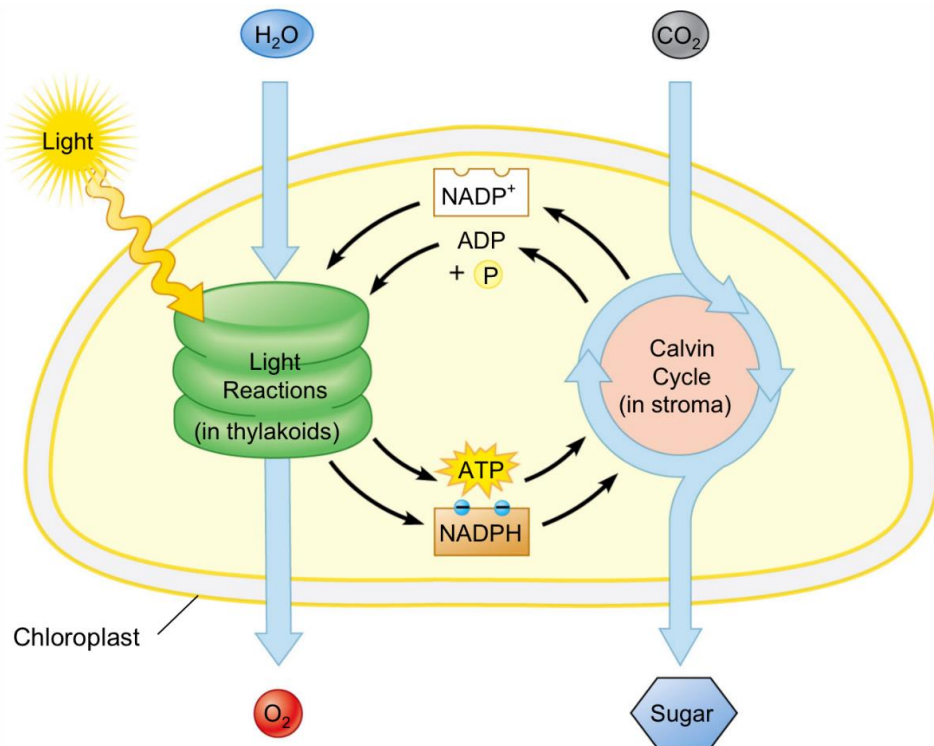


# Photosynthesis

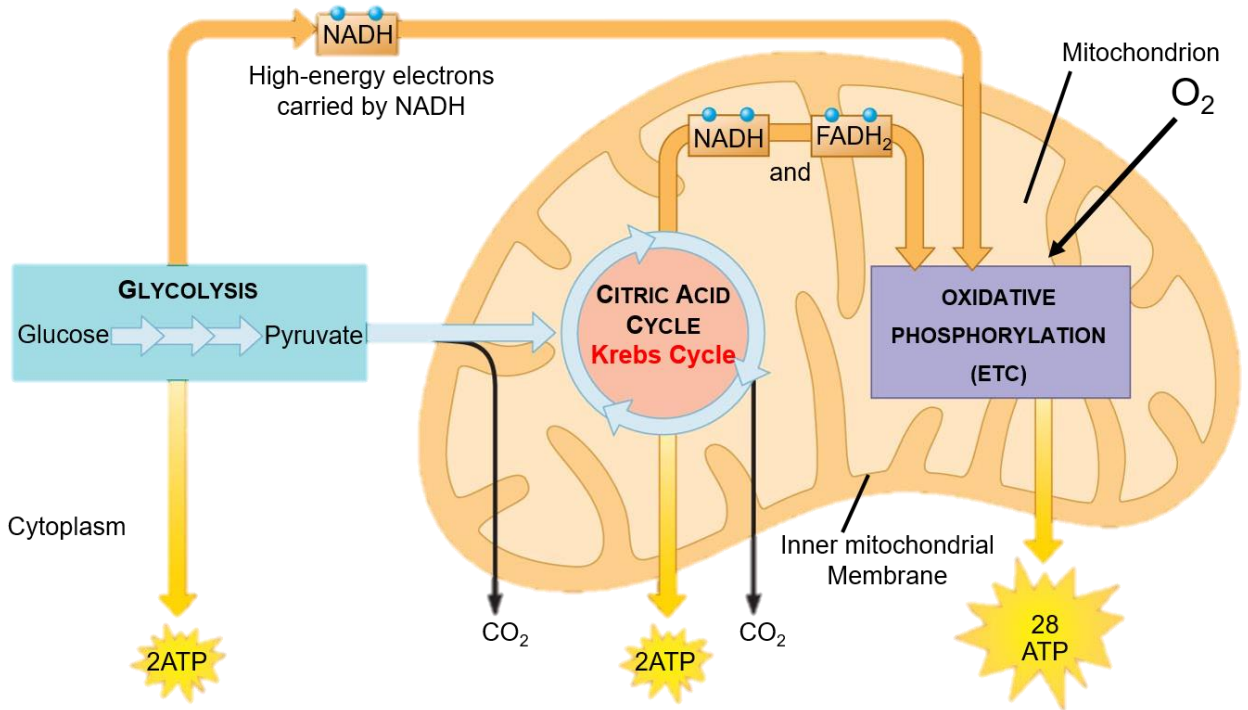
<b>Over all in put</b>	CO <sub>2</sub> + H <sub>2</sub> O + Light (energy)	
<b>Over all out put</b>	O <sub>2</sub> + Sugar	
<b>Stages of Photosynthesis</b>		
<b>Stages and Names</b>		
<b>Light reaction</b> <b>Light dependent reaction</b>	<b>In put</b>	Light + H <sub>2</sub> O + NADP <sup>+</sup> + ADP + P
	<b>Out put</b>	O <sub>2</sub> + NADPH + ATP
	<b>Occur in</b>	Thylakoids membrane
	<b>Function</b>	Converting light energy to chemical energy stored in both ATP and NADPH
<b>Calvin cycle</b> <b>Dark reaction</b> <b>Carbon fixation</b> <b>Light independent reaction</b>	<b>In put</b>	CO <sub>2</sub> + NADPH + ATP
	<b>Out put</b>	Sugar + NADP <sup>+</sup> + ADP + P
	<b>Occur in</b>	Stroma
	<b>Function</b>	Converts CO <sub>2</sub> to sugar.

- Each turn of Calvin cycle requires (1 CO<sub>2</sub>) + (2 NADPH) + (3 ATP).
- It needs 6 turns of the cycle to make 1 molecule of glucose.



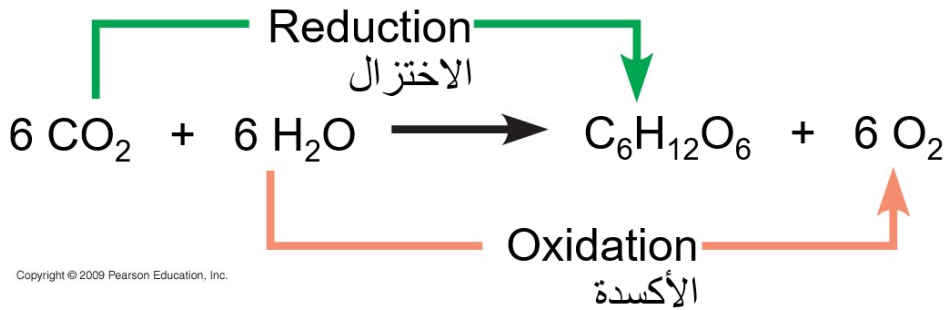
<b>Cellular Respiration</b>	<b>Over all in put</b>	Sugar + (6) O <sub>2</sub>		
	<b>Over all out put</b>	(6) CO <sub>2</sub> + (6) H <sub>2</sub> O + 32 ATP (energy)		
	<b>Stages of Cellular Respiration</b>			
	<b>Stages and Names</b>			
	<b>Stage (1)</b> <b>Glycolysis</b>	<b>In put</b>	Glucose + NAD <sup>+</sup>	
		<b>Out put</b>	2 Pyruvate + 2 ATP + NADH	
		<b>Occur in</b>	Cytoplasm	
		<b>Function</b>	Breaking glucose into pyruvate. Supply the third stage with electrons (NADH)	
	<b>Stage (2)</b> <b>Critic acid cycle</b> <b>Krebs cycle</b>	<b>In put</b>	2 Pyruvate + NAD <sup>+</sup> + FAD <sup>+</sup>	
		<b>Out put</b>	CO <sub>2</sub> + 2 ATP + NADH + FADH <sub>2</sub>	
		<b>Occur in</b>	Mitochondria Matrix	
		<b>Function</b>	Pyruvate is oxidized to a two-carbon compound. Supply the third stage with electrons (NADH + FADH <sub>2</sub> )	
	<b>Stage (3)</b> <b>Oxidative phosphorylation</b> <b>Electron Transport Chain (ETC)</b>	<b>In put</b>	O <sub>2</sub> + NADH + FADH <sub>2</sub>	
<b>Out put</b>		H <sub>2</sub> O + 28 ATP + NAD <sup>+</sup> + FAD <sup>+</sup>		
<b>Occur in</b>		Inner Mitochondria Membrane		
<b>Function</b>		Produced most of the ATP using chemiosmosis.		

- The main function of the first two stages is to supply the third stage with electrons. (through electron receptors NAD<sup>+</sup> and FAD<sup>+</sup>).
- Fermentation enables cells to produce ATP without Oxygen, fermentation generates ATP through **Glycolysis**.



**Photosynthesis (uses light energy)**

البناء الضوئي (يستخدم الطاقة الضوئية)



**Cellular respiration (releases chemical energy)**

التنفس الخلوي (تحرير الطاقة الكيميائية)

