

CALVIN CYCLE

- does not require sunlight
- this is when carbon dioxide is converted into carbohydrates
- there are three phases: carbon fixation, reduction reactions, and ribulose 1,5-bisphosphate (RuBP) regeneration
- The entire cycle has to happen twice in order to create 1 glucose molecule

Carbon Fixation:

3 CO₂

3 RuBP
(Ribulose biphosphate - 5C)

3 H₂O

6 3-Phosphoglycerate
(3C)

- Plants that fix carbon this way are called C₃ plants

Reduction Reactions:

6 3-Phosphglycerate (3C)

6 ATP

6 ADP

6 1,3-bisphosphoglycerate (3C)

6 NADPH

6 NADP⁺

6 P_i

6 glyceraldehyde 3-phosphate (3C)

1 glyceraldehyde 3-phosphate

(half of a glucose molecule: leaves the cell as a by product and used as a building block for sucrose, starch, or cellulose)

RuBP Regeneration:

5 glyceraldehyde 3-phosphate

2 H₂O

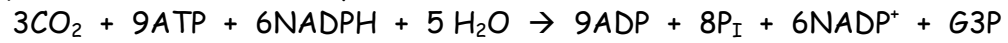
2 P_i

3 ATP

3 ADP

3 ribulose 1,5-bisphosphate (RuBP)

- the ADP, NADP⁺, and P_i diffuses back to the light reaction where they are converted back into ATP, NADPH
- see Fig. 9 on pg. 161.
- the net equation from the Calvin cycle:



SEATWORK

Pg. 167 # 9 - 16