PLANTS, ALGAE → **PHOTOSYNTHESIS** → Redox Reaction (Predominantly Reduction), Anabolic Reaction

↓ CYANOBACTERIA

Auto-trophic Organisms

- Simple Molecules
- Inorganic Molecules
- Energy Poor
- Oxides of C, H

→

- Complex Molecules
- Organic Molecules
- Energy Rich
- Hydrates

"OXIDATION"

$6CO_2 + 12xH_2O \xrightarrow{Chl.} C_6H_{12}O_6 + 6O_2 + 6H_2O$

"REDUCTION" ⇝ Main Reaction

REACTANTS

- CO_2 → 0.03 - 0.04 %
- H_2O
- Light → "Limiting Reactant"
- Chlorophyll

PRODUCTS

- $C_6H_{12}O_6$
- O_2

VAN NEIL HYPOTHESIS

- "O_2 came from water molecules"

Group - I

$6CO_2 + 12H_2O^{18} \longrightarrow C_6H_{12}O_6 + 6H_2O + 6O_2^{18}$

Group - II

$6C^{18}O_2 + 12H_2O \longrightarrow C_6H_{12}O_6 + 6H_2O + 6O_2$

→ Transducing

LIGHT REACTION

- Light Dependant
- Granum / Thylakoid
- Energy conversion

light → Chemical Energy

Assimiliatory Power . ATP

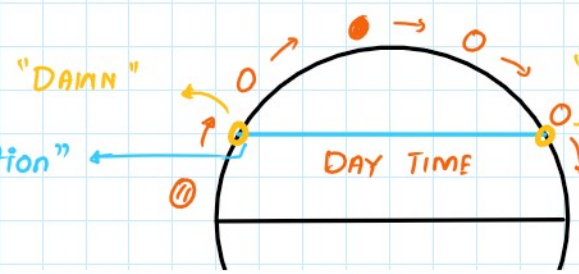
Reducing Power . NADPH

DARK REACTION

- Light independant
- Stroma / Ground substance
- Reduction / Sugar formation

CO_2 → $C_6H_{12}O_6$

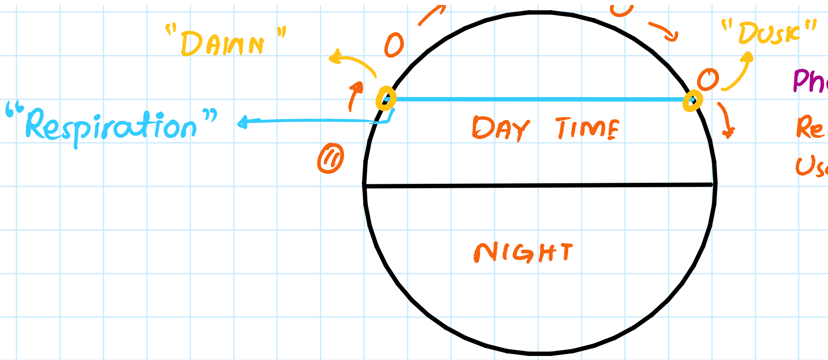
"COMPENSATION POINT"



Photosynthesis = Respiration

Release of O_2 = Use of O_2

Use of CO_2 = Release of CO_2



Photosynthesis = Respiration

Release of O_2 = Use of O_2

Use of CO_2 = Release of CO_2