

BOOK

5

# SCIENCE BASICS



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## How plants make food

We have seen a lot of plants. We know that a plant has two main parts: one part grows above the ground and is called shoot, and the other part grows below the ground and is called root.

The roots fix a plant firmly in the soil. They provide water and minerals to the plant. In some plants they also store food.



The shoot has the stem, branches, leaves, buds, flowers and fruits.

The stem supports the plant above the ground.

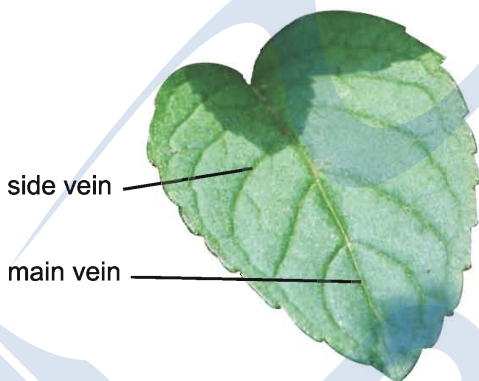
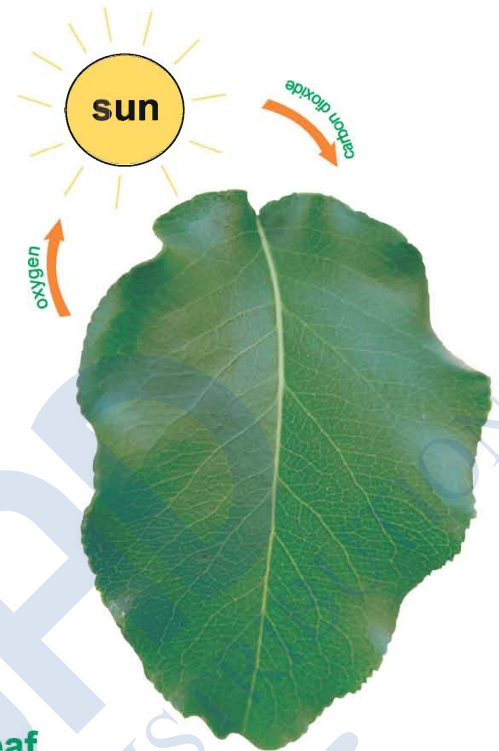
The water and minerals absorbed by the roots travel to the leaves through the stem. The food prepared by the leaves reaches all parts of the plant through the stem. Sometimes, the stem also stores food .

## How plants make food

**The leaf**

Plants are different from other living beings because they make their own food. In fact, they make food for all other living beings.

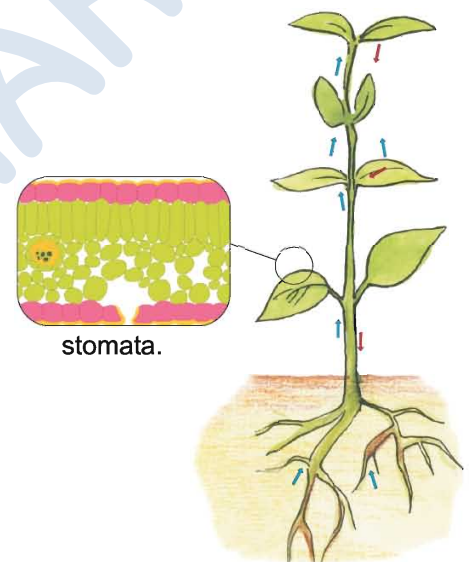
Plants make their food in leaves. The leaves are mostly green in colour because of a green substance called chlorophyll. This substance is necessary for the leaf to make its food. That is why plants with green leaves can make their own food.

**The structure of a leaf**

The flat part of a leaf is called the leaf blade. The main vein and the side veins can be seen on the leaf blade. It is through these veins that water is carried to the leaf. They also carry food from the leaf to other parts of the plant.

**Photosynthesis - process of making food**

The plant puts together carbon dioxide from the air, and water from the soil to make its food. The energy it needs for this is obtained from sunlight. It is the chlorophyll which traps the sunlight for this purpose. This process is called photosynthesis. Photo means light and synthesis means putting together.

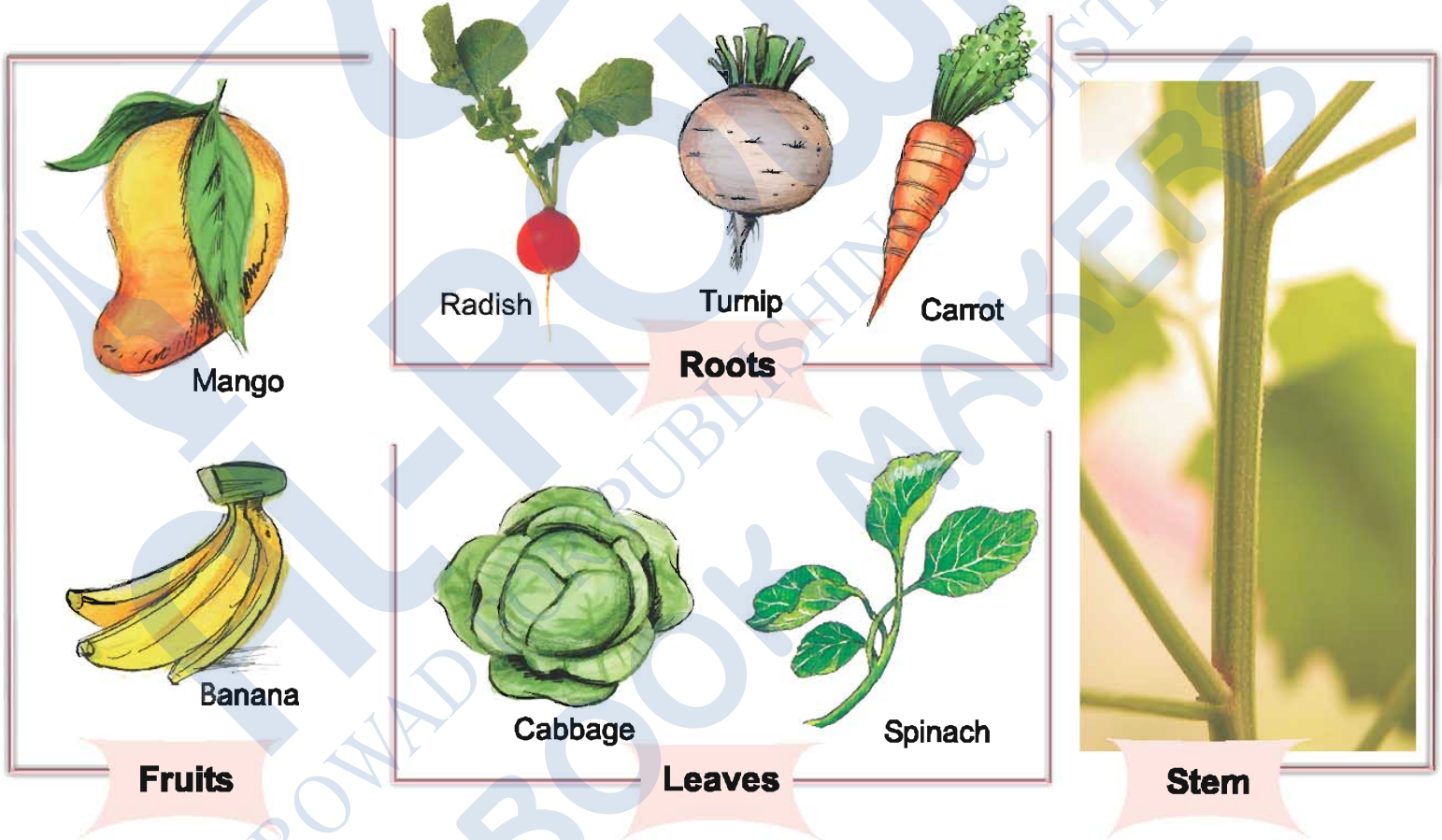
**INVESTIGATE**

If you cover both sides of a leaf with wax, can it still make food? Why or why not?

On the underside of the leaf are small openings, called stomata. They are like the windows in our house. Windows are made to bring fresh air in the house. In the same way, carbon dioxide from the air enters the leaf through the stomata to make food.

During the process of photosynthesis, the leaf prepares food. The oxygen gas is also produced. It is given off into the air through stomata.

Many plants store food in their fruits. Some plants store food in their roots. Some in their leaves. Sugarcane is a stem in which the food is stored. Plants can store food in fruits, stem, roots or leaves.



During photosynthesis, the plant takes in carbon dioxide from the air, and adds oxygen to it.

The plant, thus, purifies the air by adding oxygen that all of us need to stay alive.

## How plants make food

## How plants use food

Plants need food like animals. But they prepare more food than is needed by them. This food is used for many purposes.

1. Food is used to make new parts and to repair damage. For example, if an animal eats a portion of a plant, the plant can make this portion to repair the damage.
2. Plants need energy to grow, and to produce flowers, fruits, seeds and more leaves. This energy is provided by the food they prepare. Food is burnt slowly inside the plant to provide energy.
3. The extra food prepared by the plant is stored in different parts such as fruits, stem, root, seed or leaf. Humans and animals eat this food.



### Remember

1. Roots fix the plant to the soil, and provide water and minerals to the plant.
2. The stem supports the plant, and carries water and minerals to the leaves. It also carries food to all parts of the plant.
3. Green leaves contain chlorophyll. They make food for the plant by photosynthesis.
4. Photosynthesis is a process in which carbon dioxide and water combine in the presence of light to prepare food.
5. Plants use some of the food for getting energy, and for repair and growth.
6. The extra food is stored in fruits, stem, leaves, roots or seeds.

1. Put a  for true and a  for false.

Can you give any reason why you said it true or false?

a) All humans and animals depend on the food made by plants.

Reason \_\_\_\_\_

b) Chlorophyll provides energy for making food by trapping sunlight.

Reason \_\_\_\_\_

c) Plants take in carbon dioxide through their stomata.

Reason \_\_\_\_\_

d) Plants make food at all times during day and night.

Reason \_\_\_\_\_

e) Plants give off oxygen during photosynthesis.

Reason \_\_\_\_\_

f) Plants store food only in the fruits.

Reason \_\_\_\_\_

2. Name these:

a) It carries food to all parts of the plant. \_\_\_\_\_

b) Green substance of leaf. \_\_\_\_\_

c) Very small openings in the leaves. \_\_\_\_\_

d) Plant prepares its food by this process. \_\_\_\_\_

e) Flat part of a leaf. \_\_\_\_\_

f) Through it water is carried to the leaf. \_\_\_\_\_

How plants make food

3. How do plants prepare food?

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4. Why is the process of preparing food by plants called photosynthesis?

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5. What does a plant use food for?

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6. How and where do plants store food?

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7. Discuss this in class and then answer.

How is preparing food in the kitchen different from the preparation of food by plants?

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### AWARENESS BEYOND THE CLASSROOM

#### Largest leaves

Leaves are of different shapes and sizes. The huge floating leaves of the giant water-lily are the world's largest simple leaves, often reaching 2 meters across.

They are supported by ribs that radiate from the centre, like spokes on a wheel. The leaves are so strong that they can support the weight of a young child.

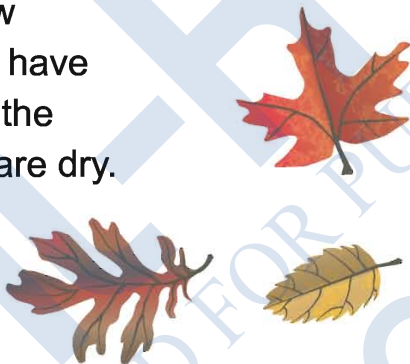
### PROJECT

#### ● Prepare a leaf skeleton.

##### You will need:

- a few leaves of different plants.
- a pan.
- washing soda.
- burner.

1. Take a few leaves that have fallen from the trees, and are dry.



2. Take water in a pan and add about two tablespoons of washing soda to it. Heat the pan until the water is nearly boiling.



3. Stop heating the pan. Place the leaves in the pan and leave them for about 30 minutes. Put the pan under a tap and let cold water flow for a few minutes.



4. You will find that the veins of the leaf have fallen off. The veins of the leaf can now be clearly seen. Dry and keep the leaf skeletons.



**Adult supervision is needed in this project.**

# Our food


We need food every day. We need food to get energy, to grow, and to help our body remain healthy by fighting diseases.

Different foods have different nutrients that help us in different ways. Some nutrients provide energy. Others help us to grow. Some other nutrients help us to fight diseases.

**There are six main nutrients found in foods. These are proteins, carbohydrates, fats, vitamins, minerals, and water.**

## 1-Proteins

Proteins are nutrients that help our body in growth. Our body needs protein to grow. Children need a lot of protein.

	<p><b>Foods that contain protein</b></p> <ul style="list-style-type: none"> <li>● Egg</li> <li>● Fish</li> <li>● Chicken</li> <li>● Beef</li> <li>● Mutton</li> <li>● Pea</li> </ul>
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## 2-Carbohydrates

Sugars and starches are carbohydrates. These are nutrients that give us quick energy. Children who play a lot, and people who do physical labour need a lot of carbohydrates.

<p><b>Foods that contain carbohydrate</b></p> <ul style="list-style-type: none"> <li>● Potato</li> <li>● Carrot</li> <li>● Bread</li> <li>● Pineapple</li> <li>● Sweets</li> </ul>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid orange; border-radius: 15px; padding: 5px;">  <p>foods containing sugar</p> </div> <div style="border: 1px solid orange; border-radius: 15px; padding: 5px;">  <p>foods containing starch</p> </div> </div>
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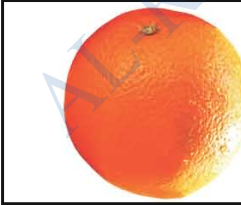



3-Fats

Fats are nutrients that give our body energy to store. Our body uses the stored fat for energy if it does not get enough food. Fat also helps to keep us warm. Our body also makes its own fat from the foods that we eat. Our body does not require too much fat to be healthy. Eating too much fat will make our body fat. It can also cause diseases of the heart when a person becomes older.

			<p><b>Foods that contain fat</b></p> <ul style="list-style-type: none"> <li>● Butter</li> <li>● Cooking Oil</li> <li>● Cream</li> <li>● Cheese</li> <li>● Milk</li> <li>● Ghee</li> </ul>
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4-Vitamins




Vitamins are a group of nutrients that our body needs for good health and proper growth. Only a small quantity of each vitamin is required. But if the body does not get any vitamin in proper quantity, it can cause dangerous diseases. There are six types of vitamins namely Vitamin A, Vitamin B, Vitamin C, Vitamin D, Vitamin E, and Vitamin K.

<p><b>Vitamin A</b> good for eyesight</p> 			<p><b>Foods that contain vitamins</b></p> <ul style="list-style-type: none"> <li>● Fruits</li> <li>● Fish</li> <li>● Egg</li> <li>● Milk</li> <li>● Cod-liver oil</li> <li>● Vegetables</li> <li>● Meat</li> </ul>
<p><b>Vitamin C</b> good for skin, bones, teeth and gums</p>		<p><b>Vitamin B</b> good for heart and nerves</p>	
	<p><b>Vitamin D</b> good for bones and teeth</p>		

Our food

5-Minerals

These are also nutrients that our body requires in small quantities to remain healthy. Some minerals also help to build body parts.

<p><b>Foods that contain minerals</b></p>		<p>Iron forms blood</p>	
<ul style="list-style-type: none"> <li>● Apple</li> <li>● Spinach</li> <li>● Milk</li> <li>● Banana</li> </ul>	<p>Potassium helps muscles work</p>		<p>Calcium for strong bones</p>

6- Water

Water makes up more than half of our body weight. We lose a lot of water every day. We lose water when we sweat, breathe or pass urine. We must replace this water. All foods contain water. They give us some of the water required by our body. In addition we must drink a lot of water to stay healthy. Most people need eight to ten glasses of water every day.

A balanced diet

Our diet is the food that we eat. For good health our diet must have all the nutrients that our body needs, in proper quantities. This is called a balanced diet.

**INVESTIGATE**

- What nutrients should be present in a balanced diet?
- What would be the best food for a one year old child?
- What kind of nutrients does your favourite food contain?



**Do not forget**

- Only fresh and clean food is good for health.
- Only boiled water should be used for drinking because tap water may contain germs.
- We should always be thankful to Allah for the food and water He gives us.

### Cooking food

Some foods, such as fruits are not cooked. They should be properly washed to get rid of dust and germs before eating. Other foods, such as vegetables and cereals, are cooked before eating. Cooking makes food soft, tasty and easy to digest. It also kills germs in the food. But overcooking of food destroys several nutrients in it.

Foods should be cooked in just enough water. Cooking in too much water and then throwing the water away makes food lose nutrients. Vegetables and fruits should not be washed after cutting them. Many nutrients then get lost with the water.

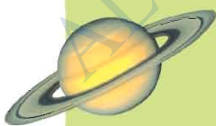
### Preserving food

Stale food goes bad because germs and mould start growing in it. Food can be stored for a few days in the refrigerator. This is because germs and mould cannot grow well in cold conditions. These days you can get frozen food in the market. These foods can be kept in the freezer of a refrigerator for several weeks, but it is better to eat fresh food rather than stored food.



### Remember

1. The nutrients required by the body are: proteins, carbohydrates, fats, vitamins, minerals and water.
2. Different nutrients help the body in different ways.
3. You must eat a balanced diet, containing all the nutrients in proper quantities.
4. If food is overcooked, it loses nutrients.



## Our food

1. Put a  for true and a  for false.

- a) All nutrients give energy to your body.
- b) Fats give you quick energy.
- c) Vitamins and minerals are required by the body in small amounts.
- d) Germs can be killed by heating food.
- e) Frozen food does not get spoilt for a long time.

2. Name these.

- a) The food that helps you to grow. \_\_\_\_\_
- b) The food that keeps your body warm. \_\_\_\_\_
- c) If you do not get them in proper quantities in your food, you may get dangerous diseases. \_\_\_\_\_
- d) This makes up more than half of your body weight. \_\_\_\_\_
- e) They give you quick energy. \_\_\_\_\_
- f) Diet that has all the necessary nutrients. \_\_\_\_\_

3. In what ways do nutrients help our body?

\_\_\_\_\_

\_\_\_\_\_

4. Name two foods each of which contains these nutrients.

- sugar \_\_\_\_\_ starch \_\_\_\_\_
- fat \_\_\_\_\_ protein \_\_\_\_\_

5. Which main nutrient do these foods contain?

- Meat \_\_\_\_\_ Bread \_\_\_\_\_
- Pulses \_\_\_\_\_ Egg \_\_\_\_\_
- Orange \_\_\_\_\_ Potato \_\_\_\_\_

6. Discuss in class and then answer.

What nutrients are specially important for children? Why?

\_\_\_\_\_

\_\_\_\_\_

**AWARENESS BEYOND THE CLASSROOM**

**Why do some people become fat?**

Different foods give you different amounts of energy. The energy in food can be measured in calories. An apple gives you about 100 calories. A 100 gram chocolate bar can give you about 600 calories.

When you do work you use calories. The more you run around, the more calories you use up. You will use up about 100 calories, if you skip rope for 15 minutes. If you sit all day, you do not use many calories.

If you eat more calories than you use up, you have calories left over. This gets converted to body fat and your weight increases. If you eat a lot, but do very little work, you will get fatter and fatter. Such people can have health problems.

**PROJECT**

• **Count your calories**

An average child needs about 2000 calories per day. A child, who is very active, needs more. A child, who sits the whole day and does not run around or play, needs less.

Make a list of what you normally eat in a day. Take the help of your parents to put down the approximate weight of each food. Ask your teacher to give you a calorie chart. Add up the calories eaten by you.

Food I ate	Weight of food	Calories

Do you think you are taking the right amount of calories?