

Look for Similarities (*Compare*) and Differences (*Contrast*)

	Photosynthesis	Respiration
Chemical reaction:	Carbon dioxide and water combine in presence of sunlight to produce <u>glucose</u> .	Glucose (food) is broken down into water and carbon dioxide to produce <u>energy (ATP)</u> .
Production of ATP:	Yes	yes, 36-38
<u>Requirement of sunlight:</u>	<u>Can occur only in presence of sunlight</u>	<u>Occurs at all times.</u>
Fate of oxygen and carbon dioxide:	Carbon dioxide is absorbed and oxygen is released.	Oxygen is absorbed and carbon dioxide is released.
<u>Product:</u>	<u>C₆H₁₂O₆ and O₂</u>	<u>CO₂ and H₂O</u>
Main function:	Production of food. Energy Capture.	Breakdown of food. Energy release.
Location (Main structure):	Chloroplasts	Mitochondria
<u>Reactants:</u>	<u>CO₂ (Carbon Dioxide) and H₂O</u>	<u>C₆H₁₂O₆ (glucose) and O₂(oxygen)</u>
Stages:	2 stages (The light dependent reaction, light independent reaction).	3 stages (Glycolysis, pyruvate oxidation, Krebs cycle).
Equation:	$6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light energy}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$	$6\text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy(heat)}$
Occurrence:	Occurs in plants, protista (algae) and some bacteria.	Occurs in all living organisms.
Energy	Needs energy	Produces energy

Definitions of Photosynthesis and Respiration

- **Photosynthesis** is a process that converts carbon dioxide into organic compounds in presence of sunlight.
- **Respiration** is the set of metabolic reactions that take in cells of living organisms that convert nutrients like sugar into ATP (adenosine tri phosphate) and waste products.