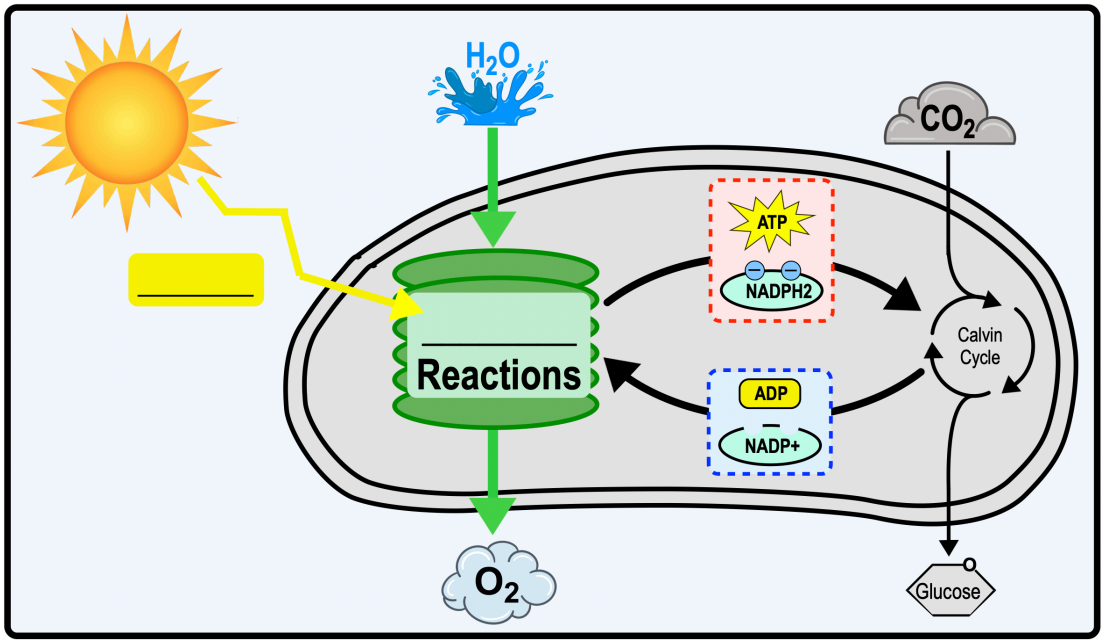
CONCEPT: LIGHT REACTIONS OF PHOTOSYNTHESIS

●**Light Reactions**: 1st stage of photosynthesis that occurs in the _____ membrane/space.

□ Synthesizes _____ & _____ to "*power*" the *Calvin Cycle* while producing _____ as a byproduct.

□ **NADPH**: an _____ *carrier* that transports _____ *energized* electrons.



EXAMPLE: The light reactions are powered by _____ energy. In normal photosynthesis the products of the light reactions are used to power _____.

a) potential; photorespiration.
b) sunlight; photorespiration.
c) sunlight; the Calvin cycle.
d) potential; the Calvin cycle.

PRACTICE: Describe the primary function of the light reactions of photosynthesis.

a) Production of NADPH used in cellular respiration.
b) Use of ATP to make glucose.
c) Conversion of chemical energy to light energy.
d) Production of ATP and NADPH.

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Steps of the Light Reactions

●Recall: *Light Reactions* occur in the _____ within chloroplasts, which contain *photosystems*.

a) **Photosystem II** absorbs *photons* of light to energize *electrons* donated by a _____ molecule.

□ Water molecules are _____ to provide electrons & react to form _____ *gas* (O_2).

b) Electrons move from **Photosystem** _____ to **Photosystem** _____ via an **Electron Transport Chain**.

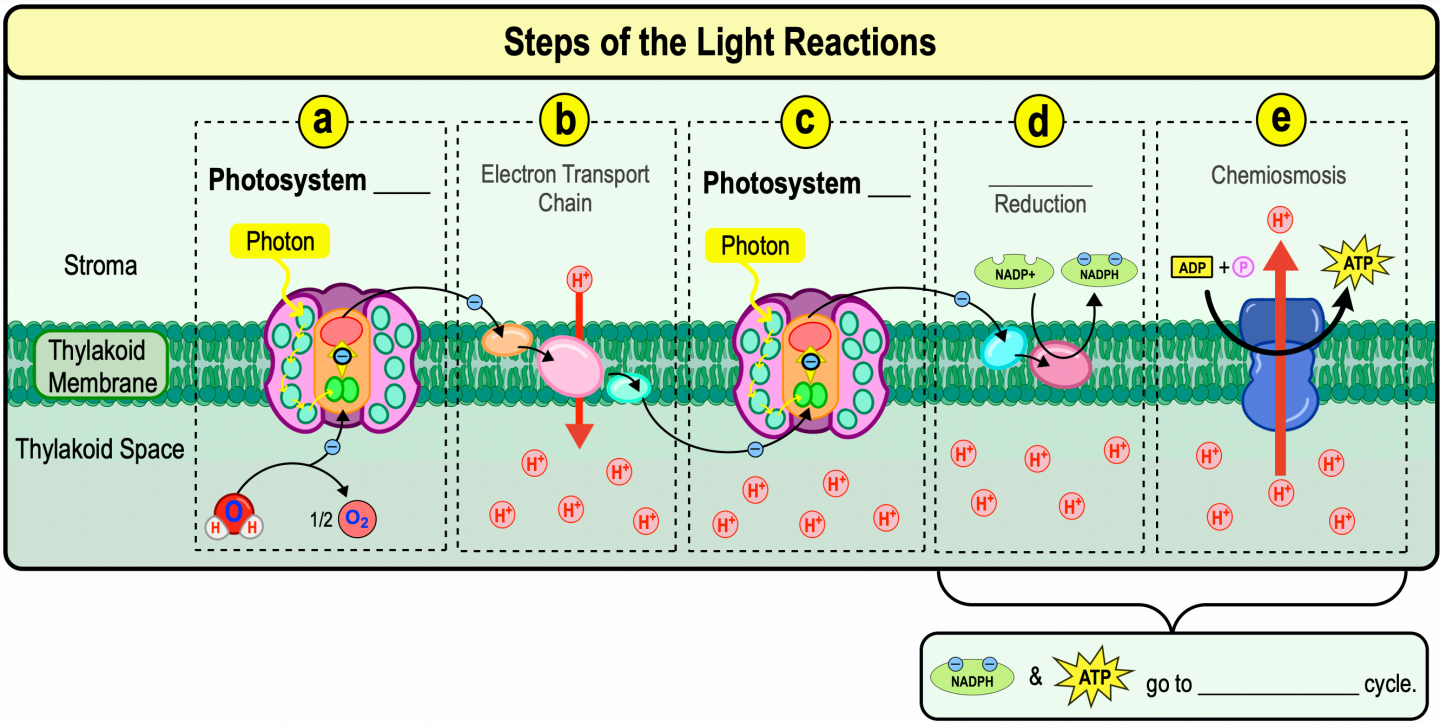
□ Generates a *hydrogen ion* (_____) *gradient.*

c) **Photosystem I** *electrons* are energized even MORE & continue through the **Electron Transport Chain**.

d) **NADP⁺** serves as the "*final electron acceptor*" & is _____ to form _____.

e) *Hydrogen ion* (_____) *gradient* formed by the ETC is used to generate some _____ via *Chemiosmosis.*

EXAMPLE: The light reactions of photosynthesis.



PRACTICE: Where do the electrons that are excited in photosystem II come from?

a) CO_2. b) O_2. c) Glucose. d) Photosystem I. e) Water.

PRACTICE: During the light reactions, photosystem I functions to_____, and photosystem II functions to _____.

a) Reduce CO_2; oxidize NADPH.
b) Synthesize ATP; Produce O_2.
c) Produce O_2; oxidize NADPH.
d) Reduce $NADP^+$; oxidize H_2O.

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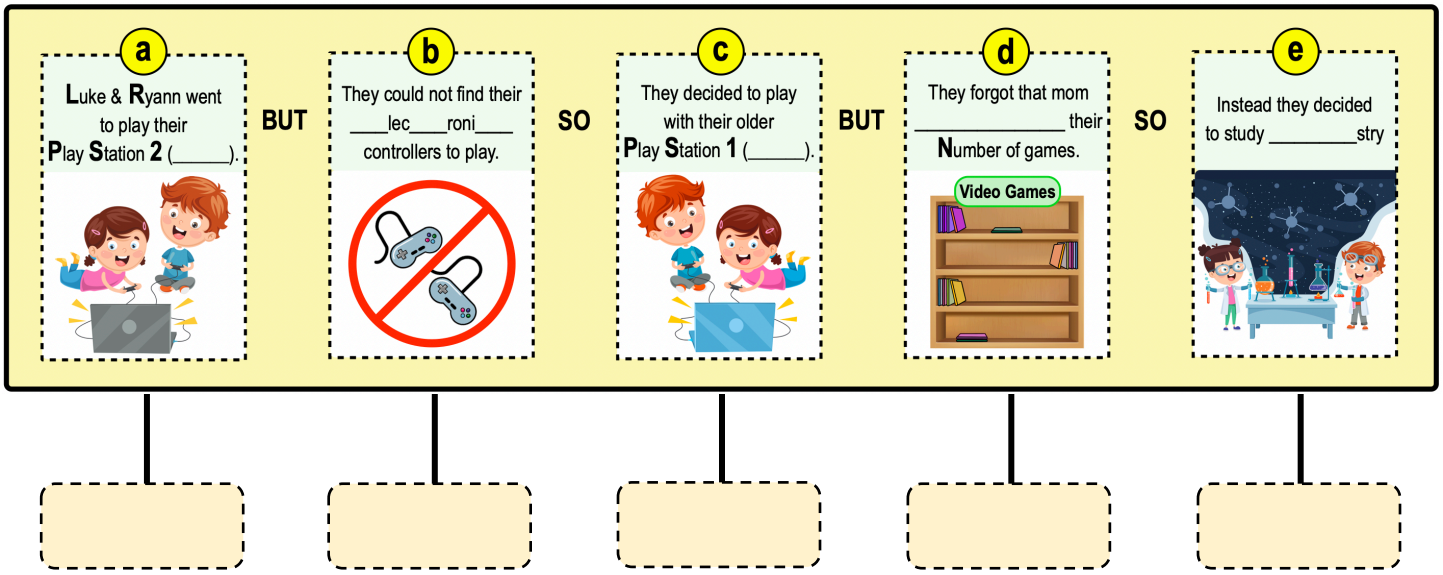
How to Memorize the Light Reactions of Photosynthesis



PRACTICE: What is the correct order of steps of the light reactions of Photosynthesis?

a) photosystem I, ETC, photosystem II, $NADP^+$ reduction, chemiosmosis.

b) photosystem I, photosystem II, ETC, $NADP^+$ reduction, chemiosmosis.

c) photosystem II, ETC, photosystem I, $NADP^+$ reduction, chemiosmosis.

d) photosystem II, photosystem I, ETC, $NADP^+$ reduction, chemiosmosis.