

**Biotechnology in our daily lives**

**Grade 12U/C Biotechnology**

Biotechnology in our daily lives	Assessment	AS/OF
	Cross-curricular	Disease & Pathogen
<p><b>Big Ideas</b></p> <p>1. investigate various techniques used in biotechnology and how they are applied in the food industry and the health and agricultural sectors;</p> <p>2. analyse a variety of social, ethical, and legal issues related to applications of biotechnology in the health, agricultural, or environmental sector;</p> <p>3. demonstrate an understanding of biological processes related to biotechnology and of applications of biotechnology in the health, agricultural, and environmental sectors.</p> <p><b>Learning Goals</b></p> <ul style="list-style-type: none"> <li>• To understand the various types of biotechnological applications related to our everyday world;</li> <li>• Understand some of the ethical aspects of biotechnological applications;</li> <li>• Investigate a technique (fermenting) used in biotechnology.</li> </ul>	<p><b>Specific Expectations</b></p> <p>2.1 use appropriate terminology related to biotechnology.</p> <p>2.2 plan and conduct an inquiry into various traditional biotechnological techniques used in the food industry (e.g., the use of fermentation to produce bread, cheese, yogurt)</p> <p>3.1 explain various methods used, over time, in the field of biotechnology (e.g., use of living organisms to make or modify products, selective breeding to create particular breeds of animals, manipulation of genes</p> <p>3.3 describe applications of biotechnology in the health (e.g., genomics, gene therapy, xenotransplantation, in vitro fertilization), agricultural (e.g., genetically modified crops, biopesticides, cloning), and environmental sectors (e.g., bioremediation, phytoremediation)</p>	

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**Description**

Part A: In small groups, using either the recipe provided, or having researched their own, students will make homemade cheese or yogurt. They will also create a display board outlining their procedure and observations.

Part B: Students will research and prepare a written report of another biotechnological application in the health, agricultural, environmental or food industry.

Part C: Students will present their findings to their classmates.

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**Materials**

See handout for cheese making ingredients

WiFi

Computer

Bristol board, glue, markers, pens, ink

Props

Journal articles,

access to library books

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**Safety Notes**

Be careful around heat when making the cheese/yogurt.

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## Introduction

As a class, discuss the types of biotechnology that exists in our daily lives. Create a concept/mind map about these topics. Ask students to make a note or take a picture of the concept map as they will need it for later. If time allows, choose one topic and discuss some ethical issues associated with that topic (ie. in vitro fertilization).

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## Action

Students will carry out a 3-part culminating activity:

**Part A:** In small groups, using either the recipe provided, or having researched their own, students will make homemade cheese or yogurt using the fermentation process as an example of biotechnology. They will also create a display board outlining their procedure and observations.

**Part B:** Students will research and prepare a written report of another biotechnological application in the health, agricultural, environmental or food industry.

**Part C:** Students will present their findings to their classmates.

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## Consolidation/Extension

As students carry out their presentations, they will also have class discussions and answer questions from their colleagues about their research.

Students and teacher have the opportunity to debrief the rubrics together as well in order to understand how students are being evaluated.

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## Resources

[http://culturecheesemag.com/recipes/make\\_cheese/winter\\_2011/cheese\\_curds](http://culturecheesemag.com/recipes/make_cheese/winter_2011/cheese_curds)

<http://www.cheesemakingrecipe.com/>

[http://biology.clc.uc.edu/fankhauser/cheese/cheese\\_course/cheese\\_course.htm](http://biology.clc.uc.edu/fankhauser/cheese/cheese_course/cheese_course.htm)