

**COURSE TITLE:**

Foundations of Energy

**UNIT TITLE:**

Renewable Energy – Biomass

**SECTION 1: General Information and Overview**

**Grade Level:**

9-12

**Suggested Number of Lessons:**

6-8

**Suggested Time to Complete Unit:**

5-10 class periods

**Unit Overview:**

This unit provides an overview of biomass and bio fuels as sources of energy and how waste can be transformed into energy.

**SECTION 2: Essential Questions**

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| 1. | What basic information concerning biomass and bio-fuels will I need to know regarding the future of energy? Biomass; Bio-Gas; Waste to Energy power generation plants. |
| 2. | What processes are involved in changing biomass into bio-fuels?  |
| 3. | . How can the use of biomass impact my future as an individual, my family and the economy?   |

**SECTION 3: Major Focus**

Technical Content CTE Program of Studies	Learner Activities (Enabling Knowledge and Skills/Processes)	Core Content For Assessment	Academic Expectations
Construction Technology KOSSA Standard-AD-002 Demonstrate the ability to learn new processes and steps. *Assess the impact of various current and new technologies on the Economy.  2.3 Describe similarities and differences between renewable and nonrenewable sources of energy	Using the provided PDF files in the <i>Biomass Unit:</i> Students will <b>research</b> and discuss current and new technologies in relation to waste and energy technology.  <b>View</b> a video or a power point on “Biomass and Biofuels,” Identify key components as: -definition of terms -sources of biomass -products produced from various sources of biomass materials	SC-HS-4.6.4 <b>Students will:</b> <ul style="list-style-type: none"><li>• <b>describe the components and reservoirs involved in biogeochemical cycles ( water, nitrogen, carbon dioxide and oxygen);</b></li><li>• <b>Explain the movement of matter and energy in biogeochemical cycles and related phenomena.</b></li></ul> <b>The total energy of the universe is constant. Energy can change forms and/or be transferred in many</b>	2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

<p>5.4 Assess the impact of the various energy sources on the economy of Kentucky</p>	<p>-availability of these resources (both raw and finished Products) -future trends in the industry</p> <p><b>Compare</b> findings with classmates and agree on definition, availability in Kentucky and future trends both regionally and nationally.</p> <p><b>Conduct</b> a research using resource texts, websites, brochures, booklets and NEED materials (<i>Energy Info book</i>) <a href="http://www.need.org/Energy-Infobooks">http://www.need.org/Energy-Infobooks</a> to <b>identify</b> and <b>define</b> the following terms: -biodegradable -compostable -life cycle assessment -polylactic acid (PLA)</p>	<p><b>ways, but it can neither be created nor destroyed. Movement of matter between reservoirs is driven by Earth’s internal and external sources of energy. These movements are often accompanied by a change in physical and chemical properties of the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water as dissolved carbon dioxide and in all organisms as complex molecules that control the chemistry of life.</b> <b>DOK 3</b></p>	<p>5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real life situations.</p>
<p>6.2 Identify ways to conserve energy</p>	<p><b>Listen</b> to a discussion by teacher on the process to be used in group work on “Building a Museum of Solid Waste”. From this presentation, identify one the following topic for group work:</p> <ul style="list-style-type: none"> <li>• Introduction to Solid Waste</li> <li>• Source Reduction</li> <li>• Intro to Recycling</li> <li>• Recycling Plastics</li> <li>• Recycling Metals</li> <li>• Recycling Paper/Glass</li> <li>• Waste to Energy</li> <li>• Landfills</li> </ul>	<p>SC-H-ET-U-7 Explore Waste to Energy Solutions</p>	<p>6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.</p>

<p>2.1-2.3 Engage in meaningful hands-on mind-on in conceptual based activities in the area of energy</p> <p>5.1 Compare the pros and cons in the use of the various energy sources</p>	<p><b>Participate</b> in the group activity you identified from the above listing.</p> <p>As a group, <b>identify</b> questions needed to research the chosen topic and the answers needed for a presentation to the class.</p> <p>Use materials as references, resource texts, booklets , videos and website to document their answers.</p> <p><b>Develop</b> a script including visuals, graphs and other display materials for the exhibit and presentation.</p> <p><b>Participate</b> in the presentation of the group's component of the activity <i>Museum of Solid Waste</i></p> <p><b>Evaluate</b> the group presentation/exhibit using a prescribed rubric.</p> <p>Take notes on each group's presentation/exhibit</p>		<p>2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.</p> <p>6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.</p>
<p>KOSSA Standard AD-003 Implement new processes given oral instructions. Engaging in meaningful hands-on, minds-on conceptual based activities in the areas of energy technologies.</p>	<p><b>Participate</b> in a class discussion on the impact biomass has on an individual, the family and the national economy.</p> <p><b>Participate</b> in a Jeopardy type exercise to determine major concepts learned in This unit.</p>	<p>SC-HS-4.6.5 <b>Students will describe and explain the role of carbon-containing molecules and chemical reactions in energy transfer in living systems. Living systems require a continuous input of energy to maintain their chemical and physical organization since the universal tendency is toward more disorganized states. The energy for life</b></p>	<p>2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.</p>

		<p>primarily derives from the Sun. Plants capture energy by absorbing light and using it to break weaker bonds in reactants (such as carbon dioxide and water) in chemical reactions that result in the formation of carbon-containing molecules. These molecules can be used to assemble larger molecules (e.g., DNA, proteins, sugars, fats). In addition, the energy released when these molecules react with oxygen to form very strong bonds can be used as sources of energy for life processes.</p> <p><b>DOK 3</b></p>	
<p>KOSSA Standard-EA-005 Display initiative. Students will investigate with teacher guidance the role of bio mass and bio gas technology in the future of energy.</p>	<p>Using the NEED resource CD and the <i>Secondary info book</i> students will <b>explore</b> bio mass and <b>investigate</b> its physical characteristics and <b>interpret</b> findings.</p> <p><b>Develop</b> a plan for recycling in the school. Develop a plan for the class and share with classmates.</p>	<p>SC-HS-4.6.10 <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>identify the components and mechanisms of energy stored and released from food molecules (photosynthesis and respiration);</b></li> <li>• <b>Apply information to real-world situations.</b></li> </ul> <p><b>Energy is released when the bonds of food molecules are broken and new compounds with lower energy bonds are formed. Cells usually store this energy temporarily in the phosphate bonds of adenosine triphosphate (ATP). During the process of cellular respiration,</b></p>	<p>2.3 Students identify and analyze systems and the ways their components work together or affect each other</p> <p>2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.</p> <p>2.5 Students understand that under certain conditions nature tends to remain the same or move toward a balance.</p>

		<b>some energy is lost as heat. DOK 3</b>	
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## SECTION 4: Culminating Project with Scoring Guide

Students will build and display a Waste to Energy Expo using 3 sided sciences fair boards accompanying each expo board with a power point or short video clip.

### SCORING GUIDE:

	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CONTENT</b>	EXTENSIVE-CONTENT BEYOND WHAT IS TAUGHT IN CLASS	GOOD-EXPLANATION OF CONCEPTS COVERED IN CLASS	BASIC – WHAT HAS ALREADY BEEN COVERED IN CLASS	LIMITED-DOESN'T COVER MATERIAL AS WELL AS DONE IN CLASS
<b>TECHNOLOGY</b>	EXTENSIVE-POWER POINT WITH EXCELLENT ANIMATION AND PICTURES	APPROPRIATE-POWER POINT HAS SOME ANIMATION AND PICTURES	BASIC- POWER POINT WITH LITTLE ANIMATION AND PICTURES	LIMITED – POWER POINT WITH NO ANIMATION OR PICTURES
<b>PRESENTATION</b>	EXCELLENT-FLOWS WELL, AUDIENCE VERY ATTENTIVE- WELL REHEARSED	GOOD – FLOWS WELL PARTICIPANTS KNOW MATERIAL WELL	BASIC – FLOWS UNEVENLY MAY HAVE SOME READING OF NOTES OR SLIDES	LIMITED- PARTICIPANTS READ FROM NOTES OR SLIDES
<b>INTEREST</b>	EXTENSIVE – PARTICIPANTS MAKE MANY EXTENSIONS AND EXPLANATIONS	APPROPRIATE – ENCOURAGES QUESTIONS AND COMMENTS	BASIC – CAN FIELD SOME QUESTIONS	LIMITED – GLAD TO BE THROUGH WITH THE PRESENTATION

## SECTION 5: Assessment and Enabling Skills and Processes

<b>Assessment:</b>	Waste to Energy Exhibit/Expo and presentation, Plan of Action for Recycling, Group work, Class notebook.
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## SECTION 6: Support Materials (i.e., Resources, Technology, & Equipment

<b>A. Resources</b>	NEED materials,( Bio Mass Folder, Museum of Solid Waste), videos, film clips and web-sites(Bio-Mass-Biofuels in Kentucky , <a href="http://www.energy.ky.gov">www.energy.ky.gov</a>
<b>B. Technology</b>	Personal tools, computer, LCD projector
<b>C. Web-sites (samples of many available)</b>	<a href="http://www.need.org">www.need.org</a> ; <a href="http://www.eia.gov">www.eia.gov</a> ; <a href="http://www.energy.gov">www.energy.gov</a> ;
<b>D. Equipment</b>	Glue guns and supplies fair boards

**COURSE TITLE:**

Foundations of Energy

**UNIT TITLE:**

Building Management & Conservation

**SECTION 1: General Information and Overview**

**Grade Level:**

9-12

**Suggested Number of Lessons:**

5-7

**Suggested Time to Complete Unit:**

10-14 Class periods

**Unit Overview:**

In this unit students will focus on the building management, conservation management and audits of the building envelope and construction materials.

**SECTION 2: Essential Questions**

1.	What role does building materials have in reducing consumption?
2.	What role can students play in managing resources?
3.	Why is a building or home audit important to the energy portfolio?

**SECTION 3: Major Focus**

<b>Technical Content CTE Program of Studies</b>	<b>Learner Activities (Enabling Knowledge and Skills/Processes)</b>	<b>Core Content For Assessment</b>	<b>Academic Expectations</b>
KOSSA Standards 6000 construction technology- AD-002  Demonstrate the ability to learn new processes and steps. Assess the impact of various current and new technologies on the economy.	Using the NEED PDF files in the <i>Management and Conservation</i> unit: Students will <b>research</b> current and new technologies in Saving energy, current energy trends and the impact on our nation's energy portfolio and economy.	<b>SC-HS-4.6.1</b> <b>Students will:</b> <ul style="list-style-type: none"><li>• <b>explain the relationships and connections between matter, energy, living systems and the physical environment;</b></li><li>• <b>Give examples of conservation of matter and energy.</b></li></ul> <b>As matter and energy flow through different organizational levels (e.g., cells, organs, organisms, communities) and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination</b>	2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

		<p><b>results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.</b></p> <p><b>DOK 3</b></p>	
<p>KOSSA Standard AD-003</p> <p>Implement new processes given oral instructions. Engaging in meaningful hands-on, minds-on conceptual based activities in the areas of energy technologies.</p>	<p>Using the NEED resource files on the CD (<i>Future is Today</i>) Students <b>develop</b> a presentation on Plug load modeling and how to <b>conduct</b> energy audits. Presentation will be assessed in the activity <i>Saving Energy expo</i>.</p>	<p><b>SC-HS-4.6.2</b></p> <p><b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>predict wave behavior and energy transfer;</b></li> <li>• <b>Apply knowledge of waves to real life phenomena/investigations.</b></li> </ul> <p><b>Waves, including sound and seismic waves, waves on water and electromagnetic waves, can transfer energy when they interact with matter. Apparent changes in frequency can provide information about relative motion.</b></p> <p><b>DOK 3</b></p>	<p>2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.</p>
<p>KOSSA Standard EA-005</p> <p>Display initiative. Students will investigate with teacher guidance the role of management and conservation technology in the future.</p>	<p>Using the NEED resource CD Foundation of Energy and the Monitoring and Mentoring Kit students <b>explore and investigate</b> ways of saving energy at school and home.</p> <p>Interpret findings present to class and conduct an energy audit.</p>	<p><i>SC-HS-4.6.3</i></p> <p><i>Students will understand that electromagnetic waves, including radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, x-rays and gamma rays result when a charged object is accelerated.</i></p>	<p>2.3 Students identify and analyze systems and the ways their components work together or affect each other</p>
<p>KOSSA Standard OC-002</p> <p>Students will describe the appropriate application and use of measurement devices.</p>	<p>Students perform classroom, building and home audits.</p>	<p><b>SC-HS-4.6.10</b></p> <p><b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>identify the components and mechanisms of energy stored and released from food molecules (photosynthesis and respiration);</b></li> <li>• <b>Apply information to real-world situations.</b></li> </ul> <p><b>Energy is released when the bonds of food molecules are broken and new compounds with lower energy bonds are formed. Cells usually store this energy temporarily in</b></p>	<p>2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.</p>

		<p><b>the phosphate bonds of adenosine triphosphate (ATP). During the process of cellular respiration, some energy is lost as heat.</b></p> <p><b>DOK 3</b></p>	
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## **SECTION 4: Culminating Project with Scoring Guide**

Students will conduct a building audit using the Learn and Conserve Kit along with the Monitoring and mentoring kit.

### **SCORING GUIDE:**

<b>CATEGORY</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>CONTENT</b>	EXTENSIVE- CONTENT BEYOND WHAT IS TAUGHT IN CLASS	GOOD- EXPLANATION OF CONCEPTS COVERED IN CLASS	BASIC – WHAT HAS ALREADY BEEN COVERED IN CLASS	LIMITED- DOESN'T COVER MATERIAL AS WELL AS DONE IN CLASS
<b>TECHNOLOGY</b>	EXTENSIVE- POWER POINT WITH EXCELLENT ANIMATION AND PICTURES	APPROPRIATE- POWER POINT HAS SOME ANIMATION AND PICTURES	BASIC- POWER POINT WITH LITTLE ANIMATION AND PICTURES	LIMITED – POWER POINT WITH NO ANIMATION OR PICTURES
<b>PRESENTATION</b>	EXCELLENT- FLOWS WELL, AUDIENCE VERY ATTENTIVE- WELL REHEARSED	GOOD – FLOWS WELL PARTICIPANTS KNOW MATERIAL WELL	BASIC – FLOWS UNEVENLY MAY HAVE SOME READING OF NOTES OR SLIDES	LIMITED- PARTICIPANTS READ FROM NOTES OR SLIDES
<b>INTEREST</b>	EXTENSIVE – PARTICIPANTS MAKE MANY EXTENSIONS AND EXPLANATIONS	APPROPRIATE – ENCOURAGES QUESTIONS AND COMMENTS	BASIC – CAN FIELD SOME QUESTIONS	LIMITED – GLAD TO BE THROUGH WITH THE PRESENTATION

## **SECTION 5: Assessment and Enabling Skills and Processes**

<b>Assessment:</b>	Students will design build and evaluate ideas of an energy efficient house, use the Energy house in the need provided kit to complete the project. Make presentations using power point or some other technology to the class. Students will Conduct building audits and plug load surveys and report to school officials.
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## **SECTION 6: Support Materials (i.e., Resources, Technology, & Equipment**

<b>A. Resources</b>	NEED Materials, M&M kit, Solar Kit
<b>B. Technology</b>	Personal and shop tools and equipment
<b>C. Web-sites (samples of many available)</b>	<a href="http://www.need.org">www.need.org</a> ; <a href="http://www.eia.gov">www.eia.gov</a> ; <a href="http://www.energy.gov">www.energy.gov</a> ;
<b>D. Equipment</b>	

**COURSE TITLE:**

Foundations of Energy

**UNIT TITLE:**

Non Renewable - Coal

### **SECTION 1: General Information and Overview**

**Grade Level:**

9-12

**Suggested Number of Lessons:**

13-15

**Suggested Time to Complete Unit:**

3 weeks

**Unit Overview:**

This unit will focus on the energy of coal including the geology, excavation, distribution and its various uses.

### **SECTION 2: Essential Questions**

1.	Why is coal such an important source of energy in my home, business and industry?
2.	What are the methods of the extraction of coal and how does that affect me and industry and the workers of the industry?
3.	What is the future for coal as an energy source in Kentucky, the nation and around the globe?

### **SECTION 3: Major Focus**

<b>Technical Content CTE Program of Studies</b>	<b>Learner Activities (Enabling Knowledge and Skills/Processes)</b>	<b>Core Content For Assessment</b>	<b>Academic Expectations</b>
Construction Technology- KOSSA Standard AD-002 Demonstrate the ability to learn new processes and steps. Assess the impact of various current and new technologies on the economy.	Using the provided PDF files in the <i>Coal unit</i> : Students will research and discuss: - current and new technologies in coal mining -clean coal for understandings of current energy trends - impact on our nation's energy portfolio and economy.  Students will view the CD <i>Coal Kentucky's power source</i> . Brainstorm and summarize why coal is a	SC-HS-1.18 <b>Students will:</b> <ul style="list-style-type: none"><li>• <b>explain the importance of chemical reactions in a real-world context;</b></li><li>• <b>Justify conclusions using evidence/data from chemical reactions.</b></li></ul> <b>Chemical reactions (e.g., acids and bases, oxidation, combustion of fuels, rusting, tarnishing) occur all around us and in every cell in our bodies. These reactions may release or absorb energy.</b> DOK 3	2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.          5.4 Assess the impact of the various energy sources on the economy of Kentucky

	<p>major supplier of electricity and its impact on the economy.</p> <p>Students will use the KWL sheet to identify learning regarding coal technology.</p> <p>Students will discuss the geology of coal and work in groups to develop a model of the earth's and show where coal is located and why it is in earth's geology.</p>		<p>2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.</p>
<p>KOSSA Standard AD-003</p> <p>Implement new processes given oral instructions. Engaging in meaningful hands-on, minds-on conceptual based activities in the areas of energy technologies.</p> <p>2.18 Analyze how supply and demand impacts Kentucky's economy in relation to energy</p>	<p>Using the resource files on the CD and "<i>This mine of Mine</i>"</p> <p>Students will use a map of Kentucky and the USA Identify areas that are being mined. Discuss methods of extracting coal.</p> <p>That info will be assessed in the activities, <i>this mine of mine</i> which include developing a pie chart of coal used for electricity production.</p> <p><b>View</b> the CD Clean Coal Technologies. Summarize and discuss production and technological advances in mining and the impact it has on the environment.</p>	<p>SC-HS-1.2,2</p> <p><b>Students will:</b></p> <ul style="list-style-type: none"> <li>• explain the relationship between electricity and magnetism;</li> <li>• Propose solutions to real life problems involving electromagnetism.</li> </ul> <p><b>Electricity and magnetism are two aspects of a single electromagnetic force. Moving electric charges produce magnetic forces or "fields" and moving magnets produce electric forces or "fields". This idea underlies the operation of electric motors and generators.</b></p> <p><b>DOK 3</b></p>	<p>5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real life situations.</p> <p>6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.</p>
<p>KOSSA Standard EA-005</p> <p>Display initiative. Students will investigate with teacher guidance the role of hydrogen technology in the future.</p>	<p>Using the resource CD and the activities in the document <i>energy on public lands</i> students will explore coal properties, laws and interpret findings. Share findings with class.</p>	<p>SC-HS,4.6.1</p> <p><b>Students will:</b></p> <ul style="list-style-type: none"> <li>• explain the relationships and connections between matter, energy, living systems and the physical environment;</li> <li>• Give examples of</li> </ul>	<p>2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.</p>

<p>5.1 Compare the pros and cons in the use of the various energy sources</p> <p>KOSSA Standard 6000: AC-002</p> <p>Students will Identify methods of planning that will save costs on time and materials</p>	<p>Students will develop a power point presentation on the new or emerging technologies they researched regarding coal.</p> <p>Students listen to guest speaker from the coal industry.</p>	<p><b>conservation of matter and energy. As matter and energy flow through different organizational levels (e.g., cells, organs, organisms, communities) and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.</b></p> <p><b>DOK 3</b></p>	
		<p>SC-HS-4.6.4 <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>describe the components and reservoirs involved in biogeochemical cycles ( water, nitrogen, carbon dioxide and oxygen);</b></li> <li>• <b>Explain the movement of matter and energy in biogeochemical cycles and related phenomena.</b></li> </ul> <p><b>The total energy of the universe is constant. Energy can change forms and/or be transferred in many ways, but it can neither be created nor destroyed. Movement of matter between reservoirs is driven by Earth’s internal and external sources of energy. These movements are often accompanied by a change in physical and chemical properties of</b></p>	<p>2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.</p>

		<p><b>the matter. Carbon, for example, occurs in carbonate rocks such as limestone, in the atmosphere as carbon dioxide gas, in water as dissolved carbon dioxide and in all organisms as complex molecules that control the chemistry of life.</b></p> <p><b>DOK 3</b></p>	
<p>KOSSA Standard EA-009 Students will show an understanding of established guidelines for safety in the mines</p>		<p>SC-HS-4.6.9 <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>explain the cause and effect relationship between global climate and weather patterns and energy transfer (cloud cover, location of mountain ranges, oceans);</b></li> <li>• <b>Predict the consequences of changes to the global climate and weather patterns.</b></li> </ul> <p><b>Global climate is determined by energy transfer from the Sun at and near Earth's surface. This energy transfer is influenced by dynamic processes such as cloud cover and the Earth's rotation and static conditions such as the position of mountain ranges and oceans.</b></p> <p><b>DOK 3</b></p>	<p>2.6 Students understand how living and nonliving things change over time and the factors that influence the changes.</p>
		<p>SC-HS-4.6.10 <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>identify the components and mechanisms of energy stored and released from food molecules (photosynthesis and respiration);</b></li> <li>• <b>Apply information to real-world situations.</b></li> </ul> <p><b>Energy is released when the bonds of food molecules are broken</b></p>	

		<p><b>and new compounds with lower energy bonds are formed. Cells usually store this energy temporarily in the phosphate bonds of adenosine triphosphate (ATP). During the process of cellular respiration, some energy is lost as heat.</b></p> <p><b>DOK 3</b></p>	
		<p>SC-HS-4.73  <b>Students will: predict the consequences of changes to any component (atmosphere, solid Earth, oceans, living things) of the Earth System; Propose justifiable solutions to global problems. Interactions among the solid Earth, the oceans, the atmosphere and living things have resulted in the ongoing development of a changing Earth system.</b></p> <p><b>DOK 3</b></p>	

**SECTION 4: Culminating Project with Scoring Guide**

Students in pairs will create and present a power point over an issue dealing with coal as a source of energy. The slide presentation will have between 8-12 slides and the presentation will take 10-15 minutes to present. Preapproval of project from teacher is necessary.

**SCORING GUIDE:**

	4	3	2	1
CONTENT	EXTENSIVE- CONTENT BEYOND WHAT IS TAUGHT IN CLASS	GOOD- EXPLANATION OF CONCEPTS COVERED IN CLASS	BASIC – WHAT HAS ALREADY BEEN COVERED IN CLASS	LIMITED- DOESN'T COVER MATERIAL AS WELL AS DONE IN CLASS
TECHNOLOGY	EXTENSIVE- POWER POINT WITH EXCELLENT ANIMATION AND PICTURES	APPROPRIATE- POWER POINT HAS SOME ANIMATION AND PICTURES	BASIC- POWER POINT WITH LITTLE ANIMATION AND PICTURES	LIMITED – POWER POINT WITH NO ANIMATION OR PICTURES
PRESENTATION	EXCELLENT- FLOWS WELL, AUDIENCE VERY ATTENTIVE- WELL REHEARSED	GOOD – FLOWS WELL PARTICIPANTS KNOW MATERIAL WELL	BASIC – FLOWS UNEVENLY MAY HAVE SOME READING OF NOTES OR SLIDES	LIMITED- PARTICIPANTS READ FROM NOTES OR SLIDES
INTEREST	EXTENSIVE – PARTICIPANTS MAKE MANY EXTENSIONS AND EXPLANATIONS	APPROPRIATE – ENCOURAGES QUESTIONS AND COMMENTS	BASIC – CAN FIELD SOME QUESTIONS	LIMITED – GLAD TO BE THROUGH WITH THE PRESENTATION

## **SECTION 5: Assessment and Enabling Skills and Processes**

<b>Assessment:</b>	Evaluation of class participation.
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## **SECTION 6: Support Materials (i.e., Resources, Technology, & Equipment**

<b>A. Resources</b>	NEED Secondary Infobook
<b>B. Technology</b>	Kentucky Coal Council, DOE
<b>C. Web-sites (samples of many available)</b>	<a href="http://www.eia.gov">www.eia.gov</a>
<b>D. Equipment</b>	