

SUBJECT – SCIENCE

GRADE- 8

NCERT BOOK - CHAPTER -2

NAME OF THE CHAPTER- MICROORGANISMS: FRIENDS OR FOE

LEARNING OUTCOMES- *Students will know and understand*

- Different types of microorganisms like – bacteria, fungi, algae, protozoa and virus.
- To compare friendly and harmful microorganisms.
- Understand about vaccine and how it works.
- Antibiotics and its harmful effects also.
- Differentiate between communicable and non- communicable diseases.
- The percentage of nitrogen in the atmosphere remains more or less constant.

LESSON PLAN

Unit-1	Biology (Chapter- Microorganisms: Friend and foe)
Class Transaction	Total periods required:6 (approx. 40 min each)
Pre-requisite for the course	Basic knowledge of organisms. Basic knowledge of preparation of protein by plants which students had already learnt in class VII.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	• Given the content (chapter) the learners will be able to describe the Different types of microorganisms like – bacteria, fungi, algae, protozoa and virus, To compare friendly and harmful microorganisms, Understand about vaccine and how it works, Antibiotics and its harmful effects also, Differentiate between communicable and non-communicable diseases, The percentage of nitrogen in the atmosphere remains more or less constant.
Learning Outcomes	Knowledge- <i>Students will know and understand</i> • Different types of microorganisms like – bacteria, fungi, algae, protozoa and virus. • To compare friendly and harmful microorganisms. • Understand about vaccine and how it works. • Antibiotics and its harmful effects also. • Differentiate between communicable and non-communicable diseases. • The percentage of nitrogen in the atmosphere remains more or less constant
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on microorganisms, their living conditions, harmful and usefulness n plants and animals.

	(Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Rally robin</i>- A problem will be posed by the teacher to which there is multiple solutions. In pair students take turn stating response or solution about replenishment of soil with nutrients. (Communication, Collaboration)
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the different types of microorganisms and their shape. (Character, Citizenship) Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the parasitic and insectivorous mode of nutrition in plants and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the concept of nutrition. He will be able to define symbiosis, host, parasite etc. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: • Summarizing approach • Feedback approach Techniques to be used: Quiz MCQ PPT Computer aided simulation/3D pictures Skit/Role playing Group discussion HOTS questions Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	• Text Book • NCERT text book • Reference Books • Free online source present on internet. • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity

	HW notebooks to be marked as per the given plan: Rubrics: On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	4 UNIT TESTS20 Mark each= 80 Marks. HALF YEARLY EXAMINATION = 80+20 (10+5+5)=100 Marks ANNUAL EXAMINATION= 80+20(10+5+5)=100 Marks By administering pen paper test, we assess creativity and critical thinking. INTERNAL ASSESSMENT - 20 Marks in each Term • Subject Enrichment Activity - 5 +5(Notebook)Marks With the help of subject enrichment activities we assess communication, collaboration, character building and citizenship(Demonstration and implementation of on force and pressure in our daily life). The students in a group of 5 will be demonstrating the activity. • Paper pen test- 10 Marks (average of UT-1&UT-2)
	It's a different classroom today: As the kids are from different socio- economic background, so are their needs, demands and aspirations. Today all kinds of students including the gifted, the average and the differently able are mainstreamed into one class. So, the teaching learning process must be devised in such that can cater to the needs and aspirations of students of abilities The following techniques can be used for different groups: <i>For the gifted:</i> • Preparing a debate • Making PPT • Writing a report • Preparing a talk • Encouragement for referring other resources <i>For the average/slow learners</i> • Making a Chart/diagram/poster/ flashcards • Buddy system help to be provided • Provide grade-up classes
Unit	Day 1 (introduction of microorganisms and their living conditions.)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of organisms.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook

	Oral revision
Objectives	Given the content (chapter) the learners will be able to describe the 5 groups of microorganisms and their living conditions and to draw their shape.
Learning Outcomes	Knowledge- <i>Students will know and understand</i> • The group of microorganisms. • Their living conditions • Able to draw their shapes.
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on microorganisms. (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Rally robin</i>- A problem will be posed by the teacher to which there is multiple solutions. In pair students take turn stating response or solution about nutrition in plants. (Communication, Collaboration)
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the heterotrophic mode of nutrition in plants. (Character, Citizenship) Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the parasitic and insectivorous mode of nutrition in plants and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the concept of nutrition. He will be able to define bacteria, algae, protozoa, virus etc. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: • Summarizing approach • Feedback approach Techniques to be used: - Quiz - MCQ - PPT - Computer aided simulation/3D pictures - Skit/Role playing - Group discussion - HOTS questions - Lab Activities <i>Guided practice to be followed by Independent Practice-</i>

	NCERT questions to be discussed in the classroom
Resources	• Text Book • NCERT text book • Reference Books • Free online source present on internet. • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Rubrics: On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Unit	Day 2 (useful microorganisms)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of microorganisms.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the uses of microorganism in commercial industry of baking and alcohol production, increasing the fertility of soil and cleaning of environment.
Learning Outcomes	Knowledge- Students will know and understand • The formation of curd and bread. • The process of fermentation. • Role of microorganisms in cleaning the environment and to increase the fertility of soil.
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on uses of microorganisms.. (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Rally robin</i>- A problem will be posed by the teacher to which there are multiple solutions. In pair students take turn stating response or solution about replenishment of soil with nutrients. (Communication, Collaboration)
Facilitation	

	Differentiation- The students in a group of 10 will be demonstrating the different uses of microorganisms and their importance not only in life of human beings but also in plants. (Character, Citizenship) Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question relating how they feel during the role play . (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the usefulness of microorganisms.. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: - Summarizing approach - Feedback approach Techniques to be used: Quiz MCQ PPT Computer aided simulation/3D pictures Skit/Role playing Group discussion HOTS questions Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	- Text Book - NCERT text book - Reference Books - Free online source present on internet. - CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Rubrics: On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day -3 (lab activity)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of handling lab apparatus. Basic knowledge of the structure of bread mould which students had already learnt in class VII.
Assessment of qualifying knowledge	Able to draw the structure of bread mould in note book after observing it under the microscope,
Objectives	Learner will be able to see a microscopic fungus called bread moule with its exact structure under the microscope
Learning Outcomes	Bread mould contain sprorangium and spores which help it in reproduction
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	• Lab apparatus • Learning by doing method • Scientific approach
Self Study, Home Work, Assignments	Write the same activity in practical notebook
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Unit	Day 4 (vaccine, vaccination and antibiotics)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of nutrition. Basic knowledge of insectivorous plants and parasite which students had already learnt in class VI.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the • Difference between vaccine and antibiotics • Different examples of antibiotics. • Working of vaccination. and list them in their notebook with 90% accuracy.
Learning Outcomes	Knowledge- Students will know and understand • Difference between vaccine and antibiotics • Different examples of antibiotics. • Working of vaccination
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on Nutrition in plants. (Critical thinking)
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the heterotrophic mode of nutrition in plants. (Character, Citizenship)

	Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the parasitic and insectivorous mode of nutrition in plants and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the concept of nutrition. He will be able to define symbiosis, host, parasite etc. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: • Summarizing approach • Feedback approach Techniques to be used: Quiz MCQ PPT Computer aided simulation/3D pictures Skit/Role playing Group discussion HOTS questions Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	• Text Book • NCERT text book • Reference Books • Free online source present on internet. • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Rubrics: On time submission..... 1 mark Presentation/ Neatness..... 1 mark Content (critical thinking and creativity)..... 3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.

Unit	Day 5 (Food preservation and food poisoning)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of food.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the Meaning of food preservation. Pasteurisation Define food poisoning and how it can be caused.
Learning Outcomes	Knowledge- <i>Students will know and understand</i> • Meaning of food preservation. • Pasteurisation • Define food poisoning and how it can be caused.
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on food preservation. (Critical thinking)
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the food poisoning. (Character, Citizenship) Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the food , its preservation and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the concept of food poisoning. He will be able to define food , preservation etc. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: • Summarizing approach • Feedback approach Techniques to be used: Quiz MCQ PPT

	Computer aided simulation/3D pictures Skit/Role playing Group discussion HOTS questions Lab Activities <i>Guided practice to be followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Resources	• Text Book • NCERT text book • Reference Books • Free online source present on internet. • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Rubrics: On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Unit	Day 6 (nitrogen cycle)
Class Transaction	approx. 40 min
Pre-requisite for the course	Basic knowledge of leguminous plants.
Assessment of qualifying knowledge	Written test Group Discussion Quiz HW Notebook
Objectives	Given the content (chapter) the learners will be able to describe the Importance of replenishment of soil with nitrogen and list them in their notebook with 90% accuracy.
Learning Outcomes	Knowledge- <i>Students will know and understand</i> Nitrogen cycle and leguminous plants
Transaction Methodology (Approaches, Strategies, Tools and Techniques)	Transaction would proceed in the following manner- Active learning- <i>Consider all factors</i> on nutrients in soil. (Critical thinking)
Facilitation	Differentiation- The students in a group of 10 will be demonstrating the nitrogen cycle. (Character, Citizenship)

	Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the nitrogen cycle and will ask these questions during discussions. (Critical thinking, Communication) Brain Storming-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Introduction of the topic- PPT and Digital Content would be shared. Facilitation of content-The facilitator will enable the learners to understand the concept of nitrogen fixation.. He will be able to define rhizobium, blue green algae, nitrogen fixation etc. Approaches- The facilitator should apply some or all of the approaches while administering the teaching learning process: • Summarizing approach • Feedback approach Techniques to be used: Quiz MCQ PPT Computer aided simulation/3D pictures Skit/Role playing Group discussion HOTS questions Lab Activities <i>Guided practice to be followed by Independent Practice</i>- NCERT questions to be discussed in the classroom.
Resources	• Text Book • NCERT text book • Reference Books • Free online source present on internet. • CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W note books as mentioned in the monthly planner by which we can assess their critical thinking and creativity HW notebooks to be marked as per the given plan: Rubrics: On time submission.....1 mark Presentation/ Neatness.....1 mark Content (critical thinking and creativity).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
HOT SPOT	Why nitrogen gas cannot be taken through stomata as carbon dioxide gas?
Closure	Involving students in summarizing by asking them to prepare

	questions based on the topic.
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