

Photosynthesis Notes

The Big Picture

What is an Autotroph?

Give an example

What is a Heterotroph?

Give an Example

Why does Photosynthesis Happen?

What is needed to do Photosynthesis?

- a.
- b.
- c.

What does Photosynthesis produce?

- a.
- b.

What are the uses of the products?

- a.
- b.

The Overall Formula:

Now the Details

What part of a plant does Photosynthesis?

What is the chemical that is present in those parts?

Where energy is hiding

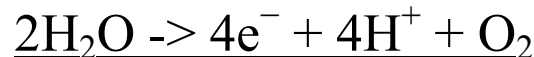
Bonds –

Electrons–

Part 1 -The Light Reactions

1. Directly use light. Can only happen with sunlight
2. Use energy in the sun to break apart molecules of water into Oxygen gas, electrons and protons.

The electrons (e^-) and protons (H^+) that make up hydrogen atoms are stripped away separately from water molecules.



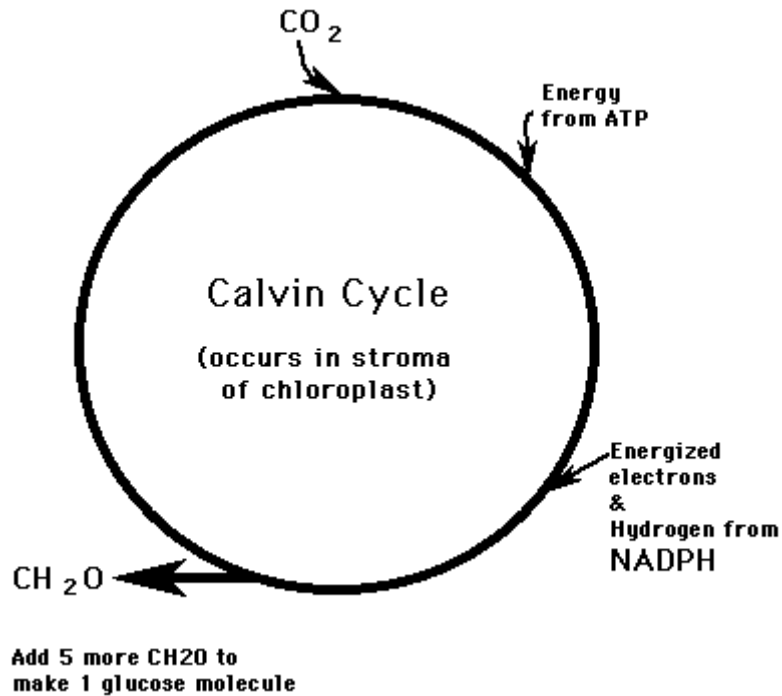
3. The electrons serve one main function:
 - They reduce $NADP^+$ to [NADPH](#) for use in the Calvin Cycle.
4. The protons also serve two functions:
 - They participate in the reduction of $NADP^+$ to NADPH.
 - The Protons are being produced inside the chloroplasts. As they diffuse out towards the cytoplasm, they release enough energy to convert 1 ADP to 1 ATP.



The Dark Reactions of Photosynthesis

(Also known as the Calvin Cycle)

1. All the reactions of photosynthesis that are not directly dependent upon light are known as the **dark reactions**.
2. The dark reactions occur whether there is light present or not.
3. The purpose of the dark reactions is to take the ingredients produced during the light reactions, and add them to CO₂ to make glucose or sugar.
 - a. ATP from protons in Light reactions
 - b. Energized electrons and hydrogen ions from NADPH in Light Reactions



- c. The cycle repeats 6 times making 6CH₂O.
- d. The 6 CH₂O are strung together into C₆H₁₂O₆ = sugar for food.