



Discussion Guide for

ELECTRICITY: THE INVISIBLE RIVER OF ENERGY

OBJECTIVES

After viewing this program, students will be able to:

- Locate electrons in an atom.
- Contrast static and current electricity.
- Explain electromotive force.
- Compare conductors and insulators.
- Compare AC and DC current.
- Diagram a parallel circuit and a series circuit.
- Define coulombs, volts, amps, ohms, and watts.
- Explain the importance of resistance as a safety factor.
- Describe the chemical effects of electric current.
- Draw a simple electromagnet. Explain how solar cells generate electricity.

This program is part of the AIMS Interactive Science Essentials Series. This twenty-four part series covers four subject areas—Earth Science, Biology, Physics, and Chemistry. There are six programs in each subject area. The individual programs are divided into randomly accessible sections. A glossary provides written definitions of terms used in the program, and in most cases will run a section of the video where the word is used in context. A script of the narration is accessible, as well as a bulletin board containing a general introduction to the subject. A quiz allows the student to test their knowledge and the results are recorded for

you. In the teacher's section you can view each student's test responses and edit or create your own quiz and test questions.

OVERVIEW

Electricity: The Invisible River of Energy is part one of the Physics Essentials series which examines modern day physics. The modern world is based on the flow of electrical energy. This program provides students with a fundamental understanding of electricity by covering the following topics in depth: static and current electricity; parallel, series, and complex circuits; and how fuses and circuit breakers protect us from the hazards of overloading circuits. It will also define volts, ohms, amperes, watts, insulators, and conductors as well as examine how electricity is generated and is turned into mechanical energy by electric motors. As students learn about the relationship between magnetism and electricity, they will grow to understand just how important electricity is in everyday life.

TEACHER'S PREPARATION

- Before the student uses the program set up the computer so that they can easily reach the mouse and the keyboard.
- Load the CD-ROM into the computer so that it is ready for the student to begin using.
- While students are able to work at their own pace, some students may benefit from using the program more than once.

SUGGESTED DISCUSSION QUESTIONS

1. Draw a diagram of an atom having 6 protons, 6 neutrons, and 6 electrons. Label these subatomic particles. How does an atom become positively or negatively charged? How do atoms with like charges affect each other?
2. Contrast static and current electricity and give an example of each.
3. In your own words define electromotive force.
4. Compare the characteristics of conductors and insulators.
5. What specific characteristics of metals make them conductors?
6. List several ways insulators can be useful to people who work with electricity.
7. Compare the flow of electricity in AC and DC currents.
8. Diagram a basic parallel circuit and a series circuit indicating the significant differences.
9. Define each of the following units: coulombs, volts, amps, ohms, and watts.
10. Discuss why resistance in a fuse or circuit breaker is an important safety factor.
11. Describe some of the chemical effects that may be produced when electric current is run through substances such as fresh water and salt water.

12. Make a mind map showing how electromagnets are made. List some of the ways electromagnets are used in technology.

13. Explain how solar cells can generate a flow of electricity.

VOCABULARY

AC	Amps
Battery	Conductor
Current	DC electrons
Fuse	Generator
Insulators	ions
Lightning	Magnetism
Neutrons	Ohms
Parallel circuit	Protons
Resistance	Series circuit
Static	Static electricity
Volts	watts

PROGRAMS DETAILS

LENGTH:

23 minutes

SUBJECT AREAS:

Physics

AUDIENCE LEVELS:

Junior/Senior High

ORDER NUMBER:

1-9093SG

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