

Mapping Your Future: North Carolina Essential Standards

Unit I: Biotechnology and its Applications			
	<i>A. What is Biotechnology?</i>	<i>B. Biotechnology Timeline</i>	<i>C. Practical Applications of Biotechnology</i>
Grade 7 Science	<p>Science 7.L.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</p> <p>Science 7.L.1.1 Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including Euglena, Amoeba, Paramecium, Volvox.</p> <p>Science 7.L.1.2 Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).</p>		
Grade 8 Science	<p>Science 8.L.2 Understand how biotechnology is used to affect living organisms.</p> <p>Science 8.L.2.1 Summarize aspects of biotechnology including: specific genetic information available, careers, economic benefits to North Carolina, ethical issues, implications for agriculture.</p>		
Exploring Biotechnology	<p>EB 1.01 Describe concepts and examples of biotechnology.</p>	<p>EB 1.02 Discuss historical applications of biotechnology.</p> <p>EB 5.03 Investigate when various techniques of food biotechnology were introduced.</p>	<p>EB 1.01 Describe concepts and examples of biotechnology.</p> <p>EB 4.02 Analyze cellular design and function in plant, animal and bacterial cells.</p> <p>EB 4.03 Explore the structure of DNA and its relationship to the cell.</p> <p>EB 7 Analyze the use of biotechnology applications in industry and the environment.</p> <p>EB 8.03 Analyze the benefits of biomedical research.</p> <p>EB 10. Analyze careers in biotechnology, bioinformatics, biomanufacturing, agriculture and health care.</p>
Biology			<p>Bio. 1.1.3 Explain how instructions in DNA lead to cell differentiation and result in cells specialized to perform specific functions in multicellular organisms.</p> <p>Bio. 1.2.1 Explain how homeostasis is maintained in a cell and within an organism in various environments (including: temperature and pH).</p> <p>Bio. 3.1.1 Explain the doublestranded, complementary nature of DNA as related to its function in the cell.</p>
Biomedical Technology	<p>BT 11.00 Analyze challenges to biomedical research.</p>	<p>BT 12.00 Analyze current issues in biomedical technology.</p>	<p>BT 5.03 Discuss the use of DNA typing and forensic anthropology in identification.</p> <p>BT 9.00 Evaluate careers and techniques that use biomedical technology.</p>
Health Science II	<p>HS 3.04 Understand biotechnology research and development.</p>		

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Biotechnology And Agriscience Research I	BA08.01 Define terminology related to biotechnology.	BA07.01 Identify important historical achievements in biotechnology and agriscience research. BA07.02 Discuss the importance of the biotechnology industry. BA07.03 Discuss the historical impact of biotechnology on the field of agriculture.	BA11.04 Apply laboratory skills in the culturing of microorganisms and cells. BA13.01 Discuss the structure and function of DNA in relation to sexual reproduction in organisms. BA13.02 Explain the relationship between DNA, gene sequences, traits, and the genome. BA15.01 Identify methods and goals of DNA analysis in production agriculture and agriscience. BA15.02 Explore the process of DNA extraction in order to observe the structure of DNA.			
Unit II: Drug Discovery and Manufacturing						
	<i>A. How a New Drug Gets to Market</i>	<i>B. The Pharmaceutical or Biopharmaceutical Industries: Regulated for Safety and Quality</i>	<i>C. Clinical Trials</i>	<i>D. Producing a Pharmaceutical or Biopharmaceutical: The Manufacturing Process</i>	<i>E. What Quality Means and Why It Matters</i>	<i>F. Standard Operating Procedure (SOP) and Regulations</i>
Grade 8 Science	Science 8.L.2 Understand how biotechnology is used to affect living organisms. Science 8.L.2.1 Summarize aspects of biotechnology including: specific genetic information available, careers, economic benefits to North Carolina, ethical issues, implications for agriculture.					
Exploring Biotechnology	EB 8.0 Analyze biomedical research methods. EB 8.01 Identify components of biomedical research. EB 8.02 Discuss biomedical research methods. EB 8.03 Analyze the benefits of biomedical research.					
Biomedical Technology	BT02.00 Analyze biomedical ethics and legal principles. BT02.01 Summarize legal principles of biomedical technology. BT02.02 Analyze the ethical principles of biomedical technology. BT06.00 Analyze issues of public health, infectious diseases and bioterrorism. BT06.01 Discuss the infectious disease process.					
Health Science II	HS 1.02 Understand effective communication. HS 1.03 Understand healthcare agencies, finances, and trends. HS 1.04 Understand legal and ethical issues in healthcare.					
Biotechnology and Agriscience Research I	BA09.01 Explain safety rules for a biotechnology laboratory. BA09.02 Outline procedures for achieving and maintaining aseptic conditions during biotechnology laboratories.					
Unit III: Career Opportunities						
	<i>A. Biotechnology Generates Opportunities</i>	<i>B. Seizing the Opportunity</i>	<i>C. On the Job: Careers in a Typical Bioscience Company</i>			
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Biomedical Technology	BT 9.01 Investigate laboratory careers. BT 9.02 Discuss imaging careers and technology. BT 9.03 Describe environmental careers, resources and hazards. BT 9.04 Outline biotechnology careers and genetics				
Health Science II	HS 3.04 Understand biotechnology research and development.				
Biotechnology and Agriscience Research I	BA04.01 Identify biotechnology careers and related employment opportunities.				
Unit IV: Getting a Job and Getting Ahead					
	<i>A. Taking Charge of Your Future</i>	<i>B. Education</i>	<i>C. Basic Skills</i>	<i>D. Scientific/ Technical Knowledge and Skills</i>	<i>E. Employee Success Skills</i>
Grade 8 Science	Science 8.L.2 Understand how biotechnology is used to affect living organisms. Science 8.L.2.1 Summarize aspects of biotechnology including: specific genetic information available, careers, economic benefits to North Carolina, ethical issues, implications for agriculture.				
Exploring Biotechnology	EB 10.0 Analyze careers in biotechnology, bioinformatics, biomanufacturing, agriculture and health care. EB 10.01 Describe careers in biotechnology. EB 10.02 Discuss bioinformatics and biomanufacturing careers. EB 10.03 Analyze careers in agriculture that support biotechnology. EB 10.04 Analyze careers in health care that support biotechnology.				
Biomedical Technology	BT 9.01 Investigate laboratory careers. BT 9.02 Discuss imaging careers and technology. BT 9.03 Describe environmental careers, resources and hazards.				
Health Science II	HS3.04 Understand biotechnology research and development.				
Biotechnology and Agriscience Research I	BA04.01 Identify biotechnology careers and related employment opportunities. BA04.02 Explain various skills and credentials needed for employment in the biotechnology industry.				