

# CURRENT ELECTRICITY MULTI-GROUP KIT

**by Carl Pfeiffer**

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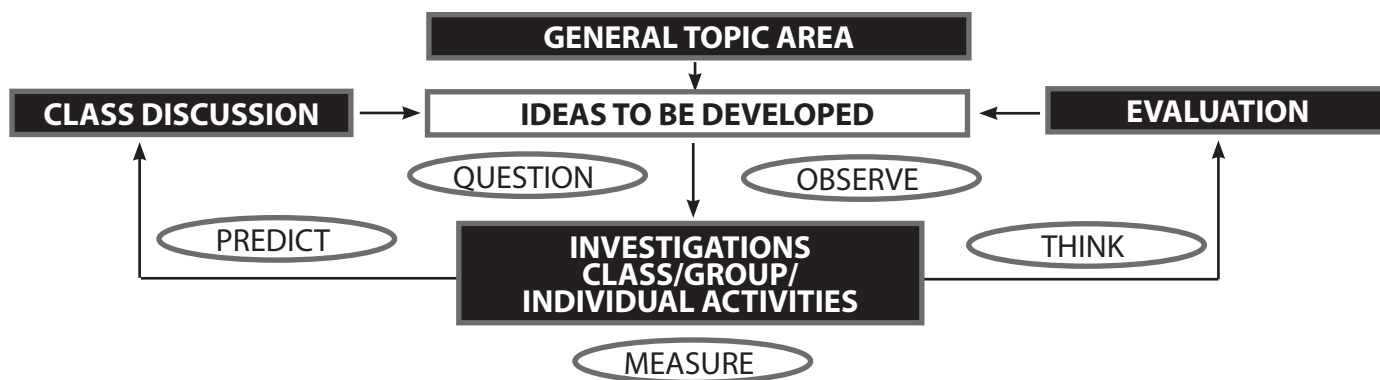
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Your SciQuest® Multi-Group Kit has been especially designed to enable you to incorporate a wide range of unique and interesting “hands-on” investigative activities into your existing science program.

The SciQuest® topic areas are designed to make it easy for you to match the specific topics and ideas to be developed, through the investigations the kit provides, to the topics and ideas associated with the scope and sequence which make up your current science program.

When used in conjunction with your “in-place” curriculum, your SciQuest® Kit and Teacher’s Guide will help you to add a meaningful and exciting dimension to the teaching/learning opportunities you provide for your students.

MODEL FOR IMPLEMENTATION



Each specific activity level topic is described in terms of a set of “Ideas to Be Developed.” The teaching strategy intended is that these “Ideas to Be Developed” become the focal point of the investigations, activities, and class discussions.

Your Teacher’s Guide includes blackline masters for producing copies of the Data Sheets for your students. For some activities and investigations, you may want to produce copies of the Teacher’s Guide for your students as well.

As you become more familiar with your SciQuest® Kit, you will probably find that there are certain activities which you will want to have your students do on an individual basis or in small groups. The additional equipment and/or materials that are required to do this can be ordered from Nasco as separate items. It is in situations where you have your students working individually or in small groups that you will most likely want to produce copies of your Teacher’s Guide for your students to use.

Remember, science is a “quest” to develop an understanding about the world around us. It is a “quest” which provides unique opportunities to develop learning skills in observation, questioning, measuring, predicting, and thinking. Best of all, it is fun for you and your students!

We hope that you and your students enjoy using these materials.

Sincerely yours,

*Carl Pfeiffer*  
 Carl Pfeiffer

Prior to conducting the **investigations** described in your **Teacher’s Guide**, it would be convenient to make up six permanent sets of wire connectors for each group of students as described below. Each wire lead provided in the kit is 5 feet, so make sure to cut **exact** lengths. Listed below is what you need to make one wire connector set.

- (4) 6" length, alligator clip at each end
- (4) 12" length, alligator clip at each end
- (1) 24" length, alligator clip at one end and bare at the other end. Remove 2"-3" of insulation from the middle of wire (Fig. 1).
- (1) 36" length, alligator clip at each end
- (1) 12" length, one alligator clip and one bare end
- (1) 4" length, strip ½" of insulation from each end



Fig. 1

Each SciQuest® kit is custom designed and developed to allow you to easily incorporate Educational Standards. The Current Electricity Multi-Group Kit **SB50691** satisfies the following:

#### 4. Energy

Students who demonstrate understanding can:

**4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.**

**4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.**

#### Science and Engineering Practices

##### Planning and Carrying Out Investigations

- Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)

##### Construction Explanations and Designing Solutions

- Apply scientific ideas to solve design problems. (4-PS3-4)

#### Disciplinary Core Ideas

##### PS3.B: Energy Transfer

- Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (4-PS3-2), (4-PS3-4)

##### PS3.D: Energy in Chemical Processes and Everyday Life

- The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use. (4-PS3-4)

#### Crosscutting Concepts

##### Energy and Matter

- Energy can be transferred in various ways and between objects. (4-PS3-1), (4-PS3-2), (4-PS3-3), (4-PS3-4)

##### Science is a Human Endeavor

- Most scientists and engineers work in teams. (4-PS3-4)
- Science affects everyday life. (4-PS3-4)

#### Common Core State Standards Connections:

##### Mathematics

**MP.2** Reason abstractly and quantitatively. (4-ESS3-1)

**MP.4** Model with mathematics. (4-ESS3-1)

## M.S. Forces and Interactions

Students who demonstrate understanding can:

**MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.**

### Science and Engineering Practices

#### Asking Questions and Defining Problems

- Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. (MS-PS2-3)

### Disciplinary Core Ideas

#### PS2.B: Types of Interactions

- Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. (MS-PS2-3)

### Crosscutting Concepts

#### Cause and Effect

- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS2-3), (MS-PS2-5)

### Common Core State Standards Connections:

#### ELA/Literacy

**RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS2-1), (MS-PS2-2), (MS-PS2-5)

#### Mathematics

**MP.2** Reason abstractly and quantitatively. (MS-PS2-1), (MS-PS2-2), (MS-PS2-3)

**6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-1), (MS-PS2-2)