

CLASS -7
SUBJECT – SCIENCE(BIOLOGY)
CHAPTER - NUTRITION IN
PLANTS

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Period/ worksheet -1

LIFE PROCESSES (NUTRITION AND NUTRIENTS)

1.1 NUTRITION

*The process of taking in food and its utilization by the body is called **nutrition** (derived from Latin word *nutrire* meaning to nourish). As you have learnt in class VI, food provides us with a number of **nutrients** which are necessary for the proper functioning of our body. To recall, the different nutrients are carbohydrates, proteins, fats, vitamins and minerals. Do you remember (i) the nutrients which provide us energy and (ii) the roles which the different nutrients perform in our bodies?*



Fig. 1.1: Worms are an excellent source of plant nutrition

LIFE PROCESSES (worksheet 1)

• **WHAT ARE LIFE PROCESSES?**

All living organisms perform some basic functions to keep themselves alive. These basic functions which allow living organisms to live on earth are known as life processes. Example : nutrition , respiration , excretion , reproduction , growth , movement etc.

• **WHAT DO YOU MEAN BY THE TERM “ NUTRITION”?**

The process of taking food and its utilization by the body is called nutrition. The word derived from Latin word nutrire meaning to nourish.

• **WHAT ARE NUTRIENTS?**

Substances which provide nutrition to living organism are called nutrients. Example: carbohydrates, proteins , fat, vitamins , minerals.

Types of nutrition:- 1. AUTOTROPHIC AND 2. HETEROTROPHIC

1.2 MODES OF NUTRITION

Living organisms show two modes of nutrition:


- they prepare their own food and
- they take in ready-made food, either from plants (fruit and vegetables) or from animals (milk, meat and eggs).

The nutrition of the first type is called **autotrophic** (*auto* = self and *troph* = nourishment), while the second type of nutrition is called **heterotrophic** (*heteros* = other).

1.2.1 Autotrophic Nutrition


Autotrophic nutrition is found in green plants. *Green plants prepare their own food through a process called photosynthesis.* The leaves of these plants contain a green pigment called **chlorophyll**. Without chlorophyll, food cannot be prepared by the plants.

Green plants are called **autotrophic organisms** or **autotrophs**.



pitcher shaped leaf

(a) Pitcher plant



two halves of a leaf with spines on the margins

(b) Venus flytrap

2. HETEROTROPHIC NUTRITION

1.2.2 Heterotrophic Nutrition

All animals show heterotrophic mode of nutrition and hence are called heterotrophs.


Heterotrophs are organisms that cannot manufacture their own food and derive food from plants or animals or both.

If you list all the food items that you eat during the day, you will know how much we depend on plants and animals. Wheat, rice, pulses (dals), vegetables and fruit are obtained from plants. For milk, curd, cheese, eggs and meat, we depend on animals.

Do you know that even some plants are heterotrophs as they can eat insects? Pitcher plant and venus flytrap are plants which eat insects (Fig. 1.2). Such plants are called **insectivorous plants**. Insectivorous plants, however, also prepare their food as an autotroph.


Based on their eating habits, animals are divided into three categories (Fig. 1.3):

- Herbivores:** Plant eaters like cow, buffalo, deer, sheep and goat
- Carnivores:** Meat eaters like tiger, lion and wolf



(b) Venus flytrap

Fig. 1.2: Insectivorous plants



autotroph

herbivore

carnivore

omnivore

Fig. 1.3: Categories of animals based on their eating habits

MODES OF NUTRITION (worksheet 2)

- **NAME TWO MODES OF NUTRITION FOLLOWED BY LIVING ORGANISMS?**

The two modes of nutrition are 1. autotrophic nutrition

2. heterotrophic nutrition.

- **DEFINE AUTOTROPHIC NUTRITION WITH EXAMPLE.**

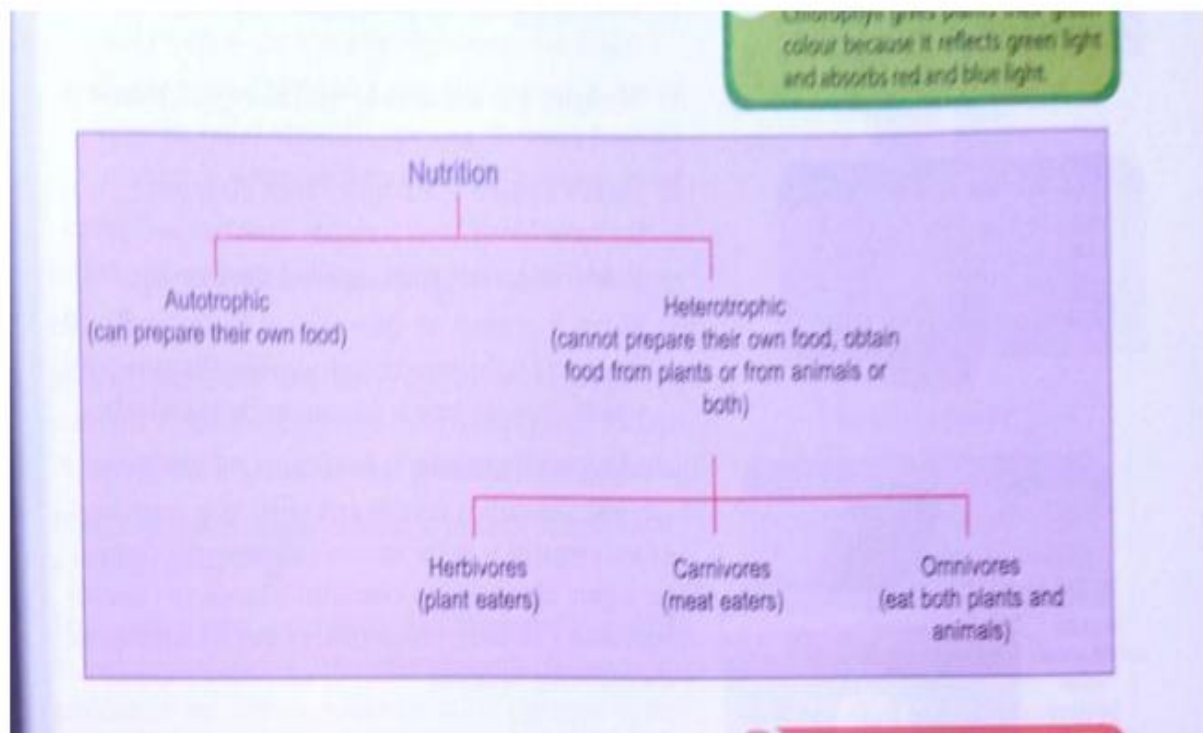
. Auto=Self , Troph = nourishment. Green Plant prepare their own food by the process called photosynthesis. They need chlorophyll for that. This is called autotrophic nutrition.

- **DEFINE HETEROTROPHIC NUTRITION WITH EXAMPLE**

Heteros= other , troph= nourishment. Animals derive readymade food either from plants or from animals. They can not prepare their own food due to lack of chlorophyll. This is called heterotrophic nutrition.

- **NAME TWO HETEROTROPHIC PLANTS.**

Some plants like insectivorous plants(example ; pitcher plant , venous fly trap) feed on insects to fulfil their nitrogen deficiency. They need insects to make their protein. They are also the example of heterotrophs.



1.3 NUTRITION IN PLANTS— PHOTOSYNTHESIS

Plants, as discussed above, are autotrophs. They prepare their own food.

Let us find out:

- Where is the food prepared in the plant body.
- What are the raw materials which the plants use to prepare their food.
- What is the chemical nature of food that is produced.

Food is prepared or synthesized only by those plants which are green in colour. You must remember that the majority of plants are green due to the presence of a green pigment called chlorophyll. Chlorophyll is present in the leaves and also in the young green stems.

The process by which green plants prepare their own food is called **photosynthesis** (*photo* = light, *synthesis* = to combine). During this process, plants absorb the sun's energy through their leaves and convert it into food energy, using raw materials from the atmosphere and soil (Fig. 1.4).

Key Fact
Joseph Priestley's experiments (1771) demonstrated that plants produce oxygen and purify air.

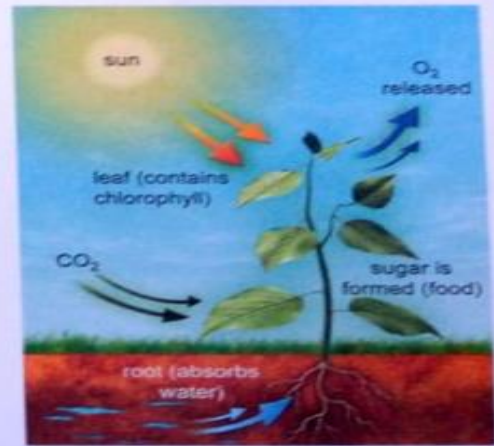


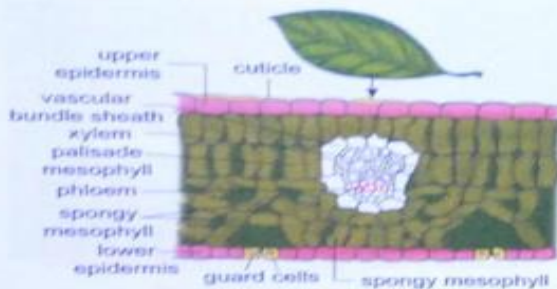
Fig. 1.4: Photosynthesis

Vessels

They are the channels for transport of water and minerals in plants.

Starch

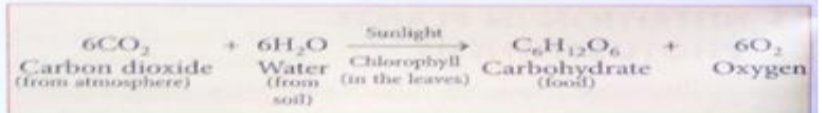
- Presence of starch in the leaves is used as an evidence of photosynthesis taking place.
- Its presence is tested by iodine test.



Thus, for photosynthesis, the following four things are required:

- Chlorophyll:** It is the green pigment present in the leaves (Fig. 1.5).
- Sunlight:** It is absorbed by the chlorophyll present in the leaves.
- Carbon dioxide:** It is absorbed from the atmosphere by the leaves through small pores present on the lower surface of the leaves. These pores are called **stomata** (Fig. 1.6).
- Water:** It is taken up from the soil by the roots and transported to the leaves through pipe-like structures called **vessels**. They are present throughout the plant body.

The chlorophyll-containing cells of leaves, in the presence of sunlight, use carbon dioxide and water to prepare food. The food prepared is in the form of carbohydrates (sugars). These sugars ultimately get converted into starch (another carbohydrate). In brief, photosynthesis can be represented by the following equation:



TYPES OF HETEROTROPHIC NUTRITION (work sheet 3)

- Fill in the blanks:
 1. Animals eat only plants or plant product, are called.....
 2. Animals eat only meat are called
 3. Animals eat both plants and animals are called.....
 4. The process by which green plants prepare their own food is called
 5. Write the name of the raw materials required for photosynthesis. Also write their sources.
 6. Draw the transverse section of leaf to show different layers of cells present in it.
 7. Write the chemical equation of photosynthesis.