

## SCIENCE

VALUE PLUS EDITION

Based on the Latest Syllabus  
Prescribed by NCERT

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# SCIENCE

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SMART BOOKS FOR SMART LEARNING

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# 1

## Food



### KEY WORDS

#### Terms To Remember

- \* **AUTOTROPHS** : organisms that can make their food from simple inorganic substances.
- \* **HETEROTROPHS** : organisms that cannot make their food and depend on green plants (or autotrophs) for their food.
- \* **SAPROPHYTES** : plants which derive their food from the dead and decaying organic matter.
- \* **PARASITES** : organisms that derive their food from the body of the host plant or animal.
- \* **INSECTIVOROUS** : green plants which make their own food but depend on insects for nitrogenous food.
- \* **SYMBIONTS** : two plants which live together as part of the same plant and mutually help each other.
- \* **SYMBIOSIS** : the mode of nutrition in which two different organisms work together for their mutual benefit.



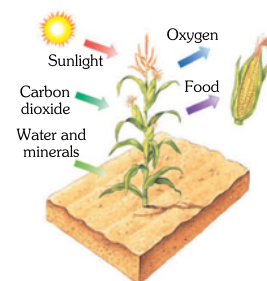
Most food we eat is in insoluble form. The various components of our food are, Carbohydrates, Fats, Proteins, Vitamins, Minerals, Roughage and Water. Food provides us energy for our daily activities and helps us in growth and reproduction.

Different animals take different kinds of food. Green plants make their own food by a process called photosynthesis.

Humans and animals get their food from plants or from smaller animals. This dependence for food on one another and various aspects of nutrition are discussed in this chapter.

#### NUTRITION

All living organisms need energy to perform various activities. They obtain this energy from the food they eat. Energy is stored in the food materials as chemical energy. To make this food



**Food making in a maize plant**

#### Multiple Choice Questions

- Nutrition
- Modes of nutrition
- Photosynthesis— food making process in plants
- Synthesis of food other than carbohydrates by plants
- Other modes of nutrition in plants
- How are nutrients replenished in the soil ?

( 1 )



### Do You Know ?

The way food is burnt in our body is different from the way the fuels such as petrol, diesel, coal etc., are burnt to produce energy.

energy available to the living organisms, it is broken down into smaller and soluble molecules inside their body. These smaller molecules then react with oxygen inside the cell to release energy.

The process of taking food and its utilisation by the body is called **nutrition**.

### MODES OF NUTRITION

In living organisms, food is the basic source of energy. Therefore, it is very important to know how different organisms get their food. Based on the food habits, the modes of nutrition in all living organisms are divided into two categories.

- ✦ Autotrophic nutrition
- ✦ Heterotrophic nutrition

#### Autotrophic Nutrition

The mode of nutrition in which the organism makes its food itself from simple inorganic substances is called **autotrophic nutrition** (*auto* means self and *trophes* means nourishment).

- ✦ The organisms which make their own food from the simple substances present in the environment are called **autotrophs**.
- ✦ **Autotrophs** are the producers of food, so they are also called **producers**.

Green plants make their food from carbon dioxide and water in the presence of chlorophyll and sunlight. So, **the mode of nutrition in green plants is autotrophic**.

#### Heterotrophic Nutrition

The mode of nutrition in organisms that cannot make their food and depend on others for their food is called **heterotrophic nutrition** (*heteros* means other and *trophes* means nourishment).

- ✦ The organisms which cannot make their food and depend on others for their food are called **heterotrophs**. The mode of nutrition in heterotrophs is called **heterotrophic**.
- ✦ Animals and humans do not make their food. They eat the food prepared by plants or eat the flesh of the smaller animals. Therefore, **all animals and humans are heterotrophs**.

Depending upon the food they eat, heterotrophs can be divided into the following three types :

- ✦ Herbivores
- ✦ Carnivores
- ✦ Omnivores

- ✦ **Herbivores (plant eaters)** : The animals which eat only grass, plants or plant products are called **herbivores**. Elephant, Camel, Cow, Deer, Goat, Grasshopper etc., are herbivores.



- ✦ **Carnivores (meat eaters)** : The animals which eat meat or flesh of the other animals are called **carnivores**. Lion, Tiger, Jackal, Hawk, Frog, Snake, Vulture, Lizard are carnivores.



✦ **Omnivores (both plant and meat eaters)** :The animals which eat both plants and meat are called **omnivores**.

Man eats both meat (animal), and plants (vegetables and cereals). Therefore, **man is an omnivore**. Crow, Dog, Ant, Sparrow and Mynah are some other omnivores.

We depend on plants and animals for our food.

✦ **Food items obtained from plants** :Rice, Wheat, Pulses (*dals*), Fruits, Vegetables.

✦ **Food items obtained from animals** : Milk, Cheese, Curd, Meat, Eggs.



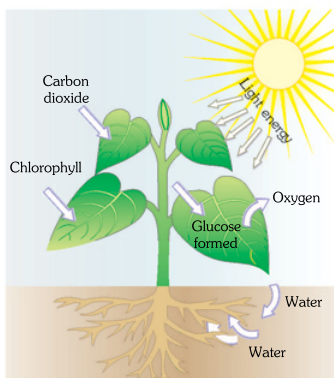
**Pulses (Dals) are obtained from plants**



**Animal products**

### PHOTOSYNTHESIS—FOOD MAKING PROCESS IN PLANTS

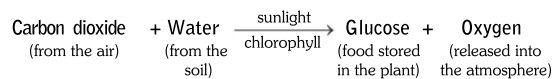
Green plants make their own food from carbon dioxide and water in the presence of chlorophyll and sunlight.



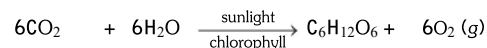
**Photosynthesis in plants**

The process by which green plants make their food is called **photosynthesis**, (*photo* means light, *synthesis* means building up).

Photosynthesis is described by the following reaction,



Or



- ✦ Plants thus convert **solar energy** into **chemical energy** of the food.
- ✦ This synthesized food is then distributed to different parts of the plant/tree.
- ✦ During photosynthesis green plants take carbon dioxide of the air through tiny pores called **stomata**. The stomata are present on the under-surface of the leaves.
- ✦ Water and minerals are absorbed through their roots.



#### Do You Know ?

The Sun is the ultimate source of energy for all living organisms.

#### Factors Affecting Photosynthesis

Photosynthesis is affected by a number of environmental factors.

These are :

- ✦ **Light intensity** : As the light intensity is increased, the rate of photosynthesis increases almost linearly. At higher light intensity, the rate of photosynthesis becomes limiting.

Food



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- ✦ **Nature of light** :The blue and red regions of the visible light are most effective for photosynthesis. If the light of some other colour is made to fall on the plants, then the rate of photosynthesis decreases.
- ✦ **Carbon dioxide and water** : Poor availability of carbon dioxide and water lowers the extent/rate of photosynthesis.
- ✦ **Temperature** : The temperature does not affect the light reaction, but affects the dark reaction markedly. The effect of temperature on photosynthesis varies from plant to plant.

In addition to these factors, the internal factors such as, age of the leaf, chlorophyll level in leaf, internal structure of the leaf etc., also affect photosynthesis.

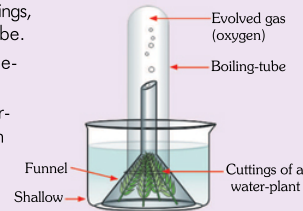
## Activity 1

**To show that green plant produce oxygen during photosynthesis.**

**MATERIALS REQUIRED** : Beaker, water-plant cuttings, glass funnel, boiling-tube.

**PROCEDURE** : ✦ Fill a beaker to about three-fourths with pond water.

- ✦ Place a few cuttings of water-plant in it and cover them with a glass funnel. Fill a boiling-tube with water, cover its mouth with your thumb and place it over the stem of the funnel. Place the whole set-up in the sunlight.



**Production of oxygen during photosynthesis**

- ✦ After some time bubbles of a gas starting from the leaves are found moving into the test-tube.
- ✦ When the test-tube is filled with the gas, remove it from the beaker.
- ✦ Now bring a glowing splinter near its mouth. The splinter starts burning with a bright flame.

**CONCLUSION** : This shows that the gas in the test-tube is oxygen, and it is produced during photosynthesis in green plants.

## Activity 2

**To show that leaves make starch as food by photosynthesis and that sunlight is necessary for photosynthesis.**

**MATERIALS REQUIRED** : A potted plant, Aluminium foil, Ethyl alcohol, Iodine solution.

**PROCEDURE** : Take a potted plant and cover a part of one of its leaves with aluminium foil. Place the plant in sunlight. Pluck the leaf after a few days and remove the aluminium foil from it. Take about 20 mL of ethyl alcohol in a boiling tube and dip the leaf in it. Place the boiling tube in a hot (about 55°C) water bath. After some time, when the alcohol

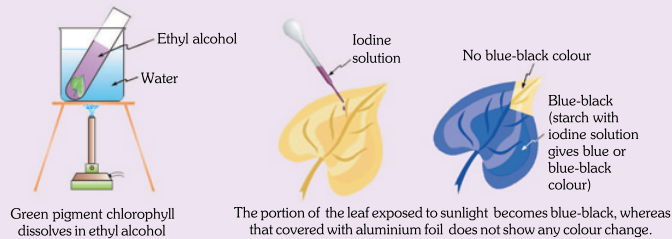


turns green, remove the leaf from the boiling tube. Wash the leaf with warm water. Place a few drops of iodine solution on the leaf. What do you observe ?

The portion of the leaf exposed to sunlight turns blue or blue-black. The portion which was covered with the aluminium foil does not show any change in colour. What does this experiment show ?

**CONCLUSIONS:** From this experiment we conclude that

- ◆ Leaves make starch as food by photosynthesis.
- ◆ Sunlight is necessary for photosynthesis.



**An experiment to show that light is essential for photosynthesis, and during photosynthesis leaves make starch as food.**



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Activity

**TO SHOW THAT PHOTOSYNTHESIS TAKES PLACE ONLY IN THE GREEN PORTION OF THE LEAVES.**

**MATERIAL REQUIRED :** A coleus/croton plant, Iodine solution

**PROCEDURE :** Take a potted plant with variegated leaves—a coleus or a croton plant will do. Keep it in the sun for a few days.

Pluck a leaf and repeat the experiment as described in the previous activity (without covering it with an aluminium foil). Observe and record your observations. Only the green part of the leaf gives blue-black colouration with iodine solution. The white portion of the leaf does not show any colour with iodine solution.

**CONCLUSION :** These observations indicate that photosynthesis takes place only in the green portion of the leaf, (or only in the green leaves). This shows that chlorophyll is required for photosynthesis.

So now you know

- ◆ Food is the source of energy for living organisms.
- ◆ The organisms which make their own food from simple substances present in the environment are called autotrophs.
- ◆ The mode of nutrition in autotrophs is called autotrophic.
- ◆ The organisms which cannot make their food and depend on others for their food are called heterotrophs. The mode of nutrition in heterotrophs is called heterotrophic.
- ◆ Heterotrophs are of three types—Herbivores (plant eater), Carnivores (meat eater), and omnivores (*e.g.*, plant and meat eater)
- ◆ The process by which green plants make their food from carbon dioxide and water in the presence of chlorophyll and sunlight is called photosynthesis.

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### Oral Questions

1. What kind of energy transformation takes place during photosynthesis ?
2. What is the mode of nutrition in green plants ?
3. Name the green pigment present in green leaves which takes part in photosynthesis.
4. Write the mode of nutrition in humans.
5. Which light is more effective in photosynthesis ?



### How do Plants Obtain Their Requirements for Photosynthesis ?

For photosynthesis, plants need the following :

- ❖ Carbon dioxide ( $\text{CO}_2$ )
- ❖ Chlorophyll
- ❖ Water ( $\text{H}_2\text{O}$ )
- ❖ Sunlight

These are obtained by the plants as follows :

- ❖ **Carbon dioxide** : Plants take up carbon dioxide from the atmosphere (or air) through stomata present on the under-surface of leaves.
- ❖ **Water** : Plants take up water from the soil through the root system.
- ❖ **Chlorophyll** : It is present in leaves.
- ❖ **Sunlight** : Sunlight comes from the sun.



#### Do You Know ?

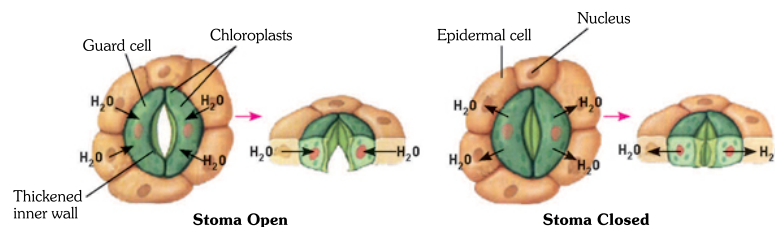
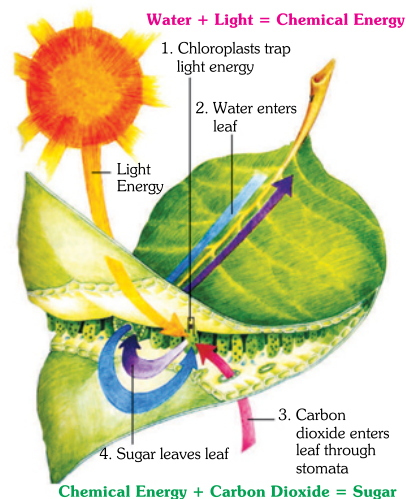
Algae (blue-green) contain chlorophyll and can prepare their own food by photosynthesis.

### Role of Leaves in Photosynthesis

Photosynthesis occurs mostly in leaves.

The inner structure of the leaf shows two important features :

- ❖ Presence of chlorophyll-containing cells.
- ❖ Presence of small pores, generally on the under surface of the leaves. These pores are called **stomata**, (singular : stoma). Carbon dioxide enters a leaf through these pores.



### SYNTHESIS OF FOOD OTHER THAN CARBOHYDRATES BY PLANTS

Plants synthesise glucose through photosynthesis. Glucose is the simplest carbohydrate and contains carbon (C), Hydrogen (H) and Oxygen (O).

Plants synthesise other food nutrients such as fats and proteins (through amino acids). Proteins contain elements like nitrogen (N), phosphorus (P) and sulphur (S).

The process by which plants synthesise proteins and fats from glucose is quite complex. The other elements present in proteins are derived from the soil. Here we describe the sources of nitrogen needed by the plants to synthesise proteins.

- Plants get nitrogen in the form of soluble salts such as nitrates, urea, ammonium sulphate etc. from the soil through their root system.
- The atmospheric nitrogen cannot be utilised by plants as such. However, certain bacteria such as symbiotic bacteria present in the root nodules of the leguminous plants can convert atmospheric nitrogen into soluble salts of nitrogen e.g., nitrates.

These salts being soluble, are absorbed by the plants through their root system.

In this way plants get nitrogen to prepare proteins needed for their growth and for the animals deriving their food from plants.

#### So now you know

- ❖ Plants take up carbon dioxide from the atmosphere through the stomata present on the under-surface of their leaves.
- ❖ Plants take up water from the soil through their root system.
- ❖ During photosynthesis the stomata remain open.
- ❖ Plants get nitrogen from the soil provided by fertilizers/manures and from the salts prepared by symbiotic bacteria and nitrobacter by fixing up the atmospheric nitrogen.

#### Oral Questions

1. What does 'photo' in photosynthesis mean ?
2. What is the site of photosynthesis in green plants ?
3. From where does carbon dioxide enter a leaf ?
4. Name the nutrients other than glucose synthesised by plants.
5. How do plants meet their requirement of nitrogen to synthesise proteins ?



### OTHER MODES OF NUTRITION IN PLANTS

Green plants can make their own food from carbon dioxide and water in the presence of chlorophyll (a green pigment present in green leaves) and sunlight. So, green plants are autotrophic.

Plants which do not contain chlorophyll (nongreen plants) depend on other living organisms for their food. Thus, the plants which do not contain chlorophyll are **heterotrophs** and their mode of nutrition is **heterotrophic**.



### Do You Know ?

The mode of nutrition in plants which do not contain chlorophyll (nongreen plants) is heterotrophic or holozoic.

Nongreen plants such as fungi, certain bacteria, some flowering plants do not contain chlorophyll.

Fluffy umbrella-like patches growing on rotting wood during rainy season are fungi.

Fungi also grow on pickles, leather etc. if left in hot and humid weather.

Various types of heterotrophic nutrition are described below :

- ❖ Saprophytic nutrition
- ❖ Parasitic nutrition
- ❖ Insectivorous nutrition
- ❖ Symbiotic nutrition

### Saprophytic Nutrition

The plants which derive their food from the dead and decaying organic matter are called **saprophytes** or saprophytic plants or saprotrophs.



Mushroom

The mode of nutrition in plants such as fungi (e.g., bread mould), mushrooms, and some bacteria (e.g., *Lactobacillus*, *Acetobacter*) is **saprophytic**, because they derive their food from the dead and decaying organic matter.



Bread Mould

Saprotrophs secrete digestive juices on the dead and decaying matter and convert them into a solution. Then, they absorb the nutrients from it.

### Parasitic Nutrition

- ❖ The mode of nutrition in which plants derive their food from the bodies of some other green plants and animals is called parasitic. The green plant or the animal which provides the food is called the **host**.
- ❖ The plants which derive their food from the bodies of the host plants and animals are called **parasites** or **parasitic plants**. The parasitic plants may be total parasites or partial parasites.
- ❖ The plants which depend wholly on the host plant, for their food are called totally **parasitic plants**.



Cuscuta on a host tree



Apodanthes

Plants such as **Cuscuta** (Amarbel), **Apodanthes**, Certain bacteria and Fungi are **totally parasitic**.

- ❖ The plants which make a part of their food themselves by photosynthesis but derive other components such as, water, minerals etc., of food from the host plant are called **partial parasitic**.

The mode of nutrition in some plants like, **Mistletoe** is partially parasitic, because they make their food themselves but get water and minerals from the host plant.



Mistletoe fruit



Mistletoe plant



### Do You Know ?

A parasitic plant called *Rafflesia* in Sumatra bears the largest flower : diameter 106 cm, weight up to 10 kg.



Rafflesia

### Insectivorous Nutrition

The mode of nutrition in which green plants make their own food but depend on insects for nitrogenous food is called **insectivorous nutrition**.

The green plants which make their own food but depend on insects for nitrogenous food are called **insectivorous plants**.

Plants such as, Pitcher plant (Nepenthes) Sundew, and Bladderwort derive their nutrition partly from the soil and the atmosphere and partly from small insects. These plants are called **insectivorous** plants.



Pitcher plant

### How does Pitcher plant derive its food from insects ?

Pitcher plant has long pitcher-like structure (modified part of leaf) hanging from the tip of a leaf. The apex of the leaf form a lid which can close and open the mouth of the pitcher. The inner surface of the pitcher has hair directed downwards.

When an insect enters the pitcher, the lid closes and the insect gets entangled into the hair. The insect gets digested by the digestive juices secreted in the pitcher.

### Symbiotic Nutrition

The two plants which live together as parts of the same plant and mutually help each other are called **symbionts**.

Such relationship of mutually helping each other is called **symbiosis**.

The mode of nutrition in Lichens is **symbiotic**. A Lichen is made up of a fungus and an alga living together.

In Lichens, alga (**autotroph**) and fungus (**saprophyte**) depend on one another for their nutritional needs. The fungus supplies water and minerals to the alga. The alga being green and autotroph synthesises food by photosynthesis and supplies organic food to the fungus.



Lichen



#### Do You Know ?

Lichens are a group of plants having a composite thallus consisting of an alga and a fungus.

Lichens act as indicators of air pollution. They disappear from the area having excess of CO and SO<sub>2</sub> in the air.

### HOW ARE NUTRIENTS REPLENISHED IN THE SOIL

Plants get their mineral nutrients from the soil. If crops/plants are grown year-after-year, the soil will become poorer in such nutrients. Nitrogen, Phosphorus, Potassium, Magnesium, Calcium are the major nutrients. In addition to these, plants also need Iron, Copper, Magnesium, and Zinc etc. in smaller amounts. So, if the soil becomes poorer in these nutrients, it loses its fertility and crop yield falls. Therefore, it is important to replenish (to make up the loss) these nutrients in the soil.

This is done by one or more of the following methods :

- ❖ By using manure
- ❖ By using fertilizers
- ❖ By crop rotation method



**Do You Know ?**

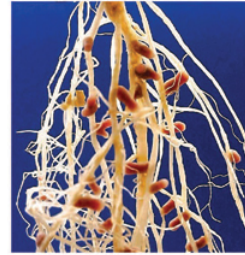
*Rhizobium cannot make its own food. It lives in the root nodules of the legumes. It provides nitrogen to the plants and the plants provide food and shelter to the bacterium. Thus this is another example of symbiotic relationship.*

Usually plants require a lot of nitrogen to make proteins.

Nitrogen in the soil can be replenished by using

- ❖ Manure or spent slurry from the biogas plant.
- ❖ Nitrogenous fertilizers such as Urea, Ammonium nitrate, Ammonium sulphate etc.
- ❖ By crop-rotation method. The practice of sowing a cereal crop alternately to a leguminous crop.

Gram, Peas, Moong, Beans etc., are legumes. The roots of these crops have nodules on them. These nodules have symbiotic bacteria. These bacteria have a property to convert atmospheric nitrogen into nitrates. Nitrates are soluble in water and can provide nitrogen to plants. Thus Rhizobium can convert atmospheric nitrogen into soluble salts of nitrogen.



**Rhizobia in the roots of a leguminous plant**

**So now you know**

- ❖ Nongreen plants are heterotrophic.
- ❖ Plants which derive their food from the dead and decaying organic matter are called saprophytes. The mode of nutrition in such plants is saprophytic.
- ❖ Plants which derive their food from the bodies of the host plants and animals are called parasites. These plants undergo parasitic mode of nutrition.
- ❖ The green plants which make their own food but depend on insects for nitrogenous food are called insectivorous. Some plants are totally parasitic, whereas others may be partially parasitic.
- ❖ The two plants which live together as parts of the same plant and mutually help each other are called symbionts. They share a symbiotic mode of nutrition. Such relationship of mutually helping each other is called symbiosis.
- ❖ Nitrogen of the soil can be replenished by using manure, fertilizers and by crop rotation method.

**Oral Questions**

1. Which type of nutrition is shown by nongreen plants ?
2. Name one plant showing the saprophytic mode of nutrition.
3. Name the two components in the thallus of Lichens.
4. By what name the practice of sowing a cereal crop alternately to a leguminous crop called ?
5. From where do the plants such as pitcher plant get their nutrients ?



## EXERCISES



### A VERY SHORT-ANSWER QUESTIONS : Answer in one-word

1. Name the process by which green plants make their food.
2. What type of heterotroph is a frog ?
3. What are the small pores on the under surface of the leaves called ?
4. What is the mode of nutrition in fungi ?
5. Where does the bacterium Rhizobium live ?

### B SHORT-ANSWER QUESTIONS : Answer in 10-15 words

1. Why are the animals and humans called heterotrophs ?
2. Name the factors which affect photosynthesis.
3. Name one each of (a) totally parasitic (b) partial parasitic plants.
4. How are the soil nutrients replenished ?
5. What is crop-rotation method ?

### C LONG-ANSWER TYPE QUESTIONS : Answer in 20-25 words

1. What are the functions of food ?
2. What is meant by nutrition ? Draw a chart showing classification of the modes of nutrition.
3. Describe photosynthesis. Name the various factors affecting photosynthesis.
4. Describe the role of leaves in photosynthesis.
5. Describe the term symbiosis. Give the name of a plant that exhibits symbiotic relationship.

### D TICK (✓) THE ODD-ONE OUT GIVING REASON

1. Green plants, Photosynthesis, Producer, Carnivores, Carbon dioxide
2. Starch, Iodine solution, Stomata, Saprophyte
3. Water, Chlorophyll, Root hair, Carbon dioxide
4. Fungi, Mushroom, Saprophytes, Cuscuta
5. Manure, Urea, Ammonium nitrate, Rhizobium

### E DEFINE THE FOLLOWING TERMS

- |                          |                        |              |
|--------------------------|------------------------|--------------|
| 1. Autotrophic nutrition | 2. Parasitic nutrition | 3. Omnivores |
| 4. Photosynthesis        | 5. Symbiosis           |              |

### HOTS HIGHER ORDER THINKING SKILLS: Think and Answer

1. Why can't animals and human make food from carbon dioxide and water in the presence of light ?
2. Why are the insectivorous plants called partially heterotrophs ?
3. How is the association between fungi and algae beneficial to each other ?
4. Where does Rhizobium live ? How does it help the plant ? What kind of relationship exists between Rhizobium and the plant ?




**QUICK ASSIGNMENT**
**A MULTIPLE CHOICE TYPE QUESTIONS:** Tick (✓) the correct answer

- Green plants are  
(a) herbivores (b) omnivores (c) carnivores (d) autotrophs
- The most effective light for photosynthesis is  
(a) blue + red (b) blue + green (c) green + yellow (d) orange + red
- Which of the following will give blue colour with iodine solution ?  
(a) proteins (b) fats (c) starch (d) roughage
- The gas produced during photosynthesis is  
(a) oxygen (b) carbon dioxide (c) nitrogen (d) carbon monoxide
- The mode of nutrition shown by mistletoe is  
(a) parasitic (b) partial parasitic (c) saprophytic (d) symbiotic

**B WRITE ONE WORD FOR THE FOLLOWING**

- The process of taking food and its utilisation by the body.
- An organism which cannot make its own food and depends on others for its food.
- The process by which green plants make their food.
- The small pores on the under-surface of the leaves.
- The mode of nutrition in the plants that derive their food from the dead and decayed organic matter.

**C MATCH THE COLUMNS**
**Column A**

- Animals
- Blue and Red lights
- Autotrophic
- Lactobacillus*
- Sundew

**Column B**

- Photosynthesis
- Chlorophyll
- Saprophytic
- Insectivorous
- Heterotrophs


**EXPLORE MORE**
**GROUP DISCUSSION**

- “The mineral nutrients for plants”. How are these replenished in the soil ?

<http://www.ncagr.gov/cyber/kidsworld/plant/nutrient.htm>  
<http://www.globalrepair.ca/soil.htm>

<http://www.rodsgarden.50megs.com/improvingsoil.htm>

**GROUP ACTIVITY**

- Visit a zoo. List the animals present there. Find out the food they eat and classify them on the basis of their mode of nutrition.

<http://www.bodduman.com/education/24-arts-a-science/13246-nutrition-in-plants-and-animals.html>

<http://www.preservearticles.com/201101042478/complete-information-on-the-diet-of-herbivores-carnivores-omnivores-and-carrion-eaters-animals.html>

- Perform any experimental activity given in the chapter.

<http://en.wikipedia.org/wiki/Photosynthesis>

<http://www.ftexploring.com/photosyn/chloroplast.html>

**SEMINAR/SYMPOSIUM**

- Collect information about a plant called **Rafflesia** found in Sumatra.

Present this information before your class.

[http://en.wikipedia.org/wiki/Rafflesia\\_arnoldii](http://en.wikipedia.org/wiki/Rafflesia_arnoldii)

[http://www.lostworldarts.com/asia/rafflesia\\_2.htm](http://www.lostworldarts.com/asia/rafflesia_2.htm)

<http://www.kew.org/plants-fungi/Rafflesia-arnoldii.htm>



## Chapter Based Practice Paper

### A. MULTIPLE CHOICE TYPE QUESTIONS : TICK (✓) THE CORRECT ANSWER

- Which part of the plant takes up carbon dioxide from the air for photosynthesis ?  
(a) root hair                      (b) leaf veins                      (c) stomata                      (d) sepals
- Amarbel is an example of  
(a) autotroph                      (b) totally parasitic                      (c) saprotroph                      (d) host

### B. FILL IN THE BLANKS TYPE QUESTIONS

- Human beings are \_\_\_\_\_ .
- The rate of photosynthesis depends upon the \_\_\_\_\_ of light.
- The small pores on the lower side of a leaf are called \_\_\_\_\_ .
- \_\_\_\_\_ are a group of plants having a composite thallus consisting of an alga and a fungus.
- Mistletoe is \_\_\_\_\_ plant.

### C. TRUE OR FALSE TYPE QUESTIONS

- Blue and red regions of visible light are less effective in photosynthesis.
- Cuscuta is a totally parasitic plant.
- Saprophytes are green in colour.
- Partial parasites make their own food but depend on the host for water and minerals.
- The mode of nutrition in lichens is symbiotic.

### D. PUZZLES AND QUIZ

Solve the crossword puzzle with the help of clues given.

<sup>4</sup> O	<sup>1</sup> M				L			E
	<sup>5</sup> H	<sup>2</sup> S	<sup>6</sup>		M			<sup>8</sup> S
								M
V		D						
				<sup>7</sup> L				
	V							O
								S
S								
<sup>3</sup> L		U			N			

#### ACROSS

- A partially parasitic plant. (9)
- Small pores on the undersurface of a leaf. (7)
- Plant having Rhizobia in its root. (10)

#### DOWN

- Both plant and meat eaters. (9)
- Plant or grass eaters. (9)
- An insectivorous plant. (6)
- Family of Gram, Peas, Beans and Moong. (6)
- Two organisms work together to benefit each other. (9)

( 13 )

# 2



## Nutrition in Animals and Humans

### KEY WORDS

#### Terms To Remember

- \* **ASSIMILATION** : process in which the absorbed food is used for producing energy and for growth.
- \* **PLAQUE** : sticky layer containing food particles, saliva and bacteria.
- \* **ALIMENTARY CANAL** : the digestive system from oesophagus to the anus.
- \* **FAECES** : unabsorbed portion of the food that is thrown out of the body.
- \* **TASTE BUDS** : taste-sensitive locations on the surface of the tongue.
- \* **VILLI** : Finger-like-projections on the inner wall of the small intestine.
- \* **CUD** : partially digested food stored in a part of stomach called rumen.
- \* **RUMINANTS** : plant/grass-eating animals that digest their food in two steps.
- \* **CONTRACTILE VACUOLE** : the point from where the undigested food is thrown out of the body by Amoeba.

#### MODES OF PROCURING FOOD

Different organisms use different methods to procure food. Each animal has some special structures on its body to procure food.

- ❖ Animals such as **cow, horse** etc., pick up food directly into their mouth.
- ❖ Human beings use their hands to put food into their mouth.
- ❖ **Amoeba** uses its false feet called pseudopodia to engulf the food particles.
- ❖ A **Paramecium** has brush-like body structures called cilia. It sweeps food particles from water with the help of these structures.
- ❖ **Frog** uses its tongue to catch its prey.



**We use our hands to put food into our mouth**



**A cow directly eats the grass**



**The sticky tongue of frog helps to catch the insects**

#### Objectives

- Modes of procuring food
- Process of nutrition
- Teeth in human beings
- Care of the teeth (or oral hygiene)
- The human digestive system
- Process of nutrition in animals
- Digestion in grass-eating animals
- Feeding and digestion in amoeba



A butterfly sucks nectar with its feeding tube

- ❖ **Butterfly** uses its feeding tube to suck the nectar.
- ❖ **Hydra** uses its tentacles with sting cells to kill the prey and put it into its body cavities.
- ❖ **A spider** weaves web around it to catch its prey.



The web of the spider traps its prey



1

TO FIND OUT AND RECORD THE TYPE OF FOOD, AND MODE OF FEEDING FOR THE FOLLOWING ANIMALS.

HOUSEFLY, BUTTERFLY, MOSQUITO, ANT, LICE, SNAIL, EAGLE, HUMMING BIRD.

PROCEDURE : Search for the information in literature or internet and record.

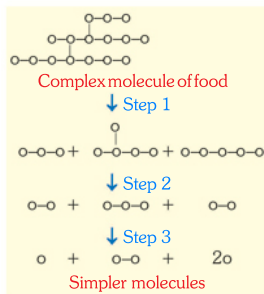
Animal	Food	Mode of taking food
Housefly		
Butterfly	Nectar of flowers	Sucking
Humming bird	Nectar of flowers	Sucking
Mosquito	Blood	Sucking
Ant		
Lice		
Snail		
Snake	Small animals	Swallowing
Eagle		

## PROCESS OF NUTRITION

Various aspects of **obtaining food, mode of intake of food** and its **utilisation** in the body for growth and development is known as **nutrition**.

The various steps involved in the process of nutrition are :

- ❖ **Ingestion** : The acts of getting and eating food collectively are called **ingestion**. In human beings, ingestion takes place through the mouth.
- ❖ **Digestion** : The break down of food into simpler and soluble molecules inside the body is called **digestion**. The process of digestion begins in the mouth and gets completed in small intestine.
- ❖ **Absorption** : The process by which soluble molecules present in the digested food passes into the body fluids like blood is called **absorption**. In human beings absorption takes place in the small intestine.
- ❖ **Assimilation** : The process in which the absorbed food is used for producing energy and growth is called **assimilation**.
- ❖ **Egestion** : The process by which the undigested food materials are thrown out of the body is called **egestion**.



Breakdown of complex molecules in the food to simpler molecules



Mosquitoes, houseflies, and butterflies live on liquid food.

**So now you know**

- ◆ Different organisms use different methods to procure food. Each animal has some special structure on its body to procure food.
- ◆ Various steps involved in the process of nutrition are Ingestion, Digestion, Absorption, Assimilation and Egestion.

**Oral Questions**

1. Name the structure used by butterfly to procure food.
2. Name the structure used by Amoeba to procure food.
3. Name an organism which lives on liquid food. ?
4. In which part of the human body the absorption takes place ?

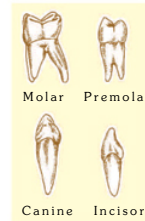


**TEETH IN HUMAN BEINGS**

Before we describe the nutrition in human beings, it is very important to know about the teeth and their care.

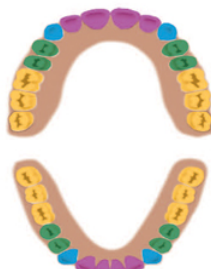
In humans, teeth grow twice in their life-time. First set of 20 teeth appears by the age of 2 years. These teeth are called **milk teeth**.

These milk teeth fall off one by one and a new set of 32 **permanent teeth** is formed by the age of 12. These 32 teeth are called permanent teeth and last for the rest of our life.



These 32 teeth (for an adult) can be classified into four types.

Type of teeth	No. of teeth in each jaw	Total no. of teeth of each type	Function
Incisors		8	Biting/cutting
Canines		4	Tearing
Premolars		8	Chewing, Grinding
Molars		12	Chewing, Grinding
Total :		32	



Arrangement of different types of teeth in human beings

- ◆ The front teeth which help us in **cutting** or **biting** the food are called **incisors**. There are four incisors in each jaw.
- ◆ Next to each incisor, there is one **canine** on each side. Thus there are 2 canines in each jaw. Canines help in **tearing** the food.
- ◆ Next two teeth on each side of the jaw are **premolars**. There are four premolars in each jaw. These are helpful in **chewing** and **grinding** the food.
- ◆ At the end, there are three **molars** on each side of the jaw. Thus, there are six molars in each jaw.

These help in **chewing** and **grinding** the food.



**COUNT YOUR TEETH BY OPENING YOUR MOUTH BEFORE A MIRROR HELD IN A SUITABLE POSITION.**

**RECORD THE NUMBERS IN THE TABULAR FORM.**

**OBSERVATION :** Age of the Student Year

Type of teeth	Role of teeth	Number of teeth		Total number of teeth
		lower jaw	upper jaw	
Incisors	_____	_____	_____	_____
Canines	_____	_____	_____	_____
Premolars	_____	_____	_____	_____
Molars	_____	_____	_____	_____

**COMMENT:** Compare your observation with that given in the Table on page 16.

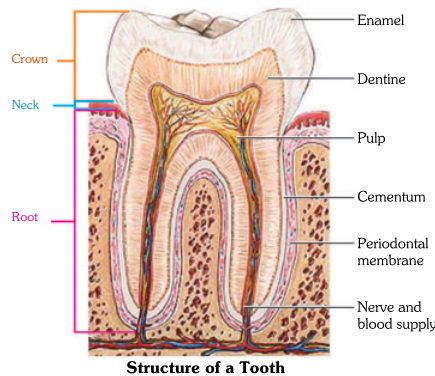
### Structure of a Tooth

Teeth are fixed into the gums. Each tooth has the following parts.

- ❖ **Root :**The part of a tooth embedded into the jaw.
- ❖ **Crown :**The top part of the tooth outside the gums.
- ❖ **Neck :**The part between the root and the crown.

The tooth internally is made up of

- ❖ **Enamel :**It is the white part of a tooth and is the hardest substance in our body. It is deposited outside the crown of the tooth. Enamel contains calcium salts.
- ❖ **Dentine :**Dentine is like a bone structure. It is hard.
- ❖ **Pulp cavity :**Inside the dentine, there is a soft pulp cavity which contains blood vessels and nerves.



**Arrangement of teeth in human beings**



### CARE OF THE TEETH (OR ORAL HYGIENE)

Healthy teeth are white and healthy gums are pink. If proper care is not taken, teeth become yellowish due to the formation of a sticky layer containing food particles, saliva and bacteria. This is called **plaque**.



Proper brushing of teeth keeps them healthy

The plaque absorbs sugary and starchy food materials. The bacteria in the plaque convert sugar and starch into acids. The acid so formed dissolves the tooth enamel and leads to the formation of cavity in the tooth.



Before brushing



After brushing

Gums hold the teeth. The build up of plaque at the place where teeth meet the gums leads to loosening of the teeth. You may now feel the importance of oral hygiene.

Given below are some helpful suggestions for the proper care of teeth and gums :

- ❖ Properly brush your teeth everyday in the morning and again before going to bed. Massage your gums gently with a soft brush.
- ❖ Wash your mouth thoroughly with water after every eating.
- ❖ Eat self-cleaning foods such as raw vegetables, carrot, radish, cabbage, fresh fruits particularly citrus fruits.
- ❖ Avoid eating sticky and starchy foods and sweets, chocolates, toffees, ice-cream etc.



A soft thread called floss is used to clean between the teeth



Correct ways of brushing the teeth

#### Do You Know ?

Tooth enamel is the hardest material in our body. This is also chemically the most stable tissue in the body. That is why teeth are selectively preserved after death.

Teeth of ancient human and animals have provided the most useful data for studying the process of evolution.

#### So now you know

- ❖ First set of 20 teeth appears by the age of 2 years. These are called milk teeth.
- ❖ The milk teeth fall off one by one and a new set of 32 permanent teeth is formed by the age of 12.
- ❖ The 32 permanent teeth are classified as, Incisors (8), Canines (4), Premolars (8) and Molars (12).
- ❖ Teeth are fixed into the gums. Each tooth has the following parts—Root, Crown, Neck.
- ❖ Internally tooth is made of, Enamel, Dentine and Pulp cavity.
- ❖ Proper brushing of teeth is essential to keep them healthy.

### Oral Questions

1. Which teeth help us in cutting the food ?
2. Name the hardest substance in our body.
3. How many molars are there on each side of the jaw ?
4. Name the part of a tooth embedded into the jaw.
5. What causes the loosening of teeth ?



## THE HUMAN DIGESTIVE SYSTEM

Our body needs energy to do work. We get this energy from the food we eat. The food we eat cannot be used as such by our body. To make the food usable by our body, the food must be broken into simpler and soluble molecules. The simpler and soluble molecules are then absorbed by the body cells. The unabsorbed portion of the food is thrown out of the body as **faeces** (stool).

The process of digestion involves many steps and is carried out by the digestive system.

The organs which constitute the digestive system of human beings are :

#### • Food tube or alimentary canal

- ❖ buccal cavity
- ❖ food pipe or oesophagus
- ❖ stomach
- ❖ small intestine
- ❖ large intestine
- ❖ rectum
- ❖ anus

#### • Digestive glands

- ❖ salivary glands
- ❖ liver
- ❖ pancreas
- ❖ gall bladder



### Do You Know ?

The process by which complex food molecules are broken down into simpler and soluble form is called **digestion**.

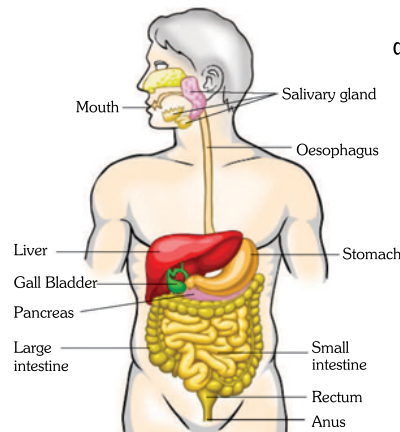
The process of digestion involves enzymes such as **amylase, pepsin, trypsin, lipase and sucrase**. These are called **digestive enzymes**.

**Amylase** breaks down starch to sugars e.g., glucose.

**Pepsin** and **Trypsin** break proteins into peptides.

**Lipase** helps in the breaking down of fats/oils.

**Sucrase** breaks down sugar sucrose to glucose.



**Digestive system of humans**

The digestive system from oesophagus to the anus is called **alimentary canal**. In humans, the alimentary canal is about 9 m long.

Now we discuss the journey of food through different parts of the digestive tract.

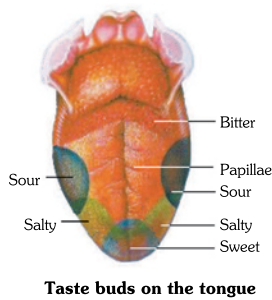
### Ingestion of Food in Humans

Humans take in food through the mouth. We put food morsels into our mouth with our hand, generally the right hand.

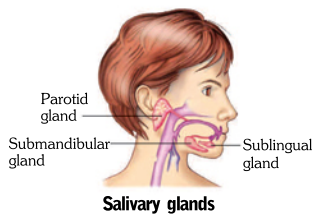
The mouth contains teeth, tongue and salivary glands.

The front teeth (incisors) are used for biting and cutting the bulk food into smaller pieces. The canines pierce and tear the small pieces of food. The premolars and molars help in chewing and grinding the food.





Taste buds on the tongue



Salivary glands

The process of digestion starts in the mouth with the help of saliva secreted by the salivary glands.

The tongue is a fleshy muscular organ attached at the back to the floor of the buccal cavity.

The main functions of the tongue are :

- ❖ it helps in mixing saliva with food
- ❖ it helps in swallowing the food
- ❖ it tells the taste of the food
- ❖ it helps in speaking.

The tongue has small **taste buds** on its surface. The taste buds in a location detect a particular taste. Locations of buds that detect different tastes are shown in the diagram alongside.

### Digestion of Food

- ❖ **In Buccal Cavity :** The food is chewed and masticated with the help of premolars and molars and tongue.

The salivary glands (three pairs) release a digestive juice called **saliva** in the buccal cavity. Saliva makes the chewed food wet and slippery. This makes the swallowing of food easier.

During digestion in buccal cavity starch present in the food gets converted into sugar maltose.



3

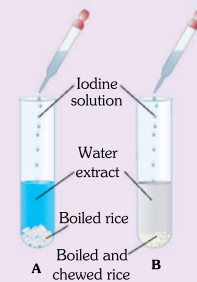
### Activity

#### TO SHOW THAT SALIVA BREAKS DOWN STARCH INTO SUGAR.

**MATERIAL REQUIRED :** Test tubes, Dropper, Boiled rice, Boiled and chewed rice, Iodine solution.

**PROCEDURE :** Proceed as follows :

- Take two test tubes and label them as A and B.
- Put half a spoonful of boiled rice in test tube A.
- Chew well one spoonful of boiled rice for about 4–5 minutes, till it becomes paste-like.
- Transfer the chewed boiled rice into test tube B.
- Add about 5 mL of distilled water in both the test tubes and shake well.
- Now add 2–3 drops of iodine solution to each test tube and shake well.
- Observe if there is any change in colour.

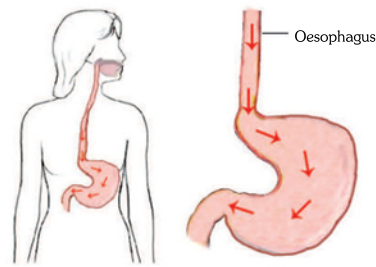


- OBSERVATIONS:**
- The mixture in test tube A turns to blue or blue-black.
  - The mixture in test tube B remains unchanged or becomes greyish.

**EXPLANATION:** Boiled rice (Test tube A) contains starch. Starch gives blue/blue black colour with iodine solution.

The starch in boiled rice is converted into sugar by saliva during chewing. Therefore in test tube B there is virtually no starch left. As a result the colour in test tube B remains unchanged.

❖ **In Oesophagus (or Food Pipe)** :Oesophagus is a hollow tube (about 25 cm long) made up of muscles. After the food is swallowed, it moves down by the movement of its muscular wall. From oesophagus the food goes into the stomach.



**Movement of food through oesophagus into the stomach**

❖ **In the Stomach** :Our stomach is a J-shaped bag-like structure made of muscles. The stomach is the widest part of the alimentary canal.

The gastric glands in the lining of stomach secrete digestive juices which contain mucus, hydrochloric acid and digestive enzymes.

The mucus protects the stomach lining from the action of enzymes and acid. Hydrochloric acid kills bacteria that might enter alongwith the food. The acid makes the food acidic to promote the action of enzymes.

The stomach muscles churn the food with gastric juices secreted by the glands in the stomach wall. The food stays in the stomach for 2 –4 hours. Most of the food is digested in stomach.

❖ **In the Small Intestine** :The small intestine is a long coiled narrow tube about 7.5 m long in length. It is located below the stomach. Here the partially digested food gets mixed with pancreatic juice from pancreas, bile juice from liver and several digestive juices of its own. Digestion of all the components of food gets completed here, and the end-products are ready for absorption.

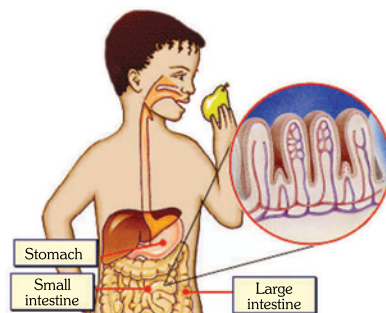


#### Do You Know ?

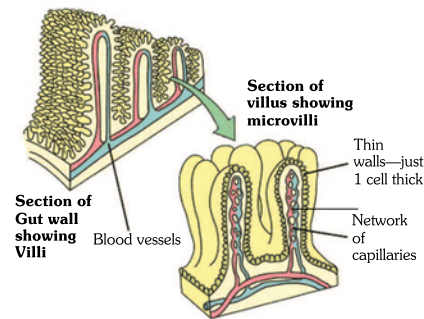
Bile juice makes the food alkaline and helps in the digestion of fat.

### Absorption of Digested Food in the Small Intestine

The nutrients present in the digested food are then absorbed by the finger-like projections on the inner wall of the small intestine. These finger-like projections on the inner wall of the small intestine are called **villi**



**The small and large intestines**



**The villi**



(singular : villus) These villi increase the surface area for absorption. Villi contain blood vessels. The digested food passes through the thin walls of these blood vessels and enters the blood stream.

The absorbed nutrients are then taken to all the cells of the body by the blood. Energy from the food is produced in the cells.

The excess of nutrients are stored in the body until they are needed.

The incorporation of the absorbed nutrients into the cell components is called **assimilation**.

### Absorption in Large Intestine and Egestion

Large intestine is about 1.5 m long in length.

The undigested food (called *the waste*) moves from the small intestine to the large intestine. The large intestine removes most of the water and certain salts from the waste by **absorption**.

The almost solid wet waste is then sent to the **rectum**. This wet solid waste called **faeces** leaves the body through **anus**. This process of throwing the solid waste out of the body is called **egestion**.

#### So now you know

- ◆ The process by which complex food molecules are broken down into simpler and soluble form is called digestion.
- ◆ Various organs of our digestive system are : Mouth, Oesophagus, Stomach, Small intestine, Liver, Gall bladder, Pancreas, Large intestine and Anus.
- ◆ Digestion of food starts in the mouth when saliva gets mixed with the chewed food, and gets completed in small intestine.

### Oral Questions

1. Name the process in which the absorbed nutrients are incorporated into the cell components.?
2. What is the unabsorbed portion of the food thrown out of our body called ?
3. What is the name of an organ which is long coiled narrow tube located below the stomach ?



### PROCESS OF NUTRITION IN ANIMALS

Different animals have different body structures. The process of nutrition in different animals is different. In this section, we describe the process of nutrition in some unicellular and multicellular animals.

### DIGESTION IN GRASS-EATING ANIMALS

It is very common to see grass-eating animals chewing leisurely continuously even when they are not eating.

The grass-eating animals such as Cow, Buffaloes, Horse etc swallow half chewed grass quickly and store it in a part of their stomach called **rumen**.

Here the food gets partially digested. The partially digested food is called **cud**. When the animals are not eating, the cud returns to the mouth in small lumps and is chewed. This process is called **ruminating**.

These animals are called **ruminants**. Ruminants have four chambers in their stomach. These chambers are called *rumen*, *reticulum*, *omasum* and *abomasum*.

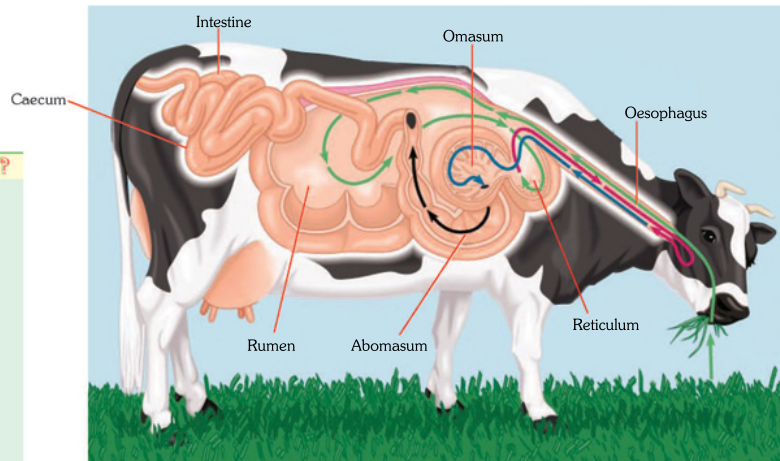


#### Do You Know ?

The digestion that occurs inside the cell is called **intracellular digestion**.

The digestion that takes place outside the cell is called **extracellular digestion**.

In more complex multicellular animals such as fish, frog and human, all the steps in the process of nutrition are performed by specific organs and organ systems.



Digestive system of a ruminant (here cow)

### Digestion of Cellulose

Grass is rich in cellulose. Most animals and human beings cannot digest cellulose.

Ruminants have a large sac-like structure called **caecum** between the small intestine and large intestine. Cellulose of the grass is digested here by the action of cellulose-digesting bacteria.

This bacteria is not present in humans. It is due to this, that humans cannot digest grass/cellulose.

### FEEDING AND DIGESTION IN AMOEBIA

Amoeba is a unicellular organism found in pond water. Amoeba has a cell membrane, a rounded dense nucleus and many small vacuoles in its cytoplasm. Amoeba has an irregular shape which keeps on changing slowly. It has projections on its body. These are called **pseudopodia**.

Amoeba feeds on some microscopic organisms.

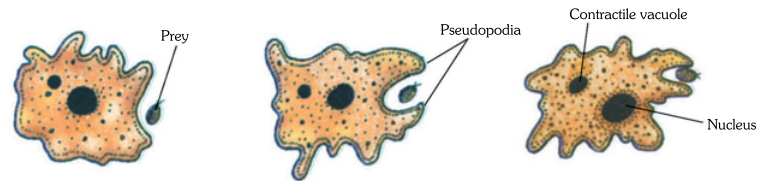
Amoeba engulfs tiny particles of food with the help of its false feet called pseudopodia.

The pseudopodia close to form a small cavity called **food vacuole**.

The food vacuole moves around in the cytoplasm. Here, the digestive enzymes help in the break-down of food into simpler and soluble molecules.



The digested food is then absorbed and assimilated and the Amoeba grows in size.



The nutritional process in Amoeba

After the Amoeba reaches a critical size, it divides into two daughter cells.

The undigested food is thrown out of the body through the **contractile vacuole** at any point because Amoeba has no anus.

So now you know

- ❖ The grass-eating animals like Cow, Buffaloes etc. are called ruminants. They quickly swallow their food and store it in rumen. Later the partially chewed food called cud, returns to the mouth and is chewed by the animal.
- ❖ In most animals, cellulose of grass is digested in caecum by the action of cellulose-digesting bacteria.
- ❖ Amoeba feeds on some microscopic organisms.
- ❖ Amoeba engulfs tiny particles of food with the help of its false feet (called pseudopodia). The food is digested in the food vacuole. The digested food is then absorbed and assimilated.
- ❖ Amoeba grows in size and after reaching a critical size, it divides into two daughter cells.
- ❖ The undigested food is thrown out of the body through the contractile vacuole.
- ❖ Amoeba has no anus.

Oral Questions

1. Name the part of stomach where half-chewed grass is stored by grass eating animals.
2. By what name is the partially digested food called ?
3. Where is the caecum located in the body of ruminants ?
4. Name the body part used by Amoeba to throw the undigested food out of body.
5. Where in the body of Amoeba, the food is digested ?



## EXERCISES



### A VERY SHORT-ANSWER QUESTIONS : Answer in one-word

1. Name two organisms that live on liquid food only.
2. Name the cavity in unicellular animals in which food is present.
3. What is the white hard substance that covers the teeth ?
4. Name the process in which absorbed food is used for producing energy.
5. What is the sticky film on teeth consisting of food particles, saliva and bacteria called ?

### B SHORT-ANSWER QUESTIONS : Answer in 10-15 words

1. Name the digestive glands present in the digestive system.
2. What is the function of large intestine ?
3. What is the structure of stomach in ruminants ?
4. Show with the help of a flowsheet diagram the nutritional process in Amoeba.
5. Write two suggestions for the proper care of teeth and gums.

### C LONG-ANSWER TYPE QUESTIONS : Answer in 20-25 words

1. Mention the various steps involved in the process of nutrition.
2. How many teeth do we have in our mouth ? Classify them into various types. What kind of function do they perform ?
3. Name the various organs which constitute the digestive system.
4. Draw a labelled diagram of alimentary canal.
5. How do the grass-eating animals digest cellulose ?

### D TICK (✓) THE ODD-ONE OUT GIVING REASON

1. Cow, Horse, Human beings, Amoeba
2. Canines, Premolars, Chewing, Grinding
3. Pulp cavity, Crown, Buccal cavity, Plaque
4. Large intestine, Small intestine, Stomach, Kidney
5. Pseudopodia, Caecum, Rumen, Cud

### E DEFINE THE FOLLOWING TERMS

- |               |                        |                     |
|---------------|------------------------|---------------------|
| 1. Nutrition  | 2. Tooth enamel        | 3. Digestive glands |
| 4. Rumination | 5. Contractile vacuole |                     |

### HOTS HIGHER ORDER THINKING SKILLS : Think and Answer

1. Digestion needs the help of two more systems in the body to provide energy from food.
  - (a) Name these systems
  - (b) How do they help for providing energy from food ?
2. Which food will take longer to get digested—glucose or beans ?
3. Which component of grass is indigestible ? Don't you think if grass is made digestible in human systems, the food scarcity will be over ?




**QUICK ASSIGNMENT**
**A MULTIPLE CHOICE TYPE QUESTIONS: Tick (✓) the correct answer**

- Each jaw consists of \_\_\_\_\_ teeth.  
(a) 32 (b) 10 (c) 16 (d) 20
- The juice secreted by the glands in stomach wall is  
(a) bile (b) insulin (c) saliva (d) gastric juice
- The chemicals that help to digest the food are called  
(a) digestive juice (b) vitamins (c) enzymes (d) hormones
- The upper part of the small intestine is the  
(a) rectum (b) oesophagus (c) liver (d) duodenum
- Glycogen formed from excessive glucose in the blood gets stored in  
(a) heart (b) adipose tissue (c) liver (d) stomach

**B WRITE ONE WORD FOR THE FOLLOWING**

- The act of getting and eating food.
- The white part of the tooth containing calcium salts.
- The digestive system from oesophagus to anus.
- The fleshy muscular organ that helps in speaking.
- Large sac-like structure between small intestine and large intestine in the body of a ruminant.

**C MATCH THE COLUMNS**
**Column A**

- Humming bird
- Buccal cavity
- Large intestine
- Rumen
- Contractile vacuole

**Column B**

- Alimentary canal
- Amoeba
- Sucking
- Absorption of water and salts
- Cow


**EXPLORE MORE**
**GROUP DISCUSSION**

- How does the nature prevent food getting into trachea?  
<http://kidshealth.org/kid/watch/er/choking.html> <http://www.sciencebob.com/research/digestion.php>

**GROUP ACTIVITY**

- Study the arrangement of teeth in our mouth with the help of models of the two jaws. Discuss amongst your friends.  
<http://en.wikipedia.org/wiki/Dentition> <http://www.essortment.com/teeth-27449.html>  
<http://www.daviddarling.info/encyclopedia/T/teeth.html>
- Perform an experiment to show that saliva breaks down starch into sugar.  
<http://en.wikipedia.org/wiki/Amylase> <http://hyperphysics.phy-astr.gsu.edu/hbase/organic/carb.html>  
<http://library.thinkquest.org/11226/main/c03txt.htm>

**SEMINAR/SYMPOSIUM**

- Root Canal Therapy—History and its role in the treatment of teeth.  
[http://en.wikipedia.org/wiki/Endodontic\\_therapy#Root\\_canal\\_treatment](http://en.wikipedia.org/wiki/Endodontic_therapy#Root_canal_treatment)  
<http://www.webmd.com/oral-health/dental-root-canals>



## Chapter Based Practice Paper

### A. MULTIPLE CHOICE TYPE QUESTIONS : TICK (✓) THE CORRECT ANSWER

- The teeth which help in cutting the food we eat are  
(a) incisors (b) canines (c) premolars (d) molars
- The last part of digestion of food takes place in the  
(a) stomach (b) large intestine (c) small intestine (d) oesophagus

### B. FILL IN THE BLANKS TYPE QUESTIONS

- Saliva is secreted by the \_\_\_\_\_ in the mouth cavity.
- \_\_\_\_\_ molar teeth are present in a human adult.
- Finger-like projections in the walls of small intestine are called \_\_\_\_\_.
- Absorption of water from the undigested food takes place in \_\_\_\_\_.
- The four chambers in the stomach of the ruminants are \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

### C. TRUE OR FALSE TYPE QUESTIONS

- The process of taking food is called assimilation.
- The removal of faeces through anus is called excretion.
- Canines are suitable for tearing flesh.
- The sac-like structure in the body of ruminants between the small intestine and large intestine is called caecum.
- Amoeba throws out its undigested food through food vacuole.

### D. PUZZLES AND QUIZ

Solve the crossword puzzle with the help of clues given.

#### ACROSS

- Digestive juice secreted by glands in the buccal cavity (6).
- Hollow tube through which the swallowed food moves down (10).
- Partially digested food stored in rumen (3).
- Animal that swallows its prey (5).
- Teeth that help in tearing the food (6).

#### DOWN

- Finger-like projections on the inner wall of the small intestine (5).
- Process by which the undigested food materials are thrown out of the body (8).
- Top part of the tooth outside the gums (5).
- Sticky film consisting of food particles, saliva and bacteria (6).
- A large sac-like structure between the small and large intestine of ruminants (6).



### E. LIFE SKILL

- Good Eating Habits—Search on Internet and present it before your classmates.