

Pre- Content/Content /Post –content	Learning Outcome/Objectives	
<u>Pre –Content :</u> Students recall their previous knowledge of organisms visible and invisible through naked eye. Students will recall the examples of such organisms. Teacher will motivate the students to introduce the lesson. The living organisms which cannot be seen with the naked eyes and can only be observed through microscope are called microorganisms or microbes. <u>Content :</u> • Micro-organisms – unicellular and multicellular micro-organisms. • Useful and harmful micro-organisms with examples. • Food preservation. <u>Post Content :</u> The students at the end of this chapter should be able to comprehend the following concepts: • Discuss the role of micro-organisms in our daily life. • Reasons out the causes of spoilage of food, the conditions that cause spoilage, and how this can be avoided. • Elaborate the concepts that micro-organisms are not only harmful but also useful.	<u>General</u> Students will be able :- • develop the definition of micro-organisms. • enlist the role of micro-organisms in our daily life. • appreciate the use of microorganisms. • tabulate and identify the disease causing micro-organisms. • appreciate and adopt the methods of food preservation.	<u>Specific</u> Students will be able to :- • classify and group the micro-organisms into useful and harmful categories. • draw the different types of micro-organisms. • evaluate the role of micro-organisms in our daily life. • explore the commercial use of micro-organisms. • discover and identify the medicinal use of micro-organisms. • analyse the role of micro-organisms in cleaning the environment. • explore some common disease caused by micro-organisms in animals and plants. • adopt the method for prevention of the disease. • evaluate and appreciate the value of food. • discover the various methods use to preserve food, such as pasteurization and using preservatives.

Home Work / Assignments

- Exercise questions
- Extra questions
- Worksheets

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teachers will: show permanent slides of microscopic organisms under microscope <u>Annexure 2 (A) :</u> make and demonstrate slide of moist soil sample <u>Annexure 2 (B) :</u> make and demonstrate slide of pond water/ stagnant water sample <u>Annexure 2 (C) :</u> demonstrate the process of fermentation using flour dough initiate the discussion on vaccination and its importance by asking questions based upon their own experience. <u>Annexure 2 (D)</u> discuss about the nitrogen cycle using diagrammatic flow chart.	Students will: observe the permanent slides and list the important points <u>Annexure 2 (a)</u> observe the slide and note down their observations <u>Annexure 2 (b)</u> observe the slide and note down their observations <u>Annexure 2 (c) :</u> observe the process and write the important points prepare a table in their notebook depicting the various diseases and their causative agents. <u>Annexure 2 (d) :</u> complete the nitrogen cycle using placards and arrows	

Teaching Aids – Blackboard, Chart, Textbook, ICR and Material required for experiments.

Methodology / Innovative Methods: Activity based teaching, Know to Unknown, Discussions.

Interdisciplinary Links – English – It will improve the power of expression while explaining the activity and also vocabulary. Chemistry – Role of nitrogen in atmosphere. Biology/Environmental Science – food preservation. Art – Neatness in drawing the diagrams.

HOD

Coordinator

Vice-Principal

Principal

➤ **ANNEXURE 2 (A)**

Teacher will make and demonstrate the slide of moist soil.

AIM: To prepare a temporary slide of moist soil sample.

MATERIAL REQUIRED: Slide, cover slip, dropper, beaker and Microscope.

PROEDURE: Collect some moist soil from the field/ park in a beaker and add water to it. After the soil particles have settled down, observe a drop of water from the beaker under a microscope.

➤ **ANNEXURE 2 (a)**

Students will observe and note down the observations.

OBSERVATION: Tiny organisms moving around.

CONCLUSION: Moist Soil also consists of Micro-organisms.

ANNEXURE 2 (B), 2(b)

ACTIVITY NO. 2 – WINDOW TO THE MICROBIAL WORLD

Subject	Science
Class	VIII
Chapter/Unit	Microorganisms: Friend and Foe
Topic	Presence of micro-organisms in stagnant water
Time	30 minutes
Nature of Activity	Pair work

What will I learn (Learning Outcome)?

Will experimentally observe the presence of microbes in the stagnant water.

Skills: Analyzing and Creating

What I have to do?

To prepare and observe the slide of stagnant water for presence of micro-organisms

What do I require?

A glass tumbler, pond/stagnant water samples, muslin cloth, dropper, micro-slide, cover glass, Petri plate, Compound microscope.

What do I need to know?

There are other living organisms around us which we cannot see with eyes alone. These are called microorganisms or microbes.

➤ **Teacher's Activity**

Teacher will make pairs of the students and will explain the steps of the activity. She/he will ensure that each participant of the pair performs the activity on his/her own.

1. Collect water in a glass tumbler from stagnant water.
2. If water is turbid, filter it through muslin cloth.
3. With the help of a dropper, place a drop of filtered water on a clean micro-slide.
4. Place a cover glass on the drop of water without letting in any air bubbles.
5. Observe under the Compound microscope.

How will I proceed?

➤ **Student's Activity**

Students will observe the demonstration and will prepare the slides on the same lines following the correct procedure and taking care of precautions. Record the observation in the space given below.

What have I observed?

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What have I learnt?

Water contains several kinds of small organisms which are _____ to the naked eye but can be seen with the help of a Compound microscope. These organisms are called _____.

What am I curious to learn?

Micro-organisms thrive in almost every kind of environment– soil, water, air, hot springs, etc. Different habitats have different kinds of microorganisms. To understand the concept, let us perform the following activities.

- Collect some moist soil from the field in a beaker. Half-fill the beaker with water. Keep the beaker aside till the soil particles settle down. Take a drop of water on a micro-slide and observe under the microscope. You will observe some organisms which will be different from those observed in pond water.
- Place a drop of curd on a glass slide and observe under the Compound microscope. Curd contains a few bacteria, such as Lactobacillus and Staphylococcus.

Let me evaluate myself

1. What are the five categories of microorganisms?

2. Why some microorganisms are considered harmful?

3. Is pond water fit for drinking? Give reason for your answer.

4. Why it is advised to boil the water before drinking?

5. What are the conditions in which microorganisms grow?

➤ **ANNEXURE 2 (C)**

Teacher will demonstrate the process of fermentation using flour dough.

AIM: To show the process of fermentation using flour dough

MATERIALS REQUIRED: Flour, sugar, yeast powder, warm water

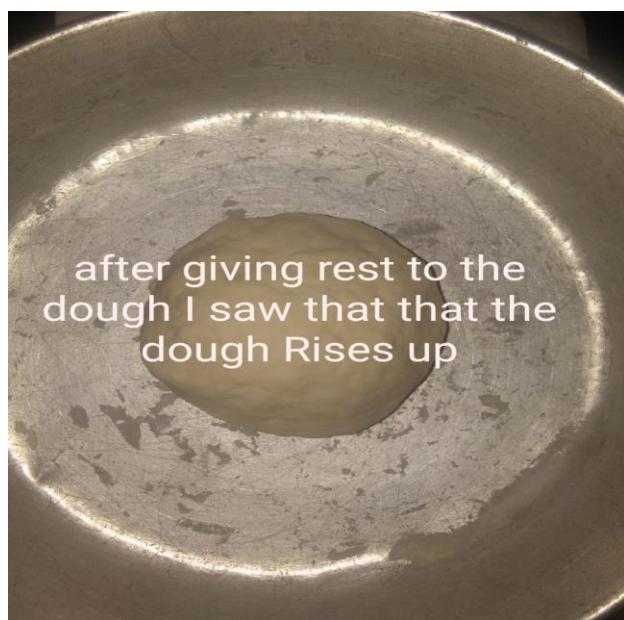
PROCEDURE: Take 20g flour (atta or maida) , add some sugar and mix with warm water. Add a small amount of yeast powder and knead to make soft dough. Observe after two hours.

➤ **ANNEXURE 2 (c)**

Students will observe and note down the observations.

OBSERVATION: The dough will rise after a few hours due to liberation of CO₂.

CONCLUSION: Micro-organisms bring about conversion of sugar to alcohol and carbon-dioxide.



ANNEXURE 2 (D), 2(d)

Activity- Playing with Cards

Chapter- Microorganisms

Class: VIII

Duration:30 minutes

Nature of the activity: Group

Learning Outcome: Students will be able to analyse the various steps involved in fixing Nitrogen from the abiotic world into the biotic world and removing nitrogen from the biotic world into the abiotic world.

What we have to do?

Analyse the cards and Rearrange them to create a Nitrogen Cycle.

What do we need?

Cards, A4 size sheet and Coloured Pen (to make Arrows).

What we need to know?

Nitrogen Cycle depicts the methods by which Nitrogen is fixed in the Biotic world and the methods by which it is returned back to the Abiotic World.

How do we proceed?

➤ **Teacher's Activity:**

Teacher will arrange Activity Kits, one kit will be given to a group of 2 students.

➤ **Student's Activity:**

Analyze the cards given to you carefully. Synthesize the knowledge about the Nitrogen Cycle and create the Nitrogen Cycle in the box given below.

What do we observe?



What have we learned?

1.What is a Biogeochemical Cycle?

2.List the methods by which Nitrogen is fixed in the soil. Name the micro-organism responsible for the process, if any.

3.List the methods by Nitrogen is removed from the soil. Name the micro-organism responsible for the process, if any.

What more can we do?

Find out about other Biogeochemical Cycles(like Oxygen Cycle, Carbon Cycle, Water Cycle) and draw a flow chart to represent the cyclic flow of the element in nature.