

What is metabolism?

The sum of all chemical reactions that occur as part of the growth and development of an organism.

What are anabolic and catabolic reactions?

Anabolic = synthetic (building)

Catabolic = degradative (breaking down)

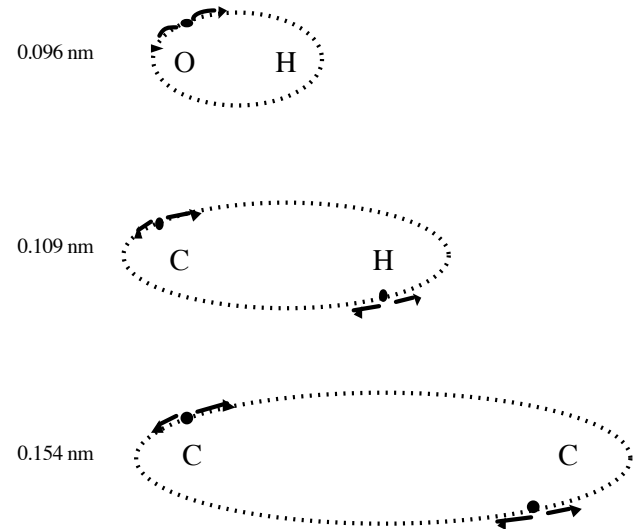
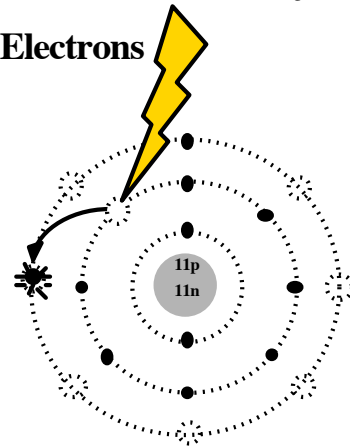
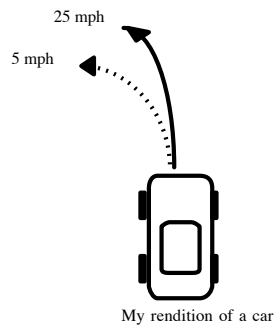
What is energy?

The ability to ~~do work~~ make something move.

What is work?

Making something move.

Energized Electrons



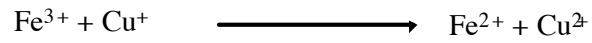
Oxidation-Reduction Reactions



Aerobic Respiration Carbon is oxidized

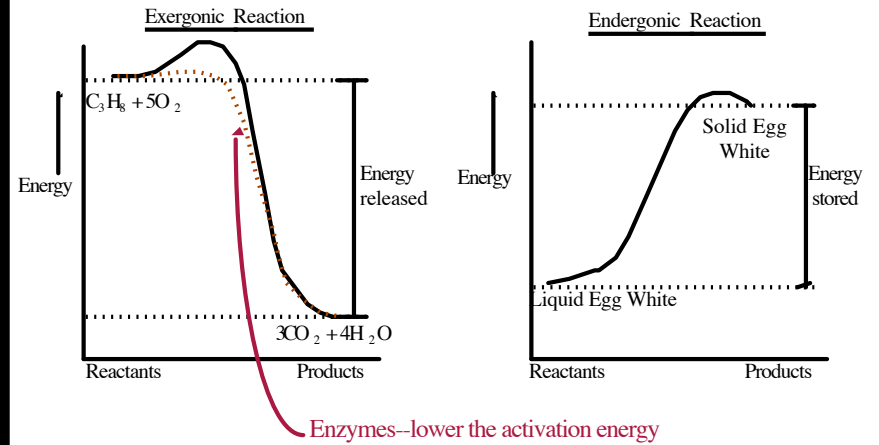


Oxygenic Photosynthesis Carbon is reduced

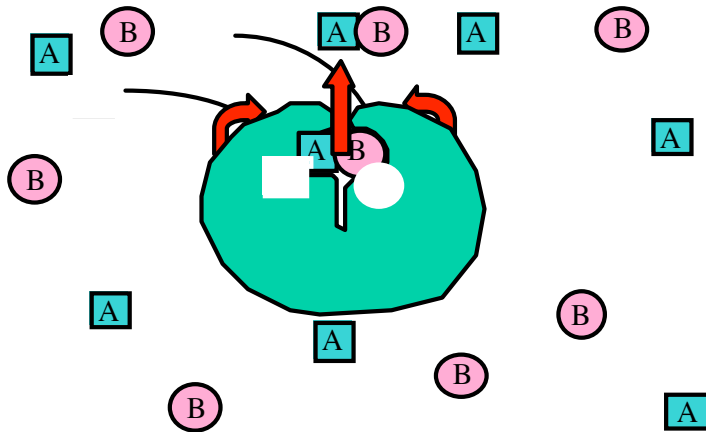


Iron is reduced. Copper is oxidized.

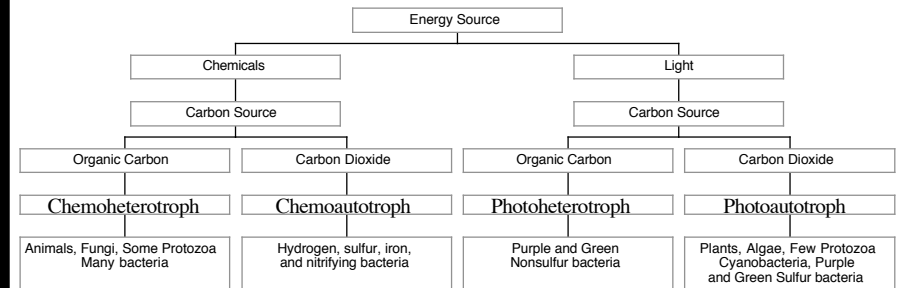
Energetics and Enzymes



Induced Fit Model of Enzyme Action



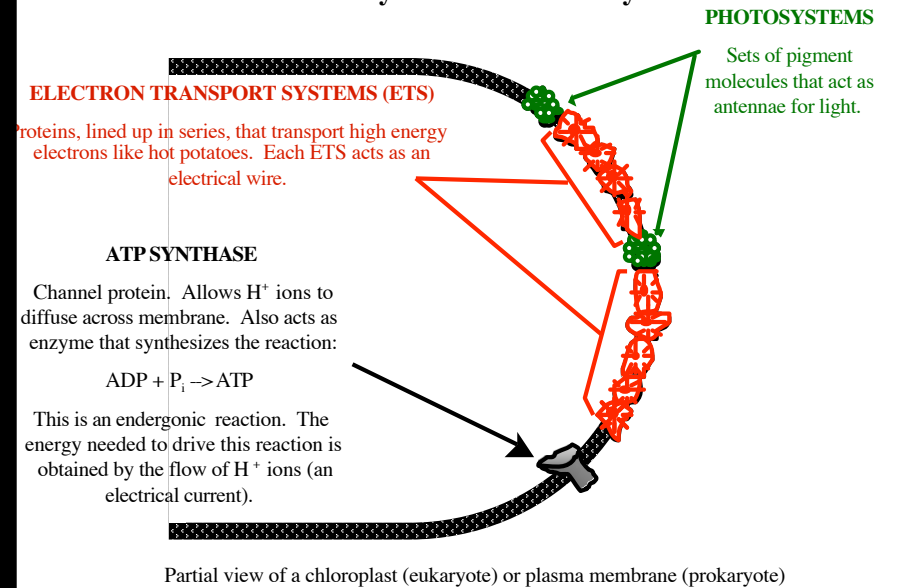
Types of Metabolism



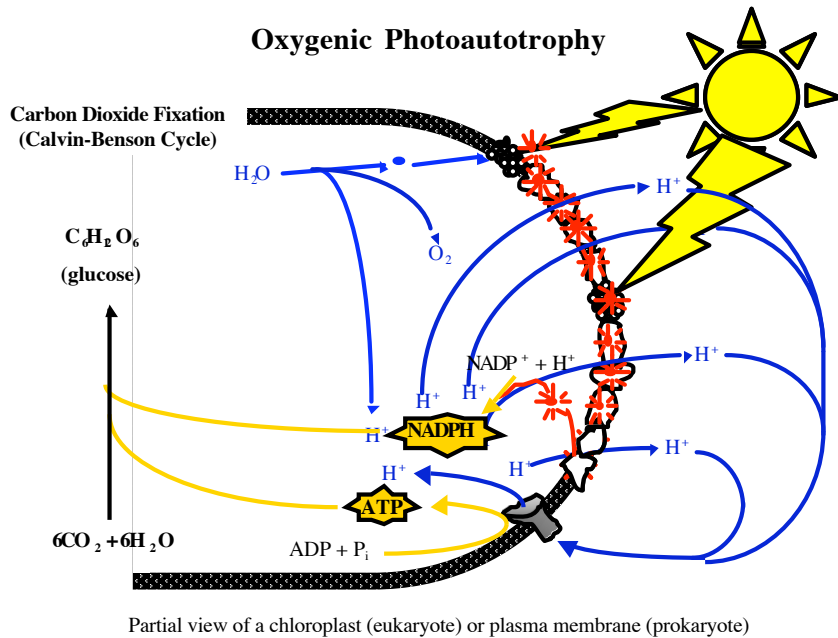
Sources of High-Energy Electrons

Photoautotrophs	→	Electrons in pigment molecules energized by sunlight.
Photoheterotrophs	→	Electrons in pigment molecules energized by sunlight.
Chemoautotrophs	→	Inorganics: Electrons in large orbits (like the valence shells of metals) or in reduced molecules (like SH_2 , NH_3 , and H_2).
Chemoheterotrophs	→	Electrons in C-C and C-H bonds of organic molecules like glucose, lipids, or proteins.

Photosynthetic Machinery



Oxygenic Photoautotrophy



Anoxygenic Photoautotrophy

