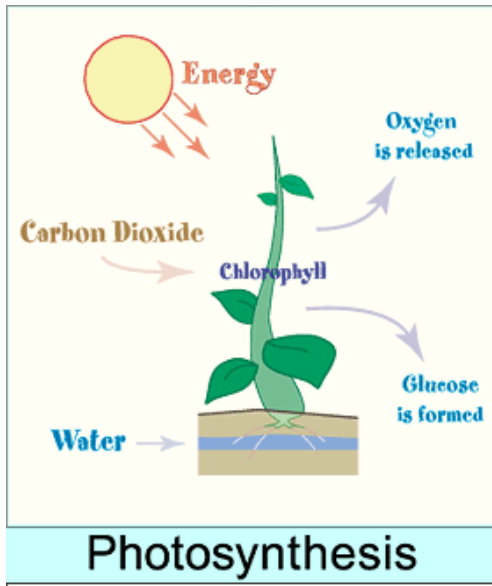




# Biology

## Unit 2 – Life Processes, Background Paper 2-9

### Photosynthesis II



Along with water and oxygen, food is basic for survival. All of our food originates with the process of photosynthesis. By understanding the specifics of how plants turn  $\text{CO}_2$  and  $\text{H}_2\text{O}$  into sugars we can better plan for the future.

As this simple concept map shows we are to the point where we need to discuss the two reactions of photosynthesis that occurs in the chloroplasts of plant leaves.

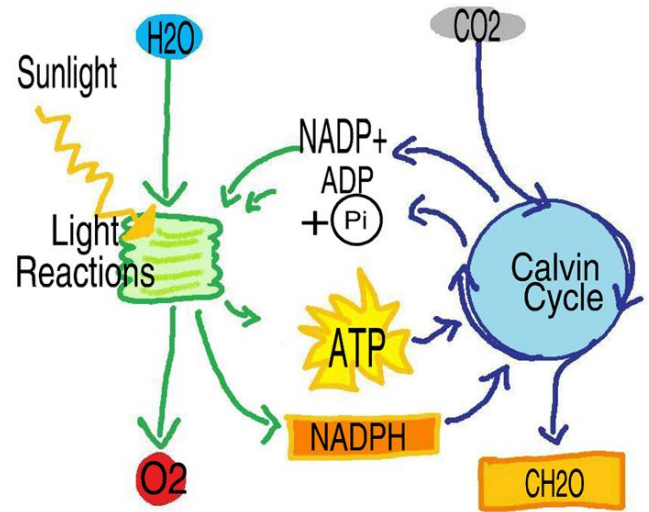
In the first stage (Light Reactions). Light energy is captured by the chlorophyll pigments embedded on structures within the chloroplast called thylakoids. The light reactions do just what they sound like they would, they react with light. This is the stage where photons of light energy are captured by the chlorophyll molecule and transferred to electrons. The electrons become 'excited' by the light and eventually pass on their excitement to ATP. ATP is the main energy molecule for all living things. ATP doesn't store energy for very long but it is a great way for cells to transport usable energy from place to place. In the case of photosynthesis the ATP transfers the energy captured from

sunlight during the light reactions to another set of reactions. The second set of reactions does not require light so is sometimes called the 'dark' reactions. Since a guy named Melvin Calvin discovered the cycle it is also sometimes called the Calvin cycle. During the Calvin cycle the high energy ATP is used to combine carbon, hydrogen, and oxygen into sugar. You see some other molecules in the diagram ( $\text{NADP}^+$ ,  $\text{NADPH}$ ,  $\text{ADP}$ ), they are other methods used by the chloroplasts to shuffle energy around. The whole process is rather involved but if you can remember that light is captured by the light reactions → Energy is transferred using ATP →  $\text{CO}_2$  is 'fixed' into sugar in the Calvin cycle, you will have a great start.

Visit;

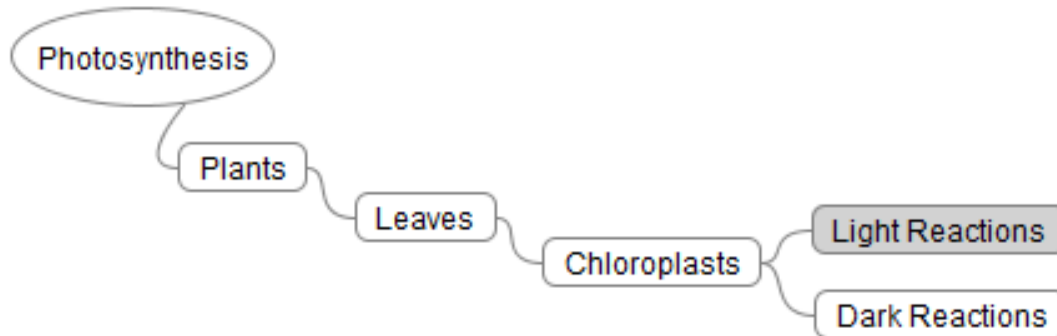
<http://www.sumanasinc.com/webcontent/animations/content/harvestinglight.html>

and play the animation. This will take you the next step in understanding photosynthesis. Don't let the series of electron transfers and the chemical names scare you. It is still basically the transfer of energy to ATP using electrons excited by sunlight. The quiz questions will come from the animation. To guide you the questions are on the back of this reading.



Title of Reading: 2-9 Photosynthesis II

**Concept Map of Reading (3 points)**  
**Add to the Concept Map started below**  
**(5 more links minimum)**



**1 Point**  
**A & B**

A) What one question do I have about this article?

B) Show or describe the reading to a parent or guardian (Name \_\_\_\_\_).  
 What comments or questions did they have concerning the reading?  
 (Biology Homework Time \_\_\_\_\_)

#	Class Quiz – Answers (3 Points)	X / C
1	What is the source of the oxygen given off by plants?	
2	How many 'photosystems' capture light energy in the light reactions?	
3	What is the source of the electrons that are excited by sunlight?	