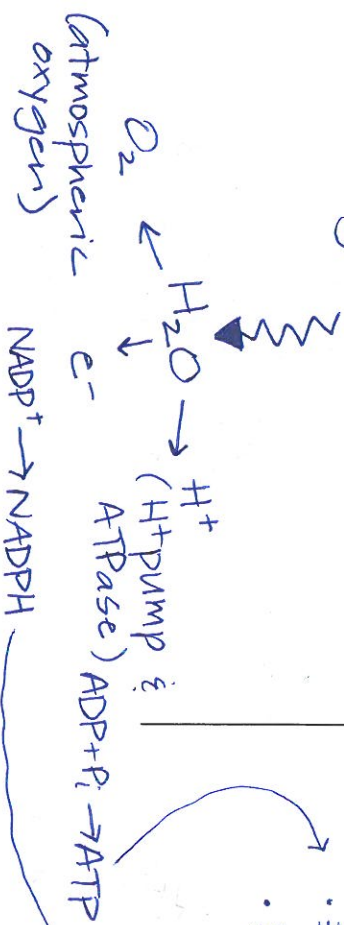


Photosynthesis: $6 \text{ CO}_2 + 6 \text{ H}_2\text{O} + \text{energy} \rightarrow 1 \text{ C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2$

Light Reactions

- occurs in thylakoids
- Light energy from sun is absorbed by the plants & splits water.

Light energy

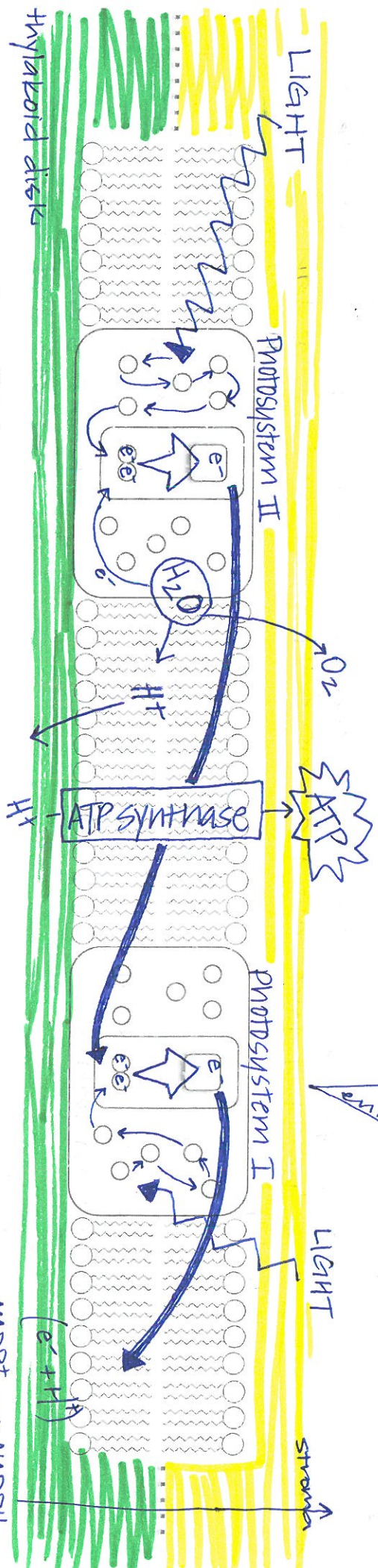
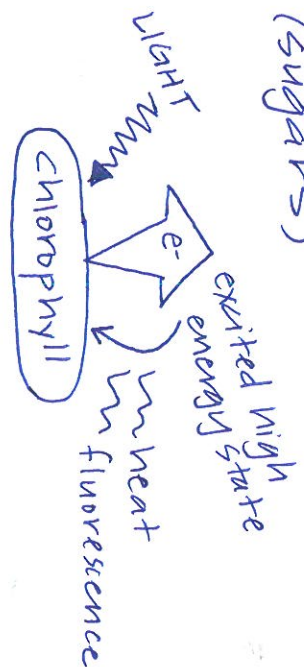
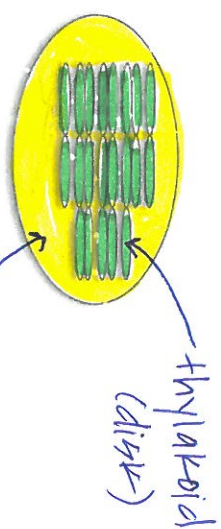


Dark Reactions (Calvin Cycle)

- occurs in the stroma
- CO_2 is added to existing organic molecules by the enzyme Rubisco to make carbs (sugars)

NEEDS:

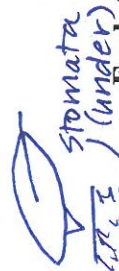
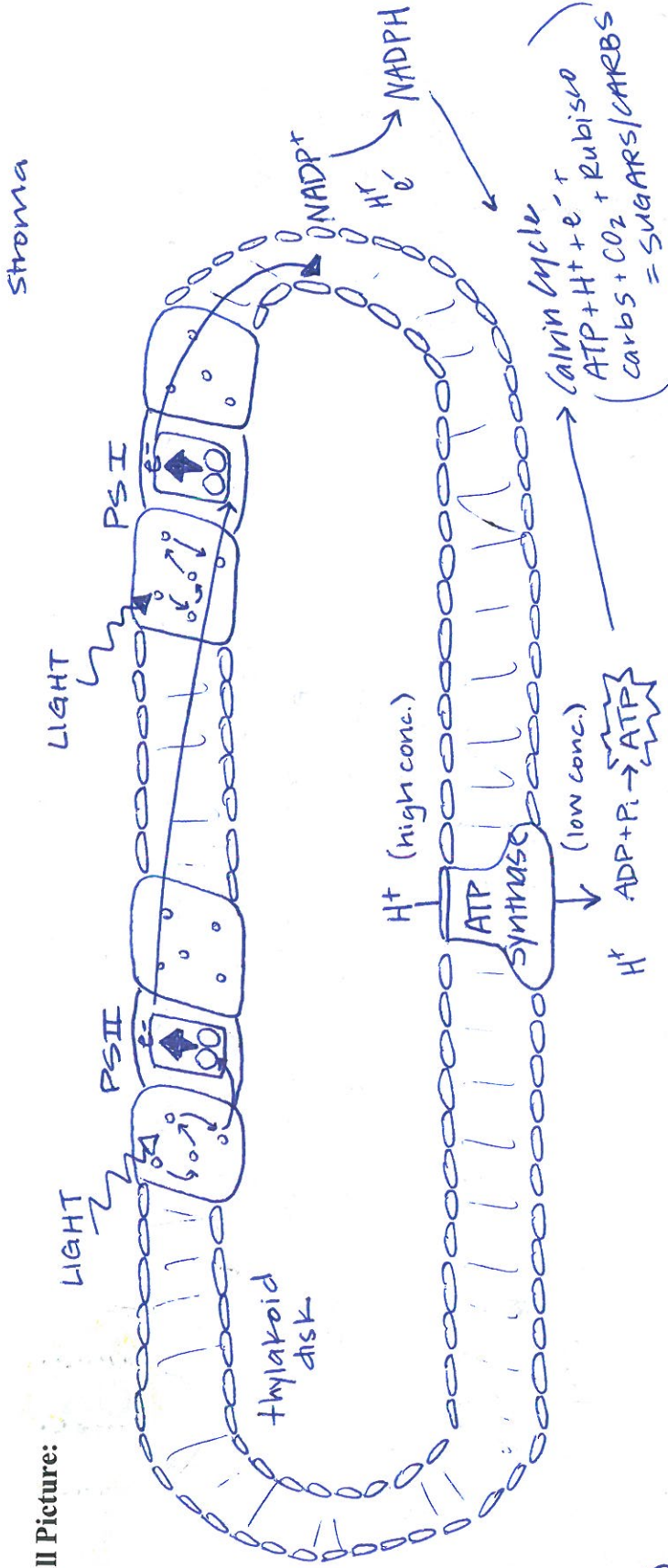
- Energy
- H^+ and e^-



Light Rxn details:

- 1.) Light excites chlorophyll molecules, e^- moved to ↑ energy state; H_2O split
- 2.) e^- move through membrane & ATP created by chemiosmosis
- 3.) e^- move to PSI and NADP^+ picks the e^- and H^+ at the end.

Overall Picture:



Evolution Connections: Plants & Energy

	C ₃	C ₄	CAM
	"Spatial"	"Spatial"	"Temporal"
Stomata	partially closed on hot, dry days (Avoid H ₂ O loss)	closed for most of the day	close stomata completely during the day & open during the night
Production	↓ sugar production because Calvin cycle (dark rxn's) doesn't get enough CO ₂	PEP carboxylase will create CO ₂ in another cell to be used in the Calvin cycle.	→ DAY: closed, no CO ₂ in, pulls from night storage, light makes ATP & NADPH for Calvin cycle. → NIGHT: stomata open, gathers and stores CO ₂
Examples	ex. rice, wheat, soy	ex. corn, grass, sugarcane	ex. cacti, pineapples