

Name \_\_\_\_\_

Date \_\_\_\_\_

## What is Photosynthesis?

Photosynthesis (*photo = light and synthesis = to make*) is the process plants use to change carbon dioxide and water into sugar using sunlight. This sugar (glucose) is their food, and the process gives off oxygen.

Photosynthesis is the conversion of light energy into chemical energy by living organisms. The raw materials are carbon dioxide and water. The energy source is sunlight, and the end-products include glucose and oxygen. It is arguably the most important biochemical pathway, since nearly all life depends on it. It is a complex process occurring in higher plants, phytoplankton, algae, as well as bacteria such as cyano-bacteria. Photosynthetic organisms are also referred to as *autotrophs*.

Photosynthesis is the process by which plants, some bacteria, and some protistans use the energy from sunlight to produce sugar, which cellular respiration converts into ATP, the "fuel" used by all living things. The conversion of unusable sunlight energy into usable chemical energy is associated with the actions of the green pigment chlorophyll. The photosynthesis process uses water and releases oxygen that we absolutely must have to stay alive.

We can write the overall reaction of this process as:



6 water molecules + 6 carbon dioxide molecules + light is converted into 1 glucose molecule and 6 oxygen molecules

The first photosynthetic organisms probably evolved about 3,500 million years ago, early in the evolutionary history of life, when all forms of life on Earth were microorganisms and the atmosphere had much more carbon dioxide. They most likely used hydrogen or hydrogen sulfide as sources of electrons, rather than water.



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## Photosynthesis Multiple Choice Questions

- 1. The process of photosynthesis gives off**
  - a) Carbon di oxide
  - b) Nitrogen
  - c) Oxygen
  - d) None of the above
  
- 2. Which of the following is NOT involved in process of photosynthesis?**
  - a) Sunlight
  - b) Sugar (glucose)
  - c) Water
  - d) Nitrogen
  
- 3. Photosynthesis is the conversion of \_\_\_\_\_ into \_\_\_\_\_.**
  - a) Chemical energy in light energy
  - b) Chemical energy into food
  - c) Light energy in chemical energy
  - d) Potential energy into kinetic energy
  
- 4. For plants, the end product of the process of photosynthesis is**
  - a) Oxygen
  - b) Glucose
  - c) Water
  - d) All of the above
  
- 5. The first photosynthetic organisms probably evolved about how many years ago?**
  - a) 3500 million
  - b) 4500 million
  - c) 5500 million
  - d) 7000 million

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## What is Photosynthesis?

### *Answers*

1. **c**
2. **d**
3. **c**
4. **b**
5. **a**

### *Explanation of Answers*

1. The final products of photosynthesis are oxygen and glucose. Option C is oxygen which is the right answer.
2. Nitrogen has no role in process of photosynthesis.
3. Photosynthesis is the conversion of light energy into chemical energy by living organisms
4. Glucose is the food of plants whereas oxygen is used by animals and humans for breathing.
5. The first photosynthetic organisms probably evolved about 3,500 million years ago.

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## What is Photosynthesis? Writing Activity

1. Explain briefly the process of photosynthesis.

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2. What are autotrophs?

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3. What is the chemical equation that explains the process of photosynthesis?

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4. Is it possible that some animals may also have photosynthesis? If not, give reason.

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