



GREEN-EDU Learning Activity

Title: Biotechnology and its applications

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Summary

<i>Lesson plan summary</i>	
Subject	Green Biotechnology
Topic	<i>Biotechnology</i>
Age of students	12-15
Preparation time	30Minutes
Teaching time	60Minutes
Online teaching material (links for online material)	
Offline teaching material	<i>Water, flour, yeast, bowl, beaker</i>

Aim of the lesson

By the end of this lesson students will:

- 1) *Define Biotechnology.*
- 2) *List some biotechnological products used in daily life*
- 3) *List general application of biotechnology in various fields.*

Trends

STE(A)M Learning / Collaborative Learning etc.



Activities

Describe here in detail all the activities during the lesson and the time they require. Remember, that your lesson plan needs to revolve around the topic of bioeconomy.

Name of activity	Procedure	Time
Introduction	<p>Worm up activity</p> <ul style="list-style-type: none"> Brainstorm the students about asking different questions: <ul style="list-style-type: none"> What they know about microorganisms? (Expected response: They are used in making yogurt, cake, bread, milk, meat and medicines.) Now introduce them the today's topic "Biotechnology and its application" in which they will learn, how the scientists use the microorganisms in order to make products for human use. 	X min
Activity 1	<ul style="list-style-type: none"> arrange the warm water, flour and yeast. Ask the students to: <ul style="list-style-type: none"> Mix the yeast with the flour, and add warm water to make dough. Leave it for 20 minutes. Then ask the students to observe this dough carefully and tell: <ul style="list-style-type: none"> Ø What is the change? Ø What may be the cause of this change? Now explain that yeast acted upon flour dough and produces CO₂ and alcohol, which made hollow cavities / pores inside the dough. This process is known as fermentation. image Now introduce the term Biotechnology and define with the help of students. Ask the students about some biotechnological products used in daily life and make a list on the board. <p>Ask the students about general applications of biotechnology in various fields and make a list on board.</p> <ul style="list-style-type: none"> image After that ask the students to copy from the board on their notebooks. 	Xmin
Activity 2	<ul style="list-style-type: none"> Ask the students that what do diabetic persons use for their treatment? (Expected response: Medicine Insulin) From where they get insulin? (Expected response: Medical store) Can you guess how this insulin is prepared on commercial basis for the use of diabetic persons? (Expected response: By microorganisms) Now explain the other applications of biotechnology like tissue culture, medicines, drugs, dairy and bakery items etc. 	X min
Conclusions	Summarize the lesson; Biotechnology is a large scale industrial use biological process of microorganisms to make substances useful for mankind e.g. making of yogurt, cake, bread and medicine etc.	Xmin
		Xmin
		Xmin



Assessment

Assessment

- Ask the students to write the names of the products in front of process of biotechnology given in the table:

Application	Products
Fermentation	
Genetic engineering	
Tissue culture	

- What will happen if we add yeast instead of baking soda in dough for making pizza/cake