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4H EGL 40

The Power Of ELECTRICITY

Leader's Guide

Florida 4-H Energy Education Program

OUR NATURAL WORLD

UNIVERSITY OF FLORIDA
EXTENSION
Institute of Food and Agricultural Sciences

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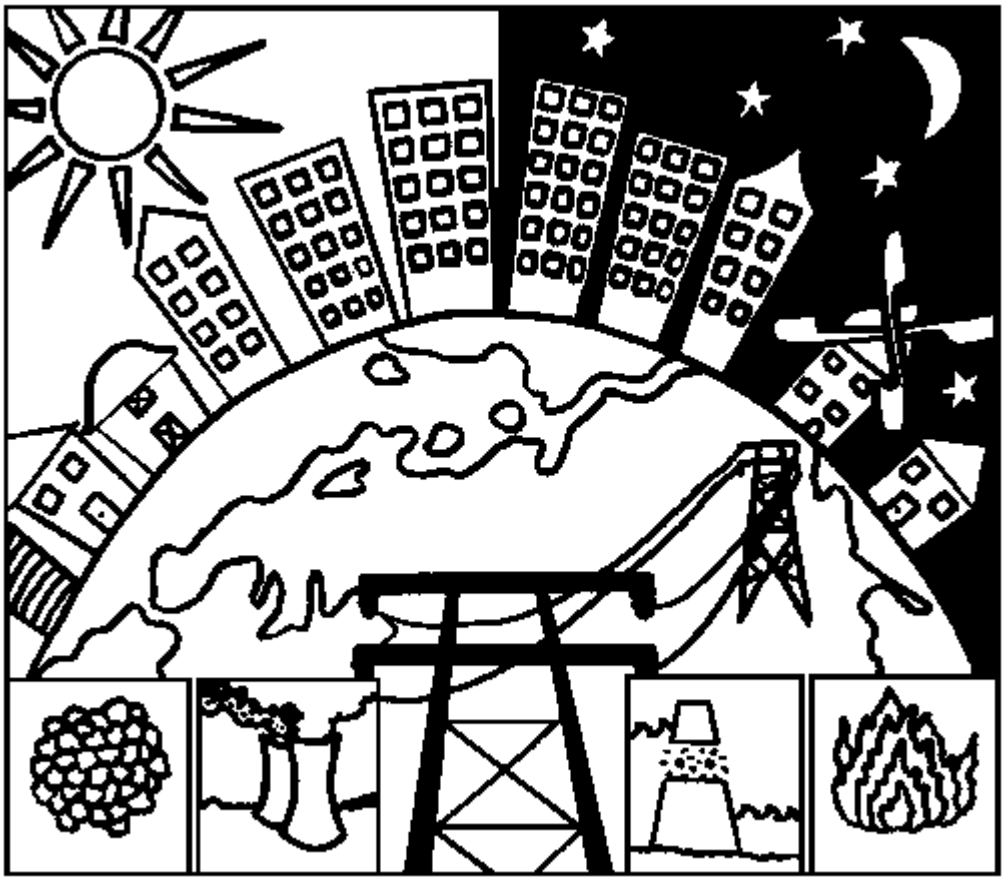
The POWER OF ELECTRICITY



UNIVERSITY OF FLORIDA
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The following program was pilot-tested in St. Lucie and Martin Counties.

RESOURCES..

Power of Electricity includes materials adapted from:

U.S. Department of Energy
Electricity's Silent Partner-Magnetism # CO 003
Behind the Switch - # CO 009
Electricity For Family Living - # CO 007
Exploring Energy - # 4-H 401
Exploring the World of Electricity - CO 001
The Harnessed Atom - DOE/NE 0072
The How's and Why's of Electricity-Members Manual Unit Two
The National Energy Education Development Project
Harper's Beginning Electricity
Teaching Science on a Shoestring

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PREFACE

4-H POWER OF ELECTRICITY

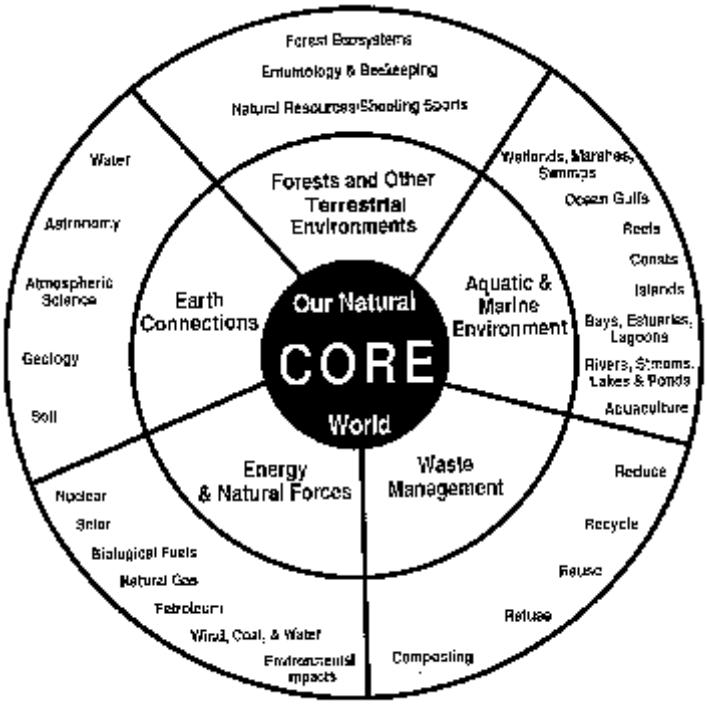
The Florida 4-H Environmental Education curriculum, OUR NATURAL WORLD, includes a basic premise, i.e., our environment is a web of cooperation and interdependence. One of the five key components of the curriculum is "Energy and Natural Forces."

The ***4-H POWER OF ELECTRICITY*** of OUR NATURAL WORLD, is designed to help 12-14 year old youth understand the environmental and economic issues associated with ENERGY. Additional curriculum packages will be designed for youth in other age ranges and for sequential advancement in energy education.

To the informed Florida citizen, it is not surprising that energy commands a priority within the total 4-H Environmental Education curriculum. An investment in young people's knowledge, understanding and attitudes about energy origins, uses, and conservation issues and their affect on the natural environment can not be ignored now or in the future.

In ***4-H POWER OF ELECTRICITY***, we are particularly interested in helping young people develop a personal environmental ethic and understand each person's individual impact on energy's consumption and resource availability.

4-H ENVIRONMENTAL EDUCATION
CURRICULUM FRAMEWORK



DEPARTMENT OF 4-H & OTHER YOUTH PROGRAMS
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TABLE OF CONTENTS

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TABLE OF CONTENTS (continued)

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About Power of Electricity

The development of this 4-H Environmental Education Project Kit was driven by two basic principles:

1. Learning about energy can be fun! The kit provides simple and inexpensive, yet fun activities that teach youth about major energy concepts, including the energy sources, energy uses, and energy conservation.

2. 4-H volunteer teaching activities must be ready-to-use. This project includes materials needed to conduct energy education activities into an easy-to-use format. It was designed to be teacher friendly and takes much of the guesswork out of teaching this subject.

AGE OR GRADE LEVELS

This project was developed for youth ages 12-14. Both group and individual activities encourage participation and action in all aspects of energy education. Teachers and volunteers are encouraged to select learning activities that are most suitable to their youth. The overall intent is to facilitate learning and to spark creativity in both teachers and youth.

CONTENTS

The following resources are components of the 4-H Energy Program:

- LEADER'S GUIDE - This three-ring notebook contains a complete, easy-to-read outline for lessons. Each lesson provides a variety of activities that can be conducted depending upon the time frame devoted to this project. The following activities are a mix of games, experiments, role plays or demonstrations that help to teach the basic principles and concepts in each lesson. The lesson concludes with a review using activity sheets in the youth's Workbook and discussion questions for youth to REFLECT and APPLY.

- POWER OF ELECTRICITY WORKBOOK - contains activity sheets for youth that correspond to each lesson. A variety of activities including puzzles, word searches, connect-the-dots, and other instructional activities make up this fun booklet.

- TEACHING KITS - containing materials needed for many of the activities. Solar Ovens are also available to enhance teaching (contact your County Extension Service for more information).

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LESSON PROFILES

IMPORTANT: It is important that each activity be done in each lesson in the correct order. Each activity teaches "energy" and "electric" concepts that are vital to understanding the next activity. The lessons and activities are designed to provide youth with the knowledge to further enjoy learning about electricity as they proceed through The Power of Electricity.

A brief description of the five Power of Electricity Lessons:

- **LESSON 1 -** Understanding Electricity

  Through activities in Lesson 1, youth discover how much they have grown to depend on electricity in their everyday lives. Understanding the basic energy forms is taught to allow youth to understand how electric energy is dependent on many forms of energy. Youth learn about subatomic particles and how important electrons are for electric energy. Youth also discover nature's energy and build a battery.

- **LESSON 2 -** How Electricity Travels

  Discovering how electrons flow and that they flow only through certain materials is the key in learning about electricity. Activities in Lesson 2 focus on building an understanding of electron flow and electric circuits. Amps and volts are also important in understanding electron "flow measurements."

- **LESSON 3 -** Electricity's Silent Partner

  Taking electron flow a step further in understanding how electricity is generated, magnetism and the use of magnets in generating electricity is explored. Youth apply what they've learned in Lesson Two and Three in making a simple motor.

- **LESSON 4 -** Electricity: Energy in Action

  Youth explore how electricity is used while developing an understanding of the importance of taking safety precautions with electricity. Youth calculate the cost of various electrical appliances with regard to KwH cost and watt demands. They explore the energy requirement of many household appliances.

- **LESSON 5 -** Electric Environment

  Youth learn how natural resources are used in an electrical power plant as well as how electricity is generated and transported to our homes. They examine the effects that power generation has on the environment.