# NEW HORIZON SCHOOL SUPPORT MATERIAL PERIODIC TEST- 1 SUBJECT – SCIENCE CLASS – 7

## Chapter – 1

### **Nutrition in Plants**

#### Nutrition:

The mode of taking food by an organism and its utilization by the body is called **Nutrition.** 

**Nutrients:** The chemical components of food which are essential for body are called **Nutrients.** 

There are five major nutrients:

- 1. Carbohydrates
- 2. Fats
- 3. Proteins
- 4. Vitamins
- 5. Mineral

Roughage and water are also important for digestion.

#### organisms need to take food:

Growth is the main reason for all the organisms to take food. Food provides essential energy to run and walk. The main reason is to repair the damaged and injured parts of the body and, it provides a shield against deadly diseases and increases immunity against many infections.

Modes of Nutrition: There are two modes of nutrition-

**Autotrophic mode of nutrition:** The mode of nutrition in which organisms make food themselves from simple substances is called **autotrophic** (auto = self; trophs = nourishment) nutrition.

**Heterotrophic mode of nutrition:** Animals and other organisms take in readymade food prepared by the plants. They are called **heterotrophic** (hetero = others) nutrition.

### **Photosynthesis:**

The leaves have green pigment called chlorophyll. It helps leaves to capture the energy of the sunlight. This energy is used to synthesise food from carbon dioxide and water is called **Photosynthesis** (photo = light; synthesis; to combine).

Carbohydrate which is produced in the process of photosynthesis is ultimately converted into starch and stored in leaves. From leaves it is transported to different parts of a plant. Starch is a type of carbohydrate. The oxygen so produced is released into atmosphere through the stomata.

#### Carbon dioxide + Water $\rightarrow$ Carbohydrates + Oxygen

Leaves are known as the kitchen or food factories of the plants because photosynthesis takes place in leaves. Leaves look green because of the presence of chlorophyll.



**Stomata:** The stomata are minute pores which occur in the epidermis of the plants. Each stoma remains surrounded by two kidneys or bean shaped epidermal cells the guard cells. The stomata may occur on any part of a plant except the roots.



## Definition of a Cell:

A cell can be defined as the smallest unit of life. It is the structural, functional and biological unit of all living beings. A cell can replicate itself independently and are thus referred to as the *building blocks of life.* Each cell contains a cytoplasm which is enclosed by a membrane and contains several biomolecules like proteins, nucleic acids, etc.

The cell was first discovered in 1665 by Robert Hooke. Then in 1839, the *Cell Theory* was developed.



Cell

#### Parasitic mode:

In parasitic mode of nutrition, plants depend on other live plants or animals for their nourishment. Such plants are called as parasites and the ones on which parasites depend are called as hosts.

The insectivorous mode of nutrition is observed in plants like pitcher plant and the Venus fly trap. They purely depend on other insects and small animals for their nutrition.

Cuscuta is a parasitic plant which develops special roots called haustoria. Haustoria penetrate deep into host plant tissues and just absorb the nutrients from them.

### Saprophytic mode:

The plants which exhibit saprotrophic mode of nutrition are called as saprotrophs. Saprotrophs are the plants that obtain their nutrition from dead and decaying organic matter. Saprotrophs secrete digestive juices onto dead and decaying matter to dissolve it and then absorb nutrients from it.

#### Insectivorous plants:

**Insectivorous plants** are plants that derive some or most of their nutrients by trapping and consuming insects. **Insectivorous plant** especially adapted for capturing and digesting insects.

Example: Pitcher plant.



Pitcher plant

### Saprotrophs:

Saprotrophs are organism that feeds on nonliving organic matter. The word *saprotroph* meaning is sapro("rotten) and *troph* ("nourishment"). Saprotrophic organisms are considered critical to <u>decomposition</u> and <u>nutrient</u> <u>cycling</u> and include <u>fungi</u>, certain <u>bacteria</u>, and funguslike organisms known as bread moulds.

### Symbiotic Relationship:

Symbiotic Relationship means living together. In this relation two different types of organisms live and work together for their mutual benefit from each other. They share shelter and nutrients, e.g. Lichens. Lichens are composite organisms composed of fungus and alga. Fungus is a saprophyte and alga are an autotroph. The Fungus supplies water and minerals to the cells of the alga while the alga supplies food; prepared by photosynthesis.

## Chapter – 2

## Nutrition in animals

## **Animal Nutrition**

Plants make their food by the process of photosynthesis, but animals cannot make their food themselves. Animals get their food from plants. Some animals eat plants directly while some animals eat plant eating animals. Thus, animals get their food from plants either directly or indirectly.

All organisms require food for survival and growth. Requirement of nutrients, mode of intake of food and its utilization in body are collectively known as nutrition.

Nutrition in complex animals involves following steps:

- Ingestion
- Digestion
- Absorption
- Assimilation
- Egestion

### Digestion:

The breakdown of complex components of food into simpler substances is called digestion.

## Alimentary canal:

Alimentary canal, also called digestive tract, pathway by which food enters the body and solid wastes are expelled. The alimentary canal includes the <u>mouth</u>, <u>pharynx</u>, <u>oesophagus</u>, <u>stomach</u>, <u>small intestine</u>, <u>large intestine</u>, and <u>anus</u>. See <u>digestion</u>.

## Human Digestive System:

A human digestive system is a group of organs working together to convert food into energy and basic nutrients to feed the entire body. The food we take in is digested and utilized by our body and the unused parts of the food are defecated. Human digestive system is the sum of the gastrointestinal tract (also called alimentary canal) and accessory organs (tongue, liver, pancreas, etc.). These two parts together help in <u>digestion</u> in humans.

Humans have two sets of teeth from which we develop four different types of teeth throughout our life span. These two sets of teeth are:

- Primary
- Permanent

#### Four Main Types of Teeth:

#### Incisors:

Incisors are the pair of eight teeth directly situated in the front and center of our mouth. The format includes four on top and four on the bottom.

#### **Canines:**

There are four canine teeth in our mouth and these are the sharpest of all. These teeth first appear between 11 and 20 months of age and take their lifelong formidable shape between 11 to 12 years.

### **Premolars:**

Premolar teeth are situated at each side of your mouth in deep settings. These teeth are used for chewing and grinding food so that it becomes totally in a semiliquid form helping food particles to gulp down the throat and digest smoothly. These teeth first premolar in the upper jaw appears at the age of 10 while the second in the bottom appears at 11.

### **Molars:**

The final type of our teeth are the molars, a formidable replacement of permanent premolar ones. In the premolar form, there were only two teeth

above and two below. However, when molars appear at the age 11 - 13 years, they add two more teeth to their pair – four above and four below.

#### Ruminant:

**Ruminant**, any <u>mammal</u> which includes giraffes, <u>deer</u>, <u>cattle</u>, antelopes, <u>sheep</u>, and goats. Most ruminants have four-chambered stomachs and a two-toed foot. The upper incisors are reduced or sometimes absent. Camels and chevrotains, however, have a three-chambered <u>stomach</u>. Ruminants eat quickly, storing masses of grass or foliage in the first chamber of the stomach, the rumen, where it softens. They later regurgitate this material, called <u>cud</u>, and chew it again to further break down its cellulose content, which is difficult to digest. The chewed cud goes directly to the other chambers of the stomach (the reticulum, omasum, and abomasum), where it is further digested with the aid of various essential microorganisms that live in the stomach.

#### NUTRITION IN AMOEBA:

Amoeba is a microscopic, single-celled organism. It is found in ponds, pools and ditches. It doesn't have a fixed shape. It constantly changes its shape by pushing out one or more finger-like projections called pseudopodia or false feet meant for locomotion and capturing of food. All the processes of nutrition are performed by the single cell of

an Amoeba. Let us study nutrition in amoeba in detail.

**Ingestion:**1 Amoeba eats tiny microscopic plants and animals as food, which floats on water in which it lives. When an Amoeba, encounters a suitable organism, it pushes out two pseudopodia around the organism. Gradually, the tips of the pseudopodia fuse with each other. As a result, the food is engulfed with a little water to form a food vacuole inside it.

2. Digestion: The enzymes from the surrounding cytoplasm enter the food vacuole and break down the food into

simple soluble substances. 3. Absorption: The digested food present in the food vacuole is absorbed directly into

3. Absorption: The digested food present in the food vacuole is absorbed directly into the cytoplasm.

4. Assimilation: The digested food absorbed by the cytoplasm is stored or utilized for its growth, development, multiplication and release of energy.

5. Egestion: The undigested food gets stored inside the vacuole. The cell membrane of the amoeba suddenly ruptures at any place and the undigested food is thrown outside the body by the vacuole.



#### Chapter 3

#### Fibre to fabric

Fibres are a thread like structures that are long, thin and flexible. These may be spun into yarns and then made into fabrics. There can be different types of fibres. On the basis of their origin, fibres are classified as **natural fibres** and **synthetic fibres**.



**Classification of Fibres** 

#### Natural Fibres

Natural fibres are the fibres that are obtained from plants, animals or mineral sources. Some of the examples are cotton, silk, <u>wool</u> etc. Natural fibres can again be divided into two types based on their source i.e. plants and animals.

**Animal fibres:** These are the fibres that are obtained from animals. For example Wool, silk etc.

- 1. **Wool:**Wool is a natural textile fibre obtained from sheep, goats and camels. It traps a lot of air. Air is a bad conductor of heat. This makes clothes made from wool useful in winter.
- 2. **Silk:** <u>Silk</u> is also a natural textile fibre which is obtained from silkworms. The rearing of silkworm to obtain silk is known as sericulture.

**Plant fibres:** These are the ones that are obtained from plants. These fibres are extracted from the plants to make fabrics.

- 1. **Cotton:** It is one of the plant fibres that are used to make clothes. It is a soft staple fibre that is found as a boll around the seeds in a cotton plant.
- 2. Jute: It is a vegetable fibre that is soft, shiny and is spun into coarse strong threads.

#### Synthetic Fibres

Synthetic fibres are the man-made polymers designed to make a fabric. Polymers are obtained when many small units are joined together chemically. Some of the examples of synthetic fibres are:

- 1. **Rayon:** It is made from wood pulp. It is also known as artificial silk as it has characteristics resembling silk.
- 2. **Nylon:** It was the first synthetic fibre. It is used in the making of ropes, sleeping bags, parachutes, different types of clothes, etc. It is one of the strongest fibres known to us.

#### Advantages of synthetic fibres:

- 1. They can be washed and dried quickly.
- 2. They are easy to maintain.
- They are cheaper than natural fibres.
- 1. Easily available.
- 2. Do not wrinkle easily and are very durable.

(a) Rearing: It is a process of breeding, feeding and providing medical care to useful animals. These animals are kept since they produce one or more useful products for the human beings.

(b) Shearing: It is the process of removing fleece from the sheep along with a thin layer of skin.

(c) Sericulture: It is the rearing of silkworms to obtain silk is known as sericulture.

#### LIFE CYCLE OF SILK MOTH:



Life Cycle – Silk Moth: Actually, silkworms are not worms, but the larvae or caterpillars hatched from the eggs of the silk moth. The life history of a silk moth starts when a female silk moth lays eggs.

The larvae or caterpillars hatched from the eggs of the silk moth. These silkworms feed on fresh mulberry leaves the silkworm grows in size and then becomes a pupa.

In the pupa stage, it weaves a net to hold itself. It then swings its head from side to side, secreting a fibre that hardens on contact with air. This fibre is made of a protein and becomes the silk fibre.

The caterpillar covers itself completely with silk fibre and turns into a pupa, this covering is known as the cocoon. The moth continues to develop within the cocoon. The silk thread or yarn is obtained from the silk moth's cocoon.

#### Chapter – 4

#### Heat

**Heat** is a type of <u>energy</u> transfer in which energy flows from a warmer substance or object to a colder one.

#### **Temperature:**

The degree of hotness and coldness of body is called temperature. The unit of temperature is degree Celsius or degree Fahrenheit.

#### \*conduction.

An ice-cold steel fork is dipped into a mug of hot water. Transfer of heat to the other end is by the process of **<u>conduction</u>**.

**\*Convection:** The process continues till the whole water gets heated is called convection.

\*Radiation\_requires no medium for heat transfer for the process.

# **Difference Between Conduction, Convection and Radiation**



While **conduction** is the transfer of

heat energy by direct contact, **convection** is the movement of heat by actual motion of matter; **radiation** is the transfer of energy with the help of electromagnetic waves.

#### **Clinical Thermometer:**

An instrument for measuring temperature, often a sealed glass tubethat contains a column of liquid, as mercury, that expands and contracts, or rises and falls, with temperature changes, the temperature being read where the top of the column co incides with acalibrated scale marked on the tube or its frame.



Clinical thermometer

**Laboratory thermometer:** It is a thermometer which we can use to measure the temperatures of liquids.



Laboratory Thermometer

**Digital thermometer**: It is electronic thermometer which we use to measure body temperature.

**Conductors:** Materials which can pass through electricity easily are conductors Example: All metals, water, salt water, vinegar etc.

#### Insulator or poor conductors:

Materials which cannot pass through electricity easily are insulators. Example: Rubber, dry wood, plastic, paper etc.

#### Sea breeze:

A sea breeze describes a wind that blows from the ocean inland towards land. This breeze occurs most often in the spring and summer months because of the greater temperature differences between the ocean and nearby land, particularly in the afternoon when the land is at maximum heating from the sun.

During the day, the sun heats up both the ocean surface and the land. Water is a good absorber of the energy from the sun. The land absorbs much of the sun's energy as well. However, water heats up much more slowly than land and so the air above the land will be warmer compared to the air over the ocean. The warm air over the land will rise throughout the day, causing low pressure at the surface. Over the water, high surface pressure will form because of the colder air. To compensate, the air will sink over the ocean. The wind will blow from the higher pressure over the water to lower pressure over the land causing the sea breeze. The sea breeze strength will vary depending on the temperature difference between the land and the ocean.



Sea Breeze

#### Land breeze:

At night, the roles reverse. The air over the ocean is now warmer than the air over the land. The land loses heat quickly after the sun goes down and the air above it cools too. This can be compared to a blacktop road. During the day, the blacktop road heats up and becomes very hot to walk on. At night, however, the blacktop has given up the added heat and is cool to the touch. The ocean, however, is able to hold onto this heat after the sun sets and not lose it as easily. This causes the low surface pressure to shift to over the ocean during the night and the high surface pressure to move over the land. This causes a small temperature gradient between the ocean surface and the nearby land at night and the wind will blow from the land to the ocean creating the land breeze.



Land Breeze