VoCATS
Course Blueprints

Agricultural Education
Health Occupations Education

6828 Exploring Biotechnology

Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Office of Instructional and Accountability Services
Division of Instructional Services

Raleigh, North Carolina
May 2004

For a list of educators and business people who reviewed and approved this blueprint for technical content and appropriateness for the industry, contact:

David Harris – Western Region Agriculture Education Coordinator, NC State University, at david_e_harris@ncsu.edu

Kathy Turner – Education Consultant, NCDPI, HOE, at kturner@dpi.state.nc.us

12/1/98

VoCATS Course Blueprint

A course blueprint is a document laying out the framework of the curriculum for a given course.

Shown on the blueprint are the units of instruction, the core competencies in each unit, and the specific objectives for each competency. The blueprint illustrates the recommended sequence of units and competencies and the cognitive and performance weight of the objective within the course.

The blueprint is intended to be used by teachers in planning the course of work for the year, preparing daily lesson plans, and constructing instructionally valid assessments.

For additional information about this blueprint, contact program area staff. For additional information about the VoCATS Competency Achievement Tracking System, contact program area staff or VoCATS, Workforce Development, Division of Instructional Services, North Carolina Department of Public Instruction, 301 North Wilmington Street, Raleigh, North Carolina 27601-2825, 919/715-1674, email: rwelfare@dpi.state.nc.us.

Interpretation of Columns on VoCATS Course Blueprints

No.	Heading	Column information
1	Comp# Obj.#	Comp=Competency number (three digits); Obj.=Objective number (competency number plus two-digit objective number).
2	Unit Titles/Competency and Objective Statements	Statements of unit titles, competencies per unit, and specific objectives per competency. Each competency statement or specific objective begins with an action verb and makes a complete sentence when combined with the stem "The learner will be able to. . ." (The stem appears once in Column 2.) Outcome behavior in each competency/objective statement is denoted by the verb plus its object.
3	Time Hrs	Space for teachers to calculate time to be spent on each objective based on the course blueprint, their individual school schedule, and the students' performance on preassessments.
4&5	Course Weight Cognitive Performance	Shows the relative importance of each objective, competency, and unit. Weight is broken down into two components: cognitive and performance. Add the cognitive and performance weights shown for an objective in columns 4 and 5 to determine its total course weight. Course weight is used to help determine the percentage of total class time that is spent on each objective. The VoCATS Annual Planning Calendar shows how to use the course weight to determine the approximate number of days to be devoted to each objective. The breakdown in columns 4 and 5 indicates the relative amount of class time that should be devoted to cognitive and performance activities as part of the instruction and assessment of each objective. Objectives with performance weight should include performance activities as part of instruction and/or assessment.
6	Type Behavior	Classification of outcome behavior in competency and objective statements. (C=Cognitive; P=Performance)
7	Integrated Skill Area	Shows links to other academic areas. Integrated skills codes: A=Arts; E= English Language Arts; CD=Career Development; CS=Information/Computer Skills; H=Healthful Living; M=Math; SC=Science; SS=Social Studies.
8	Core Supp	Designation of the competencies and objectives as Core or Supplemental. Competencies and objectives designated "Core" must be included in the Annual Planning Calendar and are assessed on the statewide assessments..

Agricultural Education and Health Occupations Education

COURSE BLUEPRINT for 6828 Exploring Biotechnology

(Recommended hours of instruction: 68 - 82 hours)

Comp # Obj #	Unit Titles/Competency and Objective Statements (The Student will be able to:)	Time Hours	Course Weight		Type Behavior	Integrated Skill Area	Core Supp
			Cognitive	Performance			
1	2		4	5	6	7	8
			100%				
	Total Course Weight		**80%**	**20%**			
A	**INTRODUCTION TO BIOTECHNOLOGY**						
EB01.	**Analyze basic concepts and historical development of biotechnology.**		**4%**	**1%**	**C3**	**SC/SS/H**	**Core**
EB01.01	*Describe concepts and examples of biotechnology.*		*1%*		*C1*	*SC/SS/H*	*Core*
EB01.02	*Discuss historical applications of biotechnology.*		*1%*		*C2*	*SS*	*Core*
EB01.03	*Analyze specific contributions to biotechnology by notable figures in history.*		*2%*	*1%*	*C3*	*SC/SS/H*	*Core*
B	**BIOTECH TERMINOLOGY AND MATH**						
EB02.	**Analyze the language and math of biotechnology.**		**5%**		**C3**	**H/SC/M**	**Core**
EB02.01	*Define terms common to the field of biotechnology.*		*2%*		*C1*	*H/SC*	*Core*
EB02.02	*Identify roots, prefixes and suffixes used in biotechnology.*		*1%*		*C1*	*H/SC*	*Core*
EB02.03	*Use metric math and the 24 hour clock.*		*2%*		*C3*	*M*	*Core*
C	**LABORATORY SAFETY AND INFECTION CONTROL**						
EB03.	**Analyze methods for protecting the safety of biotech workers and the public.**		**5%**	**3%**	**C3**	**SC/SS/H**	**Core**
EB03.01	*Analyze the use of equipment and materials and apply rules for safety in the laboratory.*		*2%*	*1%*	*C3*	*SC*	*Core*
EB03.02	*Use correct body mechanics.*		*1%*	*1%*	*C3*	*H/SC*	*Core*
EB03.03	*Analyze methods of infection control.*		*2%*	*1%*	*C3*	*H/SC*	*Core*
D	**CELLULAR DESIGN AND DNA**						
EB04.	**Investigate cellular design and DNA.**		**10%**	**4%**	**C3**	**SC/SS/H**	**Core**
EB04.01	*Discuss the nature of science, scientific inquiry and problem solving.*		*2%*	*1%*	*C2*	*SC/SS*	*Core*
EB04.02	*Analyze cellular design and function in plant, animal and bacterial cells.*		*2%*	*1%*	*C3*	*SC*	*Core*
EB04.03	*Explore the structure of DNA and its relationship to the cell.*		*4%*	*1%*	*C3*	*SC*	*Core*
EB04.04	*Evaluate forensic techniques.*		*2%*	*1%*	*C3*	*SC/SS/H*	*Core*

Comp # Obj #	Unit Titles/Competency and Objective Statements (The Student will be able to:)	Time Hours	Course Weight		Type Behavior	Integrated Skill Area	Core Supp
			Cognitive	Performance			
1	2		4	5	6	7	8
E	**AGRICULTURAL BIOTECHNOLOGY**						
EB05.	**Analyze the science of plants, food and animals in agricultural biotechnology.**		**11%**	**2%**	**C3**	**M/SC/SS**	**Core**
EB05.01	*Discuss the fundamentals of biotechnology in agriculture.*		*2%*		*C2*	*M/SC*	*Core*
EB05.02	*Analyze biotechnology and plants.*		*4%*	*2%*	*C3*	*SC*	*Core*
EB05.03	*Investigate when various techniques of food biotechnology were introduced.*		*1%*		*C3*	*SC/SS*	*Core*
EB05.04	*Analyze the production and processing of genetically modified foods.*		*3%*		*C3*	*SC*	*Core*
EB05.05	*Discuss the use of transgenic farm animals.*		*1%*		*C2*	*SC*	*Core*
F	**BIOTECHNOLOGY IN HEALTH CARE**						
EB06.	**Analyze biotechnology in health care.**		**9%**	**2%**	**C3**	**H/SC/CS**	**Core**
EB06.01	*Describe computer applications and biomedical devices in health care.*		*2%*		*C2*	*H/SC/CS*	*Core*
EB06.02	*Discuss the human genome project and genetic engineering.*		*2%*	*1%*	*C2*	*H/SC*	*Core*
EB06.03	*Analyze genes and disease.*		*3%*	*1%*	*C3*	*H/SC*	*Core*
EB06.04	*Describe the use of recombinantly produced drugs and pharmacogenomics.*		*1%*		*C2*	*H/SC*	*Core*
G	**INDUSTRIAL AND ENVIRONMENTAL BIOTECHNOLOGY**						
EB07.	**Analyze the use of biotechnology applications in industry and the environment.**		**7%**	**2%**	**C3**	**SC**	**Core**
EB07.01	*Discuss industrial and environmental biotechnology.*		*2%*		*C2*	*SC*	*Core*
EB07.02	*Analyze components of industrial biotechnology.*		*2%*	*1%*	*C3*	*SC*	*Core*
EB07.03	*Evaluate environmental biotechnology applications.*		*3%*	*1%*	*C3*	*SC*	*Core*
H	**BIOMEDICAL RESEARCH**						
EB08	**Analyze biomedical research methods.**		**9%**	**1%**	**C3**	**SC/SS/H**	**Core**
EB08.01	*Identify components of biomedical research.*		*3%*		*C1*	*H/SC*	*Core*
EB08.02	*Discuss biomedical research methods.*		*3%*		*C2*	*H/SC*	*Core*
EB08.03	*Analyze the benefits of biomedical research.*		*3%*	*1%*	*C3*	*H/SC/SS*	*Core*
I	**BIOETHICS**						
EB9.	**Analyze ethical and professional standards in health care and biotechnology.**		**7%**	**1%**	**C3**	**H/SC/SS**	**Core**
EB9.01	*Discuss basic rules of ethics and patient rights.*		*2%*		*C2*	*H/SS*	*Core*
EB9.02	*Analyze professional standards in health care and biotechnology.*		*2%*		*C3*	*H/SC*	*Core*
EB9.03	*Research and debate selected bioethical issues.*		*3%*	*1%*	*C3*	*H/SC/SS*	*Core*

Comp # Obj #	Unit Titles/Competency and Objective Statements (The Student will be able to:)	Time Hours	Course Weight		Type Behavior	Integrated Skill Area	Core Supp
			Cognitive	Performance			
1	2		4	5	6	7	8
J	**CAREERS IN BIOTECHNOLOGY**						
EB10.	**Analyze careers in biotechnology, bioinformatics, biomanufacturing, agriculture and health care.**		**13%**	**4%**	**C3**	**CD/SC/H**	**Core**
EB10.01	*Describe careers in biotechnology.*		*3%*		*C2*	*CD/SC*	*Core*
EB10.02	*Discuss bioinformatics and biomanufacturing careers.*		*2%*		*C2*	*CD/CS*	*Core*
EB10.03	*Analyze careers in agriculture that support biotechnology.*		*3%*	*1%*	*C3*	*CD/SC*	*Core*
EB10.04	*Analyze careers in health care that support biotechnology.*		*3%*	*1%*	*C3*	*CD/SC/H*	*Core*
EB10.05	*Create a personal Career Development Plan.*			*1%*	*C3*	*CD*	*Core*
EB10.06	*Demonstrate professional qualities and leadership skills.*		*2%*	*1%*	*C3*	*CD*	*Core*