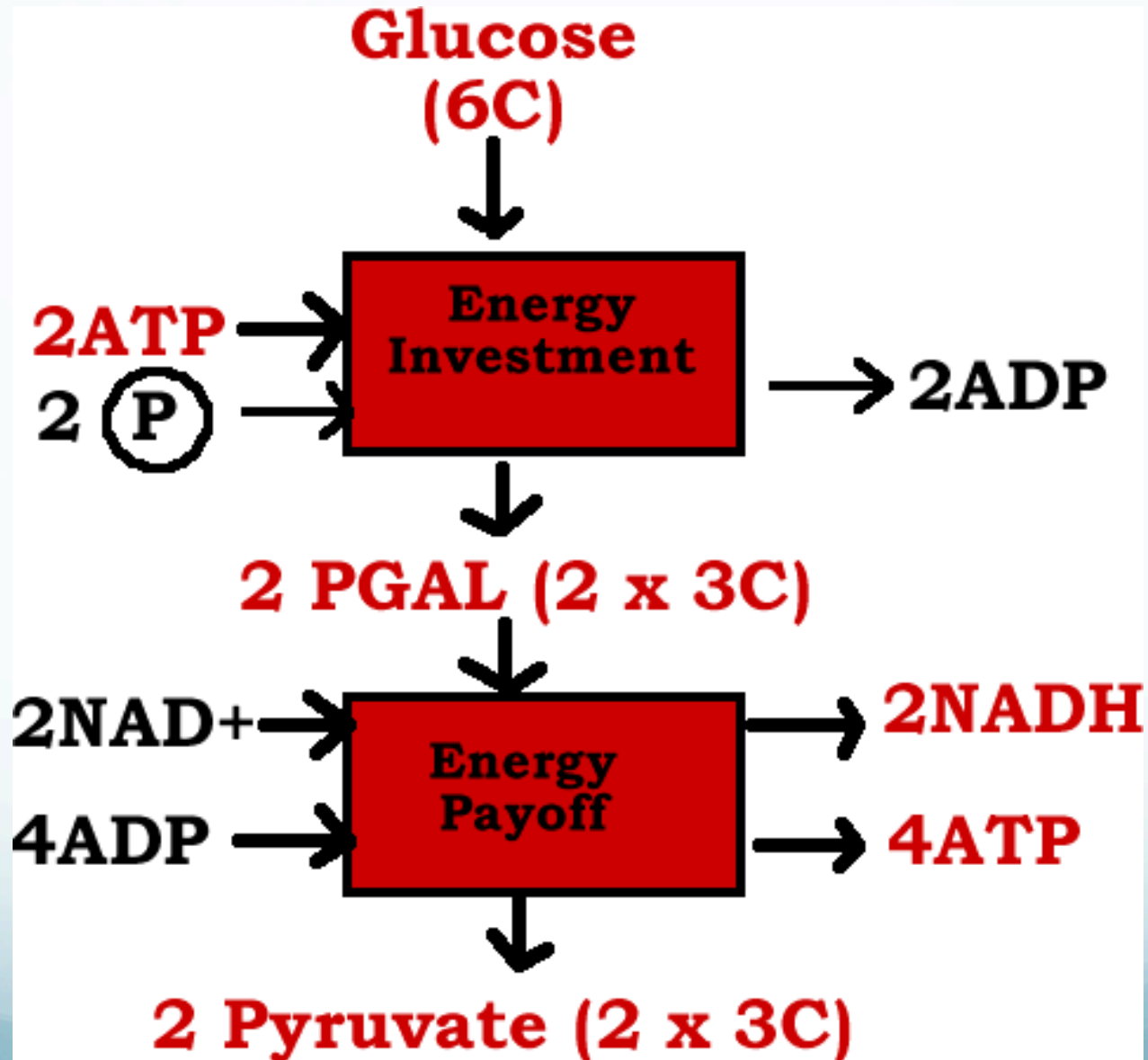
uses the high-energy electrons from the Krebs Cycle to convert ADP into ATP



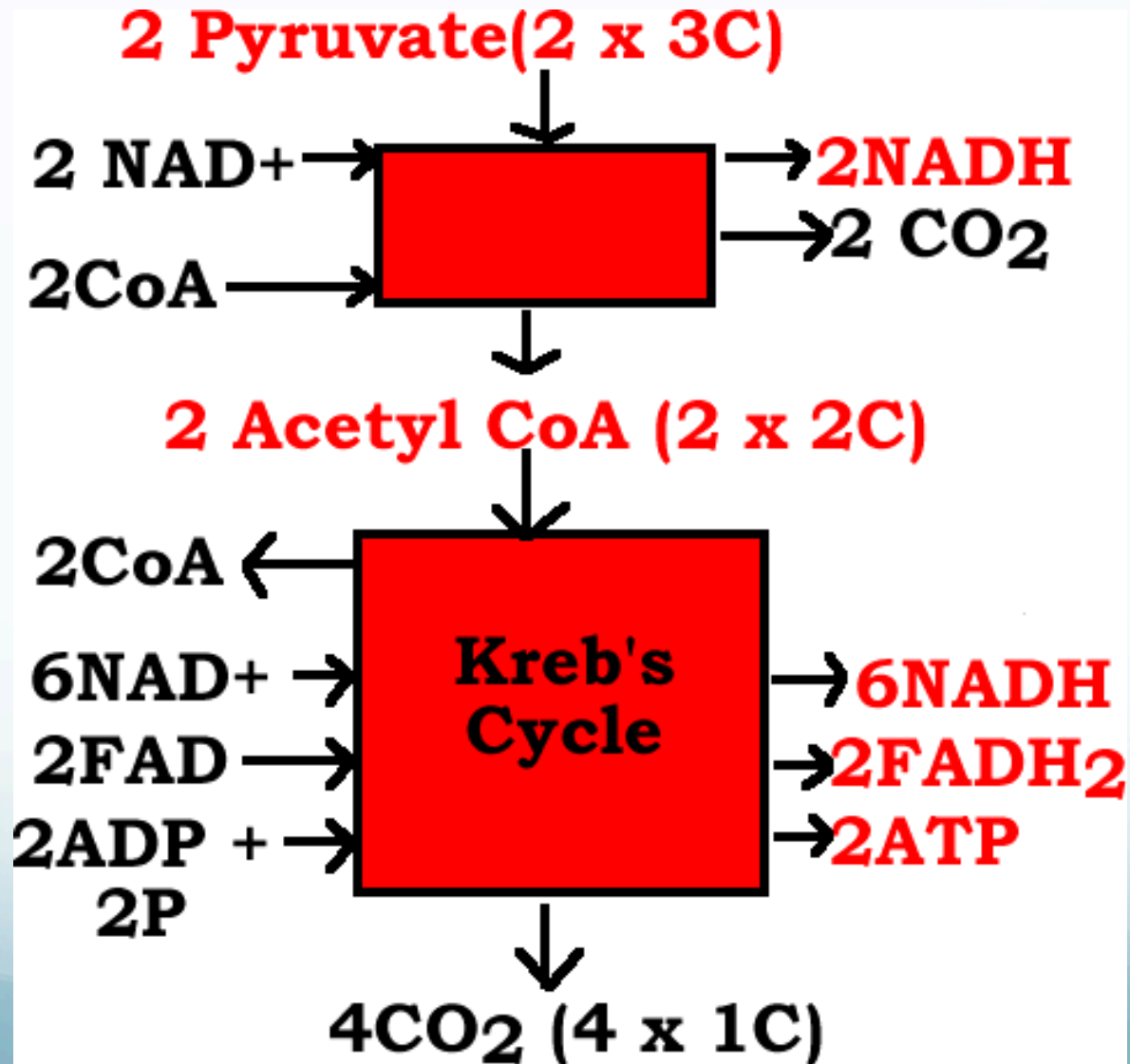
# Cellular Respiration- Net Yield



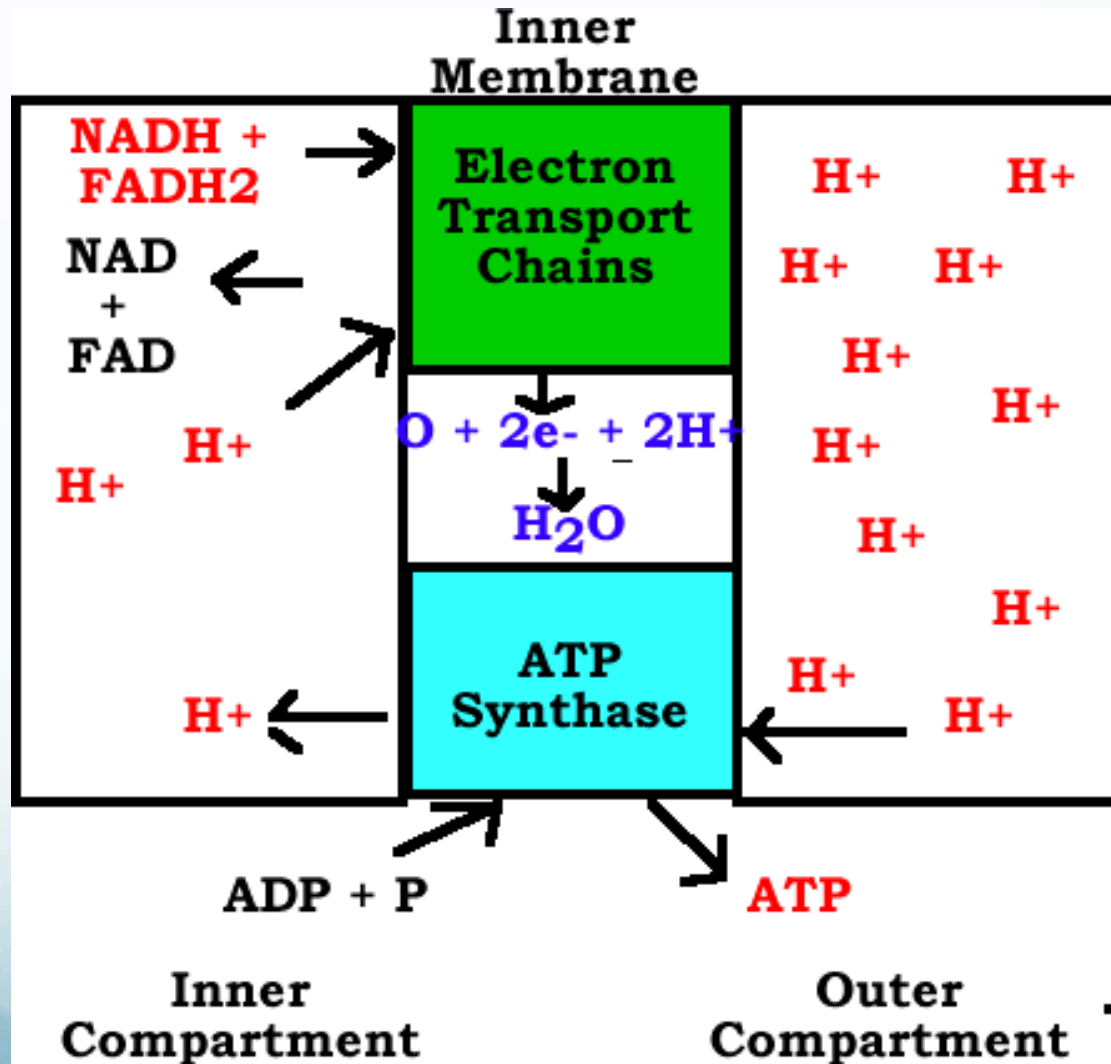
# Glycolysis- Net Yield



# Krebs Cycle: Net Yield



# Electron Transport Chain : Net Yield



# NOTEBOOK #9

1. What is the Krebs Cycle?
2. What is the electron transport chain?
3. What is the net yield of ATP at the end of Cellular Respiration?