

L.D.  
5655  
A961  
R38  
no 500  
1978

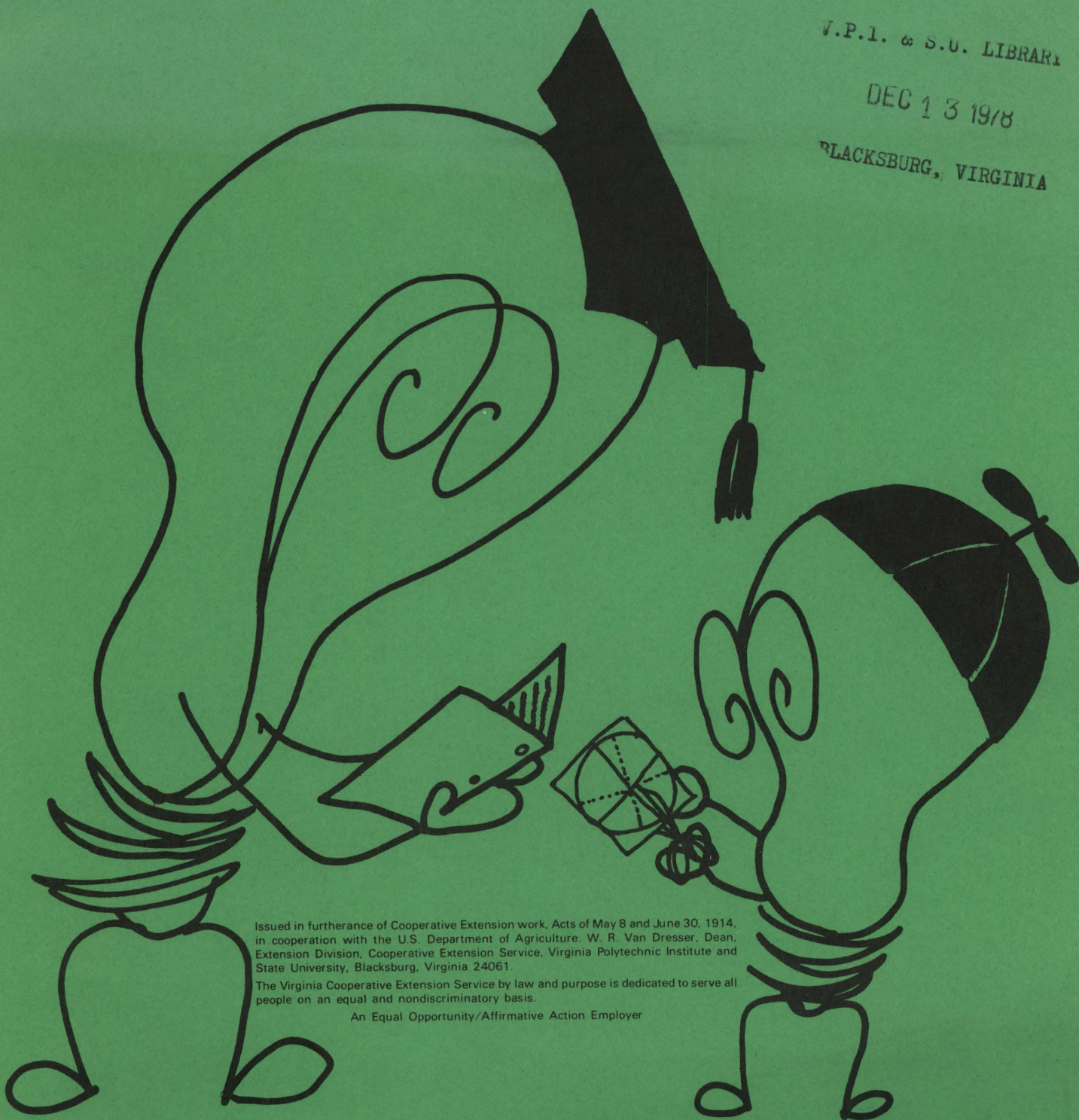
EXTENSION DIVISION  
VIRGINIA POLYTECHNIC INSTITUTE  
AND STATE UNIVERSITY

RB 5002  
Reprint October 1978

# 4-H Electric Project Leader's Guide

*Electro 1*

V.P.I. & S.U. LIBRARY  
DEC 13 1978  
BLACKSBURG, VIRGINIA



Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W. R. Van Dresser, Dean, Extension Division, Cooperative Extension Service, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

The Virginia Cooperative Extension Service by law and purpose is dedicated to serve all people on an equal and nondiscriminatory basis.

An Equal Opportunity/Affirmative Action Employer



## 4-H ELECTRIC PROJECT LEADER'S GUIDE

For

### E L E C T R O 1\*

This guide outlines the subjects for seven meetings in ELECTRO 1 of the 4-H Electric Project. Leaders do not need to have technical or academic knowledge of electricity to assist 4-H members in completing the project.

The members' project book has been prepared to be compatible with the skills and interests of nine and ten-year old boys and girls. Leaders should not need more information than that presented in the project book to guide the members in ELECTRO 1.

It is possible that the leader, after viewing the material in ELECTRO 1, may prefer to combine part III "ELECTRICITY IS HEAT" and part IV "ELECTRICITY IS COOLING" as two separate subjects in the same meeting thereby reducing the number of meetings from seven to six.

The objectives of ELECTRO 1 are to:

- Provide an interesting and educational project for rural and urban boys and girls who are entering 4-H at the minimum age.
- Develop an awareness of the importance of electricity in our everyday lives.
- Help members gain an appreciation of the many different kinds of jobs electricity can do for them.
- Provide opportunity and experience in sharing their knowledge with others through discussions, talks, and demonstrations.
- Help members gain experience in recording 4-H activities, and an appreciation of the importance of records.
- Help members to observe and appreciate the electrical world around them by taking tours and trips.

### M E E T I N G O U T L I N E S

#### MEETING NO. 1

##### Before This Meeting

- Procure a copy of ELECTRO 1 for each member.
- Thoroughly familiarize yourself with the entire contents of ELECTRO 1 project book.

\*Grateful acknowledgement is given to H. L. Candler, Agricultural Engineer, Appalachian Power Company for preparing this Leader's Guide.

- Obtain a copy of the leaflet "Virginia 4-H Electric Program" for each member. Familiarize yourself with its contents.
- Schedule a film and projection equipment for the date of meeting No. 1. (Films on electricity are available through your County Extension Agents and Power Suppliers).

### I N T R O D U C I N G   E L E C T R O   1

#### What To Do

1. Give a brief introduction to ELECTRO 1, including requirements, and highlights of activities you have planned, such as tours or picnics.
2. Briefly cover contents of "Virginia 4-H Electric Program" pointing out opportunities for learning and awards.
3. Introduce and show film on electricity.
4. Allow a short time for members' comments on the movie.
5. Hand out members' project books. Go over Part I - "ELECTRICITY IS POWER FOR WORK AND FUN". Point out the activities in Part I the members are expected to complete before the next meeting. Suggest that they ask for parents' help in finding pictures to paste in the project books and also with the check-lists.

#### Before Meeting Is Over

- Announce place, date and time of the next meeting.
- Encourage members to make posters for next meeting.

### MEETING NO. 2

#### Before This Meeting

- Fill in your copy of the members' project book just as you expect the member to do.
- Secure and take to the meeting materials to make a simple windmill.
- Find as many paste-in pictures as you can. Take them to the meeting to help those who did not find them.

#### I. ELECTRICITY IS POWER FOR WORK AND FUN

##### What To Do

1. Go over Part I "ELECTRICITY IS POWER FOR WORK AND FUN" giving an opportunity for discussion by the members at the end of each point made by the project book. This can be stimulated by leaders questions.
2. Check with the members their answers to questions and lists in Part I.

Here are the answers:

1. Tell here what happens when you blow on the windmill.  
IT TURNS. (SPINS)

2. Does the water falling on it make it turn?  
YES
  3. Which gave it more power?  
WATER
  4. Some things which get electricity from electric batteries:  
radios, televisions, watches, clocks, flashlights, tape recorders, record players, hearing aids, pencil erasers, toy cars, toy boats, real boats, lawn mowers, golf carts, fork lifts, flash cameras, lawn trimmers, automatic starters, tractor starters, walkie-talkies, etc.
3. Give members opportunity for "show and tell" (Illustrated Talk) with the posters they have made.
  4. Assist members in filling in Part I of their project records.

Before Meeting Is Over

- Encourage members to come to next meeting with Part II of project books filled in.
- Encourage members to come to next meeting prepared to give a demonstration on "How Glare Makes it Harder for Us to See".
- Announce place, date and time of next meeting.

MEETING NO. 3

Before This Meeting

- Fill in your copy of the members' project book just as you expect the member to do.
- Secure and take to the meeting materials necessary to perform the demonstration "How Glare Makes it Harder for Us to See".  
NOTE: A substitution for the flashlight can be made with a lamp cord, plug, and socket containing a 100-watt bulb.

II. ELECTRICITY IS LIGHT FOR SEEING

What To Do

1. Go over Part II "ELECTRICITY IS LIGHT FOR SEEING" giving an opportunity for discussion by the members at the end of each point made in the project book. This can be stimulated by your questions.
2. Check with the members their answers to the questions in the project book Part II.

Here are the answers:

"Is it easy to read the letters?" NO

"Show what you have learned by checking the correct answer."

1. c; 2. b; 3. c; 4. b; 5. b; 6. a; 7. b; 8. c;  
9. a; 10. c.

Help members check their scores.

Have the members enter their scores in the project record Part II. (Ten points for each correct answer).

3. Give members an opportunity to give a demonstration on "How Glare Makes it Harder for Us to See."
4. Assist members in filling in Part II of the project record.

Before Meeting Is Over

- Encourage members to come to next meeting with Part III of project book filled in.
- Encourage members to come to next meeting prepared to give a demonstration on "How to Make a Simple Resistance Heater".
- Announce place, date and time of next meeting.

MEETING NO. 4

Before This Meeting

- Fill in your copy of the members' project book just as you expect the member to do.
- Get and take to the meeting the materials necessary to perform the demonstration "How to Make a Simple Resistance Heater".

III. ELECTRICITY IS HEAT

What To Do

1. Go over Part III "ELECTRICITY IS HEAT" giving an opportunity for discussion by the members.
2. Check with the members their answers to the questions in the project book Part III. Give them an opportunity to tell what they have listed as jobs electric heating is doing for the member and his family. Answer to question at end of experiment: "Tell here why the wire heats."  
IRON IS NOT A GOOD CONDUCTOR OF ELECTRICITY. THE IRON WIRE OFFERED RESISTANCE TO THE FLOW OF ELECTRICITY AND THE WIRE HEATED.
3. Give the members an opportunity to demonstrate "How to Make a Simple Resistance Heater".
4. Assist members in filling in Part III of the project record.

Before Meeting Is Over

- Remind members to come to next meeting with Part IV of project book filled in. Point out that the cooling equipment to be listed can be in places other than the home.
- Announce place, date and time of next meeting. (It will be well if meeting No. 5 can be held where a refrigerator is available).

## MEETING NO. 5

Before This Meeting

- Attempt to arrange this meeting where a domestic electric refrigerator will be available. (This will be a fine opportunity for the leader to point out the working parts of a refrigerator as shown on the sketch in the project book. Some preparation will make it possible to serve the members ice cream made in the refrigerator trays).
- Fill in your copy of the members' project book just as you expect the member to do.

## IV. ELECTRICITY IS COOLING

What To Do

1. Go over Part IV "ELECTRICITY IS COOLING" giving an opportunity for discussion by the members.
2. Check with the members their answers to the questions in the project book Part IV.  
Give them the opportunity to read the list they have prepared showing the cooling equipment they know about.

Answers to questions:

- "Hand inside refrigerator." What do you feel? COOL
- "Hand behind refrigerator." What do you feel? WARM or HOT
- "Outside near running air conditioner." What do you feel?  
WARM AIR

3. Assist members in filling in Part IV of the project record.

Before Meeting Is Over

- Point out to the members that Part V of ELECTRO 1 offers many opportunities for simple experiments with magnets and that magnets are important to electricity.
- Encourage each member to get the inexpensive materials required in Part V and do the experiments at home.
- Point out that Part V offers opportunities for many short and simple demonstrations:
  1. "Magnets do not Attract Everything"
  2. "How to Make a Compass"
  3. "How Magnets Work Together"
  4. "How to Make a Magnet Motor"
- Encourage each member to come to the next meeting prepared to give a demonstration on magnets.
- Announce place, date and time of next meeting.

## MEETING NO. 6

Before This Meeting

- Thoroughly familiarize yourself with the content of Part V ELECTRO 1.
- Obtain all of the materials required for the experiments and demonstrations in Part V "FUN AND POWER WITH MAGNETS" (Magnets may be obtained from hobby shops, hardware stores, and sometimes can be borrowed from science teachers. One possible source is the meter section of your power supplier. They sometimes have magnets taken from retired or damaged meters).
- Take these materials to the meeting.
- Fill in your copy of the members' project book.

## V. FUN AND POWER WITH MAGNETS

What To Do

1. Ask questions of the members to ascertain what they have learned from reading Part V.
2. Ask for volunteers to perform the experiments mentioned in Part V. It is suggested that the experiments be done in the order they are presented in the members' project book. (The leader might prefer to do the experiments himself, bringing out the teaching facts as he progresses).
3. Provide opportunity for member demonstrations on magnets.
4. Check with the members their answers to the questions in the project book Part V.

Here are the answers:

"Magnets Attract" iron, steel

"Magnets with north ends together." What happens?  
THEY PUSH AWAY FROM EACH OTHER (REPEL)

"Magnets with south ends together." What happens?  
THEY PUSH AWAY FROM EACH OTHER (REPEL)

"North end of one and south end of the other together."  
What happens? THEY PULL TOGETHER (ATTRACT)

5. Assist members in filling in Part V of the project record.

Before Meeting Is Over

- Announce that the next meeting will be about electrical safety.
- Encourage the members to study Part VI of their project books and complete with their family's help the safety check list.
- Announce place, date and time of next meeting.

## MEETING NO. 7

Before This Meeting

- Schedule a film on electrical safety for the date of meeting No. 7. Procure projection equipment. (Films are usually available through your County Extension Agents or your power supplier). Ask for films and projection equipment far enough in advance to assure their availability.



- Familiarize yourself with Part VI ELECTRO 1.
- Fill in your copy of members' project book Part VI.
- Obtain as many kinds of service cords as you can and take to the meeting. Be sure at least one cord carries the UL label.

## VI. YOUR FRIEND - ELECTRICITY

### What To Do

1. Show film on electrical safety.
2. Review information on Part VI ELECTRO 1. Encourage discussion by members.
3. Show different kinds of service cords and point out UL label.
4. Check with members their list showing the condition of cords and attachment plugs on the appliances in their homes.
5. Assist members in filling in Part VI of the project record.

### Before Meeting Is Over

- Work on completing record books.
- Discuss the next project - ELECTRO 2
- Announce any optional activities - tours, trips, etc.





