Biotechnology

Course Description:	The purpose of this course is to provide an introduction to Biotechnology. Biotechnology helps people and the environment. It helps us meet our basic needs. How well these needs are met determines our quality of life. In 45 class periods, we will study areas related to both agriculture and the environment and will look at how biotechnology has effected these areas in making our lives better and more productive on earth.
Grade Level:	8
Length of Course:	Frequency: 6 days per 6 day cycle Duration: 42 minutes Length: 45 days Hours: 31 ½
Prerequisites:	None
Textbook:	Managing our Natural Resources
Expected Level of Achievement	Students will be required to maintain a 70% or better. They will be required to come to class prepared to learn. 93-100% = A 85 – 92% = B 77 – 84% = C 70 – 76% = D Below 70% = F

Northern York County School District Curriculum

Course Name:	Biotechnology
Content:	Watersheds and Wetlands
Key Learning(s):	Describe the water cycle Describe a watershed and its role in the water cycle Describe the physical factors that make a watershed Describe the characteristics and function of a wetland
Essential Question(s):	How does the water cycle work? What is a watershed and how does it relate to the water cycle? What are the physical factors that create a watershed? Describe a wetland and its characteristics? What are the functions of a wetland?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.1.7A 4.1.7B	Explain the role of the water cycle within a watershed Understand the role of a watershed	Students will describe the water cycle from observations on handouts and overheads Students will observe how water cycle works by helping build an enclosed water cycle in class Students will help build a water shed in class using plastic bags and newspaper Will observe water running in different directions due to barriers constructed by the students Students will observe what creates the boundaries of a watershed by observing the lab and visualizing mountains and hills.	Quizzes Lab Participation Observation notes from wetland tour	Internet Video – Maligned Treasures Overhead transparencies Water Cycle Lab – clear containers, water, plastic wrap, heat lamp Watershed Lab – White plastic, newspaper, spray bottles food coloring

4.1.7D	Explain and describe the characteristics of a wetland	Students will be able to locate watersheds locally and nationally using maps Students will identify specific characteristics of wetland plants and soil Students will list the functions of a wetland Describe the different types of wetlands Students will construct a wetland to observe the effects of flood control and soil erosion control with and without wetlands Students will visit a wetland and observe the common vegetation and animals that live in this habitat		Wetlands Lab – foil pans, clay, sponges, soil and water Enviroscape Illustration Lab

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Course Name:	Biotechnology
Content:	Agriculture and Society
Key Learning(s):	Know society's standard of living in relation to Agriculture Agriculture systems use natural and human resources Agriculture production has improved through technology
Essential Question(s):	How is a society's standard of living affected by agriculture? What is the food and fiber system? What are the main agricultural commodities of the United States and Pennsylvania? How does society use natural resources in agricultural systems for human survival? What is the impact of technology on agricultural systems and society? What is the importance of soil to humans? How are soils formed? What is the importance of various soil chemical and physical characteristics?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.4.7A	Explain society's standard of living in relation to agriculture	Students will create a timeline listing the advancement in technology and food production Compare several technological adnancements and their effects on historical growth of agriculture Compare and contrast how plant and animals affect agriculture production	Quizzes Lab - worksheets Lab – Ag Commodity Maps	Internet Agriculture Journals Ag Commodities Maps Hydrotube – Hydroponics Lab Overheads – Ag Facts

4.4.7C	Explain agriculture systems use of natural and human resources	Analyze the needs of plants and animals as they relate to climate conditions and soil Identify the plants and animals that can be raised in certain areas and explain why Define issues associated with food and fiber production Identify natural resources necessary for agriculture production		Graphs Field Trip – Mason Dixon Farms, Gettysburg
4.4.7D	Explain how technology improves agriculture production	Compare the technologies that have advanced agriculture production Explain how energy sources have changed to meet agriculture technology Will understand the use of agriculture products in the replacing or supplementing fossil fuels		

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Course Name:	Biotechnology
Content:	Environmental Health
Key Learning(s):	Identify environmental health issues Describe how human actions affect the health of the environment
Essential Question(s):	How is health affected by the human/environmental interactions?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.3.7A 4.3.7B	Identify environmental health issues Identify how human actions affect environmental health	Students will identify examples of long-term pollution and explain it's effect on the environment Describe different types of pest control and their effects on the environment Identify alternative products that can be used to reduce pollution Describe how human actions affect the health of the environment Identify land use practices and relation to environmental health Explain how natural disasters affect environmental health Identify residential and industrial sources of pollution Explain the differences between point and non-point source pollution	Quizzes Classroom discussion/work Oral presentations	Newspaper Text: Managing Our Natural Resources Internet Video – Pollution Enviroscape Model Demonstrator - curriculum

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Course Name:	Biotechnology
Content:	Environmental Laws and Regulations
Key Learning(s):	Explain the role of environmental laws and regulations
Essential Question(s):	What local, state, or national legislation is in place to protect natural resources? Who is responsible for protecting our natural resources?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.9.7A	Explain the role of environmental laws and regulations	Students will identify and list the environmental laws and regulations in PA Will explain what thee laws entail Will explain the role of local and state agencies in enforcing these laws and regulations	Quizzes Worksheets	Internet Video – Maligned Treasures DEP Dept. of Ag Pa Game commission Text – Managing Our Natural Resources

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Course Name:	Biotechnology
Content:	Integrated Pest Management
Key Learning(s):	Know the benefits and harmful effects of pests Pest management does effect the environment What are the various IPM techniques used today
Essential Question(s):	What occurrences cause people to classify some organisms as pests? How can pests be controlled? How do various pest management strategies affect the environment?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.5.7A	Explain benefits and harmful effects of pests	Identify what a pest is and explain the benefits and harmful effects of each Identify locations where pests can be found and compare effects on each location	Quizzes Worksheet – Pest Control Methods at home Worksheets	Internet Video Pesticides in Ag IPM Mngmnt in Ag Overheads – IPM
4.5.7B	Explain how pest management affects the environment	Will explain the history of pest management Will describe the different types of pesticides used Explain the issues related to IPM, chemical practices, resistant varieties, monitoring, biological Explain the harmful effects on the environment when pesticides are not used properly	Lab – "over the counter" pesticides	Pesticide - over the Counter - Agway

4.5.7C	Explain the various IPM practices used in society	Will describe the different methods of pesticide management using the pyramid of tactics Will design their own pest management strategy to use at home Compare IPM to past pest management practices Analyze the log-term effects of using IPM products		

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Course Name:	Biotechnology
Content:	Renewable and Non-Renewable Resources
Key Learning(s):	Know that raw materials come from natural resources Examine the renewability of resources Explain natural resource distribution Describe the role of recycling and waste management
Essential Question(s):	What is a natural resource? What are the primary categories of natural resources? How are renewable and nonrenewable resources different? How do humans manage and distribute natural resources? Where are various resources located? How are consumer goods derived from natural resources? What is the role of recycling and waste management in controlling resource use? What are the costs and benefits of recycling? How are different materials reused and recycled?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.2.7A 4.2.7B	Know that raw materials come from natural resources Examine the renewability of resources	Students will be able to define a natural resource and list examples Students will be able to identify how those natural resources are used for every day use Students will identify renewable resources and non renewable resources	Quizzes Worksheets Oral presentation on how a product is recycled	Textbook – Managing Our Natural Resources Trash – Recycled trash Trees – school grounds Video – Land Use Management

		Students will identify trees as a renewable resource and Identify trees surrounding school and match them to their uses Compare renewable fuels versus non renewable fuels Identify wastes derived from the use of renewable and non-renewable resources		Internet
4.2.7C	Explain natural resource distribution	Students will be able to observe a resource map and be able to locate natural resource concentrations Analyze the effects of management practices on natural resources		
4.2.7D	Describe the role of recycling	Students will identify materials that can be recycled Students will be able to describe the methods that could be used to reuse materials		

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Course Name:	Biotechnology
Content:	Threatened, Endangered and Extinct Species
Key Learning(s):	The diversity of plants and animals in an ecosystem Living organisms can adapt to their environment There are both natural and human action that effect loss of species
Essential Question(s):	What is biological diversity? How does biological diversity relate to the viability of an ecosystem? What are various adaptations within ecosystems? How can humans impact the health of ecosystems?
Grade Level:	8

Number	Standard	Student Learning Experiences	Procedures for Assessment	Resources
4.7.7A	Describe the diversity of plants and animals in an ecosystem	Students will select an ecosystem and describe the plants and animals that live there Identify adaptations in plants and animals Recognize that adaptations are developed over long periods of time	Quizzes Presentations Poster project – of a plant or animal native to PA Lab ID animal pelts	Internet Pa Game Commission - guest speaker Animal Pelt ID Kit – Pa Game Commission Animals of PA Field Notes Video – Un Endangered Series
4.7.7B	Explain how species of living organisms adapt to their environment	Explain how an adaptation is an inherited structure or behavior that helps an organism survive Compare and contrast animals and plants that have very specific survival requirements Will list examples of species becoming extinct because of human actions Will identify pelts of animals native to PA and observe adaptations of these animals		