
Everything We Have and Everything We Use Comes From Our Natural Resources

Everything we have and everything we use has to come from somewhere. Help your students look closely at everything around them and learn where things come from. Remembering the Law of the Conservation of Matter will help them truly understand the saying—

"If it can't be grown, it has to be mined."

- *The Law of Conservation of Matter*—Matter can be neither created nor destroyed. It also means you cannot make something out of nothing — therefore, *Everything Is Made From Something.*

FOOD



Where do you think food comes from?

- What do you think it would be like to live on a farm?
- Is it easy to be a farmer? What would you grow?
- What do you think it was like to be a farmer a long time ago?

CLOTHING



What do you think clothes are made of?

- Do all clothes have labels? What do they say?
- How are your clothes like another classmate's? How are they different?
- What would you do to make your clothes better, easier to wear, last longer, look nicer?

SHELTER



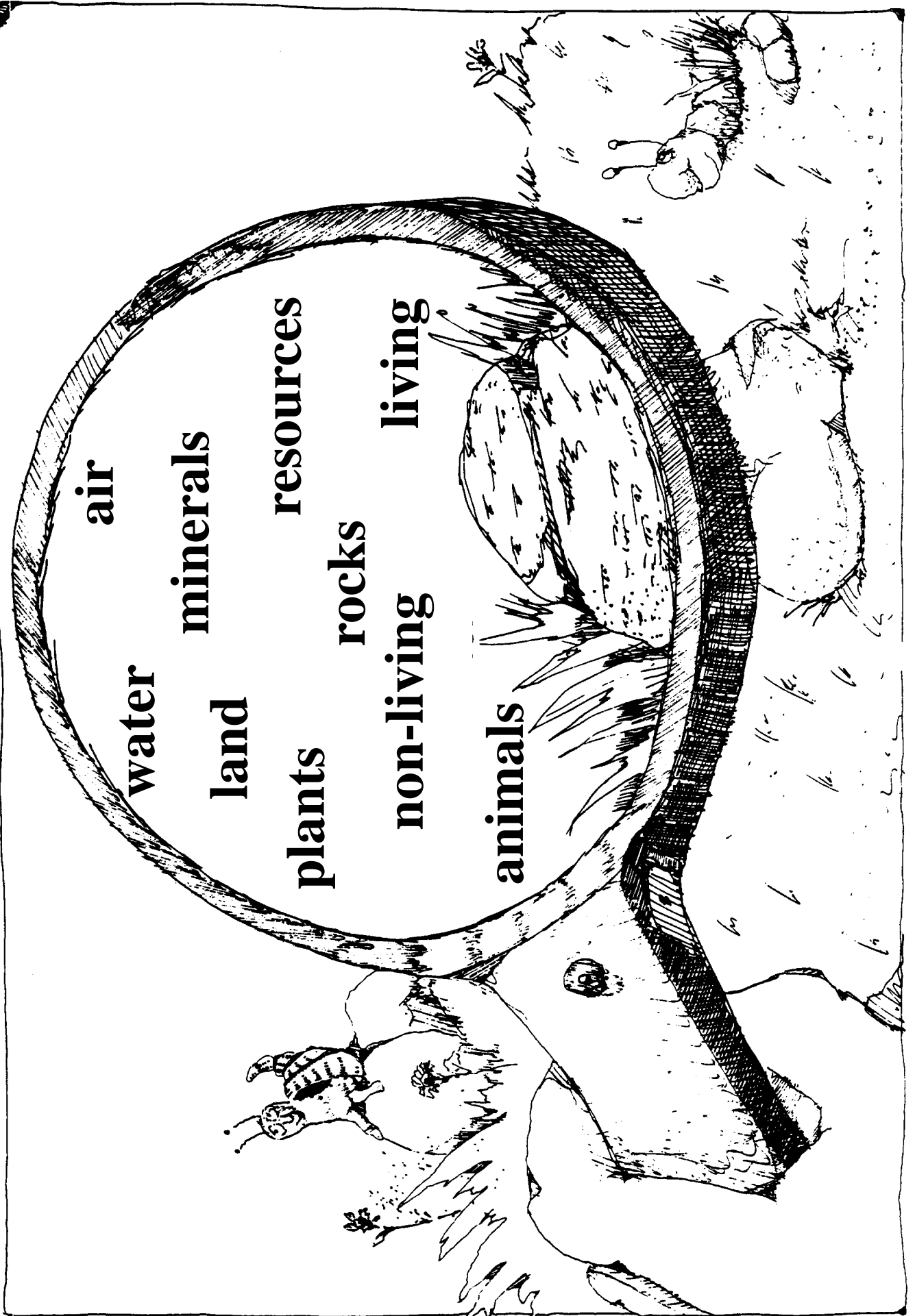
What do you think your house is made of?

- Where did the materials come from?
- Is there a factory where you live that makes materials used to build your house?
- If you were building a house, what would you do first?

Play a game of **20 Questions**—where students find objects in the classroom, while other students ask questions to try to identify the origin of the object. Then classify each item into one of the three categories of Animal, Vegetable, Mineral.

Assign an object (or one of the metals or minerals) to each student to research. From what raw materials is it made? What properties and characteristics does the metal or mineral have that makes it suitable for use in that product? Do you think there is a substitute for the mineral used? Why, and where does it come from?

Natural Resources are all around us



Where Do Things Come From?

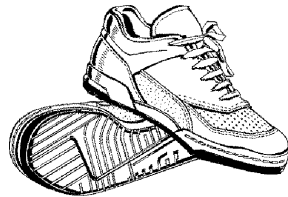
Is it Animal?

Is it Vegetable?

Is it Mineral?

Name _____

Your Shoes
 Animal
 Vegetable
 Mineral



Your School
 Animal
 Vegetable
 Mineral



Animal



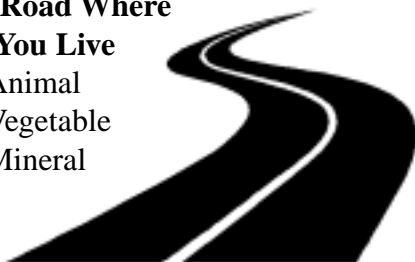
Food
 Animal
 Vegetable
 Mineral

Vegetable

Teddy Bear
 Animal
 Vegetable
 Mineral

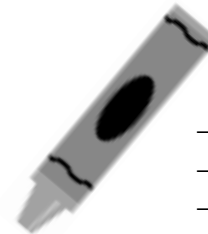


**The Road Where
You Live**
 Animal
 Vegetable
 Mineral



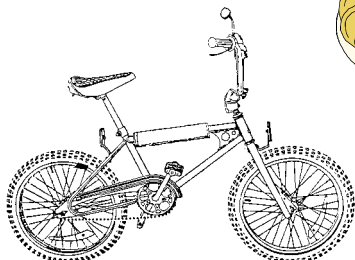
Plant
 Animal
 Vegetable
 Mineral

Mineral

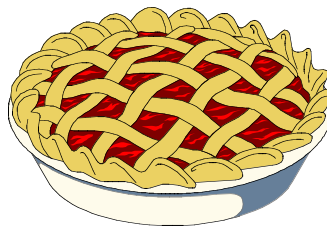


Crayons
 Animal
 Vegetable
 Mineral

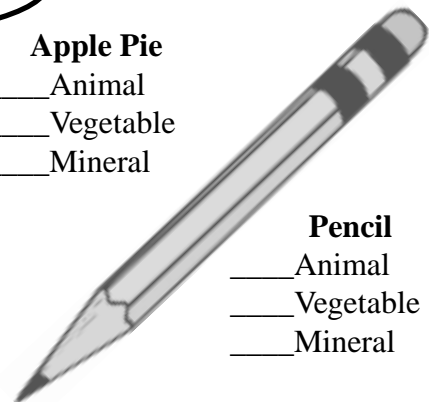
Bicycle
 Animal
 Vegetable
 Mineral



Apple Pie
 Animal
 Vegetable
 Mineral



Pencil
 Animal
 Vegetable
 Mineral



Some things can be made of all three—Animal, Vegetable, AND Mineral.
Everything comes from our natural resources.

Where Do Things Come From?

Is it Animal?

Is it Vegetable?

Is it Mineral?

Name _____



Your House

- Animal
- Vegetable
- Mineral



Airplane

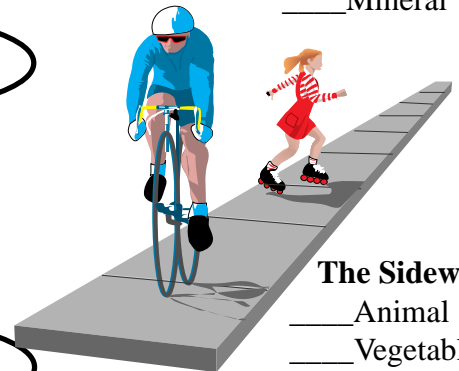
- Animal
- Vegetable
- Mineral

Animal



Car

- Animal
- Vegetable
- Mineral



The Sidewalk

- Animal
- Vegetable
- Mineral

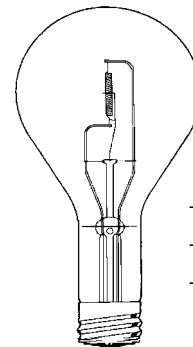
Vegetable



Glasses

- Animal
- Vegetable
- Mineral

Mineral



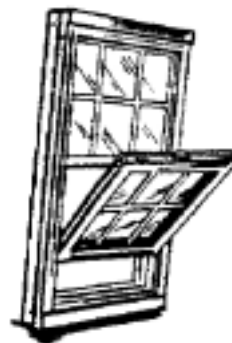
Lightbulb

- Animal
- Vegetable
- Mineral



Television

- Animal
- Vegetable
- Mineral



Window

- Animal
- Vegetable
- Mineral

Some things can be made of all three—Animal, Vegetable, AND Mineral.
Everything comes from our natural resources.

Special Report About Rocks

The rock I am writing about is _____
(name of your rock)

Identify the type of rock you have and how it was formed.

Geology

Interesting Fact
I didn't know about my rock



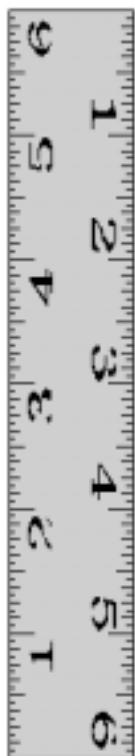
Is your rock common and found in many places?
Or is it rare, and found only in a few, special places?

Where _____ **is Found**
(rock name)

_____ (rock name)

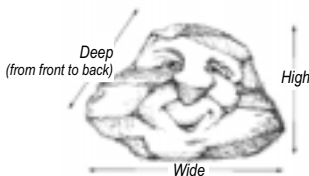
is found near where I live.

is not found near where I live.



Rocks occur in all sizes, from smaller than sand to bigger than houses. My rock is

_____ inches high,
_____ inches wide, and
_____ inches deep.



- I had a real rock sample to study to help research and write this report.
- I did not have a sample to study.

Most rocks are used to build things you use every day.
Is there a special or famous use for your rock?

How _____ **is Used**
(rock name)

Enlarge to 154% *Tabloid Newspaper* report, page 2

Special Report About Minerals

The mineral I am writing about is _____
(name of your mineral)

Geology

I can identify minerals by studying their special characteristics.

This is what I found out studying _____
(name of your mineral)

Color is _____

Weight— is heavy for its size

Yes No

Magnetic— is attracted to a magnet

Yes No

Hardness— can be scratched by a nail

Yes No

— can scratch other rocks and minerals?

Yes No

If so, which ones? _____

Luster is _____

Floats on water?

Yes No

Interesting Fact
I didn't know about my mineral



Some minerals are rare and are not found in many places? Which U.S. states, Canadian provinces, and other countries have deposits of your mineral.

(mineral name)
 is
 is not found in the state where I live

Where _____ **is Found**
(mineral name)

States/Provinces

Major Countries

I had a mineral sample to study to help research and write this report.

I did not have a mineral sample to study.

Most minerals have many uses.
Is there a special or famous use for your mineral.

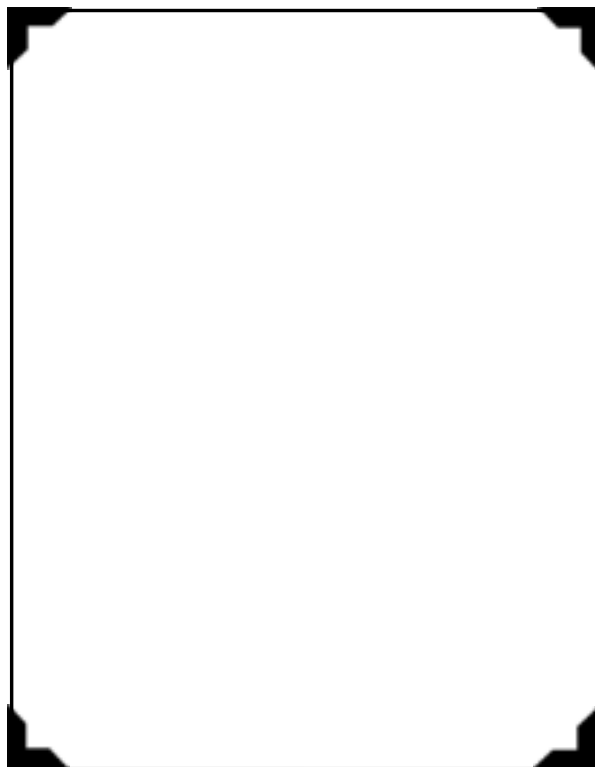
Uses of _____
(mineral name)

I didn't know _____
(mineral name)

was used to make _____

Is there a substitute material (a different mineral) that can be used if we run out of your mineral?

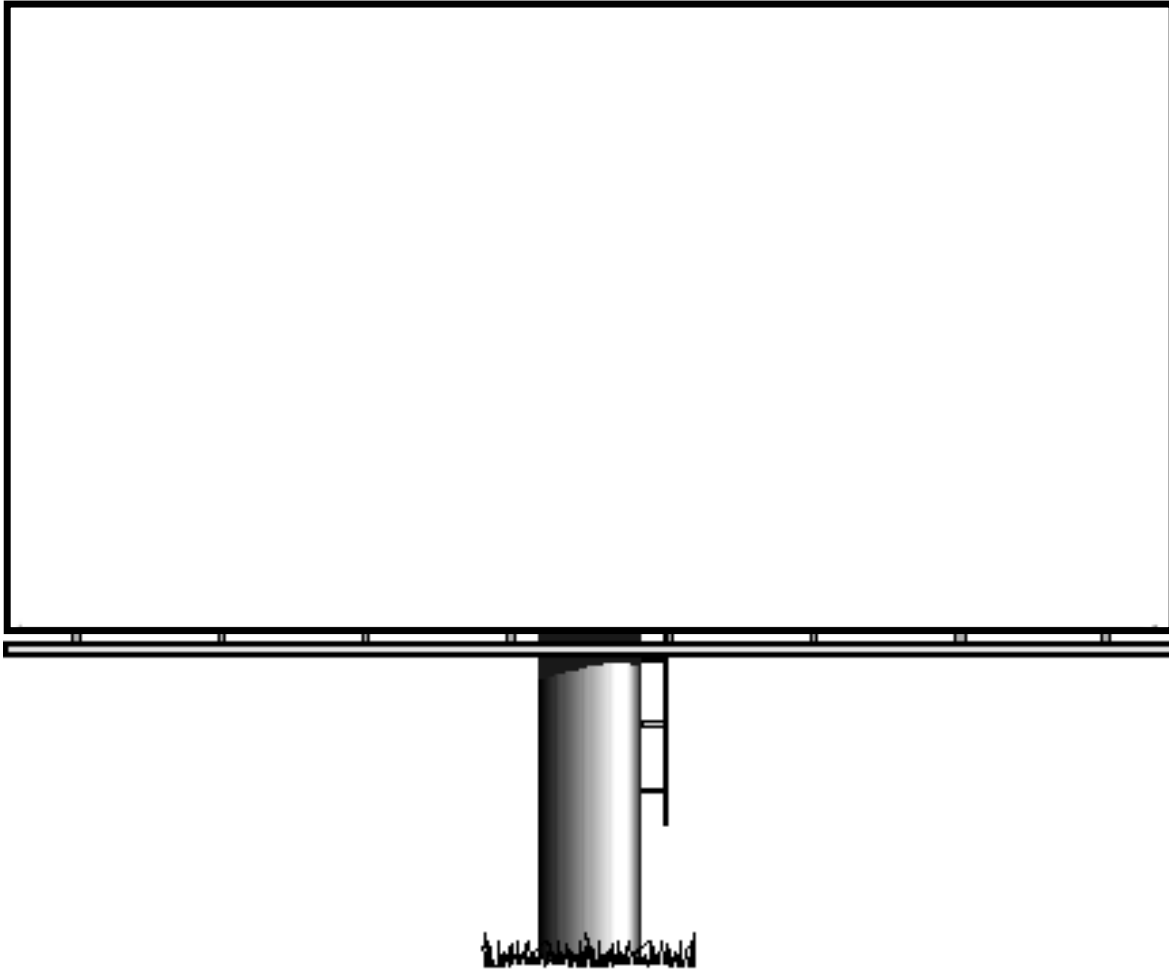
Yes No



What Do You Think? Paste or draw a picture of the most useful product you use that is made with your mineral.

Enlarge to 154% *Tabloid Newspaper* report, page 3

Design a billboard advertisement for your rock or mineral.



Enlarge to 154% *Tabloid Newspaper* report, page 4

The Sources of Information for My Report Were:

People I spoke with:

Books, Magazines, Newspapers:

Internet Sites:

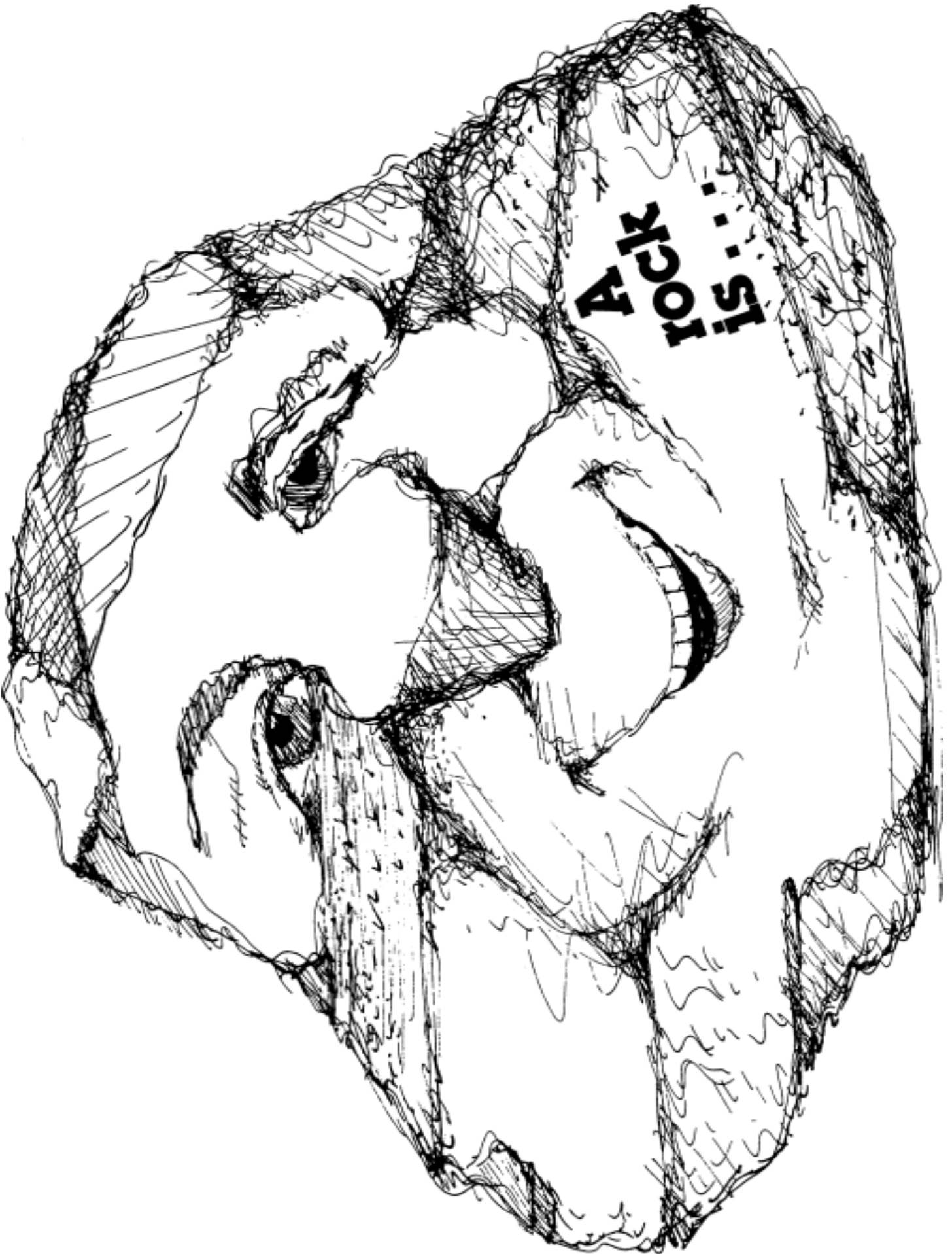
www. _____

www. _____

Other Sources:

Which was your most important source? _____

Why? _____

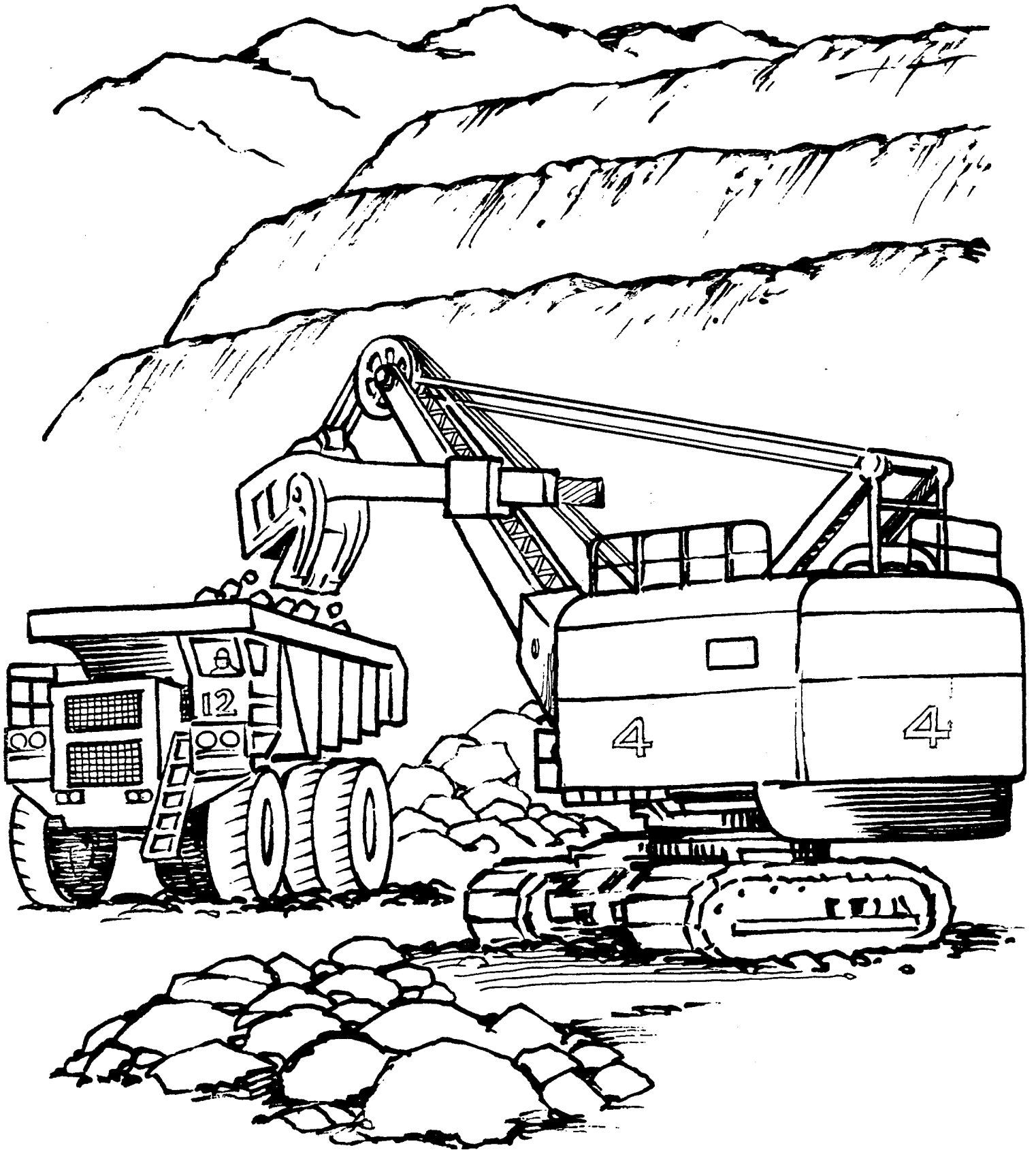


Mining Long Ago



Miners helped settle much of the Wild West.
His burro was an important tool.

Mining Today



Most people have never seen a mine, but we all use the things that are made from the special rocks that are dug out of the ground. Are there special rocks mined near where you live?

Turn on A Light

And Do Your Own Revegetation

You flip a light switch and the room brightens with a glow. It's the electricity delivered to your home that provides the power to light the bulb. It also provides the energy for your television, refrigerator, washing machine, computer and other machines. With nearly 60% of the electricity in the United States produced by coal-burning power plants, whenever you use electricity, you are causing more coal to be mined. And whenever coal is mined, the land must be reclaimed because that's the law.

Before the first ton of coal can be mined, reclamation permits must be obtained from various state and federal agencies to ensure that the land will be returned to a beneficial use when mining has been completed.

These permits describe in detail how the coal companies are going to mine and reclaim the land. The processes include vegetation removal, soil removal, rock or other overlying materials (over-

Use electricity and plant a seed. That's the process when coal is the major fuel to produce electricity.

Use the enclosed packet of native seeds to experiment with revegetation.

burden) removal, coal removal, placement of the broken rock and other materials back in the place where coal was removed (backfilling). Then, contouring the land surface to resemble the landscape as it looked before mining, soil replacement, and topsoil placement, seeding, mulching and fertilizing if necessary, and paying attention to revegetation standards (If trees were removed, new trees will be transplanted. If there was a pasture field or a corn field, these lands have to be able to support and produce pasture or corn).

A small but important part of any reclamation process is the selection and placement of the seeds that will be used to revegetate the disturbed land. After we have used one of our natural resources, by reclaiming the land we are returning it for other beneficial uses, which might include farm or grazing land, wild life use, forests and parks, or some other use.

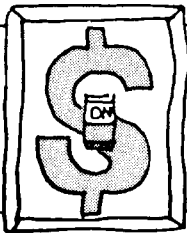
The seed mix in this information packet is often used for reclamation of mine sites in the western states. If you are interested in the composition of the seed mix recommended for the eastern United States, please contact:

Public Affairs Office
Office of Surface Mining
1951 Constitution Avenue, N.W.
Washington, D.C. 20240
202/208-2553

Activities

- Have your students compile a list of things in their home that use electricity.
- Plant this seed in your school playground to see if you can successfully reclaim a disturbed area. Remember, mines **MUST BE** successfully reclaimed.
- Experiment with different types of water, fertilizer, and soil types to provide living examples of what influences plant growth.
- Find out where your electricity comes from, and the fuel that is used to produce it.

Original activity from the Office of Surface Mining, Denver, Colorado.



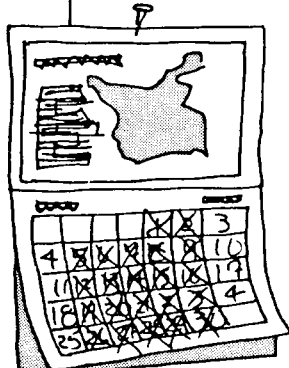
How much does it cost to light your school?

Materials

Pencil and paper
Classroom with
fluorescent bulbs
Chalkboard and colored
chalks

OR

Newsprint pad and
felt-tipped markers



First determine how much electrical energy it takes to light your classroom for 1 hour, then compute the cost. Record this amount on the table below.

Number of tubes in your classroom	×	3¢*	=	Cost per hour to light your classroom
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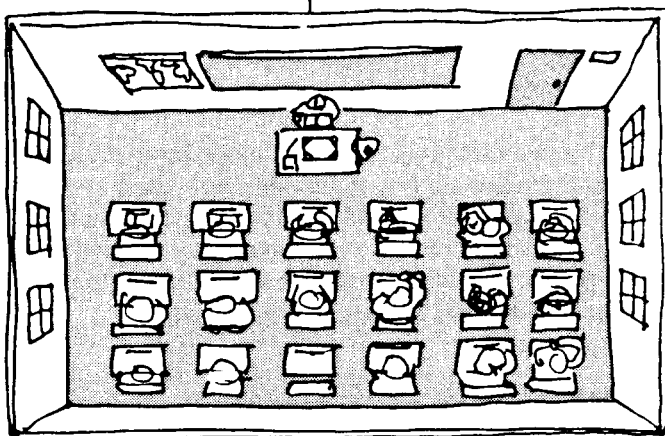
Then, compute how much it costs to light your classroom for 1 day. Record below.

Cost per hour to light your classroom	×	Hours per day classroom is lit	=	Cost per day
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*Note

Fluorescent tubes cost approximately 3¢ per hour for the electricity needed to light them. The cost ranges from 2¢ to 4.5¢ per hour, depending on where you live.

How much does it cost to light your classroom for 1 week? 1 month? 1 year? How many kilowatt hours (kwh) of electricity were used? How many fluorescent tubes are there in your school? How many classrooms? How much does it cost to light your entire school for 1 hour? 1 day? 1 week? 1 month? 1 year? How many kwh of electricity were used? Record your calculations below.



	Classroom	School
Cost per hour		
Cost per day		
Cost per week		
Cost per month		
Cost per year		
Kilowatt hours used		
Tons of coal used		

American Coal Foundation
101 Constitution Avenue, NW
Suite 525 East
Washington, DC 20001-2133
Phone: 202-463-9785
Fax: 202-463-9786

www.teachcoal.org

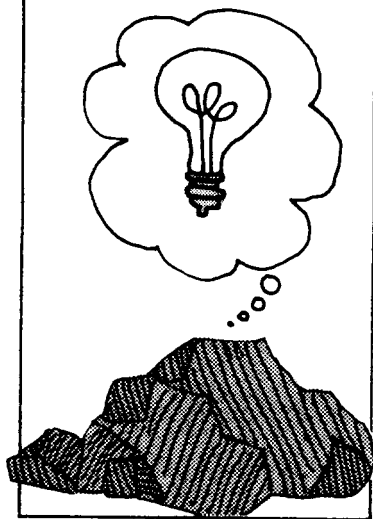
An average 2500 kwh of electricity are produced by burning 1 ton of coal.

How many tons of coal would it take to light your classroom?
Your school?

1 of 9 Activities from
Coal: An Introduction,

American Coal Foundation
101 Constitution Avenue, NW
Suite 525 East
Washington, DC 20001-2133
Phone: 202-463-9785
Fax: 202-463-9786

www.teachcoal.org



Guide To Activities

How much does it cost to light your school?

Concept

Coal produces more than half of the electricity used in the United States, and is our most abundant domestic nonrenewable energy source.

Objective

The students will compute the cost of electricity used to light their classroom and their school for one hour through one year, the number of kilowatt hours of electricity used, and the number of tons of coal mined and burned to produce the electricity used.

Curriculum Skills/Processes

Observing, collecting data, computing, organizing, and discussing.

Time

One to two class periods, with assignments.

Background

More than 75% of the coal mined in the United States is used to produce electricity. Typically it takes about one ton of coal to produce 2500 kilowatt-hours of electricity. By checking the number of kilowatt-hours used during a billing period, a customer can determine how many pounds of coal were used to meet his or her needs—presuming that all the power was coal-generated, of course.

Here are some examples of how much coal is used yearly by a family of four to produce the electricity needed to operate various appliances:

Electric water heater — 3,375 pounds	Range — 560 pounds
Electric iron — 48 pounds	Hairdryer — 20 pounds
Vacuum cleaner — 37 pounds	Clock — 14 pounds
Color television, solid-state — 256 pounds	

The U.S. has approximately 30% of the world's coal reserves. Today, electricity can be produced more cheaply from coal than from oil, gas, or nuclear power. Most of the costs of mining and burning coal in an environmentally safe manner are included in the cost of today's coal. Consequently coal should remain a reasonably priced source of electricity compared to other sources. The cost of transportation to deliver coal to the power plant can be the largest influence in the price people pay for electricity.

Action

Have the students do the calculations listed in the activity and fill in the chart provided. Discuss the actual cost per hour to operate a fluorescent bulb in your area and the reasons that regional electrical costs vary.

Results/Teaching Suggestions

Find out and discuss where your electricity comes from. It might start from a coal mine thousands of miles away. Discuss the importance of the "cost" of electricity. Help students realize that everyone uses electricity and the fuel that created it.

Other Ideas to Explore

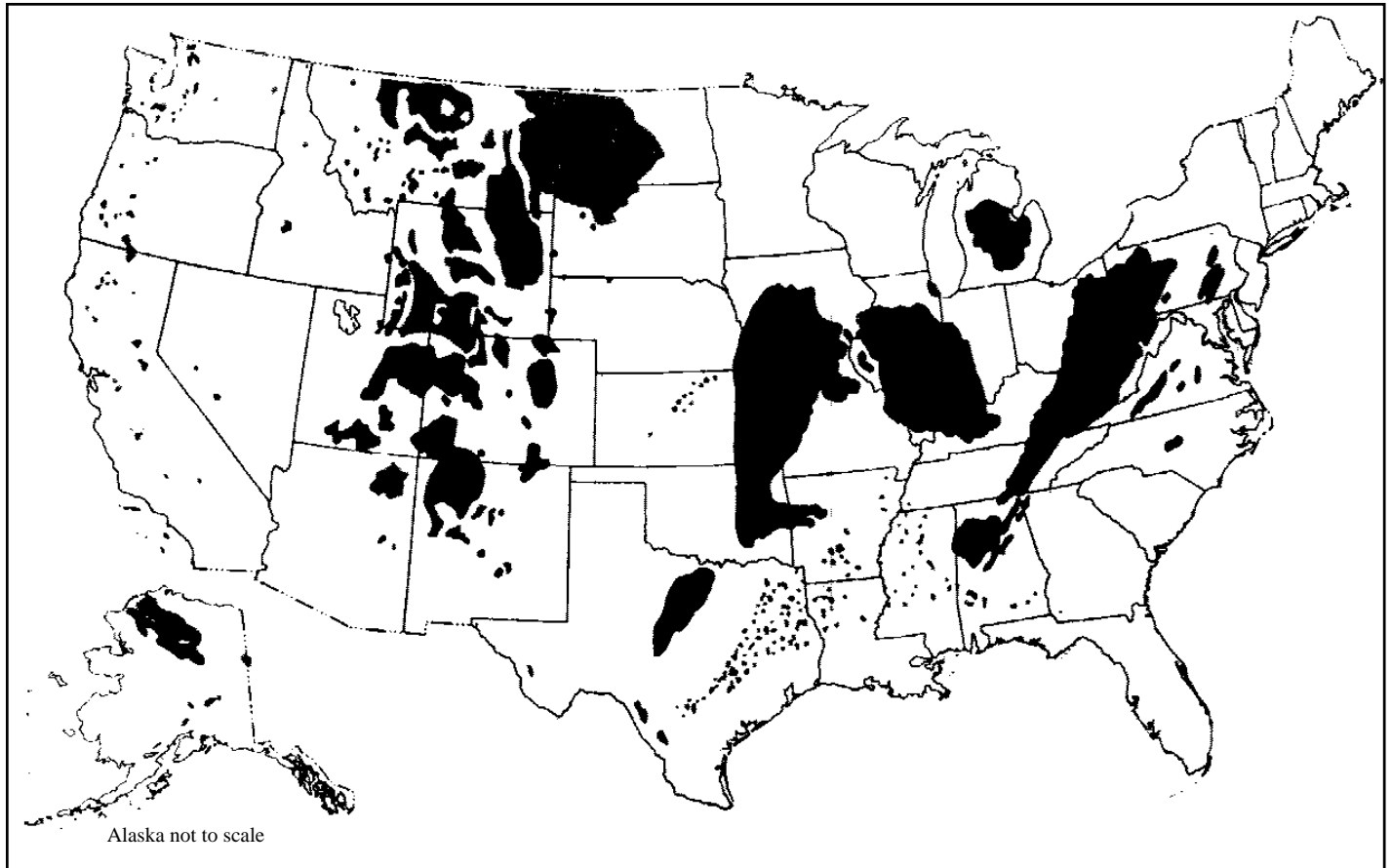
Discuss how you could "lower" the cost of lighting your classroom and your school.

Why is coal a good fuel source for producing electricity?

What are some of the problems we need to solve to make coal a better fuel source?

Coal Areas in the United States

This map shows where coal is found in the United States. The information below tells which states mine coal and how much they produced in 2004.



Top Coal Producing States, 2004

(in Million Short Tons)

		% of Total U.S.
1. Wyoming	376	35.1%
2. West Virginia	139	13.0%
3. Kentucky	113	10.5%
4. Pennsylvania	64	6.0%
5. Texas	48	4.5%
6. Montana	37	3.5%
7. Colorado	36	3.4%
8. Indiana	35	3.3%
9. Illinois	32	3.0%
10. Virginia	32	3.0%
11. North Dakota	31	2.9%
12. New Mexico	26	2.4%
13. Utah	23	2.1%
14. Ohio	22	2.1%
15. Alabama	20	1.9%
16. Arizona	12	1.1%
17. Washington	6	0.6%
18. Maryland	5	0.5%
19. Louisiana	4	0.4%
20. Mississippi	3.7	0.4%
21. Tennessee	2.6	0.2%
22. Oklahoma	1.6	0.1%
23. Alaska	1.1	0.1%
24. Missouri	0.5	0.05%
25. Kansas	0.2	0.02%
26. Arkansas	neg.	
U.S. Total	1,072 million (short) tons	

In the U.S., more than half of the electricity that is generated uses coal as the fuel.

Questions:

1. Fill in the names of the ten states that produced the most coal in 2004.
2. Can you tell from this map (or list) how many tons of coal we have in the United States. Why or why not?
3. What region of the country does not have coal reserves?
4. Find out what fuel is used in your state to generate electricity? Does your state produce coal?
5. Computers (mostly the Internet) are credited with using more than 10% of all the electricity that is used in the U.S. What new demands for electricity do you think will occur in the future?

Fuels used in the U.S. to generate electricity.

Coal	Nuclear	Natural Gas	Hydro	Oil	All Other
51%	20%	17%	7%	3%	2%

How Much Electricity Do You Use Each Year

In the United States, electricity can be created from many different sources. More than 50% of the electricity we use is generated by burning coal.

Coal	Nuclear	Hydro	Natural Gas	Oil	Other*
51%	20%	7%	17%	3%	2%

* Includes Renewable Energies (Solar, Wind, Geothermal, etc.) except hydro

Here are examples of how much coal is used each year by a family of four to produce the electricity needed to operate various appliances.

1. Electric water heater	3,375 pounds
2. Range	560 pounds
3. Color television	256 pounds
4. Electric Iron	48 pounds
5. Hairdryer	20 pounds
6. Vacuum cleaner	37 pounds
7. Clock	14 pounds

One ton of coal can produce 2,500 kilowatt hours (kwh) of electricity. One ton equals 2,000 pounds.

1. If the family uses all of the appliances listed in the chart above, how much coal is used in one year? _____
2. How much coal does each family member use in one year, if each member uses the same amount of coal? _____
3. In one year, how many kilowatt hours of electricity are used by the family if they use all of the appliances? _____
4. How many years would the family have to use the range to equal the amount of coal used by the electric water heater in one year? _____
5. If the family bought its color television on September 1, how much coal did the television use for the remainder of the calendar year? _____
6. The family decided to purchase an additional electric iron. How much coal is used by both irons in one year? _____
7. During a five year period, one iron worked for all five years. The second iron worked for three years. During the fourth year, the second iron worked for eight months and during the fifth year for two months. How much coal was used by both irons during the five years?

Answers: 1. 4,310 pounds 5. 85 pounds
 2. 1,077 pounds 6. 96 pounds
 3. 5,262.50 kilowatt hours 7. 424 pounds
 4. 6 years