

# **CEDAR**

## ***COAL STUDY UNIT PROGRAM***

**2009-2010 School Year**

**Eastern Kentucky Counties  
of**

**Floyd, Harlan, Johnson, Knott, Lawrence,  
Letcher, Magoffin, Martin, and Pike**

## COAL STUDY UNIT PACKET CONTENTS

Enclosed you will find information that will explain the program, along with instructions on how to apply for a grant. This packet contains the following:

- Page 1 Coal Study Unit Packet Contents
- Page 2 Coal Study Unit Guidelines
- Page 3-8 CSU Application
- Page 9 Grant Request Itemization Forms  
*This form must be completed showing individual items and description of use, necessary to implement your unit. NOTE: Only line items will be approved for purchase by the Grant Review Committee. Also, please be advised that the grant recipient must reimburse any expenditure not pre-approved by CEDAR.*
- Page 10 Notice of Non-Approved Items
- Page 11-13 Resource List
- Page 14 Resource Order Form
- Page 15 Time Line
- Page 16/17 CSU Reporting Format/Guide  
*Informational guide to completing a Coal Study Unit report.*
- Page 18 CSU Grant Reconciliation Form  
*Report required by CEDAR.*
- Page 19 UNIT REPORT - COVER PAGE  
*Required to accompany submission of final unit report*

If you should have any questions, please do not hesitate to contact:

John F. Justice  
(606) 477-3456 (phone)  
(606) 437-0986 (fax)  
[JFJustice@setel.com](mailto:JFJustice@setel.com)

## COAL STUDY UNIT GUIDELINES

### PURPOSE:

Design a unit to teach students about the importance of coal in their daily lives. The unit should teach critical thinking and decision-making about coal, including the role of coal in the nation's energy future, in the economies of Kentucky and the nation, the historical and cultural aspects of coal production, and the challenges and possibilities relating to producing and using coal while protecting the environment.

**DESCRIPTION:** Develop a unit of study based on coal involving as many students as possible.

#### Suggested topics:

<i>Science of coal</i>	<i>Economics of Coal</i>
<i>Mining methods</i>	<i>Culture changes affected by</i>
<i>Coal preparation</i>	<i>the coal industry</i>
<i>Transportation of coal</i>	<i>Environmental or Safety Concerns</i>
<i>Uses of Coal</i>	<i>Coal Careers</i>
<i>Other: Explain</i>	<i>Other: Explain</i>

- \* Or one of the following from the Kentucky Strategy for Energy Independence:
- Strategy 1: Improving the Energy Efficiency of Kentucky's Transportation Fleet*
  - Strategy 4: Development of a Coal-to-Liquids Industry in Kentucky to Replace Petroleum-Based Liquids*
  - Strategy 5: Implementation of a Major and Comprehensive Effort to Increase Coal-to-Gas in Kentucky*
  - Strategy 6: Initiation of an Aggressive Carbon Capture/Sequestration (CCS) Projects for Coal-Generated Electricity in Kentucky*

Coal Units may include activities outside as well as in the classroom.

Grant Applications are due November 6, 2009. CEDAR will make every effort to respond by December 18, 2009. Unit implementation will be January through April 9, 2010.

### NOTE:

If the unit addresses current issues with differing public points of view and you would like assistance in determining how best to proceed in a fair and balanced manner, then CEDAR will be glad to refer you to a certified environmental educator. This individual would be qualified to assist in developing a balanced approach to such issues. For assistance in securing such an individual contact John Justice at (606) 477-3456 or email to [JFJustice@setel.com](mailto:JFJustice@setel.com)

- \* CEDAR encourages all teachers and students to familiarize themselves with the Governor's Energy Plan, formally known as, ***INTELLIGENT ENERGY CHOICES FOR KENTUCKY'S FUTURE - KENTUCKY'S (7) POINT STRATEGY FOR ENERGY INDEPENDENCE***.

The complete plan, along with an executive summary can be accessed at [www.energy.ky.gov/kyenergyplan2008/](http://www.energy.ky.gov/kyenergyplan2008/)

**CEDAR  
COAL STUDY UNIT  
APPLICATION / GRANT REQUEST FORM**

- 1. Applicant's Name \_\_\_\_\_
- 2. Home Street Address \_\_\_\_\_
- 3. Home Mailing Address \_\_\_\_\_
- 4. Home Phone \_\_\_\_\_ Cell Phone \_\_\_\_\_
- 5. Email Address \_\_\_\_\_
- 6. School Name \_\_\_\_\_ Grade \_\_\_\_\_
- 7. Anticipated Number of Students Involved in Study Unit \_\_\_\_\_
- 8. Coal Study Unit Title \_\_\_\_\_
- 9. Number of Classroom Teachers at this School \_\_\_\_\_
- 10. Number of Teachers Teaching This Unit \_\_\_\_\_

NOTE: PLEASE LIST THE NAME, ADDRESS, AND E-MAIL ADDRESS OF ANY OTHER TEACHER THAT WILL BE INVOLVED IN THE TEACHING OF THIS UNIT. *(Do not list other teachers in your school who will be submitting or has submitted a grant request.)*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

***The applicant, as listed on line #1, is responsible for submitting the written and financial report per CEDAR guidelines and Grant Agreement.***

THIS APPLICATION (PAGES 3-8) AND THE GRANT REQUEST ITEMIZATION FORM (Page 9), MUST BE COMPLETED AND POST-MARKED NO LATER THAN NOVEMBER 6, 2009, IN ORDER TO ASSURE CONSIDERATION.

SEND TO: CEDAR, INC.  
P.O. BOX 2152  
PIKEVILLE, KY 41502













## NOTICE

Listed below are certain items that CEDAR generally does not approve as expenditures of grant money. Please submit a written explanation if any listed item would prevent you from implementing your unit. Please note, this list includes but is not limited to the following:

TVs

VCRs

Computer Hardware (Printers, Modems, Digital Cameras, etc.)

Camcorders

Cameras Other Than Disposable

*(For reporting purposes there will be a \$40.00 allowance for disposable cameras or inkjet cartridges)*

Furniture or Fixtures

Engineering Equipment

Multiple Copies of Books or Software

Kitchen Utensils

Overhead Projectors

Laboratory Equipment (Kilns, Hot Plates, etc.)

Food and/or Meal Expenses

Local School Fair Awards, Displays, Ribbons, etc.

T-shirts or Hats

Guest Speaker Fees or Gifts

Miscellaneous Items (Everything must be specified)

## CEDAR RESOURCE LIST

### BOOKLETS

- **What Everyone Should Know About Electricity From Coal** - 15 page illustrated booklet that explains how electricity is generated from coal and delivered to homes. **(Grades 4-12)**
- **What Everyone Should Know About Land Reclamation** - 15 page illustrated booklet that describes the land reclamation process. (Grade 4-12)
- **What Everyone Should Know About Coal** - 15 page illustrated booklet which describes the types of coal, the basic ways to mine coal, how coal is used, how it affects the environment and new technologies. **(Grades 4-12)**
- **Let's Learn About Coal** - 16 page booklet that uses activities such as puzzles and word games to explain how coal is formed, produced used in the United States. **(Grades 3-6)**
- **Power from Coal** - 16 page booklet with text and activities that describes the formation, history, production, transportation, and current uses of coal. Each set includes a teacher's guide and suggested additional activities. **(Grades 6-9)**
- **Mining Glossary and Games** - An easy-to-use collection of more than 600 mining terms designed to help students learn the basics of mining. Also included - 28 games and activities that help students learn and retain significant words dealing with mining and minerals. **(Grades K-8)**
- **Kentucky Coal and the Environment** - An attractive booklet filled with photos and examples of how Kentucky has benefited from reclaimed land.
- **Coal Today** - A 32 page booklet on coal, a coal miner's life, coal and electricity, and coal glossary.
- **Coal Facts** - A 41 page booklet on Kentucky coal history, uses, statistics, and facts.
- **Coal and the Environment - (American Geological Institute's Environmental Awareness Series)**  
A very attractive and professionally produced booklet containing 64 pages that addresses the appropriate balance of policies for maximizing our country's resources, meeting energy needs, and providing a healthy environment. **(One Per Unit)**

### TOOLKITS

- **Fossil Energy Study Guide** - (*U.S. Dept. of Energy's Office of Fossil Energy*)
  - **Elementary** - A 9 page leaflet addressing; What is Coal?; A Brief History of Coal; Coal Mining and Transportation; Converting Coal into Electricity; Delivering Electricity; Cleaning up Coal; Coal and Climate Change; Kit contains the following activities; Word Search (3 pages); Crossword Puzzle (4 pages); Conserving Electric Energy (3 pages); How Much Does It Cost to Light You School? (3 pages)
  - **Middle School** - An eleven page leaflet addressing; Coal - Our Most Abundant Fuel; A Brief History of Coal; Coal Mining and Transportation; Coal's Role in Electrical Supply; Cleaning Up Coal; Clean Coal Technology; Burning of Coal; Coal and Climate Change.
  - **High School** - An eight page leaflet addressing; Types of Coal; Use of Coal; How We Mine Coal; History of Coal; Coal and the Environment; Coal Gasification; Current Clean Coal Technologies; Carbon Sequestration.

## CEDAR RESOURCE LIST

(cont.)

### NEWSPAPERS

- **The Energist - Coal** - Newspaper format publication which discusses the formation and types of coal and their locations; coal production/mining technologies; coal uses; synthetic fuels from coal; new coal technologies; coal and the environment; and coal characteristics. **(Grades 6-12)**
- **The Energist - Getting to Know Electricity** - Electric current and resistance; chemical, thermo, and static electricity; transformers, motors, and generators; circuits, generation, and distribution; load management, billing, safety, and conservation. **(Grades 5-12)**
- **Mining Reclamation Primer** - An eight page newspaper format publication that discusses Mining Reclamation, the laws that impact reclamation, phases of reclamation, etc. This is a companion piece for the Mining Reclamation Poster. **(Grades 6-12)**

### EXPERIMENTS

- **Coal Sample Kit** - Samples of peat, lignite, bituminous coal, and anthracite, including a brief description of the formation and different types of coal. **(Grades K-12)**

### POSTERS

- **Mining Reclamation** - Colorful poster with a technical focus on the process of reclamation from pre-mining activities to future beneficial use of the reclaimed land.
- **From The Mine To My Home** - Created to teach five stages relating to mineral resources: exploration, mining, processing, consuming, and recycling.
- **Coal Technology: The Future Is Now** - Poster with full color illustrations tells the technological story of coal from exploration to reclamation.
- **Coal** - Attractive, colorfully illustrated poster is used to convey information on the formation, exploration, extraction, transportation, and uses of coal.
- **Electrical Generation** - Illustrates the energy sources of electricity - fossil fuels, nuclear, hydro and renewable - and the transmission and distribution of electricity.
- **Reclaimed Mine Site** - Highlights the many uses of fully reclaimed mine sites: golf courses, recreation areas, schools, prisons and airports.
- **Act Responsibly: Stay Out & Stay Alive** - Highlights a series of safety situations that one may encounter around abandoned, idle, and inactive mines.

### DVDs

- **All About Coal (12 Minutes)**. An entertaining and informative look at how coal is formed, mined, washed, transported, and used in electricity generation. A puppet, dressed as a miner, takes viewers on a tour of an underground and surface mine and power plant. **(Grades K-6)** (AEP)
- **Coal: The Inside Story (16 Minutes)** - This video covers the formation, washing transportation, and burning of coal to produce electricity. Host Tim Elsert walks through the phases of coal production at both underground and surface mining operations. **(Grades 7-12)** (AEP)
- **America's Fuel (11 Minutes)** - This video demonstrates the importance of coal to the American economy and overall quality of life. A utility executive, a businessman, a former mayor and an economist/physicist each describe the benefits they have found from using coal as the source for their electricity. **(Grades 7-12)** (CEED)
- **Coal People: A Century of Pride (24 Minutes)** - A tribute to coal mining people, This video is a cinematic journey that celebrates a proud workforce and its contributions to American progress. **(Grades 5-12)** (Peabody Coal Co.)
- **Mining - Discoveries For Progress (10 Minutes)** - Video showing what today's mining industries is all about. **(Grades K-12)**
- **Coal Today** - A modern story about the new technologies and the people who produce coal and generate the power that is the foundation of our nation's economy. **(Grades 6-12)**

## **CEDAR RESOURCE LIST**

( DVDs cont.)

- **Common Ground - Modern Mining and You (27 Minutes)** - Contains information on all forms of mining, including coal. (Grades K-12)
- **Underground Mine Tour (50 Minutes)** - Video shows all aspects of underground continuous mining from outside the mine to the face. Filmed at a Pike County mine. (Grades 5-12)
- **From Mines to Lines (27 Minutes)** - Video shows coal being mined and followed to its final destination... the power plant. (Grades 5-12)
- **Coal Into Kilowatts (16 Minutes)** - A tour of American Electric Power's Big Sandy Plant. (Grades K-12)
- **The Greening of Planet Earth (28 Minutes)** - Video shows the positive effects of carbon dioxide on our forests and plants. (Grades 9-12)
- **Balancing the Needs - Coal and the Environment (14 Minutes)** - Coal's role in the past and future. (Grades 9-12)

### **GUEST SPEAKERS**

**Specialized Speakers (engineering, reclamation, mining, trucking, etc.)** will be scheduled upon request to John Justice at (606) 477-3456 or email [JFJustice@setel.com](mailto:JFJustice@setel.com)

## RESOURCE ORDER FORM

The following materials are available at no charge. Check items you wish to receive and indicate number of copies you will need (based on number of students). Please note that due to the expense of some of these items, only one or two will be provided per class. **(Materials will be shipped upon receipt of your signed *Grant Agreement*.)**

BOOKLETS	COPIES
What Everyone Should Know About Electricity From Coal	
What Everyone Should Know About Land Reclamation	
What Everyone Should Know About Coal	
Let's Learn About Coal	
Power From Coal	
Mining Glossary and Games <i>(Limit One Per Class)</i>	
Energy Glossary <i>(Limit One Per Class)</i>	
Coal Today <i>(Limit One Per Class)</i>	
Kentucky Coal and the Environment	
Kentucky Coal Facts	
Coal and the Environment <i>(Limit One Per Class)</i>	
TOOLKITS	
Fossil Energy Study Guide - Elementary School <i>(Limit Two Per Class)</i>	
Fossil Energy Study Guide - Middle School <i>(Limit Two Per Class)</i>	
Fossil Energy Study Guide - High School <i>(Limit One Per Class)</i>	
NEWSPAPERS	
The Energist - Coal <i>(Grades 5-12)</i>	
The Energist - Getting to Know Electricity <i>(Grades 5-12)</i>	
Mining Reclamation Primer <i>(Grades 6-12)</i>	
EXPERIMENTS	
Coal Sample Kit <i>(Limit Two Per Class)</i>	
POSTERS	
Mining Reclamation <i>(Limit Two Per Class)</i>	
From the Mine To My Home <i>(Limit Two Per Class)</i>	
Coal Technology: The Future is Now <i>(Limit Two Per Class)</i>	
Coal <i>(Limit Two Per Class)</i>	
Electrical Generation <i>(Limit Two Per Class)</i>	
Reclaimed Mine Site <i>(Limit Two Per Class)</i>	
Act Responsibly: Stay Out & Stay Alive <i>(Limit Two Per Class)</i>	
DVDs	
DVD 1 All About Coal	
DVD 2 Coal: The Inside Story	
DVD 3 America's Fuel	
DVD 4 Coal People: A Century of Pride	
DVD 5 Mining - Discoveries For Progress	
DVD 6 Coal Today	
DVD 7 Common Ground - Modern Mining and You	
DVD 8 Underground Mine Tour	
DVD 9 From Mines to Lines	
DVD 10: Coal Into Kilowatts	
DVD 11: The Greening of Planet Earth	
DVD 12: Balancing the Needs - Coal and the Environment	

Name \_\_\_\_\_ School \_\_\_\_\_ Grade \_\_\_\_\_  
 Home Street Address \_\_\_\_\_  
 Home Mailing Address \_\_\_\_\_  
 Home Phone Number \_\_\_\_\_ Cell Phone Number \_\_\_\_\_

**CEDAR, INC.  
COAL STUDY UNIT  
TIME LINE**

November 6, 2009                      To assure consideration - grant request forms must be **POST-MARKED NO LATER THAN THIS DATE** and mailed to:

CEDAR, Inc.  
P.O. Box 2152  
Pikeville, KY 41502

December 18, 2009                      CEDAR's response to grant requests to be mailed

January 04 - April 09, 2010              Unit Implementation

April 23, 2010                              Unit report to be postmarked **NO LATER THAN THIS DATE:**

CEDAR, Inc.  
P.O. Box 2152  
Pikeville, KY 41502

May 13, 2010                                Teacher Recognition and Awards Banquet  
Landmark Inn/Mark II Convention Center -  
Pikeville, Kentucky 6:00 P. M.

**CEDAR, INC.  
COAL STUDY UNIT  
REPORTING FORMAT**

Your report **must be** in the following

- Double-spaced on 8 1/2 x 11 paper. Typed in a professional font. (Times, Geneva, Helvetica, other) and body of text must be size 12.
- Minimum of two (2) pages and maximum of six (6). (Not including the cover sheet or pages with photographs).
- The provided "**Unit Report-Cover Page**" must be included.
- The report must contain the following sections, with each section clearly identified:

**1. An introduction**

The purpose of the written summary is to "tell the story" of the teacher's coal study unit. The "story" should include an introduction, a description of the activities and goals, and a summary. **(Note: Please do not place your name or the schools name on any page of the report other than the cover sheet.)**

The introduction should be a brief statement of "why" and "how" the unit started. This might include a description of how the specific unit topic was selected. For example, one award-winning teacher began with a description of how she and her students did a KWL (know/want/learned) activity coal, what they WANTED to know about coal, and what they would LEARN as a result of the unit. This became the foundation from which the coal unit was developed.

The introduction is extremely important as it provides the foundation for the remainder of the story. Teachers may want to consider the following questions when developing their introduction.

- How and why was the topic for the coal unit selected?
- Were educational objectives established for the unit? If so, what were they?
- Were students involved in planning the unit?

**2. A description of the activities and goals (Including one (1) picture of each activity)**

This next section of the report should show students actively engaged in the Coal Study Unit. Because of the variety of topics in the coal units, these students activities can range from regular classroom events to real-life activities, such as outdoor experiences, field trips, etc. The most important thing about this section is to show what the students "DID" as a result of the coal unit. **Note: A photograph of each activity performed in the unit is required to be included with the report. Please submit only one (1) photograph per activity.**

CEDAR is interested in seeing a variety of meaningful student activities, but only needs to see a glimpse of them and not an entire picture.

- What activities were the most meaningful?
- Will the description of the activities show a clear relationship to the educational goals of the coal unit?

### **3. A summary**

Every story needs a conclusion or summary, and this is especially true of the coal units. This section should provide information on the success of the unit through an examination/evaluation to determine if the educational goals were met. This examination of the unit's success should be conducted by the teacher and students. This component of the coal unit is, by far, the most overlooked on of the fully implemented and successful unit. The success of the unit should be determined, partially or in whole, by the goals and activities established at the beginning. A comprehensive evaluation can be achieved by answering the following questions:

- Were the educational goals of the unit accomplished?
- What, if anything, was not accomplished? Why?
- How was the unit evaluated? (i.e. teacher observation, completion of educational objectives and activities; student evaluation, such as paper and pencil tests, performance events, open-response questions, community and/or parental input; surveys of participants, etc.)
- Did the students have an opportunity to evaluate the unit? If so, were their comments favorable? If not, did they have an opportunity to make suggestions for improvements?

**CEDAR GRANT  
FINANCIAL ACCOUNTING**

A. Original Grant Amount \_\_\_\_\_

B. Itemization of Materials Purchased/Amount

*(Note: Receipts for ALL Purchases Must Be Attached)*

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_
- 7 \_\_\_\_\_
- 8 \_\_\_\_\_
- 9 \_\_\_\_\_
- 10 \_\_\_\_\_
- 11 \_\_\_\_\_
- 12 \_\_\_\_\_
- 13 \_\_\_\_\_
- 14 \_\_\_\_\_

Total Amount of Expenditures \_\_\_\_\_

C. Amount to be returned to CEDAR (A-B=) \_\_\_\_\_

\_\_\_\_\_  
(Grant Recipient's Signature)

\_\_\_\_\_  
(School)

**CEDAR, Inc.  
COAL STUDY UNIT PROGRAM**

**UNIT REPORT - COVER PAGE**

**GRANT RECIPIENT'S NAME:** \_\_\_\_\_

**SCHOOL NAME:** \_\_\_\_\_ **GRADE:** \_\_\_\_\_

**HOME ADDRESS:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**HOME PHONE:** \_\_\_\_\_ **CELL PHONE:** \_\_\_\_\_

**E-MAIL ADDRESS:** \_\_\_\_\_

**UNIT TITLE:** \_\_\_\_\_

