- For every 12 TP molecules, the cycle produces one 6-carbon sugar and 6 molecules of 5-carbon RuBP
- > 18 ATP and 12 NADPH are necessary to produce 6 RuBP and a sugar

Summary of photosynthesis

- > Light is needed for the light-independent reaction to occur but not directly
- NADP⁺ and ATP move back and forth in the chloroplasts from the thylakoids to the stroma in their reduced and oxidized forms

Light-dependent reaction	Light-independent reaction
Occurs in thylakoids	Occurs in the stroma
Uses light to form ATP and NADPH	Uses ATP and NADPH to form TP
Photolysis to provide electrons, protons and oxygen to the atmosphere	Returns ADP, Pi and NADP ⁺ to the light-dependent reaction
2 ETC, Photosystems I and II	Calvin cycle
	Latesalo
Chloroplast structure	Function
Big surface area of trank ids	Greater absorption of light
Space within thylakoids	Faster creation of concentration gradient
Stroma	Enzymes of Calvin cycle can work here
Double outer membrane	Isolation from the cytoplasm

The Calvin experiment

- In the 1940's the biologist M. Calvin found out how the light-independent reaction happens. He called it the *Calvin cycle*
- > Chlorella (algae) was exposed to radioactive carbon dioxide had the isotope ¹⁴C
- > Samples the algae were taken out over time and were boiled to stop photosynthesis
- > The compounds from the samples were separated by chromatography
- > The radioactive carbon atoms were then identified by autoradiography
- > At the substrate molecules of the Calvin cycle were found
 - GP, TP, sugar phosphates and RuBP