

# 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 lesson with ‘Science Vocabulary’ section by telling the meaning/definition of new terms which are used in the chapter.
- ✧ Now, teacher will define about microbes and with the help of teaching aids will describe that microbes are seen only with the help of a microscope.
- ✧ With the help of different teaching aids, teacher will define different types of microbes.
  - ▶ **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 non-living. 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 'Check Point 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).
- ✧ Now, teacher will ask the students to solve 'Check Point 2'.
- ✧ The teacher will sum up the chapter by going through the points given under the head 'Wrapping it up'.
- ✧ Finally, the teacher will help students to solve all the questions given in the 'Exercises'.

### **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?