

**NORTH EX PUBLIC SCHOOL (Session 2020-21)**

**Class-VII**

**Subject-Science**

**Revision of**

**Chapter-1 Nutrition in Plants**

**Chapter-2 Nutrition in Animals**

**Chapter-17 Forests : Our LifeLine**

**Worksheet-7**

**NOTE-Before attempting the question and answers you must check the link given below which will help you understand the chapter**

**You can download the assignment or if you do not have the facility to get printout then you can ask you what to copy the assignment in a simple notebook and must do question and answer the notebook.**

## **NOTES**

### **Nutrition**

**Nutrition** is the mode of taking food by an organism and its utilisation by the body.

- Nutrition is very important as the nutrients from the food consumed enables living organisms to build their bodies and grow.
- Nutrition helps to repair damaged parts and organs.
- Nutrition also provides energy for carrying out various functions.

## Autotrophs and Heterotrophs

Organisms that make food themselves are called **autotrophs**.

- Plants are an example of autotrophs as they make their own food using carbon dioxide, water and light energy.

Organisms that rely on others and usually take in ready-made food made by the autotrophs are called **heterotrophs**.

- Animals and human beings are an example of heterotrophs as they depend on plants in many ways for their food.

## Photosynthesis

**Photosynthesis** is the process of synthesis of food by green plants.

- This process usually takes place in the leaves of plants.
- The process requires *chlorophyll* (green coloured pigment), *sunlight*, *carbon dioxide* and *water*.

## Organelles

- **Organelles** are tiny cellular structures inside a cell and perform specific functions that are important for the cell.
- They are found in the cytoplasm of a cell.
- E.g. **Chloroplast** is the cell organelle that carries out photosynthesis.

## Chloroplasts

- **The chloroplast** is a type of organelle that exists in plants.
- These organelles contain *chlorophyll*, the green coloured pigment that is responsible for carrying out the process of photosynthesis in plants.

## Chlorophyll

- **Chlorophyll** is the pigment that is responsible for the synthesis of food in green plants.
- This pigment gives green colour to its bearers and is abundantly found in leaves.
- Chlorophyll is locked inside the chloroplast.

## Process of Photosynthesis

The process of photosynthesis takes place in the leaves, the “food factory” of the plants.

- Carbon dioxide is taken in through tiny pores on the leaves called stomata.
- Water and minerals that are required for the process are transported to the leaves from the roots through the stem.
- Chlorophyll helps the leaves use the energy from the sunlight to prepare food using the carbon dioxide, water and minerals.
- Oxygen is released as a byproduct of this process.
- The equation can be given as:

## Nutrients Being Replenished in Soil

### Nutrients

- Plants absorb mineral nutrients from the soil in order to make their own food and for other important processes.
- Soils need to be enriched with nutrients such as nitrogen, phosphorus, potassium etc regularly.
- Only then can we grow plants and keep them healthy.
- There are 17 most important nutrients for plants.
- 6 are called macronutrients and rest are called micronutrients.
- Macronutrients are required in large quantities while micronutrients are required in very small quantities.

## Other Modes of Nutrition

### Symbiotic Relationship

Organisms that live together and share their shelter and nutrients are said to be in a **symbiotic relationship**.

- Certain fungi live in the roots of trees.
- The tree provides nutrients to the fungus and, in return, receives help from it to take up water and nutrients from the soil.
- This association works well for both the fungi and the tree.
- Another most common example is of **Rhizobium bacteria**.
- They reside in the root nodules of leguminous plants.
- The bacteria provide a plant with nitrogen that they fix and in turn, they get shelter and food from the plant.

## Rhizobium

- Rhizobium is a type of bacteria that convert atmospheric nitrogen into a soluble form that can be utilised by plants (**nitrogen fixation**).
- It usually resides in the roots of *leguminous* plants like peas, gram, moong etc and is instrumental in providing these plants with a rich source of nitrogen.

## Nitrogen Fixation

- Nitrogen is an important nutrient required for soil and for plants.
- However, nitrogen in the atmosphere is not easily accessible.

The process by which nitrogen is converted into a form that can be used by plants and other living organisms is called **nitrogen fixation**.

## Parasites

A **parasite** is a *heterotroph* that completely depends on another organism for its food.

- The organism to which the parasite latches onto is called the **host**.
- The host, in the process, is deprived of all nutrients for its own growth as they are consumed by the parasite.

- For example, Cuscuta (Amarbel) is a nongreen plant that takes readymade food from the plant on which it is growing.

## Saprotrophs

Organisms which rely on dead and decaying matter for their food are called **Saprotrophs**.

- This mode of nutrition is called **saprotrophic nutrition**.
- For example, Fungi.
- Fungi secrete digestive juices on the dead and decaying matter and convert it into a solution.
- Then they absorb the nutrients from it.

## Insectivorous Plants

Plants that feed on insects are called **Insectivorous plants**.

- These plants are green and carry out photosynthesis.
- But they grow in nitrogen-deficient soils.
- So, in order to get nitrogen, they feed on insects.
- These insectivorous plants have their parts modified for attracting and catching insects.
- For example, The pitcher plant, Venus flytrap

## Did You Know?

### Cactus Plants

- Most of the photosynthesis takes place in the leaves of green plants.
- However, in case of some desert plants, it takes place in their stem and even branches.
- Cacti are found in the desert and their leaves are modified to spines to avoid loss of water due to transpiration.
- Therefore, their green stems enable them to carry out the process of photosynthesis.

## Chapter—2 Nutrition in Animals

### Quick Revision

- The animals depend upon other plants and animals for their food.
- Animal nutrition comprises the mode of taking in the food in the body, nutritional requirements of the body and how animals can utilize their food.
- **Digestion** - it is a process by which animals break down complex food substances in simpler substances.

### Different ways of taking the food

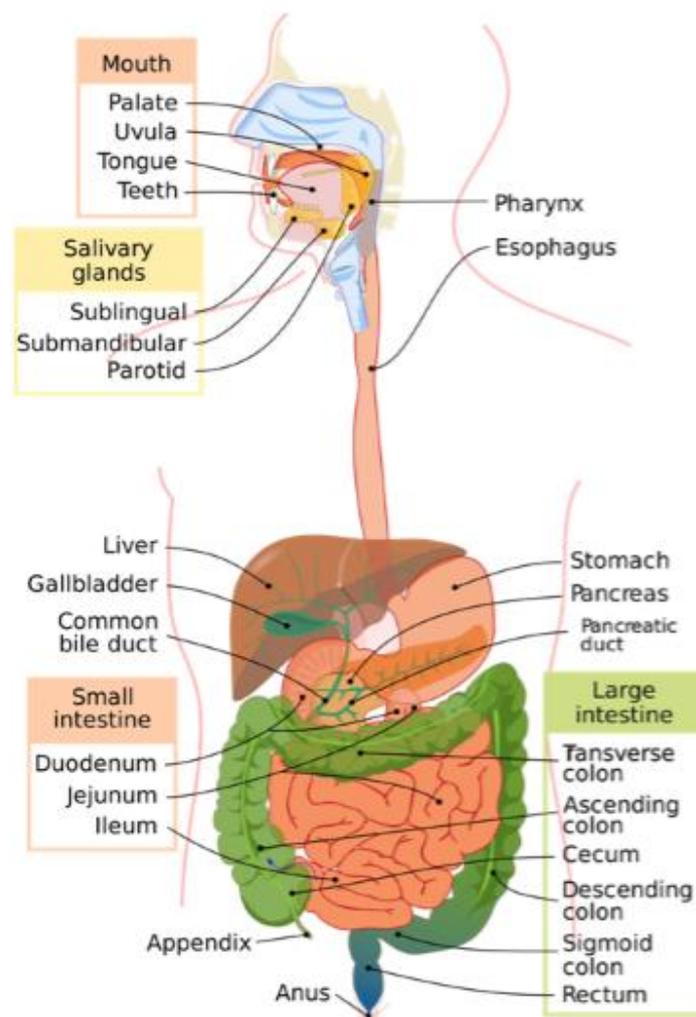
Name of animal	Kind of food	Mode of feeding
Snail	Grass	Chewing
Ant	Insects	Scrapping
Eagle	Flesh	Swallowing
Humming bird	Nectar	Sucking
Lice	Blood	Sucking
Mosquito	Blood	Sucking
Butterfly	Nectar	Sucking
House fly	Decaying matter	Brewing

Figure 1: Mode of feeding in Animals

### Digestion in Humans

- The food that we eat passes through a Canal inside our body.
- The food is processed and utilized in the body and unused food is collected inside the canal only.
- This Canal is often called as the **Alimentary Canal** or the **Digestive Tract**.
- The canal is divided into different parts:
  - The Mouth or Buccal Cavity

- Food Pipe or Oesophagus
- Stomach
- Small Intestine
- Large Intestine
- Anus



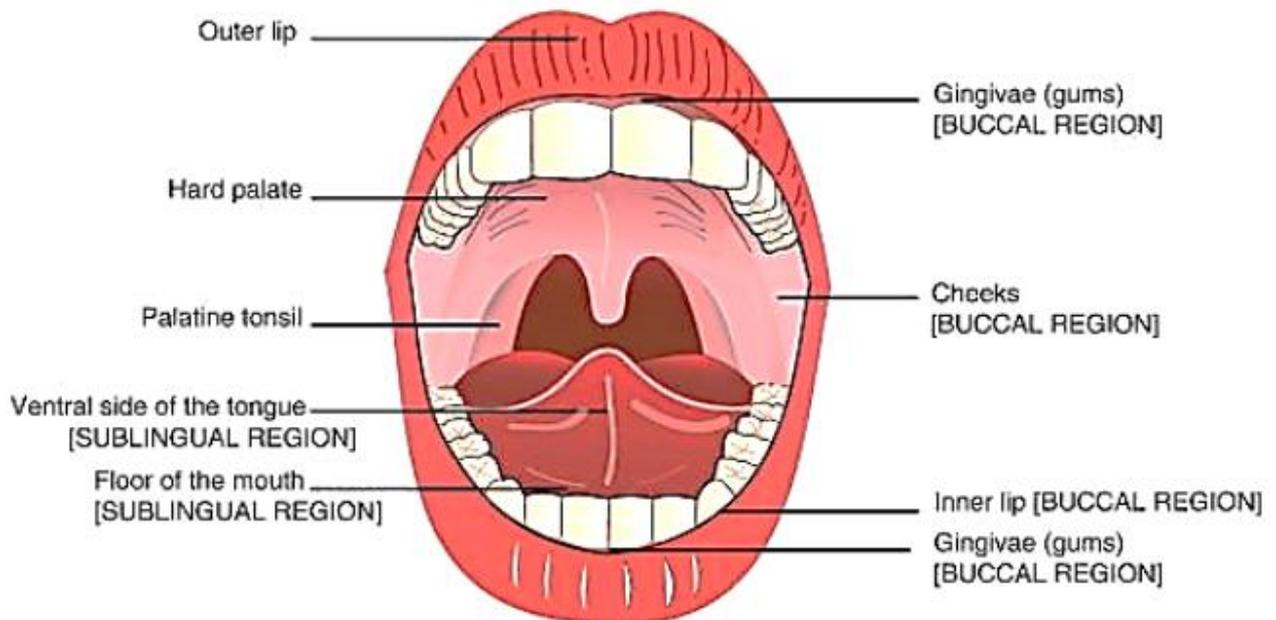
**Figure 2: Digestive Tract in Humans**

There are three glands associated with the alimentary canal that secrete digestive juices that are used to convert the complex food substances into simpler substances.

- liver
- pancreas
- salivary glands

**The Digestive System** - The alimentary canal and the digestive glands together form a system in the human body which is responsible for the digestion of food in the body. This system is called the **Digestive System**.

### **The Mouth or Buccal Cavity**



**Figure 3: The Mouth or Buccal Cavity**

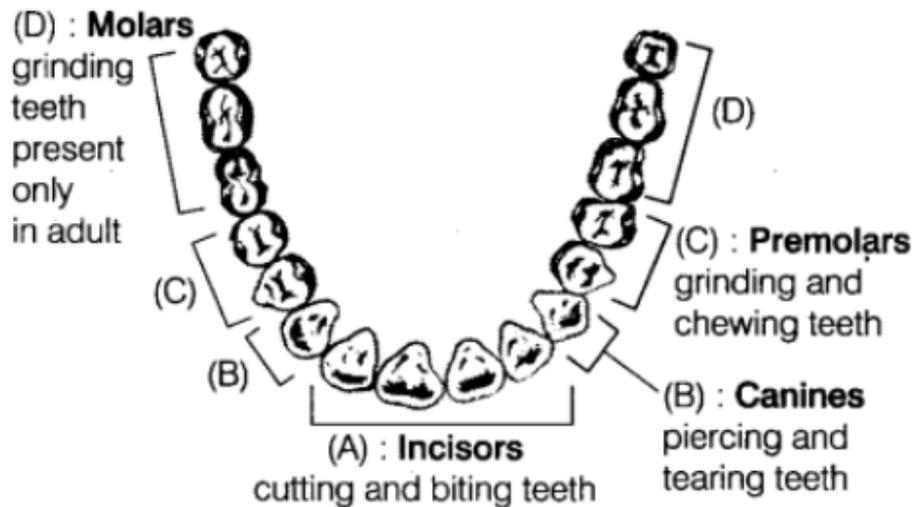
- **Ingestion** - the process of taking in the food through the mouth is called ingestion.
- The food is chewed with the help of **teeth, saliva and the tongue** present in the mouth.
- The **salivary glands** present in our mouth secrete saliva which mixes with the food, moisten it and break the starch present in the food into sugar.
- The **tongue** present in the mouth helps in mixing the food with the saliva and helps in swallowing it inside the mouth. It also has taste buds which help in identifying the taste of anything that we eat. Besides this, the tongue also helps in talking.

### **The Teeth**

**Milk Teeth** - In the early childhood a set of teeth growth in children that then fall off after certain age 6 to 8 years. These teeth are called **Milk Teeth**.

**Permanent Teeth** - The teeth that grow after milk teeth fall off are called **Permanent Teeth**. They generally remain during the lifetime of a person or at least until old age.

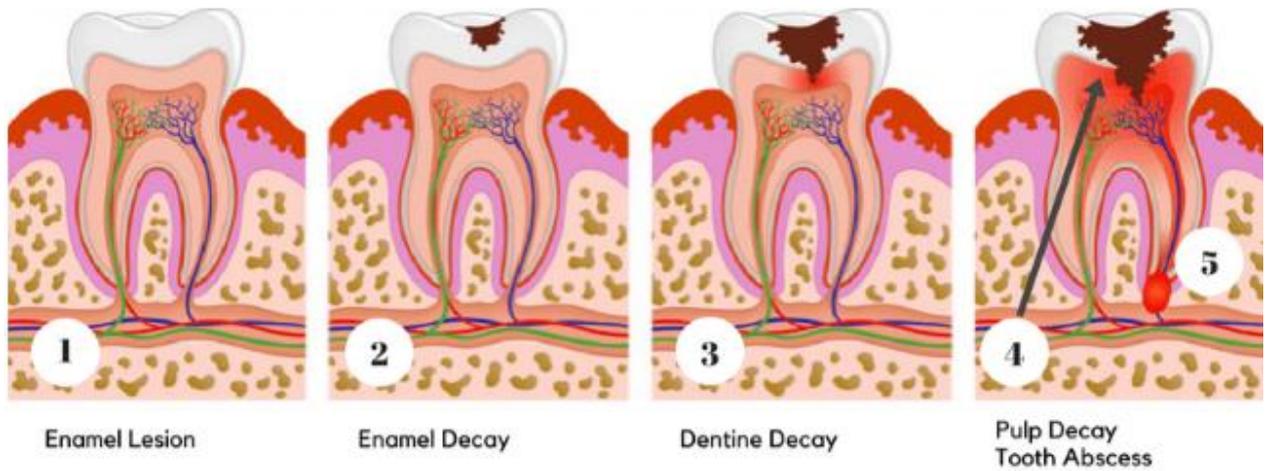
### **Different Types of Teeth**



**Figure 4: Different types of teeth**

### **Tooth Decay –**

- A gradual damage of teeth is often called tooth decay.
- The main cause of tooth decay is the presence of bacteria in the mouth that grow if we do not keep our mouth and teeth clean.
- Any leftover food present inside our teeth is broken down by such bacteria.
- As a result, an acid is released which damages the teeth slowly.
- Tooth decay can cause severe pain and even toothless.
- Tooth decay is caused mainly because of eating food with high sugar content, soft drinks and chocolates.



**Figure 5: Stages of Tooth Decay**

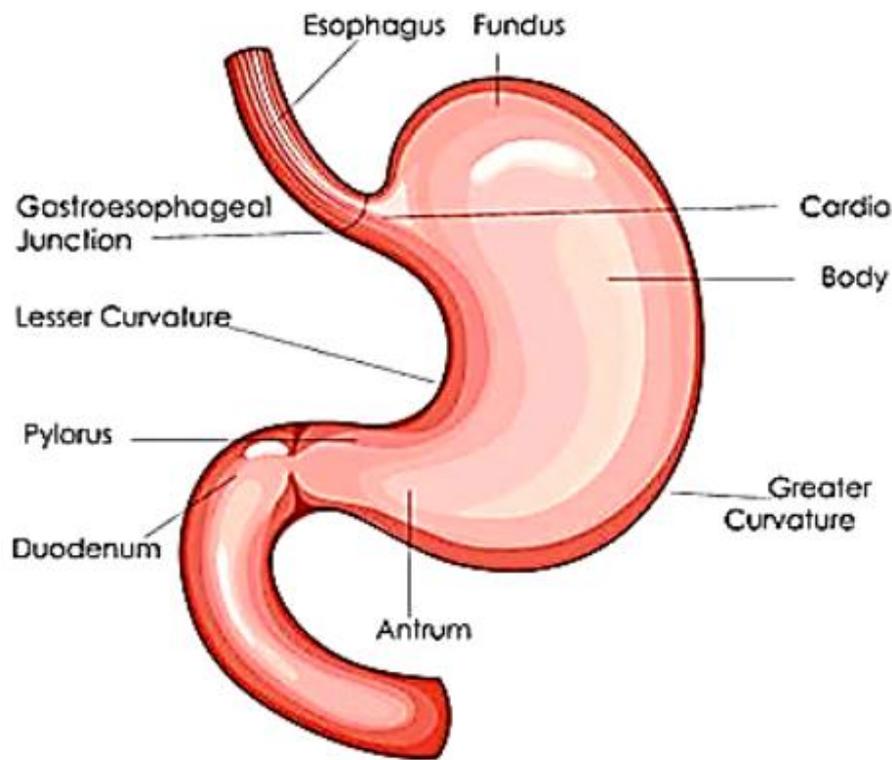
### **How can we prevent tooth decay?**

- Clean your teeth with a brush or dental floss at least twice a day
- Rinse your mouth after every meal you eat
- Do not put a dirty finger or any unwashed food items in your mouth

### **Food Pipe or Oesophagus**

- The food pipe starts from the neck region and runs until the chest area in animals.
- The food, when the chewed, moves through the food pipe and reach the stomach through this path.
- The food moves in download direction in the food pipe.

### **The Stomach**



**Figure 6: Stomach**

- It is the widest part of the alimentary canal.
- It's a bag like structure in a flat U shape.
- The stomach is connected with the food pipe and the small intestine.
- The stomach's inner lining produces three things:
  - **Mucous:** It protects the stomach lining
  - **Hydrochloric Acid:** It kills the bacteria present inside the stomach and activates the digestive juices
  - **Digestive Juices:** They help in digestion of the food by breaking down the proteins present in the food into simple substances (olimpiads)

### **Small Intestine**

- It is a highly coiled structure.
- The length of the small intestine is almost 7.5m.

- The liver and pancreas release digestive juices into the small intestine.
- The inner lining of the intestine also secretes some digestive juices on its own.
- The small intestine breaks the carbohydrates into glucose, fats into fatty acids and proteins into amino acids.

### **The Liver**

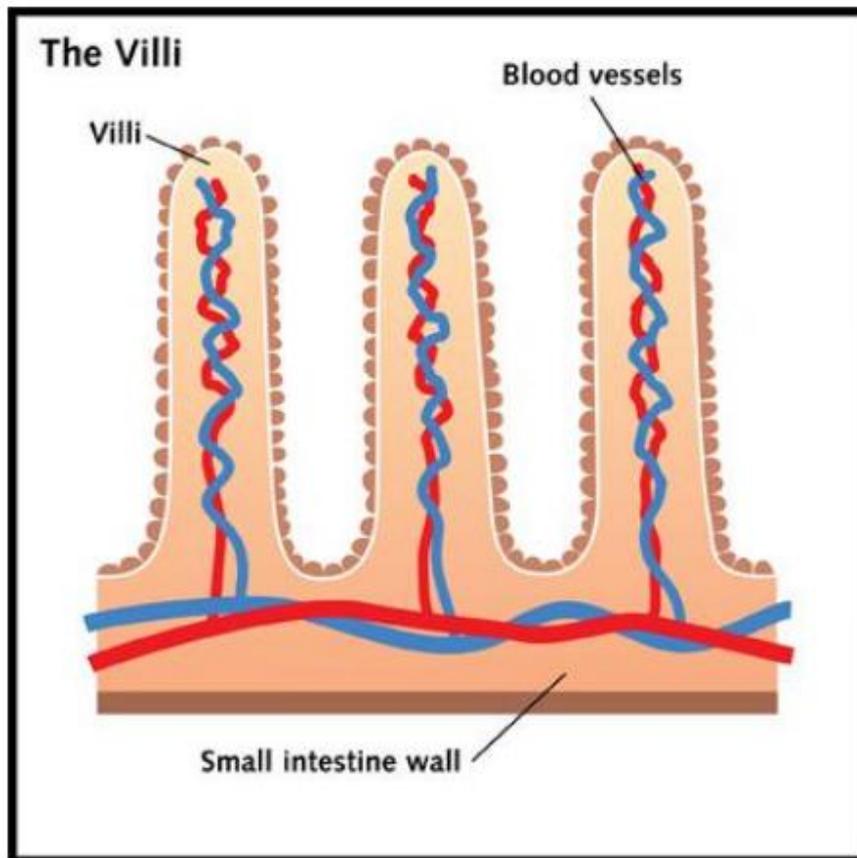
- It is a gland reddish brown in colour.
- It is known as the largest gland of the human body.
- It secretes a digestive juice called bile juice.
- The bile juice is stored in the gallbladder.
- The bile juice makes it possible for the body to digest the fats.

### **The Pancreas**

- It is a cream coloured gland present in the human body.
- It secretes pancreatic juice that helps in digestion of fats, carbohydrates and proteins.

### **How small intestine absorbs food?**

- **Absorption:** it is a process by which the digested food enters the blood vessels of the small intestine.
- **Villi in the intestine:** the small intestine contains small finger-like structures called **Villi**. They increase the surface area of the intestine thereby increasing the amount of absorption. The digested food gets into the blood vessels through villi and then reaches the whole body. (Olympiads)



**Figure 7: Villi in Small Intestine**

- **Assimilation:** The process by which the organs of the body utilize the digested food and form complex substances which the body needs such as proteins are called **Assimilation**.

### **Parts of Small Intestine**

The small intestine has been divided into three parts:

#### **1. Duodenum**

It is the first part of the small intestine whose main function is to initiate the digestive process. In this process, the food that enters the small intestine from the stomach is mixed with the digestive juices (bile and pancreatic juice) and is further broken down into simpler substances.

#### **2. Jejunum**

It is the middle part of the small intestine that contains the villi and hence undergoes absorption and assimilation.

### 3. Ileum

It is the third and last part of the small intestine that contains villi-like structures. The ileum absorbs vitamin B12, bile acids and any other nutrients present in the food.

## The Large Intestine

- Any food that is left undigested passes through the small intestine and enters the large intestine.
- It is a wide tube-like structure.
- It is only 1.5 m long.
- The main function of the large intestine is to absorb water and salts from the undigested food.
- The rest of the waste, undigested food passes through the rectum.
- **Egestion:** The process by which the waste, undigested food (the faecal matter) get out of the body through the anus.

Animals which feed on plants are called as herbivorous animals. Plant cells contain rich content of cellulose. Cellulose is an important component in the diet of herbivorous animals. Humans cannot digest cellulose.

**Ruminants:** These are also called as grass-eating animals. These are hoofed animals whose body stands on four limbs. Ruminants include, cows, buffaloes, sheep, giraffe, camel, deer etc. They also possess special type of digestive tract which extracts nutrition from the food they eat.

**Digestion in ruminants:** Digestion is quite different in rumination.

Incisors are absent on the upper jaw.

Canines are absent in both the jaws.

Molars are very strong as these animal chew the cud.

Rumination: Ruminants swallow the food without chewing. After feeding, they bring the food from the stomach back into the mouth and chew it leisurely. This process is called rumination and such animals are called as ruminants. Rumination is also called second chewing.

Ruminant stomach: The stomach of a ruminant is divided into four chambers – the rumen, reticulum, omasum and abomasum. Rumen is the largest part of the stomach.

~~Ruminants do not digest cellulose directly. They establish a symbiotic relationship~~

Digestion in ruminants is a good example of symbiosis. Microorganisms present in the stomach of ruminants help in digesting cellulose and in turn obtain shelter and nourishment from the animal. A symbiotic relationship exists between microorganisms and the ruminants.

As rumen is full, the food is taken into second part of the stomach, the reticulum.

Digestive juices of the reticulum partially digest the food. The partially digested food in the reticulum is called as cud.

While resting, cow brings back the cud into the mouth for regurgitation.

Food is chewed completely and swallowed into omasum for further digestion.

Then the food moves into abomasum for digestion brought about by digestive juices.

A large sac-like structure called the caecum lies between the small and large intestines.

The symbiotic bacteria present in the caecum help in complete digestion of cellulose. Digestion of food is completed in the intestine.

As the symbiotic bacteria are not present in the human digestive system, humans cannot digest cellulose.

## **Chapter 17 Forests : Our LifeLine**

Forests are our Lifeline. We all depend upon forests in some way or the other for survival. Forests provide us with fresh air to breathe, food, medicines, and other sources like wood, fodder and other raw materials for the industries. Forests prevent soil erosion and hold the earth firmly.

### **What is a Forest?**

Forest is a dense land or a complex ecosystem consisting mainly of trees that buffer the ecosystem and support a variety of life forms. The trees maintain the environment of the

surroundings which in turn affects the plants and animals living in the forest. They are an important component of the environment that purify the air, cool the air during the day and act as excellent sound absorbers.

They can develop wherever the average temperature is more than 10°C in the warmest month with the average rainfall exceeding 200 mm annually.

India shares a history of traditional conservation and management of forests. The annual festival of tree plantation called Vanmahotsava was started by the Indian Government and was first implemented in the state of Gujarat.

Also, read [Forest](#)

## Structure of Forest

The evergreen forests have a specific structure. It is organized in layers which are maintained by the abiotic factors such as sunlight, wind, humidity, etc.

Let us have a detailed look at the structure of forest and the different layers it is made up of:

### Emergent Layer

This layer is made up of very tall trees with straight branch-free trunks with a crown at the top. They have supporting buttress roots spreading upto about 20-30 ft. The leaves are small and pointed that are structured to withstand strong winds at the tree top.

The trees receive constant sunlight. Humming birds and parrots are commonly found in this layer. Light animals such as sloth and spider monkeys reside here.

### Canopy

This layer stops sunlight and water from reaching the underneath layers. The trees have broader leaves and drip spouts. This helps the rainwater drip down quickly rather than staying on the leaves.

Common animals found in this layer include squirrels, monkeys, reptiles, bats, and a variety of birds. Due to thick leaves, visibility is low in this region.

### Understory

This layer has few trees but a lot of shrubs and small trees growing upto a height of 12 feet. The area comprises of buttress roots from the tall trees, climbers, ferns and branches

extending downwards. Very little sunlight reaches here. The leaves and trunks are covered with fungi, mosses, mildew and algae.

This layer is wet, humid and dark and is an abode to thousands of mosquitoes and bugs. The animals found in this layer include frogs, insects, snakes, beetles, butterflies and termites.

## Forest Floor

This is the ground level of the structure. The soil is shallow with microorganisms feeding on the decaying matter on the floor. The moist and dark conditions help in the decay of organic matter and nutrient absorption by the trees. Most of the heavyweight carnivorous and herbivorous animals are found in this layer.

## Importance of Forest

There is numerous importance of the forest as it helps us by providing all the useful products which are required for our lives. Some of them are listed here.

Forests provide us with – Firewood, Timber, Wood pulp, Honey, lac, medicinal plants and herbs, raisin, biofertilizers, etc. Forests also supply us with the different types of raw materials for industrial uses, fodder for the animal's feed, fuel, and fibres.

Along with these essential products, forests also play an important role in protecting [our environment](#) by:

- Promoting rainfall.
- Reduces noise pollution.
- Maintains the ecological balance.
- Acts as a wind barrier from heavy winds.
- Provide moisture and lower the temperature.
- Prevents flash floods by slowing down the movement of water.
- Preventing soil erosion and preserve the fertility of the soil.
- Maintains the balance of carbon dioxide and oxygen in the environment.
- Preserves the biodiversity by providing shelter for many creatures that depend on the forest for their survival.

## Deforestation

The forests are being destroyed continuously to make the land available for other uses. Forests are the natural source of resources. With the advent of industrialization, forests have been constantly depleted for raw materials. Also with the rising population, there is competition for food and space. This had led to the depletion of forests on a large scale.

Deforestation has affected the climate and in turn our lives. There is a shortage of rainfall. The resources are also depleting rapidly and will not be available in future. The temperature is rising tremendously which has led to the melting of glaciers which has increased the water levels.

The weather changes and earthquakes are a result of deforestation. The trees hold the earth firmly. Due to the forest depletion, the grip of the earth is loosened which causes frequent earthquakes.

Thus we see how forests act as our lifeline. It is very important to preserve the forests. Forest is the natural resources which are being destroyed by the humans for their use. We should conserve this natural resource as it is one of the fundamental constituents for the sustainability of life on the earth.

## Facts about Forests

- Forests play an essential role in the existence of life on earth.
- 80% of the world's animal species depend on the forests for their homes
- Forests are the lungs of our planet. It plays a crucial role in improving air quality.
- Forests are storehouses of biodiversity. As per the estimations, there are around three trillion trees globally.
- Forests are the treasures of medicines. There are 5000 years old plants and about 60% of the medicines are originated from the rainforest.

## Work sheet 7

Q.1 What are the benefits of the forest?

A.1. Forests play a fundamental role in the wellbeing of life forms on the planet earth. Listed below are some of the major benefits of forests:

1. Prevent soil erosion
2. Maintains its climate
3. Purifies the air in the atmosphere
4. Controls the increasing temperatures

5. Serves as a home for a vast range of plants, trees, and animals

**Q.2. List out the different types of forests?**

A.2. There are different types of forest and are broadly classified into:

1. Tropical forests, include- Evergreen, Seasonal, Dry, cloud forests, Tropical and subtropical.
2. Temperate forests include- Temperate deciduous and coniferous forests
3. Boreal forests also called as the Taiga forests

**Q.3. How would you test the presence of starch in leaves?**

**Solution:**

Take two potted plants of the same kind. Keep one in the dark for 72 hours and the other in sunlight. Perform the iodine test with the leaves of both the plants as given below. Now leave the pot which was earlier kept in the dark, undisturbed for 3 – 4 days and perform the iodine test again on its leaves.

**Iodine test:**

Put iodine solution on the leaf

**Observation:**

Blue-black colour will be observed on the leaves of the plant kept in sunlight, which indicates the presence of starch.

Blue-black colour will not be observed on the leaves of plant kept in the darkroom. This indicates the absence of starch.

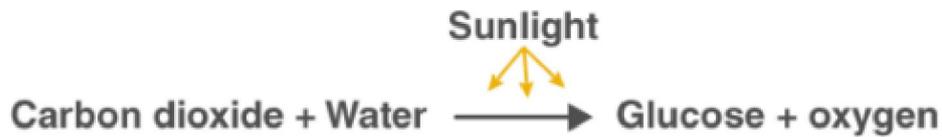
**Q.4. Give a brief description of the process of synthesis of food in green plants**

**Solution:**

Green plants use a process called as photosynthesis to prepare their food. The process is as follows

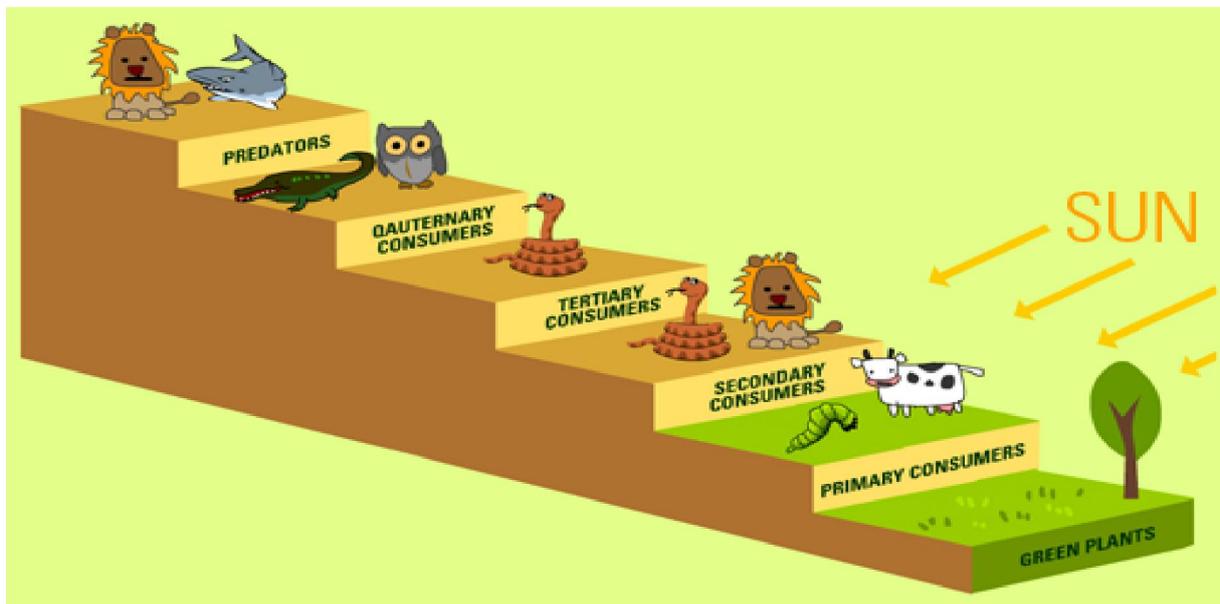
- Water is taken from the roots of the plant, and it is transported to leaves of the plant.
- Carbon dioxide from air enter the leaves through pores called stomata. This diffuses the cell containing chlorophyll.
- Water molecule is broken down into Hydrogen and Oxygen with the help of sunlight.
- Hydrogen combines with Oxygen and Hydrogen to form carbohydrates.

- Photosynthesis is represented by the following equation.



Q.5. Show with the help of a sketch that plants are the ultimate source of food.

Solution:



Q.6. Fill in the blanks:

- Green plants are called \_\_\_\_\_ since they synthesise their own food.
- The food synthesised by plants is stored as \_\_\_\_\_.
- In photosynthesis solar energy is absorbed by the pigment called \_\_\_\_\_.
- During photosynthesis plants take in \_\_\_\_\_ and release \_\_\_\_\_ gas.

Solution:

- Green plants are called **autotrophs** since they synthesise their food.
- The food synthesised by plants is stored as **starch**.
- In photosynthesis, solar energy is absorbed by the pigment called **chlorophyll**.
- During photosynthesis, plants take in **Carbon dioxide** and release **Oxygen** gas.

**Q.7. Explain how forests prevent floods.**

**Solution:**

Plants in the forests will not allow the rainwater to fall directly on earth and these plants also hold water which helps in preventing floods.

**Q.8. What are decomposers? Name any two of them. What do they do in the forest?**

**Solution:**

The micro-organisms which convert the dead plants and animals to humus are known as decomposers. Example: bacteria and Fungi. They help in recycling of nutrients by decomposing dead plants and animals.

**Q.9. Explain the role of forest in maintaining the balance between oxygen and carbon dioxide in the atmosphere.**

**Solution:**

Plants in the forests consume carbon dioxide and releases oxygen by photosynthesis process. This helps in balancing oxygen and carbon dioxide in the atmosphere.

**Q.10. Explain why there is no waste in a forest.**

**Solution:**

There is no waste in a forest because waste created is bio-degradable, which gets converted to humus by the action of microorganism.