BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

SUBJECT:- Biology

Class X - CHAPTER- Life Processes

TOPIC- Life Processes (Autotrophic Nutrition)

Guidelines:
Dear Students

- Refer to the following content for the chapter.
- These notes will help you understand the concept of the lesson and complete the assignment that follows which will be graded on submission.
- Maintain a new notebook of Biology for doing the assignment.
- Link for the Book :- http://ncertbooks.prashanthellina.com/10_Science.html

What are life processes?

The processes which together perform the job of maintenance within the body of an organism are called life processes. For example: nutrition, respiration, transportation, excretion.

Nutrition: The process of obtaining nutrients from the surroundings i.e. intake of food, followed by digesting it to liberate energy which is utilised for carrying out various body functions.

Types of Nutrition: Autotrophic nutrition and Heterotrophic Nutrition.

Given below is the table showing difference between the two different types of nutrition.

	Autotrophic Nutrition	Heterotrophic Nutrition
1.	Raw materials are required.	Raw materials are not required.
2.	Organism prepares its own food.	Organism is dependent on other organisms.
3.	Chlorophyll is required.	Chlorophyll is not required.
4.	Food is generally prepared during day time.	Food can be gathered at all times.
5.	They are at the primary level of food chain.	They are at the secondary and tertiary level in a food chain.
	Examples: green plants and some bacteria.	Examples: all animals and fungi.

Autotrophic nutrition:

- Synthesis of food by plants with the help of sunlight.
- It is done by green plants and some bacteria.

Requirement of photosynthesis:

Equation of photosynthesis:

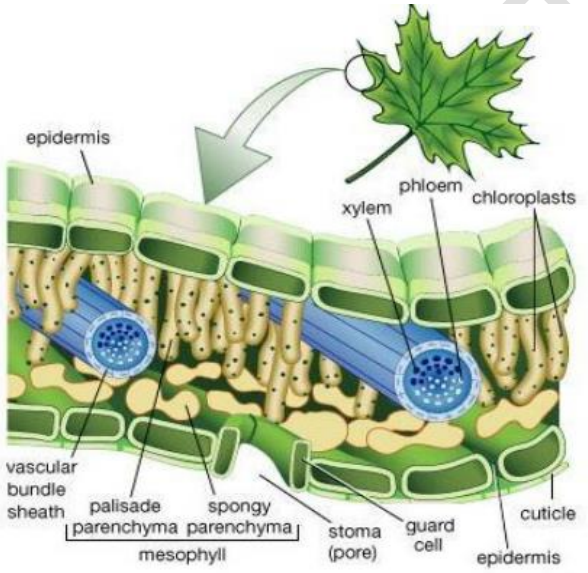
$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$

- Water- taken from the soil with the help of roots.
- Nitrogen, phosphorus, iron, magnesium – taken from the soil with the help of roots.
- Carbon dioxide- taken from the air with the help of stomata.

Events of photosynthesis:

- Absorption of light energy by chlorophyll - a green pigment provides energy for the activation of reaction
- Conversion of light energy to chemical energy and splitting of water into its constituents- hydrogen and oxygen, leading to synthesis of ATP and NADPH2.
- Reduction of carbon dioxide to carbohydrates (stored in plants in the form of starch) which provides energy to the plants.

Figure showing Cross Section of a Leaf



I wonder what these green dots in the leaves are called! Why are they so important?

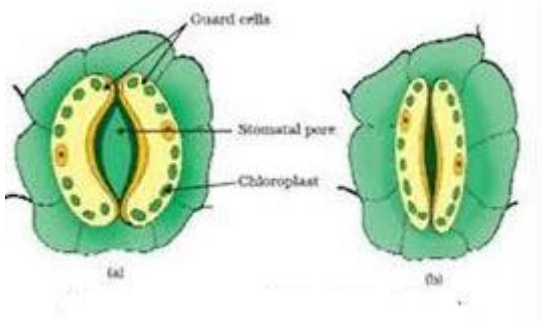
Stomata

Stomata are tiny pores present on the surface of leaves.

Structure: shown in the given diagram.

Function: Massive gas exchange takes place. It helps in transpiration.

Opening and closing of stomata is the function of guard cells. When water enters the guard cell, it swells causing the stomatal pore to open. If the guard cells shrink, the pore gets closed.



Kindly refer to the link shared for better understanding of the process of photosynthesis in plants. It will enable you to experience visual interpretation of the process.
https://www.youtube.com/watch?v=g78utcLQrJ4

Experiment 1:

Given below is an experiment to show "**Light is Necessary for Photosynthesis**":

- Take a potted plant with variegated leaves, e.g. money plant.
- Keep the plant in a dark room for three days so that all the starch gets used up.
- Now keep the plant in sunlight for about six - seven hours
- Pluck a leaf from the plant. Mark the green areas in it and trace them on a sheet of paper.
- Dip the leaf in boiling water for a few minutes.
- After this immerse it in a beaker containing alcohol.
- Carefully place the above beaker in a water bath and heat it till the alcohol begins to boil.
- Notice the change in colour of the leaf.
- Now dip the leaf in a dilute solution of iodine for a few minutes.
- Take out the leaf and rinse off the iodine solution.
- Observe the colour of the leaf and compare it with tracing of the leaf done in the beginning.

Kindly refer to the link shared below for better understanding of the experiment "Light is Necessary for Photosynthesis in Plants."

https://www.youtube.com/watch?v=j6Le0S52wt0

A. Answer the following questions:

a) How was chlorophyll removed from the leaf?

b) A portion of the leaf was covered with black paper. Why?

c) Rohit kept a destarched leaf in iodine. Which observation will show that photosynthesis took place? (Choose the correct option)

i) Yellow colouration in photosynthetic area

ii) Black colouration

iii) Blue-black colouration in photosynthetic area

iv) Red colouration in photosynthetic area

Experiment 2:

Given below is an experiment to show "**Carbon dioxide is Necessary for Photosynthesis":**

Kindly refer to the link shared below for better understanding of the experiment "Carbon dioxide is Necessary for Photosynthesis in Plants".

https://www.youtube.com/watch?v=lji6Zx3_E30

Brainstorming: Design an experiment to show that sunlight is necessary for photosynthesis.

Key points:

Nutrition	**Autotrophic Nutrition**	**Photosynthesis**	**Stomata**

ASSIGNMENT:

B. Answer the following questions briefly:

Q1. Give one word for:

a) the cell organelle where photosynthesis occurs

b) cells that surround a stomatal pore

c) the process in plants that links light energy with chemical energy.

Q2. Some leaves of a plant are coated with Vaseline. Which process/ processes will be affected? Will this plant remain healthy for long? Give reasons.

Q3. Rita wanted to observe the opening of stomata. At what time should she make the observation?

a) night b) evening c) day

Q4. Discuss the necessity of nutrition for an organism.

Q5. Elaborate on any three adaptations of leaf for photosynthesis.