Electricity

Science
TVO 1986
Science SOL PH.6, PH.12, PH.13, PS.11
6 10-minute programs for grades 11-12
One Year Tape and Keep Rights
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These programs cover the fundamentals of electrostatics and current electricity, using animation and computer graphics to help students formulate mental images of abstract concepts. The first three programs, on electrostatics, explain the charging of objects by contact and induction. The concluding three, on current electricity, illustrate such concepts as electrical charge, current flow, potential difference, and resistance.

101. Conductors and Insulators—Program one establishes some of the fundamental principles in electrostatics, including the two types of electrostatic charge: negative and positive. Illustrations of the electron flow in charged particles at the atomic level show the difference between conductors and insulators.
Va. SOL Science: PH.6, PH.11, PH.12, PH.13

102. Charging and Discharging—This program examines the following electrostatic laws: like charges repel, unlike charges attract, and a charged object attracts a neutral object. Animation shows what happens when an electrically charged object is grounded and how a metal-leaf electroscope functions.
Va. SOL Science: PH.6, PH.11, PH.12, PH.13

103. Charging by Induction—A review of the concepts of charging by contact and discharging by grounding illustrates how a charged rod affects an electroscope. One application of charging by induction is demonstrated with a simulation of the action of lightning during a thunderstorm.
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104. Current Electricity—We examine how a flow of electric charge is harnessed when an electrostatically charged object is grounded. The dry cell, or "battery" is introduced as a source of current electricity. The concepts of complete circuits, their energy conversions, electrical currents, and the ampere-the unit for currents-are also illustrated.
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105. Potential Difference—Additional concepts needed for the complete description of an electric circuit-such as potential difference-are introduced. The analogy of a ski lift and skiers is used to demonstrate changes in gravitational potential energy and changes in electrical potential energy. Finally, the unit for potential difference, the volt, is explained.
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106. Resistance—Focusing on a simple circuit, the last program introduces the concept of resistance, or relative differences in conductivity which is explained in terms of varying numbers of free electrons and pathways for electron flow. The program concludes with a caution to viewers to beware of electricity's potential hazards.
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