

Delhi Public School Ghaziabad
Class XII
Biology - Lesson plan based on DOL
Chapter 12 – Biotechnology and its applications

Unit	Biotechnology (Ch. Biotechnology and its applications)
Class Transaction	Total: 3 periods
Pre-requisite for the course	This lesson requires: • Basic knowledge of the biotechnological applications in agriculture. • Basic knowledge of the biotechnological applications in medicine • Basic knowledge of transgenic animals
Assessment of qualifying knowledge	• Written test • Lab activity • Online quiz
Objective	To provide students with knowledge of the biotechnological applications in agriculture, medicine, transgenic animals and ethical issues
Learning Outcomes	KNOWLEDGE- <i>Students will know and understand</i> the biotechnological applications in agriculture, medicine, transgenic animals and ethical issues SKILLS- <i>Students would be able to</i> Understand mechanism of developing Bt cotton, RNA interference 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- 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 Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom. Techniques to be used: Student - teacher interaction, collaborative learning, independent research, differentiated teaching, peer learning
Resources	NCERT text book, Reference Book, CBSE Exemplar, DPSG Spiral www.learncbse.in/cbse-notes/ https://mycbseguide.com www.examfear.com
Self Study, Home Work, Assignments	Independent Practice: Students would do the given questions in their spirals. 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> Encouragement for referring other resources

	<i>For low scoring students:</i> Peer education, Provide grade-up classes, <i>For differently abled students:</i> Call parents at regular intervals, Provide PCC classes, Encourage and motivate them at every level.
Marks	Weightage is provided by CBSE.

Day 1:
a. Students will be shown a ppt and will be made aware of options to increase the food production.
b. Students will be told about the production of transgenic plants.
c. Students will be told about the pest resistance in transgenic plants.
Guided practice: DOL 1
• Students will be made to write names of transgenic plants and their applications.
• Students will be made to discuss in groups ethical issues related with production of transgenic plants.
• Students will be asked to describe and discuss in groups the process of developing insect resistance in plants.
Collaboration: Students learn to work in collaboration to achieve a common goal. They learn to manage time and divide and delegate work and responsibilities.
Character and citizenship: Group discussion helps to develop interpersonal skills, respecting and valuing views of others
Summarize and check for understanding: DOL 2
• Oral questioning based on the day's teaching.
Independent practice: DOL 3
• Students will be asked to revise the work done in class.
• Students will be asked to describe the process of developing insect resistance in plants.

Day 2:
• Students will be shown a ppt and will be made aware of biotechnological applications in medicine.
• Students will be told about the production of genetically engineered insulin.
• Students will be made aware of gene therapy.
Guided practice: DOL 1
• Students will be made to recall steps of making genetically engineered insulin.
• Students will be asked to describe treatment approaches of ADA deficiency.
• Students will be asked to list all biotechnological applications in medicine.
Summarize and check for understanding: DOL 2
• Oral questioning based on the day's teaching
• Discussion on the topic in groups – ADA deficiency and its treatment.
Collaboration: Students learn to work in collaboration to achieve a common goal. They

learn to manage time and divide and delegate work and responsibilities.
Character and citizenship: Group discussion helps to develop interpersonal skills, respecting and valuing views of others
Communication and brainstorming: Students develop effective communication skills and learn to put across their views.
Independent practice: DOL 3
- Students will be asked to revise the work done in class. - Students will be asked to describe process of making genetically engineered insulin. - Students will be asked to describe treatment approaches of ADA deficiency.

Day 3:
- Students will be shown a ppt and will be made aware of process of molecular diagnosis. - Students will be told about the bioresources and biopiracy. - Students will be made aware of biopatents.
Guided practice: DOL 1
a. Students will be made to describe techniques used for molecular diagnostics.
b. Students will be asked to list examples of biopiracy.
c. Students will be asked to discuss in groups ethical issues of use of bioweapons.
Collaboration: Students learn to work in collaboration to achieve a common goal. They learn to manage time and divide and delegate work and responsibilities.
Communication and brainstorming: Students develop effective communication skills and learn to put across their views.
Summarize and check for understanding: DOL 2
a. Oral questioning based on the day's teaching
b. Discussion on the topic – significance of biopatents.
Communication and brainstorming: Students develop effective communication skills and learn to put across their views.
Independent practice: DOL 3
a. Students will be asked to revise the work done in class.
b. Students will be asked to list examples of biopiracy.
a. Students will be asked to find examples of bioweapons.

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

