

CONCEPT: CYCLIC VS. NONCYCLIC PHOTOPHOSPHORYLATION

● **Photophosphorylation:** phosphorylation of ADP to ATP using _____ energy.

□ There are 2 types of *photophosphorylation* pathways that are possible during the *Light Reactions*:

1) _____-Cyclic Photophosphorylation

2) _____ Photophosphorylation.

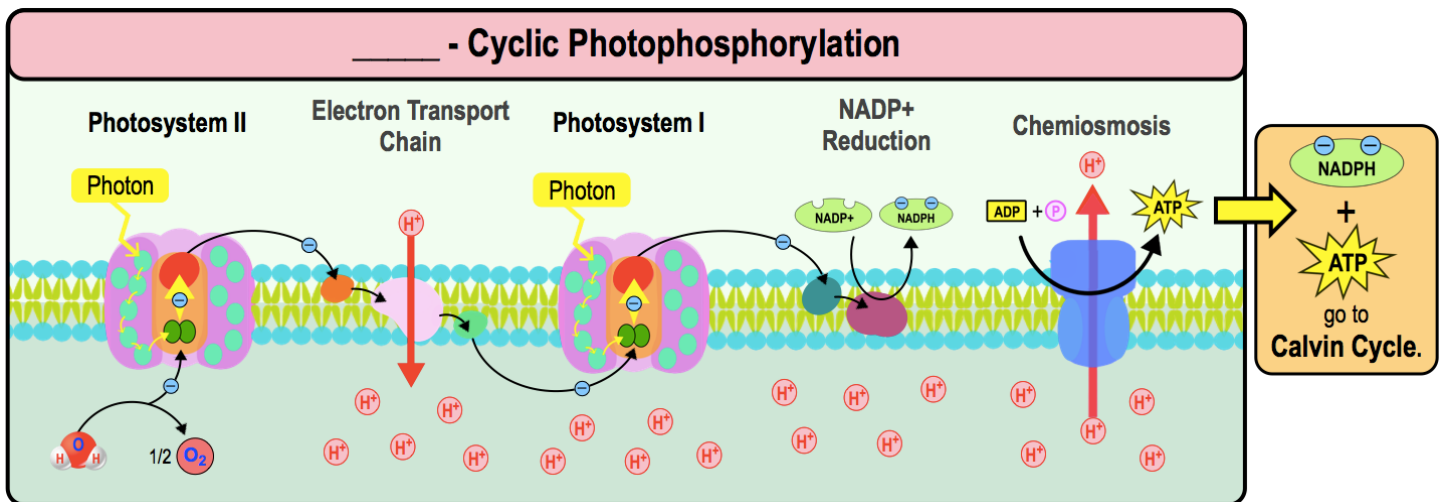
□ The cell's requirement of _____ power (NADPH) & ATP determines which one the cell uses.

Non-Cyclic Photophosphorylation

● When the cell requires production of ATP & _____, it uses _____-Cyclic photophosphorylation.

□ **Non-Cyclic Photophosphorylation:** _____ path of electrons using *PSII* & *PSI* to make ATP & NADPH.

□ It is the normal pathway of *Light Reactions* producing ATP & NADPH needed for the _____ Cycle.



PRACTICE: The main sources of energy in photophosphorylation are sunlight and _____.

- a) Proton motive force.
- b) Inorganic phosphate (PO_4^{3-}).
- c) High-energy phosphate bond.
- d) CO_2 and H_2O .
- e) Chlorophylls.

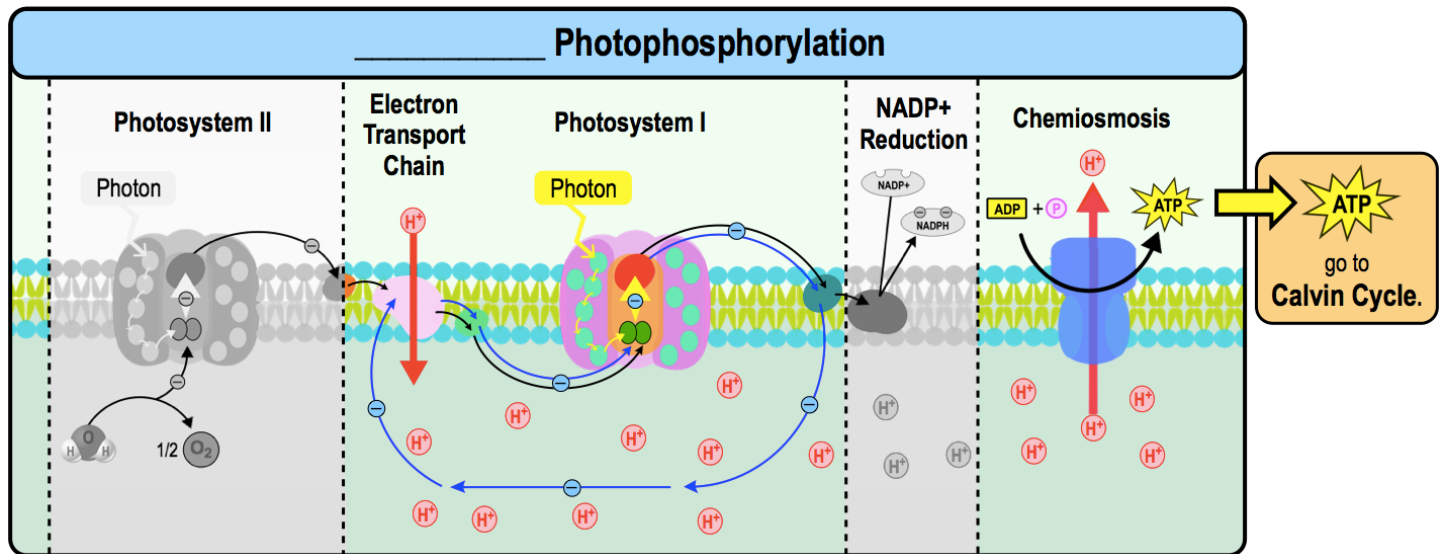
PRACTICE: Non-cyclic photophosphorylation is used to synthesize:

- a) ADP and $NADP^+$.
- b) ATP only.
- c) ADP and ATP.
- d) NADPH only.
- e) ATP and NADPH.

CONCEPT: CYCLIC VS. NONCYCLIC PHOTOPHOSPHORYLATION

Cyclic Photophosphorylation

- When the cell *only* requires _____ production, it uses *cyclic photophosphorylation* rather than non-cyclic.
 - **Cyclic Photophosphorylation:** cyclic path of electrons *only* using photosystem ____ to make ATP (no NADPH).
 - High-energy electrons from *PSI* are *cycled back* to the prior _____ to continue generating a *proton motive force*.
 - Proton motive force is used to produce more _____.



PRACTICE: Photophosphorylation is:

- The phosphorylation of ADP to ATP using light energy of photosynthesis.
- The reduction of NADP⁺ to NADPH using light energy of photosynthesis.
- The phosphorylation of glucose to glucocse-6-phosphate during glycolysis.
- The oxidation of water during the light reactions of photosynthesis.

PRACTICE: What is the important difference between cyclic & non-cyclic photosynthesis?

- Cyclic photosynthesis generates NADPH but not ATP.
- Cyclic photosynthesis generates ATP but not NADPH.
- Cyclic photosynthesis generates ADP but not NADPH.
- Cyclic photosynthesis generates ATP but not NAD⁺.
- Cyclic photosynthesis generates NADP⁺ but not ATP.