Photosynthesis: $6\text{CO}_2 + 12\text{H}_2\text{O} + \text{Light} = C_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 + 6\text{H}_2\text{O}$

Input:
- 
- 
- 

Output:
- 
- 
- 

Respiration: $C_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 = 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy}$

Input:
- 
- 
- 

Output:
- 
- 
- 

ATP:

Stages of photosynthesis

1. Light Reaction
   a. Light Harvesting
   b. Water splitting
   c. Electron transport & Photophoralation

2.

3.
Where does each part of photosynthesis take place?

Mesophyll cells of the Plant

Chloroplast-
- Granum – Light reaction
  - Lumen- proton accumulation
  - Thylakoid- light reaction
- Stroma:

Carbon Cycle

Where does the Carbon cycle take place?

Which molecules provide the energy for carbon fixation?

What is the main carbon-fixing enzyme? What are two problems associated with this enzyme?

3 stages of the Calvin Cycle:

1.
2.
3.

Draw the number of carbon and phosphate elements in RuBp:

Draw the number of carbon and phosphate elements in PGAL:
What is the main product of the Calvin Cycle?

**Climate Change and Photosynthesis**

- Climate change is driven by ___________________
- **Carbon Dioxide** is a key greenhouse gas

**The Affects of Increased Carbon Dioxide on Plants**

- Plants can only absorb and process a limited amount of CO₂ due to the limitations of other factors within the Calvin cycle
  - Limiting factors for the demand of CO₂
    - RuBP regeneration limited
    - Sugar accumulation limited
    - Rubisco limited

\[ A = \text{photosynthetic rate} \]
\[ Ci = \text{CO}_2 \text{ inside the leaf} \]

- What happens to the photosynthetic rates as temperature increases?

**Climate Change Affects on Photosynthesis**

- Change in temperature
  - Effects the rate of enzyme reactions
  - Water access

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• Change in rainfall

• Seasonal plants
  o Adapted to specific climate cycles