

# PHOTOSYNTHESIS

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Photosynthesis is the process of converting carbon dioxide and water into carbohydrates and oxygen by the energy of sunlight. This process is the basis for the nutrition of all living things, and also supplies humanity with fuel, fiber and countless beneficial chemical compounds.

The scope of our research is as follows:

1. Reveal the essence of the process of photosynthesis
2. Systematization, deepening and consolidation of knowledge on plant photosynthesis and abiotic environmental factors.
3. Analyzing the dependence of the rate of photosynthesis on the intensity of illumination, temperature and concentration of carbon dioxide in the atmosphere.
4. Consideration of the conditions necessary for the flow of this process.

Observing the indoor pot plants it is possible to conclude that the rate of photosynthesis increases with increasing light intensity, temperature and carbon dioxide concentration in the atmosphere.

Various factors affecting the rate of photosynthesis include:

1. Abiotic factors - light and temperature
2. Gaseous composition of air

Thanks to photosynthesis, billions of tons of carbon dioxide are absorbed from the atmosphere every year, billions of tons of oxygen are released; photosynthesis is the main source of organic matter formation. The ozone layer is formed from oxygen, which protects living organisms from short-wave ultraviolet radiation.

During photosynthesis, the green leaf uses only about 1% of the solar energy falling on it, the productivity is about 1 g of organic matter per 1 m<sup>2</sup> of surface per hour.

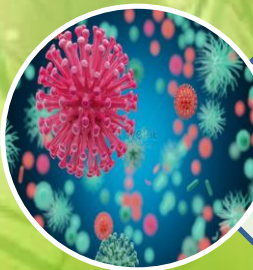
K. A. Timiryazev spoke about the role of green plants on the Earth as follows: "Hardly any process that occurs on the surface of the earth deserves such a degree of general attention as that far from unraveled process that occurs in a green leaf when a ray the sun ... is a process on which, in the final instance, all manifestations of life on our planet depend, and, consequently, the well-being of all mankind".

The process of photosynthesis involves two successive phases: light and dark:



## *Light phase*

This phase occurs only in the presence of light in the thylakoid membranes with the participation of chlorophyll, electron-carrying proteins, and the enzyme ATP synthetase.



## *Dark phase*

This phase occurs in the stroma of the chloroplast. Its reactions do not need the energy of light, so they occur not only in the light, but also in the dark. Dark phase reactions are a chain of successive transformations of carbon dioxide (coming from the air), leading to the formation of glucose and other organic substances.

## Literature:

1. Lemeza N. A., Lisov N. D. The cell is the basis of life. Studies. Stipend. - Mn.: NKF "Ecoperspektiva", 1997.
2. Nikishov A. I. Biology. Summary course. Studies.manual. - M.: Shopping center "Sphere", 1999.
3. Ponomareva I. N., Kornilova O. A., Kuchmenko V. S. Biology: 6th grade: Textbook for students of general education institutions / Ed. by prof. I. N. Ponomareva. - M.: Ventana-graf,2008.
4. Ponomareva I. N. Ekologiya. - M.: Ventana-Graf,2006.
5. Chernova N. M., Bylova A.M. Ekologiya: Ucheb.manual for students of biol. spec. ped. in-tov. - M.: Prosveshchenie, 1988