

Milwood Magnet School Center for Math, Science and Technology
Curriculum Framework

“Biotechnology: Creating solutions for myself, my community, and my world.”

Biotechnology						
Math, grades 6-8						
	<i>Unit 1</i>	<i>Unit 2</i>	<i>Unit 3</i>	<i>Unit 4</i>	<i>Unit 5</i>	<i>Unit 6</i>
	Technological Innovations	Global Food Chain	Bio-Fuel	Medical Biotechnology	Environmental Biotechnology	Sustainable Systems
Overarching Ideas	“E³: Making life Easy, Effective and Efficient”	“Sustaining and improving food production regionally and globally”	“Sustainable power for human benefit”	“Improving our Quality of Life”	“Preserving and Restoring our environment”	“Adopting a sustainable quality lifestyle for ourselves and our posterity”
6	How do technological innovations affect the efficient use of resources?	How are shapes found in nature used in food production?	How do the differences between bio-fuels and fossil fuels impact your decisions?	How have the advances in the medical field improved our use of space?	How do multiple representations effect your personal commitment to environmental issues?	How does understanding cause and effect relationships help solve problems?
7	How have changes in technological innovations affected the society in which you live?	What is the relationship between you, your community and the world?	How do rates of energy source consumption and production affect the economy?	How do you predict variability in an organism?	How does society accurately use information to make decisions?	How do actions affect the environment?
8	How has technology changed the movement of people?	How do environmental factors impact ecosystems?	How can communities work to maximize the benefits of bio-fuels?	How do we analyze imbalance to create equilibrium in a human system?	How do we analyze imbalance to create equilibrium in environmental systems?	How can you use knowledge about 3 dimensional shapes to create a sustainable “green” building?

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ELA, grades 6-8						
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	Technological Innovations	Global Food Chain	Bio-Fuel	Medical Biotechnology	Environmental Biotechnology	Sustainable Systems
Overarching Ideas	“E³: Making life Easy, Effective and Efficient”	“Sustaining and improving food production regionally and globally”	“Sustainable power for human benefit”	“Improving our Quality of Life”	“Preserving and Restoring our environment”	“Adopting a sustainable quality lifestyle for ourselves and our posterity”
6	How does our changing world affect your life?	How does understanding different needs help build relationships?	How do you come to conclusions?	How do life experiences shape you?	How do your decisions influence others?	How does point of view shape your thinking?
7	How does interacting with others help construct meaning and promote innovation?	How does interaction with others help form identity?	How can personal choices affect society?	How does point of view shape our responses?	How do actions affect our changing world?	How do actions in your community influence your life?
8	How do interactions with others help you contribute to society?	How is conflict resolved?	How can processes help people solve problems?	How does point of view shape our actions?	What are my responsibilities to society?	How is the world different because you're in it?

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Social Studies, grades 6-8						
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	Technological Innovations	Global Food Chain	Bio-Fuel	Medical Biotechnology	Environmental Biotechnology	Sustainable Systems
<i>Overarching Ideas</i>	“E³: Making life Easy, Effective and Efficient”	“Sustaining and improving food production regionally and globally”	“Sustainable power for human benefit”	“Improving our Quality of Life”	“Preserving and Restoring our environment”	“Adopting a sustainable quality lifestyle for ourselves and our posterity”
6	How do we understand our place in the world?	What developments have influenced our relationship with our environment?	How does the living world provide for human needs?	How does economic opportunities relate to economic interdependence between nations?	How do human actions effect the environment?	Why do we need sustainable living?
7	How do we understand other cultures' place in the world?	How does technology effect our environment?	How do the needs of people/business/governments drive economic systems?	How does historical perspective shape human understanding?	How do global issues of the past/present relate to my life?	How do governments/nations interact?
8	How do we understand our country's place in the world?	How does government balance economic liberty with the common good of the nation?	How does perspective shape interpretation of the past and present?	How is the pursuit of happiness in the medical biotechnology field balanced with ethical concerns?	Does government balance justice with common good effectively?	What actions can be taken to influence government?

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Science, grades 6-8						
	<i>Unit 1</i>	<i>Unit 2</i>	<i>Unit 3</i>	<i>Unit 4</i>	<i>Unit 5</i>	<i>Unit 6</i>
	Technological Innovations	Global Food Chain	Bio-Fuel	Medical Biotechnology	Environmental Biotechnology	Sustainable Systems
Overarching Ideas	“E³: Making life Easy, Effective and Efficient”	“Sustaining and improving food production regionally and globally”	“Sustainable power for human benefit”	“Improving our Quality of Life”	“Preserving and Restoring our environment”	“Adopting a sustainable quality lifestyle for ourselves and our posterity”
6	How does research and technology improve society?	How does research and development help maintain food accessibility?	How does the use of energy resources affect you and your community?	What research and technologies have caused change in our world?	How does our current knowledge help us effectively use Earth's natural resources?	How does the work of a scientist include the human footprint?
7	How does research and technology improve our quality of life?	How does research and technology maintain safe agricultural resources and practices?	How does the use of energy resources affect you and your nation?	How can research and technologies enhance our natural resources?	How does matter help us create sustainable resources?	How does scientific research guide and drive ethical decisions in society?
8	How does research and technology improve our understanding of the world?	How does research and technology increase and improve agricultural resources?	How is the use of energy resources affecting the global community?	How do we improve our resources through the use of technology?	How is technology used to preserve and sustain regional and global resources?	What are the ethical implications of sustainable decision making?

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Big Idea
Technological Innovations



Big Idea Context

Definition: Technological innovations are the creation or adaptation of tools by humans to improve society, quality of life, and our understanding of the world.

Application Description: Technological Innovations helps us to make life easy, effective and efficient through various processes of research and development. Examples include development of computer technology, space exploration, the evolution of the engine, food production processes and medical advancements. The big idea of “Technological Innovations” will be the beginning unit for each year. This will allow teachers and students to engage in inquiry-based teaching and learning experiences that support a biotechnology understanding while developing applied understanding of concepts of the core content.



Overarching Idea
E³
Making Life Easy, Effective and Efficient

Math Essential Questions

6th grade: How do technological innovations affect the efficient use of resources?

7th grade: How have changes in technological innovations affected the society in which you live?

8th grade: How has technology changed the movement of people?

Social Studies Essential Questions

6th grade: How do we understand our place in the world?

7th grade: How do we understand other cultures’ place in the world?

8th grade: How do we understand our country’s place in the world?

Science Essential Questions

6th grade: How does research and technology improve society?

7th grade: How does research and technology improve our quality of life?

8th grade: How does research and technology improve our understanding of the world?

ELA Essential Questions

6th grade: How does our changing world affect your life?

7th grade: How does interacting with others help construct meaning and promote innovation?

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Big Idea
Global Food Chain



Big Idea Context
Definition: Global Food Chain is the process of determining how and why food is engineered for human consumption and how food can be safely sustained, preserved, equitably distributed and marketed.
Applications: The Global Food Chain impacts how food production and consumption have evolved overtime including genetically modified plants and transgenic animals, attempts to remedy food shortages (due to drought, famine and changing cultural food preferences), rising food costs (due to increased demands and popularity in bio-fuels), improve food safety (preserving and handling) and the big business of distribution. The need to sustain and improve food production has driven societies to look at the role in the production and consumption of food.



Overarching Idea
Sustaining and improving food production regionally and globally

Math Essential Questions
6th grade: How are shapes found in nature used in food production?
7th grade: What is the relationship between you, your community and the world?
8th grade: How do environmental factors impact ecosystems?

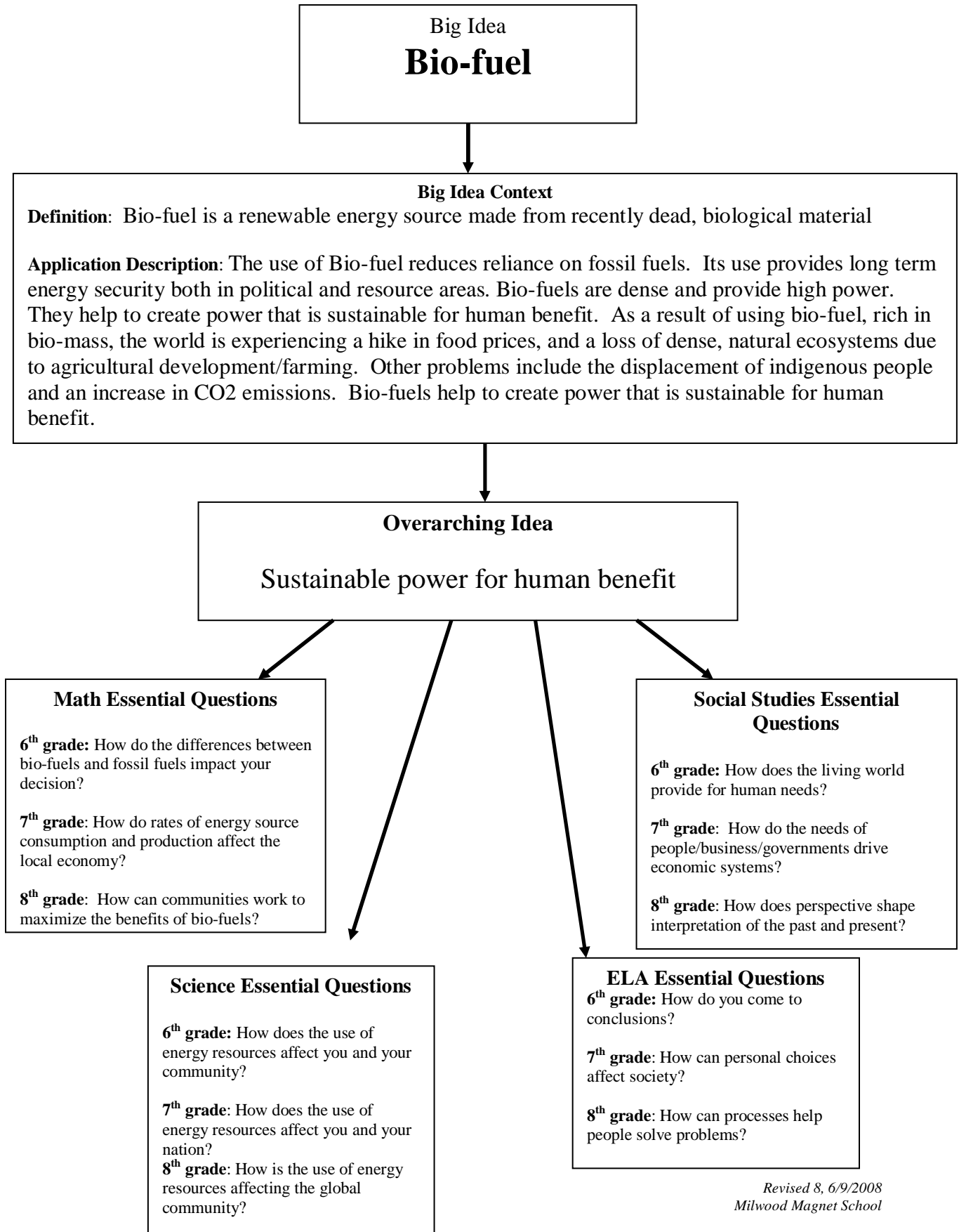
Social Studies Essential Questions
6th grade: What developments have influenced our relationship with our environment?
7th grade: How does technology effect our environment?
8th grade: How does government balance economic liberty with the common good of the nation?

Science Essential Questions
6th grade: How does research and development help maintain food accessibility?
7th grade: How does research and technology maintain safe agricultural resources and practices?
8th grade: How does research and technology increase and improve agricultural resources?

ELA Essential Questions
6th grade: How does understanding different needs help build relationships?
7th grade: How does interaction with others help form identity?
8th grade: How is conflict resolved?

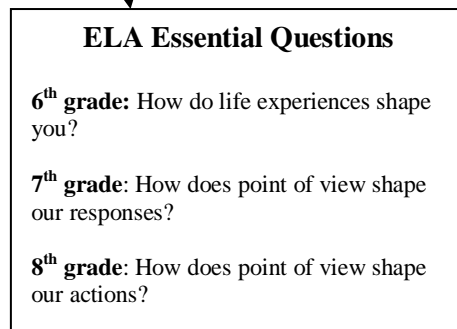
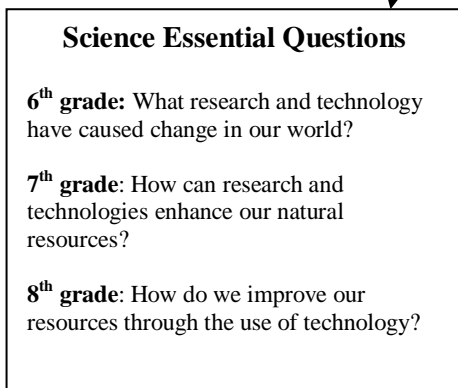
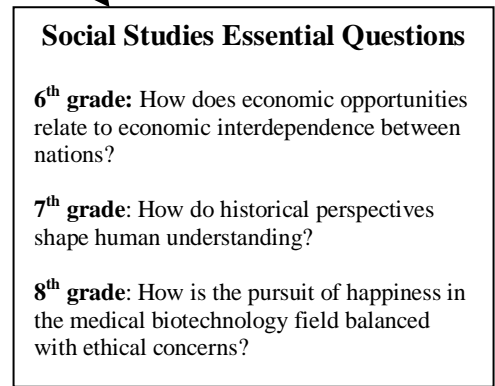
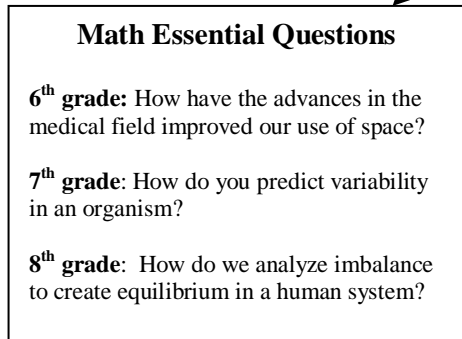
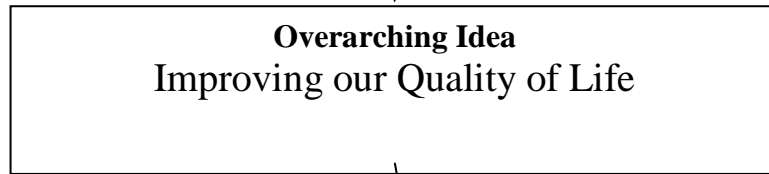
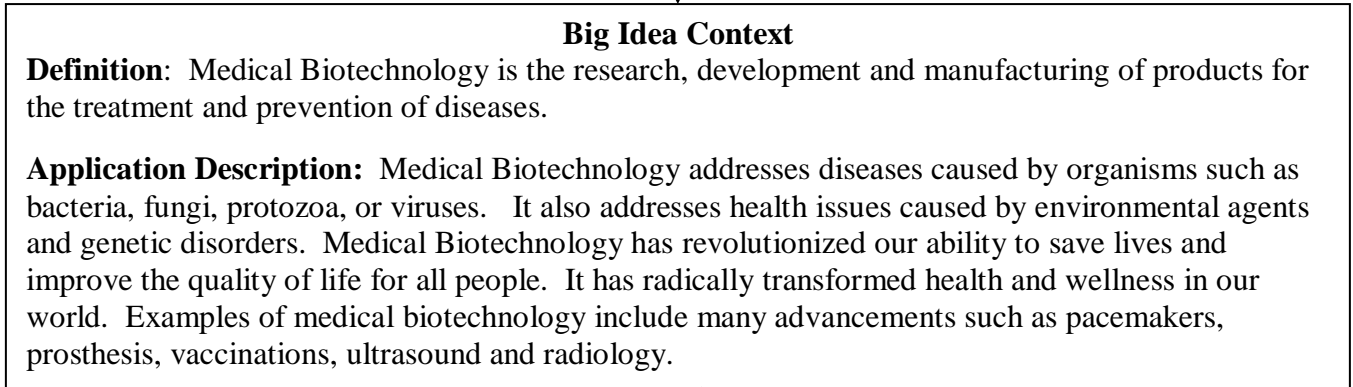
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Big Idea
Environmental Biotechnology



Big Idea Context
Definition: Environmental Biotechnology is the use of organisms or resources to address ecological and environmental issues. These include monitoring, evaluating and correcting the health of populations, communities and ecosystems.
Application Description: Environmental biotechnology focuses on the correcting environmental problems using natural resources. For example, water lilies were used to absorb radioactivity waste in water sources after the Chernobyl accident. There are also bacteria which feed on petrochemicals are used to clean up oil spills. Run-off from sewage, fertilizer or pesticides can also be cleaned using naturally-occurring and/or bio-engineered organisms. Another example is the generation of electricity which is generated from organic materials we now consider waste. By utilizing the technologies of renewable resources, reduction of pollution and capturing potential energy resources; society can be transformed in ways which improve human life and the global ecological community.



Overarching Idea
Preserving and Restoring Our Environment

Math Essential Questions
6th grade: How do multiple representations effect your personal commitment to environmental issues?
7th grade: How does society accurately use information to make decisions?
8th grade: How do we analyze imbalance to create equilibrium in environmental systems?

Social Studies Essential Questions
6th grade: How do human actions effect the environment?
7th grade: How do global issues of the past/present relate to my life?
8th grade: Does government balance justice with the common good effectively?

Science Essential Questions
6th grade: How does our current knowledge help us effectively use Earth's natural resources?
7th grade: How does matter help us create sustainable resources?
8th grade: How is technology used to preserve and sustain regional and global resources?

ELA Essential Questions
6th grade: How do your decisions influence others?
7th grade: How do actions affect our changing world?
8th grade: What are my responsibilities to society?

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