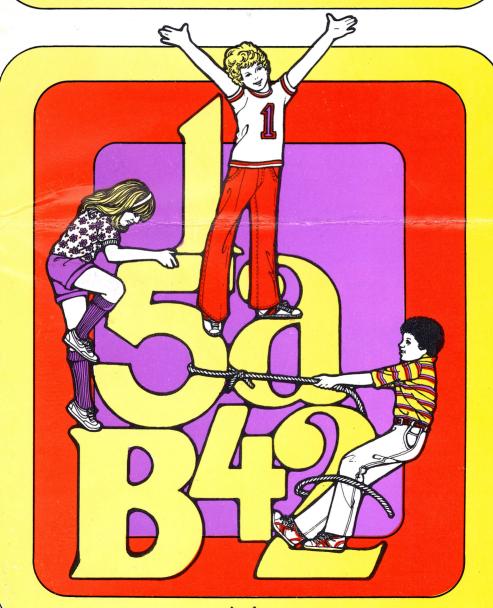# BASIC ELECTRICITY

by Ron and Sue Eckert

a learn-by-doing science experience

Apple

BASIC ELECTRICITY

by

Ron and Sue Eckert

Published by

SYSTEM REQUIREMENTS

Apple II+, IIe, or //c, DOS 3.3, and one disk drive. If you are
using an Apple //e or //c, remember to put the CAPS/LOCK key down.

(C) 1980 by Ideatech

GETTING STARTED

1. Turn on your monitor.
2. Open the disk drive door.
3. Place the BASIC ELECTRICITY disk, label side up, into the
    drive.
4. Close the drive door.
5. Turn on your computer.

Apple is a trademark of Apple Computer, Inc.

BASIC ELECTRICITY

Basic Electricity contains aspects of both a simulation and a
tutorial type of program. It simulates the classic demonstration
of using a battery, switch, light bulb and interconnecting wires
to introduce the concepts of current flow, and open, closed and
short circuits.

PROGRAM SUMMARY

The user may choose one of the program's four sections: a lesson,
quiz, switch puzzle or demonstration. Circuits are presented
through the use of Hi-Res graphic drawings that allow the users to
visualize the concepts. A lesson on electricity is presented
which introduces the user to current flow and then demonstrates
the effects of open, closed and short circuits. At each step, the
student is given the opportunity to experiment with the circuit,
thus reinforcing the concepts presented. The switch puzzle
presents the student with a problem to solve by applying the
concepts presented in the program.

WARM-UP ACTIVITIES

1. Discuss electricity and its uses in our lives. Have students
form groups and brainstorm as many ideas as possible.

2. The following are the most difficult words which are
encountered in the program. Review these words as necessary.

electricity	continue	enter
switch	terminal	through
demonstration	connected	clue
input	positive	remember
battery	negative	type
circuit	metal	following
closed	wire	nervous
electrical	current	
energy	choice	

3. Review the directions with the users.

STARTING THE PROGRAM

This program will work on any Apple family microcomputer with 48K
or more of memory. The system must have at least one disk drive.

Place the program disk into the drive, label side up, and turn on
your computer. If you are unsure, consult your owner's manual.
The disk will spin for about five seconds and the K-12 MicroMedia
introduction will appear on the screen. Any key (except Reset)
may be pressed and the disk will run for another five to seven
seconds while the main program is loaded into the computer. You
will now have the Basic Electricity menu displayed on the screen.

SELECTING FROM THE MENU

The program contains five parts which can be selected from the
menu.

1. Basic Electricity Lesson
2. Switch Puzzle
3. Quiz
4. Demonstration
5. End

To select the part you wish to run, type the number (1-5) and
press <RETURN>.

Section 1 - Basic Electricity

A Hi-Res graphics drawing of a battery, light bulb, switch and
interconnecting wires will be generated as the program progresses.
The user will be introduced to positive and negative battery
terminals, the concepts of open, closed and short circuits, and
current flow that is depicted by an animated arrow that travels
from the battery to the light bulb and back as the bulb lights up.

The current flow is from positive to negative or conventional
current flow. It is not electron flow, which would be from
negative to positive.

At each step the user is given the opportunity to experiment with
the circuit, thus reinforcing each concept as it is presented.

During the experimentation, type:

    1 - to turn the switch ON or CLOSE the circuit
    2 - to turn the switch OFF or OPEN the circuit
    0 - to continue the program

Section 2 - Switch Puzzle

The switch puzzle allows the user to demonstrate his/her
understanding of open, closed and short circuits. The animated
arrow, showing the direction of current flow, does not appear in
this section.

A battery and light bulb connected by 8 switches are presented.
The user must attempt to turn the correct switches on or off in
order to form a closed circuit from the battery to the light bulb.
When this is accomplished, the light bulb will turn on. If any
switch is thrown to open the circuit or thrown to create a short
circuit, the light bulb will turn off.

To turn a switch on (close) or off (open), complete the following
steps:

    First, type S (S implies switch).
    Second, type the number of the switch, 6.
    Third, type the word On or OFF.

    EXAMPLES:

    To turn switch 6 off, type S6OFF.
    Then press <RETURN>.

    To turn switch 3 on, type S3ON.
    Then press <RETURN>.

If a mistake is made in turning a switch on or off, the program
automatically presents the instructions for the user to review.

In order to get help during the puzzle, type HELP and press
<RETURN>.

To go back to the menu, type END and press <RETURN>.

Section 3 - Quiz

A short, 5 question quiz is presented to test the user's comprehension of the material.

Section 4 - Demonstration

The current flow between a battery and light bulb is demonstrated in Hi-Res graphics. A switch alternately opens and closes to show the difference between the open and closed circuit.

Section 5 - End

Selecting option 5 on the menu will end the program. Before running another program, reboot the system with the disk containing the next program to be used.

FOLLOW-UP ACTIVITIES

Provide materials and opportunities for activities such as the following:

**Demonstrate open and closed circuits by using a real battery, light bulb, switch and interconnecting wires.

**Draw a battery and wires to form an open, closed and/or short circuit.

**Draw or construct a number of circuits like the switch puzzle and have the students indicate which switches must be open or closed to light the bulb. Allow one student to construct the circuits for another student to operate.
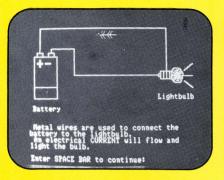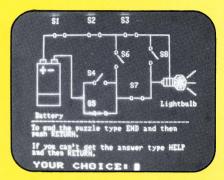
RETURN POLICY

BASIC ELECTRICITY comes with a free backup copy. K-12 MicroMedia Publishing Company uses numerous procedures to insure that each disk will boot and load correctly. If you receive a bad disk, return it within 30 days of receipt with a brief explanation of the problem and we will repair or replace it.

If a disk becomes damaged for any reason, the original purchaser may return the disk for replacement at a cost of $8.00. If the disk is still being manufactured, K-12 MicroMedia Publishing Company will replace it. The damaged disk must be returned with proof of purchase and a check or money order for $8.00.

If you purchase a program from K-12 MicroMedia Publishing Company that does not meet the needs of your particular application, it may be returned within 30 days of receipt for a refund of the purchase price, less the $2.00 shipping charge. THE SHIPPING CHARGE IS NOT REFUNDABLE.

BASIC ELECTRICITY

Metal wires are used to connect the battery to the lightbulb.
An electrical CURRENT will flow and light the bulb.

Enter SPACE BAR to continue!

To end the puzzle type END and then push RETURN.

If you can't get the answer type HELP and then RETURN.

YOUR CHOICE:

This hands-on tutorial gives students the opportunity to safely experiment with electricity. The problem solving approach stimulates logical thinking, since students must make deductions based upon the information presented. They use battery, lightbulb, switches, and interconnecting wires to deal with open, closed, and short circuits with conventional current flow. Successful problem solving is rewarded visually.

- SUGGESTED STUDENT ACTIVITIES
- LESSON
- PUZZLE
- QUIZ
- DEMONSTRATION

For Ages 7-13
Free backup disk included!

K-12 MicroMedia
THE EDUCATIONAL SOFTWARE SPECIALISTS