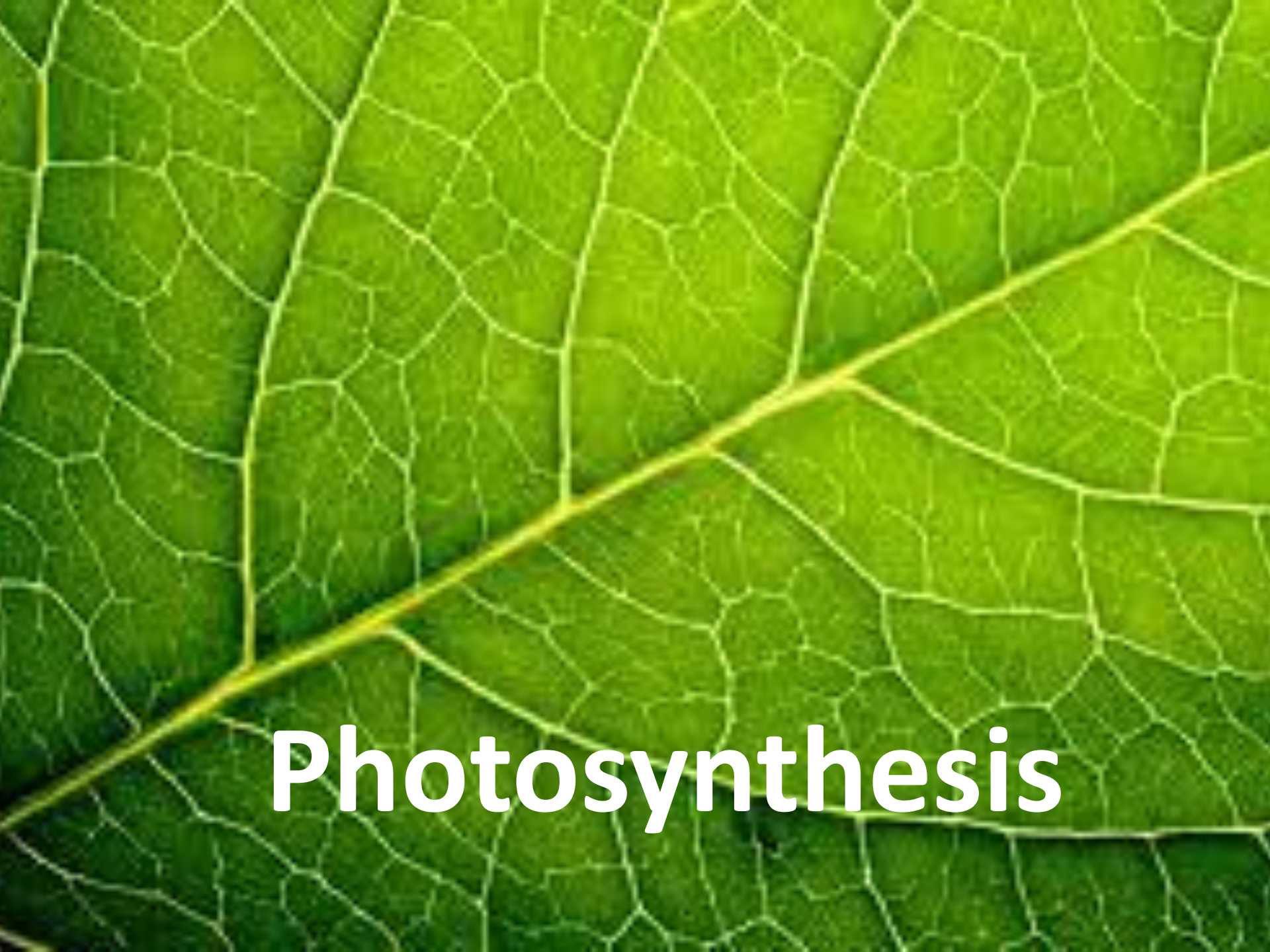
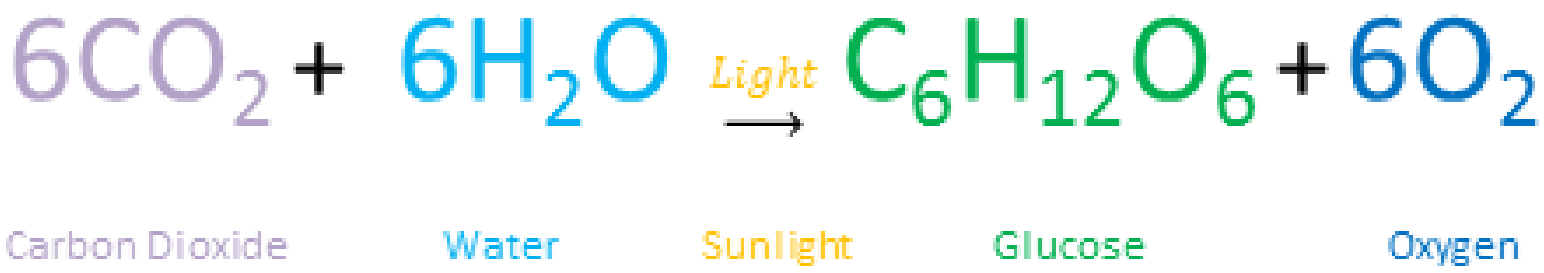

Photosynthesis

Why should you love photosynthesis?

gives you **oxygen**

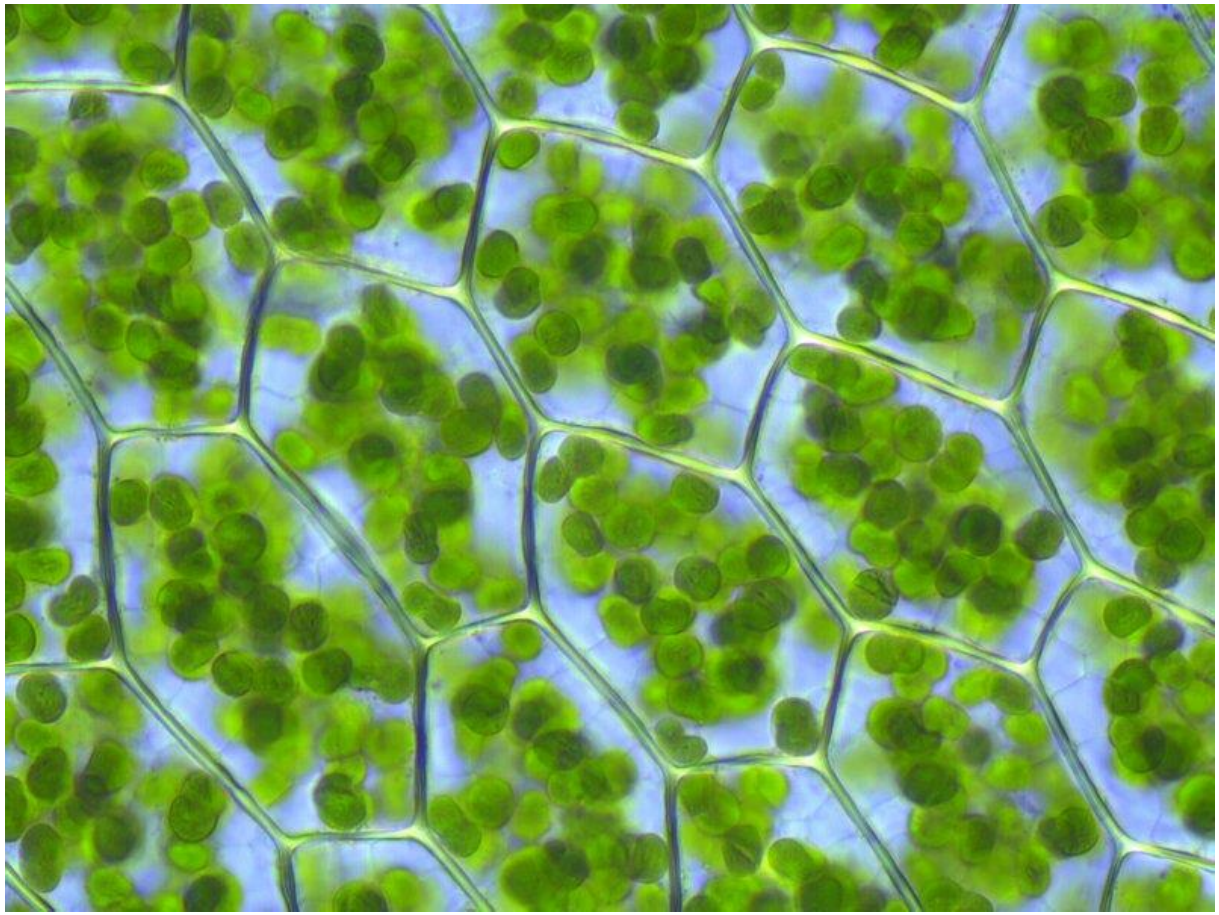
O_2

gives you **food**

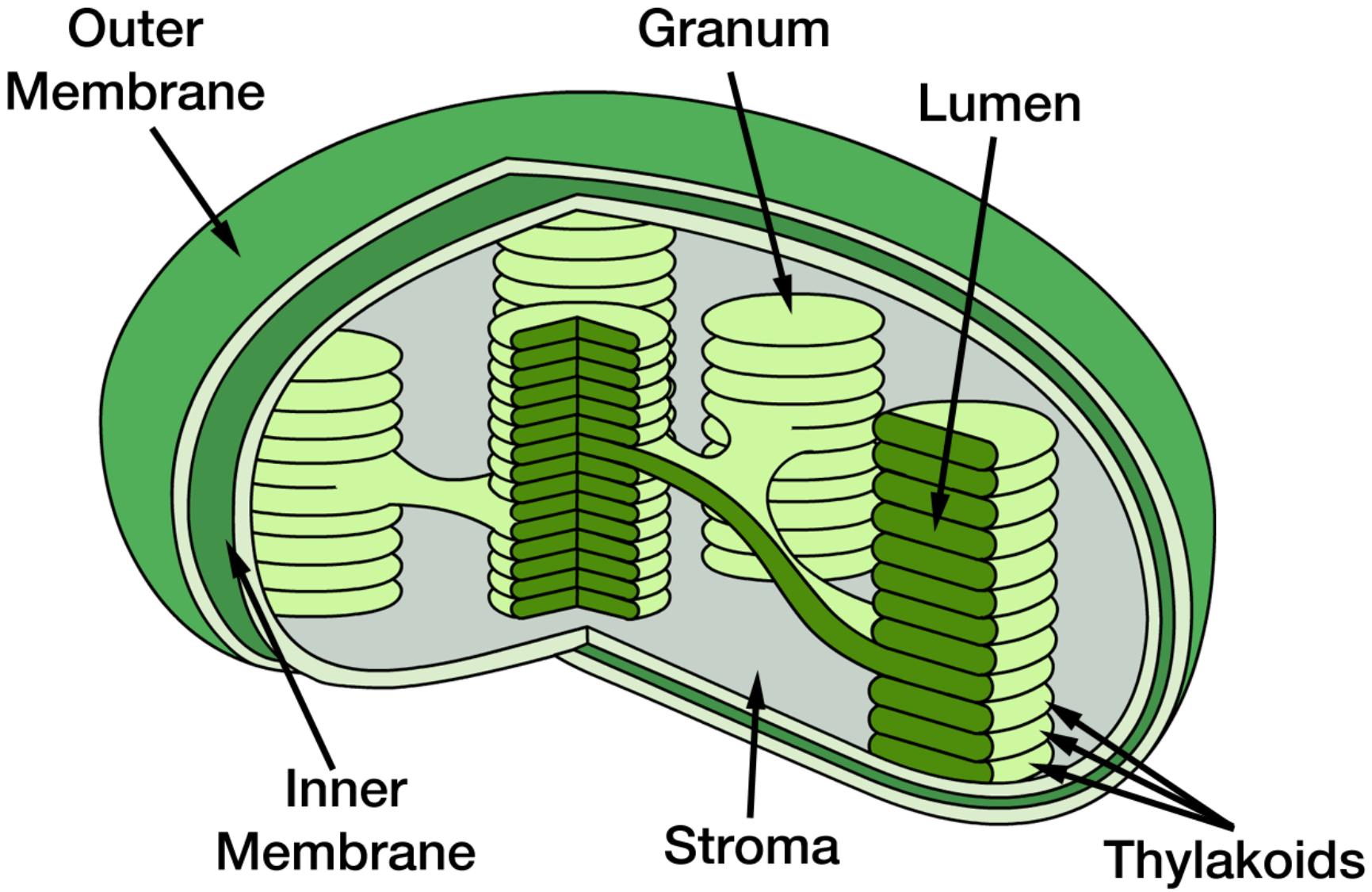


reactants products

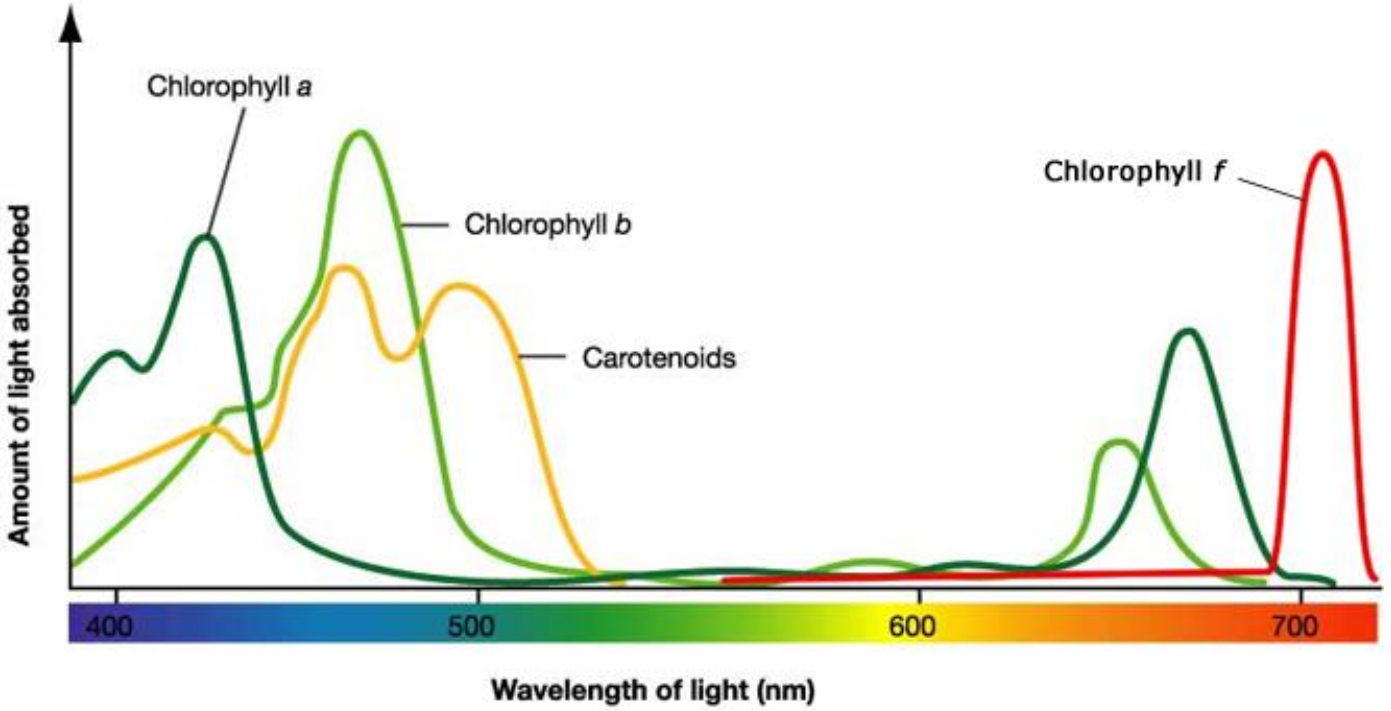
Where does it take place?

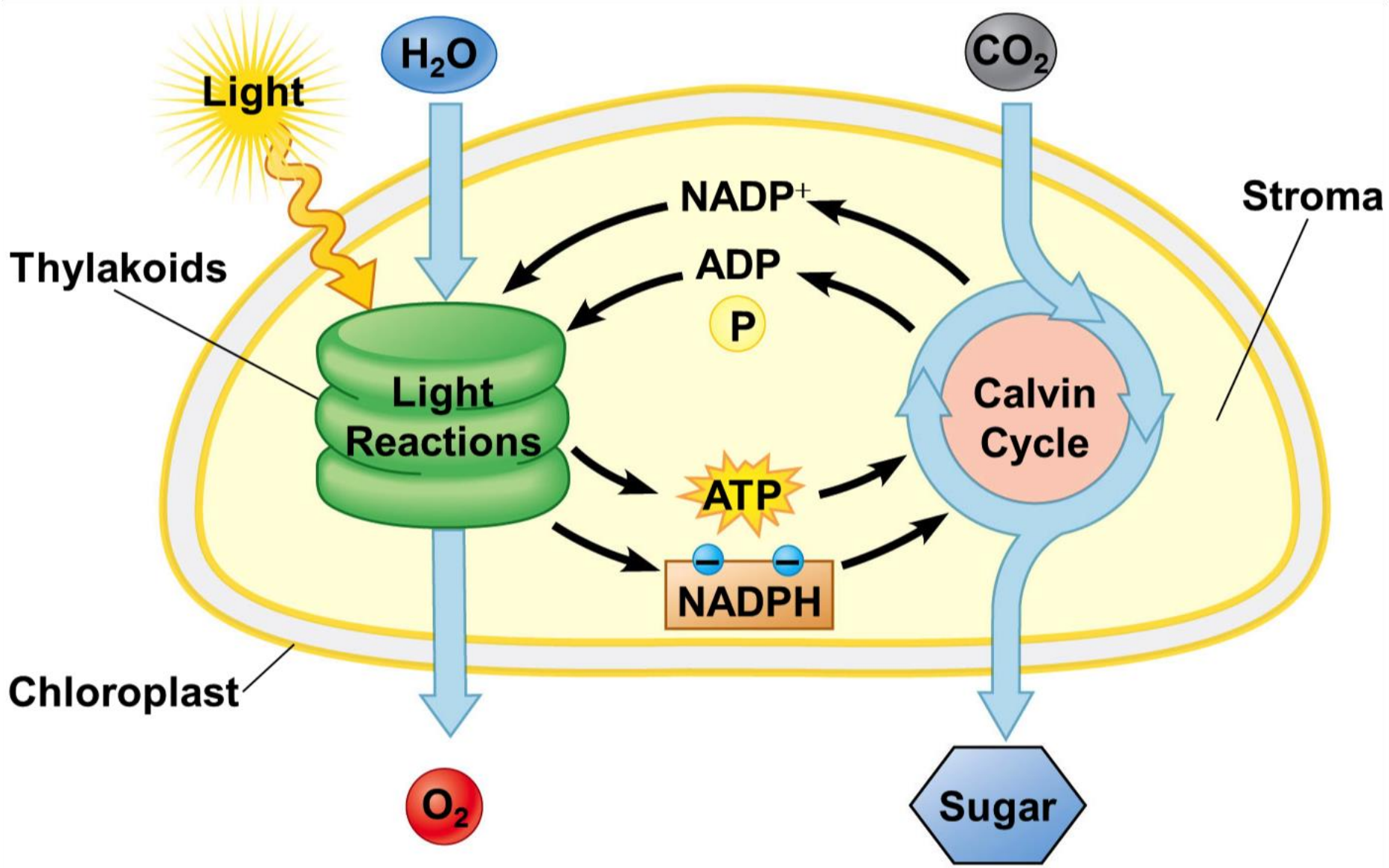


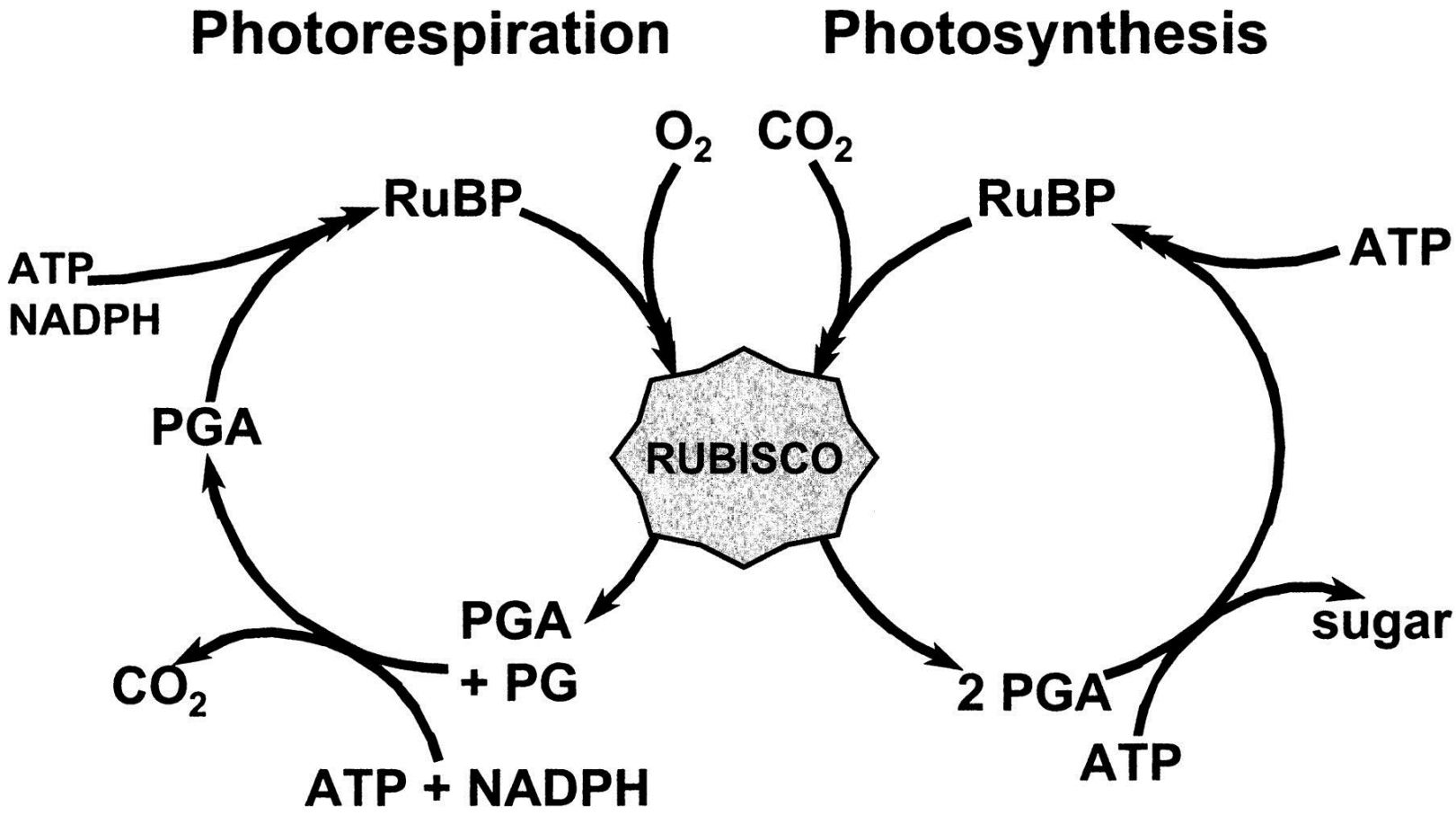
Chloroplast



Pigments

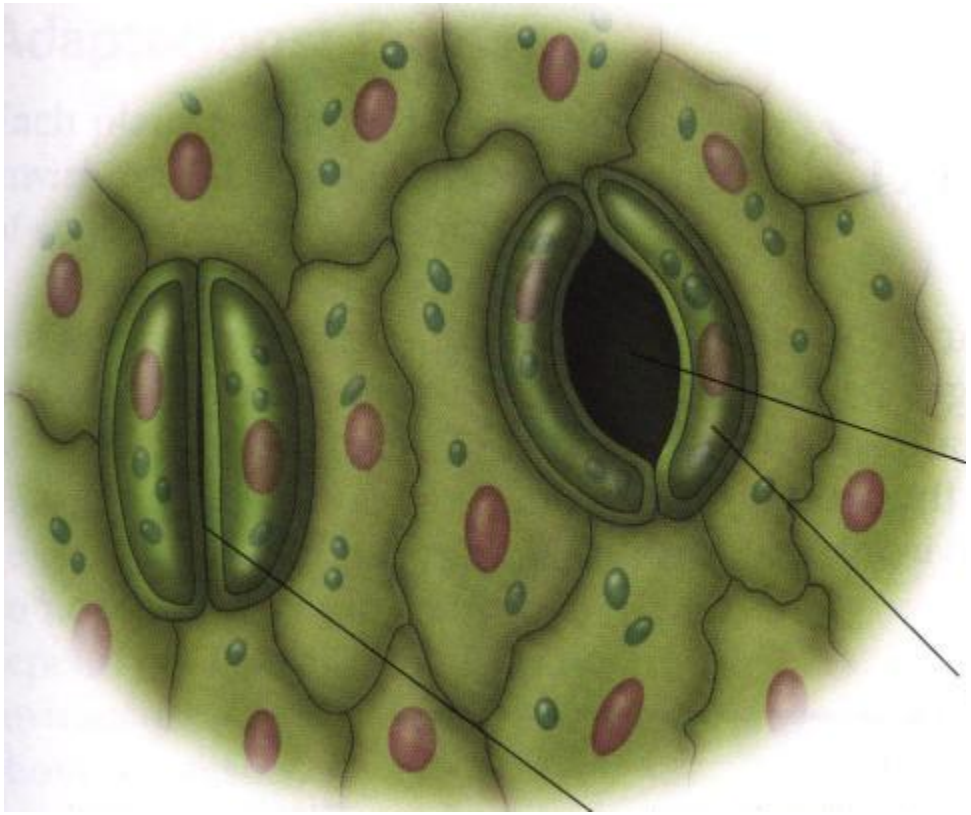

Chlorophyll a
Chlorophyll b
Carotenoids
Chlorophyll f
Amount of light absorbed
400
500
600
700
Wavelength of light (nm)

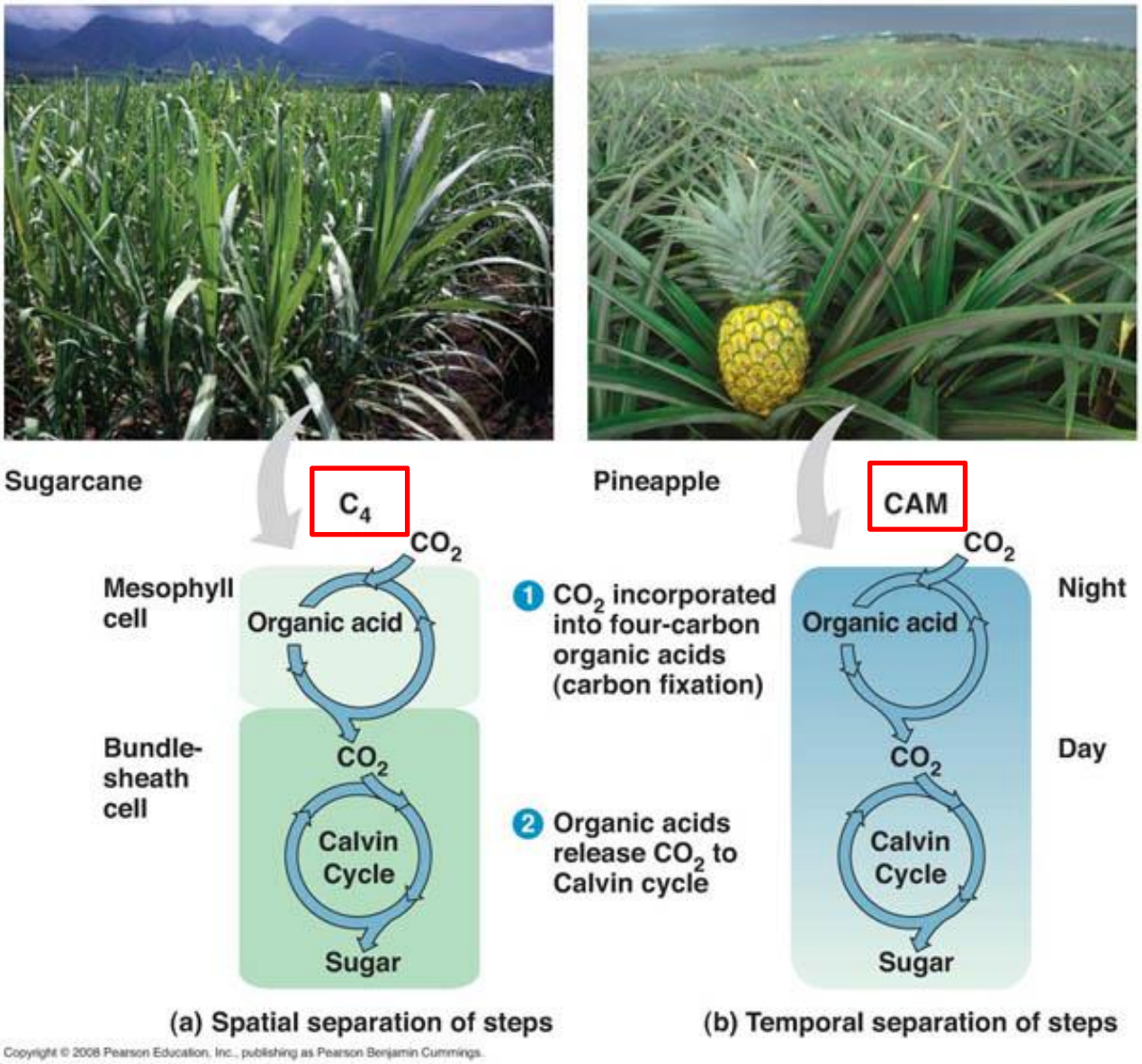



Photorespiration
Photosynthesis
O_2
CO_2
RuBP
RuBP
ATP
NADPH
ATP
PGA
RUBISCO
PGA
+ PG
sugar
CO_2
2 PGA
ATP + NADPH
ATP

Photorespiration

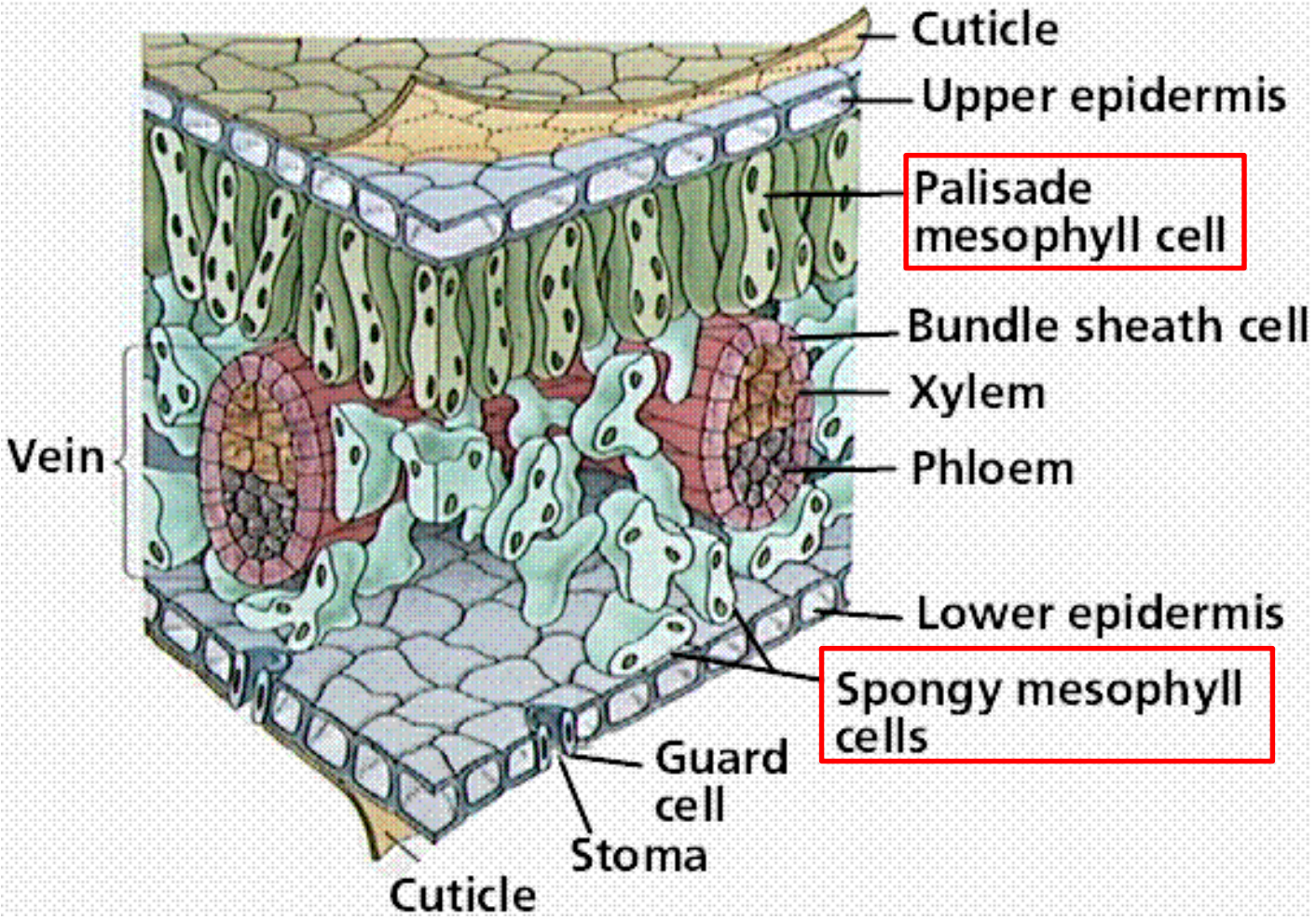
- O_2 enters Calvin cycle instead of CO_2
- without CO_2 canNOT produce sugar
- the production of glucose can be reduce up to 50%
- occurs in hot dry conditions when the water stress cause stomata to close and reducing he supply of CO_2


open stomata
guard cells
closed stomata (CO_2 cannot enter the leaf)



(a) Spatial separation of steps

(b) Temporal separation of steps


Cuticle
Upper epidermis
Palisade mesophyll cell
Bundle sheath cell
Xylem
Phloem
Vein
Lower epidermis
Spongy mesophyll cells
Guard cell
Stoma
Cuticle