

WASTING ENERGY AT HOME?

OBJECTIVES

The student will do the following:

1. Write a definition for conservation.
2. Identify ways energy is wasted.
3. List ways to conserve energy in the home.
4. Categorize home appliances as heavy, moderate, or light users of energy.

SUBJECT:

Science

TIME:

45 minutes, plus take home activity

MATERIALS:

crayons or colored markers, teacher sheet (included), student sheet (included)

BACKGROUND INFORMATION

We use more energy each year than we used the previous year. In fact, during the 20th century, the amount of energy our Nation uses has doubled about every 20 years. We used twice as much energy in 1955 as in 1935 and nearly twice as much in 1980 as in 1960. The rates of increase in our energy consumption have slowed somewhat, but we continue to use more and more energy.

Energy conservation—the wise and efficient use of energy—was not thought of before the energy crisis of the 1970s. When a shortfall in imported oil shipments and a dramatic rise in oil prices caused energy costs to skyrocket, we became concerned about saving energy. Today, energy costs have stabilized and the economy is stronger, but we still need to think about and practice energy conservation. Not only does energy conservation save us money on our energy bills now; it saves us (and consumers in the future) money in the long run by making our irreplaceable energy resources last longer.

Today's students are tomorrow's consumers. Developing energy conservation skills will serve them well in the future, when prices are certain to be higher than they are now. Additionally, students may be able to help their families conserve energy at home, benefiting themselves and others both now and in the future.

Terms

Appliance: an instrument or device designed for household use especially operated by electricity.

Conservation: the wise and efficient use of resources (e.g., energy resources).

Energy: the ability to do work.

PROCEDURE

I. Setting the stage

- A. Define energy conservation and share the background information as appropriate.
- B. Give each student a copy of the student sheet “WASTING ENERGY,” included.
 1. Have the students draw an “x” on the ways energy is being wasted.
 2. Ask the students, “How can energy be conserved in this picture?” (turn off lights, turn off TV, close door; some students may suggest covering the window and/or carpeting the floor).
 3. Have the students list examples of how energy is conserved in their homes.

II. Activity

- A. Give each student a copy of the student sheet “HOW TO CONSERVE ENERGY IN YOUR HOME,” included. Discuss the directions with the students. Have the students take the sheet home and complete it with the help of their parents.
- B. Have the students identify energy users and wasters in their homes.
 1. Give each student a copy of the student sheet “HOME ENERGY SURVEY,” included
 2. Make a transparency of the teacher information sheet “APPLIANCE ENERGY USE,” included. Have the students list the home appliances pictured on the student sheet (“HOME ENERGY SURVEY”) and given on the transparency. Put the following headings on the board and divide the listed appliances into these categories—“Heavy Users of Energy,” “Moderate Users of Energy,” and “Light Users of Energy.”
 3. Discuss with the students which appliances shown on the “HOME ENERGY SURVEY” student sheet they have in their own homes.
 4. Have the students circle in red the depicted energy wasters found in their own homes.

III. Follow-up

- A. Have the students write a definition (in his/her own words) of conservation.
- B. Have the students list five ways to conserve energy in the home.
- C. Have the students make a chart (similar to the one below) based on the information they marked on their “HOME ENERGY SURVEY” student sheets. An example is given below:

Energy Users

1. Television, lights radio, phonograph
2. Range (stove)
3. Washer
4. Car
5. Bath
6. Outside doors
7. Thermostat
8. Fireplace
9. Windows
10. Appliances

Ways to Reduce Energy Use

1. Turn off when you are not using.
2. Cover pots; thaw frozen foods before cooking; plan meals carefully.
3. Wash full loads; use cold water.
4. Walk; ride in carpools; ride a bike; observe speed limits; keep car in good running condition.
5. Short shower instead of deep bath; take shorter shower or shallower bath (use less hot water).
6. Install storm doors; keep doors closed when using heat or air conditioning; install weatherstripping.
7. Set at 68 degrees in winter and turn down at night; wear warm clothes; set at 78 degrees in summer; wear cool clothes.
8. Close flue when not in use; install glass fire screen that can be closed when fireplace is not in use.
9. Close draperies at night; put shutters, blinds, or drapes on all windows; install storm windows; install weatherstripping.
10. Do not use several heavy users at the same time; turn off appliances when not in use.

IV. Extension

- A. Invite a speaker from your local power distributor to speak to the class about ways to conserve energy.
- B. Have the students, with the help of their parents, compare several months utility bills and discuss ways to conserve electricity.
- C. Have the students project what will happen to electrical costs by the year 2000, then write and perform a skit showing a family receiving and paying an electric bill in that year.

RESOURCES

Alabama Department of Economic and Community Affairs, Science, Technology and Energy Division *Energy Savers Activity Book With the Energy Robots*. Montgomery, AL: Author, n.d. (p.17) (Address 3465 Norman Bridge Road, Montgomery, AL 36105.)

Alabama State Department of Education. *Energy Activities: A Resource Guide for Grades K – 4*. Montgomery, AL: Author, n.d. (p. 84) (Address: State Office Building, Montgomery, AL 36130.)

Energy Source Energy Education Program. *Energy in American History*. Lakewood, CA: Author, 1982. (pp. 20-21)

McDonald's Corporation. *McDonald's Ecology and Energy Action Pack*. Oak Brook, IL: Author, 1977. (p. 14) (Address: Director-Corporate Responsibility, McDonald's Corporation, One McDonald Plaza OakBrook, IL 60521.)

Nebraska Energy Office. *Energy Conservation Activity Packet*. Lincoln, NB: Author, n.d. (Telephone 402-471-2867.)

Tennessee Valley Authority. "How to Insulate Your Attic," N.p Author. 1984

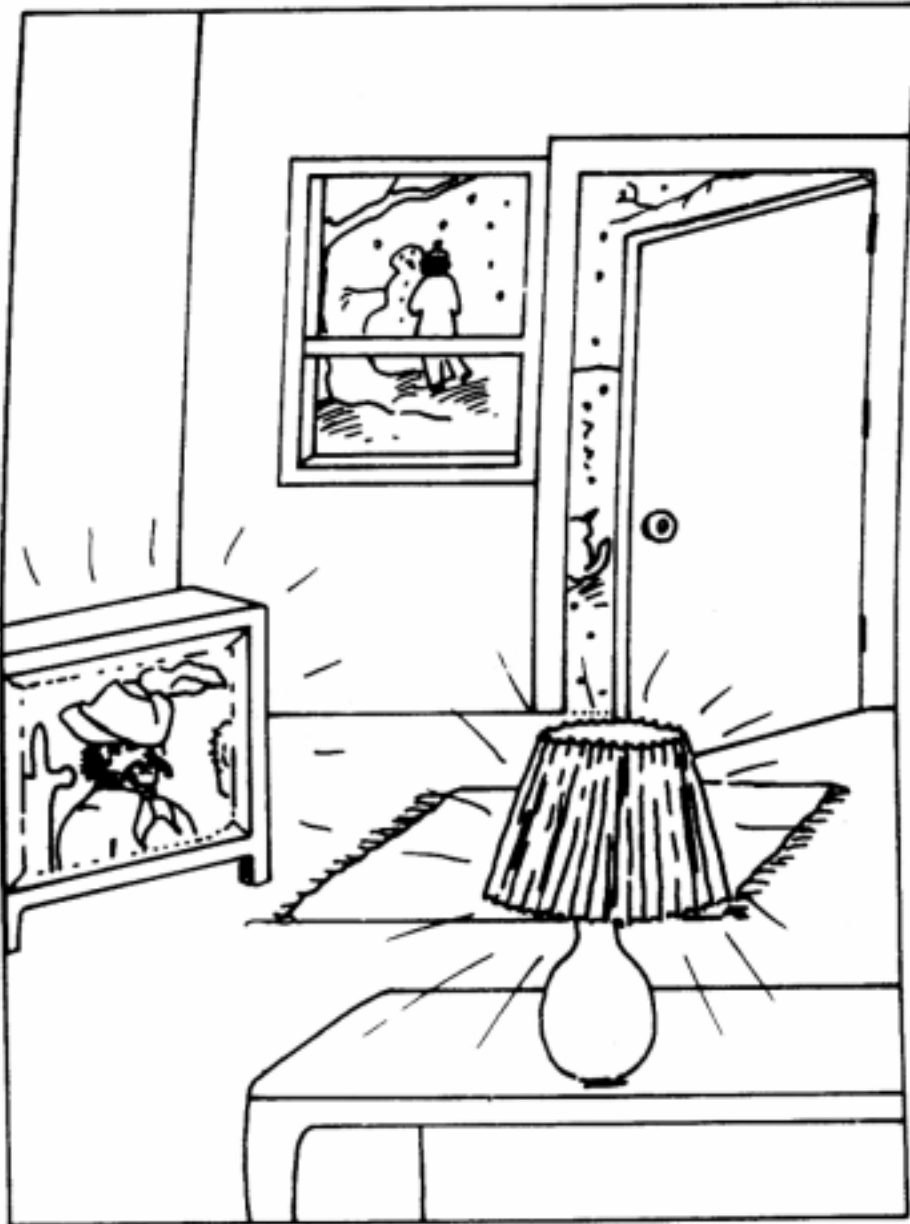
_____ "How to Insulate Your Electric Water Heater" N.p Author 1984

_____ "How to Read Your Electric Meter" N.p Author, 1987

_____ "How to Save on Your Electric Bills" N.p Author, 1984

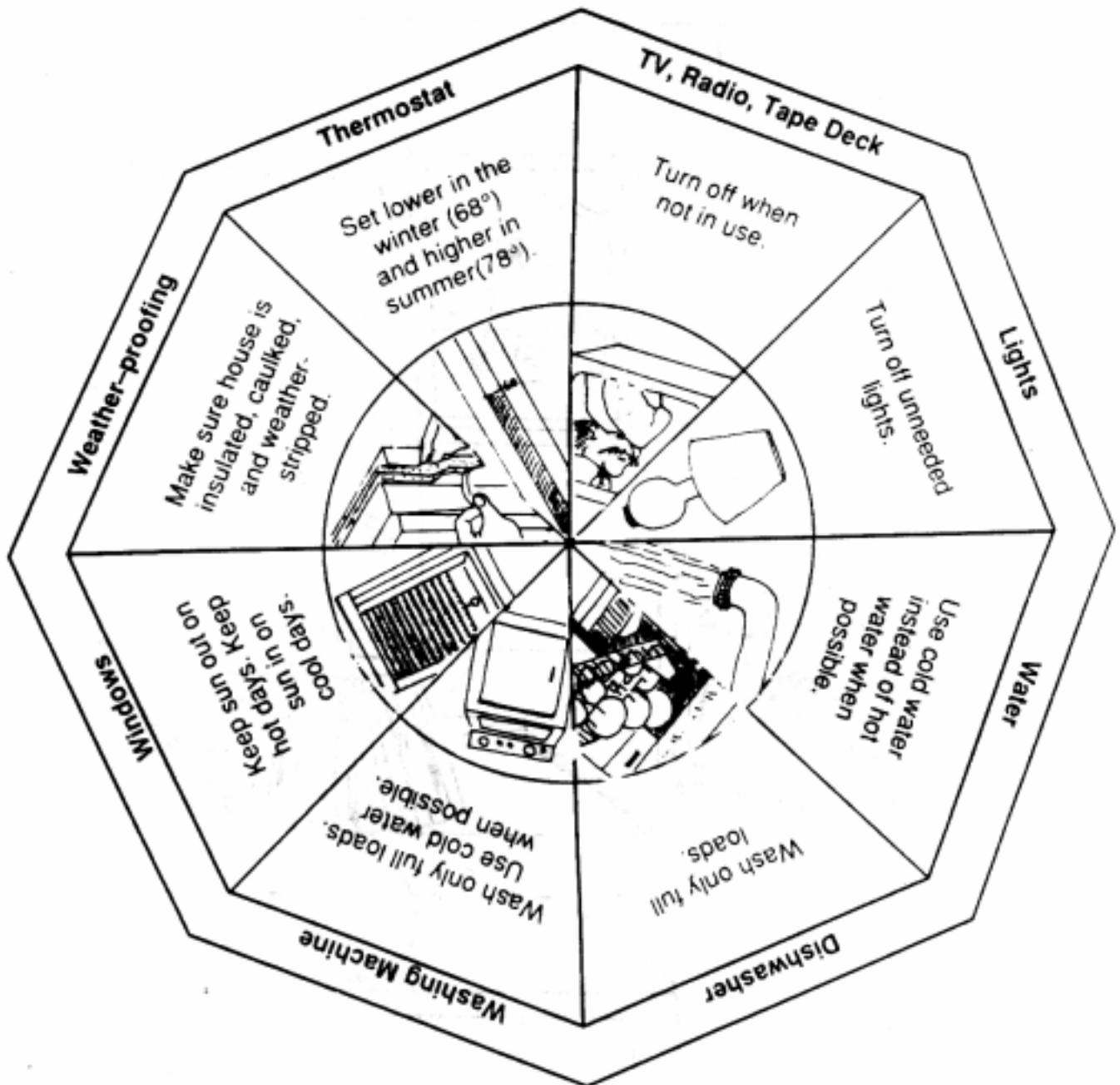
WASTING ENERGY

Put an "X" on all the ways you observe energy being wasted.

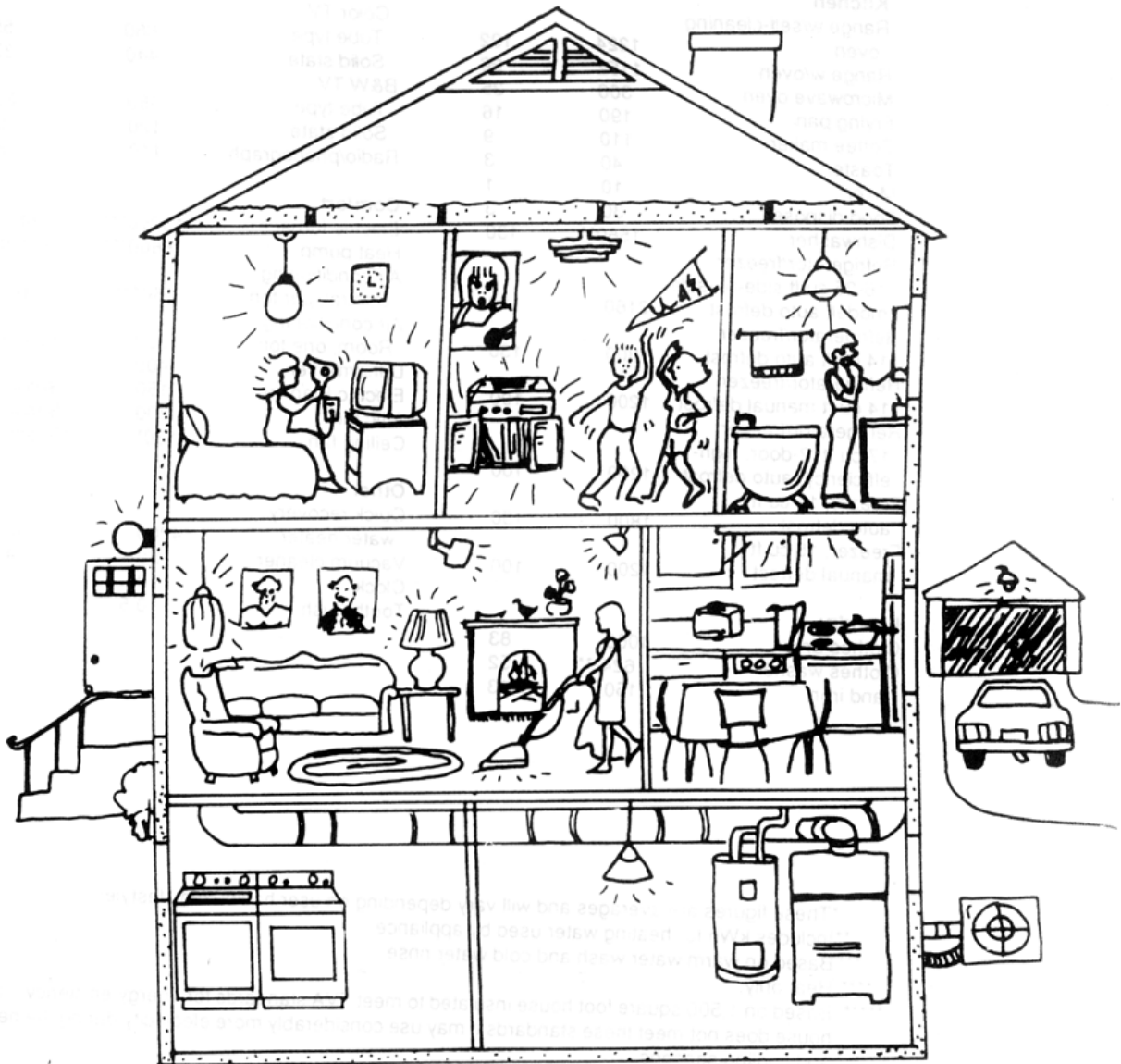


HOW TO CONSERVE ENERGY IN YOUR HOME

Directions: Read each triangular shape. Color the triangular shape light blue if you and your family observe the energy conservation rule. Color the triangular shape yellow if you and your family do not observe the energy conservation rule. Discuss with your family ways to save energy in your home.



HOME ENERGY SURVEY



APPLIANCE ENERGY USE

<u>Appliance</u>	<u>Average KWh Used</u>	
	Annually	Monthly
Kitchen		
Range w/self-cleaning oven	1,224	102
Range w/oven	1,152	96
Microwave Oven	300	25
Frying pan	190	16
Coffee maker	110	9
Toaster	40	3
Mixer	10	1
Food disposer	30	3
Dishwasher	1,560**	130
Refrigerator/Freezer 16-25 cu ft side-by-side model, auto defrost	2,160	180
Refrigerator/Freezer 14 cu ft, auto defrost	1,800	150
Refrigerator/Freezer 14 cu ft, manual defrost	1,200	100
Refrigerator/Freezer 17 cu ft, two-door, high efficiency, auto defrost	1,200	100
Freezer, 15 cu ft, auto defrost	1,800	150
Freezer, 15 cu ft, manual defrost	1,200	100
Laundry		
Clothes Dryer	1,000	83
Clothes Washer	624***	52
Hand Iron	150	13
Entertainment		
Color TV		
Tube Type	660	55
Solid State	440	37

B&W TV		
Tube Type	350	29
Solid State	120	10
Radio/phonograph	110	9
Comfort		
Electric Furnace	13,200*****	(seasonal)
Heat Pump	6,600****	(seasonal)
Air Conditioning, central, per ton	1,500*****	(seasonal)
Air Conditioning, room, 1 ton	1,500	(seasonal)
Dehumidifier	400	33
Electric Blanket	150	(seasonal)
Attic Fan	300	(seasonal)
Ceiling Fan	130*	(seasonal)
Other		
Quick Recovery Water Heater	4,200	350
Vacuum Cleaner	50	4
Clock	18	1.5
Toothbrush	0.5	0.04

*These figures are averages and will vary depending on user habits and lifestyles.

**Includes kWh for heating water used by appliance.

***Based on warm water wash and cold water rinse.

****Heat only.

*****Based on 1,500 square foot house insulated to meet TVA standards for energy efficiency. If your house does not meet these standards it may use considerably more electricity during the heating and cooling seasons.

Credit: "The Energy Sourcebook: Elementary Unit" (1990) Tennessee Valley Authority.