

MODULE 1

Objective 1.1 Lesson A

Biotechnology Timeline

Understanding of How Science Changes

Course

Advanced
Biotechnology

Unit

Biotechnology
Basics

Essential Question

What are the
major events
in history and
research in
biotechnology
?

TEKS

130.364 3B,
3D, 3F, 4C

TAKS

Obj. 1 3A, 3B

Prior Student Learning

None

Estimated Time

1 hour

Rationale

For most students, their science classes have been accompanied by very large textbooks filled with collections of often oversimplified facts that they memorize for a test. In today's world students need to understand and comprehend the entire scientific process.

Research has shown that if scientists-in-training learned the history of the way science has been done, funded and communicated over the centuries, they would be better prepared for the changes currently happening in the field of science.



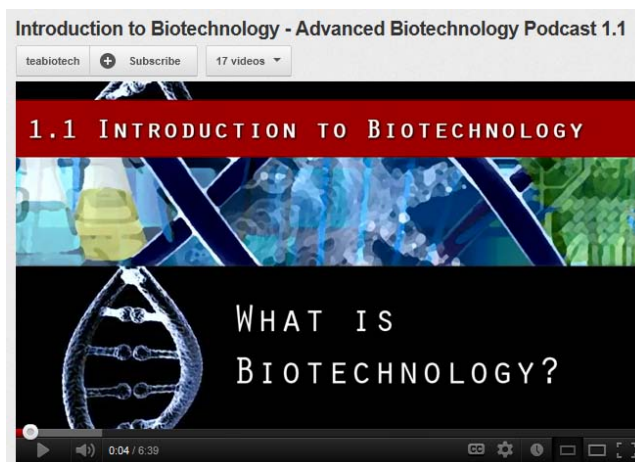
Objectives

Students will:

- Describe historical events and significant contributors in the field of biotechnology.

Engage

- Students view Podcast 1.1 Introduction to Biotechnology.

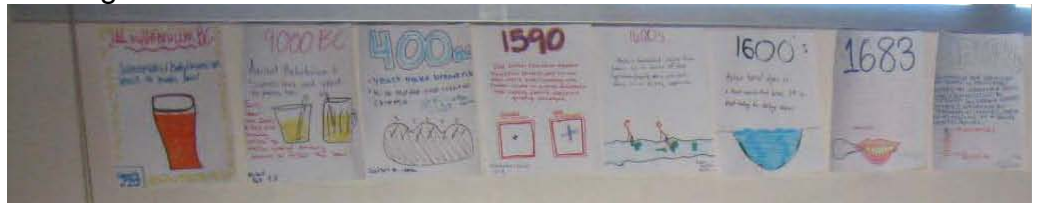


Key Points

- Power Point 1.1 Overview of Biotechnology

Activity

1. Students complete Introduction to **Biotechnology Student Resources**.
2. Cut out biotechnology timeline events into strips of paper leaving off the dates. There are many available online. A few suggestions are <http://www.bio.org/speeches/pubs/er/timeline.asp> and <http://biotechinstitute.org/what-is-biotechnology/timeline>
3. Allow students to select a random slip from a bucket.
4. Students will use the Internet to research the event, include a date for their event and 4 interesting facts about this event.
5. Students create a "mini poster" (8X10 paper) to record their research. The poster must include the date and a picture or drawing related to the topic.
5. Place event in the correct order of the timeline that has been created around the ceiling of the classroom. Place date cards around classroom so students have an idea of how to organize their events. Example date cards: B.C, A.D, 1800s, 1920s, 1950s, 1960s, 1970s, 1980s, 1990, 1991, 1992 and so on. Dates get closer as modern technology makes this information more available.
6. Once the posters have been completed, have the students present orally to the class. Teacher should use post it notes to add missing information.



7. Optional: Allow students to do a gallery walk through of the timeline making notes of significant events.
8. Throughout the school year, the teacher and the students can refer to the timeline and add events as they become relevant in the course. Update the timeline with current events.

Assessment

- Biotechnology Timeline Rubric
- Introduction to Biotechnology Student Resources

Materials

- Podcast 1.1 Introduction to Biotechnology
- Introduction to Biotechnology Student Resources
- Construction paper and markers, to make timeline posters. You could also have students produce electronic timeline posters.
- Biotechnologies timeline of events

Accommodations for Learning Differences

- Visit the **Special Populations** section of the CTE Career and Technology Education Website: <http://cte.unt.edu/special-pops>

National and State Education Standards

Science Standards

[Texas College and Career Readiness Standards](#)

III. C1, D1

IV. A1, C1, C2



Introduction to Biotechnology-Student Resources

For Podcast 1.1 Introduction to Biotechnology

I. Define Biotechnology.

II. Biotechnology dates back to the beginning of civilization. Briefly describe some historical applications of biotechnology.

a. Fermentation

b. Selective Breeding

c. Mendel's Work in Genetics

d. Vaccinations

e. Antibiotics

f. Genetic Engineering

III. Relating Biotechnology to Current World Issues

a. List fields of study with biotechnology applications.



Take Away Questions

1. Pick an example of a biotechnology application, and describe how it has affected your everyday life.

2. There are many websites that will keep you abreast of current advancements in biotechnology. Find an Internet site address that ends with .edu, .gov, or .org and offers the latest news and current events in science. Choose one article that is of interest to you and print it out. Highlight the main sentence in each paragraph. Place an asterisk (*) by three items in the article that you think are most interesting and important.

3. Biotechnology has a rich history of many important discoveries. Go to <http://www.accessexcellence.org/RC/AB/BC/> and look through the timelines and classical biotech discoveries. Generate your own timeline with the five discoveries you think were most influential.

BIOTECHNOLOGY TIMELINE RUBRIC

CATEGORY	4	3	2	1
Use of Class Time	Used time well during each class period. Focused on getting the project done. Never distracted others.	Used time well during each class period. Usually focused on getting the project done and never distracted others.	Used some of the time well during each class period. There was some focus on getting the project done but occasionally distracted others.	Did not use class time to focus on the project or often distracted others.
Graphics - Originality	Several of the graphics used on the poster reflect an exceptional degree of student creativity in their creation and/or display.	One or two of the graphics used on the poster reflect student creativity in their creation and/or display.	The graphics are made by the student but are based on the designs or ideas of others.	No graphics made by the student are included.
Graphics - Relevance	All graphics are related to the topic and make it easier to understand.	All graphics are related to the topic and most make it easier to understand.	All graphics relate to the topic.	Graphics do not relate to the topic.
Content – Accuracy	At least 4 accurate facts are displayed on the poster.	3 accurate facts are displayed on the poster.	2 accurate facts are displayed on the poster.	Less than 1 accurate fact is displayed on the poster.
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive , though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.

Student Name: _____ **Class:** _____ **Score:** ____/25

Comments: