

Color change $\rightarrow$ pH change $\rightarrow$ CO_2 change $\rightarrow$ diff. b/w photosynthesis & cellular respiration rates

$\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{CO}_3$
Carbonic acid (Proton donor)

Complex IV

Gradient-driven synthesis of ATP. As H^+ ions flow down their gradient and back into the matrix they pass through an enzyme called ATP synthase, which harnesses the flow of protons to synthesize ATP.

Overall, 1 molecule of glucose breaks down to:

Stage	Direct Products (net)	ATP yield (net)
Glycolysis	2 ATP	2 ATP
	2 NADH	3-5 ATP*
Pyruvate oxidation	2 NADH	5 ATP
Citric Acid Cycle	2 ATP/GTP	2 ATP
	6 NADH	15 ATP
	2 FADH_2	3 ATP
Total		30-32 ATP

*This one number is not precise. Glycolysis happens in cytosol, and NADH can't cross the inner mitochondrial membrane to deliver its electrons. Instead, it uses the ETC.