

Grade 7

Reading Science

The Marvel of Photosynthesis

In the heart of green plants, a fascinating chemical process is continuously taking place. This process, called photosynthesis, is essential for life on Earth. Without it, we wouldn't have the oxygen we breathe or the food we eat. But how does this incredible process work?

Imagine being able to create your own food just by soaking up sunlight. Sounds magical, doesn't it? This is precisely what plants do through photosynthesis. The word "photosynthesis" is derived from the Greek words "photo," meaning light, and "synthesis," meaning putting together. So, in essence, it's about creating something using light.

Photosynthesis primarily occurs in the leaves of plants, in specialized cells that contain a green pigment called chlorophyll. This pigment captures sunlight, which acts as the energy source to convert carbon dioxide from the air and water from the soil into glucose. Glucose is a type of sugar that serves as an energy source for plants. As a bonus, oxygen is released into the atmosphere as a byproduct.

This is a simplified overview. The actual process is a bit more intricate. Photosynthesis can be divided into two stages: the light-dependent reactions and the light-independent reactions, or the Calvin cycle.

In the light-dependent reactions, sunlight is absorbed by chlorophyll, and this energy splits water molecules into oxygen, which is released into the air, and hydrogen. The hydrogen is used in the next stage of photosynthesis.

The Calvin cycle is where the actual "food making" happens. Here, the absorbed carbon dioxide is combined with the hydrogen to produce glucose. This glucose can then be used by the plant for energy or stored for later use.

This process is vital for life on Earth. It's through photosynthesis that plants produce the oxygen we breathe. Additionally, the glucose produced serves as the foundation of the food chain. Animals eat plants to gain energy from the glucose, and then other animals eat those animals, and so on. We, humans, rely on both plants and animals for our food, so we are indirectly depending on photosynthesis for our survival.

Next time you see a green plant, remember the marvelous process it's undergoing. It's capturing sunlight, breathing in carbon dioxide, and releasing life-giving oxygen, all while creating its own food. Indeed, plants are Earth's little miracle workers!

Multiple Choice Questions:

1. What is the primary function of chlorophyll in photosynthesis?

- A) Production of oxygen
- B) Absorption of sunlight
- C) Creation of glucose
- D) Release of carbon dioxide

2. Which of the following is NOT a product of photosynthesis?

- A) Glucose
- B) Oxygen
- C) Carbon dioxide
- D) Water

3. The Calvin cycle is responsible for:

- A) Absorbing sunlight
- B) Releasing oxygen
- C) Producing glucose
- D) Splitting water molecules

4. The light-dependent reactions result in the release of:

- A) Carbon dioxide
- B) Glucose
- C) Oxygen
- D) Chlorophyll

5. Photosynthesis mainly occurs in which part of the plant?

- A) Roots
- B) Stems
- C) Leaves
- D) Flowers

6. Why is photosynthesis important for humans?

- A) It produces carbon dioxide.
- B) It allows plants to grow taller.
- C) It provides the oxygen we breathe and forms the basis of our food chain.
- D) It helps plants reproduce.

7. What does "photo" in photosynthesis mean?
- A) Plant
 - B) Air
 - C) Light
 - D) Water
8. Which process splits water molecules during photosynthesis?
- A) Calvin cycle
 - B) Light-independent reactions
 - C) Light-dependent reactions
 - D) Glucose formation
9. Which molecule is combined with hydrogen during the Calvin cycle?
- A) Oxygen
 - B) Water
 - C) Glucose
 - D) Carbon dioxide
10. What type of sugar do plants produce during photosynthesis?
- A) Fructose
 - B) Lactose
 - C) Glucose
 - D) Sucrose

Answers and Explanations:

1. B. Absorption of sunlight.

Chlorophyll's main role is to absorb sunlight, which drives the photosynthesis process.

2. C. Carbon dioxide

3. 3. C Producing glucose

The Calvin cycle combines carbon dioxide with hydrogen to produce glucose.

4. C. Oxygen

5. 5. C. Leaves

Photosynthesis primarily happens in the specialized cells in leaves.

6. C. It provides the oxygen we breathe and forms the basis of our food chain.

Photosynthesis produces oxygen and forms the base of the food chain, both crucial for human survival.

7. C. Light.

"Photo" is derived from the Greek word for light.

8. C. Light-dependent reactions.

During the light-dependent reactions, water molecules are split to release oxygen

9. D. Carbon dioxide.

Carbon dioxide is combined with hydrogen to produce glucose in the Calvin cycle.

- 10.C. Glucose.

Plants produce glucose during photosynthesis, which they use for energy or store for later use.