

New



# Science Basics 5

Second Edition



Al-Rowad for Publishing & Distribution  
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# Contents

Theme 1: How Plants Make Food

3

Theme 2: Our Food

12

Theme 3: What Happens When We Eat

23

Theme 4: How Teeth Work

31

Theme 5: How Weather Changes

42

Theme 6: Water on Earth

55

Theme 7: Understanding Energy

64

Theme 8: How Sound Works

72

Theme 9: How the Earth Moves

80

Theme 10: How Electricity Works

88

## Theme 1 How Plants Make Food

We have seen many plants. We know that a plant has two main parts: one part grows above the ground and is called the shoot, and the other part grows below the ground and is called the 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 consists of the stem, branches, leaves, buds, flowers and fruits.

The stem supports the plant above the ground.

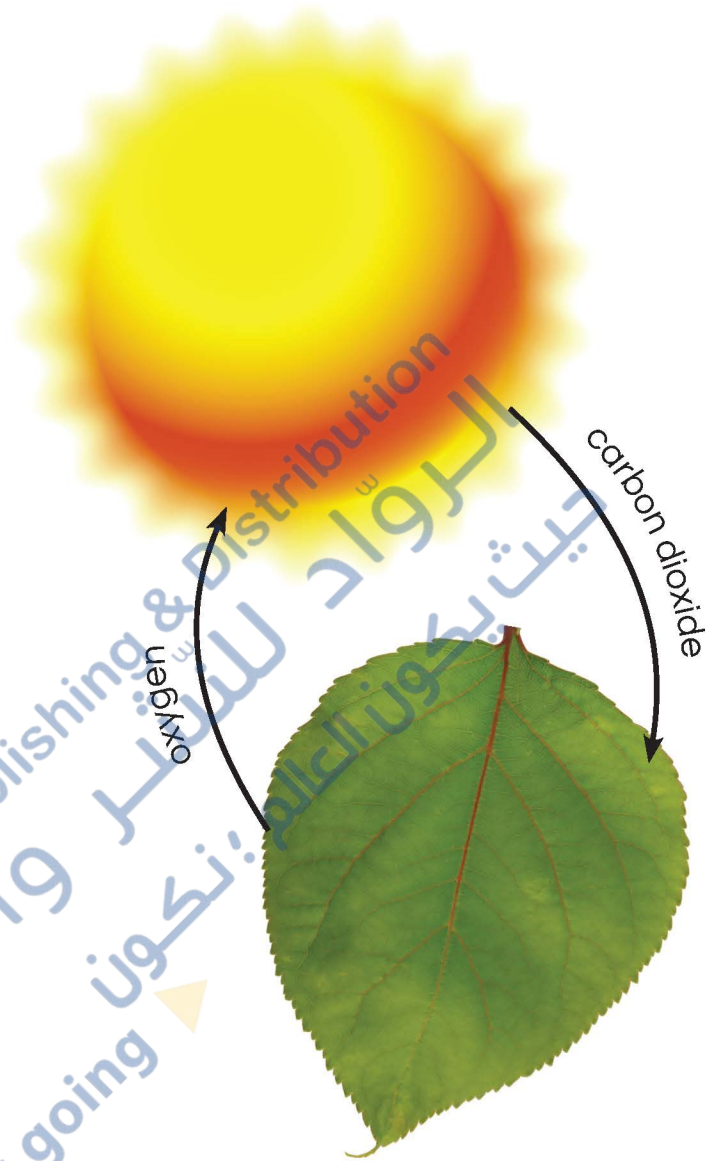
The water and minerals absorbed by the roots travel to the leaves through the stem. The food made by the leaves reaches all parts of the plant through the stem. Sometimes, the stem also stores food.

## The Leaf

Plants are different from other living things because they make their own food. In fact, they make food for all other living things directly or indirectly. Plants make food in their leaves.

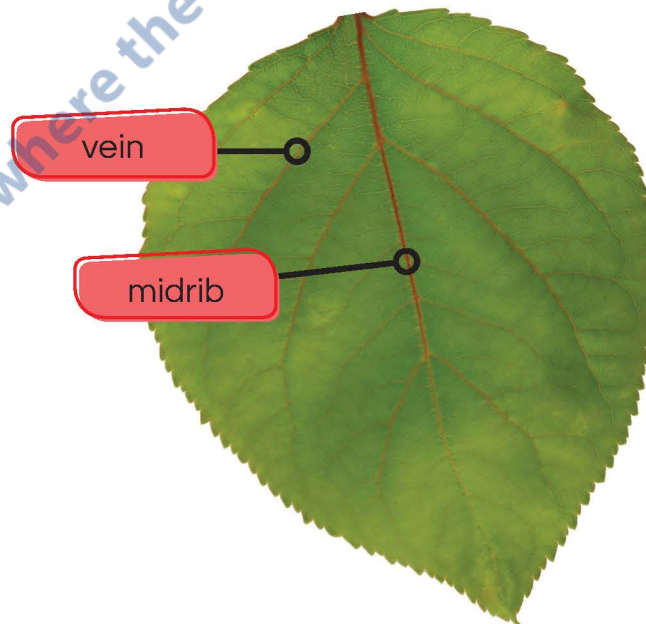
The leaves are mostly green in colour because of a green substance called chlorophyll.

This substance is necessary for the leaf to make its food.



## The Structure of a Leaf

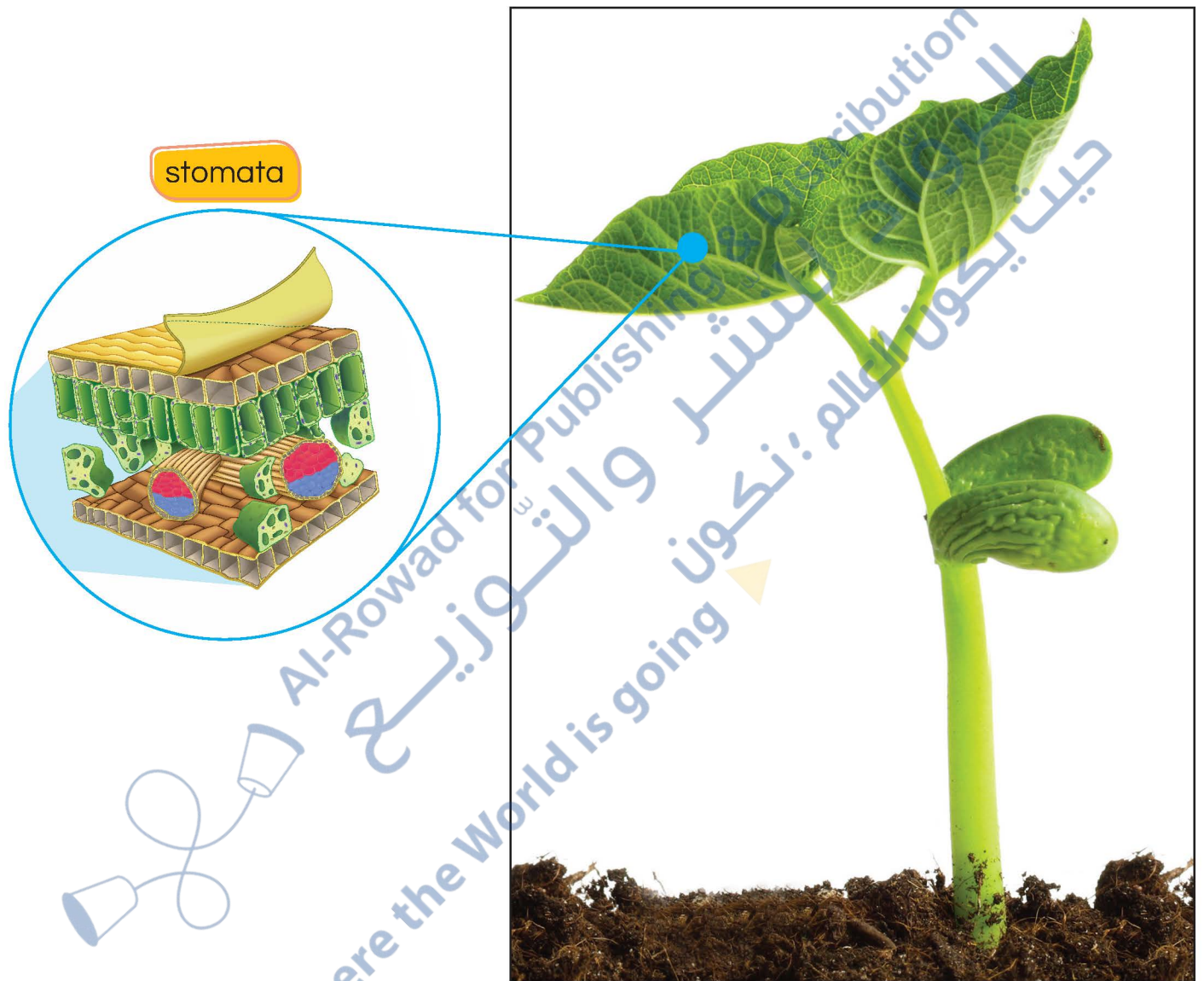
The flat part of a leaf is called the leaf blade. The main vein and the side veins can be seen on the leaf blade. It is through these veins that water is carried to the leaf. They also carry food from the leaf to other parts of the plant.



## Photosynthesis

Plants use carbon dioxide from the air, and water from the soil to make food. The energy they need for this is obtained from sunlight. Chlorophyll trap sunlight for this purpose. This process is called photosynthesis.

Photo means light and synthesis means combining together.



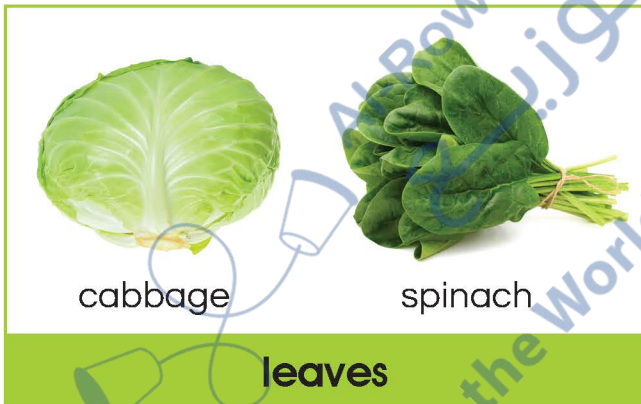
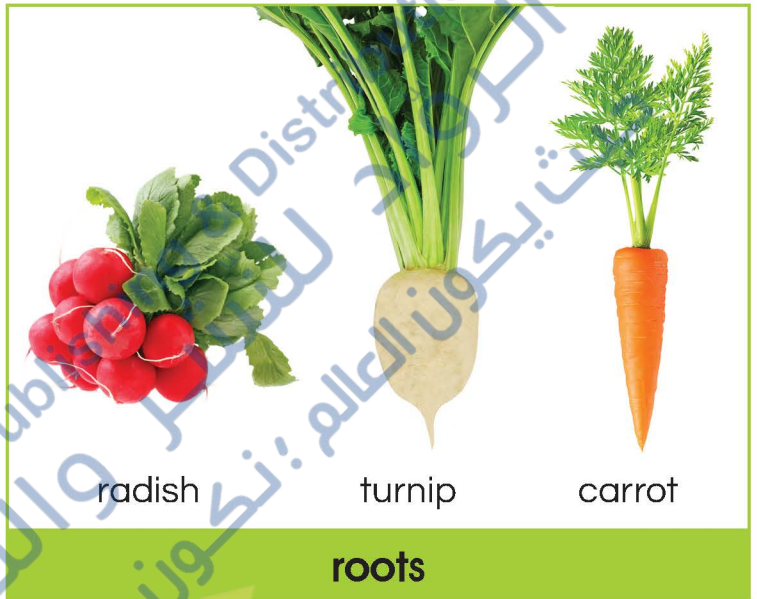
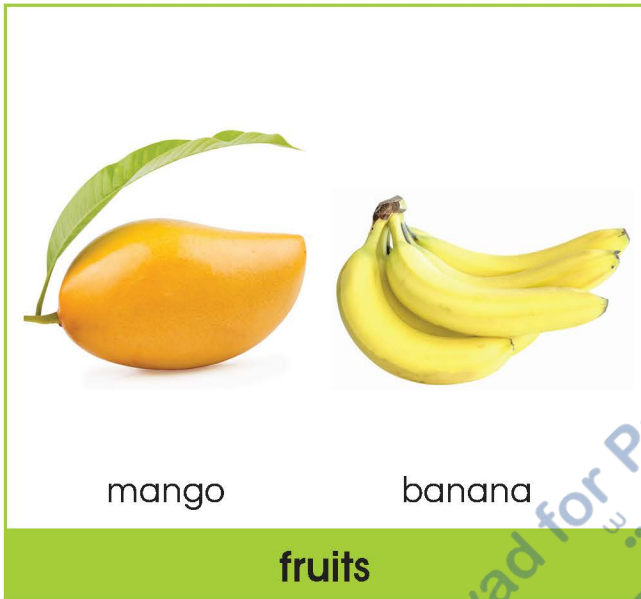
On the underside of the leaf are small openings, called stomata. They are like the windows in our house. Windows are made to bring fresh air in the house. In the same way, carbon dioxide from the air enters the leaf through the stomata to make food.



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

During the process of photosynthesis, the leaf makes food. 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 and some in their leaves. Sugarcane is a stem in which the food is stored. Therefore, plants can store food in fruits, stems, roots or leaves.



During photosynthesis, the plant takes in carbon dioxide from the air, and produces oxygen.

The plant, thus, purifies the air by adding oxygen that living things need to stay alive.

## How Plants use Food

Plants need food like animals. This food is used for many purposes.

Food is used to repair damage and to make new parts. For example, if an animal eats a portion of a plant, the plant can regrow this portion to repair the damage.



Plants need energy to grow, and to produce flowers, fruits, seeds and more leaves. This energy is provided by the food they make. Food is converted to energy inside the plant.



Extra food made by the plant is stored in different parts such as the stem, fruits, roots, seeds or leaves. 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 make food.
5. Plants use some of the food for energy, and for repair and growth.
6. The extra food is stored in the stem, fruits, leaves, roots or seeds.

Put a  for true or an  for false.

Give an explanation why you put true or false.

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

Explanation \_\_\_\_\_  
\_\_\_\_\_

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

Explanation \_\_\_\_\_  
\_\_\_\_\_

c) Plants take in carbon dioxide through their stomata.

Explanation \_\_\_\_\_  
\_\_\_\_\_

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

Explanation \_\_\_\_\_  
\_\_\_\_\_

e) Plants give off oxygen during photosynthesis.

Explanation \_\_\_\_\_  
\_\_\_\_\_

f) Plants store food only in the fruits.

Explanation \_\_\_\_\_  
\_\_\_\_\_

 **Name these.**

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

b) green substance of the leaf: \_\_\_\_\_

c) very small openings in the leaves: \_\_\_\_\_

d) plant food making process: \_\_\_\_\_

e) flat part of a leaf: \_\_\_\_\_

f) water is carried to the leaf through it: \_\_\_\_\_

 **How do plants make food?**

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 **Why is the process of making food by plants called photosynthesis?**

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 **What does a plant use food for?**

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 Where do plants store food?

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 Discuss and answer.  
How is preparing food in the kitchen different from the making of food by plants?

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## AWARENESS BEYOND THE CLASSROOM

### The largest leaves in the world

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
- washing soda
- water
- a pan
- burner



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

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

Stop heating the pan, then 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.






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.

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

We need food every day. Different foods have different nutrients that help us in a variety of ways. Some nutrients provide energy, others help us to grow. Some other nutrients help our body remain healthy by fighting diseases.







## Proteins

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

Foods That Contain Proteins		
eggs		
fish		
chicken	 	
meat		
beans		

# 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.

Foods That Contain Carbohydrates		
potato		
carrot		
bread		
pineapple		
sweets		
bananas		
	foods containing sugar	foods containing starch

## Fats







Fats are nutrients that give our body energy.

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 heart disease when a person becomes older.

Foods That Contain Fats	
butter	
cooking oil	
cream	
cheese	
milk	
ghee	




# 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. If the body does not get all vitamins in the proper quantities, 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.

Foods That Contain Vitamins		
fruits	 <p><b>vitamin B</b> good for heart and nerves</p>	 <p><b>vitamin E</b> good for blood and cells</p>
fish	 <p><b>vitamin D</b> good for bones and teeth</p>	 <p><b>vitamin K</b> good for blood and bones</p>
bread	 <p><b>vitamin A</b> good for eyesight</p>	 <p><b>vitamin C</b> good for skin, bones, teeth and gums</p>
vegetables		
nuts		
milk		

## Minerals

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

Foods That Contain Minerals	  		
apple	<p>Potassium helps muscles work.</p>	<p>Calcium for strong bones.</p>	<p>Iron forms blood.</p>
spinach			
banana			

## 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.



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?

## 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.



### Do not forget

- Only fresh and clean food is good for health.
- Only purified water should be used for drinking because tap water may contain germs.