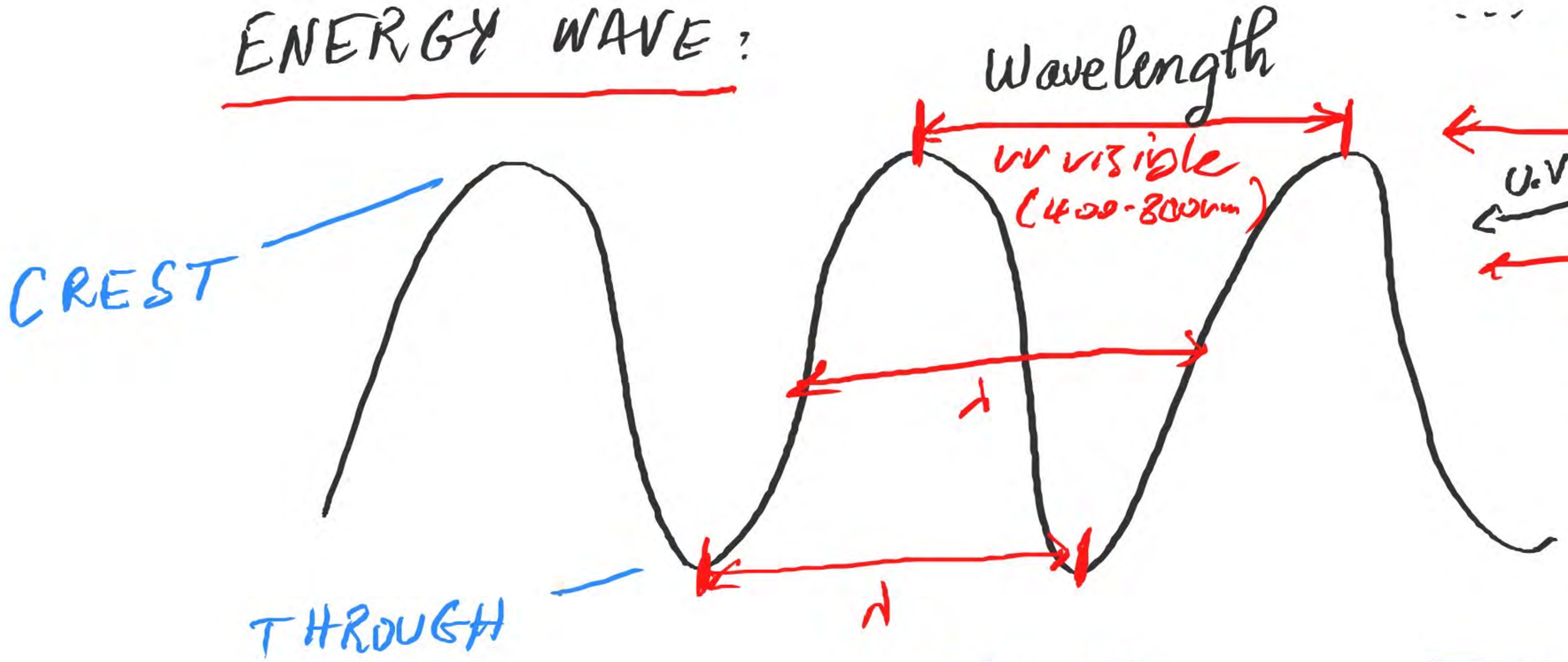
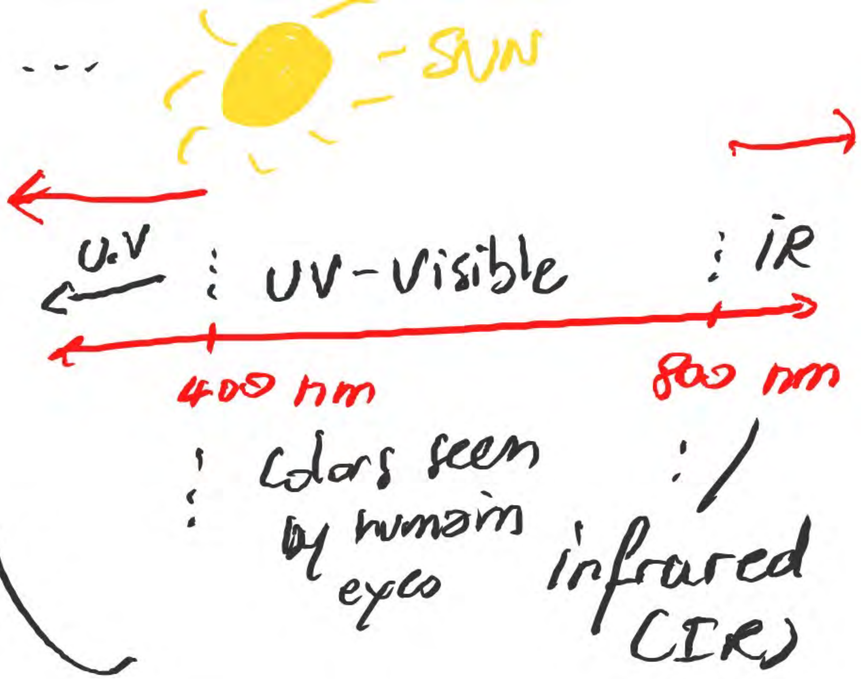
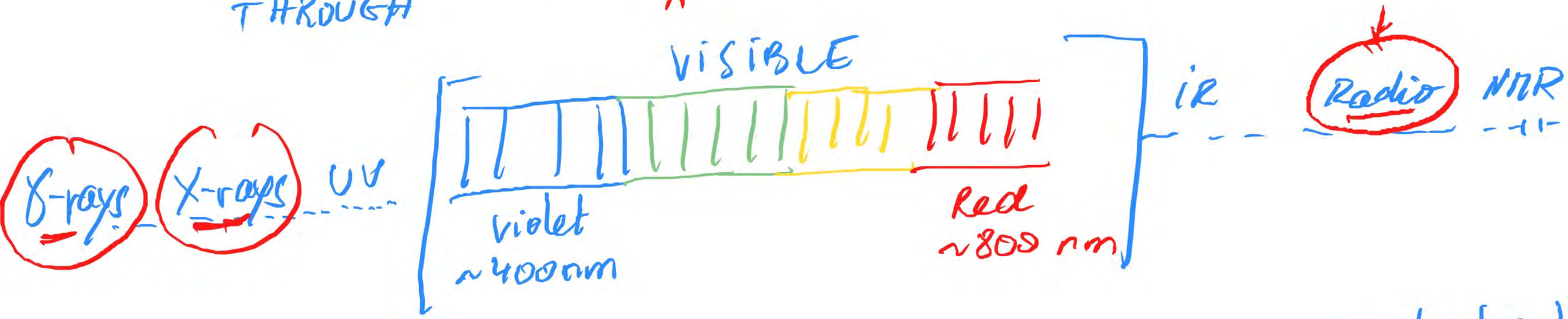
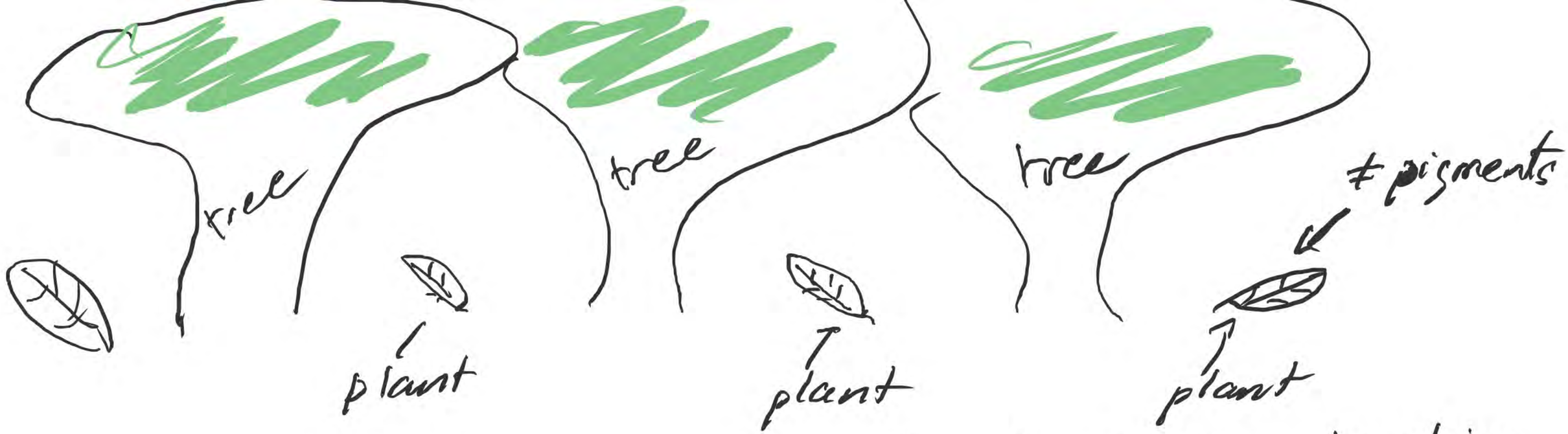
ENERGY WAVE:


Wavelength
UV visible
(400-800nm)
CREST
THROUGH
λ
λ


SUN
U.V
UV-Visible
IR
400 nm
800 nm
Colors seen by human eyes
infrared (IR)

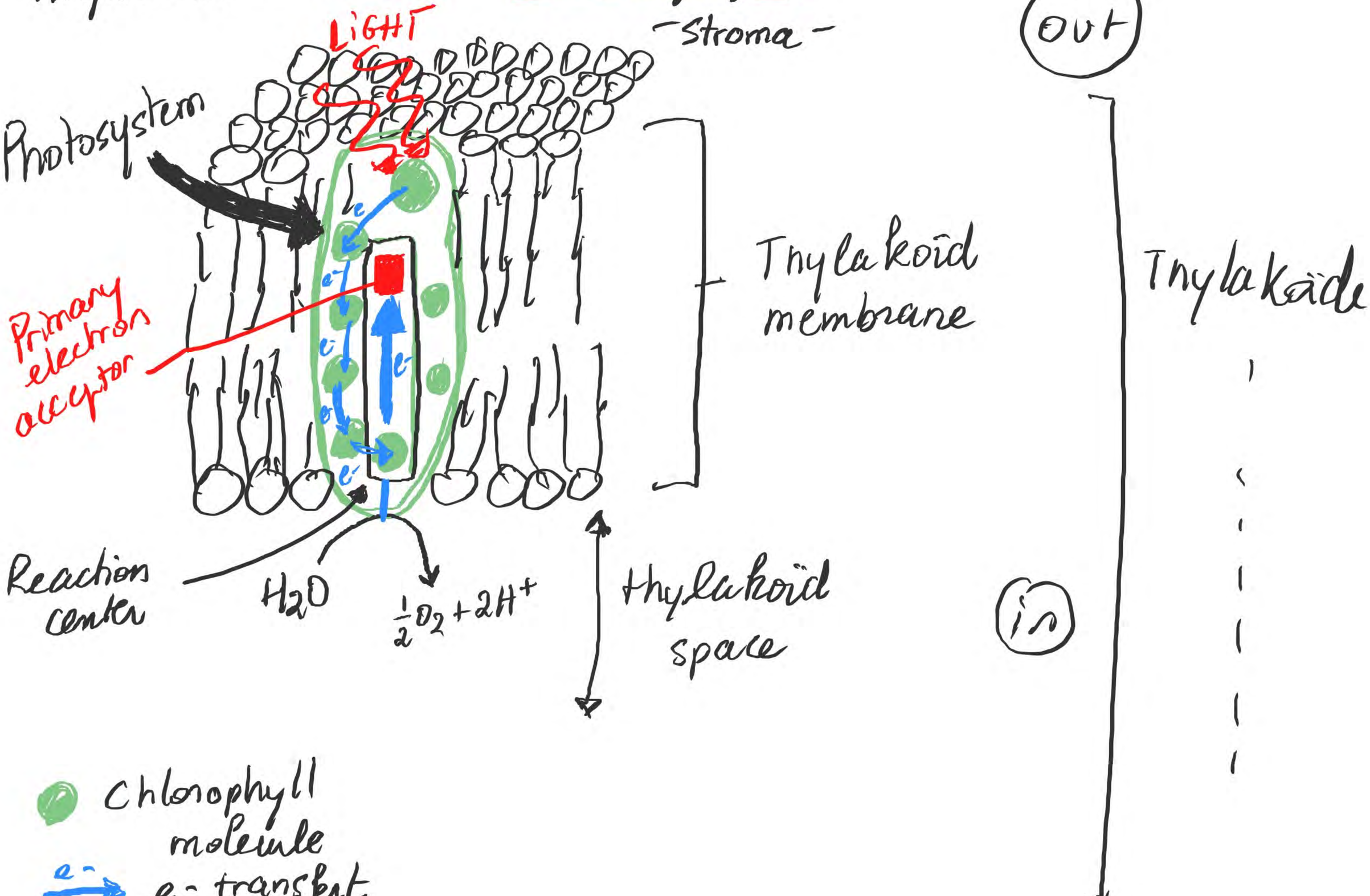

VISIBLE
γ-rays
X-rays
UV
violet
~400nm
Red
~800 nm
IR
Radio
NMR
γrays Xrays UV
⊕ lower λ
⊕ higher λ
Energy
⊕ high E
low E
wavelength in nm
(Joule)

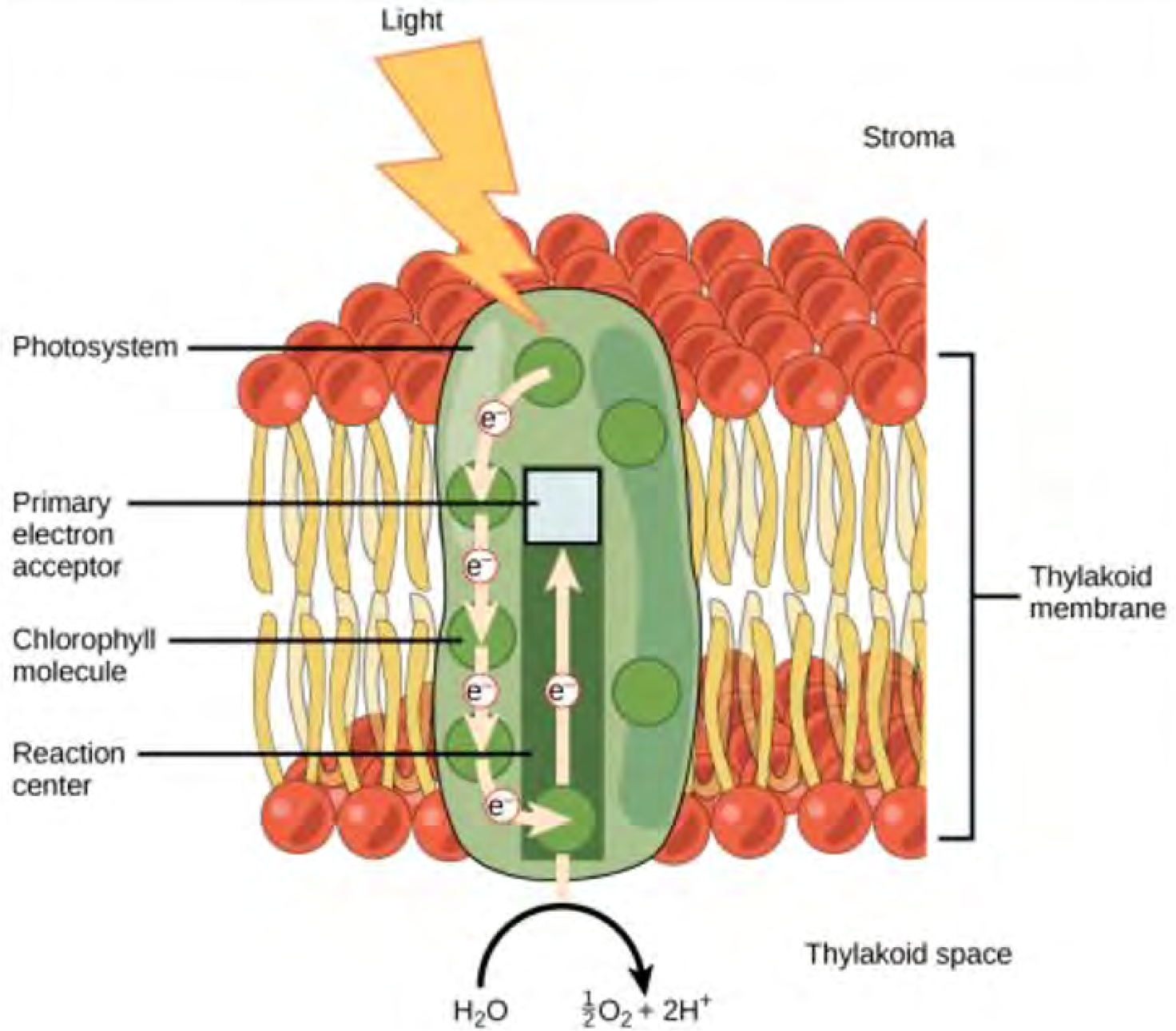


→ "Shade" plants → need variety of light-absorbing pigments.

—> Each pigment can absorb ≠ wavelengths of light. Allow the plant to absorb any light that passes through the taller trees.

important molecule: Chlorophyll




Light
Stroma
Photosystem
Primary electron acceptor
Chlorophyll molecule
Reaction center
Thylakoid membrane
Thylakoid space
e⁻
e⁻
e⁻
e⁻
e⁻
H2O
½O2 + 2H+

INPUT CO_2

CALVIN CYCLE

3PGA

RuBP

Ribulose 1,5 biphosphate (= CO_2 acceptor)

G3P

SUGAR OUTPUT

ATP

NADPH

energy-carrying molecule

stroma

NADP+

ADP

H_2O INPUT

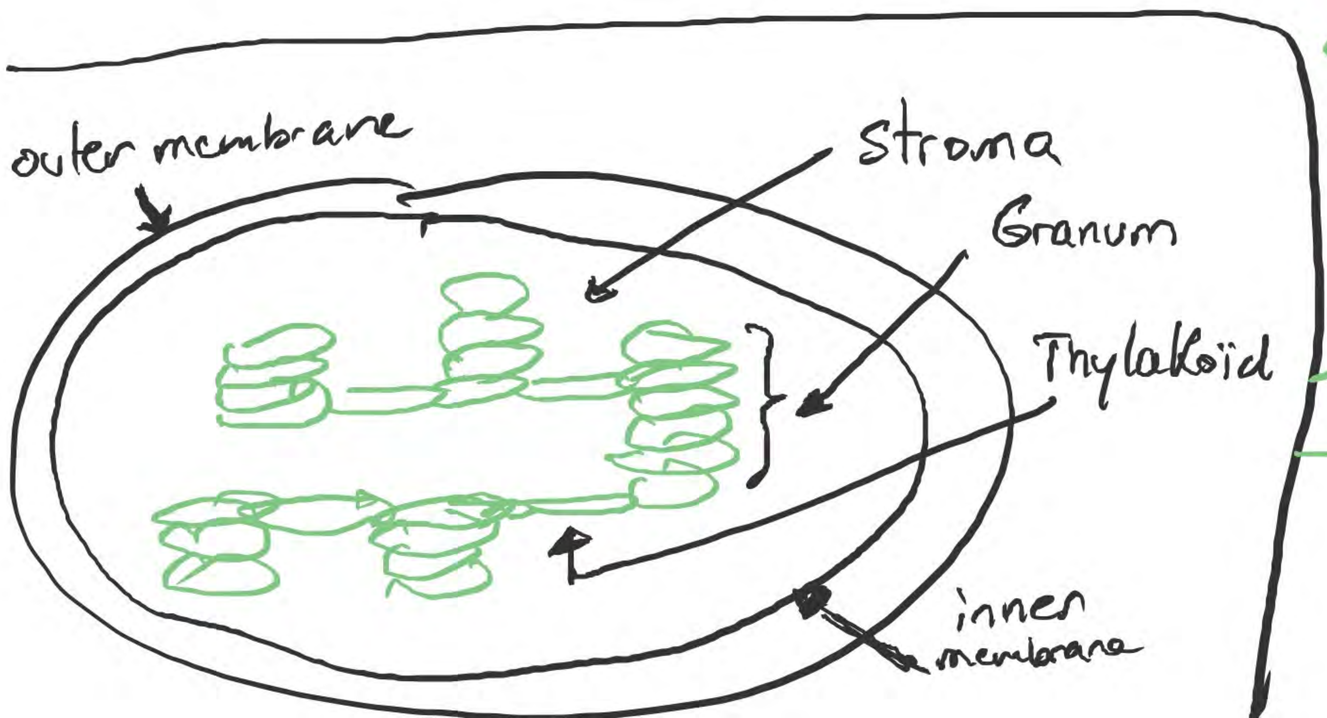
LIGHT (SUN)

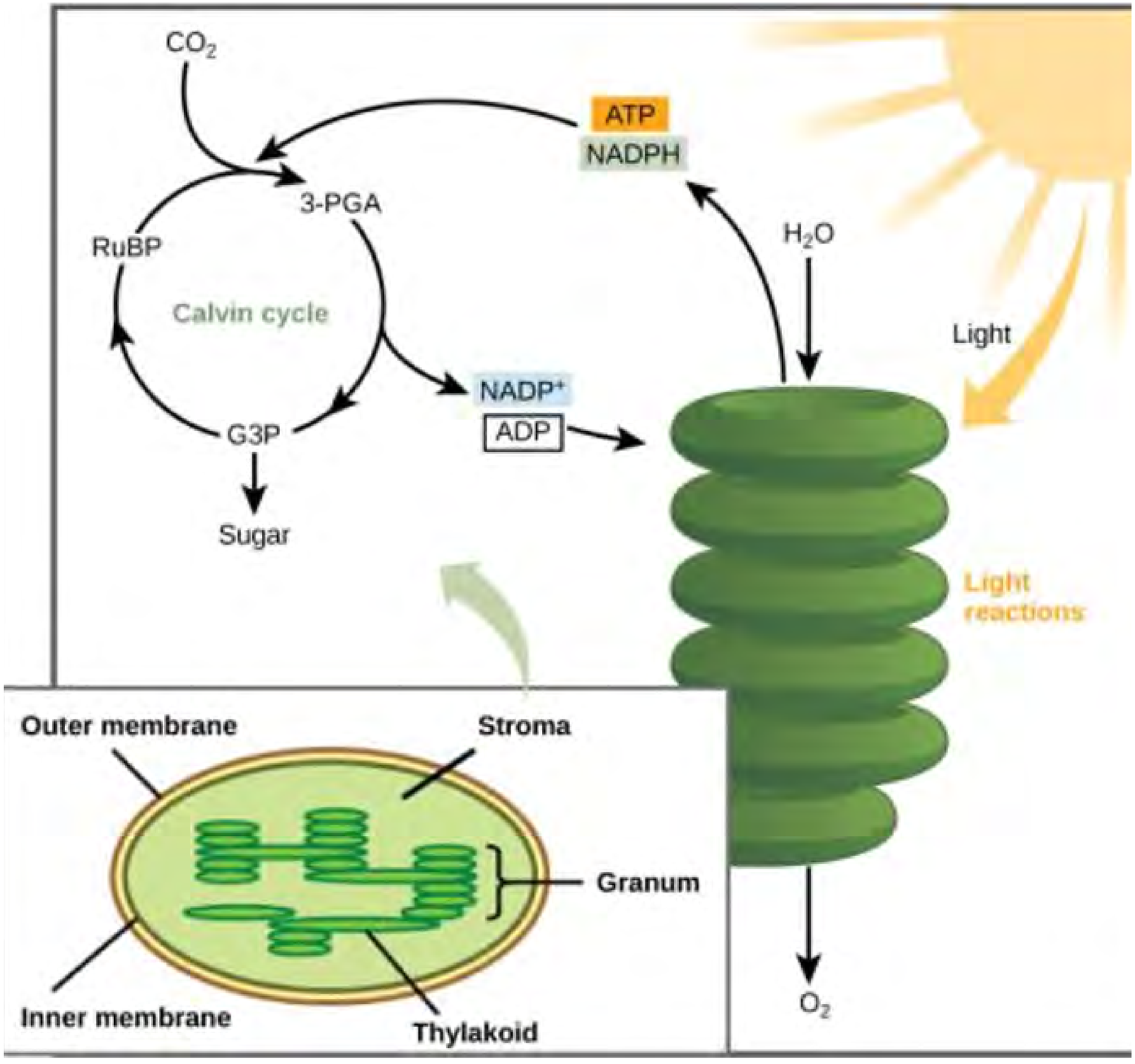
LIGHT INPUT

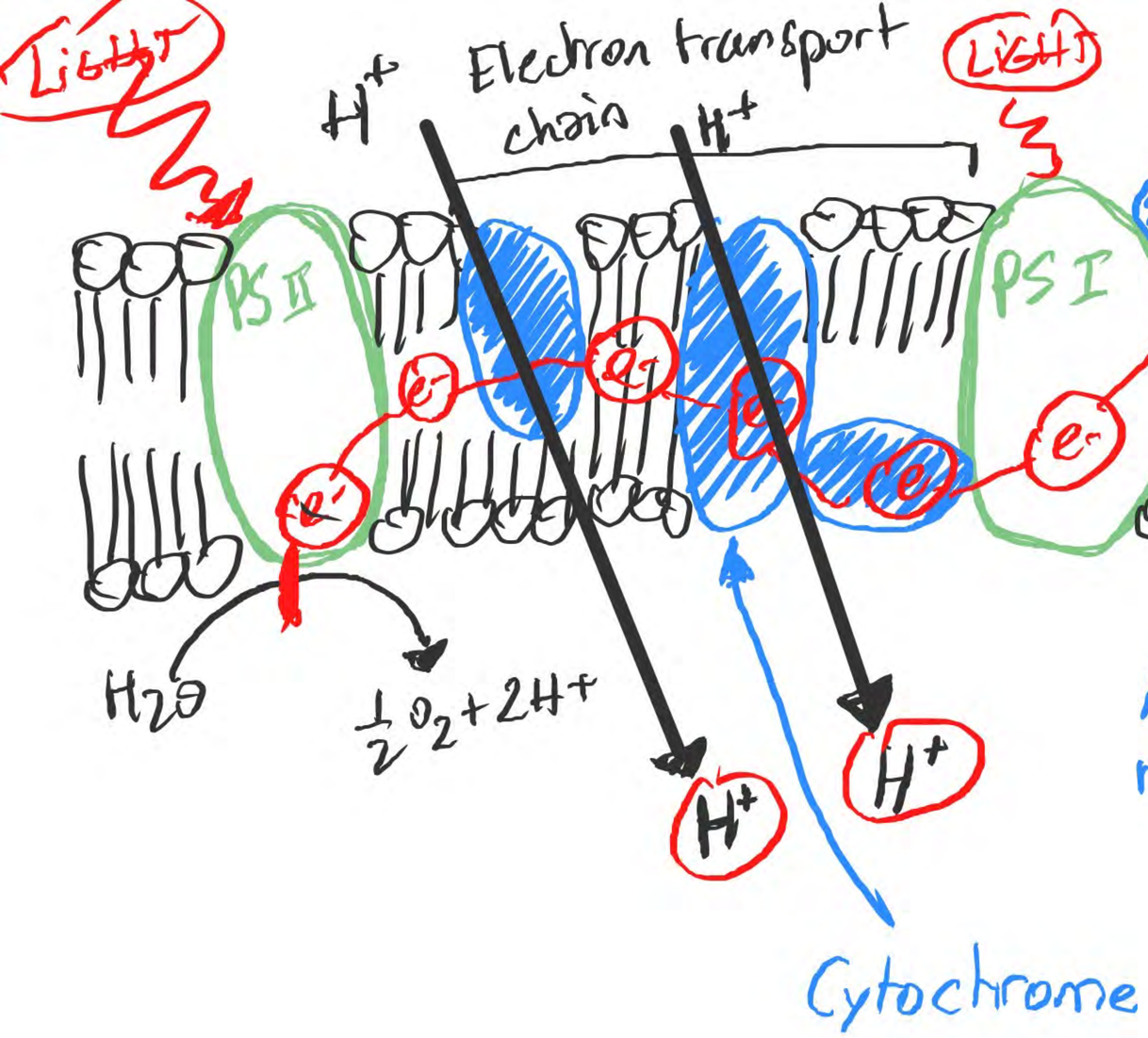
O_2 OUTPUT

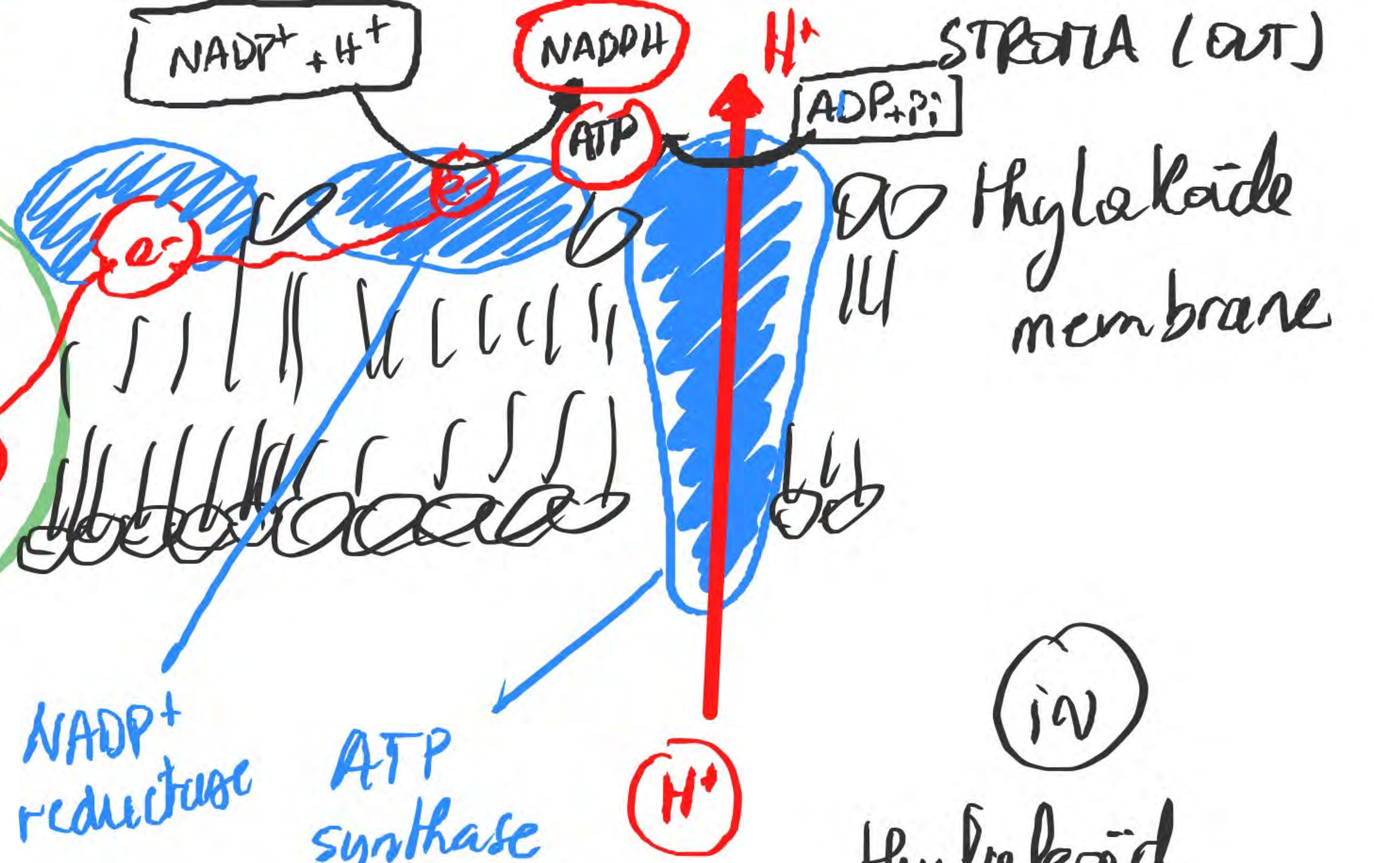
G3P Glyceraldelyde 3-phosphate

3PGA = 3 Phosphoglyceric acid




CO_2
ATP
NADPH
3-PGA
RuBP
Calvin cycle
H_2O
Light
$NADP^+$
ADP
G3P
Sugar
Light reactions
Outer membrane
Stroma
Granum
Inner membrane
Thylakoid
O_2





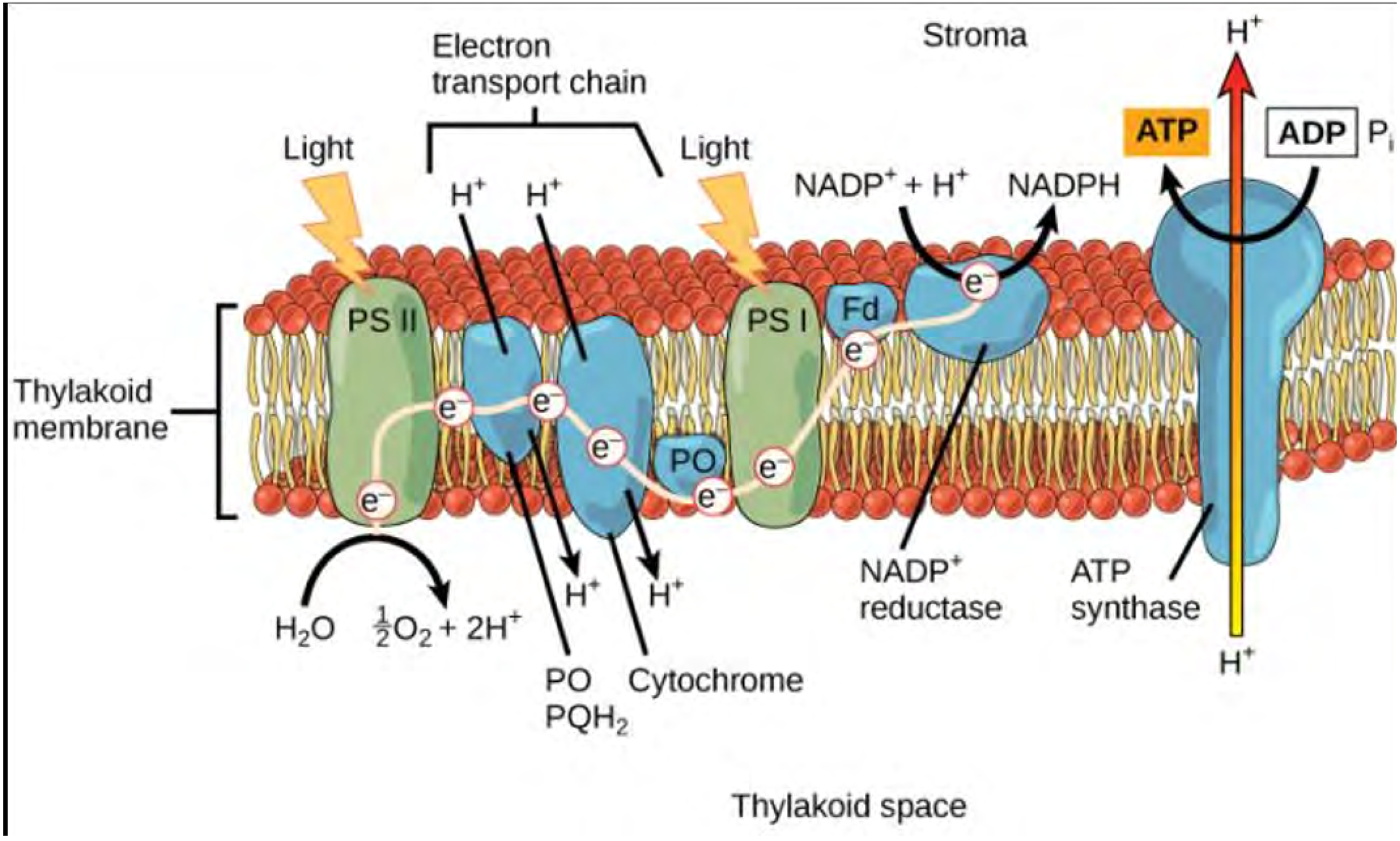
PS II : photosystem II.

PS I : " " I.

OUTPUT ON THE "RIGHT" DRAWING:

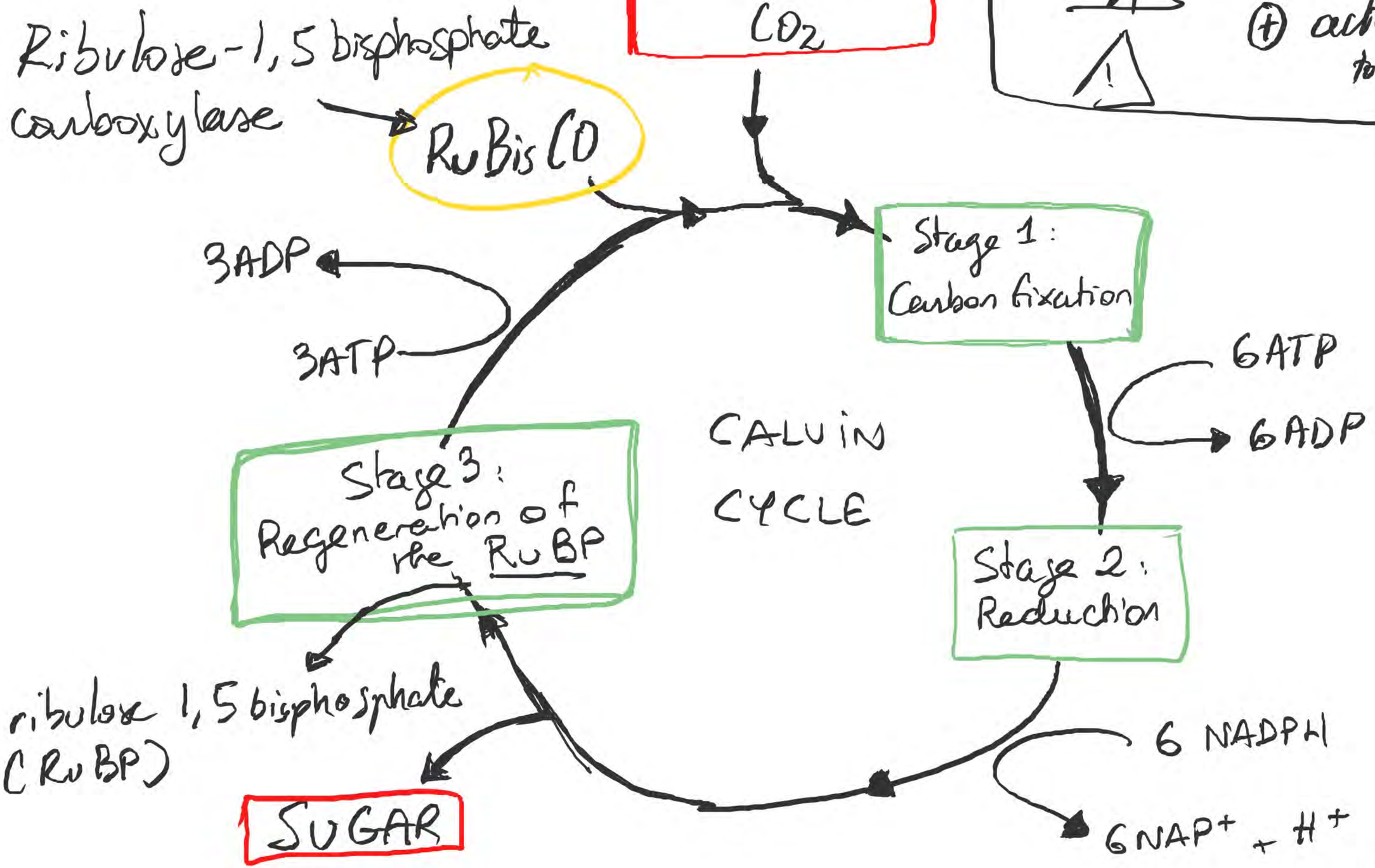
- (V) NADPH
- (VI) ATP

→ Calvin cycle


Stroma
Electron transport chain
Light
Light
H+
H+
H+
NADP+ + H+
NADPH
ATP
ADP
Pi
PS II
PS I
Fd
Thylakoid membrane
e−
PO
H2O
½O2 + 2H+
H+
H+
PO
PQH2
Cytochrome
NADP+ reductase
ATP synthase
H+
Thylakoid space

A look at the Calvin cycle ...

Name Nomenclature of Enzyme: Name of substrate + action it does to it



END CHAPTER

NEW CHAPTER:

REPRODUCTION AT THE CELLULAR LEVEL

- if cell contains two copies of each chromosomes = DIPLOÏD
  (2n chromosomes) n=23
- Each chromosomes of one pair carries the same genes
  (= homologous) ⟷ mother.
  ⟷ father.

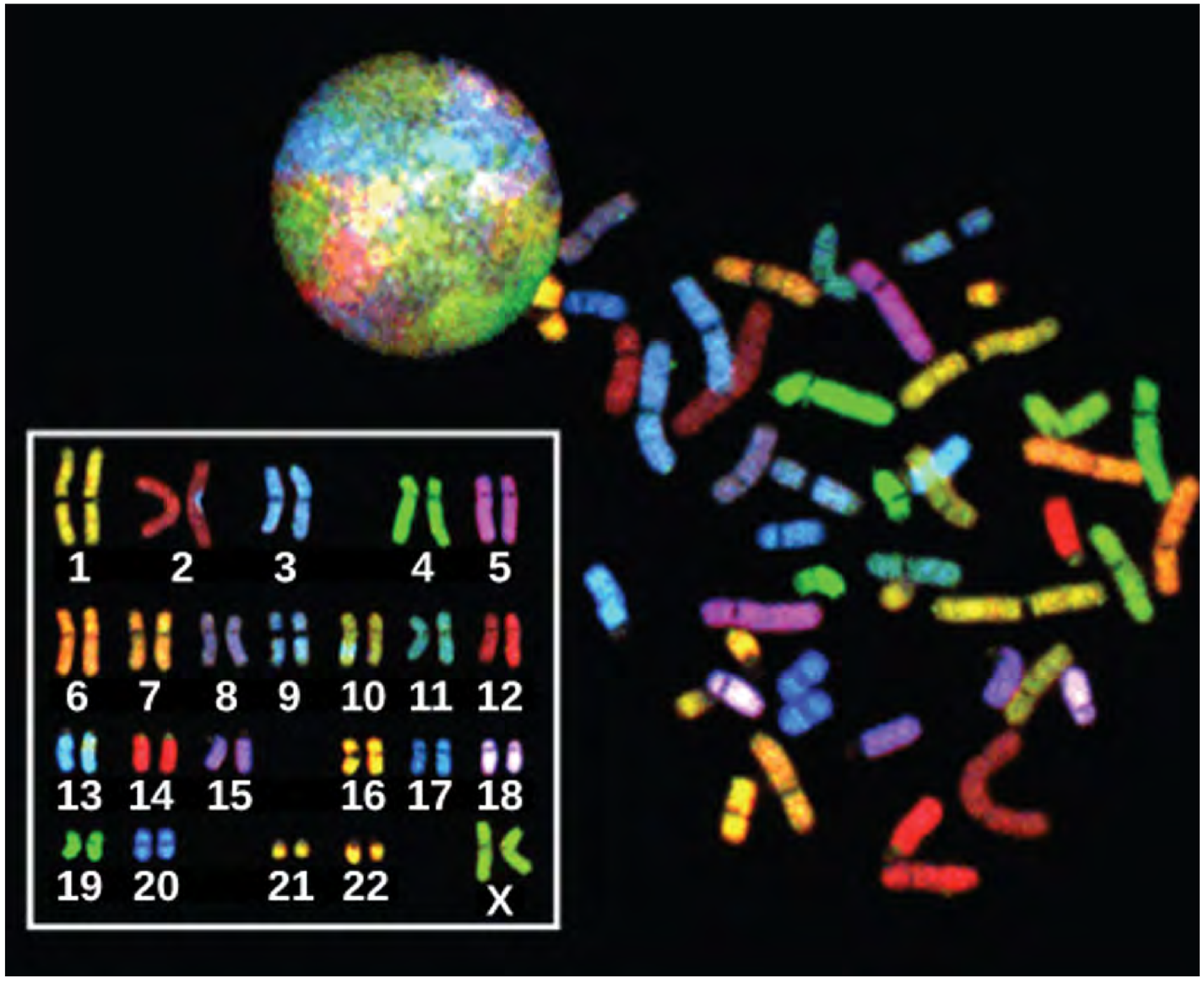
MITOSIS:

⇒ CREATE IDENTICAL CELLS.

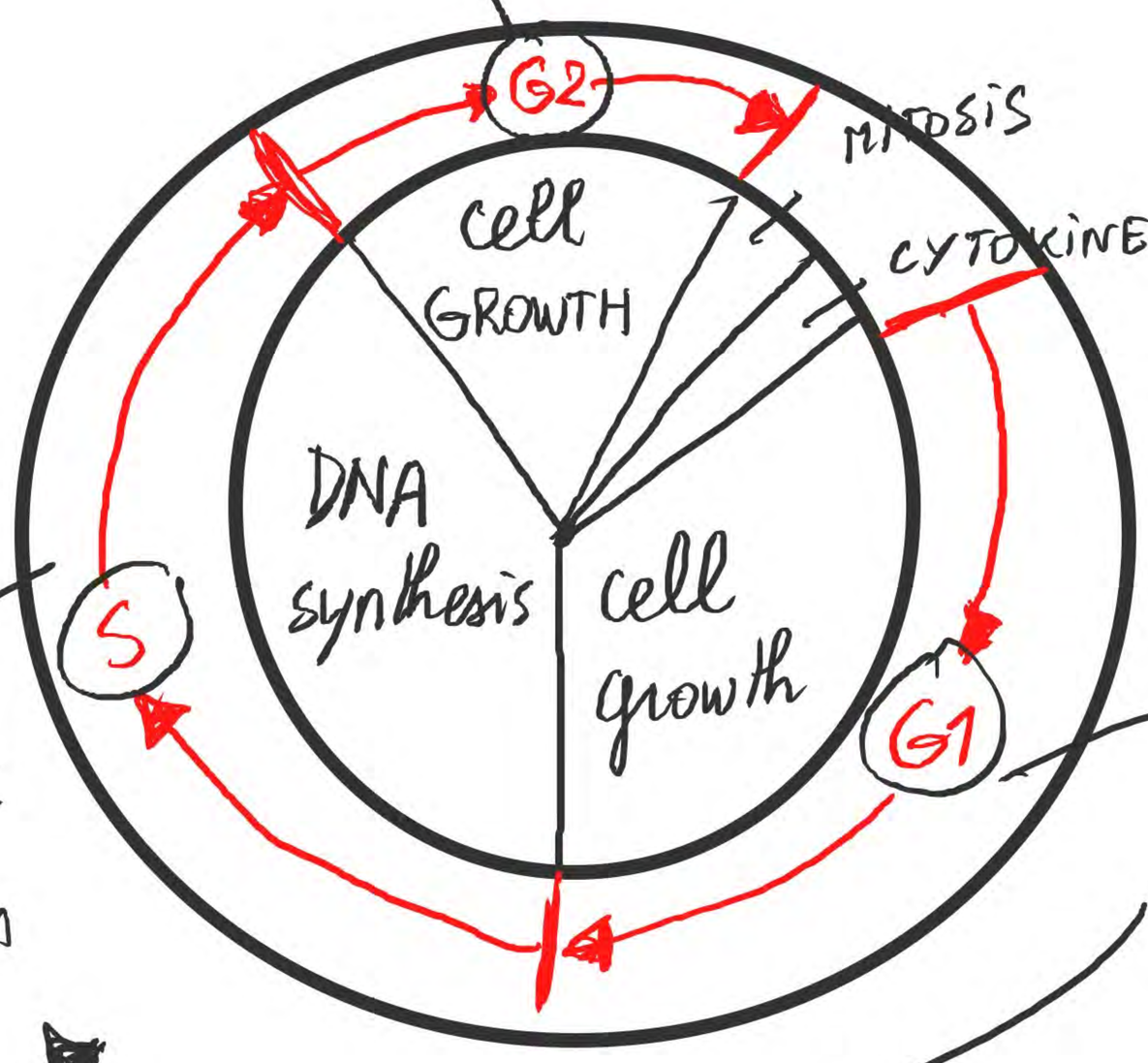
⇒ All human cells are genetically identical.

⇒ FUNCTIONS OF MITOSIS

- GROWTH
- REPAIR
- ASEXUAL REPRODUCTION.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
X

INTERPHASE (+proteins synthesis)



MITOTIC PHASE → formation of 2 daughter cells

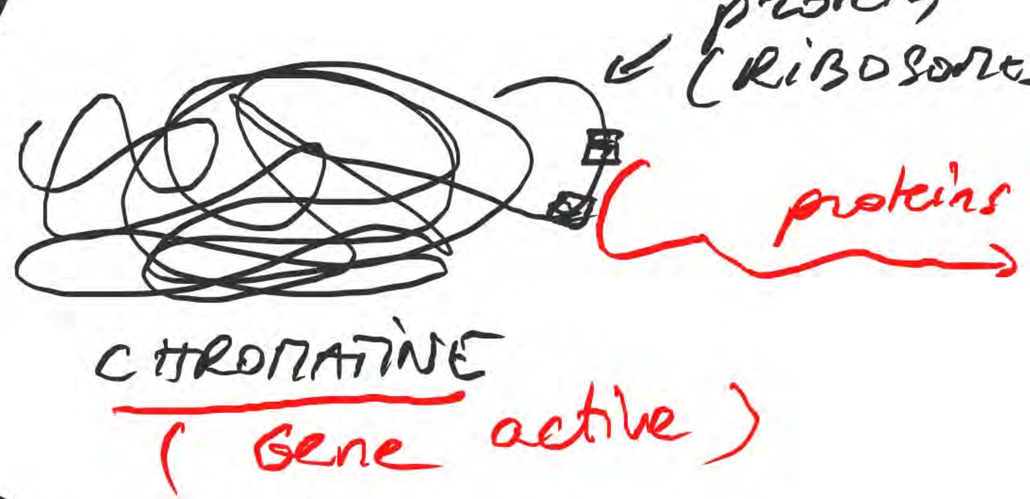
INTERPHASE (DNA replication + replication of centrosomes)

INTERPHASE + (Proteins synthesis)

* Mitosis occupies a small portion of an actively dividing cell's cell cycle

* Majority of time is spent in INTERPHASE.

* In interphase, chromosomes are UNWOUND and form CHROMATIN (gene active)



* Not all cells are actively dividing.

* SOME cells NEVER DIVIDE, or some divide under certain circumstances.