



Yale-New Haven  
Teachers Institute®

Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
1989 Volume VII: Electricity

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## Introduction

Our current electrical and electronic technologies are based upon our understanding of the physical nature of electricity. In these curricular units a combination of easily perceived analogies and a set of “hands on” experimental demonstrations illustrate this science. Electrical energy is created by spatially separating positive and negative charge. Since opposites attract each other, work is expended to accomplish this separation. When these charges are allowed to recombine by having the negative charge move through a circuit, electrical energy can be converted into other forms of energy such as heat or mechanical motion. It is the ability to transmit electrical energy for use at a location remote from the energy source that Edison recognized as the truly innovative aspect of this technology.

The implications of this action at a distance is graphically illustrated in a unit on the facsimile machine. By allowing charges to recombine through carefully designed pathways, one is able to perform arithmetic logic, hence computers. Since computers allow rapid manipulation of numerical facts, their impact upon accounting procedures has been large. Here a unit on accounting describes these changes as well as identifying the new problems of software failure and computer fraud. The rigors of binary logic, called Boolean algebra, used in computers is introduced in a unit which will appeal to students who see themselves in careers as computer designers.

In total, these units present a set of ways to convey to students at all levels important aspects of electrical technology. The passing of pennies along the circle of students, an analogy discussed in the unit on home appliances, beautifully illustrates how the notions of this science can be described.

Robert G. Wheeler

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