

# **UNIT 6 OUR BODY, FOOD AND HEALTH**

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## **6.1 INTRODUCTION**

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'Health is wealth' is an old saying. Essentially health implies good health. It is imperative that we keep this wealth safely with us as long as we live in this world. To keep good health it is necessary that we are fairly aware of our body parts and systems; the type of the food which we eat and whether it contains all the essential nutrients that is required for our body, the diseases that we may possibly contract and the preventive measures needed to be taken to keep the diseases away from us; and a knowledge of the diseases themselves and their causative agents. It is important to impart certain aspects of nutrition and health education to children for the reasons that (1) they are in the growing stage and both mental and physical health are directly related to nutrition and (2) with the body's immune or defence system not having achieved 100% efficiency they are more prone to infections diseases than adults. This unit is intended to focus attention on different aspects of health and nutrition.

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## **6.2 OBJECTIVES**

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After going through this unit, you should be able to help your students to :

- familiarise themselves with different parts of human body and list them down;
- discuss the functions of different body parts in all human beings irrespective of their size and shape;
- recognise the importance of food and nutrition for the growth and development of the body;
- analyse the consequences of malnutrition on the human body;
- list down the causes and measures to prevent communicable diseases;
- distinguish between deficiency and communicable diseases; and
- discuss the concept of hygiene in the use of water and food.

## 6.3 HUMAN BODY

To familiarise the children with different body parts and their functions, the teacher may devise suitable activities and let the children to perform the activities. In general all human being have similar body parts although there may be small differences in their sizes and possibly shapes.

### 6.3.1 Body Parts and their Functions

#### Activity 1

1. i) Choose any ten children in your class and let them stand in a line. Ask the other children to observe the ten children carefully. More specifically let them observe the similarities and differences in these children. You may put the following questions to the children.
  - Do all the children possess same height?
  - Same body colour?
  - Same eye colour?
  - Same hair colour?
  - Do all the children have same body parts such as hands, legs, nose, eyes, teeth, etc.?

The answers which children provide will become focal point of discussion. No, all the children are not of the same height. No, all the children are not of the same colour. Yes, the eye colour and hair colour are more or less same. Yes, all the children have the same body parts. Isn't it remarkable that despite the fact that all children possess the same body parts, they do not look alike? Are not such variations universal?

- ii) Tell the children to name or write down the parts of an external organ such as a hand or leg. For instance leg consists of three parts - the thigh, shank and foot. In between thigh and shank there is the knee and in between shank and foot there is the ankle (Fig. 6.1).
- iii) Tell them to write about the functions of certain body parts. What are the possible ways our hands are useful to us? What are the ways in which your arm can move? Your fingers? Assuming your fingers are inflexible and rigid will they be useful to you?

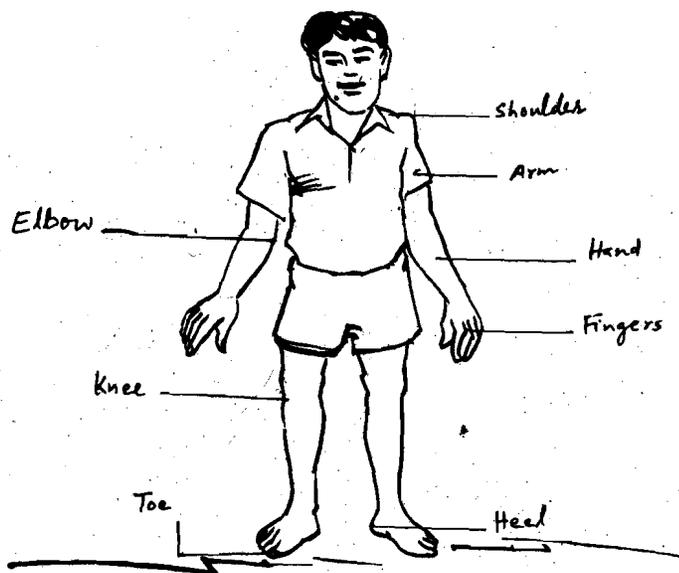


Fig. 6.1 : Diagram of a hand and leg showing different parts

Children may be asked to reply to similar questions about other body parts. An interesting discussion may follow. Teachers may conclude that each body part has specific functions to perform.

### 6.3.2 Sense Organs and their Functions

Tell the children to name the various sense organs in the body (Fig. 6.2). Ask the children to say to which of the stimuli does each sense organ respond. For instance the eye responds to light; the ear responds to sound; the skin to touch - so on and so forth. The following activities may help the children to comprehend the sense organs and their functions.



Fig. 6.2 : Some sensory organs

#### Activity 2

- i) Blindfold a child. Then place some objects on the table. Ask the blindfolded child to identify the objects placed on the table by touching and feeling them. Make the children understand that they would be able to say whether the object is smooth or rough, light or heavy without actually seeing them.
- ii) Blindfold another child. Keep in separate paper or polythene bags certain items which have strong aroma. Jasmine or rose flower, garlic or onion, curry leaf or lemon leaf, cardamom or clove and similar such items. Ask the blindfolded child to smell each bag and identify the object by smell. Later on open each bag and see whether the objects have been identified correctly.
- iii) A similar activity may be performed to illustrate the sense of taste. The blindfolded child may be asked to taste substances which taste sweet, sour, salty and bitter and then write down the different tastes that he had experienced.

Discuss the results of the above activities with children and conclude that each of our sense organs performs a specific sensory function. You may devise similar activities for the sense of vision and hearing as well.

### 6.3.3 Internal Organs

After familiarising them with the different external organs of the body, the children may be introduced to the internal organs and organ systems. With the help of diagrams or clay or plastic models the children could be given a broad idea of the internal organs such as heart, lungs, brain, kidney and the organ systems, such as digestive and respiratory systems. Students can also be introduced to the supporting structures such as bone, and structures responsible for movement - the muscles.

#### Activity 3

Tell the children to feel the different parts of their body - their forehead, upper arm, back of their hand, thigh, tip of the nose, the stomach and the external ear. Certain parts of the body are soft and certain others are hard. Let the children list the soft and hard parts of the body. Softer part of the body are made of muscles and the harder parts are supported by bones. The forehead is hard because it is formed of skull bones that protects the brain. The back of your hand is also hard being supported by bones. On the other hand the stomach is muscular and therefore soft. The forearm and thigh are also highly muscular but internally supported by hard structures-the bones.

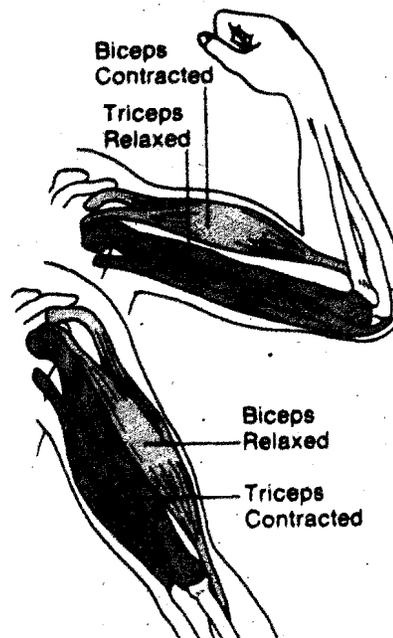


Fig. 6.3

Initiate a discussion with the children on the functions of bones and muscles. Tell them the importance of keeping the muscles and bones healthy. They should be also told the importance of daily exercise in keeping the bones and muscles healthy. Daily exercises help to keep the body trim and fit.

The structure and functioning of different systems of the body can be explained to the students mainly through diagrams, charts and models. Activities could be introduced wherever possible.

#### Activity 4

While talking about heart and circulatory system the students may be asked to place their hands on the left side of their own chest and feel the heart beat. They may asked to count the number time their heart beats in one minute. Tell the students to do some fast running or jumping and let them once again feel their heart beat. Similarly they may be guided to feel their pulse and determine the pulse rate - that is, how many counts are there in a minute.

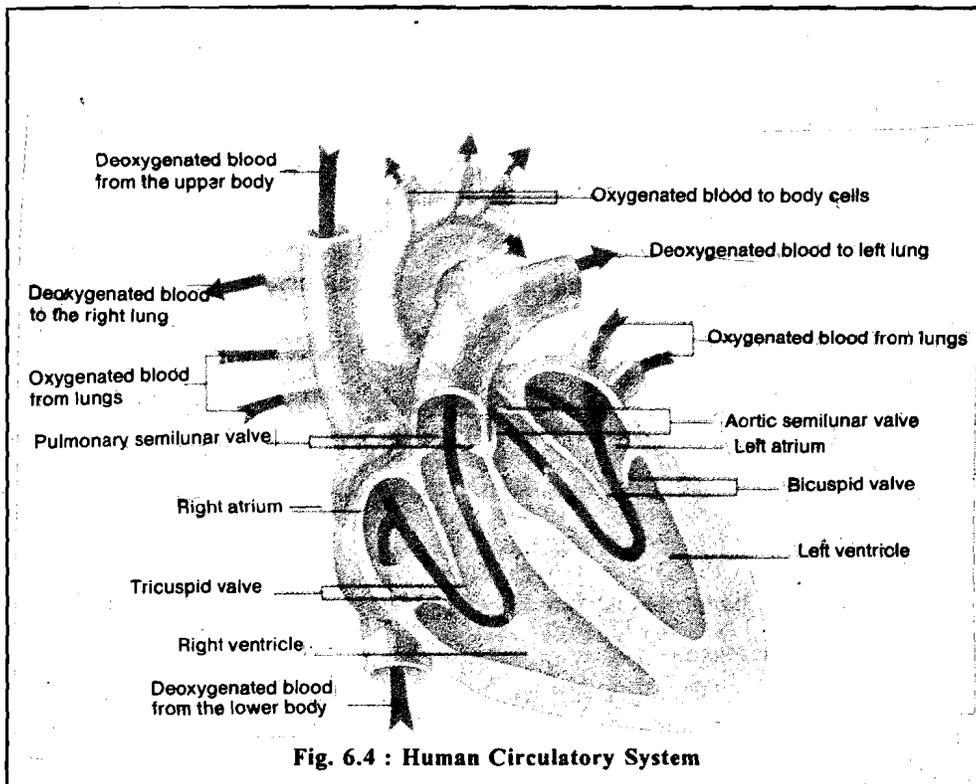


Fig. 6.4 : Human Circulatory System

The various respiratory organs - the nostrils, the wind pipe and the lungs could be described with the help of diagrams and charts. While describing the respiratory system, children may be asked to observe the heaving movements of the chest of their fellow students that signifies the breathing process. Breathing is taking in of oxygen and releasing of carbon dioxide. But keeping their fingers close to the nostrils they may feel the movement of air signifying the breathing process. They may further be told that they cannot keep their nostrils tightly closed for a longer time as they will feel suffocated for want of fresh air. They may be told that at high altitudes of mountains also such suffocation may occur because at high altitudes there is less oxygen.

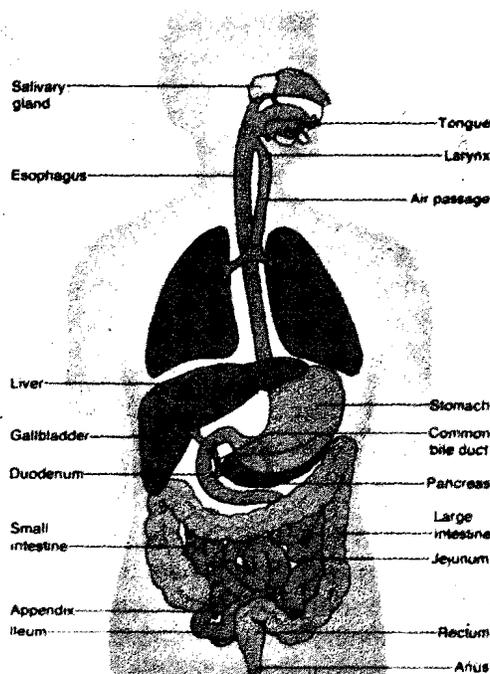


Fig. 6.5 : Human digestive system

The digestive system can be explained once again with charts and diagrams (Fig. 6.5). The students can be told about the various parts of the digestive system - the food pipe (oesophagus), the stomach, the small intestine and the large intestine. They may also be taught about digestive glands and the juices which they produce. These juices help in the digestion of food.

**Check Your Progress**

**Notes:** a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

1. What are sense organs? How will you show to the children that each sense organ performs a specific sensory function?

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2. Discuss the structure and functioning of the internal organs of the human body.

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## 6.4 FOOD AND NUTRIENTS

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In the last section you have learnt that the different organs and organ systems of the body perform different functions. To perform different functions the body requires energy. Where does the energy for performing different functions come from? Essentially it comes from the food we eat. Besides providing energy for the different function which the body performs, food also provides the various nutrients that are needed for the growth of the body. In the absence of nutrients, the growth is retarded in children. Further, the lack of nutrients result in children suffering from different types of diseases. But what are these nutrients?

**Activity 5**

Tell the children to list all the food items they consume daily. Try to classify the food items into energy producing ones, growth promoting ones and disease preventing ones.

Carbohydrates and fats are energy producing nutrients. Proteins are responsible for growth, body building and maintenance. And vitamins and minerals prevent you from suffering from diseases.

Rice, wheat, corn, potato and sugar are rich in carbohydrates. Oil, butter, ghee are some of the fat rich food substances; pulses, fish, milk, egg and meat are rich in proteins.

Several nutrients are essentially required for the normal functioning of the body and in the absence of these nutrients the body contracts certain diseases. Vitamins and minerals constitute these nutrients. Vegetables, greens, bean sprouts, milk and milk products are rich in minerals. For normal active life and growth, all the different types of nutrients are necessary for the body. In other words the food that is eaten daily should contain all the nutrients in proper proportion. Such a food could be termed as balanced food or balanced diet. In addition to all the nutrients mentioned, there is a need to drink plenty of water. You may be aware

that our body contains nearly 70% water. Water is constantly lost from the body by way of sweat and urine. And to make up the loss of water from the body, we need to drink the adequate quantity of water to maintain a water balance in the body. And finally, to aid in digestion, to facilitate bowel movement and prevent constipation, it will be good if the diet includes certain fibre content. Vegetables prepared in the form of salads such as carrots, radish, onions and cabbage provide the roughage needed for the body.

While discussing the various aspects of food and nutrition, it is important that emphasis should be made on hygiene and cleanliness.

- Hands must be clean and well washed before taking food.
- All vegetable and fruits must be thoroughly washed, particularly when eaten raw, before being consumed.
- Avoid eating food that is kept exposed. It is imperative that the food should be kept closed and kept protected from dust and flies.
- Water should be kept stored in a hygienic way and should be suitable for drinking.
- While it is advisable to eat well cooked food, overcooking should be avoided as it leads to loss of nutrients from the food.
- It is always better to consume fresh food. Food stored for a long time will grow micro-organisms which may be harmful to the body,

To show that stored food grows micro-organism in them, perform the following activity.

Activity 6			
Tell the children to leave some cooked rice or dal in a vessel for a week in a corner of the classroom. Do not allow it to become dry. Make daily observations and record them in your note book.			
Days	Smell	Colour	Other changes
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

Over a week the cooked food should have undergone changes in smell and colour. The food is dotted with black, green and gray as well as growth suggesting the growth of micro-organisms. Essentially there are bacteria and fungus. The children may view them through a magnifying glass. The toxins emitted by the micro-organisms would have contaminated and spoiled the food.

Consumption of such food leads to food poisoning. Obviously the food cannot be kept stored for too long. There are certain ways by which food can be kept stored for quite sometime.

- Food can be kept stored in refrigerators (for a limited period of four to seven days).

- Vegetable and fruits could be pickled.
- Some food can be dehydrated and salted.
- Some readymade food have preservatives in them.

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## 6.5 MALNUTRITION AND DEFICIENCY DISEASES

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In the previous section the children have learnt the importance of food and nutrition. Food, and the nutrients derived from there, are responsible for providing energy, for growth and development and for keeping the body free of diseases. Assuming the body is deprived of its food requirements, what will be its effect? In the event of body not being supplied with the requisite nutrients, it suffers from malnutrition. Lack of adequate nutrients manifests in the form of different diseases. Since these diseases arise due to the deficiency of certain nutrients in the body they are called deficiency diseases.

One of the major problems in many parts of the world; particularly in developing countries, is that due to protein deficiency in food, many children suffer from a disease called Kwashiorkor disease. Distended stomach lean and thin body and lack of adequate blood in the body are symptoms of this disease. Children, aged 2 years after being breast-fed initially, if not provided with adequate proteins suffer from this disease.

Marasmus is another malnutrition associated disease, due to shortage of all nutrients or starvation. Children of age between months to three years suffer from this disease. Some of the symptoms of this disease are :

- lack of growth and the children appear very thin and lean
- look dull and uninterested
- loose skin and sunken eyes
- swollen hands and feet
- dark skin that peels off quite often

Other deficiency diseases are essentially caused due to lack of vitamin intake in the body. Some vitamins are produced by the body but the other vitamins should form the dietary component. The following table provides an account of vitamins, the source and the deficiency disease caused due to absence in the body. Beside, the vitamins lack of certain minerals also cause certain diseases. For example, iodine is to be taken along with diet. Iodine is required for normal growth. Failure to take iodine as a dietary component results in a disease called goiter - huge swelling in the neck region. Abnormal growth and mental disability also result. Iodine is obtained in the salt from sea.

You may have noticed that nowadays iodized salt is sold in the shops. Iodine is also available in fish and onion. Similarly, iron has to be an important dietary component. Lack of iron results in anemia. All leafy green vegetables are rich in iron. Groundnut also contain adequate iron.

The teacher may explain to the children in detail about the various deficiency diseases. He/ she may ask the students if any of them have symptoms of deficiency disease. He/she may advise the students as well as the parents to see a doctor and get the disorder cured.

So far we had looked into deficiency disease. The next section will deal with communicable diseases.

**Table 6.1 : Vitamins, their sources, deficiency diseases and symptoms**

<b>Name of the Vitamins</b>	<b>Source</b>	<b>Deficiency Disease</b>	<b>Symptoms</b>
Vitamin A	Green leafy vegetables, mango, fruit, pappaya carrots, milk, curd, yellow pumpkin	Night blindness	Difficulty to see in dim light
Vitamin B complex	Meat, Cereals, peas soro skin, potatoes, cheese	Beri Beri Pellagra	Digestive disorders, memory loss, Anemia scaly skin, lack of blood pigment
Vitamin C	Sprouts, potatoes, cabbage, tomatoes oranges	Scurvy	Bleeding gums, loose Teeth, joint pain, body weakness
Vitamin D	Eggs, chees, fish liver	Rickets	Bending of bones, badly formed teeth
Vitamin K	Oils, milk, sunlight action on skin eggs, green vegetables, liver		bleeding from gums and from beneath skin

## **6.5 COMMUNICABLE DISEASES**

Communicable diseases, the children may be told are those which spread from person to person. They are also known as infectious disease. These are caused by micro-organisms, which are commonly called germs. Micro-organisms, the children may be told, are very; minute organisms which cannot be seen by naked eyes - but require an instrument called microscope. Some of these micro-organisms are called bacteria and others are called viruses. Let the children think what are the possible ways by which diseases can spread from one person to another. They may be told in detail that air, water or food could be the possible agents of infection. Sometimes the germs can directly attack and cause the disease. Sometimes other organisms, such as insects could be the cause for infection. Table 6.2 provides the names of the communicable diseases their causative agents.

**Table 6.2 : Communicable diseases**

<b>Disease causing organism</b>	<b>Agents of infection</b>				
	<b>Air</b>	<b>Water</b>	<b>Food</b>	<b>Contact</b>	<b>Insects/other organisms</b>
Viruses	Common cold Influenza, Bronchitis, Measles Whooping cough Chicken pox Small pox	Polio			Rabies (dog)
Bacteria	Diphtheria Pneumonia Meningitis Tuberculosis	Typhoid Cholera Bacillary-dysentary	Typhoid Cholera	Tetanus Leprosy	Plague (flea & rat)

Disease causing organism	Agents of infection				
	Air	Water	Food	Contact	Insects/other organisms
Protozoa		Amoebic Dysentary			Malaria (mosquito) (Sleeping sickness (tsetsefly))
Fungi				Ringworm disease	
Worms		Round worm	Tape worm	Hook worm	

Essentially Table 6.2 shows that diseases are caused by germs of different types and these germs spread from one person to another through air, water, food as well as by direct contact and by insects and other organisms. Students should also be told that there are ways and means to prevent contracting these diseases. The following practices need to be observed as preventive measures.

1. Home and surroundings should be kept very clean.
2. If there are patients at home, the various articles used by them should be sterilised before being used by others; this would prevent others getting infected.
3. Water sources such as well, tanks etc., should be maintained clean and safe and always should be free of contamination.
4. People should stop defecating in the open.
5. Children in particular should be vaccinated for all communicable diseases.

## 6.6 NATIONAL PUBLIC HEALTH SERVICES

The Government of India has launched many schemes in order to achieve its objective of 'Health for All by the year 2000'. These schemes are implemented under National Public Health Services. One of the most important programmes under this scheme is the mass immunisation of children. Pregnant women are also given such vaccines to protect the mother as well as the developing foetus. These vaccines offer protection to children and expectant mothers from many of the infectious diseases. The vaccines help in developing resistance to the infectious diseases.

It is estimated that nearly 30 lakh children die every year of infection from measles, tetanus and whooping cough and another two lakh children are permanently disabled by polio. The immunisation programme of the Government aims to totally eliminate these diseases and prevent children from being affected by them. Government is also widely publicising the immunisation programme so that expectant mothers and children do not suffer later due to lack of awareness of such measures. Teachers should speak to the children about the various health awareness schemes of the Government and the benefit they should derive of such schemes. Failure to undergo immunisation results in permanent damage to health and life-long disability.

The possible ways in which teachers can work to get the message across the children are:

- making children aware about government schemes

- explaining to children the importance of immunisation
- spreading the message of this programme through the children to their homes.
- arranging immunisation programme for the students and maintaining a record

The immunisation programme has a specific schedule. And the schedule should be strictly followed if resistance to the diseases is to be developed. These vaccines offer protection against different diseases such as diphtheria, whooping cough, tetanus, tuberculosis, measles, typhoid fever etc. The following table is the vaccination schedule against various diseases.

**Table 6.3 : Immunisation Schedule**

Age	Vaccine to be administered
At birth	BCG — against tuberculosis
Between 6 weeks to 9 months	Triple antigen — against diphtheria, whooping cough and tetanus — three doses at intervals of 4 to 6 weeks Polio drops — against polio — three doses at intervals of 4 to 6 weeks
Between 9 months and one year	Measles
Between 16 months and 2 years	DPT and Polio booster doses
Between 5 and 6 years	Typhoid 2 doses and DT (if DPT was not given)
10 years	Tetanus Toxoid

## 6.7 SAFE HANDLING OF WATER AND FOOD

Children have been told that the communicable diseases spread through air, water and food. It is in our hands to keep the water and food clean and safe for use. The diseases caused by water and food contamination are known as water and food borne diseases respectively. For instance typhoid, dysentery and cholera which are common in rainy season are water borne diseases. There is every possibility of water sources being contaminated during rainy season and it is imperative that during this season every precaution should be taken to have safe drinking water. Let the children answer the question as to what are the different ways by which water could be made clean and safe for drinking. The students may also be told that besides the above mentioned water borne diseases, there is a chance to contract other water borne diseases such as gastroenteritis and jaundice.

A discussion may be held with children on the possible sources of water contamination. The following ideas may emerge at the end of the discussion.

1. Improper disposal of dirty water which finds its way to wells, ponds and sometimes to water pipe-lines as well. The stagnation of dirty water leads to seepage of this water to underground water sources and their contamination.
2. Drinking water should always be kept covered. Clean containers should be used for storing water. Also for taking water from this container for the purpose of drinking, a clean cup or a glass should be used. It would be better that such a cup has a long handle so that one's hands do not come in contact with the water in the container.
3. If it is a habit to drink water by palms, then the hands should be thoroughly washed, preferably with soap.
4. Water used for drinking should be very clean and hygienic. The process of cleaning the water and making it potable is described in the unit on Air, Water, and Weather. The water should be germ free. Water provided by

municipalities and corporations generally chlorinated, a process which kills all germs. If the water is not chlorinated, then it should be necessarily boiled to kill all germs.

To make sure that children are aware of the significance of clean drinking water, they may be guided to make a survey of water sources in their village and their portability. In carrying out the survey, they should be able to address the following questions.

- a) What are the sources of water in the village?
- b) Is the water clean and fit for drinking?
- c) Are the water sources hygienically secure?
- d) Are the collecting and storing of water done in a clean manner?
- e) What is the arrangement of disposal of waste water from homes?
- f) Whether there is a well constructed platform around the well/hand pump/tap?

Students may be divided into four or five groups and each group should choose a specific area for survey. The teacher should discuss with the children the findings of different groups. Based on the findings of the survey the good, not so good and bad water sources could be identified and students should bring these facts to the attention of their parents.

Similarly 'students' attention can be drawn to the fact that eating unhygienic food is the cause for the spreading of the various infectious diseases. Unhygienic food is responsible for diseases like cholera, dysentary etc. To keep these diseases away, care should be taken to prevent totally any contamination of food. The following are some of the ways by which food contamination could be prevented.

- Food should always be kept closed or covered so that flies and other insects do not contaminate it.
- Food left uncovered should never be consumed.
- Food that has become stale and foul smelling should not also be consumed.
- Vegetables and fruits should be thoroughly washed particularly if they are consumed raw.
- And before touching any food, hands should be thoroughly washed.

The teacher should hold a discussion with the students on all the above steps and create an awareness among the children on the need to eat clean and hygienic food.

**Check Your Progress**

Notes: a) Write your answers in the space given below.

b) Compare your answers with those given at the end of the unit.

3. What are the essential nutrients in food? Discuss with examples of locally available vegetables/fruits.

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4. What are the different deficiency diseases? How will you explain the concept to your students?

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5. Distinguish between deficiency and communicable diseases. How will you help your students to make this distinction?

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6. How will you guide your students to conduct a survey of potable water in your are?

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## 6.8 LET US SUM UP

Based on this unit the children should be made to comprehend:

- The structure and organisation of all human beings are similar but at the same time no two humans are alike.
- Each of the body parts has specific structure and functions.
- Our five sense organs, the eye, ear, skin, nose and tongue, each perform a specialised function. The different regions of the tongue recognise different tastes.
- Also the body has different systems, each of which performs different functions. Digestive system, for instance, is responsible for the digestion of food. Respiratory system performs the function of taking in of oxygen and releasing of carbon dioxide. Circulatory system performs of the function of pumping of blood to various parts of the body. Nervous system coordinates the functions of different systems.
- The different types of food that we eat daily have different kinds of nutrients. All these nutrients are essential for the normal functions of the body. Carbohydrates, one type of nutrient, provides energy for the body; proteins, another type, promote growth of the body and fats are once again energy producers. In addition, vitamins and minerals are essential nutrients, the absence of which from our food cause several deficiency diseases.
- Rice, wheat, cereals and potato are some of the carbohydrate rich food. Pulses, meat, fish, milk and eggs are rich in proteins. Fat rich food materials include oils, butter, ghee, etc. Sprouts of grains as well as green vegetables and fruits contain vitamins and minerals. Our daily diet should include food items that contain all these nutrients. Such a diet can be described as a balanced diet. Balanced diet should also contain certain fibre-rich food items.

- Cooked items must be preserved properly; otherwise, after a while they may grow bacteria and fungi on them. Refrigeration, pickling and dehydration are some of the procedures followed in the preservation of cooked food.
- The non-inclusion of essential nutrients in daily meal over a long period of time results in malnutrition. Malnutrition results in a number of diseases. Diseases caused by carbohydrate and protein deficiency are common among young children. Diseases caused by the deficiency of vitamins and minerals are called deficiency diseases. These diseases can be cured by providing vitamin and mineral supplements to the affected individuals.
- As against the deficiency diseases caused by malnutrition, communicable diseases are caused by micro-organisms which are transmitted from person through the medium of air, water, food or through other organisms such as insects. Contracting of communicable diseases can be prevented by consuming only clean water and clean food. Vaccination also prevents contracting of certain communicable diseases.
- Proper storage of drinking water and keeping it clean will solve many of the problems caused by drinking contaminated water. Drinking of boiled or chlorine treated water ensures that water is germ free. Further cleanliness should be ensured to be present at the source from where the water is brought.

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### ANSWERS TO CHECK YOUR PROGRESS

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1. Sense organs perform specific sensory functions. They respond to stimulus e.g., eyes to light, ears to sound etc.
2. There are different internal organs like the lungs, brain, kidney, heart, etc. You can discuss the main function of each of these. Different systems of the body are the digestive system, respiratory system, uriculatōry system, nervous system, etc.
3. Carbohydrates, proteins, vitamins, minerals - you can elaborate on this with examples.
4. Diseases caused by the deficiency of vitamins and minerals are called deficiency diseases.
5. Deficiency diseases are caused by lack of proper nutrition, communicable diseases are caused by micro-organisms carried through air, water, food, etc.
6. This can be done by dividing the children into groups and asking them to identify the sources of water. They should also find out certain other facts. Discuss what these could be.