

Delhi Public School Ghaziabad
Class XII - Biology
Lesson plan based on DOL
Chapter 10 – Microbes in Human Welfare

Unit	Biology in human welfare (Chapter 10 – Microbes in human welfare)
Class Transaction	Total: 3 periods
Pre-requisite for the course	This lesson requires • Basic knowledge of microbes in household products • Knowledge of microbes in industrial products • Knowledge of sewage treatment and production of biogas
Assessment of qualifying knowledge	• Written test • Lab activity • Oral questioning
Objective	Students would be able to understand • Microbes in household, industrial products • Microbes in sewage treatment • Microbes in production of biogas • Microbes as biofertilizers and biocontrol agents
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> 1. Role of microbes in household, industrial products 2. Role of microbes in sewage treatment 3. Role of microbes in production of biogas <u>SKILLS</u>- <i>Students would be able to</i> • Understand mechanism of sewage treatment • Understand mechanisms to use microbes as biofertilizers • Understand advantages of using microbes as biofertilizers Competencies developed in students: collaborative learning, critical thinking and problem solving, character building, communication, citizenship
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Brain Storming</i>-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. <i>Introduction of the topic</i>- ppt and Digital Content would be shared <i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz, MCQ, Peer Assessment, Case Studies, Lab Activities, Any Other
Resources	NCERT text book, Reference Book, CBSE Exemplar, DPSG Spiral www.learncbse.in/cbse-notes/ https://mycbseguide.com www.examfear.com
Self Study, Home	Independent Practice: Students would do the given questions in their spirals.

Work, Assignments	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	UNIT TESTS , MID TERM EXAMINATION, HALF YEARLY EXAMINATION, ANNUAL BOARD EXAMINATION
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For high scoring students:</i> High order thinking questions to be done Encouragement for referring other resources <i>For low scoring students:</i> Spiral questions Peer education PCC classes <i>For differently abled students:</i> Call parents at regular intervals Provide grade-up classes Encourage and motivate them at every level.
Marks	The weightage of whole unit is 14 marks and is given by CBSE.

Day 1:
a. Students will be shown a ppt and will be made aware of role of microbes in household products.
b. Students will be told about the role of microbes in industrial products.
c. Students will be told about the role of microbes in production of bioactive molecules.
Guided practice: DOL 1
a. Students will be made to list microbes in industrial products.
b. Students will be made to microbes in household products.
c. Students will be asked to describe and discuss in groups significance of microbes in production of bioactive molecules.
Communication and brainstorming: Students develop effective communication skills and learn to put across their views.
Critical thinking and problem solving: Helps students to think critically and solve the given problem
Summarize and check for understanding: DOL 2
a. Oral questioning based on the day's teaching.
Discussion on the topic taught
Communication: Involves sharing of ideas and information to advance scientific understanding, processes, theories and discoveries
Independent practice: DOL 3
a. Students will be asked to revise the work done in class.
b. Students will be asked to describe importance of microbes.

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Day 2:
a. Students will be shown a ppt and will be made aware of sewage treatment.
b. Students will be told about the production of biogas.
c. Students will be made aware of importance of biogas and sewage treatment.
Guided practice: DOL 1
a. Students will be made to recall steps of sewage treatment.
b. Students will be asked to describe production of biogas and design a model of biogas plant to show its working.
Creativity and innovation: Students use the knowledge given in class and create projects and models and perform research to give innovative solutions to the problem studied.
Summarize and check for understanding: DOL 2
a. Oral questioning based on the day's teaching
b. Discussion on the topic in groups – sewage treatment and control of water pollution.
Communication, collaboration and brainstorming: Students develop effective communication skills and learn to put across their views.
Character and citizenship: Group discussion helps to develop interpersonal skills, respecting and valuing views of others
Independent practice: DOL 3
b. Students will be asked to revise the work done in class.
b. Students will be asked to describe process of biological treatment of sewage.
c. Students will be asked to describe production of biogas.

Day 3:
a. Students will be shown a ppt and will be made aware of use of microbes as biocontrol agents.
b. Students will be told about the use of microbes as biofertilizers.
c. Students will be made aware of importance of biofertilizers.
Guided practice: DOL 1
a. Students will be asked to list all microbes which are used as biofertilizers.
b. Students will be asked to investigate use of microbes as biocontrol agents.
Critical thinking and problem solving: Helps students to think critically and solve the given problem
Summarize and check for understanding: DOL 2
a. Oral questioning based on the day's teaching
b. Discussion on the topic in groups – biofertilizers vs chemical fertilizers.
Communication and brainstorming: Students develop effective communication skills and learn to put across their views.
Collaboration: Students learn to work in collaboration to achieve a common goal. They learn to manage time and divide and delegate work and responsibilities
Independent practice: DOL 3

a. Students will be asked to revise the work done in class.
b. Students will be asked to explain use of microbes as biofertilizers and biocontrol agents.

Closure of the lesson
Summarizing the lesson by mind mapping
Giving them revision worksheets