

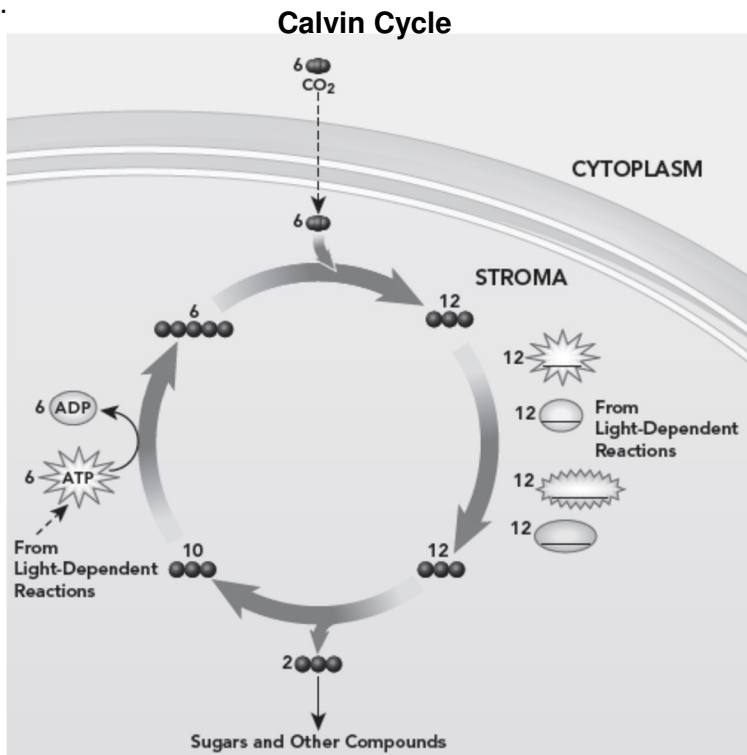
Photosynthesis Review WS – Part 2

The Light-Independent Reactions (Calvin Cycle): Producing Sugars

Both ATP and NADPH are produced by the light-dependent reactions of photosynthesis. The Calvin cycle uses the energy in ATP and NADPH to produce high-energy sugars. A model of the Calvin cycle is shown below.

Follow the directions.

1. Label the diagram by filling in the blanks.
2. Circle the places where ATP and NADPH are used.
3. Draw a square around the two 3-carbon molecules that are removed from the cycle to produce sugars, lipids, and other compounds.



Answer the questions.

4. Circle the letter of each statement that is true about the Calvin cycle.
 - A. The main products of the Calvin cycle are six carbon dioxide molecules.
 - B. Carbon dioxide molecules enter the Calvin cycle from the atmosphere.
 - C. Energy from ATP and high-energy electrons from NADPH are used to convert 3-carbon molecules into higher-energy forms.
 - D. The Calvin cycle uses 6 molecules of carbon dioxide to produce a single 6-carbon sugar molecule.
5. Why are the reactions of the Calvin cycle also called the light-independent reactions?

Light-Dependent and Light-Independent Reactions

Photosynthesis involves two sets of reactions. The light-dependent reactions need sunlight. They use energy from this sunlight to produce energy-rich compounds, like ATP. The light-independent reactions use these energy-rich compounds to produce sugars from carbon dioxide.

Complete the T-chart. Write the phrases in the box that belong in each side of the chart.

Use energy from the sun

Use carbon dioxide

Produce oxygen

Produce sugars

Convert ADP into ATP

Convert NADP⁺ into NADPH

Take place in the stroma

Take place in thylakoids

Require water

Also called Calvin cycle

Use ATP and NADPH

Light-dependent Reactions

Light-independent Reactions