

Lesson Plan 2
Class – VIII
Subject: Science
Topic: Microorganisms

KPI DEFINITION ADDRESSED TO THE LESSON PLAN

KPI 1- To strengthen in- depth understanding of some complex scientific concepts

KPI 5- Application of scientific concepts in doing experiments

KPI 6- Promoting analytical thinking in order to establish connectivity with the real world situation and compare the different physical quantities.

KPI 4 -Encourage maximum participation of students in activities and classroom discussions.

TOPIC- Heat

START DATE-

| KNOWLEDGE | UNDERSTANDING | APPLICATION | ANALYSIS | SYNTYHSIS | EVALUATION |
|-----------|----------------------|-------------|----------|-----------|------------|
| S 3, 7 | S 1, 2, 4,5, 8 | S 6 | | | |
| | | B 1, 2, 3 | B 4, 5, | | |
| Act 1 | Act 2, 3, 5, 6, 7, 8 | Act 4 | | | |
| | | | | As 1, 2 | |
| | | | | | |
| | | | | | |

Brief Description of the lesson: This topic emphasizes on the different categories of microorganisms, their uses in various aspects of life and their harmful effects like spoiling food, causing infections/diseases in plants and animals. It also briefly explains the structure of micro organisms with the help of various examples, it also explain the various methods of preservation of food and names and roles of various preservatives.

UN Sustainable Goals to be achieved (if any): Goal 12- Responsible goal and consumption, Goal 15-Life on land.

Objectives:

I - Specific Objectives

To enable the students to-

- 1) Categorize a the various micro organisms into different groups on the basis of their characteristics..(Comparing-U)
- 2) Differentiate between pathogens and micro-organisms. (Comparing-U) **KPI 1**
- 3) Recall the condition required for the growth of micro-organisms and pathogens. (Recalling- K)
- 4) Comprehend about the different methods of food preservation. (Explaining-U) **KPI 1**
- 5) Explain the structural organization of various micro-organisms. (Explaining-U)
KPI 1
- 6) Know where the different micro-organisms are found. (Executing-Ap) **KPI 5**

II - Behavioral Objectives

To enable the students to-

- 1) Practicing the diagrams of various micro-organisms. (Executing-Ap) **KPI 5**
- 2) Implement smart techniques for maintaining the proper health and keeping ourself safe from various diseases.
- 3) Select suitable materials slide to observe the various micro-organisms .(Differentiating- An) **KPI 6**
- 4) Correlate the different ways of food preservation in different parts of the world .(Organizing- An) **KPI 6**

Process / Activities

Activity (to introduce the lesson)

Warm up activity

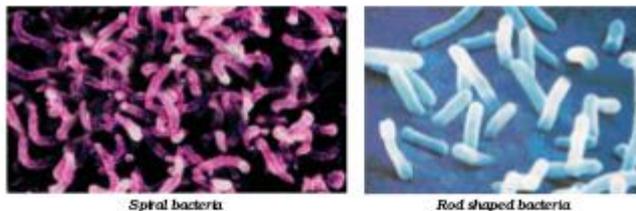
Activity 1- Observing the water (from a pit). (Recalling-K)

- (i) Collect some moist soil from the field in a beaker and add water to it. After soil particles have settled, observe a drop of water from the beaker under a microscope. What do you see ?
- (ii) Take a few drops of water from a pond. Spread on a glass slide and observe through a microscope.

Probing questions:

1. Do you observe any small organism under microscope?
2. Can you identify the organisms?
3. Can you see them without the help of microscope?

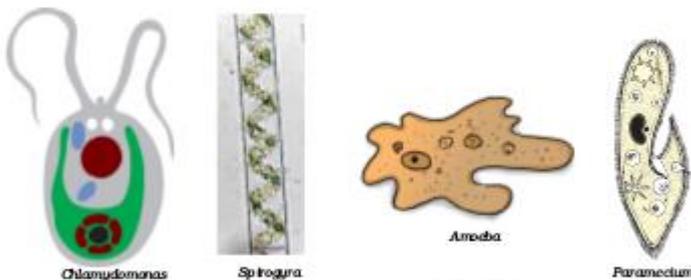
The concept of micro-organisms will be introduced.



Spiral bacteria

Rod shaped bacteria

Fig. 2.1: Bacteria



Chlamydomonas

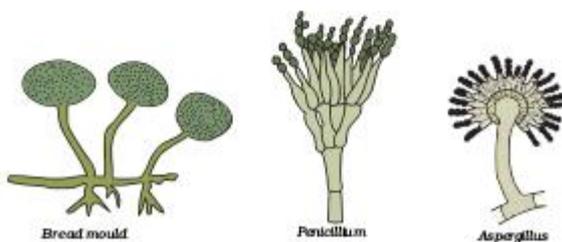
Spirogyra

Amoeba

Paramecium

Fig. 2.2 : Algae

Fig. 2.3 : Protozoa



Bread mould

Penicillium

Aspergillus

Fig. 2.4: Fungi

Difference between heat and temperature

Activity 2- To the dough for pizza (Inferring-U) **KPI 1**

Take ½ kg flour (atta or maida), add some sugar and mix with warm water. Add a small amount of yeast powder and knead to make a soft dough. What do you observe after two hours? Did you find the dough rising?



The activity will enable the students to understand the role friendly role of micro-organisms .

Activity 3: Demonstration of process of fermentation. (explaining-U)

Take a 500 mL beaker filled upto $\frac{3}{4}$ with water. Dissolve 2-3 teaspoons of sugar in it. Add half a spoon of yeast powder to the sugar solution. Keep it covered in a warm place for 4-5 hours. Now smell the solution. Could you get a smell? **KPI 1**

Skills: Analysis, Observation

Explanation by the mentor about the formation of alcohol due to the process of fermentation.

Activity 4: Take two pots and fill each pot half with soil. Mark them A and B. Put plant waste in pot A and things like polythene bags, empty glass bottles and broken plastic toys in pot B. Put the pots aside. Observe them after 3-4 weeks.

Do you find any difference in the contents of the two pots? If so, what is the difference? You will find that plant waste in pot A, has been decomposed. How could this happen? The plant waste has been converted into manure by the action of microbes. The nutrients released in the process could be used by the plants again.

Did you notice that in pot B, the polythene bags, empty glasses, bottles and broken toy parts did not undergo any such change? The microbes could not 'act' on them and convert them into manure.

You often see large amounts of dead organic matter in the form of decaying plants and sometimes dead animals on the ground. You find that they disappear after some time. This is because the microorganisms decompose dead organic waste of plants and animals converting them into simple substances. These substances are again used by other plants and animals. Thus, microorganisms can be used to degrade the harmful and smelly substances and thereby clean up the environment.

. (Executing-Ap) **KPI 5**

Activity 5: The diseases caused by various microorganisms in plants and animals.

<https://youtu.be/baXrXgBcVsg>**KPI 1**

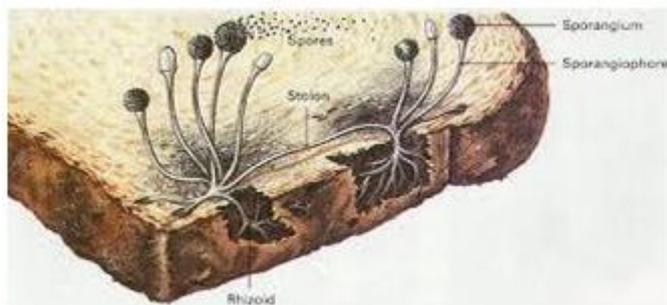
Activity 6 : To demonstrate the various methods of food preservation:

- Observing boiling of milk
- Preparation of pickles

- Freezing of food items.
- Observing pasteurized milk
- Dehydration of food materials like grains, pulses at home.

<https://youtu.be/18vbNJuzhx8>

Activity 7 To grow fungus on the bread and observe it under micro-organisms
Students will learn about the climatic conditions required for the growth of microorganisms.



Digital Content to be used:

Video demonstration on categories of microorganisms <https://youtu.be/JZjzQhFG6Ec>

Video showing method of food preservation <https://youtu.be/le41MA9OnVU>

Video showing harmful effects of pathogens <https://youtu.be/4-gFSuvUFE>

Video showing the summary of the chapter <https://youtu.be/qO8uyBXY4vo>

Expected Learning Outcomes

Students will be able to

1. Know about the condition for the growth of microorganisms. (Recalling-K)
3. Identify the various modes of transfer of microorganisms. (Recognizing-K)
4. Compare the different types of microorganisms.(Differentiating-An)
5. Select the various methods for the food preservation.(Checking-Ev)
4. Appreciate the use of microorganisms for making medicines and vaccines. (Executing-Ap)
5. Use of microorganisms for various purposes like making batter and dough for various food items (Executing-Ap)

Assessment Activity:

1. Group Activity: Making comparative chart of various microorganisms including their examples, uses and harmful effects

Parametres of Chart making (Visual and Performing arts) (Producing-SY)

| | 4 | 3 | 2 | 1 |
|-------------------|--|--|--|---|
| Visual Appearance | Appropriate content was selected. They were creatively portrayed in ways that enhanced understanding about the subject matter. | Appropriate content was selected. There was an attempt to use materials in a creative way. | Most content selected were appropriate. Not much clear with the basic requirement. | Inappropriate content was selected. Lacking in pre-requisite knowledge. |

| | | | | |
|--------------------------|--|---|---|--|
| Relevancy | Great care was taken in the chart making process so that the chart is neat and accurate. | Construction was careful and accurate for the most part, but 1-2 details could have been refined for a more attractive product. | Construction demonstrated some effort, but 3-4 details could have been refined for a more attractive product. | Construction appears careless and many details need refinement for a strong or attractive product. |
| Scientific understanding | The student demonstrates a total understanding. | The student demonstrates a proficient understanding. | The student demonstrates a basic understanding. | The student shows a minimal understanding. |

Review of the Lesson Plan: To be done when the lesson gets over

Problems faced –

Success-

Failure-

Real Learning Outcomes-

Students Response / Participation-

Teachers Learning to be added.