

Photosynthesis

Stores Energy in Glucose
 $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{ENERGY} = \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

2 Stages of Photosynthesis

Light Dependent Reaction

Light Independent Reaction / **Calvin Cycle**

Location

Calvin Cycle takes place in the

Stroma of the Chloroplasts

Calvin Cycle

Products of Light Dependent Reaction **ATP** and **NADP.2H** drive Calvin Cycle

Needs

ATP

Hydrogen + ions (Cations)

to keep going

Brief look at the 3 Stages of Calvin Cycle

- 1) Carbon dioxide combines with Ribulose Biphosphate to Form 2 molecules of Glycerate 3-phosphate
- 2) ATP and NADP.2H are required for the reduction of glycerate 3-phosphate to **Triose phosphate**
- 3) Ribulose biphosphate is regenerated

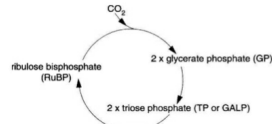
Triose Phosphate

can be used to make glucose and other organic substances

Simple

The Light-Independent Stage: Calvin Cycle

The Calvin Cycle takes place in the stroma.



Starting Compound

Ribulose Biphosphate

Finishing Compound

Triose Phosphate for making glucose

Ribulose Biphosphate regenerated back into the calvin cycle

to combine with CO_2 again to make **GP**

Building Materials

Calvin Cycle starting point for the making of organic substances a plant needs

Molecules used to make

Carbohydrates

Lipids

Amino Acids

Glossary

RUBP Ribulose Biphosphate

GP Glycerate 3-phosphate

TP Triose Phosphate

Calvin Cycle Info

Starting point for all organic substances a plant needs

Triose phosphate is used to make glucose

3 turns of calvin cycle produces 6 TP

Products of the Calvin Cycle

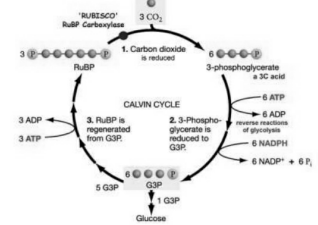
Triose Phosphate

Ribulose Biphosphate

Triose phosphate used for **making glucose**

Calvin Cycle

Calvin Cycle



1st Stage

CO_2 Enters through the **Stomata** into the **Stroma**

CO_2 combines with RuBP

Unstable 6 Carbon compound

Breaks into 3 GP

2nd Stage

Hydrolysis of **ATP**

Turns 3 **GP** into **TP**

This reaction requires **H+** ions from **NADP.2H**

TP converted into useful Organic Compounds (Glucose)

C

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3rd Stage

TP not used is regenerated back into RuBP

RuBP uses the rest of ATP produced by light dependent Reaction

Photophosphorylation

photosystems linked by Electron carriers

ETC are proteins that transfer electrons

Light energy excites electrons

photolysis of water produces H⁺ electrons and Oxygen

Energy from electrons makes ATP

And generates reduced NADP

C

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