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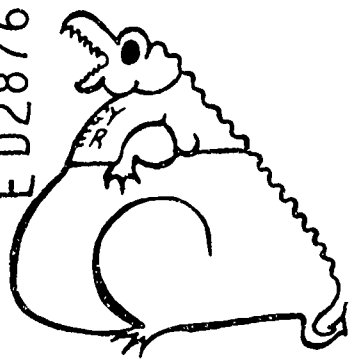
IDENTIFIERS	*Iowa

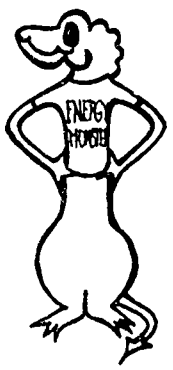
ABSTRACT

The revised Iowa Developed Energy Activity Sampler (IDEAS) was compiled using the original IDEAS program and the Energy Conservation Activity Packets (ECAPS). This booklet provides activities for teachers to use in the primary elementary grades (K-2). The activities are organized into nine units, with units 1 through 8 containing three activities each, and unit 9 serving as a final review. Each activity includes: (1) the subject area for which the activity was written; (2) the grade level; (3) a brief statement about the activity itself; (4) the objective(s) of the activity; (5) a list of materials needed; (6) the approximate amount of time needed for the activity; (7) a more complete description of the activity, including the various components of the activity and their relationship to Jean Piaget's learning cycle (awareness, concept development, application); and (8) some follow-up/background information. In some activities the original source of the activity is also given. The focal points of the entire document are energy concerns, impacts, choices, challenges, and conservation. (TW)

Iowa Developed Energy Activities Sampler



Energy Conservation Activities for Elementary Grades



(Or: How to Help Slim Down the Energy Monster)

Primary K-2

Revised 1987

State of Iowa
DEPARTMENT OF EDUCATION
Grimes State Office Building
Des Moines, Iowa 50319-0146

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Energy Division
Iowa Department
of
Natural Resources

Table of Contents

PRIMARY

REVISED IOWA DEVELOPED ENERGY ACTIVITY SAMPLER - IDEAS

INTRODUCTION TO IDEAS

The revised IDEAS were developed from the Energy Conservation Activity Packets, (ECAPS), by Ruth Bakke, and Iowa Developed Energy Activity Sampler (IDEAS), developed by Dr. Doris G. Simonis under the auspices of the Iowa Energy Policy Council and the Iowa Department of Public Instruction, now the Iowa Department of Education. An "infusion model" was used as a basic framework which recognized the interdisciplinary nature of energy education concepts. These included:

1. Energy is basic.
2. Energy usefulness is limited.
3. Environment is impacted by energy exchanges.
4. Energy conservation is needed.
5. The future of energy is ours to shape and share.

The revised IDEAS adheres to these concepts and provides activities that utilize a learning cycle to develop a knowledgeable student population concerning energy matters. Decision-making skills are emphasized and developing an energy conservation ethic is a major goal.

Under the joint sponsorship of the Iowa Department of Education, Duane Toomsen, Environmental and Energy Education Consultant, and the Energy Division of the Iowa Department of Natural Resources, Dr. W. Tony Heiting, Coordinator; the revised Iowa Developed Energy Activity Sampler (IDEAS) was created to meet the continuing need for energy education from the 1980's into the twenty-first century.

Conservation of natural resources and environmental awareness has been mandated by the State of Iowa to become a part of the quality education experienced by Iowa's future citizens in grades K-12. Energy is an integral part of our nation's natural resource base. The major emphasis of IDEAS is to provide uniquely designed K-12 classroom activities that are adaptable into various classroom situations, i.e., highly populated, urban schools to less populated rural facilities. The focal points of IDEAS are: energy concerns, impacts, choices, challenges, and conservation.

Revised IDEAS adopts a learning cycle strategy based upon the learning theory of Jean Piaget. The cycle has three phases: awareness, concept development and application. Activities are loosely structured to allow for student exploring, hypothesizing, and decision-making.

Awareness activities encourage students to experience a new idea, phenomenon or perception. A variety of experiences should stimulate the students' interest, appreciation, and initiate a positive attitude toward the concept to be formulated. Concept development involves the building of a concept of energy based upon the awareness phase. Concept development may include such activities as reading, performing experiments, solving problems, group interactions, games and role-playing in order to reinforce the developing concept. The application phase is designed to enable the student to apply the new concept to various situations or problems. Application activities may include the same types of activities plus a gamut of others, including debates, panels, simulations, surveys, designing, constructing and community or school projects.

This learning cycle approach integrates content with processes and encourages the development of higher level reasoning and thinking skills. The interdisciplinary importance of energy education is emphasized.

The activity format used in the revised edition of IDEAS includes a title, subject and grade level designation, a short description of the activity, learning objectives, materials needed, approximate time required, and descriptions of the three phases of the activity. A suggested evaluation section has been included, in most packets, to assist the instructor and/or learner in determining the extent to which each learner achieved each objective. Follow-up or background information and a detailed activity description complete the format.

Iowa is an excellent example of how energy is an interrelated and interdependent resource. Iowa imports 98% of the energy it uses and has a high potential for reducing its dependence on outside energy sources through conservation and alternative energy forms. Iowa's current energy dependence has a major impact on Iowa's economy and the ability of the state to compete in the industrial and agricultural community. All segments of Iowa's society involving service-related employment, agriculture, and industry, are impacted by energy costs and availability.

The most obvious means of energy reduction is energy conservation. More efficient use of energy resources available in Iowa (i.e. coal, wind, hydro, solar, gasohol, biomass) can have a significant impact on the cost of production/distribution factors as fossil fuels begin to diminish in the twenty-first century.

The revised IDEAS were developed by classroom teachers who realize the need to provide students with an enriched curriculum. Iowa's tradition of excellence in education has always pointed toward an improved future for our youth. IDEAS will provide the creative educator with a multitude of activities from which they can choose, adapt, and improve.

The professional educator who uses IDEAS may adapt the activities for any classroom setting. Students will be given the basis to form an energy attitude, ethic, and philosophy which will serve them and the citizens of Iowa throughout life.

Members of the IDEAS Revision Committee

Duane Toomsen, Environmental and Energy Consultant, Department of Education

Dr. Tony Heiting, Research/Education Director, Energy Division, Iowa Department of Natural Resources.

Dr. Bob Vanden Branden, University of Northern Iowa, editor.

The following were responsible for the grade and/or subject level indicated:

Primary	Linda Scheuermann	Roland-Story Elementary School Story City, Iowa
Intermediate	Janey Swartz	Sac and Fox Settlement School Tama, Iowa
Home Economics	Viki Van Ryswyk	Lewis Central High School Council Bluffs, Iowa
Industrial Arts and Technology Education	Alan Glass	Ballard High School Huxley, Iowa
Language and Creative Arts	Dr. Doug Larche	Grandview College Des Moines, Iowa
Mathematics	Dorothea Trost	Sutherland Community High School, Sutherland, Iowa
Science	Peggy Steffen	Ottumwa High School Ottumwa, Iowa
Social Studies	Steve Heiting	Oskaloosa High School Oskaloosa, Iowa

Advisory members included:

Dr. Lynn Glass, Iowa State University
Brian Johnson, Iowa Power and Light

Special Tribute to Jody Cosson, Des Moines Graphic Artist

Notebook Cover by Carol Doerr

RESOURCE ORGANIZATIONS

Iowa Department of Natural Resources, Energy Division,
Wallace Building, Des Moines, Iowa 50319

CAREIRS (Conservation and Renewable Energy Inquiry and Referral Service)
800-523-2929.

Iowa Energy Extension Service, Iowa State University,
110 Marston Hall, Ames, Iowa 50011. 515/294-6978

National Energy Foundation, 4980 West Amelia Earhart Drive
Salt Lake City, Utah, 84116. 801/539-1406

Energy and Self-Reliance Center, 3500 Kingman Boulevard
Des Moines, Iowa 50311. 515/277-0253

National Energy Information Center, El-20, Energy Information
Administration, Forrestal Building, Room 1F-048
Washington, D.C. 20585. 202/252-8800

New York Energy Education Project and the
Solar Energy Project, SUNY at Albany, 1400 Washington Avenue
P.O. Box 22100, Albany, New York 12222

Ministry of Energy, 56 Wellesley Street West,
Toronto, Ontario, M7A2B7, Canada

NATAS (National Appropriate Technology Assistance Service) 800-428-2525.

The NEED Project, P.O. Box 2518, Reston, Virginia 22090
703/860-5029

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PRIMARY

INTRODUCTION

This packet is divided into Units I - IX, and each unit works with a separate energy source. It includes an introductory Unit I and a final Unit IX review. The following information, learning experiences, and activities are entirely flexible for your use. You may do all nine units or omit some.

The following suggestions are strongly recommended for successful units:

1. Have a good supply of old magazines, catalogs, and circulars available for cutting by the students.
2. Please use recycled paper and materials as much as possible.
3. Energy Booklet is an ongoing activity listed under Follow-Up on each teacher page. This booklet is the ideal way to tie together the first eight units. The booklet itself is the Unit IX final review product. As each student completes a page at the end of each unit, the teacher collects these. Thus, for Unit IX these collected pages become the Energy Booklet and the final review product simultaneously.

The activities vary in difficulty and approach, but all emphasize a basic learning cycle. The activities are labeled K or Grade 1 or Grade 2, but the teacher has the option to try any of the activities regardless of its grade label.

List of educators who contributed to this project:

Marilyn Kolbe	- Roland-Story Elementary, Story City, Iowa
Denise Carlson	- Gilbert Elementary School, Gilbert, Iowa
Judy Ringelestein	- Roland-Story Elementary, Story City, Iowa
Naomi E. Smith	- Nevada Community School, Nevada, Iowa
Sue Stellmaker	- Roland-Story Elementary, Story City, Iowa
Linda Hutchinson	- Lawn Hill Elementary, Webster City, Iowa
June Calhoun	- Roland-Story Elementary, Story City, Iowa
Camille Jackson	- Grand Valley Community School, Kellerton, Iowa
Kris Twedt	- Roland-Story Elementary, Story City, Iowa
Nancy A. Nettleton	- Central Catholic School, Mason City, Iowa
Sue Swanson	- Tipton Community Schools, Tipton, Iowa
Dawn Rogge	- Roland-Story Elementary, Story City, Iowa
Janet E. Greiner	- Hoover Elementary School, West Branch, Iowa
Julie Skaar	- Roland-Story Elementary, Story City, Iowa

Madonna Carber	- Northeast Elementary, Camanche, Iowa
Rada Hutchison	- Roland-Story Elementary, Story City, Iowa
Tempest Kuykendall	- Roland-Story Elementary, Story City, Iowa

TITLE Getting to Know our Energy Friends

SUBJECT Art, Science LEVEL K

ACTIVITY IN BRIEF

The students will color seven pages representing some primary sources of energy. These pages can be introduced one or two at a time for discussion, colored, and put into a booklet form. The teacher may wish to only use these pages for the students to look at while drawing their own energy resources onto drawing paper folded into 4 sections (to save paper).

OBJECTIVE

Each student will be able to:
—identify some major sources of world energy.
--state the term energy and its meaning (the ability to do work).

MATERIALS

eight student handouts (1A-1G)
scissors, glue
crayons or markers
old magazines
drawing paper

TIME

Optional depending on amount needed for discussion and coloring

LEARNING CYCLE

AWARENESS - The teacher may introduce each coloring sheet and ask questions or the teacher may give verbal hints and let the students guess the source of energy.

CONCEPT DEVELOPMENT - Continue to discuss the source or sources of energy by asking questions such as: the color, size, shape of the energy source; where it could be found; who uses it; how it is used; could it get all used up, etc.

APPLICATION - Distribute the sheets for coloring, as many as the discussion allowed for. The students may design a cover for their sheets; the teacher makes sure the word energy is used in the title of the cover. (See activities 1A - 1G)

EVALUATION - At the end of the Application Session, review the sheets and the meaning of energy with each student.

FOLLOW-UP/SUPPORT/SOURCES

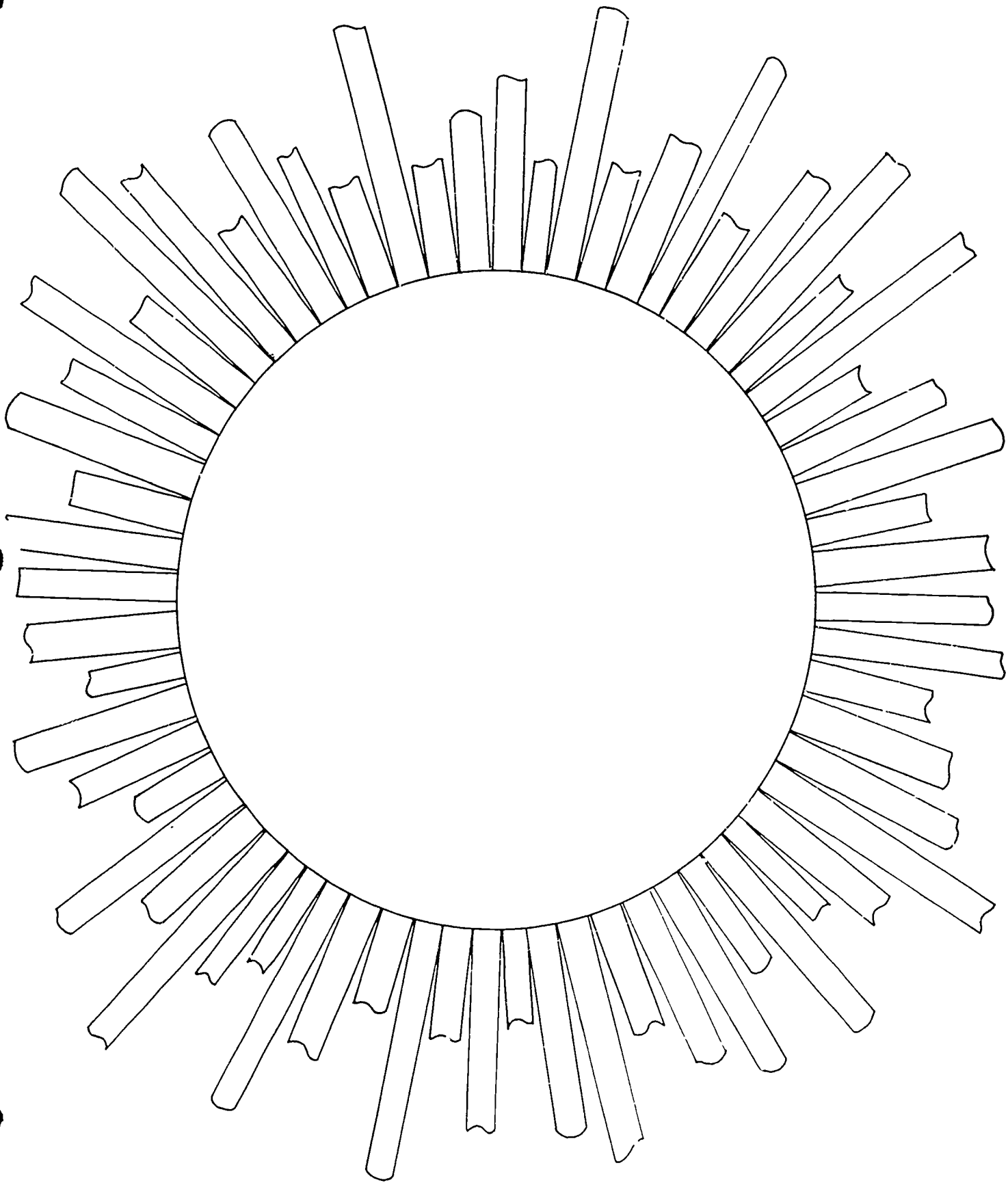
Energy Booklet - The students cut out a magazine picture or draw the source of energy they like best. The teacher collects these sheets for the Unit IX final review.

SOURCE OF ACTIVITY

Adapted from Energy and Man's Environment by Linda Scheuermann

TITLE: SUN ENERGY

NAME:_____

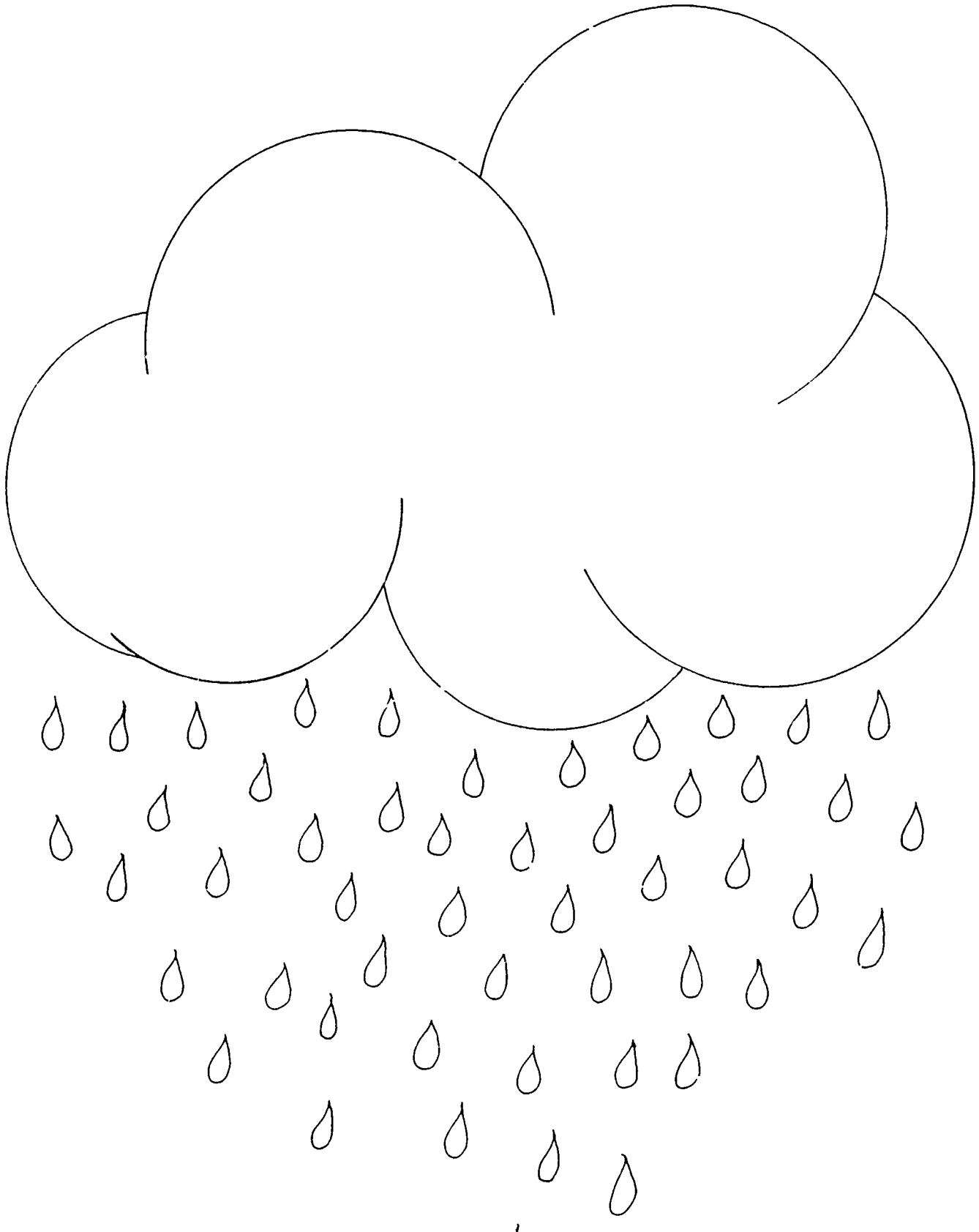


TITLE: WIND ENERGY

NAME:_____

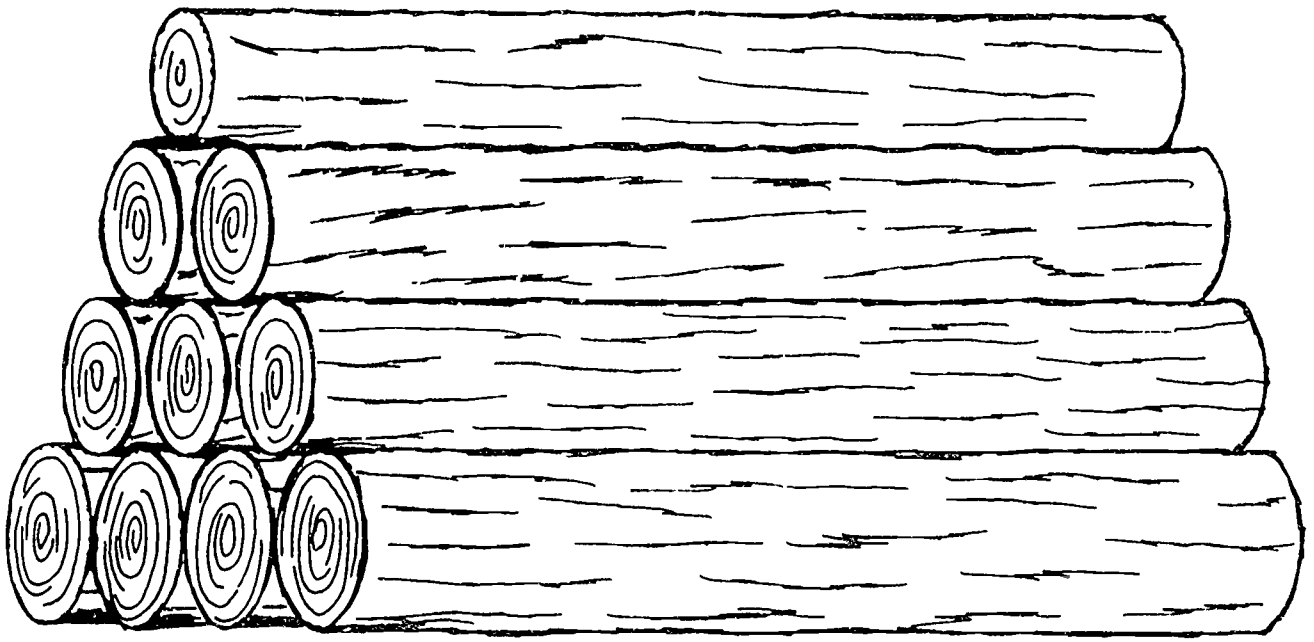
TITLE: WATER ENERGY

NAME:_____



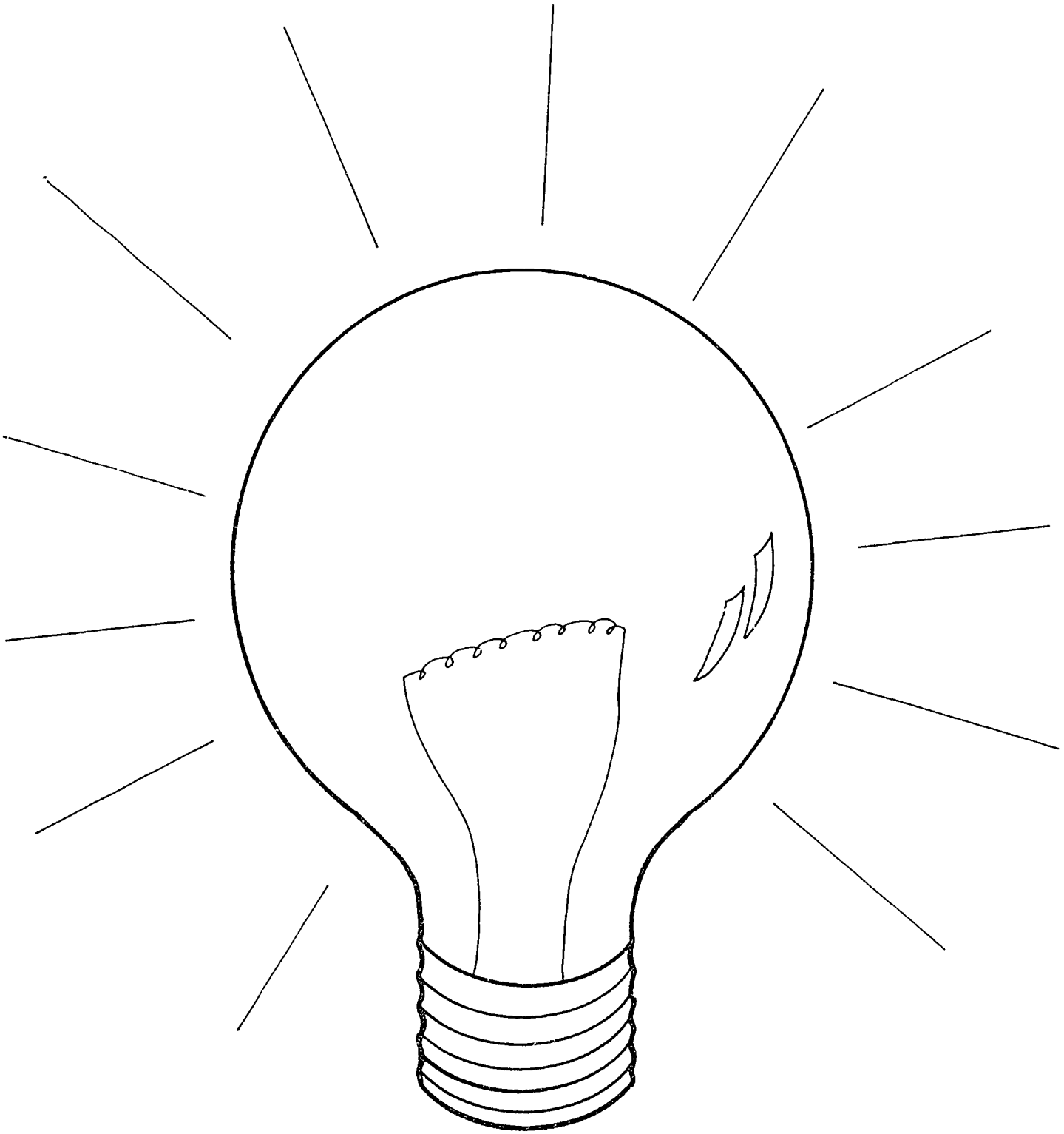
TITLE: WOOD ENERGY

NAME:_____



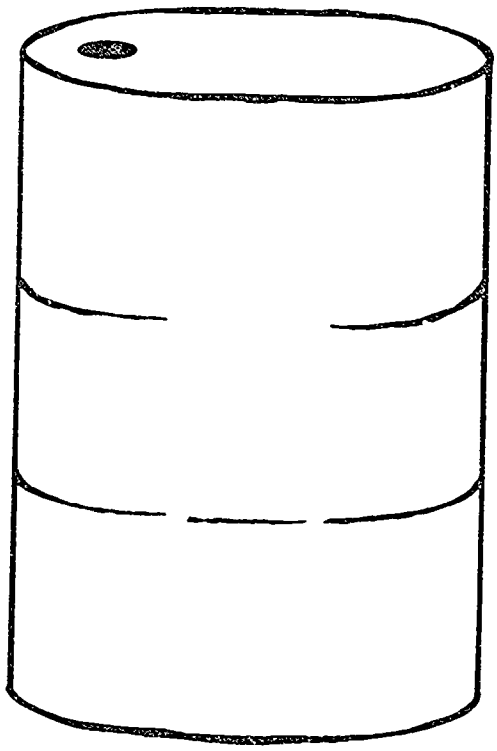
TITLE: ELECTRICAL ENERGY

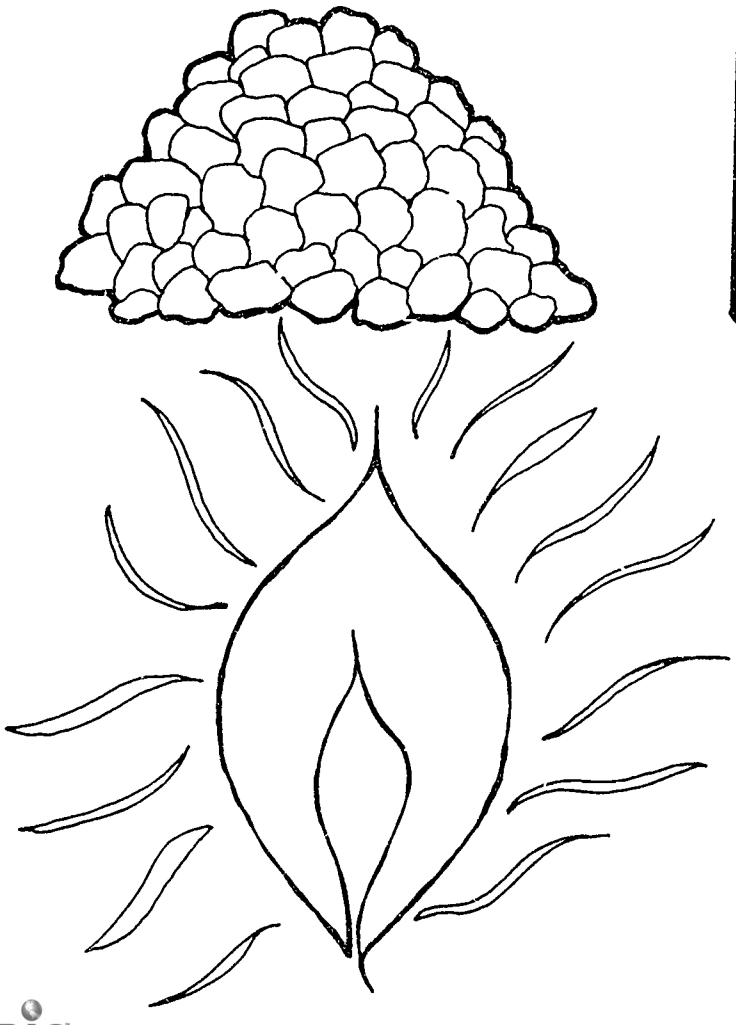
NAME:_____



TITLE: COAL, OIL, AND NATURAL GAS ENERGY

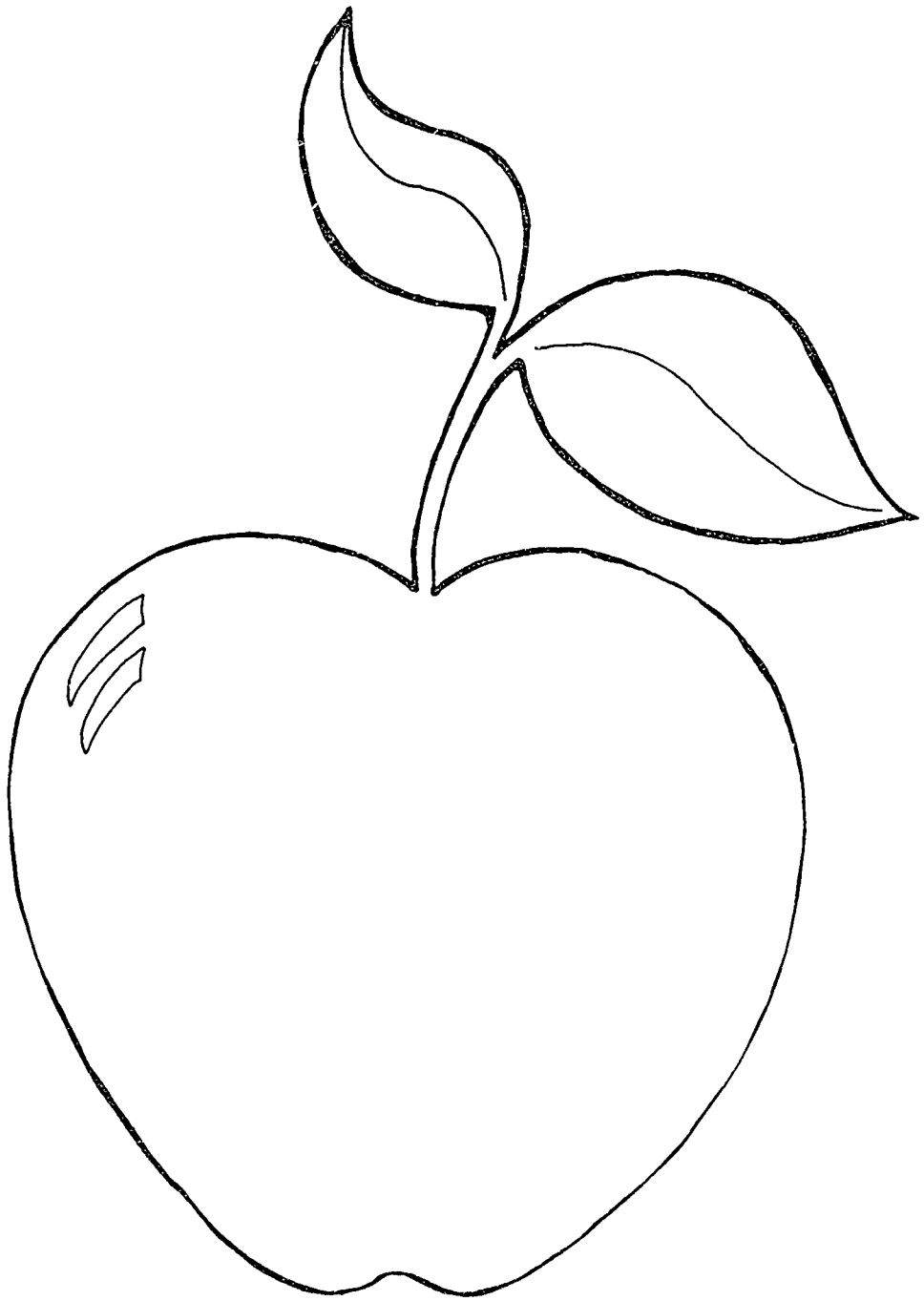
NAME:_____





TITLE: FOOD ENERGY

NAME:_____



TITLE Peter, Peter, Energy Eater

SUBJECT Language Arts, Art, Science LEVEL Grade 1

ACTIVITY IN BRIEF

This activity can be three-fold. Discussions of energy sources (See Activity 1) must be introduced prior to:

1. A school energy walk (Activity 2A)
2. A parent/student questionaire (Activity 2B)
3. "Energy Eater Creature" puzzle (Activity 2C)

OBJECTIVE

Each student will be able to:

- identify "energy eaters" in the school and home.
- make some choices regarding how they might use energy.
- explain conservation of energy.

MATERIALS	TIME
School Survey Sheet Transparency (2A) Student/Parent Questionnaire (2B) Energy Eater Creature Puzzle (2C) (on oaktag) old magazines, drawing paper, glue, scissors, crayons	energy walk and discussion: 30 - 40 minutes. Student/Parent Questionnaire: 10-15 min. to fill out, 20 to 30 minutes to discuss results. Energy Eater Creature Puzzle: 1 hour(use 2 half hr. periods)

LEARNING CYCLE

AWARENESS - The teacher may choose one, two, or three of the activities according to student ability and/or interest. Students brainstorm energy sources with teacher in discussion format. Teachers and students take school energy walk (example: library, offices, kitchen, computer room, etc.) and make mental notes of energy users. Using transparency, teacher fills in students' responses. This list could be put on a ditto and one run off for each student.

CONCEPT DEVELOPMENT - The students could invent their own student/parent questionnaire by using ideas from the energy walk survey list, or the teacher could send home the questionnaire (Activity 2B) in this unit. Questionnaires are returned, the results discussed, and concern for conserving should begin to immerge.

APPLICATION - Students draw pictures or cut pictures from magazines that represent energy eaters. Pictures are glued on stomach of the Energy Eater Creature. Caution the students to cut the creature into no more than 6 pieces. Now they have a puzzle to trade with their classmates.

EVALUATION - At the end of the Application Session:
- a review of the pictures (for Objective 1)
- ask each student to state choices (Objective 2)
- ask each student to explain conservation of energy (Objective 3)

FOLLOW-UP/SUPPORT/SOURCES

For more student background information, show film, Energy: Ability To Do Work from your AEA.

ENERGY BOOKLET - Energy Puzzle could be glued with rubber cement to an 8 x 11 1/2 inch sheet for later student use. Teacher collects these puzzles for final Unit IX review.

Support: "Peter, Peter Energy Eater
Had some fuel but couldn't keep her.
Tried conserving - so they tell
And then he lived so very well."

SOURCE OF ACTIVITY

Sue Stellmaker, Kris Twedt, June Calhoun, Denise Carlson

TRANSPARENCY

NAME:_____

ENERGY WALK IN THE SCHOOL

WHICH ROOMS DID WE VISIT?	ENERGY EATERS IN EACH ROOM
1.	1.
2.	2.
3.	3.
4.	4.

NAME:_____

ARE YOU PETER, PETER, ENERGY EATER?

DO YOU WALK OR RIDE A BIKE INSTEAD OF ALWAYS USING A CAR?
YES ____ NO ____

DO YOU TURN OFF THE LIGHTS WHEN YOU LEAVE A ROOM?
YES ____ NO ____

DO YOU TURN OFF THE TV WHEN YOU ARE NOT WATCHING IT?
YES ____ NO ____

DO YOU KEEP YOUR HOUSE TEMPERATURE AT LESS THAN 68 DEGREES? YES ____ NO ____

DO YOU WEAR A SWEATER IN THE WINTER INSTEAD OF MAKING YOUR HOUSE WARMER? YES ____ NO ____

DO YOU ALWAYS USE THE AIR CONDITIONER IN THE SUMMER?
YES ____ NO ____

DO YOU PULL DOWN THE WINDOW SHADES TO KEEP THE WARM SUN OUT ON HOT SUMMER DAYS?
YES ____ NO ____

DO YOU USE A CLOTHESLINE IN NICE WEATHER?
YES ____ NO ____

DOES YOUR HOUSE HAVE GOOD INSULATION IN ITS WALLS AND CEILINGS? YES ____ NO ____

DO YOU TRY NOT TO THROW AWAY THINGS THAT YOU COULD USE AGAIN? (PLASTIC BAGS, ALUMINUM FOIL, PAPER)
YES ____ NO ____

NAME:_____

TITLE Match-Up Your Energy Know-How

SUBJECT Language, Arts, Science, Art, Mathematics

LEVEL Grade 2

ACTIVITY IN BRIEF

Through discussion, students will brainstorm as many sources of energy they can think of. Teacher lists these on chalkboard. In groups of 3-5 students, large collages will be made with cut outs and/or drawings of energy sources. These will become classroom posters. "Energy Concentration Game" is an activity where students will match energy terms with a correct definition.

OBJECTIVE

Each student will be able to identify the definitions of at least ten energy sources.

MATERIALS

old magazines, drawing paper
glue, scissors, crayons
4-6 pieces large poster or heavy paper, one set of energy playing cards per every two pupils, graph paper (See Activity 3 Cont.)

TIME

Poster activity:
1st day - 1/2 hour
2nd day - 1 hour
Game activity;
2 - 1/2 hour sessions

LEARNING CYCLE

AWARENESS - While the students brainstorm the sources of energy, the teacher lists these clearly on the chalkboard. Materials for posters are distributed for each group of 3-5 students. These poster collages will consist of pictures of energy sources listed on the chalkboard and will be displayed in the classroom.

CONCEPT DEVELOPMENT - Game is introduced. Divide pupils into groups of two. Give each group 1 set of playing cards, Students spread out 1/2 of the cards so all the energy terms are visible. The other 1/2 of the cards (the definitions) are placed face down in a stack. The first player turns over 1 slip from the stack and tries to match it with a term. To see if the match is correct, the player turns both slips over. If the symbols match, the player gets to keep those slips and takes one more turn. The game continues until all terms and definitions have been matched. The player with the most matched sets wins the game. (If time or an aide is not available for constructing this game, allow the students to help prepare it.)

APPLICATION - Game may be expanded by adding additional energy terms appropriate for the class. This game is self-checking, so it works well for a learning center or as an individual learning game.

EVALUATION - At the end of the Application Session, the teacher calls out the same energy definitions slowly and each student quickly sketches a picture of the energy term for each definition. When finished, students self-correct as class discusses their sketches. Encourage variety in their sketches before beginning evaluation. Example: The sun's energy could be represented by a plant, solar panels, as well as the sun itself.

FOLLOW-UP/SUPPORT/SOURCES

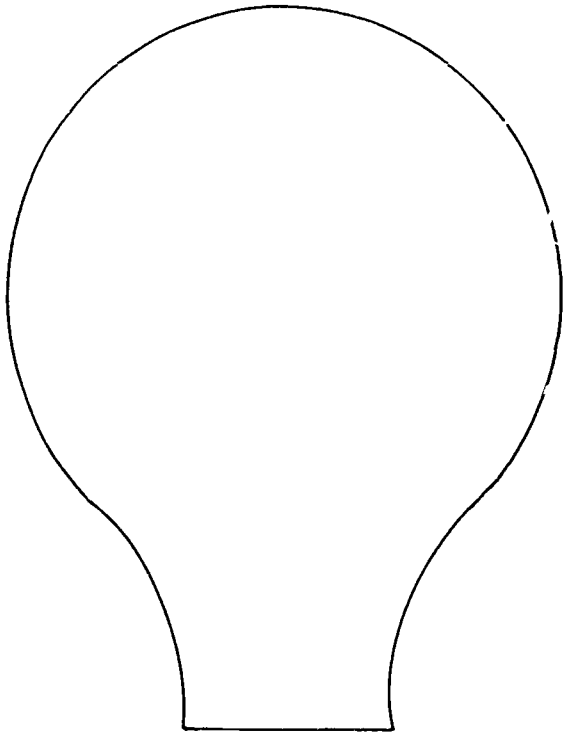
Students may develop a crossword puzzle using the terms and definitions presented in the concentration game. The definitions become the clues and the terms become the answers needed to fill in the puzzle. Students may enjoy solving the puzzles created by classmates.

Energy Booklet - On graph paper, students individually make a bar graph listing energy sources from most to least used. Teacher collects these for final Unit IX review.

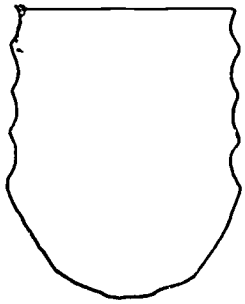
SOURCE OF ACTIVITY

Denise Carlson

TITLE: MATCH UP YOUR ENERGY KNOW-HOW



Place energy definition on this card.



Place energy term on this card.

Energy Definitions

1. spills over dams and turns big engines
2. the sun's energy
3. used in fireplaces and for heating homes
4. black liquid used for heating and making plastic
5. used for heating many homes--can't be seen
6. splitting of atoms to give us power
7. hard, black rock that can burn
8. turns blades but cannot be seen
9. energy which makes people and animals play and work
10. burning of garbage for heat ene. gy

Note: Place a matching symbol or number on the back of each term card and its corresponding definition card so this activity will be self-checking. Matching stickers or stamps would be easier for the students.

Energy Terms

Additional Terms: geothermal, kerosene, kinetic, mechanical, potential, gasoline, electricity, etc.

1. coal
2. wind
3. water
4. solar
5. wood
6. oil
7. nuclear
8. food
9. biomass
10. natural gas

TITLE The Sun Is My Friend

SUBJECT Science, Art, Math Shapes LEVEL K

ACTIVITY IN BRIEF

The students will work with the sun's heat energy and light energy by being able to feel and read the sun's warmth and by being able to see the results of the sun's light energy.

OBJECTIVE

Each student will be able to identify the sun as a source of heat energy and light energy.

MATERIALS	TIME
Two thermometers, 2 pans of water, colored piece of construction paper per student, assortment of rocks, leaves, shells or use 4A (math shapes)	Optional, depending on group size, and sunny and cool locations

LEARNING CYCLE

AWARENESS - To demonstrate the sun's heat energy, first take the students to a warm, sunny place in the classroom or school building. Then take them to a cooler place (example: storage room) without the lights on. As a group activity, discuss the differences in warmth. Let the children "guess" at the temperatures in both areas and list these on chalkboard. Be sure they understand the concept of temperature and how it is measured. (This may have to be modified for seasonal temperature changes.)

CONCEPT DEVELOPMENT - Now place thermometers in these two different areas. At a later time, retrieve the thermometers, and put the temperatures on the board. Allow students the chance to "read" the thermometers with help.

APPLICATION - To demonstrate the sun's light energy, students arrange leaves, shells, rocks, etc. on colored paper, and leave in sunlight. Or to reinforce basic math shapes, have students arrange their cut-outs of rectangles, squares, circles, triangles in same way. (see 4A) Discuss results.

EVALUATION - After the Application Session, ask each student what makes buildings, classrooms, cars, homes, etc. warm besides furnaces and heaters. Ask why or how the shapes appeared on their colored paper.

FOLLOW-UP/SUPPORT/SOURCES

As an extending activity, put the thermometers in pans of water in both areas to see if the water affects temperature. Discuss these results.

Energy Booklet - After a good amount of bleaching on construction paper has taken place, the finished pages with the students' name on them are collected by the teacher and kept for the final Unit IX review.

A follow-up activity would be to read the poem by Nora Smaridge from the book Only Silly People Waste called "Next Time, Remember."

NEXT TIME, REMEMBER

When you've enjoyed your little snack
and put the peanut butter back
CLOSE THE REFRIGERATOR DOOR
(I've said this fifty times before)
Or else the food will go to waste,
The milk will have a funny taste,
The carrots and the salad stuff
Will not be cold or crisp enough,
The jello will refuse to jell,
The pink ice cream will melt as well---
And Daddy WON'T be pleased to meet
Our butter, flowing down the street.

Take students to a cafeteria or a nearby refrigerator where a thermometer has been placed. Open the door and watch carefully what happens to the thermometer. Listen for the compressor to begin running and consume electrical energy.

SOURCE OF ACTIVITY - Marilyn Kolbe

TITLE Mary and Gary, How Does A Garden Grow?

SUBJECT Science, Career Awareness, Art LEVEL Grade 1

ACTIVITY IN BRIEF

This is an activity which is examined at the end of one week and at the end of another week. The students will examine two plants, one which is placed in the sun, and one which is in a darkened closet.

OBJECTIVE

Each student will be able to:
- explain his/her prediction of the effect of the sun on plants.
- draw the effect on plants with and without sunshine.

MATERIALS

Two green plants of equal size: marigolds, geraniums, or African violets, etc.
Student sheet for drawings. (5A)

TIME

Drawings-15-20 min. Allow time for discussion on 3 separate occasions.

LEARNING CYCLE

AWARENESS - Bring two plants of equal size and type to class and stimulate discussion about the plants' sizes, colors, leaves, blossoms, etc. Discuss also what it takes for each plant to live: soil, water, sun, air, etc.. Put one plant in a sunny window and the other in a closet. Stress that both will be watered regularly and equally.

CONCEPT DEVELOPMENT - Allow students to illustrate their predictions about what both plants will look like in two weeks (use activity 5A).(Teacher collects these.)

APPLICATION - After one week children will observe both plants side by side and examine their drawings and discuss. After another week, do the same. Discuss the students' predictions on worksheet 5A.

EVALUATION - As the students are drawing their predictions, ask each to explain her/his prediction.

FOLLOW-UP/SUPPORT/SOURCES

Children visit a nursery to learn about a career in nursery work or invite someone in this field to speak to the class.

Energy Booklet - Allow children to redraw their plant predictions, if necessary, so they will be correct. Teacher collects these sheets for the final Unit IX review.

SOURCE OF ACTIVITY

Linda Scheuermann

TITLE: MARY & GARY,

HOW DOES A GARDEN GROW?

NAME:_____

PLANT IN WINDOW

PLANT IN CLOSET

TITLE Solar Samples

SUBJECT Language Arts, Art, Reading, Science LEVEL Grade 2

ACTIVITY IN BRIEF

Using either one or both of the Solar Samples offered, the teacher can stress the sun's importance to students in their daily language experience as well as stress some basic science sun facts.

OBJECTIVE

Each student will be able to:
- define and write some compound sun words.
- label some sun facts.

MATERIALS	TIME
Student hand-outs: Compound Sun Words (Activity 6A) Sunbeam Facts (Activity 6B) crayons, scissors, glue, yarn or string	30-40 minutes for Activity 6A. 40-60 minutes which could be divided into two 1/2 hour sessions for Activity 6B.

LEARNING CYCLE

AWARENESS - The teacher can do Activity 6A - Compound Sun Words, Activity 6B - Sunbeam Facts, or both activities. To introduce Activity 6A, the teacher lists as many compound sun words on the chalkboard as the students can think of. To introduce Activity 6B - Part I, the students read the Sunbeam Facts Sheet aloud with the teacher's help. Teacher may need to explain some of the larger numbers and the more difficult concepts.

CONCEPT DEVELOPMENT - To continue Activity 6A, the teacher distributes the Compound Sun Words hand-outs (6A - Part 1 and 2) for students to color, write, cut out and glue. To continue Activity 6B, each student chooses four favorite Sunbeam Facts and writes them on hand-out (6B Part 3). Students then color, cut, and string together their Sunbeam Facts to hang up (6B - Parts 2 and 3).

APPLICATION - Using their compound Sun Words (Activity 6A), the students in groups of 2 or 3 could develop word find puzzles. For Activity 6B, the students could find more sunbeam facts from resource books and add onto their hanging Sunbeam Facts.

EVALUATION - During the Application Session, ask each student to recall as many compound sun words and sun facts as possible while the rest of the class researches more sunbeam facts.

FOLLOW-UP/SUPPORT/SOURCES

Energy Booklet - On a sheet of paper, students could illustrate compound sun words. Teacher collects these and saves for final Unit IX review.

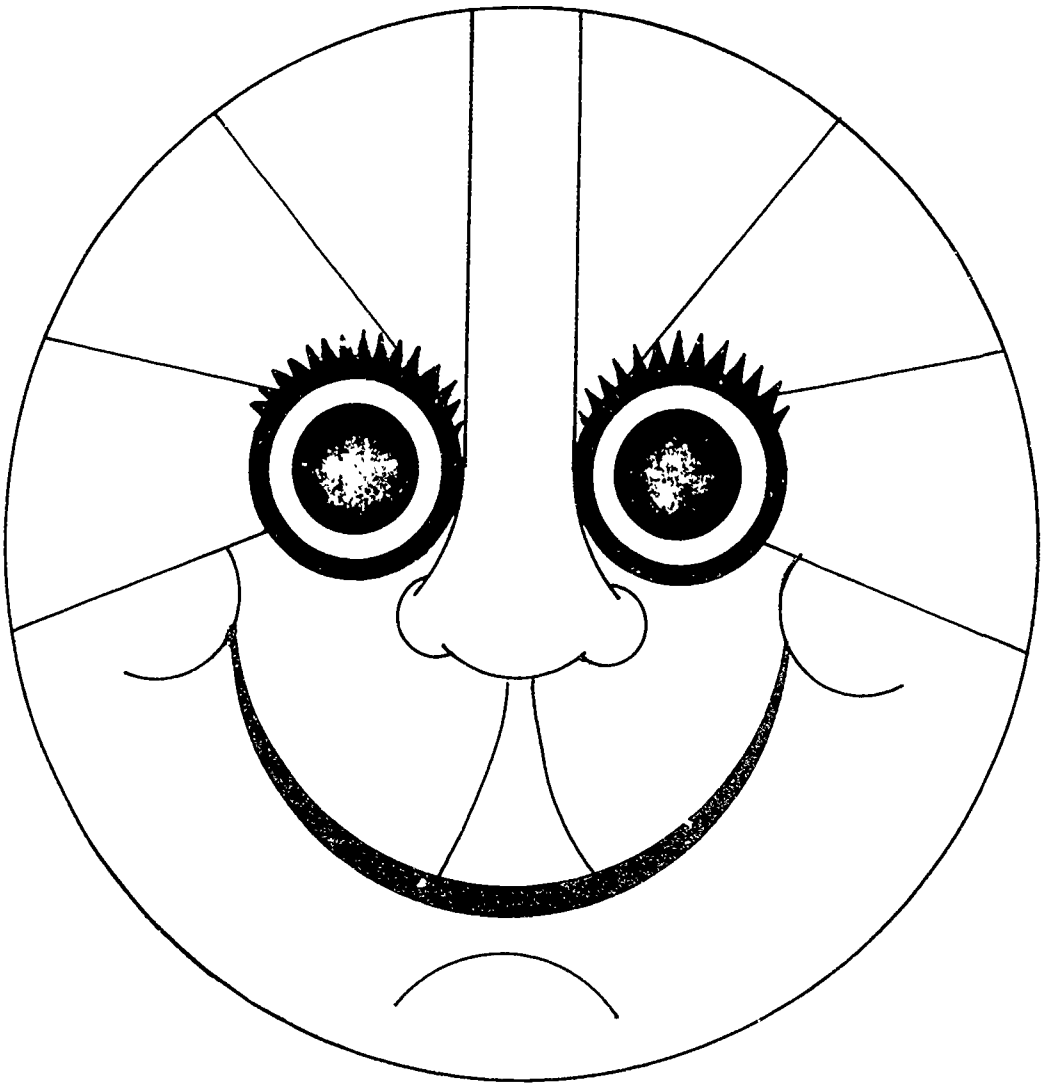
SOURCE OF ACTIVITY

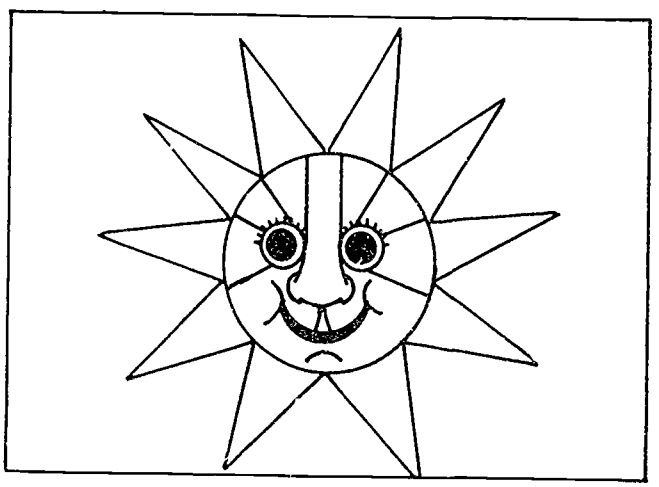
Judy Ringelestein

TITLE:

NAME:_____

COMPOUND SUN WORDS





DIRECTIONS

1. COLOR THE SUN.
2. CUT IT OUT.
3. WRITE A WORD FROM THE LIST FOR EACH SUN RAY.
4. CUT OUT THE RAYS.
5. GLUE THE RAYS TO THE BACK OF THE SUN. (SEE SUN IN BOX)

WORD LIST:

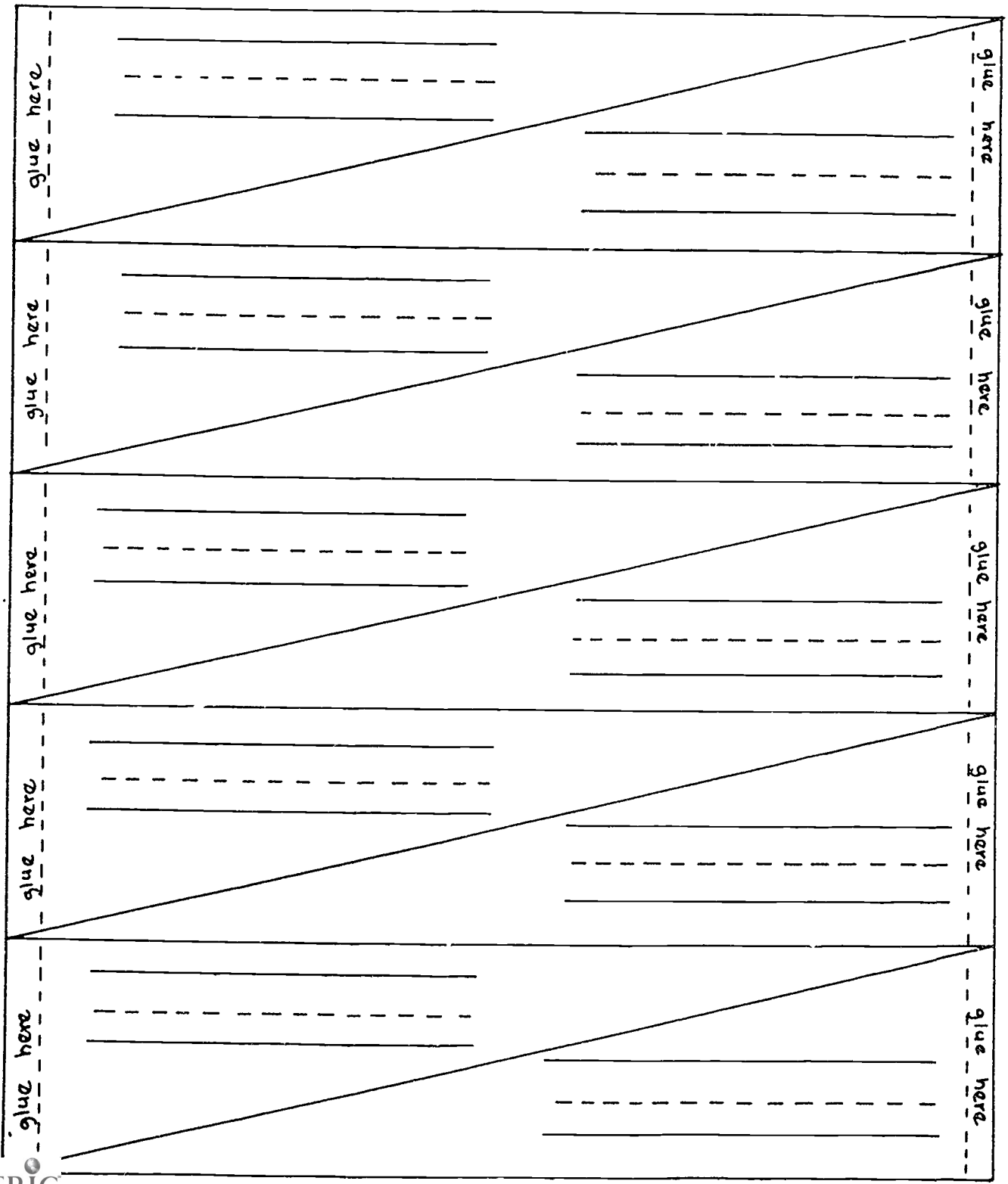
Dial	Shine
Fish	Day
Beam	Bonnet
Flower	Down
Burn	Glasses

PRIMARY- UNIT II- ACTIVITY 6A-PART 2

NAME:_____

DIRECTIONS:

1. PLACE EACH WORD ABOVE IN THE WRITING SPACES BELOW.
2. CUT OUT THE RAY.
3. GLUE RAYS TO YOUR COLORED SUN.



NAME:_____

SUNBEAM FACTS

1. Scientists estimate the sun is 4,600,000,000 years old.

2. Today the sun is the source of almost all of the light, heat, and energy on earth.

3. The surface temperature of the sun averages 10,000 degrees Farenheit.

4. The center of the sun reaches a temperature of 27,000,000 degrees F.

5. The sun is a giant star.

6. The sun is about 92,950,000 miles from the earth.

7. The sun is our nearest star.

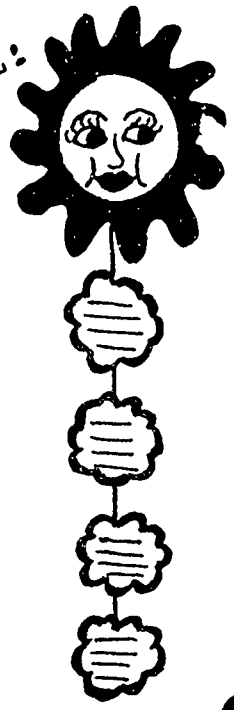
8. The sun makes plants grow.

9. It would take 1,300,000 earths to fill the sun.

10. Our sun will continue to shine for billions of years.

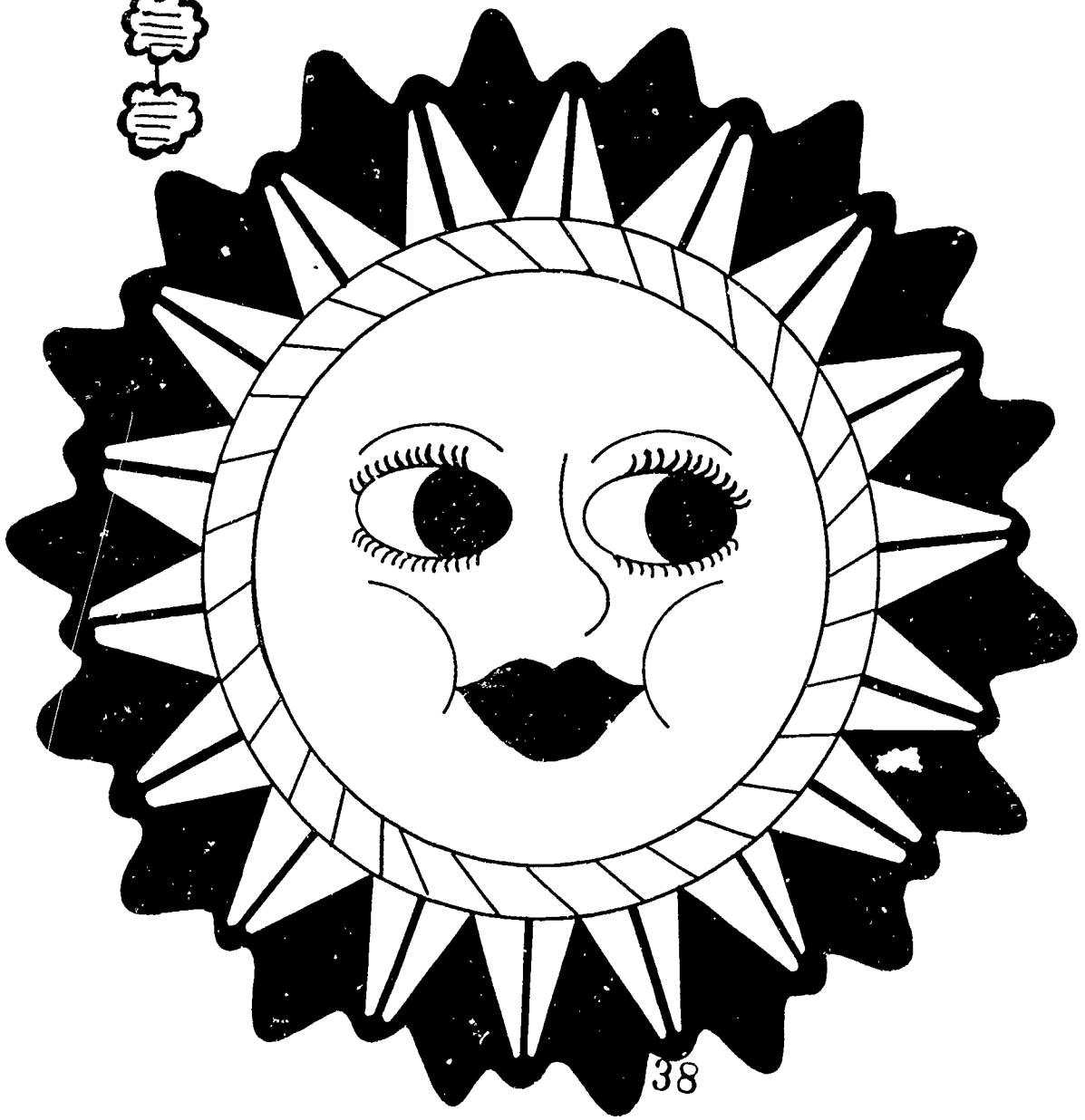
TITLE: SUN FACTS MAKE A SUNBEAM

Example:



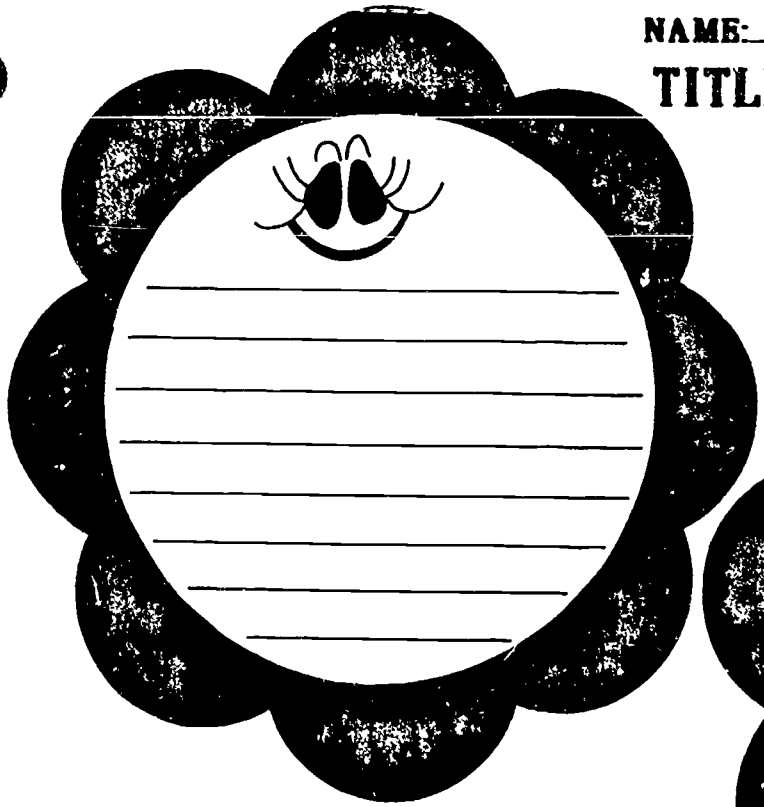
DIRECTIONS:

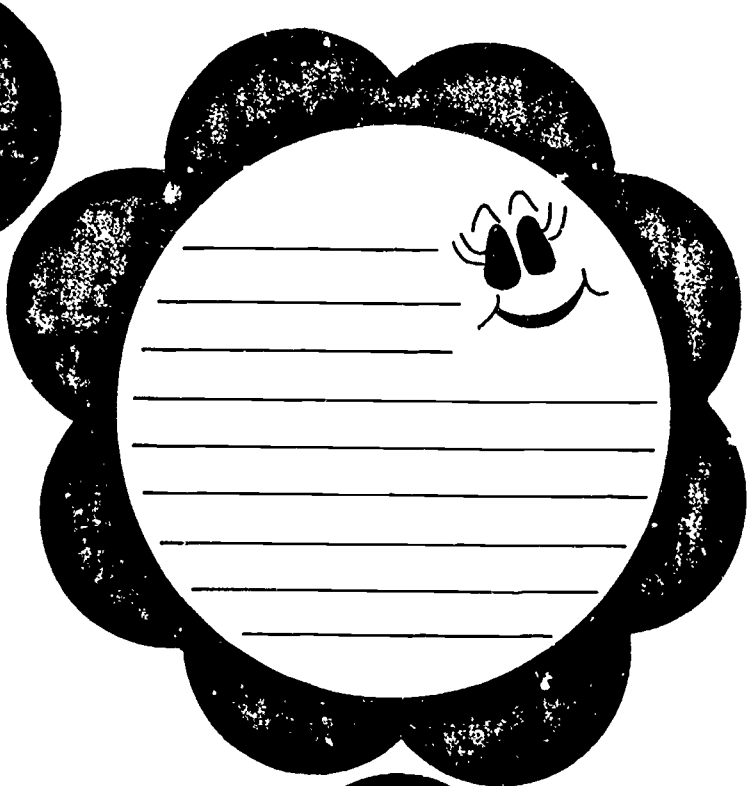
1. COLOR AND CUT OUT THE LARGE SUN BELOW.
2. ON THE NEXT SHEET, WRITE FOUR SUNBEAM FACTS.
3. CUT OUT ALL FOUR SUNBEAMS.
4. WITH THE LARGE SUN AT THE TOP, USE YARN OR STRING TO ATTACH THE SUNBEAMS.
5. HANG YOUR SUNBEAMS UP. (SEE EXAMPLE)

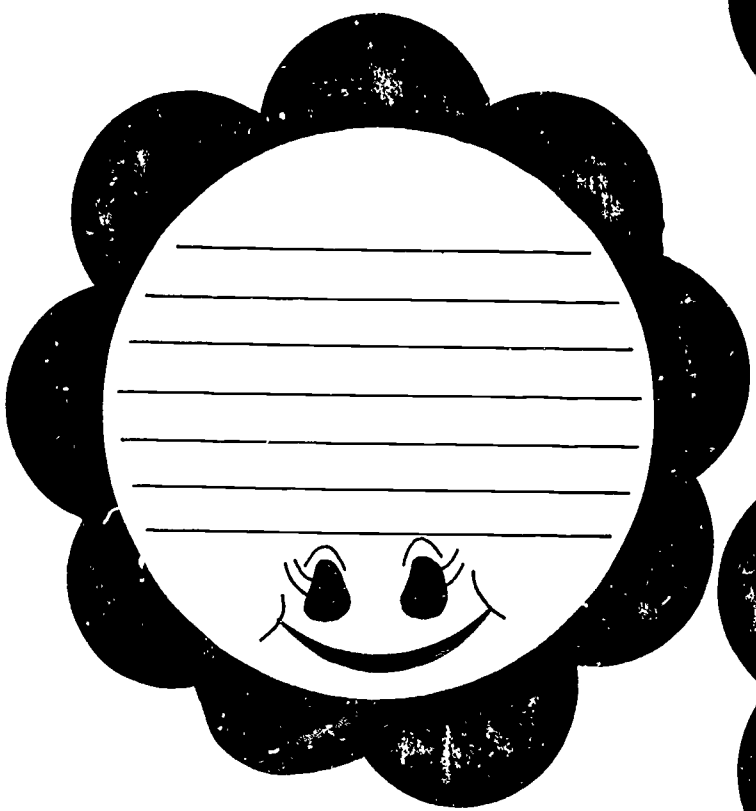


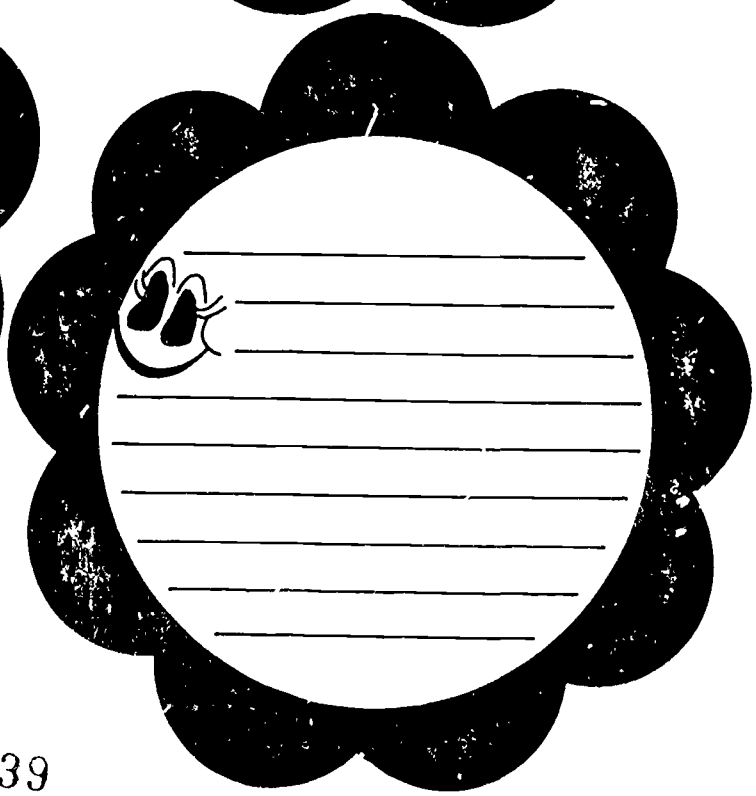
NAME:_____

TITLE: SUNBEAM FACTS PATTERN









DIRECTIONS:

WRITE A LITTLE SMALLER FOR LONGER FACTS.

TITLE The Wind is My Friend

SUBJECT P.E., Language Arts, Art, Science LEVEL K

ACTIVITY IN BRIEF

This will be done on a very windy day. The students will observe 2 fans. One is plugged in an electrical outlet in the classroom. The other is outside on the playground in a windy place, so the blades will turn. Question the students about what is happening.

OBJECTIVE

Each student will prove that wind causes motion.

MATERIALS

a windy day
2 electric box fans
scissors, pins
new unsharpened pencils, one for each student
student Wind Wheel handout (7A)
old magazines
glue, construction paper

TIME

40-60 minutes (can be in 2 or 3 sessions)

LEARNING CYCLE

AWARENESS - Pick a windy day. Plug one box fan into an outlet in the classroom on low speed. Talk about the fan: What is happening? What makes the fan move? Take students outside to the playground where the 2nd fan is turning in the wind. Ask the same kinds of questions again. Bring the students and the 2nd fan back inside. Place it unplugged in front of the running fan. Turn the running fan to higher speeds and watch the results on the unplugged fan. Continue to question the students: Can we see wind? Where does it come from? Do we use wind? Which fan is using free energy? What are wind mills?

CONCEPT DEVELOPMENT - The teacher reads the book Gilberto and the Wind by Marie Hall Ets to the students. A discussion follows the reading.

APPLICATION - The students each make a wind wheel according to instructions on the pattern following. On a not too windy day students can run outdoors with their windmills. The teacher can read Follow the Wind by Alvin Tresselt and/or Catch the Wind by Landt Dennis and/or The Wind and Peter by Alvin Tresselt.

EVALUATION - Ask each student how have you proven that the wind causes motion?

FOLLOW-UP/SUPPORT/SOURCES

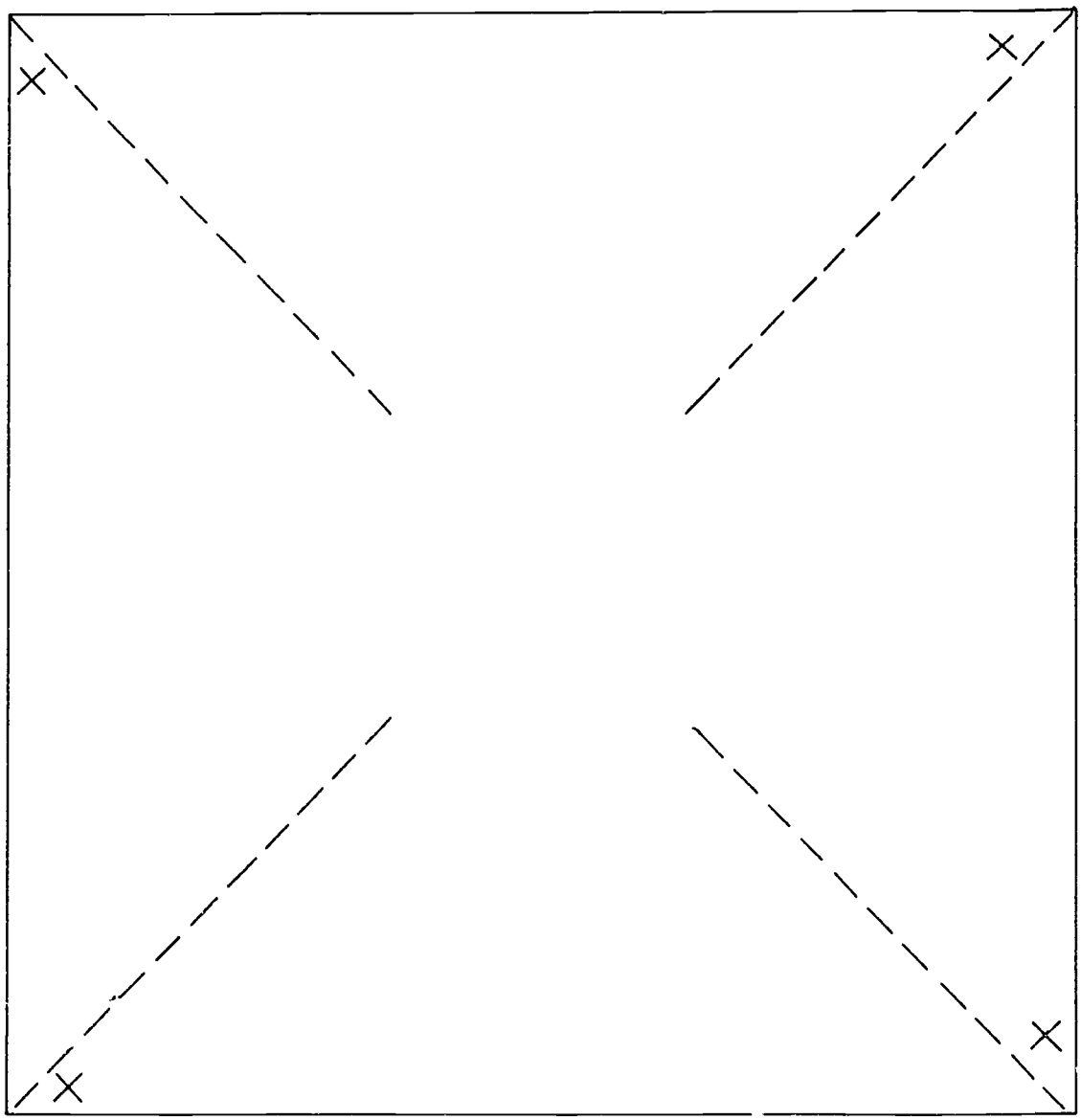
Energy Booklet-Students cut out pictures showing wind motion and glue onto sheet of construction paper. Teacher collects these for final Unit IX review.

SOURCE OF ACTIVITY

Adapted from ECAPS by Sue Swanson

TITLE: WIND WHEEL

NAME:_____



DIRECTIONS:

1. CUT IN AT EACH CORNER.
2. TAKE THE CORNERS MARKED X AND FOLD UP TO CENTER.
3. PIN ALL THE CORNERS TO THE CENTER.
4. PIN ON ERASER OF PENCIL.

TEACHER'S NOTE: RUN THIS OFF ON HEAVY PAPER SUCH AS OAKTAG

TITLE Air, Air, It's Everywhere

SUBJECT Science, Language Arts LEVEL Grade 1

ACTIVITY IN BRIEF

Air (wind) is not only an important source of energy, but is also a kind of energy mankind must take care of. Air pollution is a dilemma for all of us, and children can understand the impacts of bad air when the teacher deliberately pollutes the classroom air.

OBJECTIVE

Each student will be able to identify air pollution and state some possible causes, and some possible remedies.

MATERIALS

4-5 jars half full of ammonia or sour milk, or equally smelly substance
drawing paper
crayons or markers

TIME

two 30 min. sessions

LEARNING CYCLE

AWARENESS - The teacher should place the bad odor items around the classroom before the students arrive. Observe the students' reactions, remove the jars, and begin a discussion about how the environment is affected by air pollution. What causes air pollution? Can anything be done about cleaning our air?

CONCEPT DEVELOPMENT - The teacher should list on the chalkboard the students' inventions for cleaning up the air. Lead discussion to the value of wind as a way to clean the air (opening windows of a smelly room, smog being cleared by wind, etc.)

APPLICATION - Next the teacher will list and the children will brainstorm all the good uses of wind, for example: 1) bringing cleaner air, 2) blowing up balloons, or bubbles, 3) flying kites and wind socks, 4) melting snow and ice, 5) drying ground for crop planting, 6) sailboating, 7) cooling in summer, 8) birds riding air currents, 9) weather changes, 10) others.

EVALUATION - After the Application Session, ask each student to state some possible causes and possible remedies for air pollution.

FOLLOW-UP/SUPPORT/SOURCES

1. Show film "Wind: A First Film".

2. Show film "Air Pollution: A First Film".

3. How To Have Fun Building Sailboats by Creative Craft Book.

ENERGY BOOKLET - Students will draw their favorite use of the wind using the list of the best uses of the wind. The teacher collects these for the final Unit IX review.

SOURCE OF ACTIVITY

Adapted from Energy In Man's Environment by Linda Scheuermann

TITLE Wind Inventions

SUBJECT Science, Art, Language, Reading **LEVEL** Grade 2

ACTIVITY IN BRIEF

Teacher and students will spend time locating books and magazines on wind and its uses. After a sufficient amount of research has occurred, the students will design an individual, a small group, or an all group wind machine or a wind device.

OBJECTIVE

Each student will be able to construct a wind machine or device based upon data gathered.

MATERIALS

odds and ends from home such as:
empty margarine tubs, Popsicle sticks,
cloth pieces, wire, string, etc.
construction paper, glue, scissors, crayons,
or markers, drawing papers, Activities 9A - 9F

TIME

Could be an on-going activity where an entire day could be used. Could be divided into one hour a day for a week.

LEARNING CYCLE

AWARENESS - The teacher and class should research wind in books and magazines. Through discussion, the value of wind should be discovered. The students should become aware of wind as a power source. They should be aware that wind can do work and can create energy for farmers, homeowners, industry, and others.

CONCEPT DEVELOPMENT - Either individually, or as a small group of 3-5 students, or as a large group, the class should draw the wind machine or device they are inventing. The student should be aware of what the invention does; for example, the invention should pump water (windmill), add beauty (windsock), or make sound (wind chimes), etc.

APPLICATION - The students construct their wind inventions and use them outdoors to see how they work in the wind, or they may use the suggested wind designs. (See Activities 9A-9F.)

EVALUATION - Each student will demonstrate her/his wind invention. Credit for construction should be given based upon whether or not it works in the wind or if the plan is logical.

FOLLOW-UP/SUPPORT/SOURCES

National Geographic, Dec. 1975
Various patterns of wind designs on following pages for students to construct. (Activities (A - 9F)

Energy Booklet - Students write a short paragraph explaining their wind device. This is edited by teacher and rewritten for neatness by the student. This second page is collected by teacher for final Unit IX review.

SOURCE OF ACTIVITY

Linda Scheuermann

TITLE: AIRPLANE

NAME:_____

DIRECTIONS:

1. FOLD A STURDY PIECE OF PAPER, 9 X 12 INCHES, THE LONG WAY.
2. CUT OUT THE AIRPLANE AS IN FIGURE 1.
3. SLIT ON LINES X AND Y.
4. CUT A PAPER WING AND TAIL AS IN FIG. 2.
5. INSERT IN SLITS X AND Y.

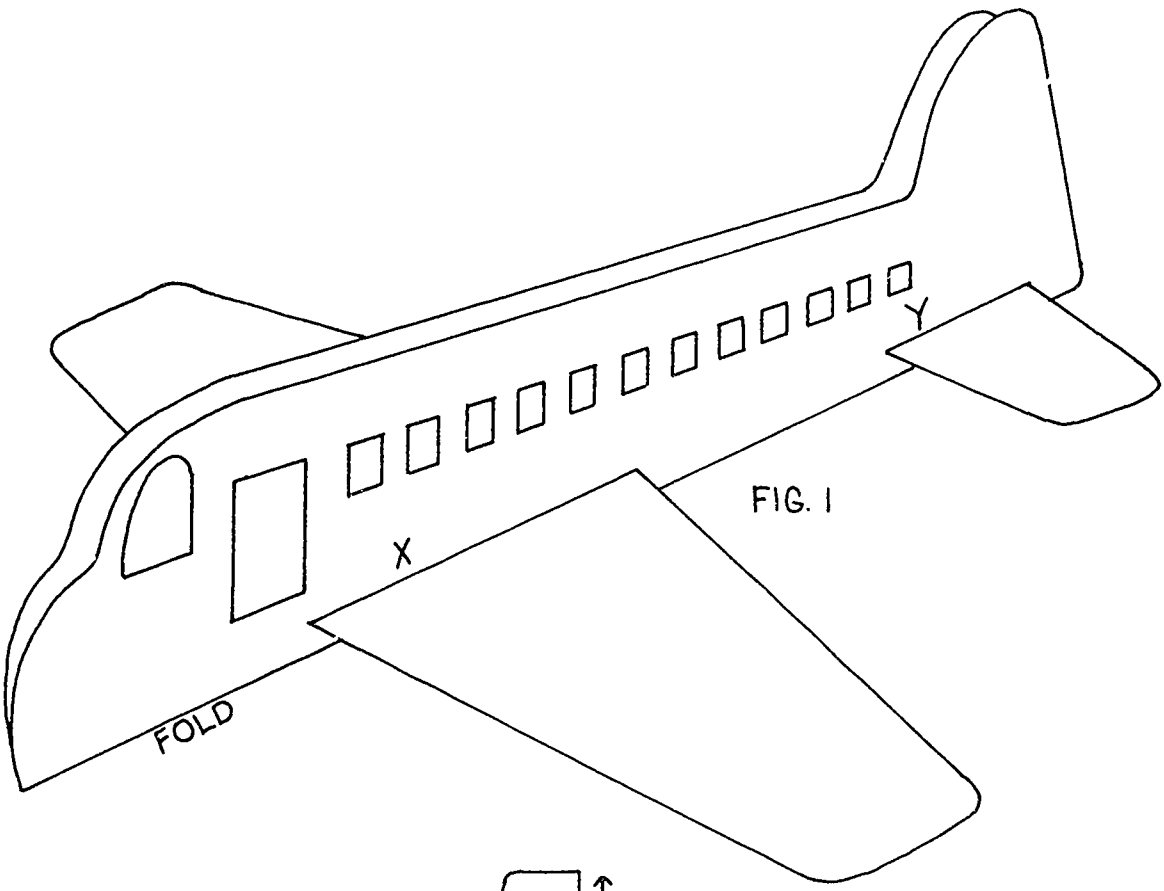


FIG. 1

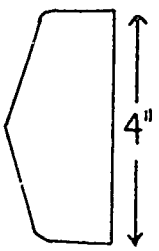
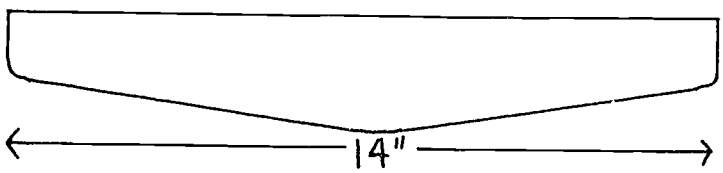


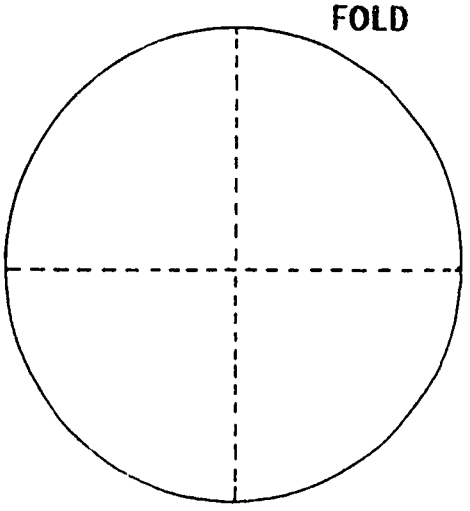
FIG. 2



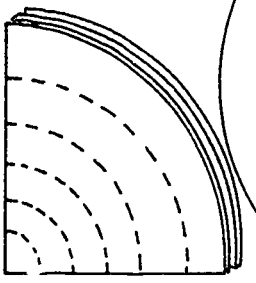
TITLE: WIND SPIRALS

NAME:_____

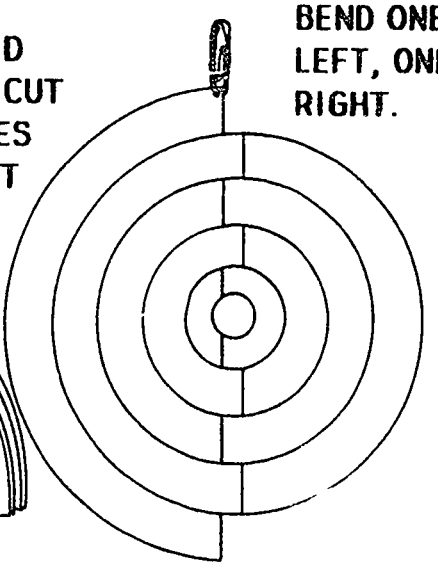
FOLD

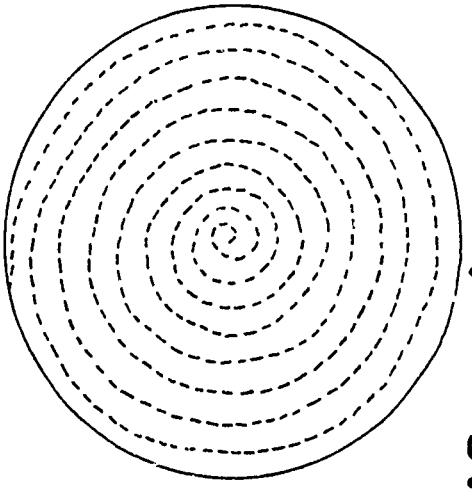


DOUBLE-FOLD SIDE DOWN. CUT DOTTED LINES AND STOP AT MARGIN.

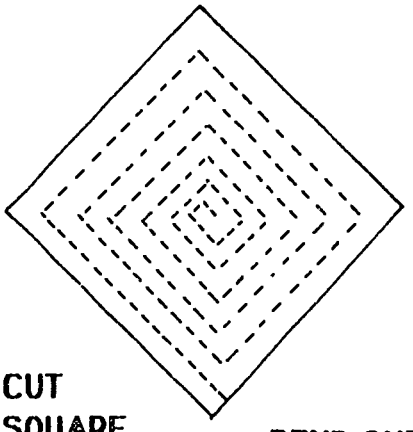


BEND ONE MOON LEFT, ONE MOON RIGHT.



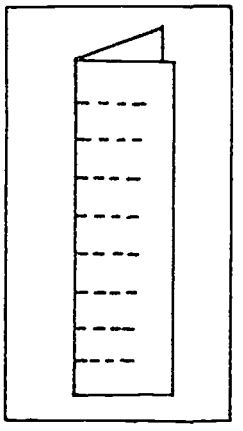


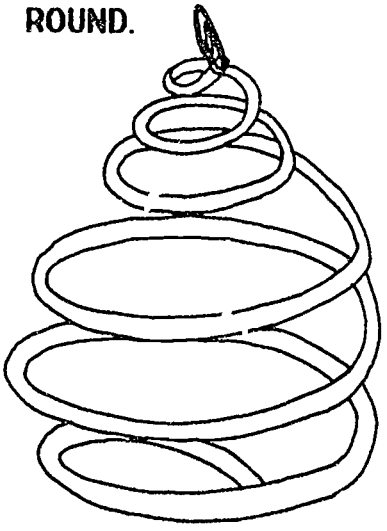
CUT ROUND.

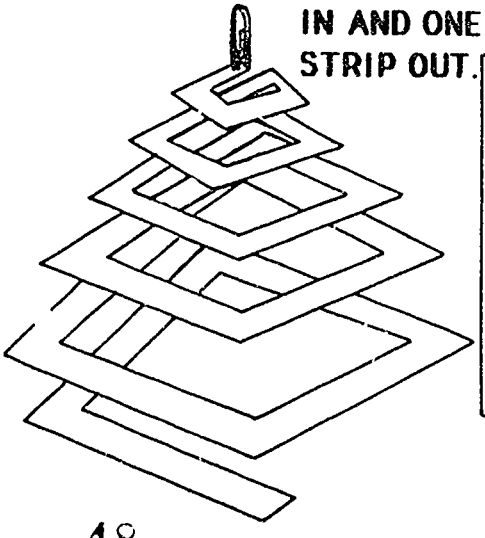


CUT SQUARE.

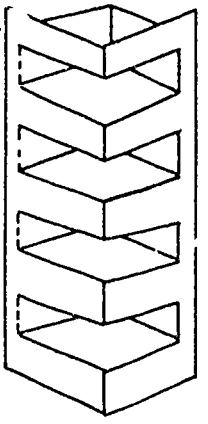
FOLD RECTANGLE. CUT TO MARGIN.







BEND ONE STRIP IN AND ONE STRIP OUT.



TITLE: PARACHUTE

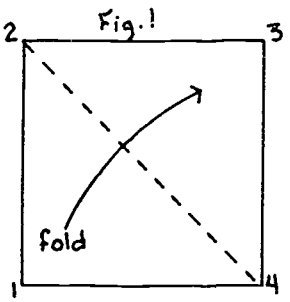
NAME:_____

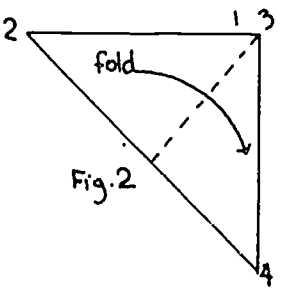
MATERIALS AND TOOLS:

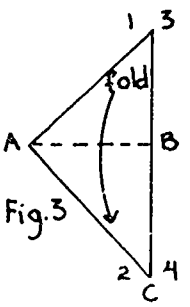
AN 8 INCH SQUARE OF LIGHTWEIGHT CLOTH, A SMALL WEIGHT SUCH AS A NAIL OR WASHER, 8 PIECES OF STRING ABOUT 9 INCHES LONG.

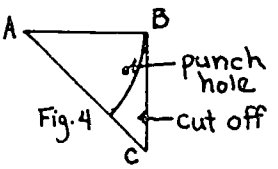
DIRECTIONS:

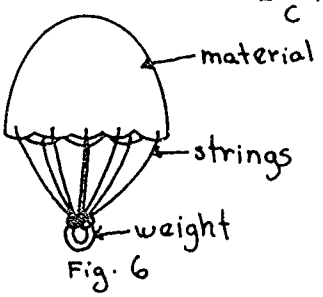
1. NUMBER THE 4 CORNERS OF THE CLOTH (FIG. 1). FOLD THE CLOTH 3 TIMES BY BRINGING CORNER 1 OVER TO 3, CORNER 2 TO 4, THEN FOLD THE DOUBLE CORNERS TOGETHER BY BRINGING 1 AND 3 DOWN TO THE 2 AND 4 CORNERS. (SEE FIGS. 1, 2, 3 AND 4)
2. MEASURE THE DISTANCE FROM A TO B AND ALONG SIDE AC MARK OFF THIS SAME DISTANCE AND DESIGNATE THIS AS POINT D. DRAW A ROUNDING LINE FROM POINT D TO B AND CUT ALONG THIS LINE TO ROUND OFF THE EDGES OF THE PARACHUTE.
3. PUNCH A HOLE HALF WAY BETWEEN THE POINTS D AND B AND 1/2 INCH FROM THE ROUNDED EDGE OF THE CLOTH. (FIG. 4)











4. UNFOLD THE CLOTH AND TIE THE STRINGS IN EACH OF THE HOLES. TIE THE OTHER ENDS OF THE STRINGS TO THE WEIGHT. (FIGURES 5 AND 6)
5. TO OPERATE THE PARACHUTE WITHOUT TWISTING THE STRINGS, PLACE THE WEIGHT AT POINT W (FIG. 6). FOLD THE PARACHUTE NEATLY AROUND THE WEIGHT AND THROW IT IN THE AIR. IF IT IS FOLDED CORRECTLY, IT WILL OPEN, FILL WITH AIR, AND SLOWLY FLOAT TO THE GROUND.

TITLE: SEE THE WIND BLOW

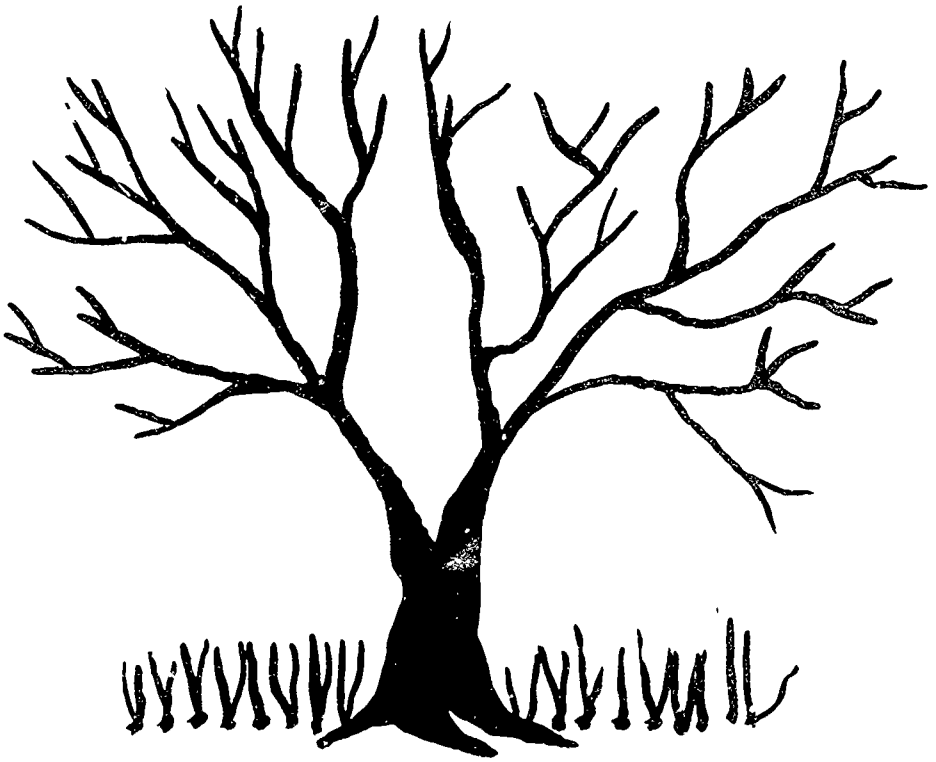
NAME:_____

Materials:

1. Any type of straws-paper, cellophane, etc.
2. Finger-paint paper, cut in half.
3. Watercolors or thin tempera paints.
4. Brushes

Directions:

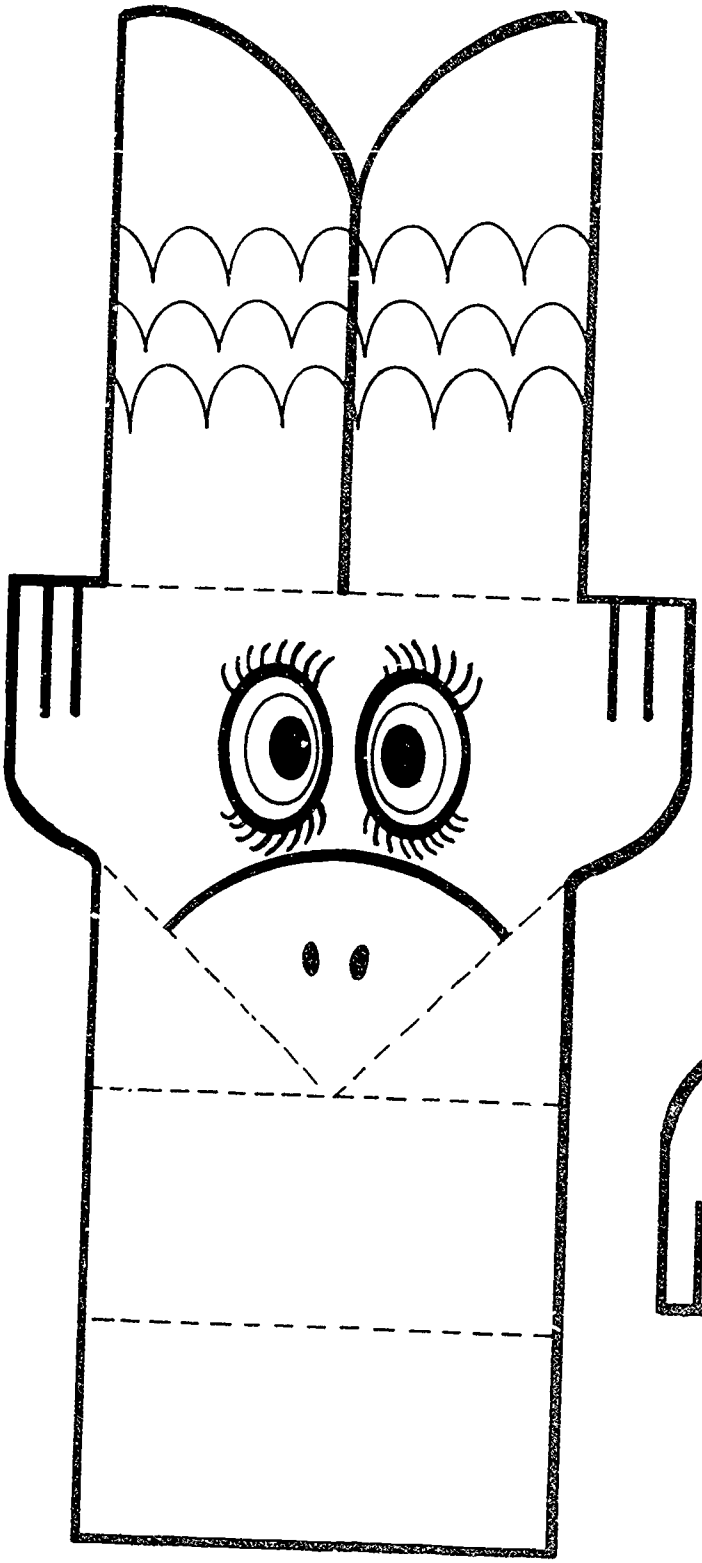
1. *Trees*-Paint tree trunk with brush. Extend two large blobs of paint from main trunk for large branches. Place straw behind paint and blow to extend branch. Touch painty brush to branches and blow out to make small branches. Finish tree by stamping leaves with paint-filled brush or sponge.
2. *Flowers*-Place large blob of bright-colored paint on paper. Blow through straw, moving straw back and forth to splatter paint into flower shape. Paint stems and leaves.

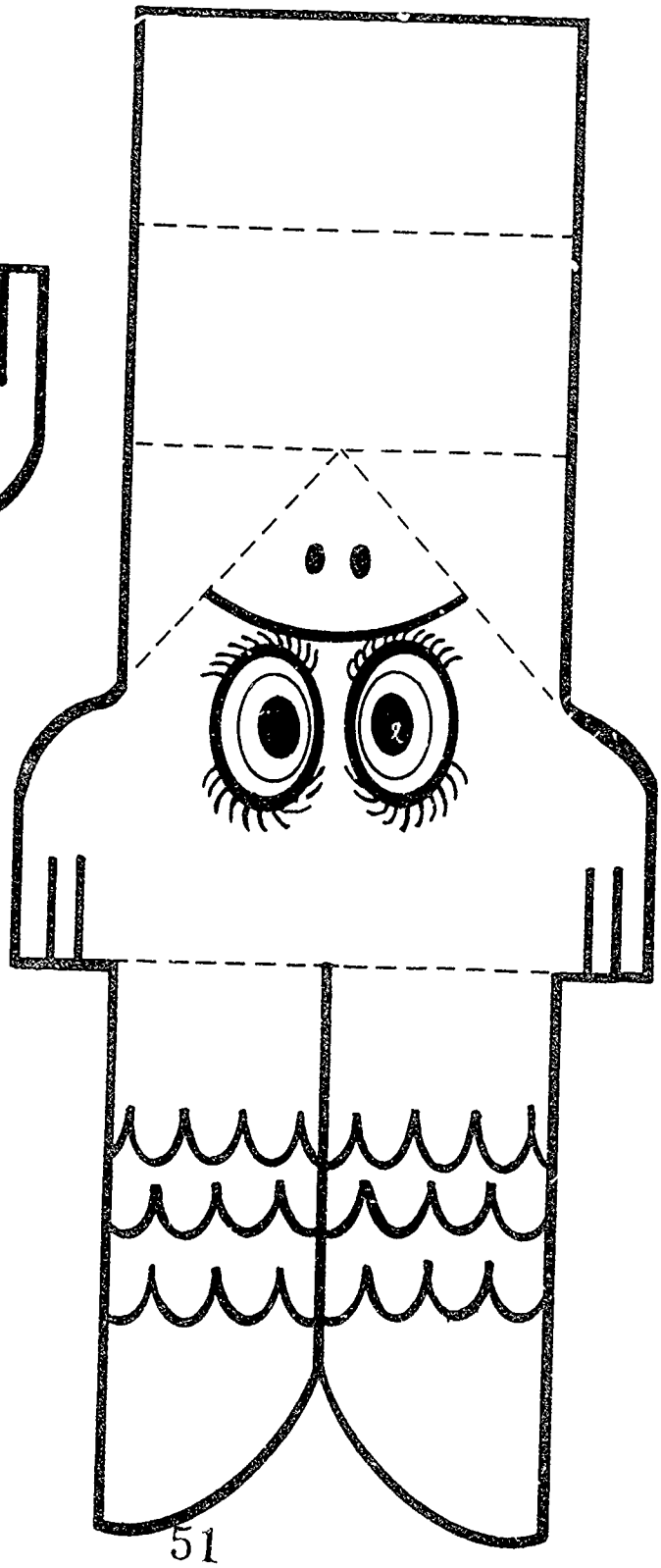


PRIMARY-UNIT III-ACTIVITY 9F

TITLE: TWIRLY-BIRDS

Hold it high and drop.
Watch it spin and twirl.





1. Color and cut out on heavy black lines.
2. Fold beak under on dotted lines.
3. Fold beak back.
4. Fold one wing forward and one wing back.
5. Add paper clip to beak for best results.

TITLE Water Is My Friend

SUBJECT Science, Language Arts, Art LEVEL K

ACTIVITY IN BRIEF

Using 2 jars filled with fresh water, the teacher will have some students add contaminants to one of the jars. Put lids on and let stand for two or three days. Allow students to observe changes in the water and to see, smell, touch, and compare differences between both jars.

OBJECTIVE

Each student will be able to explain the differences between fresh water and polluted water and state their opinions about what they feel is best for their environment.

MATERIALS

2 mayonnaise jars with lids
water
water contaminants such as
oil, soil, wrappers, bits of food and others
drawing paper, crayons, or markers

TIME

two - 15 minute sessions

LEARNING CYCLE

AWARENESS - The teacher begins by asking the students questions about water. What various forms can water take? (rain, ponds, lakes, rivers, oceans) What are the uses of water? (drinking, washing, cooking, swimming, bathing, etc.)

CONCEPT DEVELOPMENT - The teacher sets 2 jars filled with clean water on a table in front of the students. The teacher has students add pollutants to only one jar as others watch. Allow the students to orally compare both jars and to guess what the water might be like in 2-3 days. After 2-3 days, allow students to remove lids and see, smell, and examine the jars of water. They verbalize their findings, and the teacher equates it to the environment.

APPLICATION - The students will draw 2 pictures of a pond, river, or lake on a piece of paper. In one body of water they will draw pollutants suggested by the teacher, such as old tires, tin cans, bottles, etc. The other body of water shows only fish and a few plants. Students take turns showing their drawings and explaining the differences and stating their environmental preferences.

EVALUATION - This is accomplished as the last described part of the Application Session.

FOLLOW-UP/SUPPORT/SOURCES

Show "Water Pollution -- A First Film" BFA, 1971

Energy Booklet - The teacher collects these drawings for the final Unit IX review.

SOURCE OF ACTIVITY

Adapted from Energy and Man's Environment by Linda Scheuermann

TITLE Watered Down Math

SUBJECT Mathematics, Language Arts LEVEL Grade 1

ACTIVITY IN BRIEF

Using a student handout, the students will use their math knowledge to decipher messages: "I can save water." "Take showers instead of baths." "Turn off the faucets tightly."

OBJECTIVE

Each student will compute that conserving water is something she/he can do.

MATERIALS

student hand-out (11A)
pencils, paper
old magazines
scissors, glue, construction paper

TIME

two 30 min. sessions

LEARNING CYCLE

AWARENESS - This activity can serve as an introduction to water conservation. Have the students complete hand-out 11A.

CONCEPT DEVELOPMENT - The teacher lists other water-saving hints that students brainstorm, such as: don't run water while shampooing or brushing teeth, don't water grass during dry times, wash dishes by hand, keep water in refrigerator to stay cold during summer for drinking, etc.

APPLICATION - Using the hints brainstormed by the students, or by inventing new ones, groups of two or three students will invent math worksheets (shorter perhaps) and trade with friends to solve problems and discover the secret messages. Rebus pictures or drawings could also be devised by creative students.

EVALUATION - Each student would need to invent a worksheet or the teacher should be prepared to assign a math worksheet based upon the same format.

FOLLOW-UP/SUPPORT/SOURCES

Energy Booklet - In old magazines students find pictures of all forms of water: ponds, lakes, rivers, oceans, washing, drinking, etc. These are cut out and glued to a piece of construction paper. The teacher collects and saves for final Unit IX review.

SOURCE OF ACTIVITY

Adapted from Energy and Man's Environment by Linda Scheuermann

NAME_____

Watered Down Math

1 = of	6 = baths.	11 = Take
2 = in	7 = water.	12 = off
3 = save	8 = Turn	13 = faucets
4 = place	9 = can	14 = the
5 = I	10 = showers	15 = tightly

3	6	8	9	6
+2	+3	−5	−2	+5
____	____	____	____	____
2	7	6	1	2
+6	−5	−2	−0	+4
____	____	____	____	____
2	6	7	8	9
+6	+6	+7	+5	+6
____	____	____	____	____

TITLE Hydro to Home

SUBJECT Science, Language Arts, P.E., Reading LEVEL Grade 2

ACTIVITY IN BRIEF

This activity is two-fold. First the students could visit a local stream or pond and hike around the area with the teacher to use all 5 senses to locate signs of pollution. This would demonstrate a misuse of water. Next, a mental trip to a hydroelectric power dam would probably have to be made at the library by locating books on this subject. This represents a good use of water.

OBJECTIVE

Each student will be able to state his/her own beliefs about good uses of water and the misuses of water.

MATERIALS

tape recorder/tape
student hand-out - T shirts(12A)
long piece of white paper for diorama

TIME

two sessions, 1 hr. each

LEARNING CYCLE

AWARENESS - If possible, visit a local stream or pond so students can view first-hand possible signs of pollution using all 5 senses. If this trip isn't possible, have students brainstorm what a polluted stream might look like. Hang a long piece of white paper across chalkboard and have students draw a diorama of a river flowing along. Next they draw in many contaminants either seen or brainstormed.

CONCEPT DEVELOPMENT - In small groups students will prepare a short commercial to be tape recorded. This commercial should state a cause of pollution and how to solve it. This tape can be shared with the entire group when finished.

APPLICATION - Using books and discussion and diagrams on chalkboard, students decide that water power is a good use of water as an energy source. Each student will draw their own stream, keeping it pollution-free, and draw a hydroelectric dam for emphasis demonstrating a good use of water.

EVALUATION - After the Application Session, each student will state his/her belief about good use and misuse of water.

FOLLOW-UP/SUPPORT/SOURCES

1. Outlook K-2 "Who Stole the Kool-Aid?"

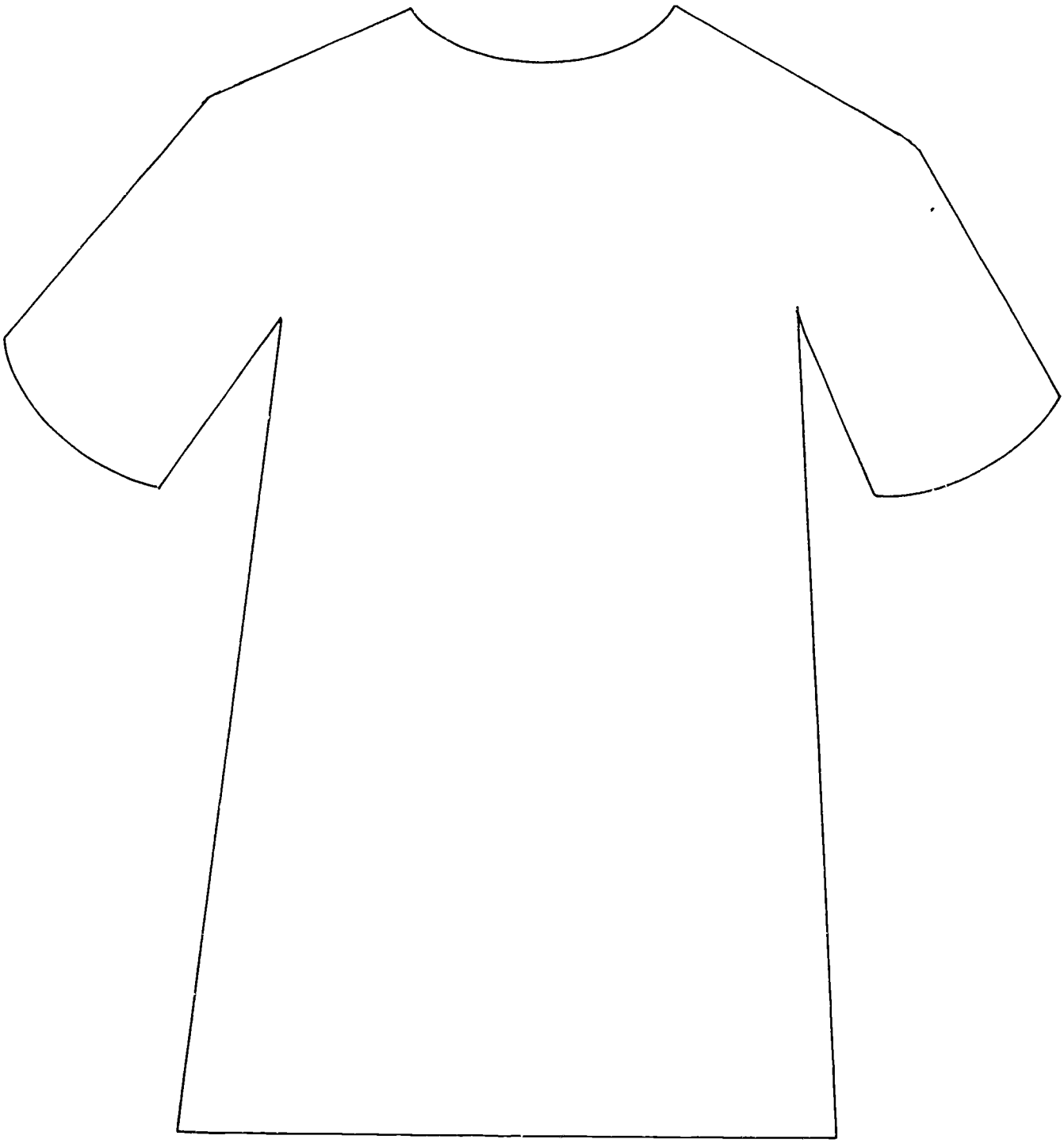
Energy Booklet - Students design slogans for T-shirts (12A). Could use quips from their taped commercials. Teacher collects these, and they are saved for the final Unit IX review.

SOURCE OF ACTIVITY

Linda Hutchinson

TITLE: SHORT SHIRT SLOGANS

NAME_____



TITLE Wood Is My Friend

SUBJECT Science, Language Arts LEVEL K

ACTIVITY IN BRIEF

The class as a whole will adopt a tree on the school grounds or nearby. It is a continuing activity because you can return to this tree many times to enjoy its beauty and to note its changes. As an extension, have the students also adopt a tree in their own yard and/or visit a woods, a nursery, or enjoy a visit by a state forester.

OBJECTIVE

Each student will be able to:
- state the basic characteristics of a tree.
- describe trees as a source of energy.

MATERIALS:

large chart and paper or chalkboard
drawing paper 11 x 14
crayons
nearby tree to visit

TIME:

Approximately 20 minutes for each visit
20-30 minutes to brainstorm ideas for chart or chalkboard
15-30 minutes to draw first picture
15-30 minutes to draw second picture

LEARNING CYCLE

AWARENESS - The teacher seats the class around the tree in a circle and asks the students to describe the tree as they see it. If they forget a characteristic such as size, shape, color, leaves, sound, etc., ask appropriate leading questions. Ask questions about the purposes of the tree: home for animals, source of food, firewood for homes, pulp for paper, energy machine that cleans air, stops soil and wind, provides shade and oxygen. Ask how it got there, how long it will stay, who takes care of it and how, and what it might look like in the upcoming seasons. To develop the concept that trees are a source of energy, tell the students that tomorrow they will make an energy story about trees.

CONCEPT DEVELOPMENT - The next day, gather the students around the chalkboard or chart and have them brainstorm what they think a tree is. Guide them in the direction of energy. Record their observations accurately to make a tree story, being sure to write in simple words most students could read. Post their story on a bulletin board, and tell the students they will draw pictures to be posted around their story.

APPLICATION - Give students drawing paper divided equally in half with a black line. On one side they draw their playground, yard, or park with its particular features and with trees. On the next day, they draw the same picture without trees on the second half of the paper. Put these drawings around their story on the bulletin board and discuss the differences

EVALUATION - Each student states the basic characteristics of a tree.
- Each student describes how a tree can be a source of energy.

FOLLOW-UP/SUPPORT/SOURCES

1. On nice days, have students enjoy their milk and cookies under their adopted tree. Talk about its beauty, shade, sounds.

2. Start trees in pots at school for students to water and take home when large enough. Extension services can help with this.

Energy Booklet - On a separate day, students draw their adopted tree from their yard or school ground. Teacher collects these for the final Unit IX review.

SOURCE OF ACTIVITY

Adapted from Project Learning Tree by Linda Scheuermann

TITLE To Be Or Not To Be - A Tree

SUBJECT Language Arts, Reading, Writing LEVEL Grades 1-2

ACTIVITY IN BRIEF

These activities are mostly pencil and paper designed to stress the different values and resources of trees. After completing the rhyming page together as a large group or small group activity, the students can write a short tree story using the values on the rhyming page. A follow-up guessing game would enhance learning.

OBJECTIVE

Each student will be able to state data gathered about trees in a story form and in game form.

MATERIALS

handout 14A
handout 14B
name cards 14C
chalkboard
crayons

TIME

10-15 minutes discussion
15-20 minutes handout 14A
20-30 minutes handout 14B
Game time is optional
depending on attention span.

LEARNING CYCLE

AWARENESS - The teacher opens a discussion by handing out worksheet 14A. Go over the ten words aloud together. Ask what the words could be referring to. Depending on your students' reading abilities, either do this activity all together, in separate small groups, or individually. Gather and keep for the next day.

CONCEPT DEVELOPMENT - On the next day, give back handout 14A and also distribute 14B. If the students are unfamiliar with writing stories, a sample story could be written on the chalkboard using the students' responses to questions based on 14A. The students would then copy this class story onto their copy of 14B. The tree could be colored, and the papers could be posted on a handwriting or science bulletin board.

APPLICATION - On the third day, introduce a game called "Guess What?". Using the cards in Activity 14C, tape one on the back of a volunteer student. The student turns backwards so the others can see the answer. The student faces the group and asks yes or no questions to discover what is on the card. The class responds yes or no as a whole. After the student asks four or five questions, the volunteer guesses the answer, then selects another student to take a turn. The new student gets a new card, and the process continues until all the cards are used or until interest declines.

EVALUATION - The completed stories will serve as one tool of evaluation. Also, the teacher will closely observe which students are not participating as actively as the others and have these students receive a turn at "being a volunteer."

FOLLOW-UP/SUPPORT/SOURCES

As a follow-up, read The Lorax by Dr. Seuss or show film of this story on trees.

Energy Booklet - Teacher gathers stories (14B) to add to booklet for final Unit IX review.

SOURCE OF ACTIVITY

Linda Scheuermann

NAME: _____

1. oxygen	4. nuts	7. home	10. paper
2. windbreak	5. fruits	8. shade	
3. soil	6. beautiful	9. clean the air	

1. You have found a friend,
   I give you_____.

2. I grow well around a lake,
   And I can be a_____.

3. I'm a helper that is very loyal,
   I work so hard to save the _____.

4. I'm a friend to squirrels and such,
   I like to give them lots of_____.

5. Apples, oranges, cherries, too,
   These are_____ to name a few.

6. People look at me and say,
   That I look very_____today.

7. Do you know I'm not alone?
   I give insects and animals all a_____.

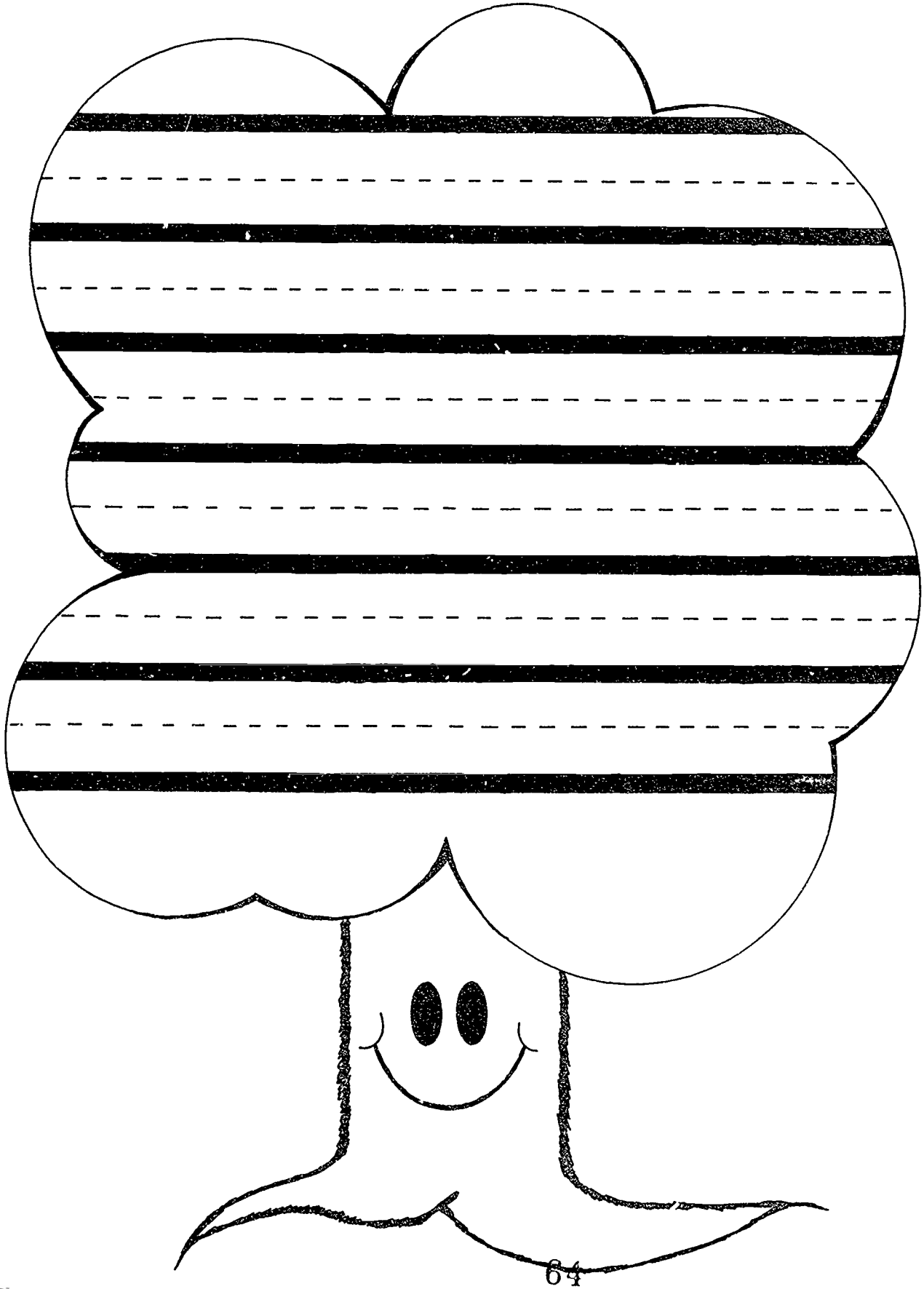
8. I know of something you wouldn't trade,
   On hot summer days, I give you _____.

9. When dirt blows, it is not too fair,
   My leaves reach out and_____.

10. I do everyone a favor,
    By giving each a lot of _____.

TITLE: MY TREE STORY

NAME_____



oxygen	beauty
wind break	home for animals
soil saver	shade
nuts	cleans the air
fruits	paper

TITLE Wood You Save Me?

SUBJECT Language Arts, Art, Math

LEVEL Grade 2

ACTIVITY IN BRIEF

After reviewing and listing the value of trees during a discussion, the students will search through a supply of newspapers for pictures relating to this list. These pictures are glued on recycled paper and made into a class booklet. The newspapers are t en recycled into other uses. A paper-saving project will involve the class and/or school.

OBJECTIVE

Each student will be able to:
—identify wood as an important source of energy.
—name ways that wood can be recycled, reused, and conserved.

MATERIALS

trash bags
newspapers - at least 2 to 3 per student
glue and scissors and black marker
construction paper or recycled paper

TIME

10-20 min. to make list
40-60 min. to locate pictures and to do gluing
30 min. to label and alphabetize
45-60 min. for discussion on paper reuse and doing what class decides

LEARNING CYCLE

AWARENESS - The teacher and students brainstorm a list of the value of trees, for example: soil conservation, oxygen, fruit and nuts, paper products, shade, beauty, homes for animals and insects, wind breaks, etc. Using this list, students will search through newspapers. (These could be brought by several students over a period of weeks prior to this lesson or contact your local newspaper for help and suggestions.) The students will cut out pictures relating to tree value and glue each one to recycled paper or a piece of construction paper. Each student could do only one or as many as are found depending on variety. After at least one per student has been completed, the students clean up the classroom carefully by refolding what newspapers can be kept.

CONCEPT DEVELOPMENT - The next day the sheets are handed out for labeling by the students. Appropriate words could be listed on the chalkboard such as: food, home, energy source, conservation, or reuse the tree value list of words. After labeling, the students come forth alphabetically one at a time to put their booklet in order.

APPLICATION - Next day, challenge the students to decide what to do with the left-over newspapers. Help them to realize that trees are the very source of their class booklet and newspapers, too. Suggest taking the leftover newspapers to a recycling center, rolling them into logs for use at home to start fires in the fireplace, saving the "funnies" for wrapping paper, or use them as an art project by tearing into animal shapes, gluing on paper, and writing a story about their unusual animal.

EVALUATION - Ask each student to state how wood is an important source of energy and to name various ways that wood can be recycled, reused, and conserved.

FOLLOW-UP/SUPPORT/SOURCES

1. Encourage students to use paper wisely by using both sides.
2. In trash bags, save only paper items used for one week. Using math and graphing, help them to understand how this increases after several weeks of school times, the number of grades, times the number of schools, etc.

Energy Booklet - Teacher collects the unusual newspaper animal pictures, or the page the student made for the class booklet for the final Unit IX review.

SOURCE OF ACTIVITY

Naomi Smith

TITLE: Electricity Is My Friend

SUBJECT Language Arts, Reading, Art LEVEL K or Grade 1

ACTIVITY IN BRIEF

The students will become aware of our dependence on electricity, especially for appliances. They will have the opportunity to decide which appliances are essential for daily life and which are luxuries. These will be called "needs" and "wants".

OBJECTIVE

Each student will be able to:
- -- name some appliances we use daily.
- -- determine that appliances use energy.
- -- review letter/sound associations.
- -- categorize appliances into "needs" and "wants".

MATERIALS

1 large sheet of paper for a group list
ditto master of group list
old magazines
glue, scissors
2 sheets construction paper per student

TIME

10-15 min. to make chart
20 min. for circling list and discussion
30-45 min. to complete needs and "wants" pages

LEARNING CYCLE

AWARENESS - Be sure to establish with the group what an appliance is and that it uses electric energy. Also, be sure to establish what electricity is and how it powers things. Write the letters A-Z on the large sheet of paper and let the students brainstorm appliances whose names begin with each letter of the alphabet. The teacher makes a ditto of this list and gives the list to each student.

CONCEPT DEVELOPMENT - Using the ditto, each student will circle those items (as it is read by teacher) which they believe are necessary to them and their world. A discussion should result based upon how many appliances get circled that perhaps should not get circled.

APPLICATION - Students will cut out pictures of appliances and glue onto a sheet marked "needs" or onto one marked "wants", according to their individual decisions.

EVALUATION - Ask each student to name an appliance used every day, what energy makes it run, what letter it begins with, and tell if it is an important appliance or if he/she could live without it.

FOLLOW-UP/SUPPORT/SOURCES

1. Make an appliance picture dictionary with magazine pictures and glue them to a page with corresponding sound.

2. Reclassify appliances using "Big/Little" or other kinds of classifying.

Energy Booklet - The "needs" and "wants" pages are gathered by the teacher for the final Unit IX review.

SOURCE OF ACTIVITY

Sue Stellmaker, Janet E. Greiner

TITLE A Zap To Tap

SUBJECT Safety, Language Arts LEVEL Grade 1-2

ACTIVITY IN BRIEF

This activity shows how electricity, though it can be dangerous, is a very useful and necessary form of energy in our lives.

OBJECTIVE

Each student will be able to:
- --state how electricity moves from place to place.
- --identify that electricity is the energy source for many things in their homes and at school.
- --explain that electricity can be dangerous.

MATERIALS

catalogs
circulars with ads for appliances
magazines
glue, scissors
Electric House handout (17A)
drawing paper
Electric Helpers handout (17B)

TIME

30 min. for film and/or discussion
30 min. for Electric House
ongoing time for Electric Helpers activity

LEARNING CYCLE

AWARENESS - The students will page through catalogs, circulars, and magazines to locate items in the home and school that use electricity. The students will watch the film "Electricity, A to Zap"* or a film on electrical safety. If no film is available, a thorough discussion of electrical safety procedures would accomplish the same goal. Be sure to ask: How does electricity move from place to place? Why is it dangerous? How can we be safe around electricity?

CONCEPT DEVELOPMENT - Now the students can go through the same catalogs, etc. and cut and paste their choices on their Electric House handout (17A). They must decide the most important pictures for their own house. They share their houses with the class.

APPLICATION - Next the students each draw something in their classroom that uses electricity. A sample list could be written by the teacher on the chalkboard as children make suggestions; for example, tape recorder, record player, computer, clock, VCR, projectors, lights, TV. These drawings are put on a large wall space and around these are placed Electric Houses (17A). This wall could be entitled "Electricity Works For Us In School and At Home".

EVALUATION - Ask each student to explain how electricity moves, what things at home and school are powered by electricity, and what safety precautions should be used around electricity.

FOLLOW-UP/SUPPORT/SOURCES

1. *"Electricity, A to Zap" - film through Iowa Southern Utilities, Centerville, Iowa.
2. Students could brainstorm ways to save electricity. This list could be put on paper and posted on wall, also.
3. Check with your local electrical company for film list or speakers available for your classroom.

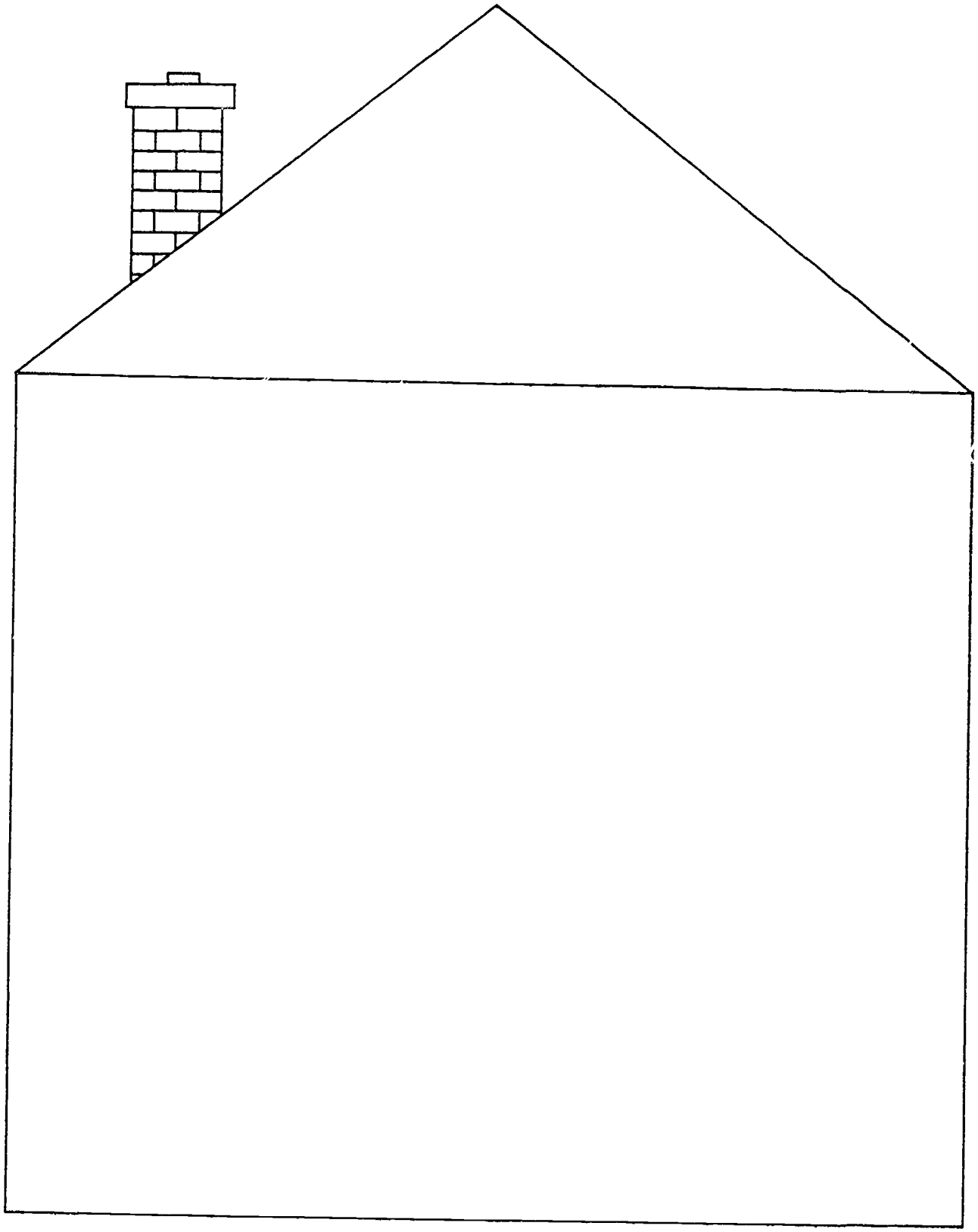
Energy Booklet - Using Electric Helpers (17B) handout, students do as many as they have interest for. This could include helpers such as mowers, saws, curling irons, stoves, etc. The teacher collects these for the final Unit IX review.

SOURCE OF ACTIVITY

Camille Jackson

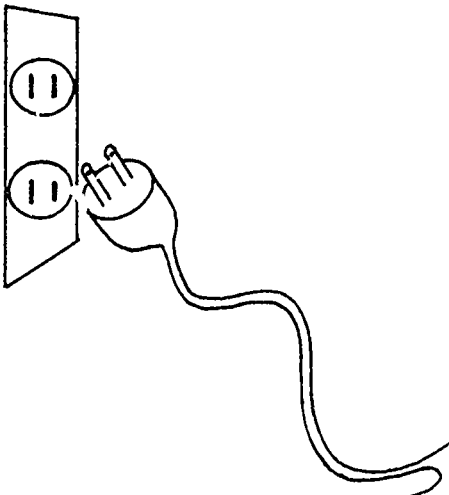
TITLE: ELECTRIC HOUSE

NAME_____



TITLE: ELECTRIC HELPERS

NAME: _____



(paste electrical appliance cutout here)

We use the - - - - - - - - - - - - - - - - - -

for -

TITLE Electrical Conservation

SUBJECT Mathematics, Art, Language Arts LEVEL Grade 2

ACTIVITY IN BRIEF

By using the parent/student survey, the children will become aware of daily electrical usage. These results will be the basis of individual or large group graphs. Energy-saving badges will be designed and shared.

OBJECTIVE

Each student will be able to:
--analyze their part in energy conservation at home.
--plot a graph using survey information.
--devise methods to conserve energy.

MATERIALS

Electric Usage Survey - one per student (18A)
graph paper - small or medium sized squares
heavy paper or oak tag for light bulbs (18B)
crayons, markers, scissors, drawing paper

TIME

Survey time will vary
30-45 min. for making graphs

LEARNING CYCLE

AWARENESS - The teacher gives each student the Electric Usage Survey handout. (18A) The children and teacher read through the list and clear up any questions. The students take home their surveys and return them the next day to avoid losing.

CONCEPT DEVELOPMENT - Use the survey the next day and list the results on the chalkboard or large sheet of paper. The teacher hands out graph paper to start the children doing simple bar graphs either using their own results or the large group results. These graphs are put up in the classroom. Through seeing these graphs and using discussion, children should see areas of excessive usage. Challenge them to help conserve.

APPLICATION - Supply the students with a pre-designed badge (light bulb 18B) or they may design their own. Extras can be made to share with others in the same grade or everyone in school depending on size.

EVALUATION - The teacher will ask each student to tell about his/her energy conservation activities at home. The completed graphs and badges can also be used for evaluation.

FOLLOW UP/SUPPORT/SOURCES

1. Children either individually or in small groups formulate 5 to 10 Energy Saving Commandments.
2. Students write letters to friends telling them why they should save energy.
3. Develop a class slogan or logo for saving energy.

Energy Booklet - Teacher could save students' graphs or commandments for final Unit IX review.

SOURCE OF ACTIVITY

Rada Hutchison, June Calhoun, Nancy Nettleton

NAME_____

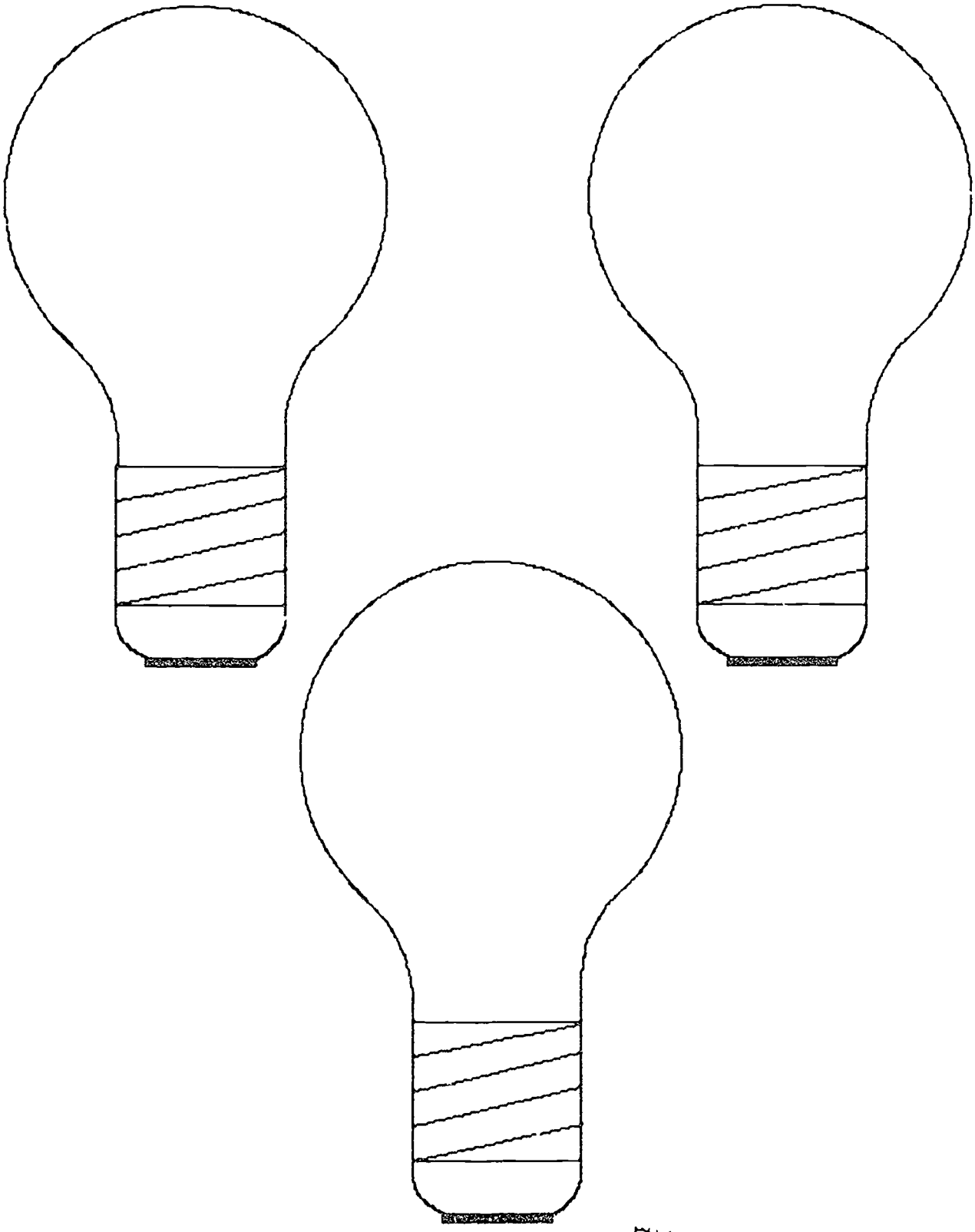
Electric Usage Survey

Count the number of items you have in your home. Write the number by each item.

1. lamps _____
2. overhead lights _____
3. number of light bulbs _____
4. TV _____
5. stereo _____
6. mixer _____
7. radio _____
8. toys run by electricity _____
9. electric tools _____
10. freezer _____
11. refrigerator _____
12. space heater _____
13. kitchen appliances _____
14. hair care items _____
15. vacuum _____
16. other items which use electricity (all you have)

1. _____	4. _____
2. _____	5. _____
3. _____	6. _____

Energy-Saving Badges



TITLE Coal, Oil, and Natural Gas Are My Friends

SUBJECT Math, Social Studies LEVEL K

ACTIVITY IN BRIEF

The teacher takes a hand count survey on the students' usual use of energy in going to school. On a hand-out, the students color in bar graph amounts with teacher help. The teacher does a graph on chalkboard first with students' results. Students will simulate using and conserving gasoline.

OBJECTIVE

Each student will be able to plot a graph to see how energy is used in getting to school.

MATERIALS

handout 19A
crayons or markers
small toy-sized cars
cardboard box to look like gas pump with rope on side as gas hose. (or use large sized watering can)
fake paper money - $1.00 amount

TIME

30 min. to discuss ways of getting to school and coloring graph 19A
15 min. per day to simulate driving cars and buying gasoline

LEARNING CYCLE

AWARENESS - Students probably are unfamiliar with surveying and graphing, so first explore these processes. Do some chalkboard examples using birthdays, number of brothers and sisters, etc. Discuss how graphs help us see what occurs most and least often. Then lead the discussion to energy uses and ways of getting to school. Discuss which ways of transportation use more or less energy and why. Discuss our lifestyles and how we could change them to save energy. Draw a likeness of handout graph (19A) on chalkboard and fill in according to how many students came to school by car, bus, walk, or bike.

CONCEPT DEVELOPMENT - Pass out handouts (19A) and let the students color their graphs to look like the teacher's graph on chalkboard. This could be done orally together if the teacher thinks it would simplify the coloring process.

APPLICATION - Each day the teacher gives each student 5 fake $1 bills. The first day it costs $5 to "drive" their cars for fifteen minutes. The second day it costs $5 for ten minutes and so on because gas becomes scarce. When the money has been spent, discuss with the class what has happened. Apply the discussion to real life and help the students realize they can help their family save gasoline so there will be some left when they grow up.

EVALUATION - The teacher will ask each student to explain how she/he gets to school and what kind of energy is used for this. The teacher can use the finished graphs for evaluation and observance of the simulated gasoline buying. Ask each student how she/he could save gasoline.

FOLLOW-UP/SUPPORT/SOURCES

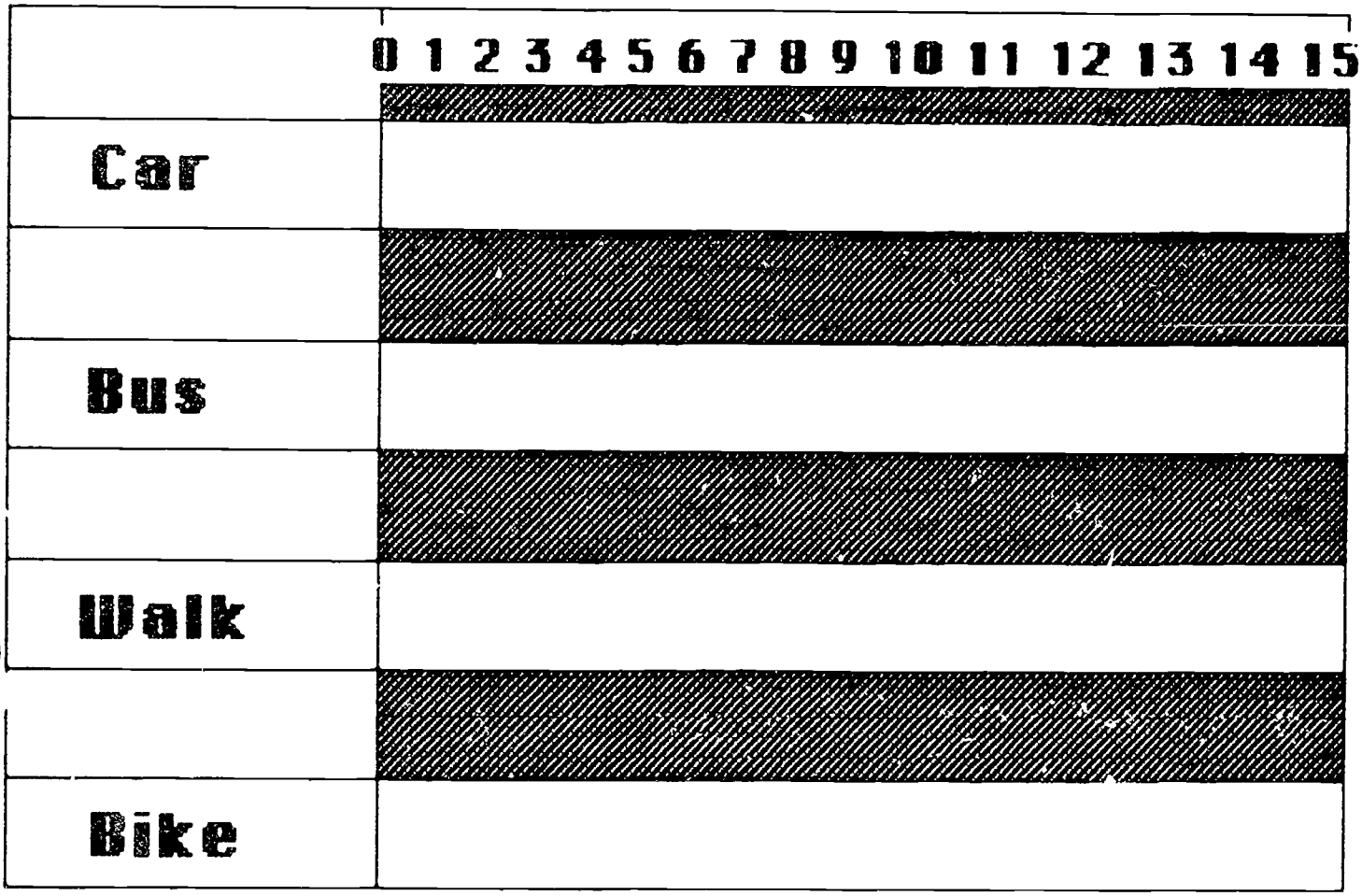
Energy Booklet - The students' graphs are collected by the teacher for the final Unit IX review.

SOURCE OF ACTIVITY

Madonna Carber

NAME_____

This is the Way We Go To School



Draw the way you go to school.

TITLE Friday's Furnace Filter

SUBJECT Science LEVEL Grade 1

ACTIVITY IN BRIEF

The students will be given brief instruction about how energy and what kind of energy makes their home and school furnaces work. The students will become "our girl/man Fridays" by reminding their parent(s) to check their furnace filters.

OBJECTIVE

Each student will be able to explain energy conservation of home heating.

MATERIALS

visual handout per student (20A)
handout per student for coloring (20B)
crayons or markers
2 furnace filters - one clean, one dirty
(or drawings of same)
calendar, drawing paper

TIME

20-30 minutes
ongoing reminders

LEARNING CYCLE

AWARENESS - The teacher distributes handout 20A to generate questions and discussion. Energy sources such as oil, and natural gas should be discussed as heat sources for furnaces as well as coal. Also, this same handout applies to electrical usage for heating.

CONCEPT DEVELOPMENT - The teacher shows 2 furnace filters to be used for comparison by the students. Discuss how the dirty filter slows down the energy efficiency of furnaces. Challenge the students to ask their parent(s) about changing furnace filters. Caution the students that they must give parents reminders and not to change filters themselves.

APPLICATION - Teacher distributes handout 20B. During these discussions, some students may become curious about what energy source their furnace uses. Encourage the students to find out what they can at home and report back. They color and answer questions on the handout and take home for a reminder. Also, discuss the school heating system and perhaps have the custodian show the students how it works.

EVALUATION - Ask each student to explain how to conserve home heating. Ask each student what kind of energy makes their furnace work.

FOLLOW-UP/SUPPORT/SOURCES

As a follow-up, you could put a large F for filter on every other Friday on the classroom calendar as a reminder for all to remind those at home to check their furnace filters.

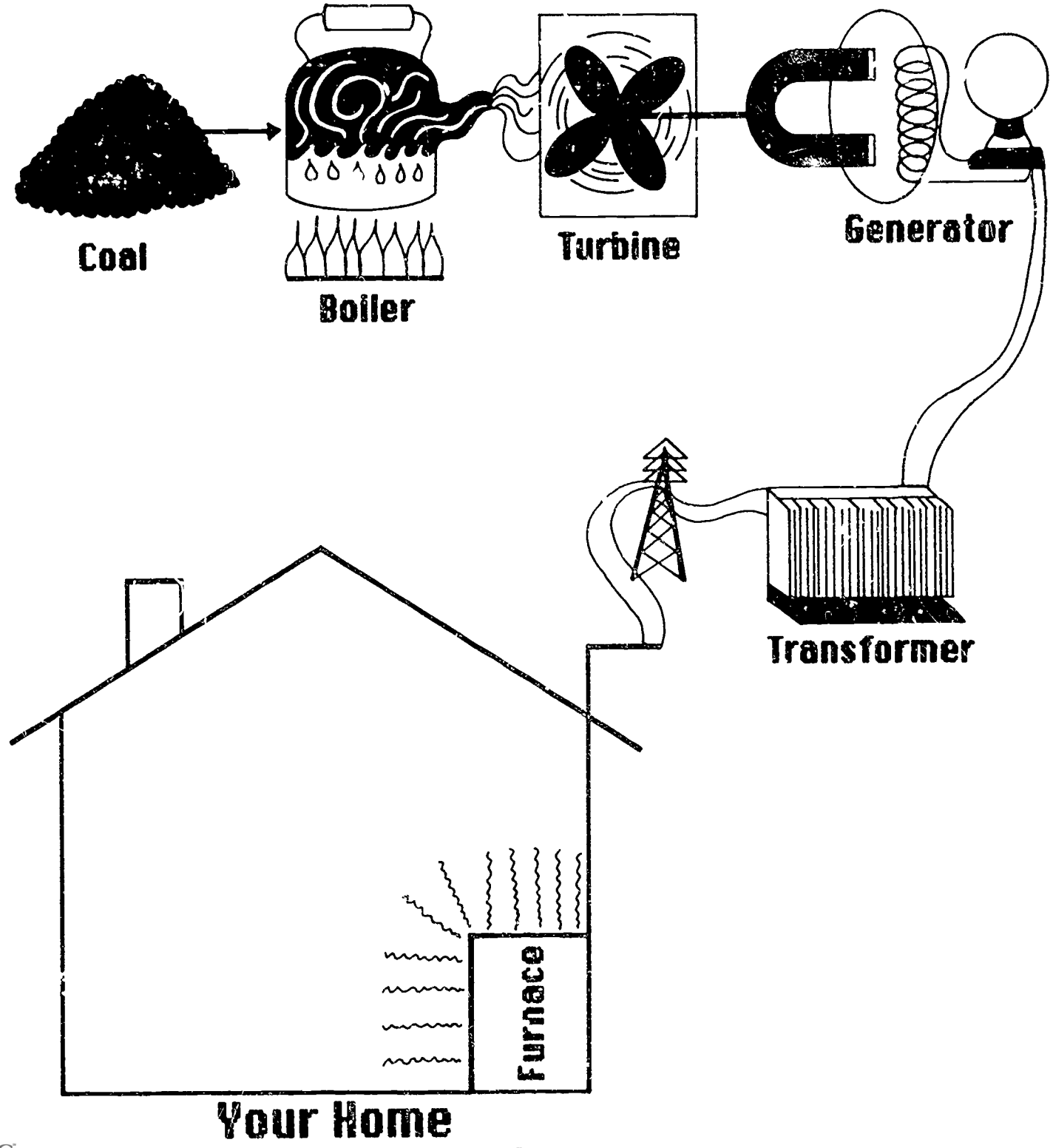
Energy Booklet - Students draw a picture of their furnace at home and what source of energy it uses. The teacher saves these for final Unit IX review.

SOURCE OF ACTIVITY

Linda Scheuermann

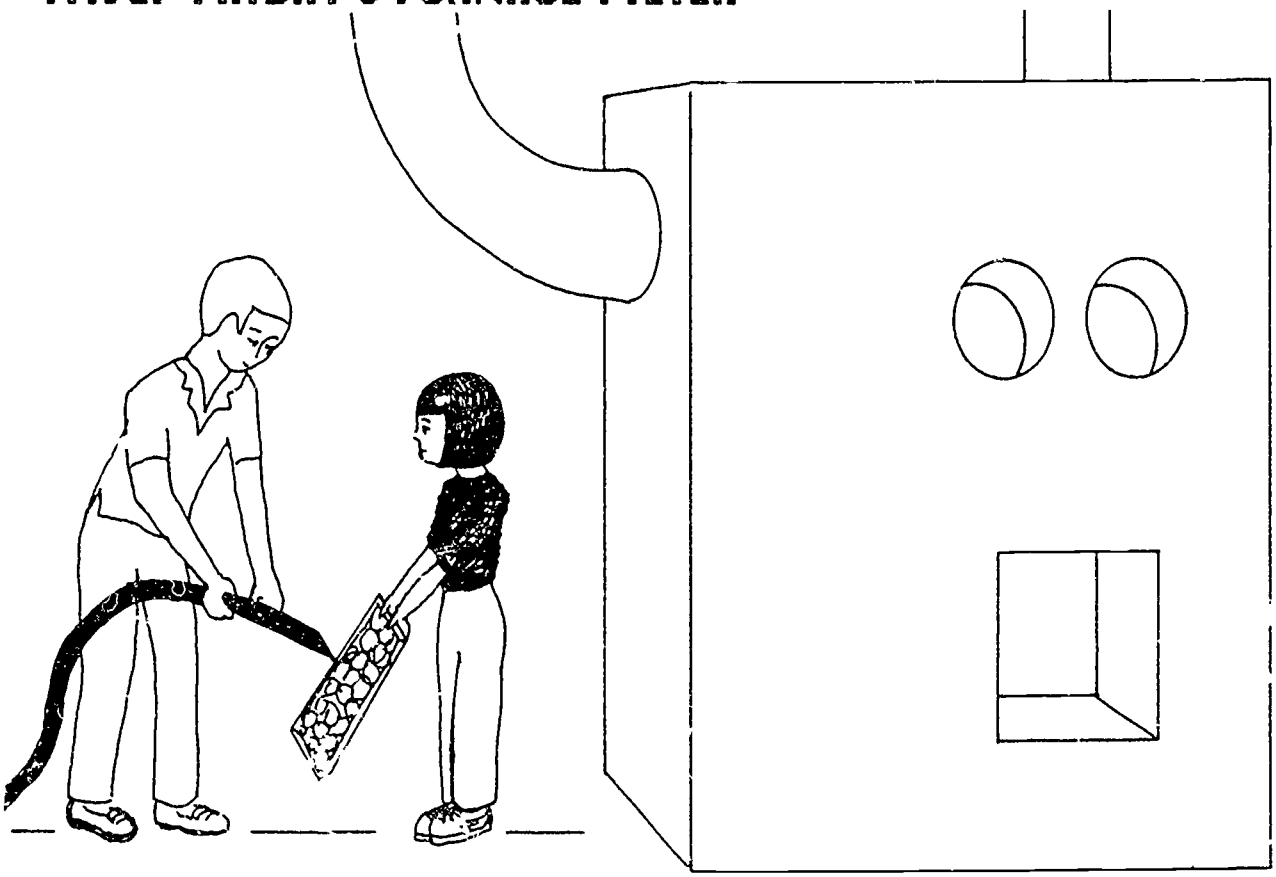
NAME_____

TITLE: HOW YOUR HOME GETS WARM



NAME_____

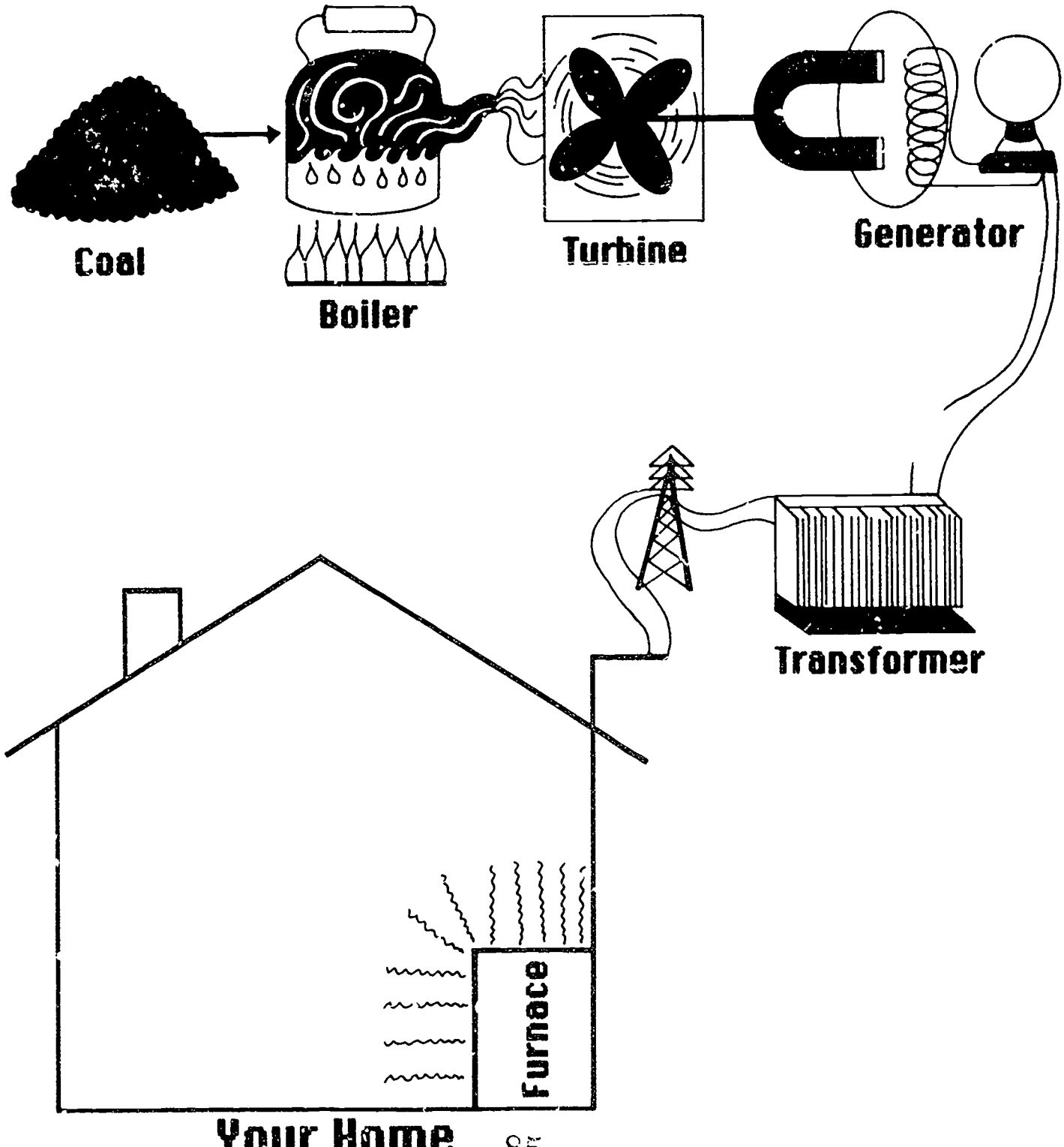
TITLE: FRIDAY'S FURNACE FILTER



Questions:	Yes	No
Can you help save energy?	○	○
Will you ask a parent if you can help?	○	○
Can you remember what to ask your parent every other Friday?	○	○

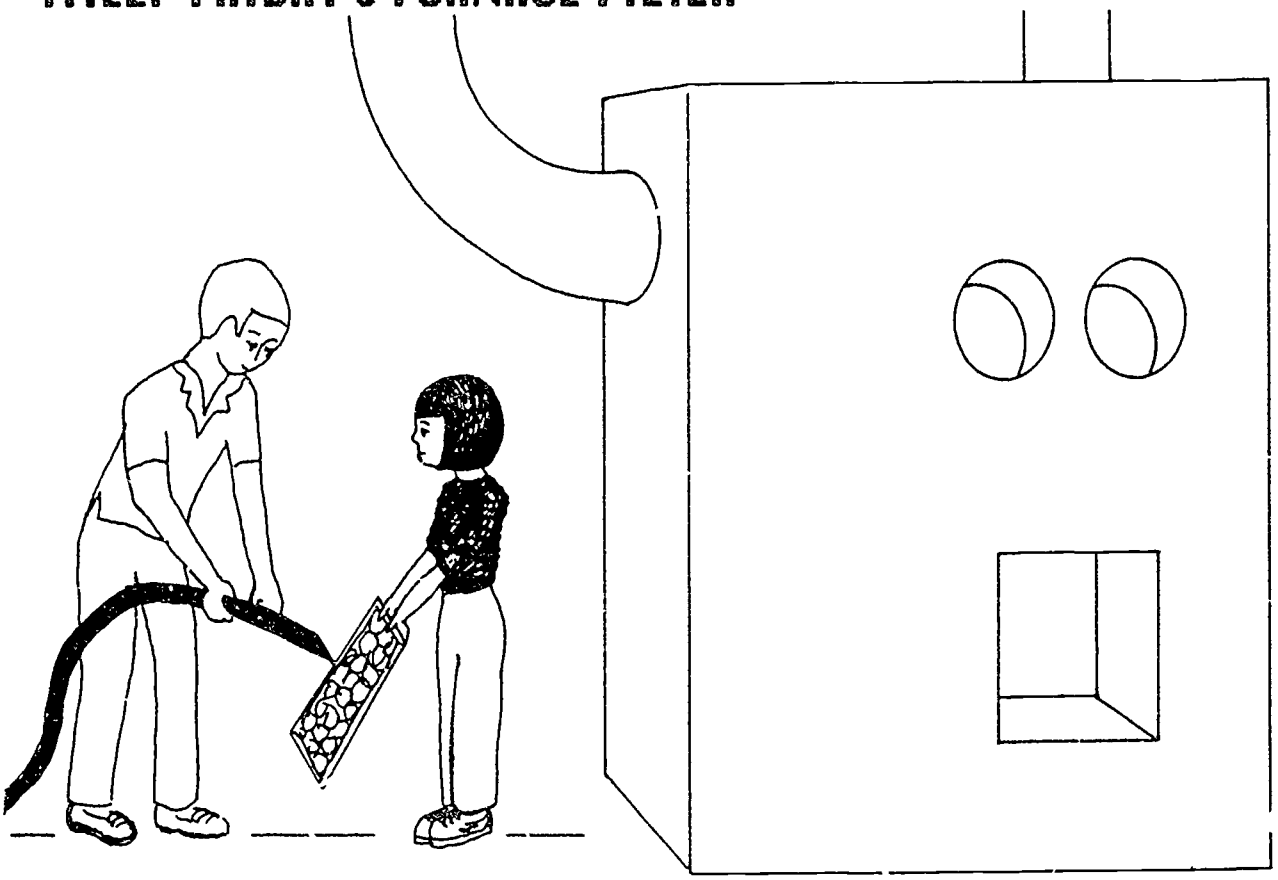
NAME_____

TITLE: HOW YOUR HOME GETS WARM



NAME_____

TITLE: FRIDAY'S FURNACE FILTER



Questions:	Yes	No
Can you help save energy?	○	○
Will you ask a parent if you can help?	○	○
Can you remember what to ask your parent every other Friday?	○	○

TITLE Insulation - Hot or Cold?

SUBJECT Science, Art, Math, Language Arts LEVEL Grade 2

ACTIVITY IN BRIEF

This activity is divided into 2 parts. One section explores the color of homes which hold heat the best. The second section examines the insulation of homes to keep them warm in winter and cool in summer. The experiments and graphing are optional according to your use. It is important to stress the conservation of coal, oil, natural gas, and others to heat homes.

OBJECTIVE

Each student will be able to:
- state which color best holds heat for homes.
- illustrate what insulation is and how it affects home heating and cooling.
- state that insulation conserves energy.

MATERIALS

handout (21A) for each student
hot water
4 painted cans (one white, one black, one green, and one red)
ice cubes
different types of insulating materials
four thermometers
one jar with lid per group of 3-4 students

TIME

Activity 21A takes 20-30 min.
Ice cube activity - varies depending on results. Check results 2-3 hours later.
Discussion 15-20 minutes
Drawing 20-30 minutes

LEARNING CYCLE

AWARENESS - This activity includes two experiments for students. The first experiment (21A) is a large group experiment which explores how heat is affected by color. The second experiment allows the students to bring insulating materials from home to keep ice cubes from melting. Each group will get a jar of ice cubes to see who can preserve the cubes the longest. (This could be a contest type of activity.)

CONCEPT DEVELOPMENT - After both experiments have been completed and handout 21A completed, bring the students together to discuss all results. Ask if they can state how these experiments relate to their homes. What would be the best color to paint their home considering summer cooling and winter heating? What source of energy keeps your home warm or cool? How do you keep the heat and coolness inside your home? Talk about insulation in attics and walls and be sure to also talk about caulking, weather stripping doors, etc.

APPLICATION - Allow the students to draw a home showing where it is insulated, examples: attic, walls, doors, windows. Also they should color the outside of their home an appropriate color for energy savings.

EVALUATION - Ask each student which color best holds heat for homes and how insulation conserves energy. Their drawings of an insulated home can be used for evaluation.

FOLLOW-UP/SUPPORT/SOURCES

1. Students write letters to their parents asking about insulation in their home.
2. Students write letters to grandparents asking what was used for insulation when they were children.
3. Large group discussion when children receive responses from their letters.

Energy Booklet - The teacher could collect handout 21A, or the graph work, or the drawings, or all three papers for the final Unit IX review.

SOURCE OF ACTIVITY

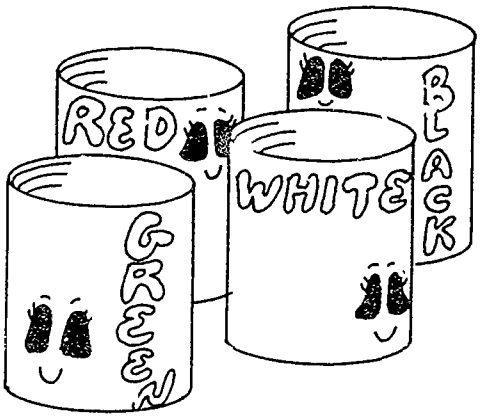
Rada Hutchison, Nancy A. Nettleton

TITLE: WHICH COLOR HOLDS HEAT LONGEST ?

NAME_____

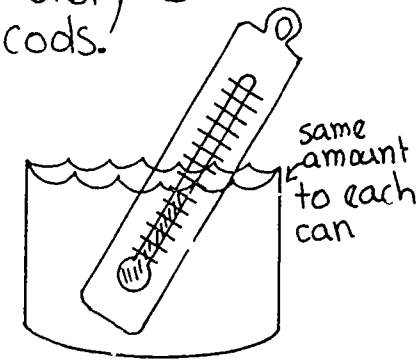
Materials:

- 4 cans painted with poster paint: 1 white, 1 red, 1 green, 1 black.
- Hot water
- 4 thermometers

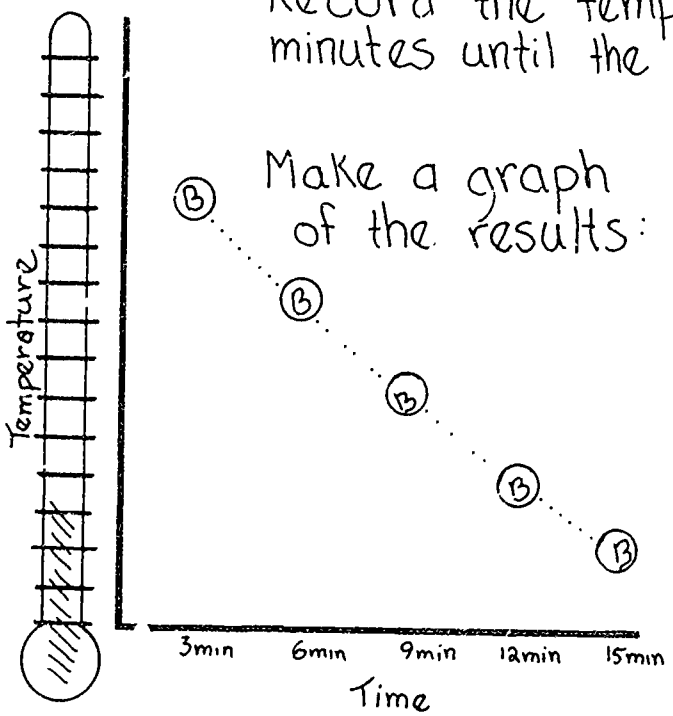


Paint each can a different color, then fill each can with the same amount of hot water.

Put a thermometer in each can. Record the temperature every 3 minutes until the water cods.



Make a graph of the results:



Which COLOR held heat best?

_____

TITLE Food Is My Friend

SUBJECT Science, Health, Music, Art LEVEL K

ACTIVITY IN BRIEF

The teacher has the class do exercises requiring "more" or "less" energy. A worksheet and song further emphasize the objective. A follow-up activity stresses exact relationships between food and peoples' movements.

OBJECTIVE

Each student will be able to explain how his/her body uses energy.

MATERIALS

stethoscopes (optional)
handout 22A
songsheet for teacher 22B
glue and crayons
construction paper

TIME

20-30 min. for exercises and discussion
10-15 min. for handout 22A
songsheet -optional amount of time.

LEARNING CYCLE

AWARENESS - The teacher gathers the children, seats them quietly in a circle, and has them feel their heartbeat or passes around stethoscopes for them to listen to their heartbeat. Next have the children do a marching exercise and finally a jumping, running exercise feeling their heartbeat after each or listening after each. When finished, have a group discussion about how people use "more" or "less" energy in their bodies and what is the source of that energy.

CONCEPT DEVELOPMENT - If time allows, work with the students on handout 22A or use it the following day to reinforce the concept that different activities use varying amounts of energy. Discuss what is going on in boxes 1 and 2 and have them label M for more and L for less. Next, have them draw in boxes 3 and 4 one activity that requires less energy and one that requires more energy.

APPLICATION - Use "A B C D Energy" song to enhance the concept that food in the body changes to energy for each person.

EVALUATION - Ask each student to explain how his/her body uses energy in more or less amounts.

FOLLOW-UP/SUPPORT/SOURCES

1. Bring empty boxes of cereal for display. Ask students why they eat cereal in the mornings. Have them find pictures of people doing activities that require food energy. Have them paste the picture on a sheet of construction paper and on the back draw a food item as the energy source.

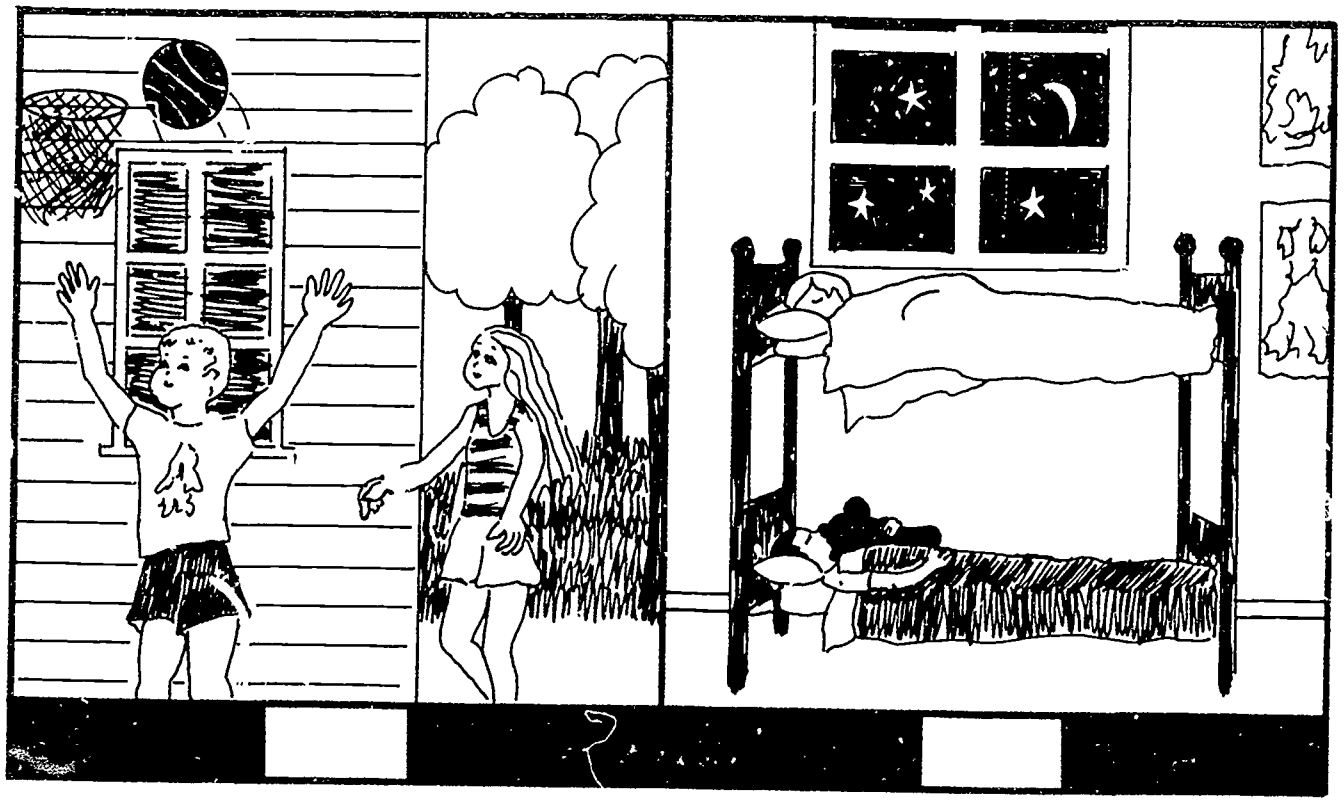
Energy Booklet - Teacher collects handout 22A for the booklet for the final Unit IX review.

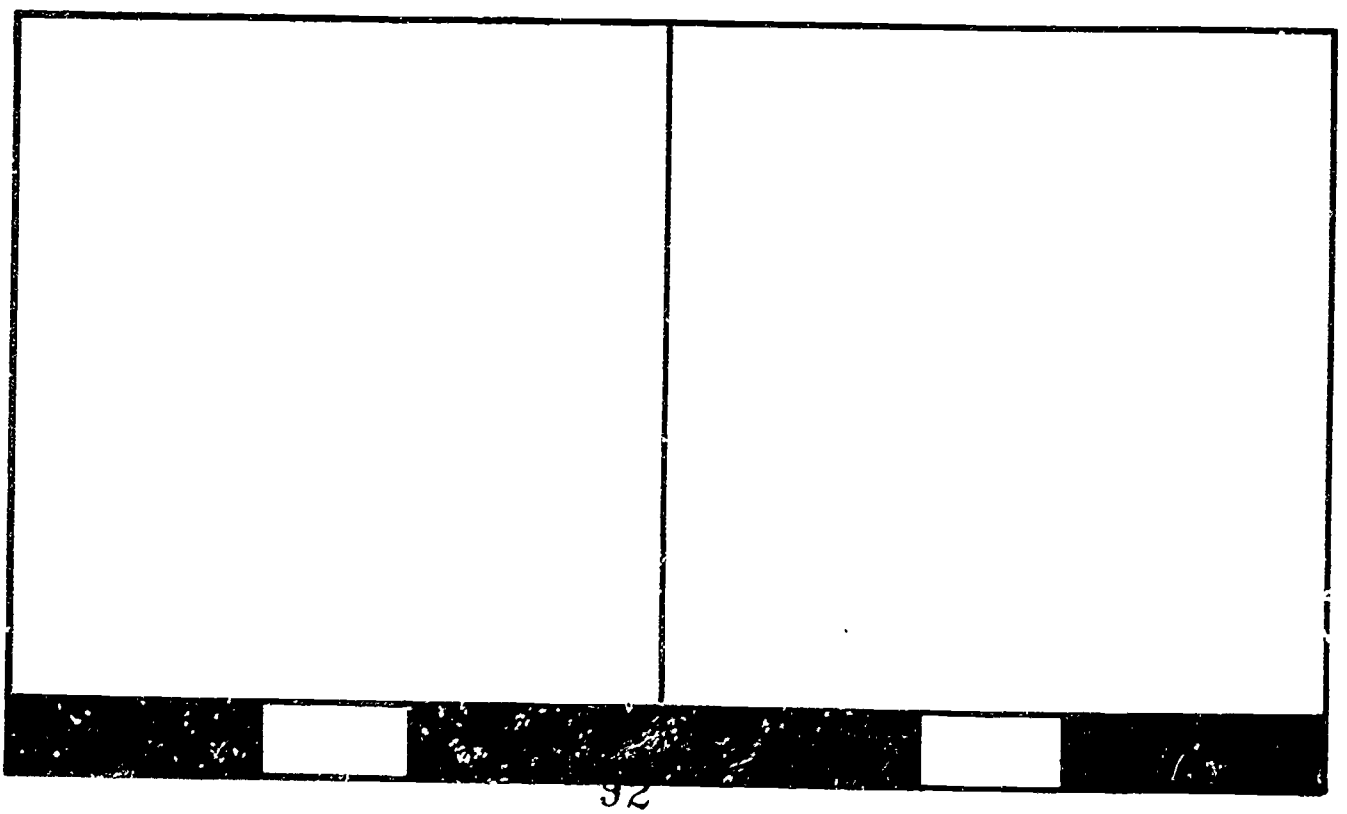
SOURCE OF ACTIVITY

Marilyn Kolbe

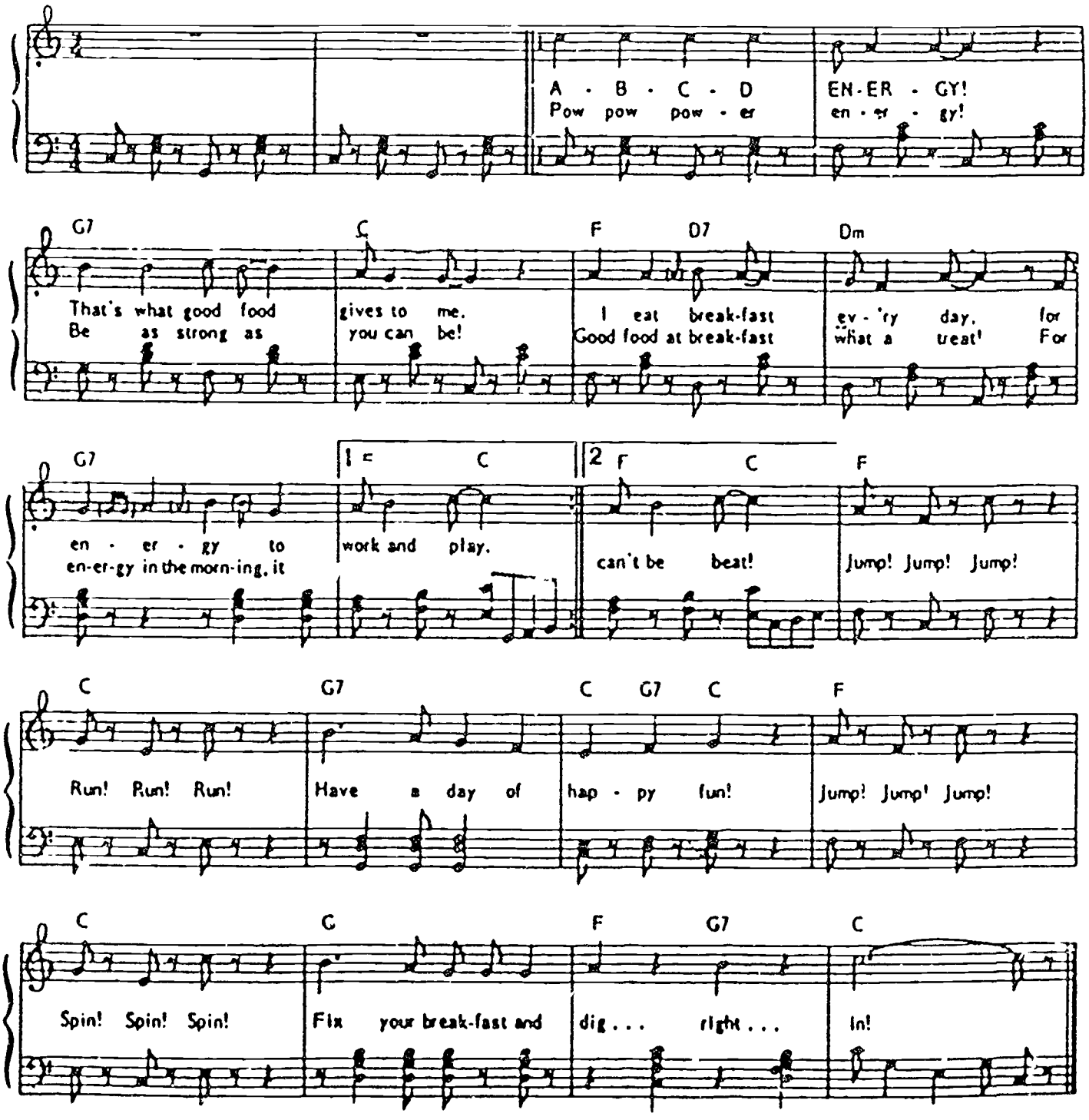
TITLE: MORE OR LESS ENERGY?

NAME_____





TITLE: ABCD-ENERGY



TITLE Nothing Lasts Forever

SUBJECT Science, Social Studies, Music LEVEL Grades 1 or 2

ACTIVITY IN BRIEF

By distributing small amounts of cereal to each student, the teacher leads the students to realize that some energy sources are limited. The remainder of the cereal is used to help the students become aware of the earth's energy limitations and to help define the terms renewable and non-renewable.

OBJECTIVE

Each student will be able to:
- explain the limits of energy sources.
- make choices regarding how to use their energy supply.
- relate food energy to other energy sources.

MATERIALS

one box of sugar coated cereal
old magazines
construction paper
glue, pencils
song 23A

TIME

1st day activity is ongoing until 15-20 min. discussion at end
2nd activity is ongoing until cereal is gone
15-20 discussion
30-45 min. for energy booklet activity

LEARNING CYCLE

AWARENESS - The teacher gives each student at the beginning of the day about 5 pieces of sugar coated cereal, instructing them to save it as much as possible to see if they can make it last all day because this is all they will receive. Help them to understand that the energy the cereal gives their bodies only lasts a short while. The energy itself is limited as well as the cereal. At the end of the day, discuss what happened with what the students saved or didn't save. Discuss the meaning of limited.

CONCEPT DEVELOPMENT - The next day the teacher displays a bowl of the remaining cereal. Tell the students that it is an experiment to see if they can make the cereal last for several days. When the cereal is gone, it will not be replaced. Tell them that anytime they want one piece of cereal, they may have one. An honor system will decide how long the cereal will last. Remind the students about limited energy.

APPLICATION - When the cereal supply is used up, relate this to limited energy sources such as coal, wood, oil, and natural gas. Ask them if these sources are renewable or non-renewable by explaining what these terms mean. Help them to understand that water, wind, and sun are renewable.

EVALUATION - The teacher will ask each student to explain what limits are for food energy sources as well as how other energy sources are also limited.

FOLLOW-UP/SUPPORT/SOURCES

1. Children could learn song "Breakfast With A Beat" - (23A).

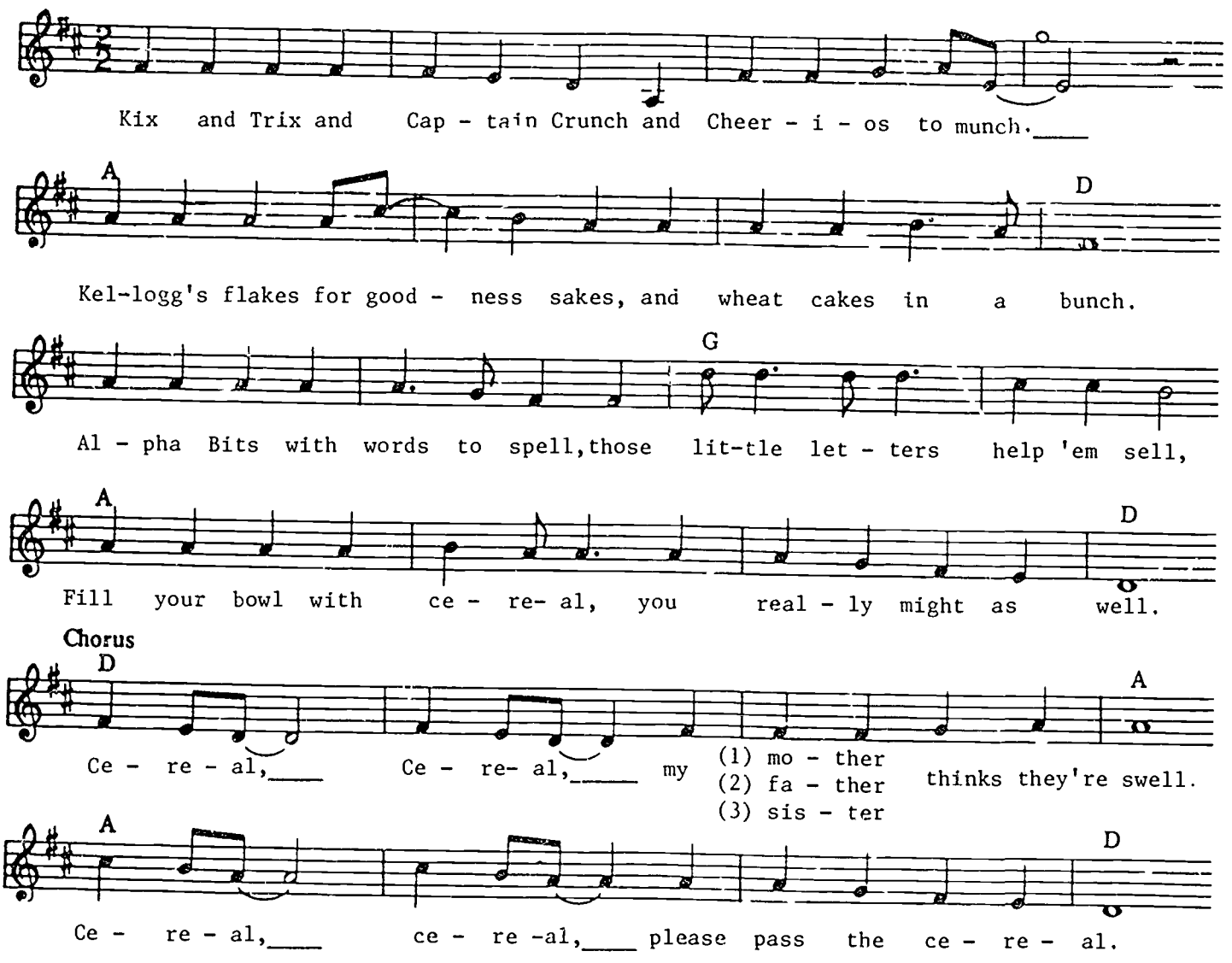
2. Have a school cook come to give a talk to the class about how food is ordered, cooked, and served so everyone gets a fair share.

Energy Booklet - Students find pictures of renewable and non-renewable energy sources and glue them to recycled paper. Teacher collects these for final Unit IX review.

SOURCE OF ACTIVITY

Adapted from Energy In Man's Environment by Linda Scheuermann

TITLE: BREAKFAST WITH A BEAT



TITLE Waste Not - Want Not

SUBJECT Health, Science, Social Studies LEVEL Grade 2

ACTIVITY IN BRIEF

Many students are great "wasters" of food, especially at school lunchtime. This activity is designed to stress student awareness of the results of wasted food, food in short supply, and food as possessing the characteristics of all energy sources.

OBJECTIVE

Each student will be able to:
- identify the result of wasting food.
- infer that food is in short supply.
- relate food energy to other sources of energy.

MATERIALS

popcorn, oil, salt, and popcorn popper
large bowl or paper bag for popped corn
chalkboard
poster paper
crayons/magic markers
handout 24A

TIME

30 min. for popcorn activity
20-30 min. for lunchroom discussions
30-60 min. for poster activity
Optional time for handout 24A

LEARNING CYCLE

AWARENESS - The teacher begins by offering the students popcorn as a treat toward the end of the day when they are most hungry. The teacher stresses that there is only a limited amount of popcorn available to pop, so there will be only small portions offered and no "seconds". While the students are working, the teacher pops the corn and "accidently" burns some or spills some or simply says that part of it isn't popped just perfectly and throws it away. Now the teacher asks related questions such as how can what's left be divided so all students get some, how can we be sure all people in the world get enough to eat, how is this popcorn like coal, oil, and natural gas, and so on.

CONCEPT DEVELOPMENT - Before school lunch the next day, challenge the students to help you list on the chalkboard ways they could stop food waste in the lunchroom. Some suggestions could be: don't take what you don't like (if this is allowed), trade food at the table with a friend before eating begins, bring a lunch from home if the menu is something you don't like, try tasting something new - you might like it, etc. Discuss results after lunch and reach some conclusions.

APPLICATION - Lead the students to believe that they can do something to help stop food waste so there would be enough for all. They can create posters in small groups with themes stressing the conserving of food. These could be posted in the lunchroom or in hallways leading to lunchroom.

EVALUATION - Teacher can use ideas written on handout 24A. Ask each student to state how food energy is related to other sources of energy.

FOLLOW-UP/SUPPORT/SOURCES

At Christmas time or other times of the school year, have a classroom food drive. Students bring cans of food to give to needy families in the community.

Energy Booklet - In pairs have students write ideas for saving food on their kernals of popcorn handout 24A. These are kept by teacher for final Unit IX review.

SOURCE OF ACTIVITY

Dawn Rogge

NAME_____

TITLE: KERNALS OF INFORMATION