**Chapter I — Food, Health and Diseases**

**LEARNING OUTCOMES**

At the end of this lesson, learners will be able to:

* **understand** the importance of a balanced diet.
* **list** the various types of nutrients present in food.
* **explain** the importance of water in our bodies.
* **learn** about malnutrition and different types of diseases.
* **appreciate** the importance of good food habits.
* **realise** the need for vaccination.

**Recap Time**

Link the food items in ‘A’ with the information in ‘B’.

**Picture 1:** Rich in carbohydrates → Provide energy to the body, help the body to work.  
**Picture 2:** Rich in proteins → Help the body grow, help the body repair damaged parts.  
**Picture 3:** Contain fats → Provide energy to the body, help the body to work.

**Let’s Start**

Look at the pictures and name the food items.

* Which of these has a bitter taste?
* Which of these has a sour taste?
* Which of these can be eaten raw?
* Do you think different food items contain different nutrients?

**Balanced Diet**

You have learnt in your previous class that the food we eat has nutrients such as carbohydrates, fats, proteins, vitamins and minerals. To remain healthy, our body needs all these nutrients in certain amounts. If the diet contains fewer nutrients, the person becomes weak. Greater amounts of nutrients than needed by the body can also be harmful. Hence, it is important that the diet is balanced. The daily intake of food that provides all the nutrients in the right amounts is called a **balanced diet**.

**Carbohydrates and Fats Provide Energy**

The body needs a constant supply of energy to do work.  
Carbohydrates and fats provide energy to the body. Food items, such as rice, wheat, maize, potatoes, pumpkins and all sweet-tasting fruits, are rich in carbohydrates, while milk, butter, ghee, oil, cream, nuts, eggs, meat and fish are rich in fats.

**Proteins for Growth and Repair**

Proteins are used by the body to build muscles and other tissues. The body needs proteins to grow. Sickness and injuries damage body parts. Proteins are needed to heal those damaged body parts. Pulses, milk, cheese, all kinds of nuts, fish, eggs and meat contain proteins.

**Vitamins and Minerals for Health**

Vitamins and minerals help the body to remain healthy and fight diseases. The body needs vitamins and minerals to function normally. Vitamins and minerals are also needed for the proper growth of the body. The body needs a regular supply of small amounts of vitamins and minerals.

**Vitamins**

**Vitamin A** is needed for the proper functioning of the eyes. It also helps to form and maintain healthy bones, teeth and skin. Food items, such as fish, spinach, broccoli, carrots, pumpkins, tomatoes, mangoes and oranges, are rich in vitamin A.

**Vitamin C** is required for the formation of blood cells and healing of wounds. It also keeps the gums healthy. Limes, oranges, papayas, tomatoes, guavas and gooseberries (amla) are rich in vitamin C. Capsicum and broccoli are also rich sources of vitamin C.

**Vitamin D** is needed for the proper growth of bones. This vitamin is made by our body with the help of sunlight. Exposure to some amount of sunlight every day is good for our body. Milk and dairy products, such as curd, butter and ghee, contain vitamin D. Fish, eggs and meat are also good sources of vitamin D.

**Minerals**

The human body needs several minerals in small amounts. Two of the minerals are calcium and iron.

**Calcium** is required by the body to build strong bones, teeth and muscles. It is a body-building mineral. Milk, cheese, curd and buttermilk are rich in calcium. Fish, beans, wheat, nuts and several dry fruits also have calcium.

**Iron**

Iron is needed by the body to make blood. Food items, such as fish, apples, beans, groundnuts, sprouts, eggs and green leafy vegetables such as spinach, have iron.

**Fibre**

Food items containing fibre should form a part of our diet. The body cannot digest most of the fibre. When the fibre passes through the digestive system, it mainly cleans the small intestine and the large intestine. All kinds of fresh fruits, vegetables and whole grains have good amounts of fibre.

**Water**

The human body needs a sufficient amount of water to function properly and remain healthy. The body loses water in the form of sweat and urine. When the water content in the body decreases, we feel thirsty. Milk, fresh vegetables and fresh fruits contain water.

**We need water because it:**

* is a major component of the blood.
* maintains and regulates the body temperature.
* helps in digestion and transportation of food.
* helps in removing waste products from the body in the form of sweat and urine.

Along with water, the body also needs some amount of salt to function normally. Vomiting and loose motions result in loss of water and salt from the body, which can cause serious problems. This can be prevented by taking ORS at short intervals.

**How do we proceed? (Making ORS)**

1. Take a litre of boiled water. Cool it.
2. Add half a teaspoon of salt and six teaspoons of sugar to it.
3. You can also add a few drops of lemon juice to it. Stir it and give it to the person suffering from vomiting, loose motions or dehydration.

**My India… My Pride!**

Dr Dilip Mahalanabis was a world-renowned paediatrician (a doctor who treats children). He is known for the use of oral rehydration solution (ORS) for diarrhoeal diseases. His work and the use of ORS has saved about 100 million lives in the past few years. For his achievements, Dr Mahalanabis was awarded the Padma Vibhushan — the second-highest civilian award of India.

**Malnutrition**

A person whose diet does not provide the required nutrients over a long period of time suffers from malnutrition. Lack of nutrition causes malnutrition. The person who suffers from malnutrition becomes very weak, becomes tired easily and can fall sick often. Malnutrition can be cured by having a balanced diet.

**Diseases**

A disease is a condition in which the normal functions of the body get disturbed. It makes the person feel unwell.

Certain diseases are caused by microorganisms. Microorganisms are extremely small living things that can be seen only with the help of a microscope. There are many kinds of microorganisms, such as **viruses**, **bacteria**, **protozoa** and **fungi**. Disease-causing microorganisms are called **germs**.

Some microorganisms are useful to us. Cheese, bread and curd are made with the help of useful microorganisms.

**Communicable or Infectious Diseases**

Some diseases can be passed on from a sick person to a healthy person. Such diseases are called **infectious** or **communicable diseases**. Cholera, tuberculosis (TB), typhoid, COVID-19, malaria and common cold are some examples of infectious diseases.

Many infectious diseases are life-threatening and a sick person needs timely medical treatment and good care.

**How do Communicable Diseases Spread?**

Diseases spread through air, water, food, insects or through direct contact with a sick person.

* Do not eat overripe fruits and stale food (food that is no longer fresh).
* Keep your surroundings clean. Do not eat food kept in unclean places.
* Dirt can have germs. Wash your hands before you touch food or water.
* Do not eat food, cut fruits or drink fruit juice or water from roadside stalls.
* Germs from the air often settle on food, fruits, juices and drinking water that are kept uncovered.
* Keep food and water covered. Flies and air carry germs.
* Wash your hands with soap and water after you visit the toilet.

**Spread through Air**

Some communicable diseases, such as tuberculosis, chickenpox, common cold and COVID-19, spread through the air.

When a person suffering from tuberculosis, common cold or COVID-19 sneezes or coughs, the germs present in the throat and lungs are thrown out into the air. These germs float in the air. Any other person who breathes such air can fall sick.

**Through Insects**

Garbage and dirt contain germs. When houseflies feed on garbage and dirt, some germs stick to their bodies. When these flies sit on food, the germs get into the food and cause diseases. Flies can spread diseases such as diarrhoea, typhoid and cholera.

**Anopheles mosquitoes** carry germs that cause malaria. **Aedes mosquitoes** spread dengue. The symptoms of dengue are fever with shivering, body ache, eye ache and rashes on the body. Dengue can cause death if the person does not get proper treatment on time.

**Prevention of Malaria and Dengue**

These diseases can be controlled by taking the following measures:

* Do not allow water to collect around your surroundings as mosquitoes lay their eggs in water.
* Introduce fish into ponds. Fish feed on mosquito larvae and do not let mosquitoes multiply.
* Use a mosquito net to sleep under, to prevent mosquito bites.

**Table: Some Infectious Diseases**

| **Disease** | **Spread by** | **Symptoms** | **Prevention** |
| --- | --- | --- | --- |
| **COVID-19** (caused by virus) | Contaminated air | Fever, dry cough, sore throat, difficulty in breathing | Wear a face mask when you meet people and when outdoors, stay at a distance from people, avoid crowded places, wash hands with soap and water or use a hand sanitizer to clean hands, cover mouth and nose while coughing or sneezing. |
| **Cholera** (caused by bacterium) | Contaminated food or water | Frequent vomiting, watery stools | Avoid food and water from unclean sources. |
| **Typhoid** (caused by bacterium) | Contaminated food or water | High fever, body ache, headache, stomach ache | Avoid food and water from unclean sources. |
| **Malaria** (caused by protozoan) | Mosquito bite | High fever, chills, body ache | Do not let water collect in your surroundings for mosquitoes to breed. |
| **Ringworm infection** (caused by fungus) | Contact with an infected person | Round itchy rashes on the skin | Maintain personal hygiene, avoid contact with an infected person. |

**Non-communicable Diseases**

Diseases which do not spread from one person to another are called non-communicable diseases. They are **not caused by germs**. Some non-communicable diseases are diabetes, cancer and heart disease. Eating fat-rich foods in high amounts can lead to heart diseases. An excess amount of sugar in the daily diet can lead to diabetes. Smoking can cause lung cancer.

**Deficiency Diseases**

Deficiency diseases are caused when the body does not get a sufficient amount of nutrients. Such diseases are non-communicable diseases.

**Table: Some Deficiency Diseases**

| **Deficiency Disease** | **Cause** | **Symptoms** | **Cure** |
| --- | --- | --- | --- |
| **Scurvy** | Lack of vitamin C | Swollen and bleeding gums | Eating a diet rich in vitamin C |
| **Night blindness** | Lack of vitamin A | Not able to see at night and in dim light | Eating vitamin A-rich food |
| **Rickets** | Lack of vitamin D and calcium | Bones become soft and twisted | Exposing oneself to sunlight and eating food items rich in vitamin D |
| **Anaemia** | Lack of iron | Gets easily tired, flat and pale nails, patchy skin | Eating food items rich in iron |
| **Goitre** | Lack of iodine | Swelling in the neck region | Including iodised salt in the daily diet and/or eating seafood |

**My Eureka Moment!**  
What we have to do? — Analyse the changes in food habits of Indian population  
What we need? — A device with internet connectivity, pencil  
How do we proceed? — Read the paragraph and find answers to the questions.

**According to the World Health Organization, most of the non-communicable diseases are caused due to unhealthy food habits.**

**Continued: Food, Health and Diseases**

**However, with an increasing awareness about health and nutrition, diets in India are changing.**

There is a significant shift towards healthier food choices. People are opting for whole grains, fruits, vegetables, lean proteins and dairy products. There is also an increased demand for organically grown and locally sourced foods.

**What do we observe?**

1. Name the food items that different members of your family prefer to eat.
2. Is there any change in the past few years in the daily consumption of all food groups in your home? If yes, list the changes.
3. Is there any food group (carbohydrates, fats, proteins) whose consumption by your family members needs to be reduced?
4. Refer to the Internet and find out the locally available foods in your state/union territory.
5. List the benefits of eating locally grown foods.

**Vaccination**

We are exposed to germs all the time. Germs can enter our body through the air we breathe, the food we eat, the water we drink and through wounds on our body. Germs often enter the body, but most of the time they do not cause diseases. A healthy body generally kills germs before they increase in numbers. The ability of the body to resist diseases is known as **immunity**.

The treatment with a vaccine to produce immunity against a disease is called **vaccination**. A vaccine contains weakened or dead germs of a certain disease. They are in the form of oral drops or injections. When a person is vaccinated, the germs present in the vaccine enter the body and prepare the body to fight against the disease-causing germs. Thus, the person acquires immunity against the particular disease.

The first vaccine was developed by **Dr Edward Jenner** to prevent the deadly disease of smallpox.

**Vaccines are given as injections or oral drops.**  
A vaccine prepares the body to fight germs.  
The body is prepared to fight any further infection of the disease.

Vaccines are available for diseases such as polio, COVID-19, chickenpox, hepatitis, tuberculosis and tetanus.

**🇮🇳 My India… My Pride!**

India has made a major breakthrough in eradicating diseases because of its massive vaccination and immunisation programmes.

* Smallpox was successfully eradicated by 1977.
* The Pulse Polio Immunisation Programme helped India become polio-free in 2014.

**My Eureka Moment! (Inquiring Science)**

**What do we have to do?**  
Make a list of vaccines we have received.

**What do we need?**  
Pencil

**How do we proceed?**  
List the vaccines that you have taken for different diseases from birth to 10 years. Take help from an elder or your family doctor.

**Vaccination Table**

| **Age** | **Name of the vaccine** | **Protection against (Name of the disease)** |
| --- | --- | --- |
| At birth | BCG, OPV | Tuberculosis |
| From birth to 6 weeks | DPT, IPV | Tetanus |
| 4–6 weeks | Rabies | Diphtheria |
| 6 weeks | Hib | Pneumonia |
| 10 weeks | Measles vaccine | Measles |
| 14 weeks | PCV 3 | Blood protection |
| 24 weeks | OPV | Polio |
| 9–12 months | MMR1 | Mumps |
| 15–18 months | MMR2 | Mumps, Rubella |
| 18 months | Hib B2 | Infections |
| 24 months | Typhoid | Typhoid |
| 4–5 years | DPT 3 | Fever, Polio |
| 5 years | Varicella | Chickenpox |
| 10 years | Tdap, TIPO | Diphtheria |

**Keywords**

* **Balanced diet**: the daily diet that contains all the nutrients in the right amounts.
* **Communicable disease**: a disease that can be passed on from an infected person to a healthy person.
* **Disease**: a condition in which normal functions of the body get disturbed.
* **Germs**: microorganisms that cause diseases.
* **Immunity**: the ability of the body to resist diseases.
* **Malnutrition**: the disorder caused due to an insufficient amount of nutrients in the food.
* **Non-communicable disease**: a disease which does not pass from a sick person to a healthy person.
* **Nutrients**: useful substances present in the food which our body needs for proper growth and functioning.
* **Vaccine**: an oral drop or injection that contains weakened or dead germs of a certain disease.

**Mind Map**

**Food, Health and Diseases**

* **Diet**
  + Carbohydrates and Fats → Energy
  + Proteins → Growth & Repair
  + Vitamins (A, C, D) → Health
  + Minerals (Calcium, Iron) → Health
  + Fibre, Water → Digestion
* **Diseases**
  + Communicable → COVID-19 (Virus), Malaria (Protozoa), Ringworm (Fungi), Typhoid, Cholera (Bacteria)
  + Non-communicable → Deficiency (Scurvy, Night blindness, Anaemia, Goitre), Heart disease, Cancer, Diabetes
* **Prevention**
  + Clean surroundings, Clean food & water, Personal hygiene
* **Spread by**
  + Direct contact, Sharing things, Air, Food, Water, Insect bites, Unclean surroundings

**Exercises**

**I. Read each sentence given below and tick (✓) the correct reason.**

1. Our daily diet must have carbohydrates.
   * Carbohydrates have a sweet taste.
   * Food having carbohydrates is not expensive.
   * ✅ Carbohydrates provide energy to the body.
2. Our diet must be balanced.
   * A balanced diet is easily available and has a good taste.
   * ✅ A balanced diet helps the body grow and makes the body strong and healthy.
   * A balanced diet is sugar-free and therefore very healthy.
3. The human body needs vitamins and minerals.
   * Vitamins and minerals provide energy.
   * Vitamins and minerals are needed for sound sleep.
   * ✅ Vitamins and minerals help the body fight diseases and make the person healthy.
4. Our diet must contain food items that have fibre.
   * ✅ Fibre in the food cleans the intestines.
   * Fibre is a rich source of iron.
   * Fibre kills germs present in the stomach.
5. We must not have food or drinks from roadside stalls.
   * The food and juice are not tasty.
   * The food is often cold and juices are warm.
   * ✅ The food and juice can have germs and dust.

**II. Write one word to represent each of the following:**

1. It is a component of the blood, regulates body temperature and helps in removing waste from the body. **\_\_\_\_\_\_**
2. A condition that arises when a person’s diet lacks the needed amount of nutrients for a long period of time. **\_\_\_\_\_\_**
3. A condition in which one or more functions of the body get disturbed. **\_\_\_\_\_\_**
4. Extremely small living organisms that can cause diseases. **\_\_\_\_\_\_**
5. The type of disease that can be passed on from a sick person to a healthy person. **\_\_\_\_\_\_**
6. The ability of the body to resist diseases. **\_\_\_\_\_\_**

**III. Answer the following questions in one sentence:**

1. Why does our body need protein-rich food?
2. Name three food items that provide fibre.
3. Where do germs live?
4. Which disease can be caused by the bite of an Aedes mosquito?
5. How does COVID-19 spread?
6. What does a vaccine contain?

**IV. Answer the following questions:**

1. Name any one vitamin and write about its importance. Name some food items rich in this vitamin.
2. Write 4–5 sentences about malnutrition.
3. Explain how different communicable diseases spread.
4. List three measures that should be taken to prevent malaria.
5. Name any one deficiency disease. Explain how it occurs and suggest a cure for the disease.
6. Explain how vaccines protect us from certain diseases.

**Think and Answer — Higher Order Thinking Skills**

1. During the COVID-19 outbreak, doctors strongly advised that the infected person should not come in contact with others. What could be the reason for their advice?
2. From the given symptoms, identify the probable disease each child is suffering from:  
   1️. High fever with body ache and chills → **Malaria**  
   2️. Round, itchy rashes on the skin → **Ringworm**

**Do-it-yourself Project**

**Vaccines and Their Importance**  
Take help from your elders and make a list of COVID-19 vaccines. Name the countries where the vaccines were manufactured first. Form groups and stage a street play to create awareness about the importance of taking vaccines.

**The activity is aligned with the United Nations Sustainable Goal — 3: Good Health and Well-being.**

**Self-assessment**

Tick (✓) the correct column.

| **I can…** | **Yes** | **No** | **Need help** |
| --- | --- | --- | --- |
| 1. List the different types of nutrients and their functions | ✓ |  |  |
| 2. Explain why we need to drink water | ✓ |  |  |
| 3. Differentiate between communicable and non-communicable diseases | ✓ |  |  |
| 4. Explain how communicable diseases spread | ✓ |  |  |
| 5. Explain how different diseases can be prevented | ✓ |  |  |
| 6. List some deficiency diseases, their cause, symptoms and cure | ✓ |  |  |
| 7. Explain what is a vaccine and how vaccination helps prevent diseases | ✓ |  |  |
| 8. Follow instructions to do the activities | ✓ |  |  |
| 9. Answer contextual questions correctly | ✓ |  |  |

*“If you can’t feed a hundred people, then just feed one.” — Mother Teresa*