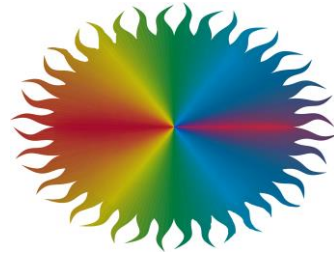


Honors POB Plant Growth Empact Project

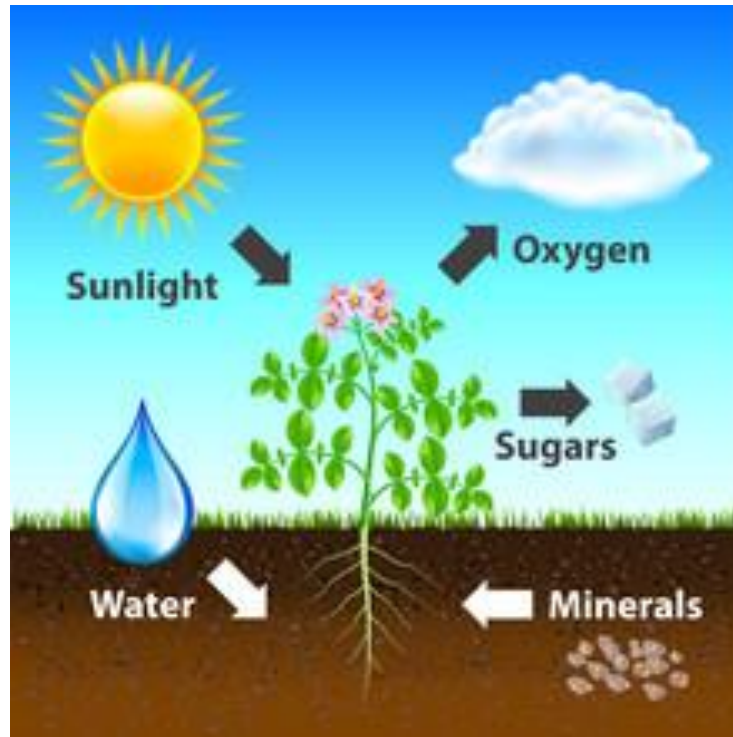
Importance of Photosynthesis

Bobbie Goodwin

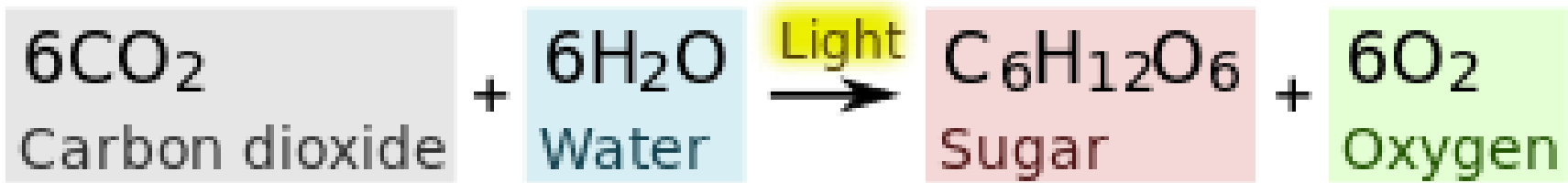
Photosynthesis



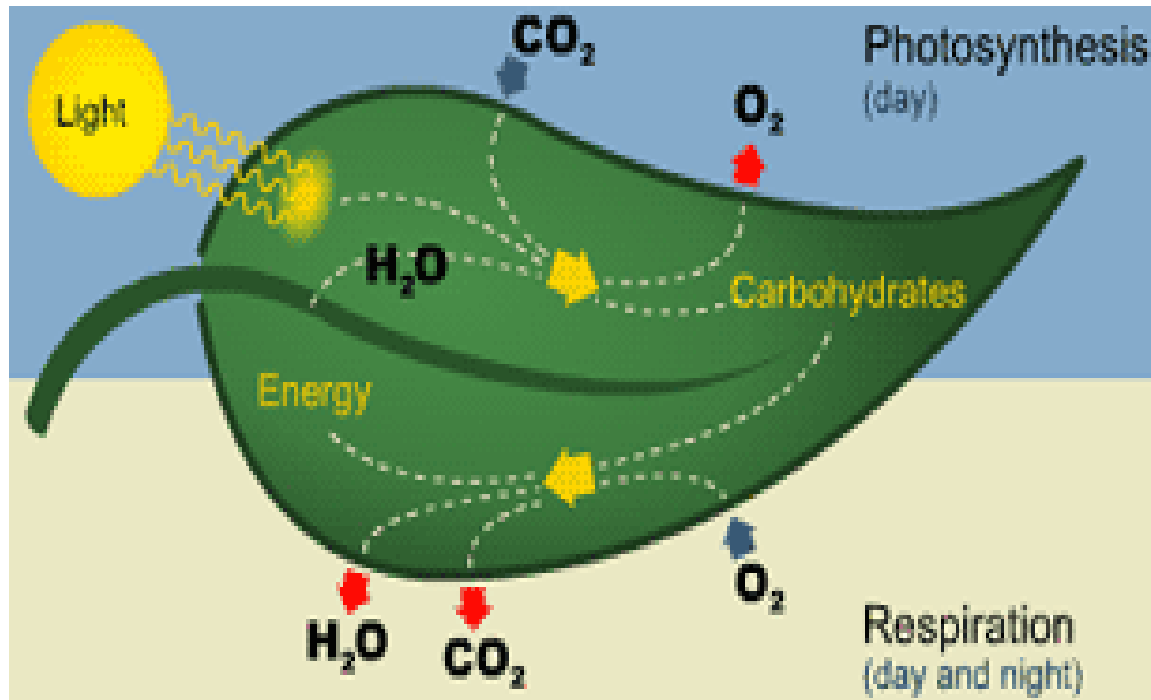
Photosynthesis occurs in microscopic particles called chloroplasts which are found inside plant cells. Chloroplasts contain chlorophyll, a green material. This absorbs the light energy required for photosynthesis to take place. Plants use their leaves to absorb carbon dioxide from the air and their roots to absorb water from the ground.



Plants do not consume food; they must grow it for themselves. This is accomplished through the process of photosynthesis. To make glucose or sugar, photosynthesis needs water, carbon dioxide from the air, and energy from the sun or another light source. This glucose gives the plant with the energy it requires to survive.



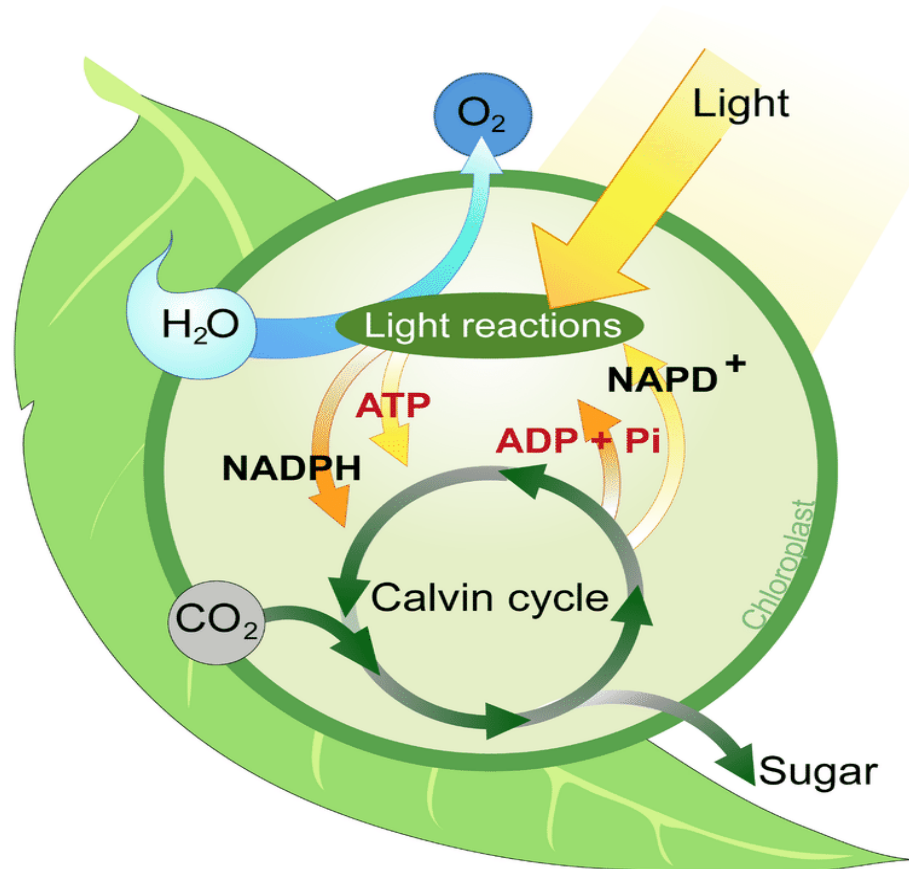
Step 1-Light Dependent- CO₂ and H₂O enter the leaf



Chlorophyll is found in the chloroplasts of plants, which are small structures within the cells. Photosynthesis creates oxygen, which is then released into the atmosphere by the plant. Because it does not absorb green wavelengths, chlorophyll gives plants their green hue.

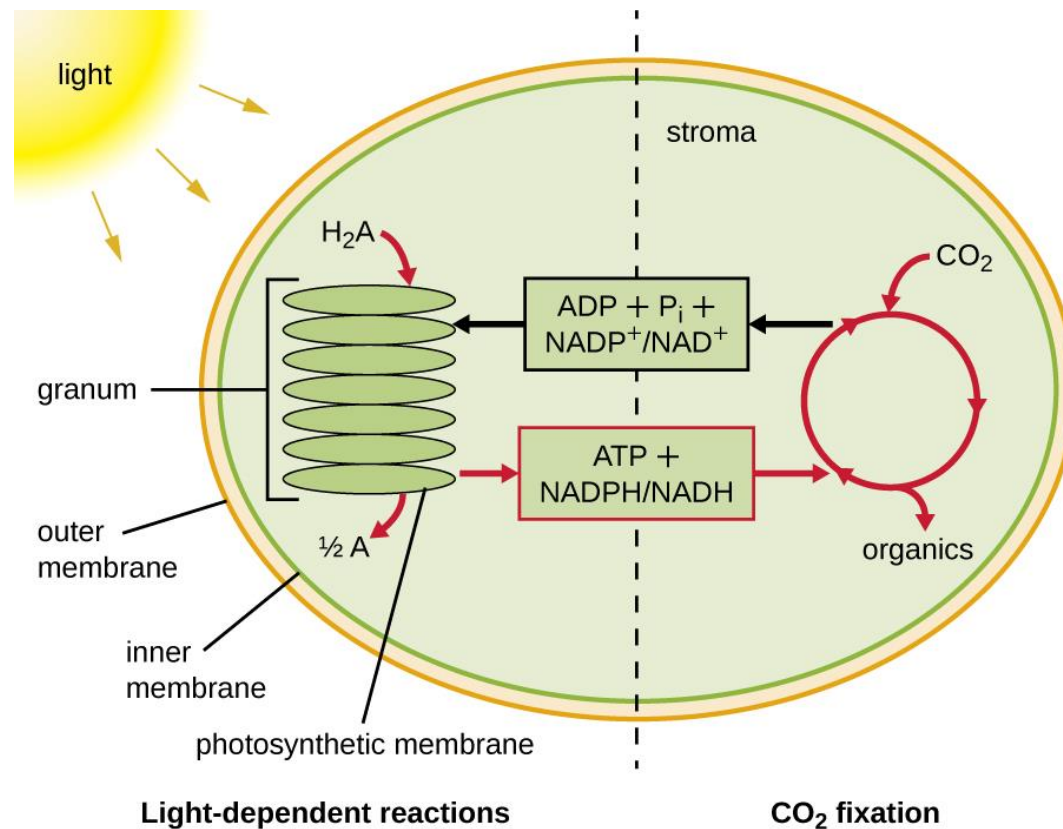
Step 2- Electron Transfer

The high-energy electron from the reaction center chlorophyll is then transferred to an acceptor molecule in an electron transport chain. The transmission of high-energy electrons across a succession of membrane carriers is then connected with the creation of ATP and NADPH.



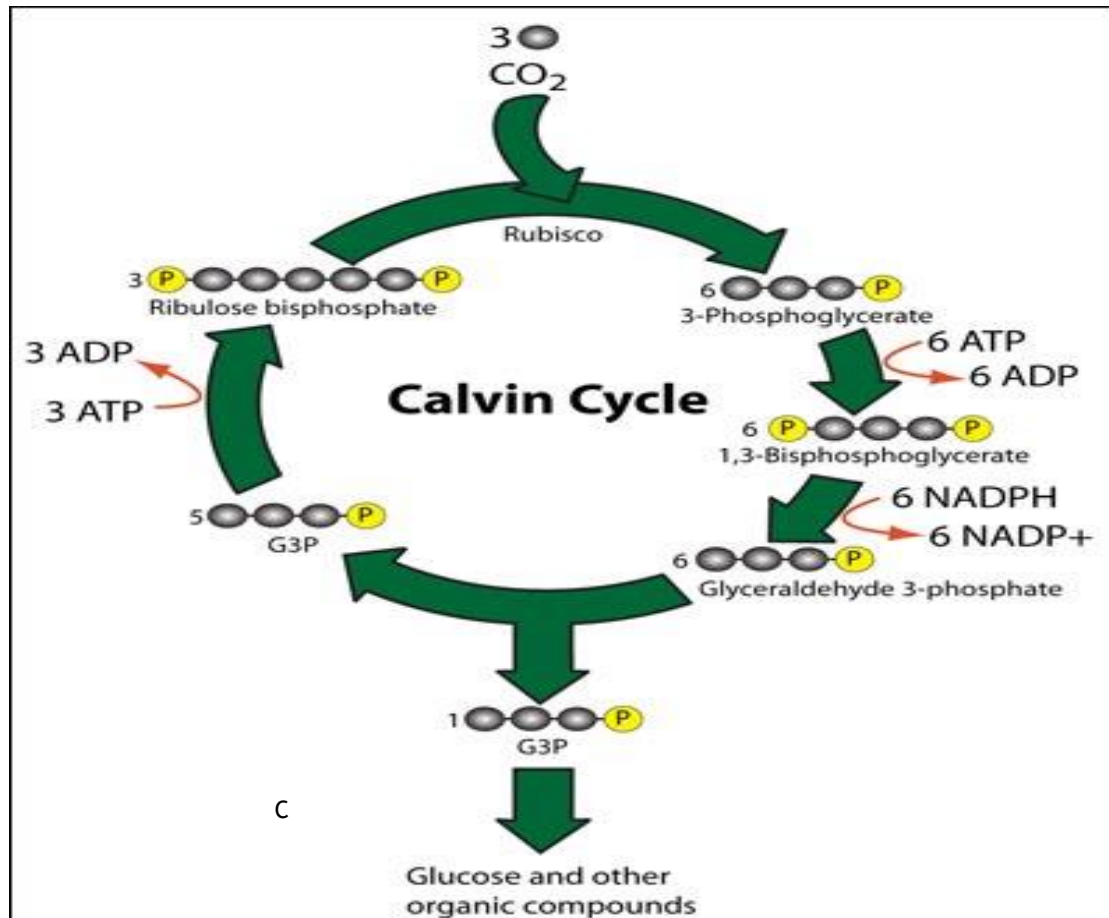
Step 3-Generation of ATP

This is done by the utilization of two separate photosystems in photosynthesis' light reactions, one for ATP production and the other for NADPH production. Electrons are transmitted between the two photosystems in a sequential manner, with photosystem I producing NADPH and photosystem II producing ATP.



Step 4- Carbon Fixture

The transfer of inorganic carbon to an organic molecule is known as carbon fixing. Carbon fixation is the first phase of the C₃ or Calvin Cycle, and it occurs during the light-independent response of photosynthesis.

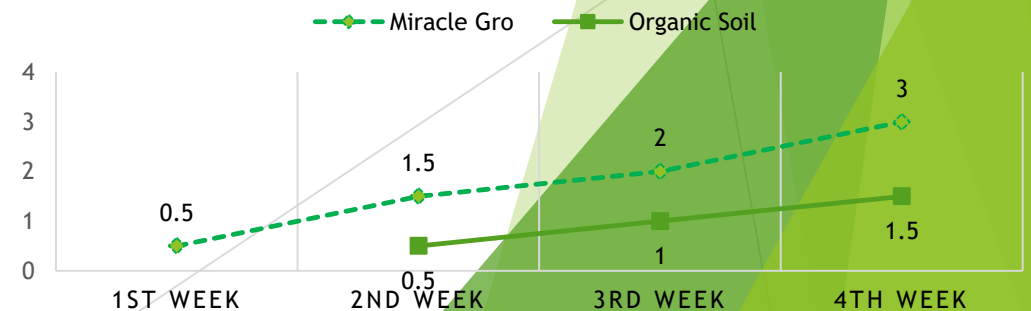


Growing Radish Seeds—*Miracle Gro vs. Organic soil*

- ▶ **Manipulation Choice:** I chose to use Miracle Gro and organic soil to grow my radish seeds in order to observe how fast one would grow over the other.
 - ▶ Miracle Gro is a synthetic fertilizer that contains ammonium phosphate and several other chemicals that can be toxic to your soil and plants. However, it used to grow plants at a steady fast pace.
- ▶ **Hypothesis:** The radish seeds in the Miracle Gro soil would grow faster than the organic soil because of the additional chemicals added which helps to facilitate quicker growth.
- ▶ **Methods and Materials:**
 - 1) used Miracle Gro and Organic soil separately with the radish seeds
 - 2) germinated the seeds for one week in a wet paper towel and sat them in a window seal
 - 3) planted about 10 seeds in each red solo cup after one week and watered both at the same day and time
 - 4) kept both cups of seed and soil sitting in a window seal for 30 days

▶ **Results:**

- ▶ The test supported my hypotheses—Miracle Gro grew 2x faster than the organic.



Conclusion

Plants are the biosphere's producers, producing the oxygen and glucose that most species require. Plants' chloroplasts are where photosynthesis takes place. The sunlight is converted into ATP and NADPH in light reactions. The Calvin Cycle, often known as the dark processes, employs ATP and NADPH to convert CO₂ into sugar. This is the way earth and the sun work together in helping plants grow.

However if you are wanting your plants to grow at a faster pace, Miracle Gro will speed up the expansion in plants because it is a fertilizer substance that is given to a plant's growth medium to replenish nutritional minerals that may be deficient. Minerals are utilized in extremely small amounts, in some cases virtually microscopic, to assist build all of the plant's numerous sections, including enzymes, proteins, vitamins, reproductive systems, and so on. Plant development is limited by mineral deficiencies, however adding particular minerals to the soil can boost growth and production. This is why my hypothesis was correct on seeds growing at a faster rate with Miracle Gro.