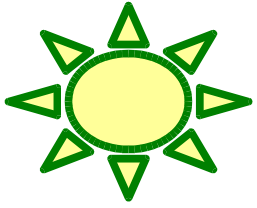
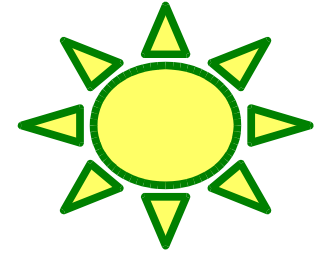


# Photosynthesis



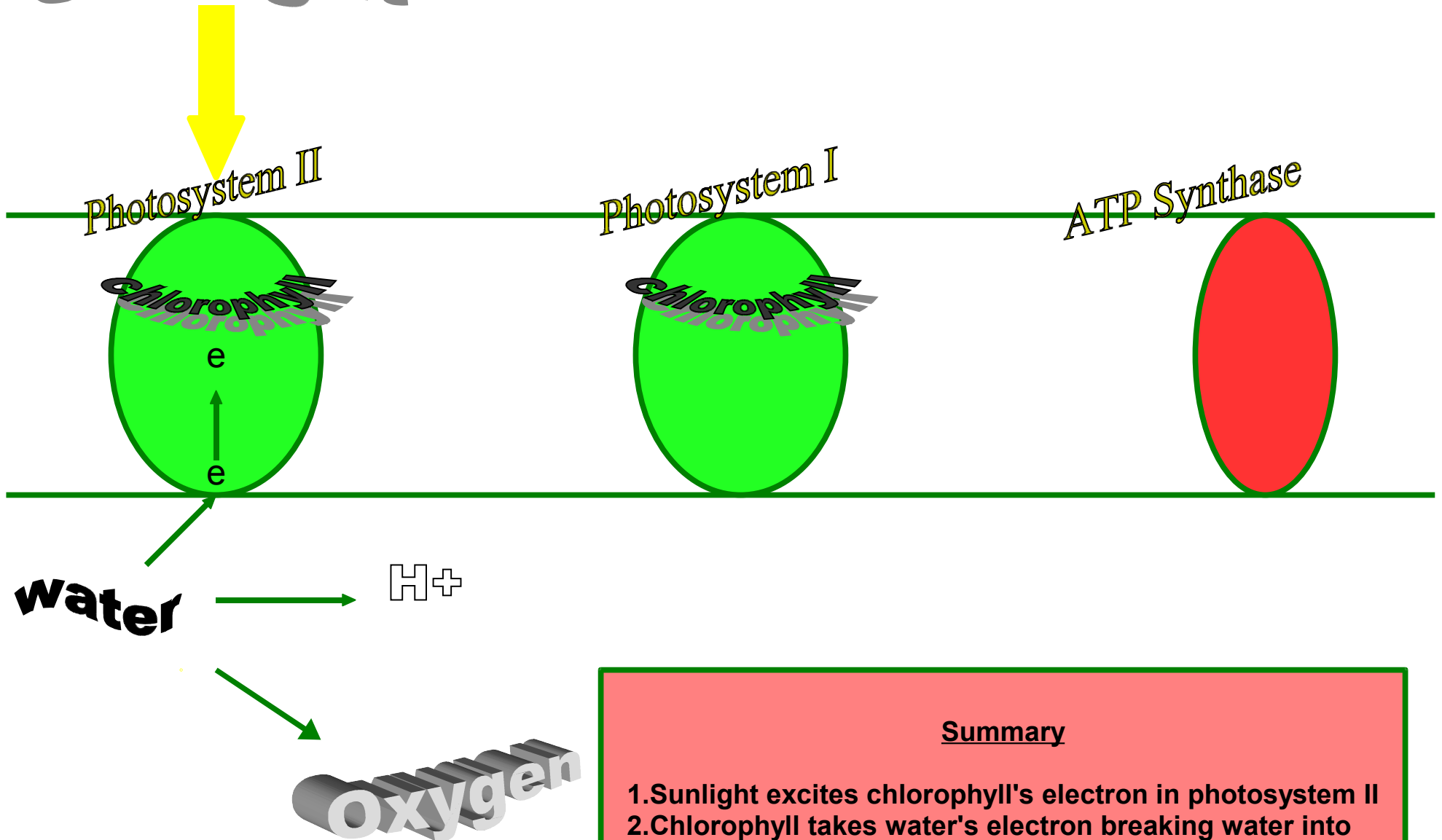
# Light-dependent Reaction



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Sunlight energy and water molecules  
are used to make  
oxygen and high-energy molecules  
(NADPH and ATP)

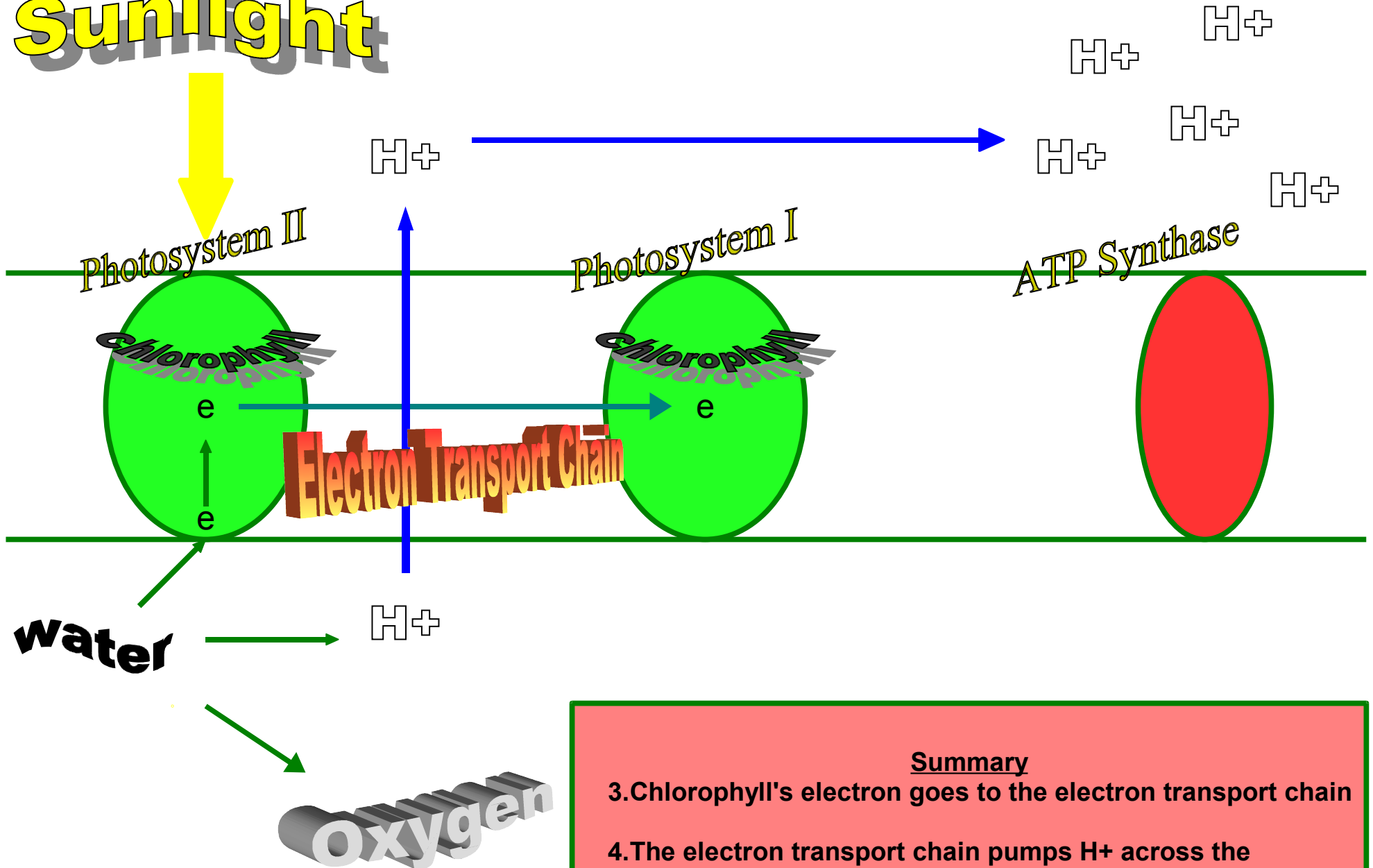
# Sunlight



## Summary

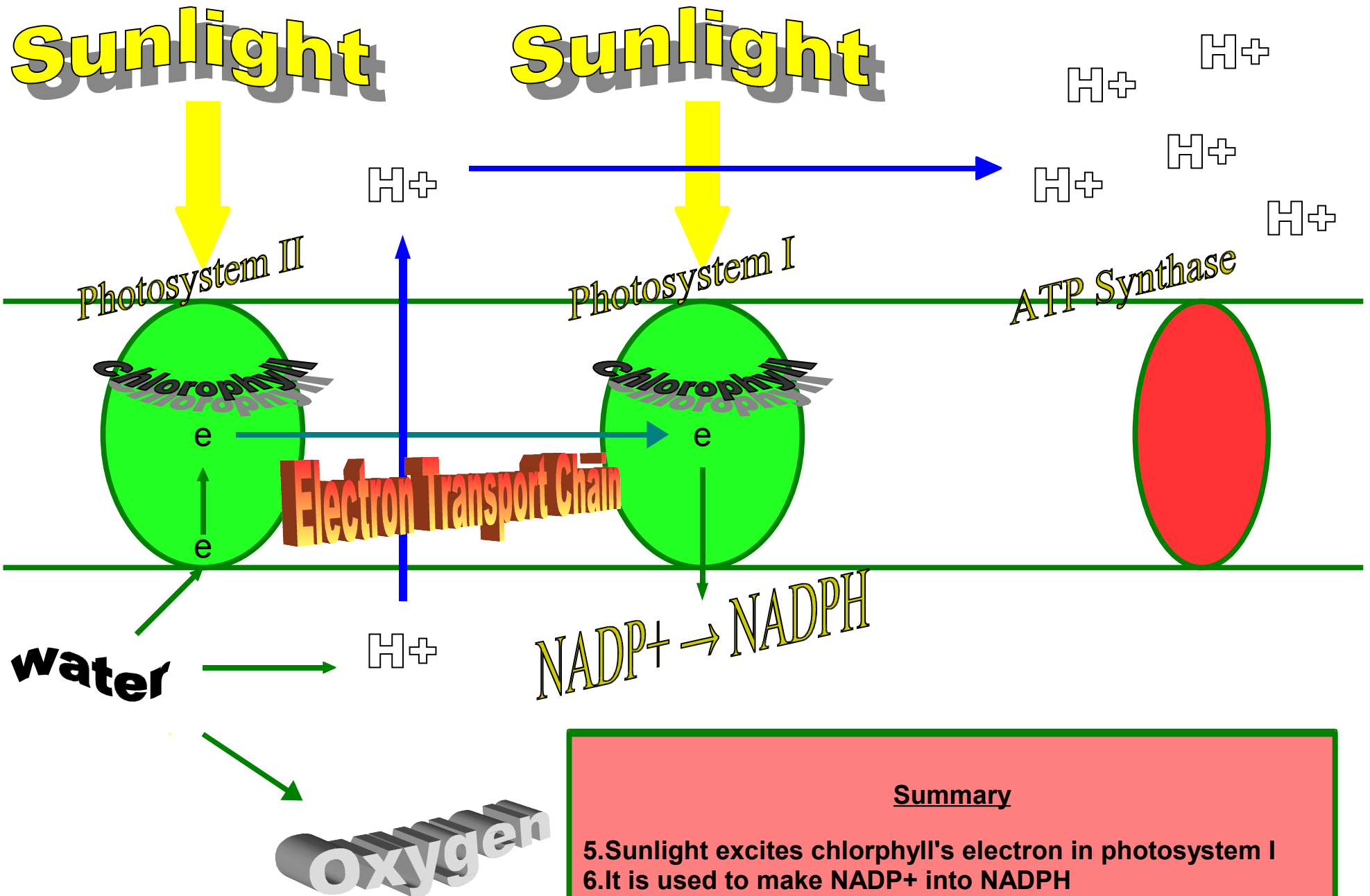
1. Sunlight excites chlorophyll's electron in photosystem II
2. Chlorophyll takes water's electron breaking water into oxygen and  $H^+$

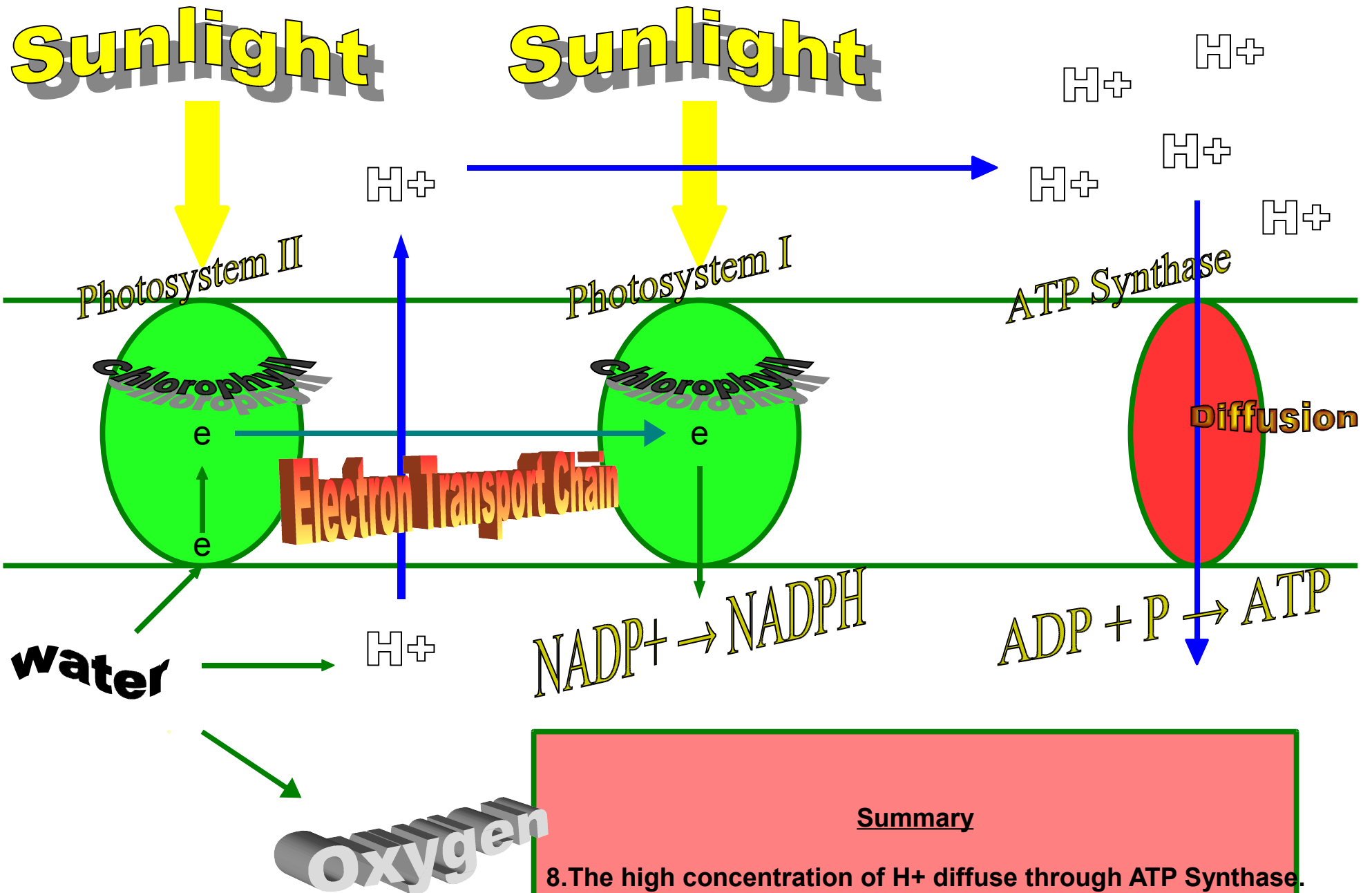
# Sunlight



## Summary

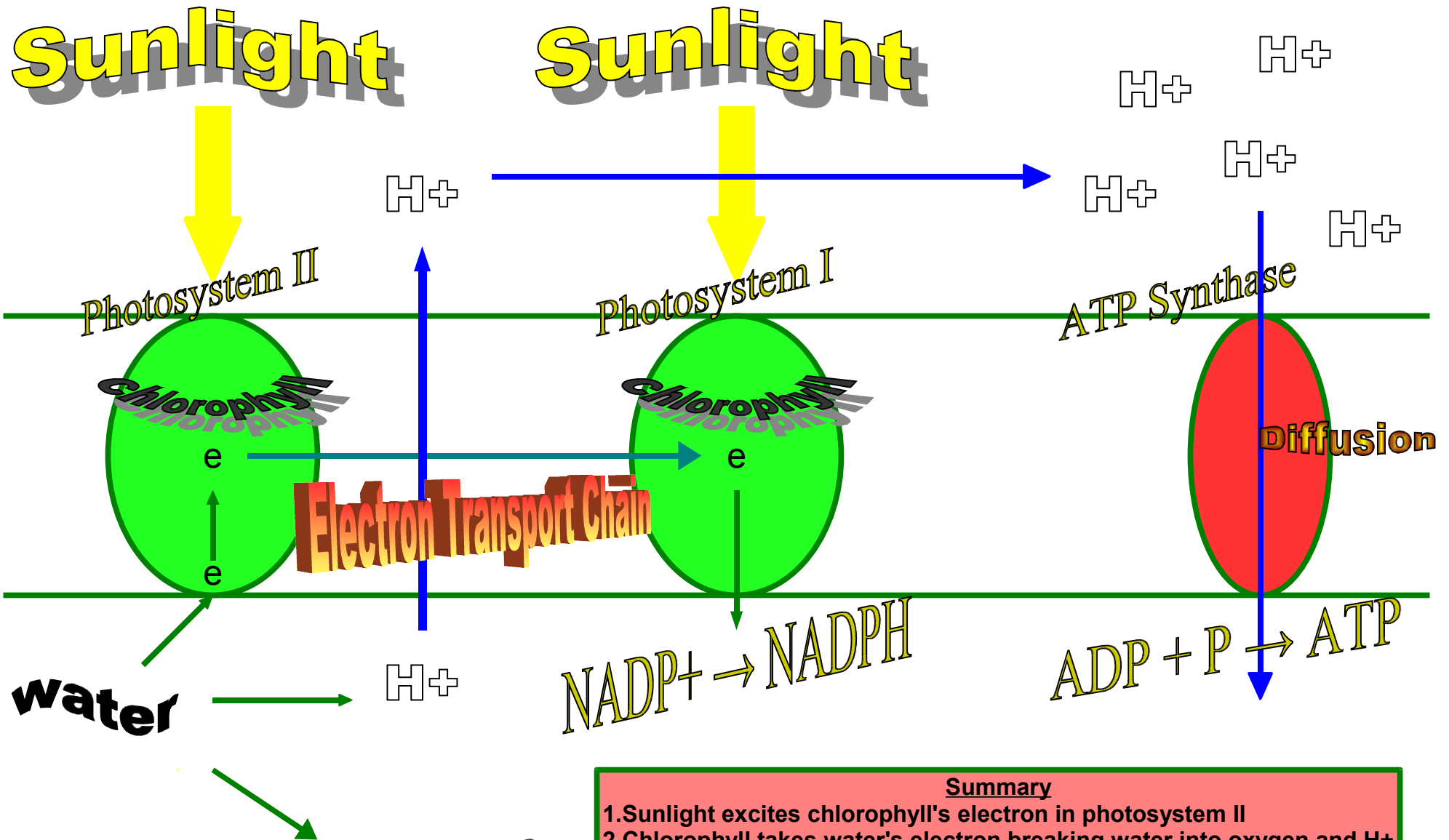
- 3. Chlorophyll's electron goes to the electron transport chain
- 4. The electron transport chain pumps  $H^+$  across the membrane





### Summary

8. The high concentration of  $H^+$  diffuse through ATP Synthase.
9. ATP Synthase uses the energy to make ADP and P into ATP



#### Summary

1. Sunlight excites chlorophyll's electron in photosystem II
2. Chlorophyll takes water's electron breaking water into oxygen and H<sup>+</sup>
3. Chlorophyll's electron goes to the electron transport chain
4. The electron transport chain pumps H<sup>+</sup> across the membrane
5. Sunlight excites chlorophyll's electron in photosystem I
6. It is used to make NADP<sup>+</sup> into NADPH
7. The electron transport chain replaces chlorophyll's electron
8. The high concentration of H<sup>+</sup> diffuse through ATP Synthase.
9. ATP Synthase uses the energy to make ADP and P into ATP

# Light-independent Reaction

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High-energy molecules

from the light-dependent reaction

and carbon dioxide

are used

to build sugar molecules

which store chemical energy

# Calvin Cycle

CO<sub>2</sub> is added to a 5-carbon molecule = 6-carbon molecule

From the light-dependent reaction:

$ATP \rightarrow ADP + P$	and energy
$NADPH \rightarrow NADP^+$	and energy

Energy is added to the 6-carbon molecule

6-carbon molecule is broken into two 3-carbon molecules

## Some 3-carbon molecules are recycled

but

Two 3-carbon molecules are bonded together to make a 6-carbon sugar

# Calvin Cycle

