



Eye Opener Worksheet 8

What Is Your School's Impact On The Environment?

Arrange with the principal and the engineer or custodian to study the operation and maintenance of the school.

Heating

What type of heating system is used? _____
How often is it inspected and serviced? _____

Is there a more efficient one that could be used? _____

If so, what prevents your school from using it? _____
What type of heating fuel is used? _____

Where does it come from? _____

How does it get to the school? _____
What, if any, adverse impacts does use of this fuel have on the environment? _____

Describe how the heating system works? _____

Describe any solar energy usage? _____

Does the school have an air cooling system? _____

If so, what kind? _____

Can each room adjust its own thermostat for heating? _____ For cooling? _____

Are empty rooms heated? _____ Air-cooled? _____

Does the school have adequate insulation? _____

Could the doors and windows be caulked to avoid heat loss? _____

How much energy does your school use per month to heat the building? _____

To cool it? _____

How much money does it cost APS to heat your school? _____

Do you have full spectrum lighting? _____

Lighting

Can the lights be regulated in each room? _____

Are the lights left burning in the cafeteria? _____

In the auditorium? _____ In the corridors?

Is the natural light sufficient most of the day in some classrooms? The Department of Energy recommends lighting levels of 50 footcandles at desks; 30 footcandles in rooms and work areas; and 10 footcandles in halls and storerooms. Use a light meter to determine the amount of light in different parts of your room and school:

_____ desks near window _____ work areas _____ halls _____ desks away from window
_____ cafeteria

What is the wattage of the light bulbs in your classroom? _____

Calculate the kilowatt hours of electricity used by all of these bulbs in your classroom in a week _____
_____ for the school year.

After School Hours Use of Heat and Light

Is the building used between 4 p.m. and 6 a. If so, how? _____

How much of the total energy consumed by the school is used after school hours? _____
How can you find out? _____

How much energy do you think your school wastes in its use of electricity? _____

What percentage of the total consumption is that? _____ %

What percentage of heating fuel is wasted? _____

How did you make this determination? _____

What are the adverse environmental impacts of over consumption of electricity?

Water

Make an inventory of all the ways water is used in your school building and on the school grounds, and list those uses.

How much water does your school consume in one month? _____

How much water is that per capita? _____

Is more used some months than others? _____ If so, which months? _____

Why? _____

If your school has a paved parking lot, what impact does that have on the water cycle and water availability?

Paper

List all the ways you can think of that paper is used in your school.

Ask the principal, or teacher in charge of ordering supplies, how much paper is used each year for classroom and office purposes.

Ask the custodian how much paper is used in the cafeteria and for maintenance.

Name other paper products that are brought into the school. _____

How many times could the exterior of the building be covered with the paper that is consumed within a month's time? _____

Ask the custodian how much solid waste is generated in the school in a year. _____

What percentage of this solid waste is paper? _____

_____ %

Find out and describe the trash management program at your school. _____

Do a survey to get a variety of opinions about what percentage of the paper thrown away was unnecessary. Ask the principal, the custodian, a few teachers, and several schoolmates. Record their answers.

List all the ways you can think of that paper consumption has an impact on the environment. Discuss your answers with your classmates.

How Can You and Your Class Combat Overconsumption?

List three ways each that you can help to conserve: (1) energy used for heating and cooling; (2) energy for lighting the building; (3) water; and (4) paper.

Heating	Lighting	Water	Paper
1) _____	1) _____	1) _____	1) _____
2) _____	2) _____	2) _____	2) _____
3) _____	3) _____	3) _____	3) _____

How can your class encourage the school to cut back on its resource consumption by 20 percent? Explain in the form of a brief essay, or sales pitch.

Eye Opener Activities 8

Human Water Chain

Setup a human chain to demonstrate what happens when you take a drink from a water fountain. Ask questions, working backward from the water fountain, until the entire water cycle has been traced.

How did the water get into the water fountain?

How does the water get into the pipes? Are the pipes clean?

How does water get into the school?

Where is the city's water stored?

How does it get there?

Where did that water come from?

Where does the water go?

Set up a similar chain to explain what happens to the waste water which goes down the drain.

Design a wetlands for waste water.

Magneto Model Generator

Use a magneto (model generator) to discover how electricity is generated. Perhaps, you can borrow a magneto from an auto body shop or an electric motor shop.

What is the source of energy used to generate electricity in the magneto?

What source(s) does Public Service Company of New Mexico use?

What environmental problems are connected with the use of fossil fuels? What is being done to try to solve some of these problems?

What is meant by energy crisis? What is the outlook for the future?

What alternative sources of energy for electricity are being studied? What are the pros and cons of each?

Develop a diagram to trace the path of electricity from the wall outlet in your classroom back to the generating plant.

School Blackout

If a storm caused a temporary *blackout* during school hours, how would this affect your class and the school? List all of the uses of electricity you can think of in the class and school.

Which of the uses of electricity are most important and would be missed the most? Which could be done without most easily?

How might the class improvise during the blackout?

How might parents be affected by the same blackout at home or their places of business?

Have we become too dependent on electricity? If so, are there things we can do about it short of turning the clock back by a century? Keep a record for one day of the electricity you, yourself, used at home. How much wattage did you use?

Air Temperature

Answer the question "What is the air temperature now? Is there any one answer to that question? Explain. What is the temperature in different parts of your room? Near the floor; near the ceiling; in a closet; in the sunlight [Shield the bulb of the thermometer from the rays of the sun]; near the window, but not in the sunlight. Explain. Graph the temperature at hourly intervals throughout the day in a given part of the room. Use a computer graphing program.

How does the temperature differ in rooms on the south side of the school from the north side? Why? Graph the temperature at hourly intervals in rooms on both sides of the school.

What is the air temperature inside a sunlit box covered with black paper? White paper? Aluminum foil? Explain.

How does the temperature inside the school differ from the temperature outside? What different temperatures do you get outside the school? Does the side of the building (north, south, east, west) matter? Does the time of day matter? Is the temperature different under a tree? If so, why? Consider transpiration as well as shade.

How can the data collected in this investigation be used to help demonstrate energy conservation measures? How can it be used to demonstrate how energy is often wasted?

Accumulated Waste

Inventory the waste accumulated by your class by the end of the day. Use both the contents of the wastebasket and the litter strewn on the floor. Discuss the fact that both collections constitute solid waste, the only difference between them being that the wastebasket is a tidier way of disposing of discards than littering. Prepare a chart of your itemized findings for a week. Determine a per capita figure. Show the results in a circle graph. Use a computer spreadsheet to help you.

Which category forms the largest part of your class' solid waste? Are there ways to cut down? Try different methods suggested by the class, and compare the quantity of solid waste after trying for a few days.

Which of the discards should never have been thrown away, and should be recovered? Which can be reused? Which should be recycled?

Which of the wastes decompose after a few days? Which decompose after a few weeks? What does *biodegradable* mean?

Which presents a greater solid waste disposal problem, biodegradable or non-biodegradable items? Explain.

What part of the waste is the result of over packaging? What part is the result of discarded objects which could be further used? What are the reasons for excessive packaging? Which of these reasons might be justified considering the realities of our current lifestyles and social problems? What role does advertising play?

Solid Waste Trace

Talk with the custodian to learn what is done with the wastes produced in the school. Trace the system used for solid waste disposal in Albuquerque. If possible, take a trip to sanitary landfill sites, and to places where illegal dumping occurs.

Does the school cafeteria use washable or disposable dishes and utensils? If disposables are used, what trade offs are involved? What economic, sanitary, and environmental factors must be considered in determining whether disposables should be used?

What, if any, problems does solid waste collection and disposal present to the city and county? How much of the city's total budget is allocated to solid waste collection and disposal? How much of this cost could be eliminated by decreasing our consumption of goods?

How do Albuquerque's solid waste disposal costs and problems compare with those of other cities? What effect, if any, might a sudden and large increase in the city's population have on the solid waste disposal system in Albuquerque?

How does consumption of goods per capita in the United States compare with that of other developed countries? With developing countries?

Additional Activities

Alternative Energy Sources

Conduct research to find out which of the alternative sources of energy are especially related to Albuquerque, or nearby parts of New Mexico.

What is the current status of geothermal research? What geological conditions are needed for collecting geothermal energy? How close to Albuquerque might a geothermal station be constructed?

What is being done in and around Albuquerque about solar energy research?

Would wind energy be practical in Albuquerque? How much wind is there in the area? Is it predictable? When is there wind? What causes wind? What parts of the city have the most wind? Why? Use the Beaufort wind scale to determine wind velocities for a given period. Record your findings. Compare with weather reports.

What is *biomass*? How is the term applied in connection with alternative sources of energy?

Untapped Oil Deposits

Discuss the statement, "There are untapped oil deposits in the Albuquerque area."

What is a fossil fuel? Which fuels are considered fossil fuels?

Are any other fossil fuels found in the Albuquerque vicinity? If so, which? Locate them. Are there plans to mine them? If so, what economic, social, and environmental impact would this have on the area?

All Energy Solar?

Discuss the contention that all sources of energy are basically solar energy.

Trace each of the major energy resources back to its origin.

Include diagrams showing energy transfer where applicable.

Activities for the Senses and Sensibilities

Recyclables

Make art out of otherwise useless pieces of trash
Have a Recycling Fair, featuring new uses for discards.

Plants

Use your imaginations and describe familiar classroom objects in creative ways. Example: a spider plant was described by a second grader as an ``octopus in a bed of seaweed.

Beautify your classroom by adding plants. Make a kitchen garden, plant avocado seeds, sweet potatoes, carrot tops, and onions.