

## Lesson Plan

|                                                                                                          |    |       |                                                                                                                                                                                                              |    |                  |  |
|----------------------------------------------------------------------------------------------------------|----|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------|--|
| Std: VIII                                                                                                |    |       | Term: I                                                                                                                                                                                                      |    | Subject: SCIENCE |  |
| <b>Topic:</b> <ul style="list-style-type: none"><li><b>MICROORGANISMS: Friend and Foe</b></li></ul>      |    |       | <b>Sub-topics:</b> <ul style="list-style-type: none"><li>Groups of microorganisms.</li><li>Microorganism as friend.</li><li>Microorganism as foe.</li><li>Food preservation</li><li>Nitrogen cycle</li></ul> |    |                  |  |
| <b>1. Reference Book(s):</b> <ul style="list-style-type: none"><li>NCERT textbook for science.</li></ul> |    |       |                                                                                                                                                                                                              |    |                  |  |
| <b>2. Reference Web site(s):</b>                                                                         |    |       |                                                                                                                                                                                                              |    |                  |  |
| <b>3. Technology:</b>                                                                                    |    |       |                                                                                                                                                                                                              |    |                  |  |
| PPT                                                                                                      | 1  | Video |                                                                                                                                                                                                              |    |                  |  |
| <b>4. Other Teaching Aids:</b>                                                                           |    |       |                                                                                                                                                                                                              |    |                  |  |
| Class work sheet                                                                                         | -- |       | Graphic organizer                                                                                                                                                                                            | -- |                  |  |
| <b>5. Extra:</b>                                                                                         |    |       |                                                                                                                                                                                                              |    |                  |  |
| Charts, permanent slides of some microorganisms such as bacteria, protozoa etc.                          |    |       |                                                                                                                                                                                                              |    |                  |  |

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| <b>Period 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Duration: 35 minutes</b>    |
| <b>Sub-topics</b> <ul style="list-style-type: none"> <li>Groups of microorganisms.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                |                                |
| <b>Learning outcome(s):</b> <ul style="list-style-type: none"> <li>Students will be able to classify different types of microorganism.</li> <li>Student will be able to identify different group of microorganism by their structure.</li> <li>Student will be able to differentiate between different microorganisms.</li> <li>Student will know and understand living place of different types of microorganisms.</li> <li>Student will be able to conduct experiments to reason out the facts.</li> </ul> |                                |
| <b>Key Vocabulary:</b> <ul style="list-style-type: none"> <li>Microorganisms</li> <li>Algae</li> <li>Fungi</li> <li>Bacteria</li> <li>Protozoa</li> <li>Virus</li> <li>Unicellular</li> <li>Multicellular</li> </ul>                                                                                                                                                                                                                                                                                         |                                |
| <b>Skills Developed:</b> Observation and recording, Identification and classification, Experimentation                                                                                                                                                                                                                                                                                                                                                                                                       |                                |
| <b>Opening/set induction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Duration: 5-6 minutes</b>   |
| <b>Opening Strategy(ies):</b> <p>Sample of moist soil from the field of Vidyalaya in a beaker are collected and some water is added to it. Also, some stagnant water or pond water are collected and a drop of water from each is observed under microscope. Their observation will be followed by some question such as:</p> <ol style="list-style-type: none"> <li>What did you see?</li> <li>Do you find any tiny organisms moving around?</li> <li>Do all the organisms looks alike?</li> </ol>          |                                |
| <b>Link Statement:</b> <p>These tiny organisms are called microorganism which are so small in size that they cannot be seen with the unaided eye. So let us know more about these microorganisms.</p>                                                                                                                                                                                                                                                                                                        |                                |
| <b>Instructional Methodology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Duration: 15-18 minutes</b> |

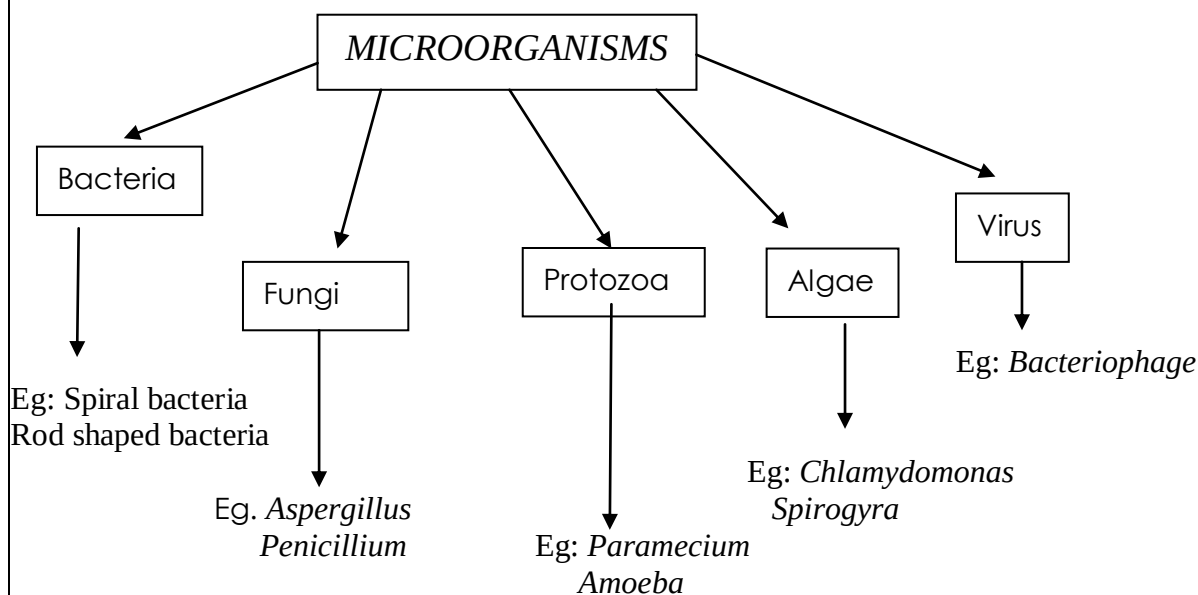
### Teaching Strategy (ies):

### Explanation Discussion:

- What are the different groups of microorganism?  
(i.e, discussion on Bacteria, Fungi, Protozoa, Algae and Virus)
- Where does Microorganism live/found?

### Tr. explains:

- Different groups of microorganisms are:



- Show different types of microorganism under microscope and draw the structures teacher discuss their specific characteristics.
- Microorganism can be found under all type of environment from ice cold climate to hot spring climate and desert to marshy land.

### Closure

**Duration: 5 minutes**

### Closure strategy (ies) : Verification – Think and Answer

- What are the major groups of microorganism?
- Observe the picture and name these microorganism:



- What is the main characteristics of virus.

### Assignment

- Can microorganisms be seen with the naked eye? If not, how can they be seen?
- Where does microorganisms are found?

Teacher's Notes:

**Teacher's Log for Period 1**

Work Actually completed:

Challenges faced during lesson:

Recommended changes to lesson plan:

Work carried forward:

Reason for above:

Learning achieved:

☐

upto expectation

☐

beyond expectation

☐

below expectation

All of my students can:

Most of my students can:

Some of my students can:

Few of my students can:

Teacher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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| <b>Period 2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Duration: 35 minutes</b>    |
| <b>Sub-topics</b> <ul style="list-style-type: none"> <li>• Microorganism as friend.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                |
| <b>Learning outcome(s):</b> <ul style="list-style-type: none"> <li>• Students will be able to explain and understand the uses of microorganism.</li> <li>• Student will be able to relate microorganism they use in day to day life.</li> <li>• Student will be able to differentiate and analyze the bacteria which are useful in household purposes.</li> <li>• Student will appreciate the importance of microorganisms.</li> <li>• Student will understand the importance of vaccination and identify different vaccine for different diseases.</li> </ul> |                                |
| <b>Key Vocabulary:</b> <ul style="list-style-type: none"> <li>• Soil fertility</li> <li>• <i>Lactobacillus</i></li> <li>• Fermentation</li> <li>• Antibiotics</li> <li>• Antibodies</li> <li>• Vaccination</li> </ul>                                                                                                                                                                                                                                                                                                                                          |                                |
| <b>Skills Developed: Understanding, Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |
| <b>Opening/set induction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Duration: 5-6 minutes</b>   |
| <b>Opening Strategy(ies): Recapitulation</b> <p>Teacher asks the following questions:</p> <ul style="list-style-type: none"> <li>• Where do we use microorganism at your home?</li> <li>• How do you prepare card?</li> </ul>                                                                                                                                                                                                                                                                                                                                  |                                |
| <b>Link Statement:</b> <p>Till now we know that microorganisms causes many diseases. But many microorganisms are there which help in production of many food items. Do you want to know how microorganisms are helpful for us?</p>                                                                                                                                                                                                                                                                                                                             |                                |
| <b>Instructional Methodology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Duration: 15-18 minutes</b> |

**Teaching Strategy (ies): Explanation****Tr. explains:**

Teacher explains the usefulness of microorganism. facilitator discuss about household purpose, Commercial purposes, medicinal purposes, agricultural purposes and many other activities of microorganism which make them human's best friends.

**Class Assignment: Writing Work**

Write 5 useful activities of microorganisms.

**Closure****Duration: 5 minutes****Closure strategy (ies) : Think and Answer**

Involving the student to summarize the topic with correct explanation.

Student thinks and discusses the importance of microorganism in our day to day life.

**Assignment**

- What are antibiotics and vaccine?
- Find and write about the great discovery by Louis Pasteur?
- Give reason as to why curd is added to idlis?

Teacher's Notes:

**Teacher's Log for Period 2**

Work Actually completed:

Challenges faced during lesson:

Recommended changes to lesson plan:

Work carried forward:

Reason for above:

Learning achieved:

☐

upto expectation

☐

beyond expectation

☐

below expectation

All of my students can:

Most of my students can:

Some of my students can:

Few of my students can:

Teacher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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| <b>Period 3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Duration: 35 minutes</b>    |
| <b>Sub-topics</b> <ul style="list-style-type: none"> <li>• Microorganism as foe.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                |
| <b>Learning outcome(s):</b> <ul style="list-style-type: none"> <li>• Student will know and understand different diseases caused by microorganisms.</li> <li>• Able to identify different microorganism causes different diseases.</li> <li>• Able to know how microorganism transmits diseases from one organism to another.</li> <li>• Able to analyze the preventive measure of such communicable diseases.</li> <li>• Student get the knowledge that all living things can be infected by microorganisms i.e., plant animals and human beings</li> </ul> |                                |
| <b>Key Vocabulary:</b> <ul style="list-style-type: none"> <li>• Pathogens</li> <li>• Communicable diseases</li> <li>• Carrier</li> <li>• Food poisoning</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                          |                                |
| <b>Skills Developed: Understanding, Identification and recording, Analyse</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |
| <b>Opening/set induction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Duration: 5-6 minutes</b>   |
| <b>Opening Strategy(ies): Recapitulation</b> <ul style="list-style-type: none"> <li>• Teacher asks students to brief all the importance of microorganisms</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                        |                                |
| <b>Link Statement:</b><br><br>We heard that because of presence of microorganisms various diseases may cause. Let us now discuss the harmful effect of microorganism.                                                                                                                                                                                                                                                                                                                                                                                       |                                |
| <b>Instructional Methodology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Duration: 15-18 minutes</b> |

### Teaching Strategy

#### (ies):Explanation Tr. explains:

- Teacher explains the harmful effect of microorganism. Teacher discusses about disease causing microorganism in human and explain the communicable diseases and non-communicable diseases.
- Teacher explains the various ways by which they enter our body and infect.
- Teacher will ask to think and find the preventive measures should be taken for to avoid such diseases.
- Teacher explains disease causing microorganisms in animals and plants.
- Teacher explains that food poisoning occurs due to the consumption of spoilt food by some microorganisms and discuss about food poisoning in detail.
- Further teacher ask the student to discuss the effect of food poisoning.

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| <b>Closure</b>                                                                                                                                                                                                                                                                                       | <b>Duration: 5 minutes</b> |
| <b>Closure strategy (ies) :</b><br>Teacher ask to list out all the adverse effect of microorganism.                                                                                                                                                                                                  |                            |
| <b>Assignment</b>                                                                                                                                                                                                                                                                                    |                            |
| <ul style="list-style-type: none"><li>• Define communicable disease.</li><li>• List out the names of some common diseases caused by infection of different microorganism. Write the name of causal organism also.</li><li>• Write a short paragraph on the harms caused by microorganisms.</li></ul> |                            |

Teacher's Notes:

**Teacher's Log for Period 3**

Work Actually completed:

Challenges faced during lesson:

Recommended changes to lesson plan:

Work carried forward:

Reason for above:

Learning achieved:

☐ upto expectation      ☐ beyond expectation      ☐ below expectation

All of my students can:

Most of my students can:

Some of my students can:

Few of my students can:

Teacher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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| <b>Period 4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Duration: 35 minutes</b>    |
| <b>Sub-topics</b> <ul style="list-style-type: none"> <li>Food preservation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |
| <b>Learning outcome(s):</b> <ul style="list-style-type: none"> <li>Able to understand the reason why food is spoilt.</li> <li>Able to understand how to prevent the attack of microbes.</li> <li>Understand the need of preservation of different food.</li> </ul>                                                                                                                                                                                                                                           |                                |
| <b>Key Vocabulary:</b> <ul style="list-style-type: none"> <li>Food spoilage</li> <li>Preservation</li> <li>Dehydration</li> <li>Pasteurisation</li> <li>Preservatives</li> <li>Gamma</li> </ul>                                                                                                                                                                                                                                                                                                              |                                |
| <b>Skills Developed:</b> Understanding, Analyzing, Experimentation                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |
| <b>Opening/set induction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Duration: 5-6 minutes</b>   |
| <b>Opening Strategy(ies): Recapitulation</b> <p>We know that food poisoning occurs due to the consumption of spoilt food by some microorganisms. Teacher will ask some questions like:</p> <ol style="list-style-type: none"> <li>How microorganism spoils food?</li> <li>How do you know that a food is spoilt?</li> <li>What happens if we take spoilt food?</li> </ol> <p>Now teacher will tell them that there is need to control the spoilage of food which will reduce the wastage of excess food.</p> |                                |
| <b>Link Statement:</b> <p>Let us understand and find out how we can preserve food for future and can control spoilage of food.</p>                                                                                                                                                                                                                                                                                                                                                                           |                                |
| <b>Instructional Methodology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Duration: 15-18 minutes</b> |
| <b>Teaching Strategy (ies):</b><br><b>Explanation:</b> <p>The process of preservation of food from spoilage using suitable chemical or physical methods is called food preservation. Students are ask to discuss the ways they observe at home to preserve different types of food.</p>                                                                                                                                                                                                                      |                                |

**Tr. explains:**

- Various physical methods of food preservation such as drying or dehydration, pasteurization, exposure of high energy gamma rays or X-rays etc.
- Various chemical methods of food preservation i.e., by adding preservatives such as sodium benzoate and sodium metabisulphite, sugar or salt etc.
- Preparation of various food items
- Purpose and need of food preservation.

**Value:**

The major reason and need of food preservation.

**Class Assignment:**

Think and list out different food items prepared for future use.

**Closure****Duration: 5 minutes****Closure strategy (ies) : Discuss**

- Students are encouraged to list out various physical and chemical methods of food preservation

**Assignment**

- What is pasteurization?
- Explain how temperature control helps in the preservation of food?

Teacher's Notes:

**Teacher's Log for Period 4**

Work Actually completed:

Challenges faced during lesson:

Recommended changes to lesson plan:

Work carried forward:

Reason for above:

Learning achieved:

☐ upto expectation    ☐ beyond expectation    ☐ below expectation

All of my students can:

Most of my students can:

Some of my students can:

Few of my students can:

Teacher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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| <b>Period 5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Duration: 35 minutes</b>    |
| <b>Sub-topics</b> <ul style="list-style-type: none"> <li>Nitrogen fixation and nitrogen-Cycle</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |                                |
| <b>Learning outcome(s):</b> <ul style="list-style-type: none"> <li>Student able to know how nitrogen gas is fixed in the soil.</li> <li>Student will understand the nitrogen cycle.</li> <li>Student will be able to draw a flow chart and relate all the process in nitrogen cycle.</li> <li>Student will be able to understand the how nature balance the nitrogen gas in atmosphere.</li> <li>Appreciate the activities occur in naturally to maintain the balance in nature.</li> </ul> |                                |
| <b>Key Vocabulary:</b> <ul style="list-style-type: none"> <li>Nitrogen fixation</li> <li>Nitrogen cycle</li> <li>Symbiotic relationship</li> <li>Leguminous</li> <li><i>Azotobacter</i></li> <li><i>Rhizobium</i></li> <li><i>Anabaena</i></li> <li><i>Nostoc</i></li> </ul>                                                                                                                                                                                                                |                                |
| <b>Skills Developed:</b> Understanding, drawing skill                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |
| <b>Opening/set induction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Duration: 5-6 minutes</b>   |
| <b>Opening Strategy(ies): Recapitulation</b> <p>We have discussed earlier that microorganism helps in various processes in our nature. Plant uses atmospheric nitrogen gas for their growth. But they couldn't take the nitrogen gas as it is from the air.</p>                                                                                                                                                                                                                             |                                |
| <b>Link Statement:</b> <p>So, let us now discuss about how microorganism helps plant to uptake nitrogen from the environment by converting nitrogen into some nitrogenous compound.</p>                                                                                                                                                                                                                                                                                                     |                                |
| <b>Instructional Methodology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Duration: 15-18 minutes</b> |
| <b>Teaching Strategy (ies):</b><br><b>Explanation Discussion:</b> <p>The nitrogen gas has to be converted into nitrogen compounds. The process of conversion of atmospheric nitrogen into nitrogenous compounds is called nitrogen fixation.</p> <p>Nitrogen fixation may be done by the following way:</p>                                                                                                                                                                                 |                                |

- i) Lighting
- ii) Nitrogen fixing bacteria eg: *Azotobacter*, *Rhizobium*
- iii) Blue green algae eg: *Anabaena*, *Nostoc*

The amount of nitrogen remains constant in the environment even though plant uses atmospheric nitrogen in the environment. These happen through a cycle of processes called nitrogen cycle.

### Tr. explains:

- Teacher explains that the process of conversion of atmospheric nitrogen into nitrogenous compounds is called nitrogen fixation.
- Explains different ways by which nitrogen fixation can be done.
- Explains nitrogen cycle with the help of flow chart.
- Discuss how the nitrogen gas maintains balance in nature.

### Class Assignment:

Make a flow chart to show nitrogen cycle.

### Closure

**Duration: 5 minutes**

### Closure strategy (ies) : Discuss

- Teacher will ask few questions such as:
  - a) What is nitrogen fixation?
  - b) What is nitrogen cycle?
  - c) Name the bacteria found in leguminous plant.
  - d) Name two blue green algae responsible for nitrogen fixation.

### Assignment

- What is symbiotic relationship?
- Explain fixation of nitrogen.
- Write the importance of nitrogen fixing bacteria in soil.

Teacher's Notes:

**Teacher's Log for Period 5**

Work Actually completed:

Challenges faced during lesson:

Recommended changes to lesson plan:

Work carried forward:

Reason for above:

Learning achieved:

upto expectation

beyond expectation

below expectation

All of my students can:

Most of my students can:

Some of my students can:

Few of my students can:

Teacher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Principal's Signature: \_\_\_\_\_

Date: \_\_\_\_\_