Ch 9.4

**Electron Transport Chain** = Long chain of protein that transport electrons to create proton gradient

* Proton Gradient = H Ions being pumped out
* Embedded in inner membrane of mitochondria
  + Cell Membrane of prokaryotes
* Release energy to used to create ATP
* Transports electrons with *redox reactions*.
  + Transfer of one or more electrons from one reactant to another
* NADH / FADH2 carry in electrons and Hydrogen Ions and leave as NAD+ / FAD+
  + FADH2 adds its electrons further down the chain because lower energy
* Electron lose energy as they move down chain

Outside is high concentration uses passive transport to bring in and power ATP **synthase**

* Is like a dam
  + H Ions are trying to go into the mitochondria and cell lets them go through a “Turbine” to make ADP then into ATP
    - Uses Ions moving across the membrane to create the
    - **Chemiosmosis** = Using H Ion gradient to make ADP

At end of chain Oxygen receives it them turns into water

Electron Carrier = **Cytochromes**

4 Hydrogen Ions moving across the gradient is enough to create 1 ATP from ADP and Pi

Active Transport used to create gradient

**Proton Motive Force** = H+ gradient

*Cellular Respiration* = Glucose -> NADH -> Electron Transport Chain -> ATP

ATP Profit

* Glycolysis = 2 ATP

Citric Acid Cycle = 2 ATP

* Electron Transport Chain / Chemiosmosis = 30 – 32 ATP
* 1NADH ~ 2.5 ATP
  + When transfer electron from glucose to ETC contributes to Proton Motive Force for about 2.5 ATP
  + Results in 10 H+ being transported
* 1FADH ~ 1.5 ATP

Some energy needed to move energy to matrix

About 30% of stored energy from glucose