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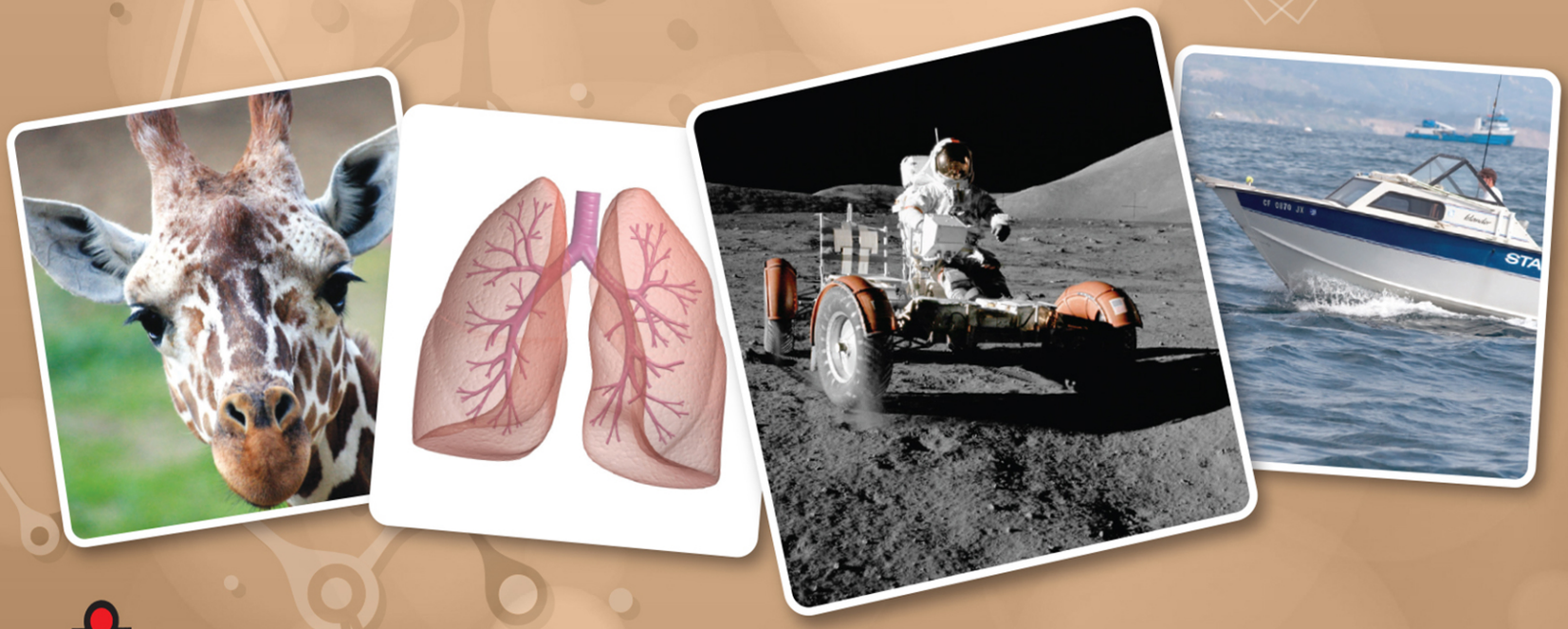

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An Open Letter

Dear Friend,

We would like to talk to you for a few minutes, just to give you an idea of some of the special features of this book. Before we go further, let us tell you that this book conforms to the NCERT guidelines prescribed by the Central Board of Secondary Education (CBSE). Just like our earlier books, we have written this book in such a simple style that even the weak students will be able to understand science very easily. Believe us, while writing this book, we have considered ourselves to be the students of the concerned class and tried to make things as simple as possible.

The most important feature of this book is that we have included a large variety of different types of questions for assessing the learning abilities of the students. This book contains:

(*i*) Objective type questions,

(*ii*) Subjective type questions,

(*iii*) Multiple Choice Questions (MCQs),

(*iv*) Questions based on High Order Thinking Skills (HOTS), and

(*v*) Activities.

Please note that answers have also been given for the various types of questions, wherever required. All these features will make this book even more useful to the students as well as the teachers. “A picture can say a thousand words”. Keeping this in mind, a large number of coloured pictures and sketches of various scientific processes, procedures, appliances, manufacturing plants and everyday situations involving principles of science have been given in this book. This will help the students to understand the various concepts of science clearly. It will also tell them how science is applied in the real situations in homes, transport and industry.

We are sure you will agree with us that the facts and formulae of science are just the same in all the books, the difference lies in the method of presenting these facts to the students. In this book, the various topics

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of science have been explained in such a simple way that while reading this book, a student will feel as if a teacher is sitting by his side and explaining the various things to him. We are sure that after reading this book, the students will develop a special interest in science and they would like to study science in higher classes as well.

We think that the real judges of a book are the teachers concerned and the students for whom it is meant. So, we request our teacher friends as well as the students to point out our mistakes, if any, and send their comments and suggestions for the further improvement of this book.

Wishing you a great success,

Yours sincerely,

Lakhmir Singh
Manjit Kaur

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CHAPTER

1

FOOD : WHERE DOES IT COME FROM ?

We all eat *chapatti* (*roti*) and rice ; bread and butter ; fruits, vegetables and pulses ; vegetable oil (cooking oil), butter and *desi ghee*. Some of us also eat eggs, meat, chicken and fish. And all of us drink milk. These are some of the examples of food. In fact, ***anything which we eat to live is called food.*** Food is necessary for us because it provides 'matter' for the growth of our body and 'energy' to do work. We can now define food as follows : **Food is a substance eaten by us to do work, grow, maintain our body and remain healthy**. Food is like a fuel for our body. Just as petrol is fuel for a car, in the same way, food is fuel for our body. We must eat food to stay alive. It is not only human beings who eat food, in fact, all the animals eat food to live. No living thing can survive without food. So, food is very precious. **We should not waste food in any way**.

Variety in the Food

We eat many different kinds of food at different times and on different days. This is called variety in food. Different people eat different types of food according to their habits, life style, taste and availability. For example, some people eat mainly food prepared from wheat (like *chapatti*, bread or noodles), pulses (*dal*), vegetables and fruits. On the other hand, some people eat mainly rice preparations (in the form of boiled rice, *biryani*, *dosa* or *idli*). And some people also eat dishes made from eggs, meat, chicken and fish. Please note that a particular variety or preparation of food served as part of a meal is called **dish**. And any of the foods or substances which are combined to make a particular dish are called **ingredients**.

Food Items and Their Ingredients

The various food items (or dishes) which we eat daily are usually made up of more than one materials or ingredients. This will become more clear from the following examples. In order to prepare boiled rice, we take raw rice and boil it in water. So, just two materials or two ingredients, raw rice and water, are needed to prepare a dish of boiled rice. Even *chapatti* (or *roti*) is made of only two ingredients : flour (*atta*), and water (Flour is the powder obtained by grinding grain, usually wheat grain).

Some food items are, however, made by using many ingredients. For example, vegetable curry is made by using many ingredients like different types of vegetables, salt, spices, oil, and water. Similarly, a dish of *dal* can be made by using many ingredients such as pulses (*urad*, *moong*, *masoor*, etc.), salt, spices, oil, and water, etc. (Please note that *urad dal* is black gram; *moong dal* is green gram whereas *masoor dal* is lentil). Some of the common 'food preparations', 'food items' or 'dishes' and their major ingredients are given below.

Some Common Food Items and Their Major Ingredients

Food item (*Dish*)	*Major ingredients*
1. Boiled rice	Rice, Water
2. *Chapatti* (*Roti*)	Flour (*Atta*), Water
3. Vegetable curry	Vegetable, Salt, Spices, Oil, Water
4. *Dal*	Pulses, Salt, Spices, Oil, Water
5. *Idli*	Rice, *Urad dal*, Salt, Water
6. *Kheer*	Rice, Milk, Sugar
7. Omelette	Eggs, Salt, Spices, Oil
8. Chicken curry	Chicken meat, Salt, Spices, Oil, Water
9. Mutton curry	Mutton (Goat meat or Sheep meat), Salt, Spices, Oil, Water
10. Fish curry	Fish meat, Salt, Spices, Oil, Water

In the above discussion we have used oil for preparing many food items or dishes. The 'oil' here means 'cooking oil'. The cooking oil includes groundnut oil, mustard oil, sunflower oil and coconut oil, etc. Please note that in place of oil, we can also use *ghee* to prepare food or cook food. *Ghee* (also called *desi ghee*) is made from milk.

The food ingredients like rice, flour (*atta*), vegetables, pulses, spices, and oil, all come from various types of plants. Sugar also comes from plants. We get sugar from sugarcane (which is a plant). On the other hand, **the food ingredients such as milk, *ghee*, eggs, chicken, mutton and fish, come from animals**. Please note that oil is a plant product (it is extracted from oil-seeds) but *ghee* is an animal product (which is made from milk).

SOURCES OF FOOD : PLANTS AND ANIMALS

Most of the food which we eat comes from plants and animals. So, the main sources of our food are :

1. Plants, and
2. Animals

The foodgrains (like wheat, rice and maize, etc.), pulses, fruits and vegetables which we eat, all come from various types of plants. The plants also give us oils (like groundnut oil, mustard oil, coconut oil and sunflower oil, etc.), which are used in cooking food. Sugar, spices, tea and coffee are also plant products. In fact, **plants are the major source of food for human beings and other animals**. Please note that the grains used for food are called foodgrains or cereals. We can now say that : **Plants are the source of food materials like cereals (wheat, maize, rice, sorghum, millet, etc.), pulses, oils, fruits, vegetables, sugar, spices, tea and coffee, etc.** About half of the human food comes from just two crops : wheat and rice. Wheat grains are ground to make flour for *chapatti* (*roti*), bread and noodles, etc. Rice is used as such in the form of boiled rice and *biryani* or in the form of *dosa* and *idli*, etc.

Animals provide us food materials such as milk, eggs, chicken, meat, fish and honey. The animals like cow and buffalo give us milk. Goat and camel are two other animals which also give us milk. The

Figure 1. This is wheat crop. It gives us wheat grains to make flour.

Figure 2. This is a cow. It gives us milk.

adult female chickens are called hens. The hens provide us eggs and chicken. Goat and sheep give us meat (or mutton). Please note that when we talk of 'chicken' as food material, it actually means 'chicken meat'. And by saying 'meat' we usually mean 'mutton' (which is goat meat or sheep meat). Fish and prawn are also animals which are used as food by many people. Honey is another food material provided by animals. Honey comes from the insects called bees (or honeybees).

PLANT PARTS AS FOOD

The various parts of plants which are used as food materials by us are : Roots, Stems, Leaves, Flowers, Fruits and Seeds. This means that almost all the parts of plants are used as food in one way or the other. This is discussed below.

1. Plant Roots as Food

Some plants store food in their roots (which are actually modified roots). We eat the roots of such plants as food. For example, **carrot, radish, beet, sweet potato, and turnip** which we use as food

Figure 3. Some of the roots of plants which we eat as food.

materials are the roots of their respective plants. Some of the roots of plants which we eat as food are shown in Figure 3.

2. Plant Stems as Food

Some plants store food in their stems (which are actually modified, underground stems). We eat the stems of such plants as food. For example, **onion, potato, ginger, garlic and turmeric** which we use as food materials are the stems of their respective plants. Some of the stems of plants which we use as food are shown in Figure 4 on the next page.

Onion Potato Ginger Garlic Turmeric

Figure 4. Some of the stems of plants which we eat as food (All these are underground, modified stems of plants).

3. Plant Leaves as Food

We eat many leafy vegetables. The leafy vegetables are the leaves of the plants. For example, **spinach** (*palak* or *saag*) are the leaves of the plant which we eat as a vegetable (see Figure 5). Similarly, the **leaves of mustard plant** are also eaten as a vegetable. It is called '*sarson ka saag*'. **Cabbage** and **lettuce** are also leafy vegetables (whose leaves are eaten as food).

Figure 5. This is spinach (*palak*). We eat these leaves as a vegetable.

Figure 6. The flowers of banana plant are eaten as vegetable.

4. Flowers as Food

The flowers of some of the plants are eaten as food. For example, the **flowers of banana plant** are eaten as a vegetable in many parts of our country (see Figure 6). The **flowers of pumpkin plant** (*kaddu* plant) are also eaten as food. The pumpkin flowers are dipped in rice paste, fried and then eaten as food. Some other flowers which are eaten as food are : **Sunflower, Gladiolus, Dandelion and Jasmine**.

5. Fruits as Food

There are some plants which store food in their fruits. So, we eat the fruits of such plants as food. For example, **apple, orange, peach, mango, pears, banana, plums, grapes, guava and pomegranate,** etc., which we eat as food are all fruits of their plants (see Figure 7). The vegetables such as **tomatoes, brinjal, lady's finger, pumpkin and chilli** (***mirch***), etc., which we eat as food are also actually the fruits of the respective plants.

Apple Orange Plum Mango Grapes

Figure 7. Some of the fruits of plants which we eat as food.

6. Seeds as Food

Some of the plants store food in their seeds. So, we eat the seeds of these plants as food (after suitable treatment). For example, the foodgrains such as **wheat, maize, rice, sorghum, millet, Bengal gram (*chana*), peas and pulses**, are all seeds of their plants (see Figure 8). The **groundnut, mustard and soyabean** are also seeds. We use the seeds of wheat plants (called wheat grains) to make flour for making *chapatti*, bread and

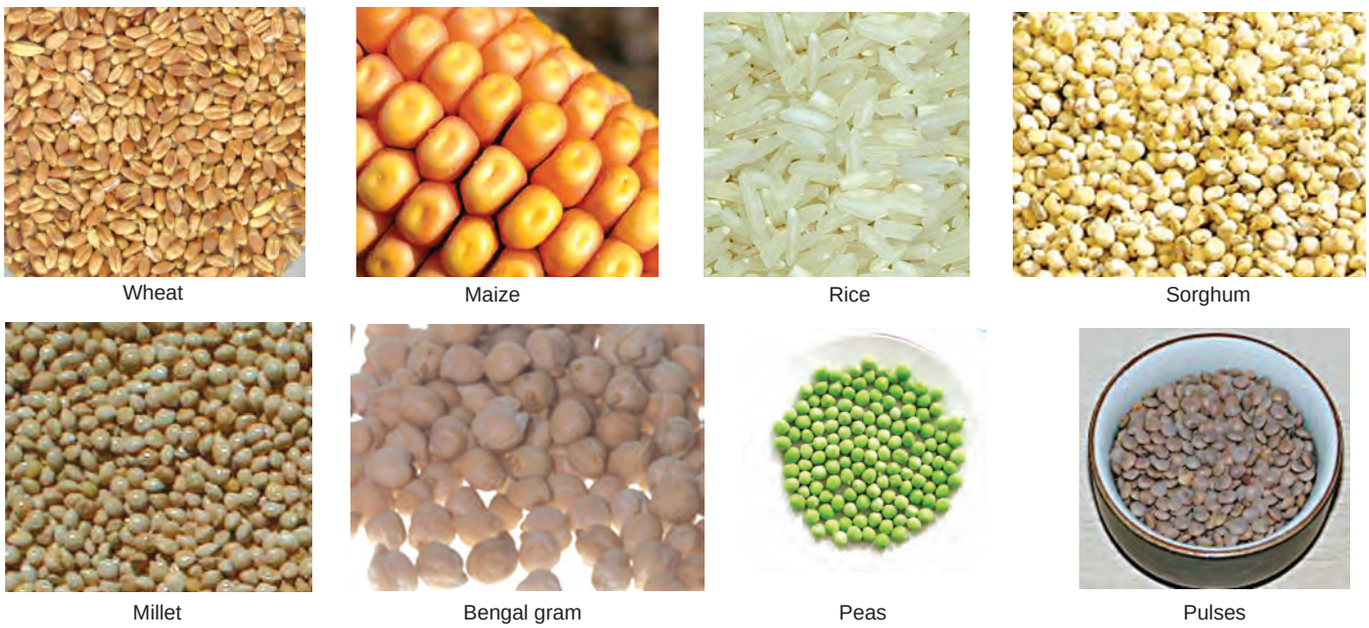

Figure 8. Some of the seeds of plants which we eat as food.

noodles, etc. The groundnut and mustard seeds are called oilseeds because they are used to extract edible 'oils' which are used for cooking food.

Some plants have two (or more) edible parts which can be eaten as food. For example, the **leaves of mustard plant** are used as a leafy vegetable (*sarson ka saag*), and the **seeds of mustard plant** are used to extract mustard oil which is used as a cooking oil in the preparation of food. Similarly, the **fruits of banana plant** are used as food, and the **flowers of the banana plant** are also used as food in the form of vegetable. Please note that **all the plants around us are 'not edible'**. Some of the plants are even **poisonous** and hence not fit for eating.

Sprouts

When the seeds begin to grow (or germinate) by developing tiny roots, they are called sprouts. The 'food value' of some type of seeds can be increased by converting them into 'sprouts'. **The sprouts contain more of vitamins A, B and C which makes them a more nutritious food**. The method of making sprouts from seeds is called 'sprouting'. Sprouting means the process whereby seeds begin to grow (or germinate).

'Sprouting' is called '*ankuran*' in Hindi. The seeds of *moong*, *moth* and *chana* are usually converted into sprouts in our homes to make snacks. Sprouts can be prepared from the seeds as follows.

ACTIVITY : TO PREPARE SPROUTS

Take about 50 gram seeds of *chana* (Bengal gram) or *moong* (green gram), put them in a vessel containing water and keep them overnight. Next day, remove the seeds from water. Now, wrap the seeds in a piece of wet cloth and keep them aside for one day. Water should be sprinkled on the piece of cloth from time to time to keep it wet. When we open the wrap we will find that tiny white structures have grown out of the seeds (see Figure 9). We say that the seeds have sprouted or that the sprouts have been formed. The sprouts can be boiled and eaten as a snack after adding salt and spice.

(*a*) Bengal gram (*Chana*) (*b*) Sprouts

Figure 9. Making of sprouts.

ANIMAL PRODUCTS AS FOOD

An important animal product which is used as food is milk. Milk can be used as such for drinking purposes. Milk is also converted into other useful products (called milk products) such as curd, butter, *ghee* and cheese (*paneer*). **The other animal products which are used as food are eggs, chicken, mutton and fish**. The eggs can be eaten in the form of boiled eggs, omelette or egg curry. Chicken, mutton and fish are used to prepare a large number of dishes. Fish also gives us 'cod liver oil' which is rich in vitamin A (Cod is a kind of fish).

A yet another animal product which is used as food is honey. Honey is called '*madhu*' or '*shahad*' in Hindi. Honey is a food material which is produced by insects called 'bees' (or honeybees). Bees collect nectar (a sugary liquid) from the flowers of plants and convert it into honey. The bees store this honey in the structures called 'hives'. The hives containing honey are called 'honeycombs'. We can see honeycombs attached to tall buildings or hanging from trees. Honey is collected from such honeycombs.

Figure 10. This picture shows a honeycomb. Honey is extracted from such honeycombs.

We have just studied that **the food which we eat comes from two sources : plants and animals**. Actually, if we trace animal food back to see where it comes from, we will always find that **even the animal food comes from the plants**. This is because all the animals which give us various food products themselves eat plants (or plant products). For example, the milk comes from cows (or buffaloes) which eat grass or grains as food. Similarly, eggs come from hens which eat grains as food. And meat comes from goat which eats grass or grains as food.

What Do Animals Eat ?

The human beings eat plant food (like cereal grains, pulses, vegetables and fruits) as well as animal food (like milk, eggs, chicken, mutton and fish, etc.). Thus, human beings eat a large variety of food. But other animals do not eat a large variety of food like humans. **The animals eat only a few types of food**. Some animals eat plant materials (grass, leaves or grains) as food, some eat the flesh of other animals, whereas some animals eat both, plant food as well as the flesh of other animals. **Some of the common animals and the food which they eat are given on the next page.**

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