

# 3

## Food and Nutrition

We'll cover the following key points:

- Food and its Components
- Balanced Diet
- Lifestyle and Deficiency Disease
- Healthy Eating Habits



Hi, I'm EeeBee

Do you Remember:

Fundamental concept in previous class.

In class 4<sup>th</sup> we learnt

- Kinds of Nutrients
- Balanced Diet

Still curious?  
Talk to me by  
scanning  
the QR code.



### Learning Outcomes

**By the end of this chapter, students will be able to:**

- Understand the concept of food and nutrition and their importance in our daily lives.
- Identify and differentiate between different types of food based on their nutritional value, such as carbohydrates, proteins, fats, vitamins, and minerals.
- Explore examples of healthy and unhealthy food choices and their impact on the human body.
- Learn how a balanced diet and proper nutrition are essential for growth, energy, and overall health.

### Guidelines for Teachers

The teacher can start the chapter by introducing the concept of food and nutrition, encouraging students to list the foods they eat daily and categorize them into different groups. Discussions can focus on the functions of nutrients in the body and the importance of a balanced diet. The teacher can also emphasize how healthy eating habits and nutrition contribute to physical and mental well-being, helping students understand the role of food in maintaining a healthy lifestyle.



Complete the table.

Nutrients	Food in			
Carbohydrate				
Protein				
Vitamin A				
Vitamin C				
Iron				

### Fun Fact



Your body is a chemical factory fueled by food! Did you know that 70% of your brain is made of water, so staying hydrated directly boosts your thinking power? Foods like almonds can help improve memory, while bananas act as nature's energy bars with their potassium content. Spicy foods can trigger the release of endorphins, making you feel happier. And dark chocolate not only tastes great but is packed with antioxidants that benefit your heart.

## Food and Its Components

### Food

Food in living beings can be compared to fuel in a car. It is the group of nutritive substances that provides energy to living beings, repairs old tissues and builds new ones and also protects the body from infections and diseases. In this chapter we will learn about the importance of food and nutrition.

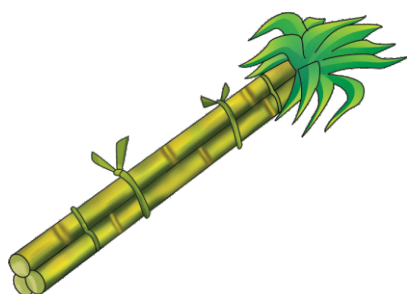
### Components of Food

The food that we eat consists of seven components. They are carbohydrates, proteins, fats, vitamins, minerals, roughage and water. These components fulfill various needs of our body and are hence required by the body for its proper functioning.

**Carbohydrates:** They are also known as energy giving foods. They are made up of carbon, hydrogen and oxygen. Since food containing carbohydrates provides energy to our body, they are required in large quantities in the diet of people doing heavy physical labor. They are of three types:



- a. **Sugar:** It is a simple carbohydrate having a sweet taste. Sources of sugar are fruits such as sugarcane, banana, grapes, honey, milk etc.



Sugarcane



Honey



Grapes

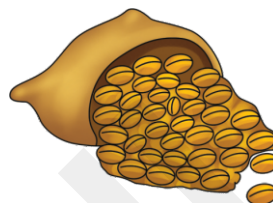


Milk

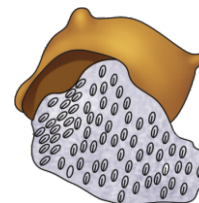
- b. **Starch:** It is a tasteless complex carbohydrate. Sources of starch are Wheat, rice, potatoes, etc.



Cotton



Wheat



Rice

- c. **Cellulose:** It is a complex carbohydrate present in plant cell wall.

### Did you know ?

1. The healthiest sources of carbohydrates: Unprocessed whole grains, vegetables, and fruits. They promote good health by giving us vitamins, minerals, fiber.
2. Unhealthier sources of carbohydrates include white bread, pastries, sodas and other highly processed or refined foods. These items contain easily digestible carbohydrates that may result in weight gain, prevent weight loss, and promote diabetes and heart disease.

### Activity

### Creative Learning

#### Testing for the presence of starch:

**Materials Needed:** Iodine solution, Small pieces of different food items, A white plate or tray

**Steps to Follow**

1. Understand the Test: • Iodine changes to a dark blue or black color when it reacts with starch.  
• The darker the color, the more starch the food has.
3. Perform the Test: • Put 1 or 2 drops of iodine solution on each food sample. • Watch closely to see if the iodine changes color.
4. Record Your Results: • If iodine turns dark blue/black, write "Yes" in the starch column; if not, write "No."

### Observation Table

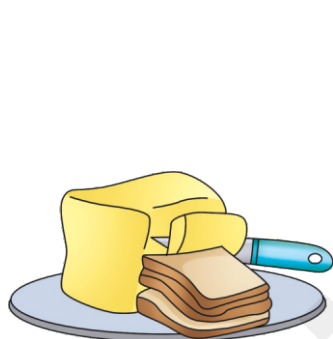
Food Item	Color Change	Starch Present
Bread		
Potato		
Apple		
Rice		

### Fats

Butter, ghee, milk, egg-yolk, nuts and cooking oils are the major sources of fat in our food. Our body stores the excess energy in the form of fat. This stored fat is used by the body for producing energy, when required so fat is considered as energy bank in our body. Fats are essential for the absorption of vitamins A, D, E and K in the body. Fat in our body also prevents heat loss from the body surface.

### Did you know ?

The units used to measure the amount of energy that the body gets from food are called calories. You can find out how many calories are in a food by looking at the nutrition facts label. The label will also describe the components of food – how many grams of carbohydrate, protein and fat it contains.



Butter



Ghee



Nuts



Oil

Though fats are essential for our body, eating too much fat can be harmful as excess body fat may lead to a condition called **obesity**. Obese people may have various other diseases like heart ailments, high blood pressure, diabetes, etc.

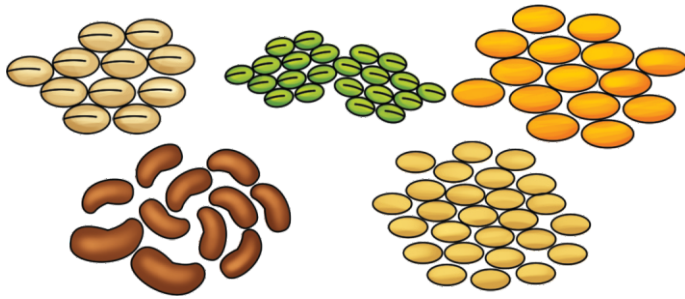
### Proteins

They are also known as body building foods. They help in the growth of our body, that is, muscle building and repairing worn-out tissues. Protein in our diet comes from both plant and animal sources.





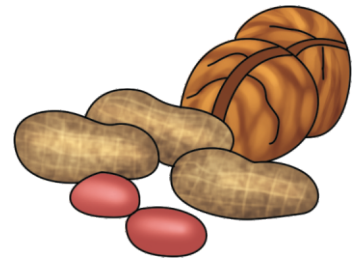
Pulses, soybeans, grams and nuts are some plant sources of proteins.



Pulses



Soyabeans

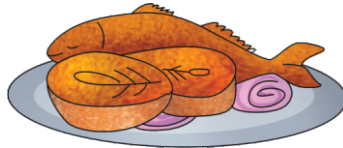


Nuts

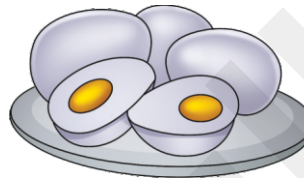
Meat, fish, eggs and milk are animal sources of proteins.



Meat



Fish



Eggs



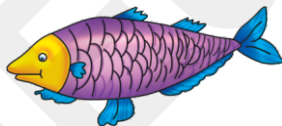
Milk

## Vitamins

These are the nutrients, our body needs to function and fight off diseases. Our body cannot produce vitamins. So we must get them through food we eat or in some cases through supplements. Carrots, green leafy vegetables, fish, eggs, fruits, etc. are good sources of vitamins. There are 13 vitamins that are essential for proper functioning of our body. Lack of vitamins in the body can cause deficiency diseases.



Carrots



Fish



Vegetables



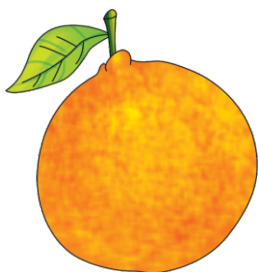
Fruits

### Did you know ?

1. All vitamins were discovered in a span of 28 years. The first vitamin A was identified in 1913 and the last one Folic acid in 1941.
2. Kiwis and strawberries contain almost twice as much vitamin C as oranges.
3. Most vitamins are destroyed when exposed to light and heat. So make sure you keep your vitamin supplements in cool shady place.
4. Sunscreen reduces your skin's ability to produce vitamin D upto 95% which may lead to vitamin D deficiency.

## Minerals

Just like vitamins, minerals help your body grow, develop and stay healthy. The body uses minerals to perform different functions – from building strong bones to transmitting nerve impulses. Some minerals are even used to make hormones or maintain a normal heartbeat.



Orange (potassium)



Green Vegetable (iron)



Milk (calcium)

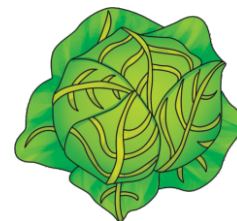
## Roughage

The fibres that we eat are known as dietary fibres or roughage. They occur naturally in fruits, vegetables and grains. Though fibres do not provide any nutrient to our body and cannot be digested by our body, yet they form an important part of our diet. Fibre is sometimes referred to as “nature's broom” because it helps “clean out” the intestinal tract. Fibres add bulk to our food making it easier to pass out of our body thus preventing constipation.

**Some Fibre Tips:** Have fibre rich cereal breakfast. Add seeds, beans and veggies to your diet. Eat a whole fruit instead of juice. Snack on nuts and dried fruits. Drink lots of water for fibre to make your bowels soft.



Whole grain



Cauliflower



Corn kernels

## Check 'N' Mate

## Critical Thinking

Write 'T' for true and 'F' for false statements.

1. Carbohydrates are also known as energy-giving food.
2. Wheat, rice, potato, etc. are the sources of carbohydrates.
3. Our body stores the excess energy in the form of minerals.
4. Pulses, soyabeans, grams and nuts are the sources of proteins.
5. Constipation is caused due to fibres.

☐  
☐  
☐  
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☐

## Water

Our body is about 70% water. Water is very important for good health. Since our body loses a lot of water as sweat and urine, it is advisable to drink 8-10 glasses of water everyday. Our body needs water for several reasons.

- ✦ It helps to transport substances inside our body.
- ✦ It helps to regulate our body temperature.
- ✦ It helps our body to absorb nutrients from food.
- ✦ It helps to remove toxins and waste once the food has been digested.
- ✦ It is needed for various chemical reactions that takes place inside our body during life processes such as digestion, excretion, respiration, etc.

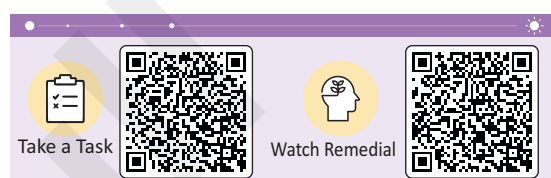
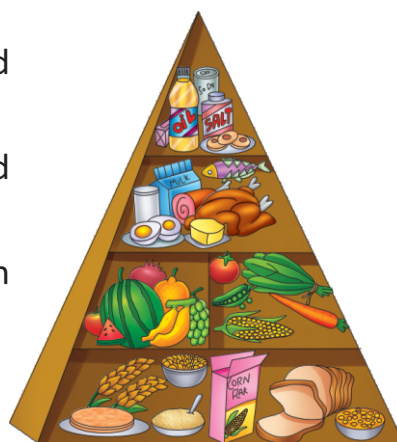
Excess loss of water from our body causes **dehydration**. Dehydration can be treated by giving Oral Rehydrating Solution (ORS) to the patient. ORS can be prepared at home by mixing 6 level teaspoons of sugar and half teaspoon of salt in one litre of Clean drinking water.

## Balanced Diet

For our body to remain healthy, we need to eat different components of food discussed so far. A diet that contains adequate amount of the various components of food for proper functioning of our body is called a **balanced diet**.

A balanced diet must contain foodstuffs from the four basic food groups:

1. The milk group: Milk, cheese, ice cream, and other milk-based foods.
2. The meat and beans group: Meat, fish, poultry, and eggs, with dried legumes and nuts as alternatives.
3. The fruits and vegetables group.
4. The grains and cereals group.



## Importance of a Balanced Diet

- ✦ **Prevents diseases and infections:** A healthy balanced diet improves our immune system and prevents several diseases like heart disease, diabetes and stroke.
- ✦ **Helps us control our weight:** A balanced diet is the only way to healthily control our weight for a longer period of time.
- ✦ **Improves our mental health:** Eating healthy helps to ease symptoms of depression and anxiety thus improving mental health.
- ✦ **Good for Growth:** Body cells are built and maintained and the body grows at the right pace with a balanced diet.
- ✦ **Better skin and hair:** Eating well provides a glow to our skin and hair and makes us look young.

## Lifestyle Diseases and Deficiency Diseases

### Lifestyle Diseases

Lifestyle diseases are defined as diseases linked with the way people live their lives. It is caused by unhealthy food habits (choosing to eat junk food over healthy food) or an unhealthy lifestyle (less or no physical activity). Some common lifestyle diseases are obesity, stroke, diabetes, high blood pressure. etc.

### Deficiency Diseases

Lack of any of the main components of food in the diet may cause diseases. Diseases that are caused by the lack of an essential nutrient in the diet such as carbohydrates, proteins, vitamins or minerals are called deficiency diseases.

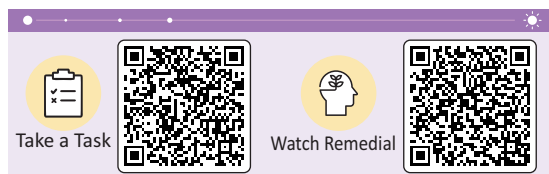
Disease	Causes	Prevention
<b>Obesity</b>	Inactivity and unhealthy eating.	Regular exercise, healthy eating plan, monitor your weight regularly.
<b>Stroke</b>	Being overweight, inactive lifestyle, etc.	Eating a healthy diet, weight management, regular exercise.
<b>Diabetes</b>	Lack of insulin production by the Pancreas, leads to high blood sugar level.	Meals at regular intervals, low-carb diet, regular exercise, avoid sugar.
<b>High blood pressure</b>	Eating food rich in salt and fat, lack of physical activity.	Regular exercise, balanced diet, cut out on salt intake.

### Deficiency of Carbohydrates

Carbohydrates are our body's main energy source and necessary for us to think and remain active. Lack of carbohydrates in the diet results in a lack of energy and stamina. Carbohydrate requirements in the body of a person with more physical activity are much more than those a person with minimum physical activity. Thus a laborers needs more carbohydrates in his diet than an officer sitting in his office.

### Deficiency of Proteins

Protein is required for muscle building, growth and repair of our bones and tissues. Inadequate protein in the diet may lead to muscle wasting i.e, reduces muscle strength and function, poor wound healing and infections. Protein deficiency leads to a disease called [Kwashiorkor](#). Deficiency of protein along with carbohydrates is called Protein Energy Malnutrition (PEM). It leads to a disease called [Marasmus](#).





## Deficiency of Vitamins and Minerals:

Vitamins and minerals are also known as protective foods. Our body needs them only in small amounts. However, their deficiency in our diet may lead to various abnormalities.



Kwashiorkor



Marasmus

Vitamins /Minerals	Sources	Functions	Deficiency Diseases	Symptoms
<b>Vitamin A</b>	Carrots, Oranges, Papaya, Green Leafy Vegetables	Maintain healthy eyes, hair and skin.	Night blindness	Impaired vision dryness of eye.
<b>Vitamin B1</b>	Eggs, Sprouts, Pulses and whole Grains	Vital for healthy nervous system and aids in digestion.	Beriberi	Weakness, fatigue, psychosis and nerve damage.
<b>Vitamin C</b>	Citrus Fruits such as Lime, Lemon, Oranges, Tomatoes and Sprouts	Needed for healthy skin, teeth, gums and bone development; essential for the healing of wounds and for body's immune system.	Scurvy	Loosening of teeth, bleeding gums, weak immune system, slow healing of wounds, nosebleeds, etc.
<b>Vitamin D</b>	Fish liver Oils; Mackerel, Salmon, Milk, Eggs and Sunlight	Aids in healthy growth and development of bones and teeth in children.	Rickets	Causes soft and deformed bones, and retarded growth in children.

<b>Calcium</b>	Milk, yogurt, cheese, sardines, broccoli, turnip greens	Bones and teeth growth, Muscle and nerve function, Blood clotting.	Rickets in children; osteomalacia (soft bones) and osteoporosis (brittle or fragile bones) in adults	Brittle bones, excessive bleeding, weak teeth and bones, stunted growth.
<b>Iron</b>	Liver, lean meat, green leafy vegetables	Essential for making hemoglobin; the red substance in blood that carries oxygen to body cells.	Anaemia	Pale body colour, weakness, fatigue, headaches, shortness of breath, difficulty in concentration, brittle nails, cracked lips.
<b>Iodine</b>	Fish and salt	Essential for proper functioning of the thyroid gland.	Goitre	Enlargement of the thyroid gland, mental retardation, retarded growth.

### Check 'N' Mate

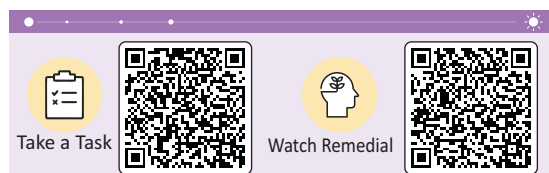
#### Critical Thinking

**Fill in the blanks with correct words.**

1. A healthy balanced diet improves our \_\_\_\_\_ (immune/respiratory) system.
2. \_\_\_\_\_ (Excess/Lack) of any of the main components of food in the diet may cause diseases.
3. \_\_\_\_\_ (Protein/Minerals) is required for muscle building, growth and repair of our bones and tissues.
4. Lack of iron leads to \_\_\_\_\_ (goitre/anaemia) disease.

### Healthy Eating Habits

Healthy eating habits go a long way in maintaining healthy weight and normal growth. Also, the eating habits picked up by children when they are young will help them maintain a healthy lifestyle when they are adults. Following are a few guidelines for healthy eating habits:





1. Have a healthy breakfast every morning, as breakfast is the most important meal of the day and a nutritious breakfast sets the tone for the day.
2. Be careful with your sweet and salt intake. Limit food and beverages containing sugar (ideally, exclude them). Avoid adding extra salt to food before eating.
3. Drink plenty of water. 8-10 glasses of water in a day is ideal. Fruits and vegetables contain structured water and can replenish our daily fluid needs. Our mornings should start with a glass of water.
4. Eat colorful fruits and vegetables every day, as fruits and vegetables with different colors gives us different nutrients. Choose leafy greens, cabbage, broccoli, lettuce, red and orange vegetables – carrots, squash, peppers, tomatoes.
5. Choose fresh fruits, they have more benefits than fruit juice, especially packaged. Fruit juice contains little or absolutely no fiber. But a lot of sugar, preservatives, and dyes.
6. Exclude from your diet: junk food, white sugar, bleached flour, trans fats (pastries, cream cheese, ice cream with vegetable fats, fast food, hot dogs, sausages, dairy desserts). Avoid commercially processed foods.
7. Eat a lot of salad and yogurt. Salads add a lot of fibre to your diet. Carefully choose your salad dressings. Dress salad with sesame, pumpkin, or olive oil, add the lemon and fresh herbs (basil, thyme, oregano).
8. Eat 4-5 times a day in small portions at the same time. Do not miss a single meal.

## Junk Food

Junk foods are processed foods consisting of high calories. They have little nutritional value. Junk food or fast food has become an increasingly popular food choice to grab when on the go. Ideally, junk foods are defined as processed foods with negligible nutrient value and are often high in salt, sugar and fat.

Following are the ways in which junk food may harm our health:

- ✦ Although junk food and fast food makes you feel full and satisfied, they lack all the necessary nutrients like proteins and carbohydrates to keep your body energized and healthy.



Junk Food

- ✦ Oil from the junk food gets deposited in the stomach causing acidity. They may also cause digestive problems.
- ✦ It causes fluctuations in blood sugar levels thus causing Diabetes.
- ✦ It affects the brain function.
- ✦ It increases the risk of heart disease.
- ✦ It can cause kidney disease and also damage the liver.



## In a Nutshell

- ✦ Food is essential for us to survive.
- ✦ Carbohydrates, proteins, fats, vitamins, minerals, roughage and water are the essential components of food.
- ✦ A balanced diet is essential for us to remain healthy. It contains food from four different food groups.
- ✦ Lifestyle diseases are associated with the way we live our life.
- ✦ Deficiency diseases arise from the lack of essential nutrients in our diet.
- ✦ Healthy eating habits must be a way of our life.
- ✦ Junk food though highly appealing, must be avoided in our diet.



## Key Words

## Improving Vocabulary

Obesity	:	A state of being grossly fat or overweight.
Supplements	:	A thing added to something else in order to complete or enhance it.
Hormones	:	A chemical substance produced in the body that controls and regulates the activity of certain cells or organs.
Toxins	:	A poison of plant or animal origin, especially one produced by or derived from micro-organisms.



## Time to Discuss

## Pondering and Communicating

What are the symptoms and preventive measures for these diseases: jaundice, tuberculosis and influenza?



# EXERCISE

That turn curiosity into confidence—let's begin!



Gap Analyzer™  
Take a Test

## A. Objective Type Questions.

1. Along with daily exercise for good health, for growth and repair of our muscles , we need to eat \_\_\_\_\_.  
a. Sugar ☐      b. Guava ☐  
c. Protein ☐      d. Cereal ☐
2. Carbohydrates are essential because \_\_\_\_\_.  
a. They filter toxins out of our body. ☐      b. They help us think clearly. ☐  
c. They help us breathe deeply. ☐      d. They give us most of our energy. ☐
3. The number of calories in food tells you about \_\_\_\_\_.  
a. How long your energy will last. ☐  
b. How much energy the food will give your body. ☐  
c. How much sugar the food contains. ☐  
d. How much fat it contains. ☐
4. This mineral helps to maintain strong bones and teeth. \_\_\_\_\_.  
a. Fat ☐      b. Calcium ☐  
c. Sodium ☐      d. Water ☐
5. Rice, pasta, bread and oats fall into which food group? \_\_\_\_\_.  
a. Milk group ☐      b. Meat and beans group ☐  
c. Fruits and vegetables group ☐      d. Grains and cereal group ☐
6. Citrus fruits contain vitamin \_\_\_\_\_.  
a. A ☐      b. B ☐  
c. C ☐      d. D ☐

## B. Fill in the blanks.

1. Water helps remove \_\_\_\_\_ and \_\_\_\_\_ once the food has been digested.
2. Lack of iodine in our diet leads to \_\_\_\_\_.
3. Water helps to \_\_\_\_\_ our body temperature.
4. \_\_\_\_\_ fruits are rich in vitamin C.

5. Diseases caused due to lack of essential nutrients in the diet are called \_\_\_\_\_ diseases.
6. \_\_\_\_\_ is a complex carbohydrate present in plant cell wall.
7. If you do not drink enough water on a hot day or while exercising, it may cause \_\_\_\_\_.

### C. Very Short Answer Questions.

**Name them.**

1. Two sources of calcium. \_\_\_\_\_
2. Two deficiency diseases. \_\_\_\_\_
3. Two good sources of fat in our diet. \_\_\_\_\_
4. Marasmus is caused due to the combined deficiency of \_\_\_\_\_
5. Two good sources of iodine. \_\_\_\_\_
6. Two foods rich in protein. \_\_\_\_\_
7. Two lifestyle diseases. \_\_\_\_\_

### D. Short Answer Questions.

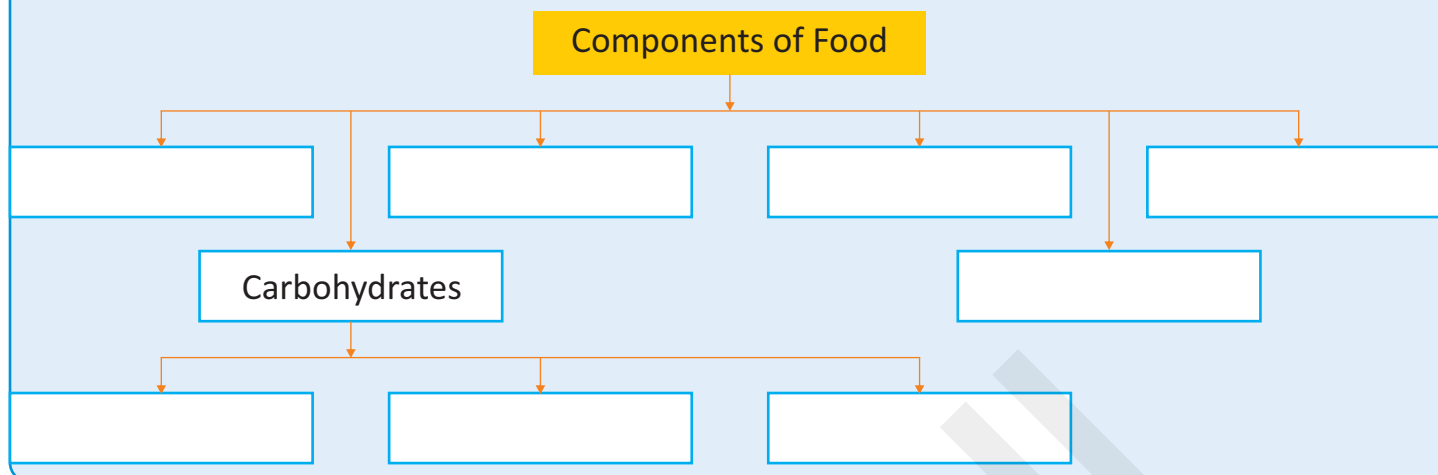
1. What is food? Why do we need food?
2. Define Balanced Diet.
3. Explain with examples the concept of lifestyle diseases.
4. Name three food rich in vitamin D.
5. How can we treat a patient with dehydration?
6. Why should we eat colourful fruits and vegetables?
7. How is roughage important in our diet?
8. Mention two importance of a balanced diet.



### E. Long Answer Questions.

1. Describe the different components of food and their important functions.
2. What are deficiency diseases. With the help of examples describe 5 deficiency diseases, their sources, functions and the vitamins or minerals associated with them.
3. Explain five healthy eating habits.
4. List out five different reasons why water is important for our body.
5. Describe an activity to test the presence of starch in a given food sample.
6. Explain with examples a few lifestyle diseases, their causes and preventive measures.

Recall and complete the concept map given below.



## Time to Apply

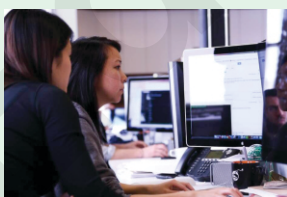
## Applying and Creating

The components of food ideally required by the following:

1. An athlete



2. A software professional



3. Our grandparents



4. Growing children





## Time to Observe

Observing, Critical Thinking, Analysing

Take a look at the packet of common salt in your kitchen. What are the main ingredients contained in the packet? Make a note on the diseases a person may suffer from due to the lack of those ingredients.



## Time to Create

Creating and Collaborating

Rajeev, a ten year old boy of St. Patrics School is a very fussy eater. Following is his diet schedule for a day. List out the unhealthy components of his menu for breakfast, lunch and dinner and substitute it with a healthy diet of your choice for the entire day.

### Rajeev's diet



### Diet suggested by you

