

COMPARISON BETWEEN PHOTOSYNTHESIS & RESPIRATION

	PHOTOSYNTHESIS	RESPIRATION
EQUATION	$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$	$\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}$
LOCATION	Chloroplast	Mitochondria
OCCURS	In light	All the time
INPUT REACTANTS	CO_2 & H_2O	$\text{C}_6\text{H}_{12}\text{O}_6$ & O_2
OUTPUT PRODUCTS	$\text{C}_6\text{H}_{12}\text{O}_6$ & O_2	CO_2 & H_2O
ENERGY SOURCE	Visible light (sunlight)	Chemical bonds (in food)
RESULT	Storage of energy	Release of energy
REACTION	Reduction (reduction of CO_2 to glucose)	Oxidation (oxidation of glucose to CO_2)
METABOLISM	Anabolic: produces sugars Endergonic → requires energy (light energy - sunlight)	Catabolic: breaks sugars Exergonic → produces energy (products less energy than reactants)
ENERGY FORMATION	ATP & NADPH (inner thylakoid membrane)	ATP, NADH & FADH ₂ (All NADH & FADH ₂ converted to ATP in the inner mitochondrial membrane; some ATP produced by substrate-level phosphorylation)