

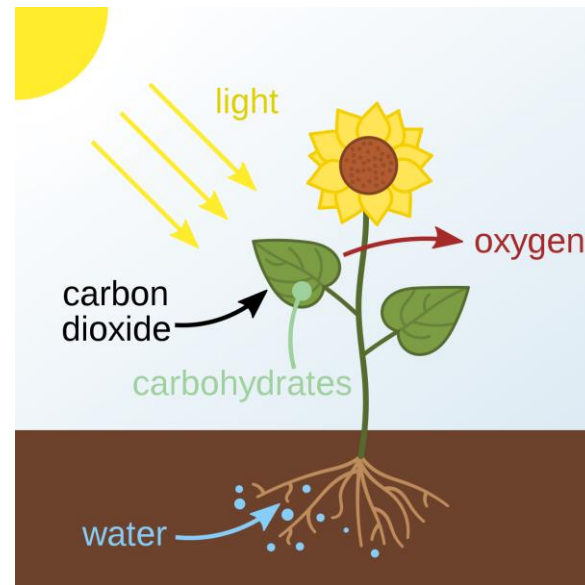
# Photosynthesis Overview

Ms. Mercado  
10th grade Biology



# Objective

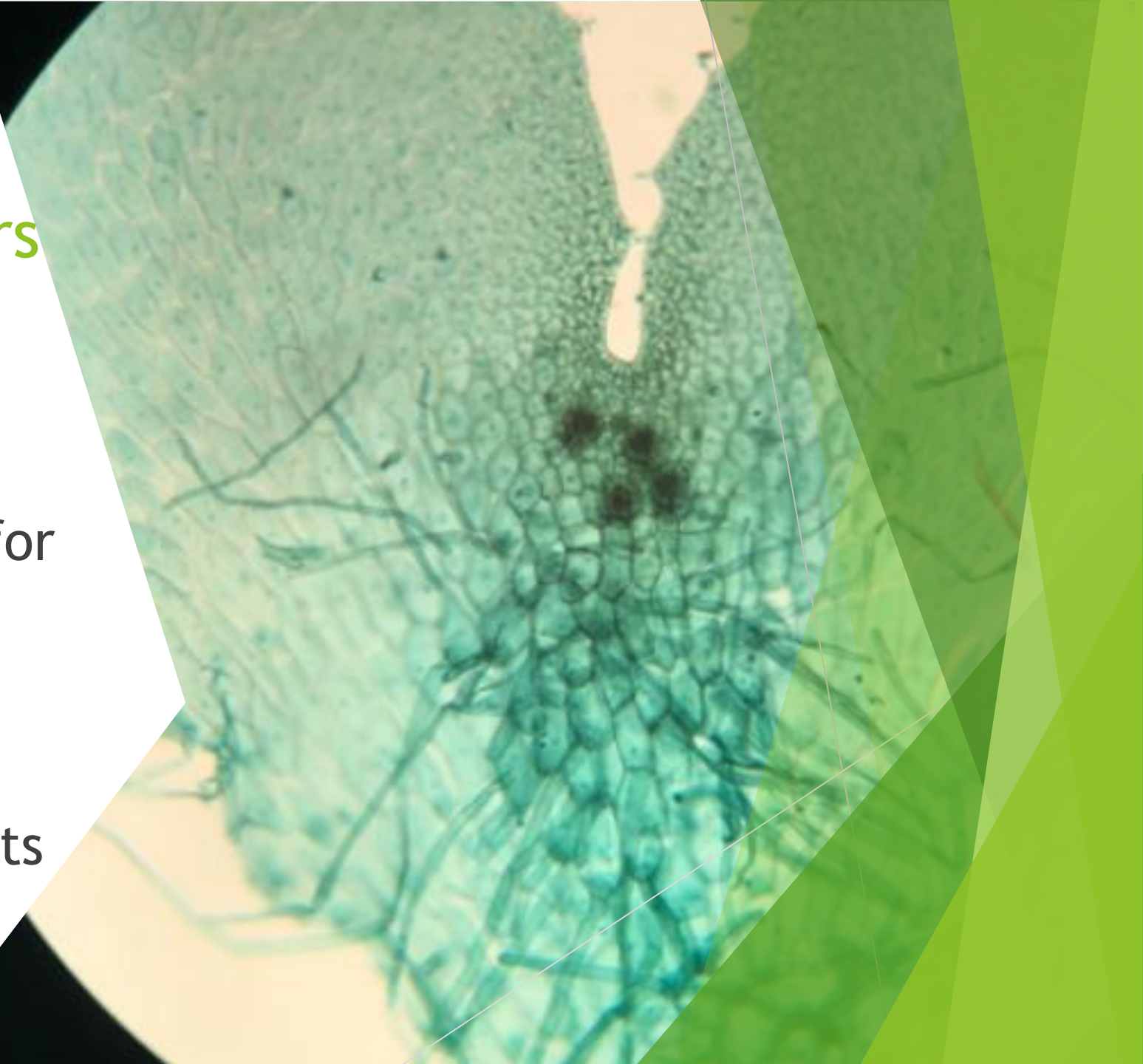
- ▶ After this presentation students will be able to explain through graphic organizers each step of the overall photosynthesis reaction.



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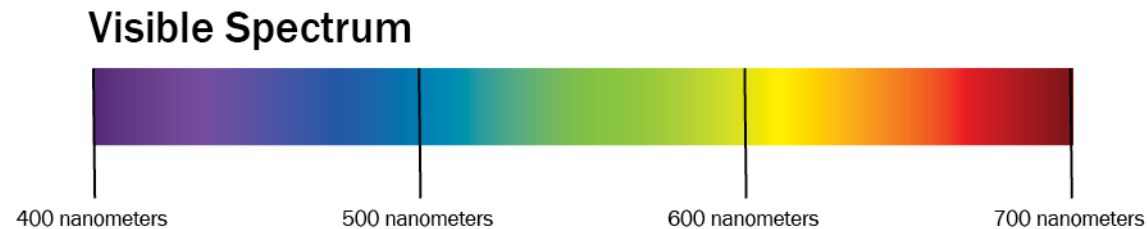
# Photosynthetic organisms are producers

- ▶ Some organisms are called **producers (autotrophs)** because they produce the source of chemical energy for themselves and for other organisms.
  - ▶ Plants
  - ▶ Some bacteria and protists



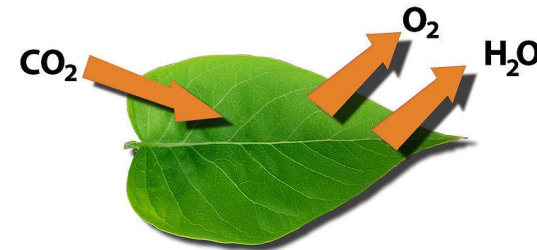
# Photosynthetic organisms are producers

- ▶ **Photosynthesis** is a process that captures **energy** from **sunlight** to make **sugars** that store **chemical energy**.
- ▶ Plants absorb **visible light** for **photosynthesis**  
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- ▶ Visible light is made up of several colors, or **wavelengths**



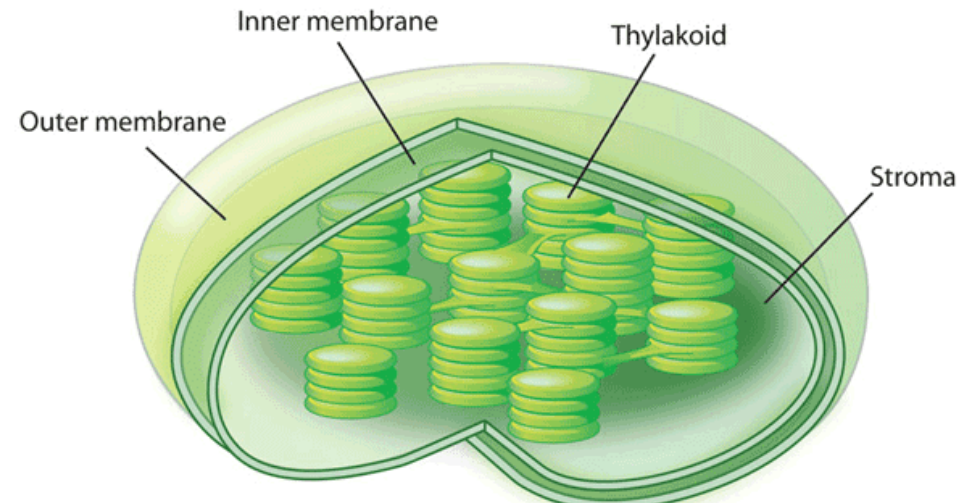
# Photosynthetic organisms are producers

- ▶ **Chlorophyll** is a molecule in chloroplasts that absorb mostly red and blue wavelengths of visible light.
  - ▶ *Chlorophyll a*
  - ▶ *Chlorophyll b*
- ▶ The green color of plants comes from the reflection of light's green wavelengths by chlorophyll



# Photosynthesis in plants occurs in chloroplasts

- ▶ **Chloroplasts** are the membrane-bound organelles where photosynthesis takes place in plants.
  - ▶ Most are in leaf cells specialized for photosynthesis
- ▶ Two main parts of chloroplasts are the **grana** and **stroma**



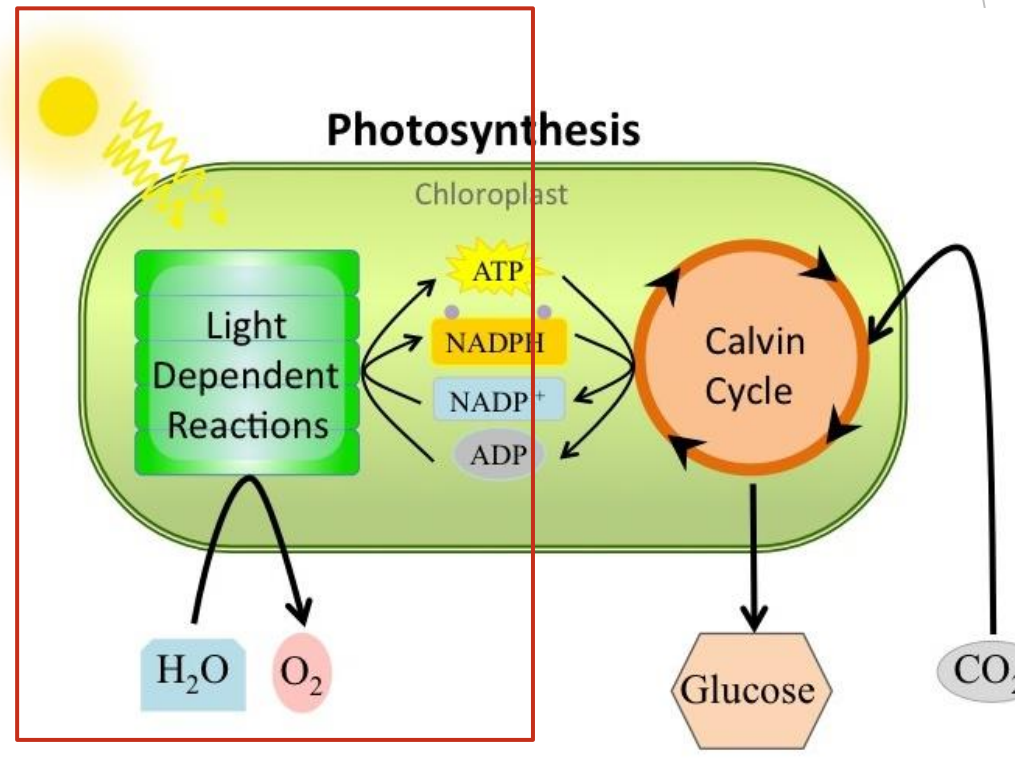
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# Photosynthesis in plants occurs in chloroplasts

- ▶ **Grana:** stacks of coiled shaped, membrane enclosed compartments called **thylakoids**.
  - ▶ Membrane of the thylakoids contain chlorophyll, other light absorbing molecules and proteins
- ▶ **Stroma:** fluid that surrounds the grana inside a chloroplast

# Overview: Light dependent reactions

- ▶ Capture energy from sunlight and transfer it to ATP.
- ▶ Take place within and across the membrane of the thylakoids
- ▶ Water and sunlight are needed for this stage





# Overview: Light dependent reactions

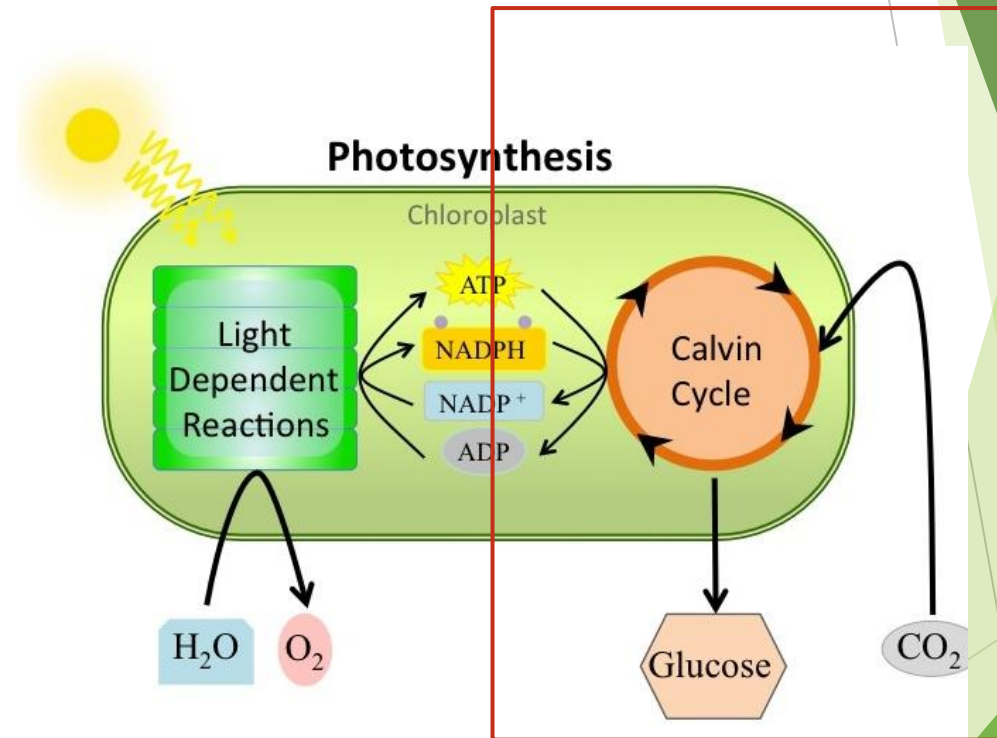
Chlorophyll absorbs energy from sunlight and transferred along the thylakoid membrane.

Water (H<sub>2</sub>O) molecules are broken down and Oxygen (O<sub>2</sub>) molecules are released.

Energy carried along the thylakoid membrane is transferred to molecules that carry energy, such as ATP.

# Overview: Light independent reactions

- ▶ Use energy from the light-dependent reactions to make sugars.
- ▶ Occurs in the stroma of chloroplasts.
- ▶ Carbon dioxide (CO<sub>2</sub>) molecules are needed during this stage.

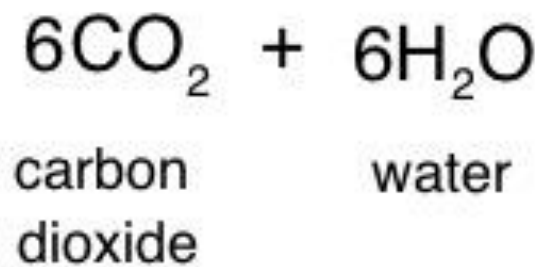


# Overview: Light independent reactions

CO<sub>2</sub> is added to a cycle of chemical reactions to build larger molecules.

Energy from the light-dependent reactions is used.

A molecule of a simple sugar is formed. It stores the energy captured from sunlight.



Photosynthesis  
→

Several arrows mean multiple steps and enzymes

