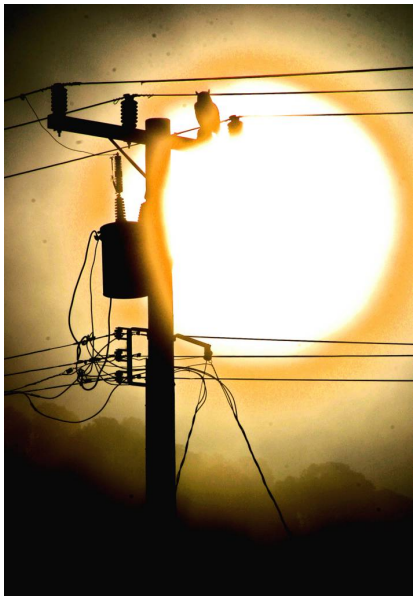
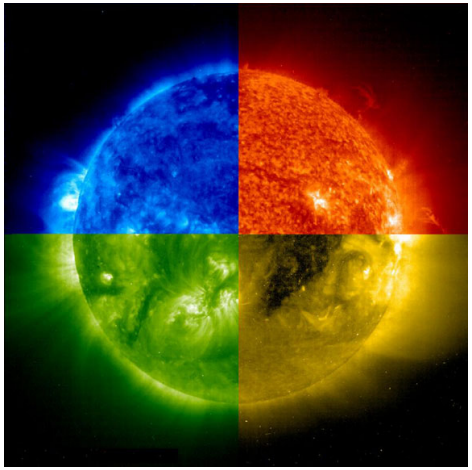
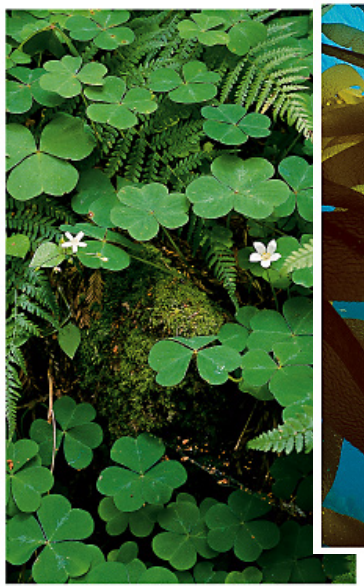
THE SUN: MAIN SOURCE OF ENERGY FOR LIFE ON EARTH



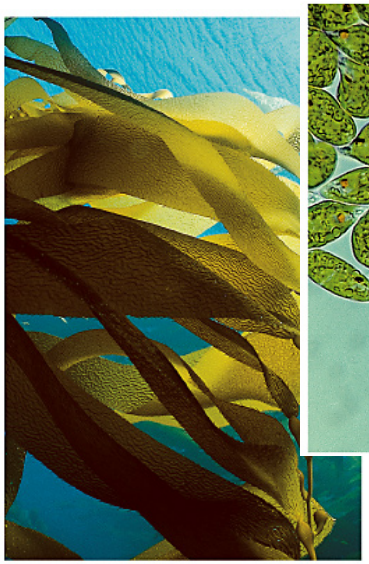


THE BASICS OF PHOTOSYNTHESIS

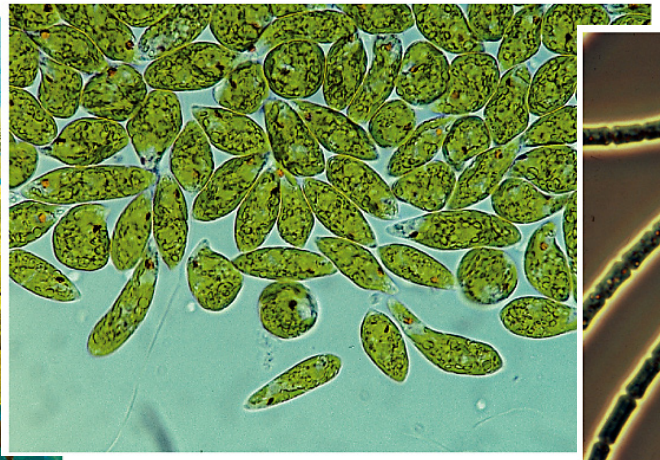
- Almost all plants are photosynthetic autotrophs, as are some bacteria and protists
  - Autotrophs generate their own organic matter through photosynthesis
  - Sunlight energy is transformed to energy stored in the form of chemical bonds



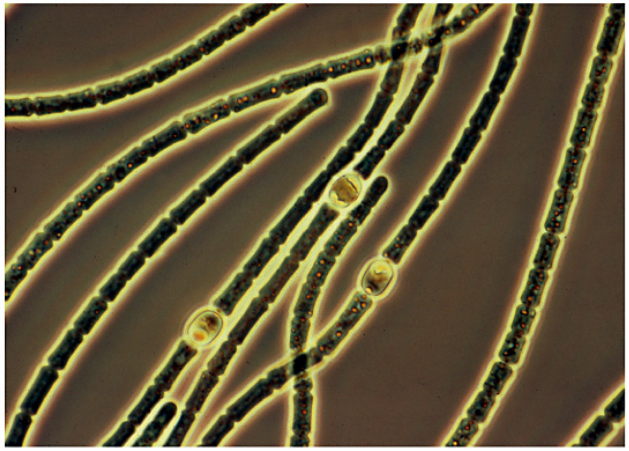
(a) Mosses, ferns, and *flowering plants*



(b) Kelp

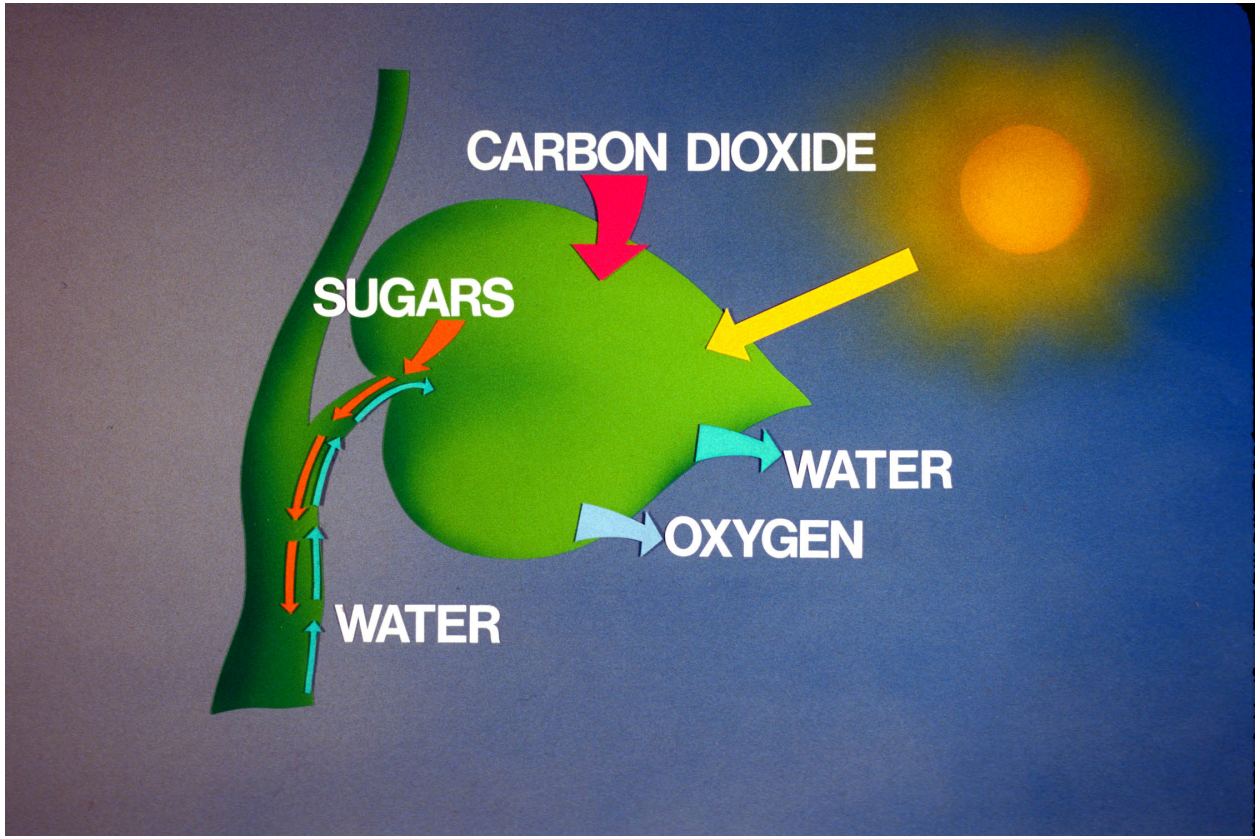


(c) *Euglena*



(d) Cyanobacteria

Light Energy Harvested by Plants & Other Photosynthetic Autotrophs



$6\ CO_2 + 6\ H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6\ O_2$

EQUATION FOR PHOTOSYNTHESIS

WATER

OXYGEN

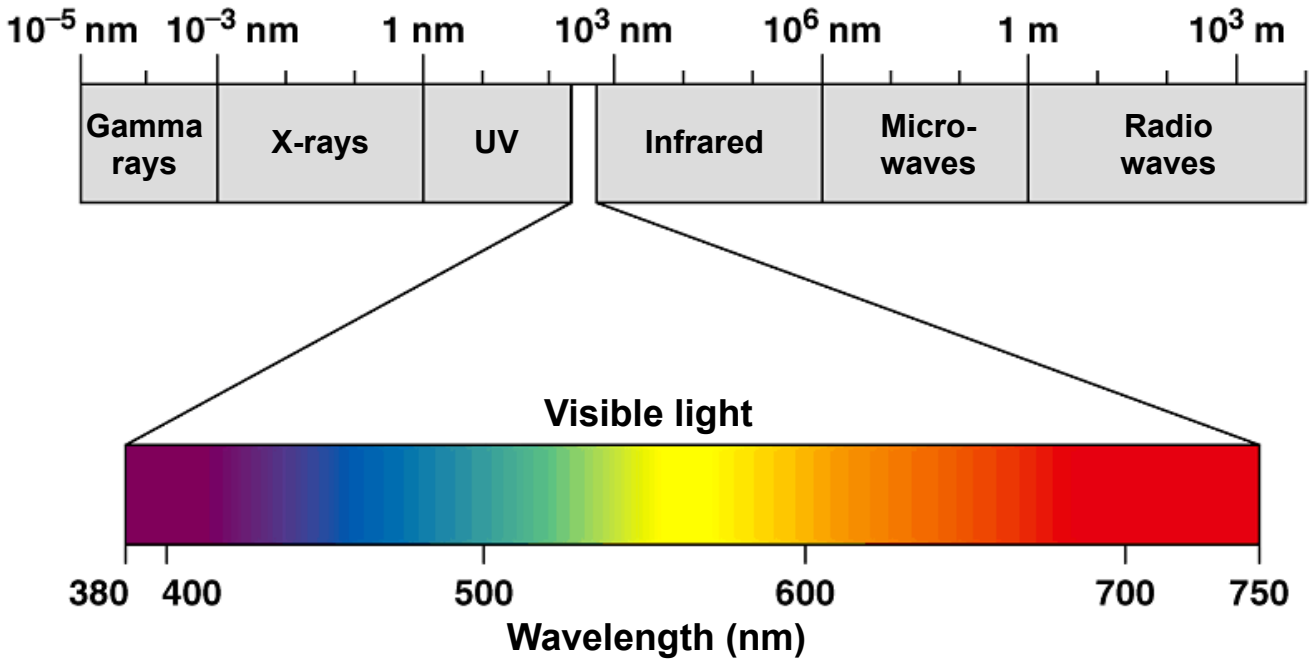
$6CO_2 + 6H_2O + ENERGY \rightarrow C_6H_{12}O_6 + 6O_2$

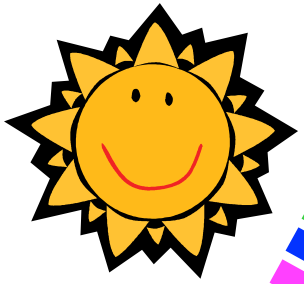
CARBON DIOXIDE

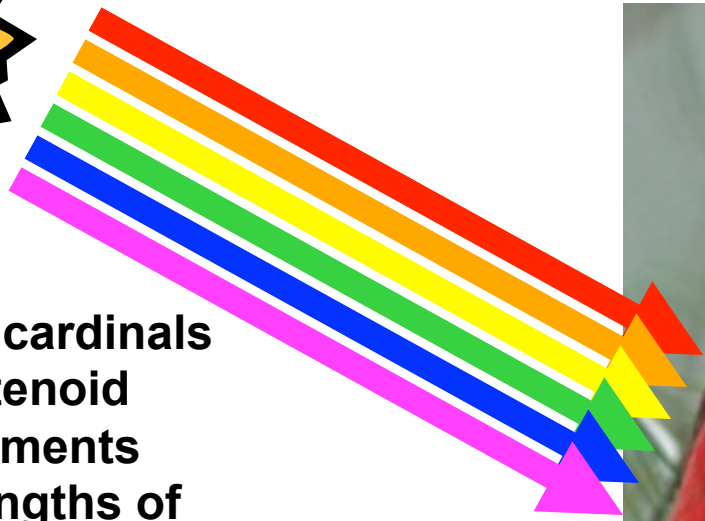
GLUCOSE

WHY ARE PLANTS GREEN?

Different wavelengths of visible light are seen by the human eye as different colors.



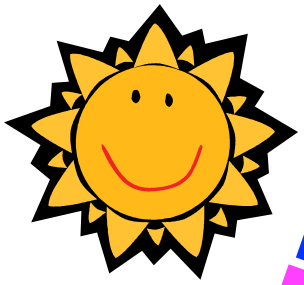




The feathers of male cardinals are loaded with carotenoid pigments. These pigments absorb some wavelengths of light and reflect others.

Reflected light

Sunlight minus absorbed wavelengths or colors equals the apparent color of an object.



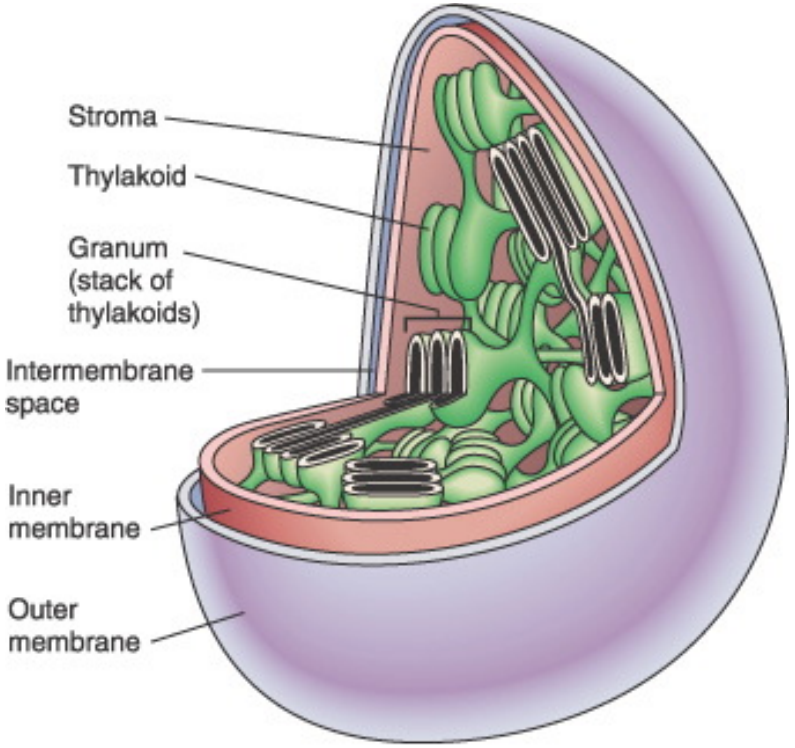
Why are plants green?

Reflected light

Transmitted light

WHY ARE PLANTS GREEN?

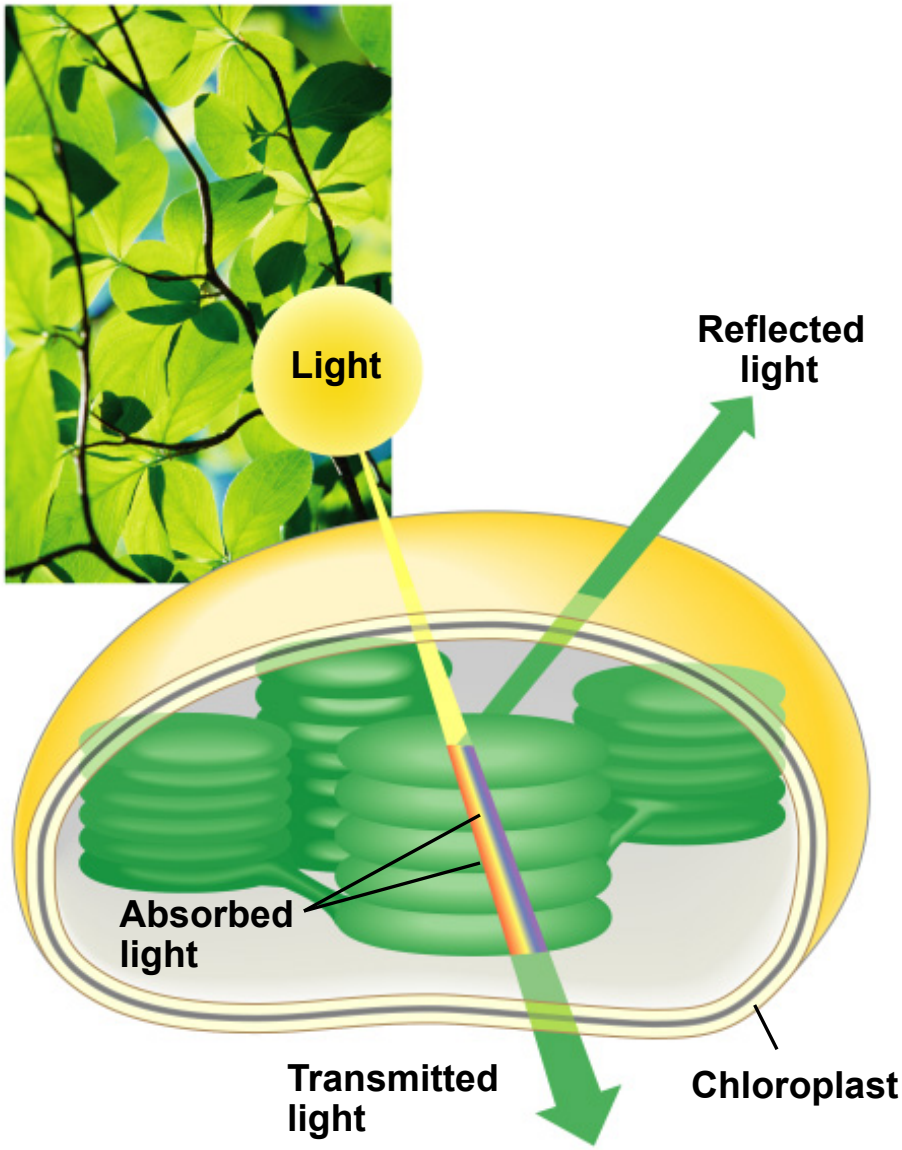
Plant Cells have **Green** Chloroplasts



The thylakoid membrane of the chloroplast is impregnated with photosynthetic pigments which are green!

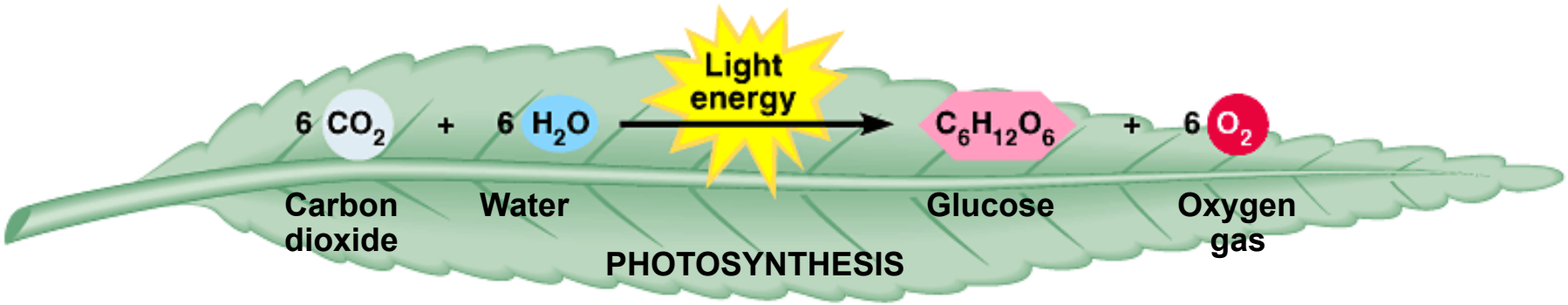
THE COLOR OF LIGHT SEEN IS THE COLOR NOT ABSORBED

- Chloroplasts absorb light energy and convert it to chemical energy



AN OVERVIEW OF PHOTOSYNTHESIS

Photosynthesis is the process by which autotrophic organisms use light energy to make sugar and oxygen gas from carbon dioxide and water



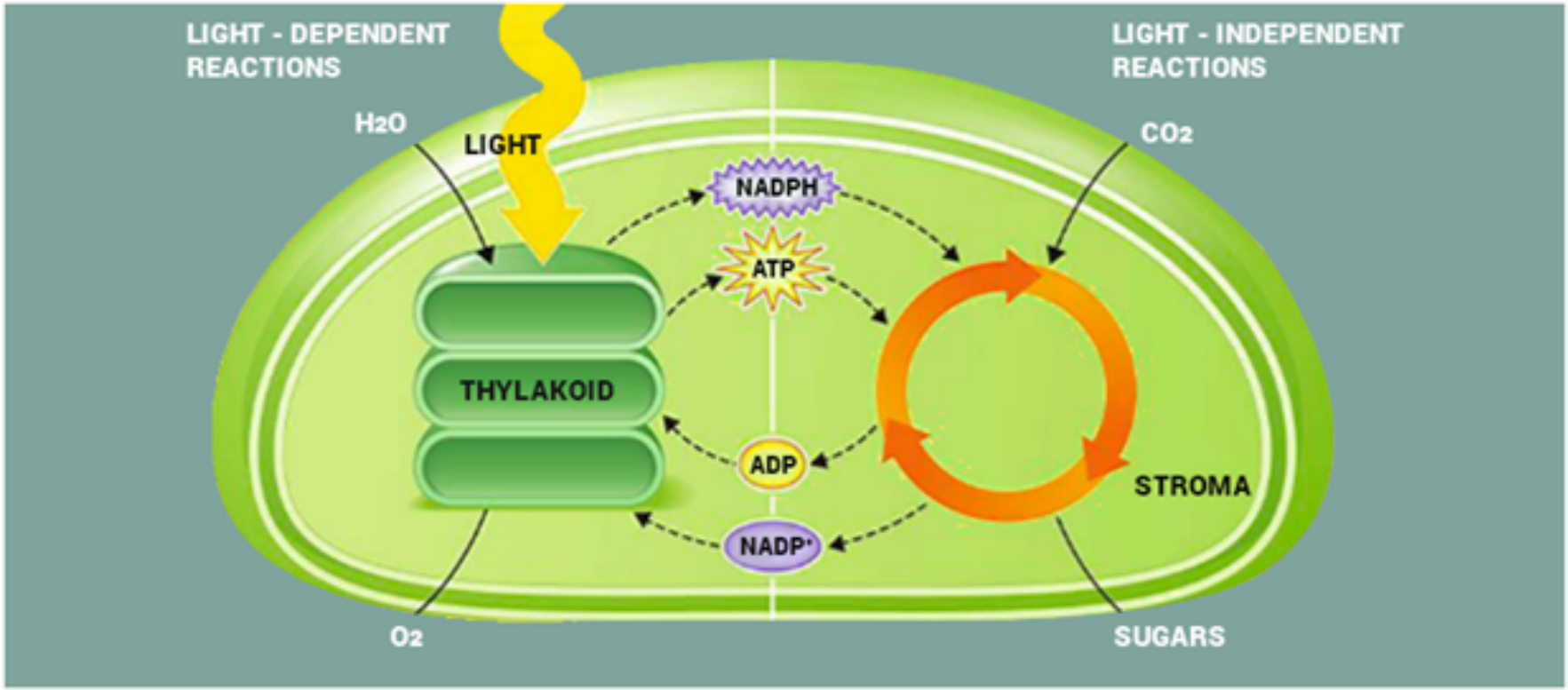
Two types of reactions

Light or

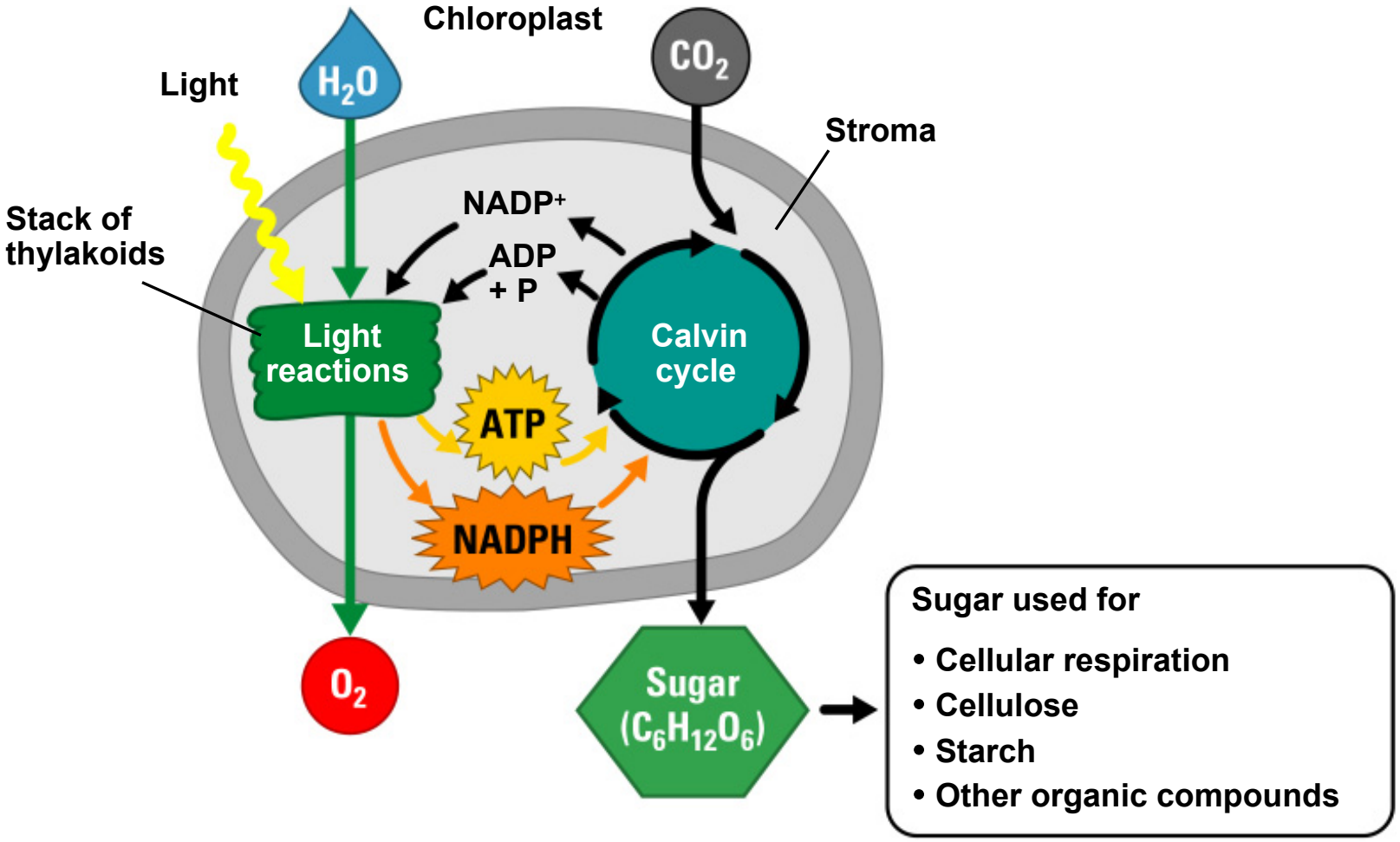
Light dependent

Dark or Light independent

also known as the Calvin cycle



A Photosynthesis Road Map




It's not that easy bein' green.... but it is essential for life on earth!