1 Food: Where Does it Come From?

What did you eat at home today? Find out what your friend ate today. Did you eat the same kind of food yesterday and today? We all eat different kinds of food at different times, isn't it?

1.1 Food Variety

Activity 1

Ask your friends in the school about the items they would be eating during a day. See if you can also get this information from friends staying in different states of India. List all the items in your notebook as given in Table 1.1, for as many friends as possible.

Table 1.1 What do we eat?

Name of the student/friend	Food items eaten in a day

Fig. 1.1 *Different food items*

There seems to be so much variety in the food that we eat (Fig 1.1). What are these food items made of?

Think about rice cooked at home. We take raw rice and boil it in water. Just two materials or **ingredients** are needed to prepare a dish of boiled rice.

On the other hand, some food items are made with many ingredients. To prepare vegetable curry, we need different kinds of vegetables, salt, spices, oil and so on.

Activity 2

Choose some of the items you listed in Table 1.1 and try to find out what ingredients are used to prepare these, by discussing with your friends and elders at home. List them in Table 1.2. Some examples are given here. Add some more items to this list.

Table 1.2 Food items and their ingredients

Food Item	Ingredients
Roti/chapati	*Atta*, water
Dal	Pulses, water, salt, oil/*ghee*, spices

What do we find? Do we find some ingredients common for different food items? Discuss in class.

So, where do these ingredients come from?

1.2 Food Materials and Sources

It may be easy for us to guess the sources of some of the ingredients that we listed in Table 1.2. Fruits and vegetables, for instance (Fig. 1.2a). Where do they come from? Plants, of course! What are the sources of rice or wheat? You may have seen paddy or wheat fields with rows and rows of plants, which give us these grains (Fig. 1.3).

And then, there are food items like milk, eggs and meat, which come from animals (Fig. 1.2b).

(a) *Plant sources*

(b) *Animal sources*

Fig. 1.2 *Sources of food ingredients*

Activity 3

Let us take the food items listed earlier and try to find out where they come from — the ingredients and their sources. Some examples are shown in Table 1.3. Fill in the blanks in Table 1.3 and add more examples to this list.

(a)

(b)

Fig. 1.3 *Source of food grains*
(a) Paddy field (b) Wheat grains transported

Table 1.3 Ingredients used to prepare food items and their sources

Food Item	Ingredients	Sources
Idli	Rice	Plant
	Urad dal	
	Salt	
	Water	
Chicken curry	Chicken	Animal
	Spices	
	Oil/*ghee*	Plants/ Animals
	Water	
Kheer	Milk	Animal
	Rice	Plant
	Sugar	

What do we conclude from Activity 3? Plants are the sources of food ingredients like grains, cereals, vegetables and fruits. Animals provide us with milk, meat products and eggs. Cows, goats and buffaloes are some common animals which give us milk. Milk and milk products like butter, cream, cheese and curd are used all over the world. Can you name some other animals which give us milk?

1.3 Plant Parts and Animal Products as Food

Plants are one source of our food. Which parts of a plant?

We eat many leafy vegetables. We eat fruits of some plants. Sometimes roots, sometimes stems and even flowers (Fig 1.4). Have you ever eaten pumpkin flowers dipped in rice paste and fried? Try it!

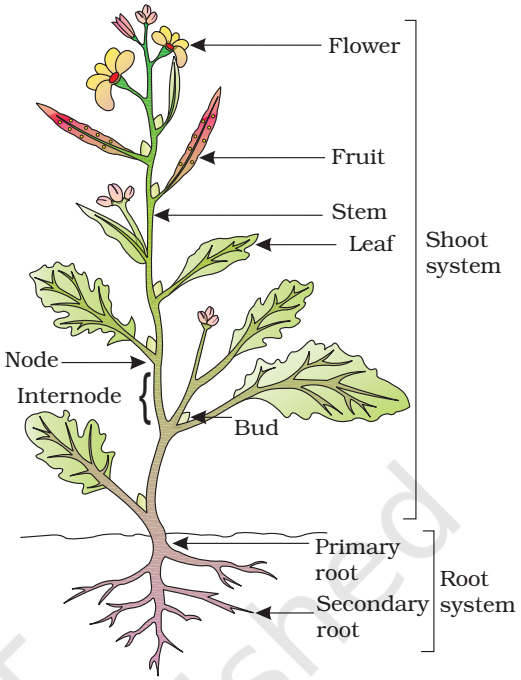


Fig. 1.4 *Different edible parts of plants*

Some plants have two or more **edible** (eatable) parts. Seeds of mustard plants give us oil and the leaves are used as a vegetable. Can you think of the different parts of a banana plant that are used as food? Think of more examples where two or more parts of a single plant are used as food.

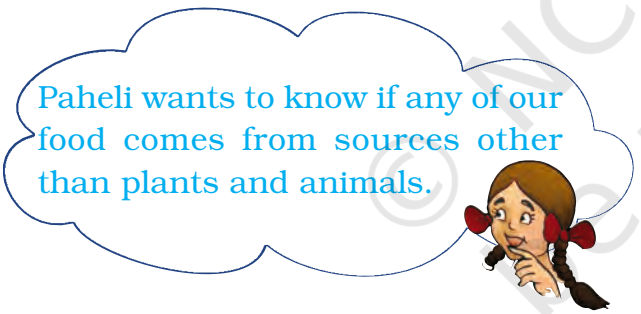


Table 1.4 Plant parts as food

Food item with plant as the major source	Ingredients/source	Plant part which gives us the ingredient
1. Brinjal curry	Brinjal	Fruit
	Chilli as spice (any other)	Fruit
	Oil from groundnut, mustard, soybean, any other plant	Seed
2.		
3.		

Do not try to taste unknown plants around you to see if they are edible! Some plants could be poisonous.

Activity 4

From all the food items you have listed in Table 1.3, choose those items whose ingredients are obtained from plants. Which part of a plant? Identify these and list the food items and plant parts as shown in Table 1.4.

Activity 5

Take some dry seeds of *moong* or *chana*. Put a small quantity of seeds in a container filled with water and leave this aside for a day. Next day, drain the water completely and leave the seeds in the vessel. Wrap them with a piece of wet cloth and set aside. The following day, do you observe any changes in the seeds?

Fig. 1.5 *Whole moong and its sprouts*

A small white structure may have grown out of the seeds. If so, the seeds have **sprouted** (Fig. 1.5 and 1.6). If not, wash the seeds in water, drain the water and leave them aside for another day, covered with a wet cloth. The next day, see if the seeds have sprouted.

Fig. 1.6 *Chana (gram) and its sprouts*

After washing these sprouted seeds, you can eat them. They can also be boiled. Add some spices and get a tasty snack to eat.

Do you know where honey comes from, or how it is produced? Have you seen a beehive where so many bees keep buzzing about? Bees collect **nectar** (sweet juices) from flowers, convert it into honey and store it in their hive (Fig. 1.7). Flowers and their nectar may be available only for a part of the year. So, bees store this nectar for their use all through the year. When we find such a beehive, we collect the food stored by the bees as honey.

Fig. 1.7 *Beehive*

1.5 What do Animals Eat?

Do you have cattle or a pet that you take care of? A dog, cat, buffalo or a goat?

Fig. 1.8 *Squirrel eating nuts*

You will then surely be aware of the food, the animal eats. What about other animals? Have you ever observed what a squirrel (Fig 1.8), pigeon, lizard or a small insect may be eating as their food?

Activity 6

Several animals are listed in Table 1.5. For some of them, the type of food they eat is also given. Fill in the blanks in the table.

Table 1.5 Animals and their Food

Name of the animal	Food the animal eats
Buffalo	Grass, oilcake, hay, grains
Cat	Small animals, birds, milk
Rat	
Lion	
Tiger	
Spider	
House lizard	
Cow	
Human beings	
Butterfly	
Crow	
Others	

Activity 7

Have a look again at Table 1.5 and group the animals entered here as follows. Place animals which eat only plants or plant products in Group 1. These are called **herbivores**. There are some animals which eat other animals. Place these in Group 2. These animals are called **carnivores**. Do you find some animals which eat both plants and animals? Place them in Group 3. These are called **omnivores**. Prepare a table as in Table 1.6 and enter these separately in the three columns, as shown.

Table 1.6

Herbivores	Carnivores	Omnivores
Cow	Lion	Dog

We know that there are many amongst us, who do not get sufficient

food. We need to find ways by which more food can be produced in the country. That will not be enough; we will need to find ways to ensure that this food is made easily available to each one of us.

Key words

Ingredients
Edible
Nectar
Sprouted seeds
Herbivore
Carnivore
Omnivore

Summary

- There is a lot of variation in the food eaten in different regions of India.
- The main sources of our food are plants and animals.
- Animals which eat only plants are called herbivores.
- Animals which eat only animals are called carnivores.
- Animals which eat both plants as well as other animals are called omnivores.

Exercises

1. Do you find that all living beings need the same kind of food?
2. Name five plants and their parts that we eat.
3. Match the items given in Column A with that in Column B

Column A	Column B
Milk, curd, *paneer*, *ghee*,	eat other animals
Spinach, cauliflower, carrot	eat plants and plant products
Lions and tigers	are vegetables
Herbivores	are all animal products

4. Fill up the blanks with the words given:

herbivore, plant, milk, sugarcane, carnivore

(a) Tiger is a _____ because it eats only meat.

(b) Deer eats only plant products and so, is called _____.

(c) Parrot eats only _____ products.

(d) The _____ that we drink, which comes from cows, buffaloes and goats is an animal product.

(e) We get sugar from _____.

SUGGESTED PROJECTS AND ACTIVITIES

1. You must have seen a garden lizard around your home. Next time whenever you see it, observe carefully and find out what it takes for food. Is the food different from that of a house lizard?
2. Make a list (with pictures, when possible) of food items generally taken by people of different regions of India. Place these on a large outline map of India to display in your classroom.
3. Find out the names of plants that grow in water and which are eaten as food.
4. In Chapter 10, you will find out ways of measuring length of curved lines. In your mathematics classes you will learn to prepare bar graphs. After you learn these, try the following interesting project. Prepare some sprouts of *moong* as discussed in the chapter. Wash them in water everyday and drain all the water. Let them grow for a week until the whole of the seeds grow into young plants. Measure the lengths of the sprouts everyday using a string. Take care that they do not break. Prepare a bar graph of the number of sprouts having lengths in different ranges.

THINGS TO THINK ABOUT

1. Does everyone around you get enough food to eat? If not, why?
2. What are the ways we can think of to avoid wastage of food?

2 Components of Food

In Chapter 1, we made lists of the food items that we eat. We also identified food items eaten in different parts of India and marked these on its map.

A meal could consist of *chapati*, *dal* and brinjal curry. Another may be rice, *sambar* and a vegetable preparation of lady's finger (*bhindi*). Yet another meal could be *appam*, fish curry and vegetables.

Activity 1

Our meals usually have at least one item made of some kind of grain. Other items could be a *dal* or a dish of meat and vegetables. It may also include items like curd, butter milk and pickles. Some examples of meals from different regions are given in Table 2.1. Select food items you depicted on the map in Chapter 1. Add some more meals to this list and enter these in Table 2.1.

Sometimes, we may not really have all this variety in our meals. If we are travelling, we may eat whatever is available on the way. It may not be possible for some of us, to eat such a variety of items, most of the time.

There must be some reason though, why meals usually consist of such a distribution. Do you think that our body needs different kinds of food for some special purpose?

2.1 What Do Different Food Items Contain?

We know that each dish is usually made up of one or more ingredients, which we get from plants or animals. These

Table 2.1 Some common meals of different regions/states

Region/ State	Item of grain	Item of *dal*/meat	Vegetables	Others
Punjab	*Makki* (corn) *roti*	*Rajma* (Kidney beans)	*Sarson saag* (Mustard leaf curry)	Curd, *ghee*
Andhra Pradesh	Rice	*Tuar dal* and *rasam* (*charu*)	*Kunduru* (*dondakai*)	Buttermilk, *ghee*, pickle (*aavakai*)

ingredients contain some components that are needed by our body. These components are called **nutrients**. The major nutrients in our food are named carbohydrates, proteins, fats, vitamins and minerals. In addition, food contains dietary fibres and water which are also needed by our body.

Do all foods contain all these nutrients? With some simple methods we can test whether cooked food or a raw ingredient contains one or more of these nutrients. The tests for presence of carbohydrates, proteins and fats are simpler to do as compared to the tests for other nutrients. Let us do these tests and record all our observations in Table 2.2.

For carrying out these tests, you will need solutions of iodine, copper sulphate and caustic soda. You will also need a few test tubes and a dropper.

Try these tests on cooked food items as well as raw materials. Table 2.2 shows you a way to record the observations from these tests. Some food items are given in this table. You can conduct the tests either with these or any other available food items. Do these tests carefully and do not try to eat or taste any chemicals.

If the required solutions are not available in readymade form, your teacher can prepare them as given in the box.

Let us begin by testing different food items to see if they contain **carbohydrates**. There are many types of carbohydrates. The main carbohydrates found in our food are in the form of starch and sugars. We can easily test if a food item contains starch.

A dilute solution of iodine can be prepared by adding a few drops of tincture iodine to a test tube half filled with water.
Copper sulphate solution can be prepared by dissolving 2 gram (g) of copper sulphate in 100 millilitre (mL) of water.
10 g of caustic soda dissolved in 100 mL of water makes the required solution of caustic soda.

Activity 2

Test for Starch

Take a small quantity of a food item or a raw ingredient. Put 2-3 drops of dilute iodine solution on it (Fig. 2.1). Observe if there is any change in the colour of the food item. Did it turn blue-black?

Fig. 2.1 *Testing for starch*

A blue-black colour indicates that it contains starch.

Repeat this test with other food items to find out which of these contain starch. Enter all your observations in Table 2.2.

Test for Protein

Take a small quantity of a food item for testing. If the food you want to test is a solid, you first need to make a paste of it or powder it. Grind or mash a small quantity of the food item. Put some of this in a clean test tube, add 10 drops of water to it and shake the test tube.

Now, using a dropper, add two drops of solution of copper sulphate and ten drops of solution of caustic soda to the test tube (Fig. 2.2). Shake well and let the test tube stand for a few minutes. What do you see? Did the contents of the test tube turn violet? A violet colour indicates presence of **proteins** in the food item.

Now, you can repeat this test on other food items.

Fig. 2.2 *Testing for protein*

Table 2.2 Nutrients present in some food items

Food item	Starch (present)	Protein (present)	Fat (present)
Raw potato	Yes		
Milk		Yes	
Groundnut			Yes
Uncooked powdered rice			
Cooked rice			
Dry coconut			
Uncooked *tuar dal* (powdered)			
Cooked *dal*			
A slice of any vegetable			
A slice of any fruit			
Boiled egg (white portion)			

Test for Fats

Take a small quantity of a food item. Wrap it in a piece of paper and crush it. Take care that the paper does not tear. Now, straighten the paper and observe it carefully. Does it have an oily patch? Hold the paper against light. Are you able to see the light faintly, through this patch?

An oily patch on paper shows that the food item contains **fat**. The food items may sometimes contain a little water. Therefore, after you have rubbed an item on paper, let the paper dry for a while. If there were any water that may have come from food, it would dry up after some time. If no oily patch shows up after this, the food item does not contain any fat.

What do these tests show? Are fats, proteins and starch present in all the food items that you tested? Does a food item contain more than one nutrient? Do you find any food item that does not contain any of these nutrients?

We tested food items for three nutrients — carbohydrates, proteins and fats. There are also other nutrients like **vitamins** and **minerals** that are present in different food items. Why do we need all these nutrients?

2.2 What do Various Nutrients do for our Body?

Carbohydrates mainly provide energy to our body. Fats also give us energy. In fact, fats give much more energy as compared to the same amount of carbohydrates. Foods containing fats and carbohydrates are also called 'energy giving foods' (Fig. 2.3 and Fig. 2.4).

Proteins are needed for the growth and repair of our body. Foods

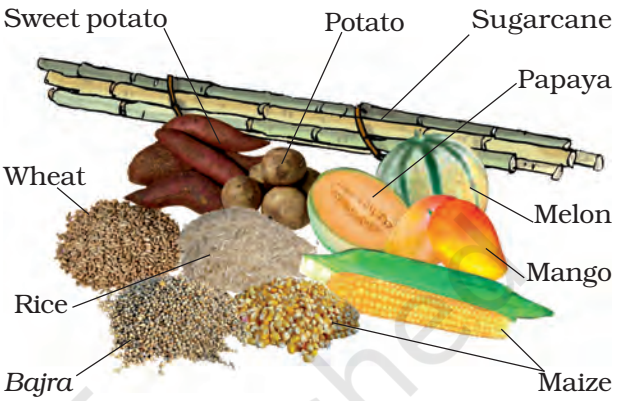
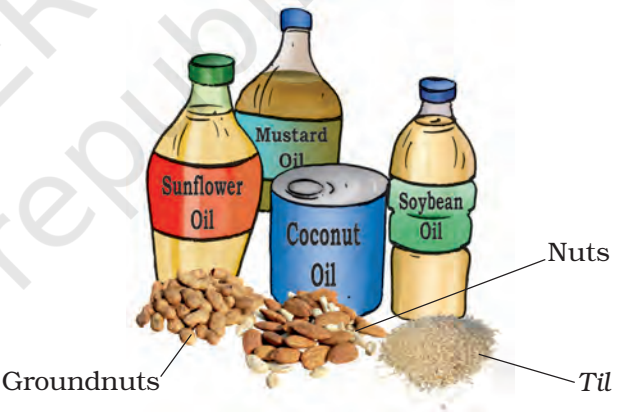
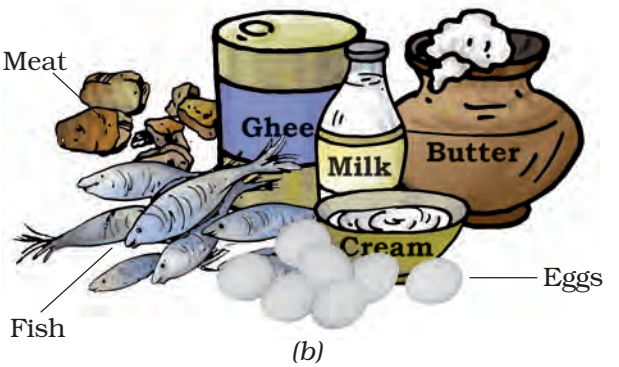


Fig. 2.3 *Some sources of carbohydrates*



(a)



(b)

Fig. 2.4 *Some sources of fats: (a) plant sources and (b) animal sources*

(a)

(b)

Fig. 2.5 *Some sources of proteins: (a) plant sources and (b) animal sources*

proteins are often called 'body building foods' (Fig 2.5).

Vitamins help in protecting our body against diseases. Vitamins also help in keeping our eyes, bones, teeth and gums healthy.

Vitamins are of different kinds known by different names. Some of these are Vitamin A, Vitamin C, Vitamin D, Vitamin E and K. There is also a group of vitamins called Vitamin B-complex. Our body needs all types of vitamins in small quantities. Vitamin A keeps our skin and eyes healthy. Vitamin C helps body to fight against many diseases. Vitamin D helps our body to use calcium for bones and teeth. Foods that are rich in different vitamins are shown in Fig. 2.6 to Fig. 2.9.

Minerals are needed by our body in small amounts. Each one is essential

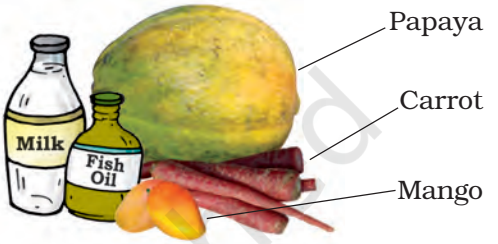


Fig. 2.6 *Some sources of Vitamin A*

Fig. 2.7 *Some sources of Vitamin B*

Fig. 2.8 *Some sources of Vitamin C*

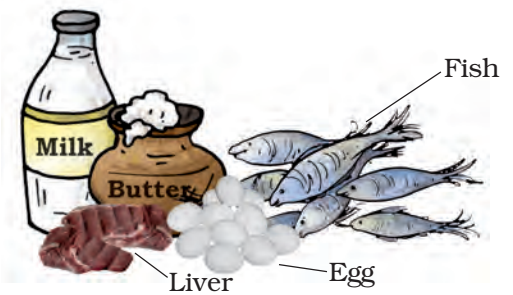


Fig. 2.9 *Some sources of Vitamin D*

Our body also prepares Vitamin D in the presence of sunlight. Nowadays, insufficient exposure to sunlight is causing Vitamin D deficiency in many people.

for proper growth of body and to maintain good health. Some sources of different minerals are shown in Fig. 2.10.

Most food items, usually, have more than one nutrient. You may have noticed this, while recording your observations in Table 2.2. However, in a given raw material, one particular nutrient may be present in much larger quantity than in others. For example, rice has more carbohydrates than other nutrients. Thus, we say that rice is a "carbohydrate rich" source of food.

Besides these nutrients, our body needs **dietary fibres** and water. Dietary fibres are also known as roughage. Roughage is mainly provided by plant products in our foods. Whole grains and pulses, potatoes, fresh fruits and vegetables are main sources of roughage. Roughage does not provide any nutrient to our body, but is an essential component of our food and adds to its bulk. This helps our body get rid of undigested food.

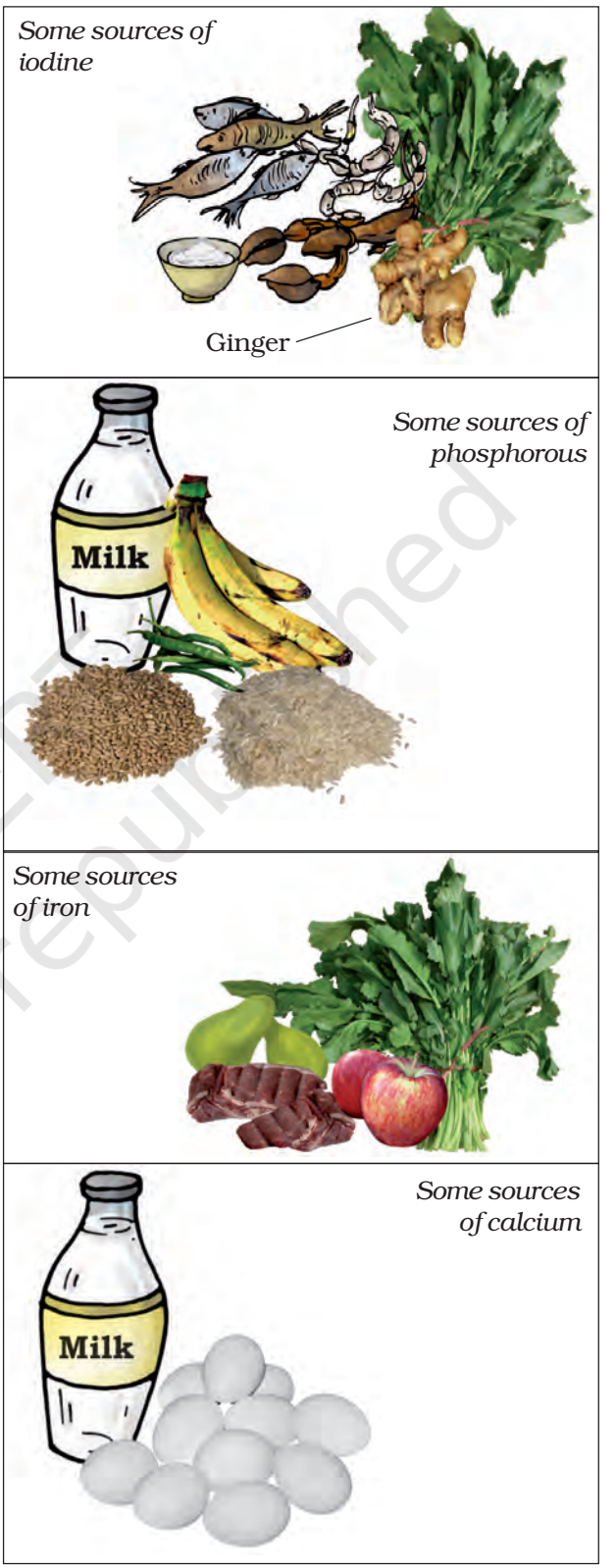


Fig. 2.10 *Sources of some minerals*

Water helps our body to absorb nutrients from food. It also helps in throwing out some wastes from body as urine and sweat. Normally, we get most of the water that our body needs from the liquids we drink — such as water, milk and tea. In addition, we add water to most cooked foods. Let's see if there is any other source which provides water to our body.

Activity 3

Take a tomato or a fruit like lemon. Cut it into small pieces. Do your hands get wet while doing so?

Carefully observe whenever vegetables and fruits are being cut, peeled, grated or mashed at your home. Do you find any fresh vegetables or fruits that do not contain some amount of water?

We see that many food materials themselves contain water. To some extent, our body needs are met by this water. Apart from this, we also add water while cooking many food items.

2.3 Balanced Diet

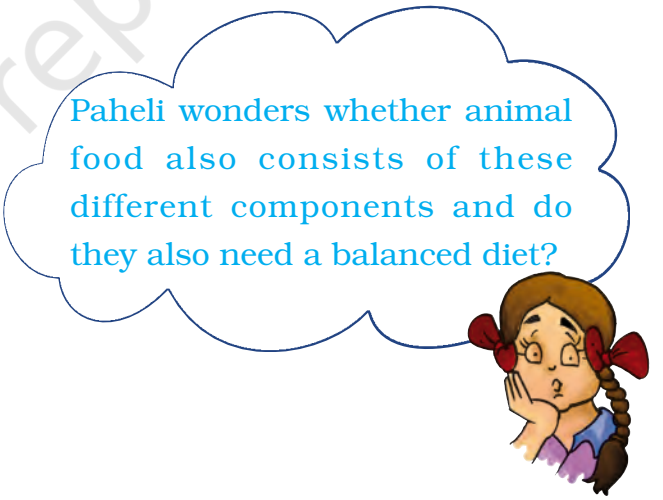
The food we normally eat in a day is our diet. For growth and maintenance of good health, our diet should have all the nutrients that our body needs, in right quantities. Not too much of one and not too little of the other. The diet should also contain a good amount of roughage and water. Such a diet is called a **balanced diet**.

Do you think that people of all ages need the same type of diet? Do you also think that, what we need for a balanced diet would depend on the amount of physical work that we do?

Prepare a chart of whatever you eat over a period of a week. Check whether all the nutrients mentioned are present in one or the other food items being eaten within a day or so.

Pulses, groundnut, soyabean, sprouted seeds (*moong* and Bengal gram), fermented foods (South Indian foods such as *idlis)*, a combination of flours (*missi roti*, *thepla* made from cereals and pulses), banana, spinach, *sattu*, jaggery, available vegetables and other such foods provide many nutrients. Therefore, one can eat a balanced diet without expensive food materials.

Eating the right kind of food is not enough. It should also be cooked properly so that its nutrients are not lost. Are you aware that some nutrients get lost in the process of cooking and preparations?



If the vegetables and fruits are washed after cutting or peeling them, it

may result in the loss of some vitamins. The skins of many vegetables and fruits contain vitamins and minerals. Similarly, repeated washing of rice and pulses may remove some vitamins and minerals present in them.

We all know that cooking improves the taste of food and makes it easier to digest. At the same time, cooking also results in the loss of certain nutrients. Many useful proteins and considerable amounts of minerals are lost if excess water is used during cooking and is then thrown away.

Vitamin C gets easily destroyed by heat during cooking. Would it not be sensible to include some fruits and raw vegetables in our diet?

Boojho thought that fats would be the best foods to eat, all the time. A *katori* (bowl) of fat will give much more energy than a *katori* of carbohydrate rich food, isn't it? So, he ate nothing but food rich in fats — fried food like *samosa* and *poori* (snacks), *malai, rabdi* and *peda* (sweets).

Do you think he was right? No, of course not! It can be very harmful for us to eat too much of fat rich foods and we may end up suffering from a condition called **obesity**.

2.4 Deficiency Diseases

A person may be getting enough food to eat, but sometimes the food may not contain a particular nutrient. If this continues over a long period of time, the person may suffer from its **deficiency**. Deficiency of one or more nutrients can cause diseases or disorders in our body. Diseases that occur due to lack of nutrients over a long period are called **deficiency diseases**.

If a person does not get enough proteins in his/her food for a long time, he/she is likely to have stunted growth, swelling of face, discolouration of hair, skin diseases and diarrhoea.

If the diet is deficient in both carbohydrates and proteins for a long period of time, the growth may stop completely. Such a person becomes very lean and thin and so weak that he/she may not even be able to move.

Deficiency of different vitamins and minerals may also result in certain diseases or disorders. Some of these are mentioned in Table 2.3.

All deficiency diseases can be prevented by taking a balanced diet.

In this chapter, we asked ourselves the reason why widely varying food from different regions had a common