

# LEARNING OBJECTIVES

By the end of this lecture you will be able to:

1. Understand that ENERGY can be transformed from one form to another.
2. Know that energy exist in two forms; free energy - available for doing work or as heat - a form unavailable for doing work.
3. Appreciate that the Sun provides most of the energy needed for life on Earth.
4. Explain why photosynthesis is so important to energy and material flow for life on earth.
5. Know why plants tend to be green in appearance.
6. Equate the organelle of photosynthesis in eukaryotes with the chloroplast.
7. Describe the organization of the chloroplast.
8. Understand that photosynthesis is a two fold process composed of the **light-dependent reactions (i.e., light reactions)** and the light independent reactions (i.e. Calvin Cycle or Dark Reactions).
9. Tell where the light reactions and the CO<sub>2</sub> fixation reactions occur in the chloroplast.
10. Define chlorophylls giving their basic composition and structure.
11. Draw the absorption spectrum of chlorophyll and compare it to the action spectrum of photosynthesis.
12. Define the Reaction Centers and Antennae and describe how it operates.
13. Describe cyclic photophosphorylation of photosynthesis.
14. Describe noncyclic photophosphorylation of photosynthesis.