5 The World of Microbes

LESSON PLAN

SPECIFIC OBJECTIVES

The students learn about

- microbes, their types and how they are studied
- useful and harmful microbes
- protection from harmful microbes
- protection of food from microbes

TEACHING AIDS

Picture/specimen of a microscope; Pictures of different types of bacteria, viruses; Picture/animation on *Amoeba*/*Paramecium*; Picture/animation/samples of mushrooms; Picture/video/animation on fermenting food and curd/dosa/idli/dhokla, etc.; Pictures of persons suffering from bacterial/viral diseases; Pictures/animation showing some good habits of cleanliness (as given in chapter); Picture/animation showing food kept in refrigerator, in sunshine, in airtight tins/cans; Pictures of jams/pickles

LESSON PLAN

- Teacher will start the chapter with 'Warm Up' section by asking simple questions on the diseases and germs, based on the previous knowledge of students.
- Now, teacher will define about microbes and with the help of teaching aids will describe that they are seen only with the help of a microscope.
- With the help of different teaching aids, teacher will define different groups of microbes and the disease they cause:
  - Bacteria are present everywhere and are found in round, spiral, rod and comma-like shapes.
  - Viruses are smaller than bacteria and cannot be seen with naked eye. They are neither living nor nonliving. They cause many diseases.
  - Protozoa are one-celled animals. They live in soil, water and some of them live as parasites.
  - Fungi are non-green plants. They cannot make their food, hence take it from dead and rotting animals and plants.
- Now, teacher will describe that some microbes are useful to us and show the pictures/samples of things made with the help of useful microbes.
- Now to check the understanding of students about the topics, teacher will ask them to solve 'Checkpoint 1'.
- Now, teacher will explain that some microbes are harmful to us. They are called germs. By showing the pictures of patients suffering from different bacterial and viral diseases, teacher will explain that these diseases are caused by microbes.
- With the help of teaching aids, teacher will define the ways to get protection from harmful microbes (as given in chapter).

- ✧ Teacher will explain that microbes also harm our food by spoiling it. With the help of different teaching aids, teacher will explain the ways to save the food from microbes (as given in chapter). The food can be protected from spoilage by
  - ◗ Keeping it in refrigerator as low temperature slows down the growth of microbes.
  - ◗ Heating it, a high temperature inactivates and kills microbes.
  - ◗ Dehydration, as it does not allow microbes to grow.
  - ◗ Canning which is sealing of food in a container. It saves food from microbes.
  - ◗ Adding too much of sugar (jams, jellies) or salt (pickles) to food does not allow microbes to grow.
- ✧ Now, teacher will ask the students to solve 'Checkpoint 2'.
- ✧ The teacher will sum up the chapter by going through the points given under the head 'At One Go'.
- ✧ Finally, the teacher will help students to solve all the exercises given under the head 'Check Your Study'.

BOOST UP

- ✧ Teacher can show curd-making *Lactobacillus* bacteria using a permanent slide and a microscope.
- ✧ Teacher should explain that microbes also spoil our leather articles, woollen clothes, etc. Therefore, these articles are kept in sunlight before storage.
- ✧ Teacher should explain that most of the mushrooms are poisonous. So all mushrooms are not edible.

EXPECTED LEARNING OUTCOMES

The students know about

- ✧ microbes, their types and use of microscope in the study of microbes.
- ✧ useful and harmful microbes.
- ✧ ways to protect human body from harmful microbes.
- ✧ know about ways to protect food from harmful microbes.

EVALUATIVE QUESTIONS

The teacher may ask the following questions for evaluating learning and understanding of students:

1. What are microbes?
2. What is a microscope?
3. Why can we not see bacteria and viruses with naked eye?
4. Why are protozoa called single-celled organisms?
5. What are non-green plants called?
6. Name a useful fungi.
7. How is curd made?
8. What are germs?
9. Which microbes cause common cold to us?
10. How does freezing save food from microbes?
11. How does dehydration save food?
12. What is canning of food?