Text 03

Photosynthesis

The word "**photosynthesis**" is derived from Greek words **Photo** means "light" and **synthesis** means, "combining together." This means "combining together with the help of light**."** Photosynthesis is a process by which phototrophs convert light energy into chemical energy, which is later used to fuel cellular activities. The chemical energy is stored in the form of sugars, which are created from water and carbon dioxide.

Photosynthesis reaction involves two reactants, carbon dioxide and water. These two reactants yield two products, namely, oxygen and glucose. Following is the photosynthesis formula:

$$\text{carbon dioxide} + \text{water} \xrightarrow[\text{chlorophyll}]{\text{sunlight}} \text{glucose} + \text{oxygen}$$

Chloroplasts are the sites of photosynthesis in plants and blue-green algae. All green parts of a plant, including the green stems, green leaves, and sepals –floral parts comprise of chloroplasts. These cell organelles are present only in plant cells and are located within the mesophyll cells of leaves.

Chlorophyll is a green pigment found in the chloroplasts of the plant cell**.** This green color pigment plays a vital role in the process of photosynthesis by permitting plants to absorb energy from sunlight. Chlorophyll is a mixture of chlorophyll-*a* and chlorophyll-*b*.

During the process of photosynthesis, carbon dioxide enters through the stomata, water is absorbed by the root hairs from the soil and is carried to the leaves through the xylem vessels. Chlorophyll absorbs the light energy from the sun to split water molecules into hydrogen and oxygen. The hydrogen from water molecules and carbon dioxide absorbed from the air are used in the production of glucose. Furthermore, oxygen is liberated out into the atmosphere through the leaves as a waste product. Glucose is a source of food for plants that provide energy for growth and development**,** while the rest is stored in the roots, leaves and fruits, for their later use.

Photosynthesis is essential for the existence of all life on earth. It serves a crucial role in the food chain, the plants create their food using this process, thereby, forming the primary producers. Photosynthesis is also responsible for the production of oxygen – which is needed by most organisms for their survival.

I- PART ONE FROM THE TEXT

1- What is Photosynthesis? Explain the process of photosynthesis?

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2- In what cell organelle does photosynthesis occur?

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3- What are the three reactants needed for photosynthesis?

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4- What are the two products of photosynthesis?

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5- What is the one component in photosynthesis that is not recycled and must be constantly available?

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6- What is the role of chlorophyll, root hairs, stomata?

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II- PART TWO

1- Rewrite the photosynthesis equation.

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2- Select the correct answer from the text below each question:

1. An inorganic molecule required by green plants for the process of photosynthesis is:

A. oxygen

B. starch

C. carbon dioxide

D. glucose.

2. Which activity occurs in the process of photosynthesis?:

A. Chemical energy from organic molecules is converted into light energy.

B. Organic molecules are obtained from the environment.

C. Organic molecules are converted into inorganic food molecules.

D. Light energy is converted into the chemical energy of organic molecules.

3. Animals have to eat other things to get their food but plants can make it themselves. Plants are known as:

A. directors

B. greens

C. producers

D. chefs

4. Photosynthesis takes place mainly in the leaves, although it can occur in any cells than contain :
   A. glucose
   B. a vacuole
   C. chlorophyll
5. _____ is a product of photosynthesis (some is used inside the plant for respiration but most is not needed and is given out as a waste product):
   A. carbon dioxide
   B. water
   C. oxygen
   D. light.