HELLO STUDENTS,

Good Morning!

Today we are going to learn something interesting. Do you know what it is?

It is related to the ‘FOOD SCIENCE’.

Do you know what is food and what are its constituents?

To know all this lets read carefully. I am sure you will enjoy going through this exercise. So let us proceed.

FRAME 1

Well Students! As you are aware of that majority of us eat Chapatti and rice, bread and butter, fruits and vegetables, egg. And pulses, vegetable, oil, butter in our diet. Some of us also eat meat and fish, and all of us take milk. These are some of the examples of food. Similarly animals also eat meat and fish and all of us take milk. These are some of the examples of food. Similarly animals also take variety of things like grass, meat, milk, water and so on. All of us want to take any of the above-mentioned things when we are hungry.

So students, with the help of above examples now easily tell what is food.

So let us now test our knowledge on the basis of this information. Let us see of the following answer is correct one.

Q. Food is a: -

a) Sweet substance
   Wrong, as sweet substance may be only the part of food, so, please try again.

b) Anything delious substance recommended by doctor for body.
Some of us like break and chapatti, while other may like rice noodles in their breakfast still other may like egg or fish. Thus different people take different varieties of food according to taste and availability of raw materials. The type and nature of food taken by organism constitute the food habits. People, who take chapatti, bread, rice or other plant materials in their food, have vegetarian food habits, whereas those who take egg, fish, meat etc. in their food have non-vegetarian food habits.

Students, now you could easily tell about vegetarian and Non-vegetarian food. So pick up the right response from the following question.

Q. Which of the following is vegetarian food.

a) Fish: -
   Fish is an animal and comes under non-vegetarian food. So your answer is wrong. Try again.

b) Chicken Pullav :-
   Your response is not correct because it is made up of flesh and flesh comes under non-vegetarian food. So try again.

c) Chicken Biryani
   Sorry, Your response is wrong as it is prepared by adding flesh and rice, so it is non-vegetarian food. Try again.

d) Mutter Pullav
   Good! You are correct because peas and rice are food elements derived from plants.
Obviously food is required by both plants and animals. Green plants and some microorganism do not derive their nutrients from any other living organism (plant life or animal life) where as animals cannot prepare food by themselves. Organisms which can derive their nutrients from non-living (plants of animals) are known as Autotrophs. On the basis of above information answer the following question:

Q. Which of the followings are Autotrophs?

a) Human being:-
   Sorry, Your response is incorrect because human beings take their food directly or indirectly from plants and animals. Human beings cannot prepare their food themselves. So try again.

b) Banyan-tree: -
   Good! You are right because banyan tree is a plant and derive its nutrients from the soil, water and sunlight not from a living source. In a simple language it is a green plant and it prepares its food by itself.

c) Amal-Bale :-
   Sorry, you response is incorrect because Amal-Bale is a non-green plant, so it cannot prepare its food. It takes it food from any plant.

d) Mosquito: -
   Wrong. Incorrect response because it is not able to prepare its own food. They have to depend for their food on the blood of human beings.

What makes green plants to able to prepare their own food? And have they actually prepared their food and have they actually prepared their food? So let’s clear this point.
Green plants contain a green coloured pigment known as chlorophyll. It is with the help of chlorophyll, carbon di-oxide, water and sunlight that green plants can prepare their food and this process is known as photosynthesis. Now tell which of the following option is correct.

a) Chlorophyll, carbon and water: -
   Your response is incorrect because photosynthesis cannot be carried out without an activator, so try again.

b) Carbon, water, sunlight: -
   Your response is incorrect because photosynthesis cannot take place in the absence of pigment.

c) Chlorophyll, carbon, water and sunlight
   Good! Keep it up! You are absolutely right as where all these four components are present together, photosynthesis occurs.

d) Water, sunlight, chlorophyll
   Your response is wrong because food cannot prepare without carbon.

Frame 6
Animals and non-green plants do not have chlorophyll in their bodies. Consequently they cannot prepare their own food. They have to depend upon green plant directly or indirectly for their food supply.

Therefore all animals are regarded as HETROTROPHS so students, the question arises: -

Q. Which of the following are Hetrotrophs?
   a) Peepul tree
      Incorrect, as peepul tree prepares its food by itself, so try other option.

   b) Amal-Bale
      Your response is correct, as Amal-Bale takes its food from other green plants.

   c) Neem
Incorrect because Neem is a green plant, so it can prepare its food by itself.

d) Chis

Your response is incorrect. Wrong as chis is a green plant, so it can prepare its food by itself.

FRAME 7

Students, let’s read something regarding energy. Various activities of living beings like running, swimming, breathing, talking and even sleeping require the expenditure of energy. Our body activities like heartbeat, expansion of lungs and various other metabolic reactions occur without our awareness i.e. they are automatic. For all these processes including the automatic, we need energy. The energy requirements vary with age and profession. The following table gives an idea of the energy requirements of people of different age groups and occupations.

<table>
<thead>
<tr>
<th>Age/occupation</th>
<th>Energy in kilo joules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (5 years)</td>
<td>6,000 KJ per day</td>
</tr>
<tr>
<td>Children (11 years)</td>
<td>9,000 KJ per day</td>
</tr>
<tr>
<td>Children (18 years)</td>
<td>10,000 KJ per day</td>
</tr>
<tr>
<td>Adult person doing moderate work</td>
<td>9,600 KJ per day</td>
</tr>
<tr>
<td>Adult person doing heavy work</td>
<td>12,000 KJ per day</td>
</tr>
<tr>
<td>Adult person doing very heavy work</td>
<td>16,000 KJ per day</td>
</tr>
</tbody>
</table>

Students, now give the correct response of the following statement:

Q. Which of the following persons required highest calories.

a) Labourer

You are correct! Good! Because a labourer does a very heavy physical work, so the energy requirement by the laborer is the highest that is 16,000 KJ per day.

b) Office Clerk

You are wrong because an office clerk has to do only deskwork or light physical work. So he requires comparatively less amount of energy.
c) Teenager boy
You are wrong, as teenager boy requires more proteins than energy for his body growth.

d) An old man
You are wrong as an old man cannot do hard physical work and so his energy requirements cannot be the highest.

FRAME 8
Students, in this frame, we shall discuss regard nutrients. So let’s proceed and read carefully.

The food that we eat consists of a variety of dishes. I am making a list of few food item liked by you e.g. chapatti, rice, cake, sandwich, curd, meat, panner, milk, butter. Your daily food may contain one or more items mentioned above. These is something common in all these food which gives us energy, namely Nutrients. So, a nutrient is an organic or inorganic substance required for the survival of a living beings. In simple terms, a nutrient can be said to be a particular type of food. So the question arises-

Q. Which one of the following statements is incorrect?

a) A nutrient is taken to provoke hunger.
You are correct because a nutrient is a particular type of food which satisfies hunger rather than provoking hunger.

b) A nutrient is an organic or inorganic compound.
You are incorrect as the statement given in the question is true.

c) A nutrient is a source of energy.
Your response is incorrect, as the statement given in the question is true. So try again.

c) A nutrient helps in survival of living being.
You are incorrect, as the statement given in the question is true.

FRAME - 9
The nutrients presence in our food are of various types :-

Carbohydrate Energy rich food.

314
Fats
Proteins Body building foods
Minerals Regulatory foods
Vitamins Protective foods
Water Medium
Roughage Helps in digestion

So the question arises-
Q. Which of the following foods help in building body cells?.
   a) Proteins
      Good! You are correct as protein are known as body building foods. Correct as protein are known as body building foods.
   b) Water
      Incorrect, because water acts as a medium in our body.
   c) Carbohydrates
      You are wrong as carbohydrates provides energy rich food. So, try again.
   d) Roughage
      Your response is wrong as it regulates only the process of digestion so try again.

Now, I am going to give you an assignment. Don't be afraid. I am going to ask you very easy question. But do it because it a quiz and marks. Will be given to you at the end of this quiz. Five questions will be there. So lets start. All the Best.
Quiz

1. Protein is known as building block of the body.
2. Adult person doing moderate work requires, 9,600 KJ calories per day.
3. Water acts only as a medium in our body.
4. Chicken Biryani is a vegetarian food.
5. Material for growth and repair is provided mainly by fats.
INTRODUCTION

Well students, it is a well understood fact that all living things require food to remain alive. In fact, no organism can survive without food. You must have heard that some people go on hunger strike. During the strike period they do not take any food substance, so they loose weight quickly. Sometimes it has also been observed that they die if they do not take food for longer time. This shows that food is very essential for us to survive. Thus, food is essential for the growth of the body. Food is divided into two classes - animal food and vegetable food.

Milk, milk products, egg, meat and fish are some of the examples of animal food while rice, wheat, mangoes, beans, peas, nuts, potatoes etc are examples of vegetable food.

The mode of food intake is different in plants and animals. Plants can prepare their own food, so for this reason all green plants are known as Autotrophs. Animals cannot prepare their own food. They have to depend upon green plants directly or indirectly for food supply. Therefore all animals are regarded as Heterotrophs.

TEACHER ACTIVITY

- Discussion with the students related to the contents of unit
- Audio and visual cassettes pertaining the contents
- Use of projector
- Diagram and charts
- Teacher will take students outside the school and show them practically kitchen garden fruits, vegetarian and non-vegetarian food items.
MEANINGS AND DEFINITIONS

Well Students! As you are aware of that majority of us eat Chapati and rice, bread and butter, fruits and vegetables, eggs and pulses, vegetable, oil, butter in our diet. Some of us also eat meat and fish, and all of us take milk. These are some of the examples of food items. Similarly animals also take variety of things like grass, meat, milk, water and so on. All of us need to take any of the above mentioned things when we are hungry.

1. CHECK YOUR PROGRESS
   a) Define food
   b) Give two examples of food items
   c) Explain the importance of food in all living organisms

Some of us like break and chapati, while other may like rice or noodles in their breakfast still other may like egg or fish. Thus, different people take different varieties of food according to taste and availability of raw materials. The type and nature of food taken by organisms constitute the food habits. People who take chapati, bread, rice or other plant materials in their food have vegetarian food habits, whereas those who take egg, fish, meat etc. in their food have non-vegetarian food habits.

Students, now you could easily tell the difference between vegetarian and non-vegetarian food.

2. CHECK YOUR PROGRESS
   a) Give two examples of vegetarian food items
   b) Give two examples of non-vegetarian food items
   c) Peas and rice are vegetarian food items (True / False)
   d) Fish is a vegetarian food item (True / False)

Obviously, both plants and animals require food. Green plants and some microorganism do not derive their nutrients from any other living organism (plant life or animal life) where as animals cannot prepare food by themselves. Organism that can derive their nutrients from non-living (plants of animals) are known as Autotrophs.

Animals and non-green plants do not have chlorophyll in their bodies.
Consequently they cannot prepared their own food. They have to depend upon green plant directly or indirectly for their food supply. Therefore, all animals are regarded as Heterotrophs.

3. CHECK YOUR PROGRESS

a) Define Autotrophs

b) Which of the following are autotrophs-
   i) Human Beings (True / False)
   ii) Amale Bale (True / False)
   iii) Mosquitoes (True / False)

c) Define Heterotrophs

d) Which of the following are heterotrophs-
   i) Human Beings (True / False)
   ii) Mosquitoes (True / False)
   iii) Peepul Tree (True / False)
SUMMARY

Food is necessary for all living beings in order to grow and keep the body in constant fit. Body requires energy for its various activities such as running, jumping, walking and other kind of manual labour. The part of the food is converted into energy that is required to do work and during the production of energy heat is also created which keeps the body warm. So, food is a substance that is very nutritious and satisfies our hunger. So all living beings need food for their growth. Important purpose served by food is that it provides materials used by the body for generation of heat and energy. Food is divided into two classes a) Animal food b) Vegetable food. Plants can prepare their own food from raw materials, e.g. carbon di oxide, water in the presence of sunlight and chlorophyll. So, all green plants are known as Autotrophs where as animas can not prepare their own food. They have to depend on green plants. So, all animals are regarded as Hetrotrophs.

MODEL ANSWERS

Ans 1
a) Food is a substance that is nutritious and satisfies hunger.
b) Pulses, Bread, butter, Fish
c) Following are the important function of food in our body –
   i) Food provides energy
   ii) Food helps in growth and development
   iii) Food helps to overcome wear and tear
   iv) Food helps to fight diseases

Ans 2
a) Pulses, Rice, Bread
b) Eggs, Meat, Chicken biryani
c) True
d) False
Ans 3
a) Autotrophs are the green plants that can prepare their own food.
b)
i) False
ii) True
iii) False
c) Hetrotrophs are the animals that can’t prepare their own food and have to be dependent directly or indirectly on green plants.
d)
i) False
ii) True
iii) False

KEY TERMS
- **Food** is a substance that is nutritious and satisfies hunger.
- **Autotrophs** are the green plants that can prepare their own food.
- **Hetrotrophs** are the animals that can’t prepare their own food and have to be dependent directly or indirectly on green plants.