

NEW!

Biotechnology CPU

Biotechnology is a broad and expanding area of study that continues to advance. The results of biotechnology can be seen in many areas of our lives and related jobs are spread across a wide range of industries. This course provides an introduction to an assortment of these very different fields.

Key Features:

- Great for preparing students for health science or advanced biology curriculum.
- Ethical and legal issues are examined throughout the course, encouraging critical thinking skills and introspection.
- Complex biological systems are explained through simple, step-by-step text and a number of hands-on activities that focus on DNA and cell structures and their applications.

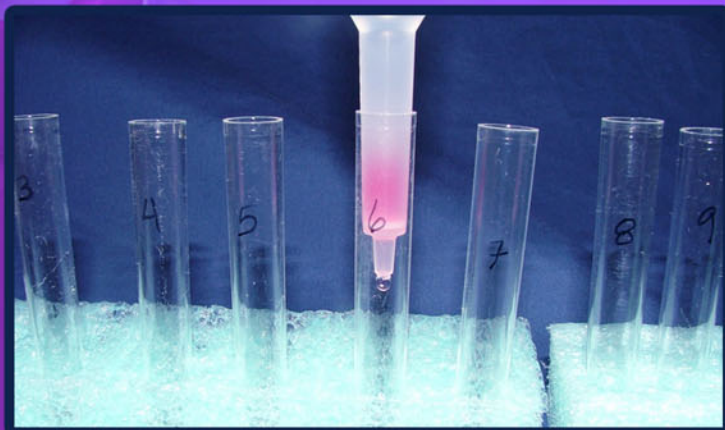


Topics Covered:

- Historical context of biotechnology advancements
- Types of biotechnology
- Cellular structures, including organelles, and the functions of each
- Importance of DNA in the human body and biotechnology
- Genetic identification, manipulation, and modification
- Biotechnology use in medicine, forensic science, agriculture, industry, and scientific research
- Comparison of morality, the law, and ethics
- Bioethics issues presented for each type of biotechnology

Academic Concepts and Skills:

- Biology
- Anatomy and physiology
- Health science
- Ethics
- History of technology
- Reading
- Writing
- Model building
- Problem solving
- Teamwork
- Resource allocation
- Technological literacy



Biotechnology CPU
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The **Biotechnology CPU** the study of biotechnology, a diverse field of science involving living things. In many ways, the most cutting edge biotechnology research revolves around the use and manipulation of cells and genetic materials. After introducing students to the basics of these biological structures, the course takes students on a tour of several fields that use biotechnology, including medical, agricultural, industrial, and forensic science. Students are also exposed to bioethics and are continuously asked to evaluate each biotechnology with ethics in mind.

- Test your pre-existing knowledge of the course material.
- Define biotechnology, organism, and other associated terms.
- Contrast biotechnology and bioengineering.
- Distinguish the types of biotechnology.
- Examine the career of a biological scientist.
- Discuss an advancement in biotechnology you have used.
- Examine the history of biotechnology.
- Determine what a cell is and how it functions.
- Distinguish unicellular from multicellular organisms.
- Compare and contrast prokaryotic and eukaryotic cells.
- Identify organelles and other cellular structures.
- Evaluate how specialized cells work together to survive.
- Identify how biochemists and biophysicists work with cells.
- Discuss how unicellular organisms evolved into multicellular, specialized cells.
- Build a model of a cell and identify its parts.
- Create a series of examples about how cells and their organelles function and work together.
- Define DNA and its components.
- Determine how DNA affects the activities of a cell and, in turn, a multicellular organism.
- Describe how DNA replicates through transcription and translation.
- Identify RNA and its role in DNA replication.
- Examine how recombinant DNA is formed.
- Assemble a model of standard DNA.
- Discuss how much DNA plays a role in human actions.
- Differentiate between the law, morality, and ethics.
- Define bioethics and its relationship to biotechnology.
- Recognize the scope of bioethics and how it affects everyone.
- Examine the Human Genome Project and advances made because of it.
- Determine the uses of genetic screening and genetic counseling.
- Recognize bioethical concerns surrounding genetic research, including genetic engineering, genetic determinism, and eugenics.
- Describe examples of how people's views on morality, ethics, and the law change over time.
- Examine cloning and its history.
- Describe the different types of cloning and how each is achieved.
- Analyze the uses of cloning and the bioethical issues surrounding it.
- Explain what stem cells are, how they are researched, and why.
- Evaluate the ethical and legal issues involved with stem cell research.
- Discuss your thoughts on the ethics of stem cell research.
- Examine DNA's role in forensic science.
- Consider why DNA has become an important type of evidence in criminal court cases.
- Identify common sources of DNA evidence and how it is collected and preserved.
- Define electrophoresis and how it works.
- Assess the process and uses of gel electrophoresis.
- Complete a simulated gel electrophoresis experiment.
- Discuss how gel electrophoresis might be used in other types of genetic analysis in a field besides law enforcement.
- Determine the roles of biotechnology in agriculture and industry.
- Describe natural selection, evolution, and artificial selection and how these have affected green biotechnology in the past.
- Examine how genetic modification plays a role in today's green biotechnology.
- Consider the bioethical implications of genetically modified organisms.
- Evaluate the uses of bioremediation.
- Identify biopharming and its uses.
- Discuss your feelings on the safety of genetically modified food sources.
- Extract DNA from a strawberry.
- Discuss very advanced biotechnology today that might one day be available for easy use by students.
- Complete challenges to meet several high-level problem-solving objectives.
- Discuss your thoughts on using DNA banks to archive the natural DNA of organisms we are altering.
- Discuss your opinions on genetically altering the plants and animals that make up our food supply.
- Discuss your thoughts on future trends in biotechnology.
- Discuss which field of biotechnology you think has had the greatest impact on human culture.
- Discuss an advancement other than DNA research that has played an important role in shaping today's biotechnology.
- Select appropriate vocabulary terms based on the definitions provided.
- Test your comprehension of concepts gained during this course.
- State and explain your opinion of the Biotechnology CPU.