

ELECTRIFYING ELEMENTARY EXPERIENCES

Grade Level: First Grade
Presented by: Barbara E. Conaway, Michele A. Bardrick, West Nichols Hills,
Oklahoma City, OK
Length of Unit: 6 to 7 days

I. ABSTRACT

The focus of this science unit is to enable students to understand the basic concepts involved in electricity and the safety rules of using electricity daily. The students will become familiar with the inventions and findings of Thomas Edison as they are related to electricity. Many science skills will be taught as well as reinforced.

II. OVERVIEW

A. Concept Objectives

1. Through demonstrations and hands-on activities, students will have experiences with disassembling and reassembling a flashlight, and be able to identify the basic functions of the parts of the flashlight.
2. Through experimentation, students will be able to classify and sort objects and understand the use of a simple circuit, conductors, and insulators of electricity.
3. Students will understand, communicate verbally, and be able to demonstrate safety rules related to electricity.
4. Through the use of objects, demonstration, and prediction, students will gain knowledge of the characteristics of static electricity.
5. Students will become familiar with Thomas Edison's inventions through the use of brainstorming and discussion.

B. Content from Core Knowledge Sequence

1. Science: Grade 1; V. Introduction to Electricity

C. Skills

1. Observation
2. Comparing
3. Prediction
4. Classifying
5. Communicating
6. Application

III. BACKGROUND KNOWLEDGE

A. For Teachers

1. *What Your First Grader Needs to Know*, edited by E.D. Hirsch, Jr., Doubleday, 1997.
2. *The New True Book: Experiments with Electricity*, by Helen J. Challand, Children's Press, Chicago, 1986.

B. For Students

1. "Better safe than sorry" (Core Knowledge Kindergarten saying)
2. "A place for everything and everything in its place." (Kindergarten saying)
3. "If at first you don't succeed, try, try again." (1st Grade saying)
4. Practical measures for conserving energy and resources (Kdgn. Sequence)

IV. Resources

A. Books

1. Berger, Melvin. *All About Electricity*. New York: Scholastic, Inc., 1995
2. Challand, Helen J. *Experiments With Electricity*. Chicago: Children's Press, 1986
3. Bains, Rae. *Discovering Electricity*. Troll Associates, 1982.
4. Martin, Patricia Miles. *Thomas Alva Edison*. Putnam, 1971.

B. Videos

1. "Safety Rules," by Oklahoma Gas & Electric, 1995
2. "Knucklehead's Electric Safety," WileySquid Productions, 1994
3. "Thomas Edison & the Electric Light," Warner Nest Productions, 1993

V. Lessons

A. Lesson One: Electricity

1. Objectives/ Goals
 - a. Students will be able to define electricity.
 - b. Students will gain a general knowledge of how electricity works.
 - c. Students will be able to tell the things that require the use of electricity.
2. Materials
 - a. "Science Rock" cassette tape
 - b. *Experiments With Electricity* by Helen J. Challand
3. Key Vocabulary
 - a. electricity
 - b. experiment
4. Procedures/ Activities
 - a. Brainstorm with the students what they think electricity is.
 - b. Read the book *Experiments with Electricity* by Helen J. Challand.
 - c. Brainstorm and identify things that use electricity.

- d. Teach the song "Electricity, Electricity" from Science Rock cassette available at Barnes & Noble.
5. Evaluation/ Assessment
 - a. Observe student's involvement in the brainstorming activities.
 - b. Observe their excitement in participating and learning the song.

B. Lesson Two: The Flashlight and It's Parts

1. Objectives/ Goals
 - a. Students will be able to identify the basic functions of the parts of a flashlight.
 - b. Students will disassemble and reassemble a flashlight.
 - c. Students will compare the things in their house that use batteries versus electricity.
2. Materials
 - a. flashlights for each pair of students
 - b. batteries for the flashlights
 - c. flannelboard with labels and pictures
3. Key Vocabulary
 - a. flashlight
 - b. battery
 - c. bulb
 - d. disassemble
 - e. reassemble
 - f. function
4. Procedures/ Activities
 - a. Using a flannelboard and pieces showing the flashlight parts, label the parts while demonstrating for the students.
 - b. As the teacher disassembles a flashlight, discuss with them the function of each part.
 - c. After demonstrating how to reassemble the flashlight, students will disassemble and reassemble their flashlights with their partners. One student will disassemble and the other will reassemble. Have partners switch places for equal opportunity.
5. Evaluation/ Assessment
 - a. Students will use the flannelboard activity as a center activity for teacher to observe.
 - b. The teacher will observe students as they reassemble the flashlight.

C. Lesson Three: Simple Circuits, Conductors, and Insulators

1. Objectives/ Goals
 - a. Students will be able to identify a simple circuit.

- b. Students will be able to construct a simple circuit.
 - c. Students will be able to classify and sort objects as conductive and non-conductive.
2. Materials
 - a. objects to make a simple circuit (battery, wire, and small bulb)
 - b. baggies with items to sort and classify for each pair of students (steel wool, rubber band, clear tape, cord, paper clip, coin, wax paper, pencil, etc.)
 - c. paper, crayons
 - d. workmats (conductive/ nonconductive)
 - e. teacher- made game
 3. Key Vocabulary
 - a. conductor
 - b. insulator
 - c. simple circuit
 4. Procedures/ Activities
 - a. Demonstrate how to construct a simple circuit.
 - b. Using the simple circuit and the items in the baggie, students will work with a partner to test and classify objects onto their workmats.
 5. Evaluation/ Assessment
 - a. Using the gameboard, students will demonstrate their knowledge of conductors and insulators. *Gameboard (from a game such as "Candyland") should have some spaces labeled as "conductors" and some labeled as "insulators." Students roll the die. If they land on a conductor space, then the student must name a conductor. If a student lands on an insulator space, then they must name an insulator. If a student is unable to answer correctly, he must go back to his last place. If he answers correctly, he keeps his space.

D. Lesson Four: Safety Rules

1. Objectives/ Goals
 - a. Students will be able to communicate verbally about the safety rules related to electricity.
 - b. Students will identify the things that use electricity.
 - c. Students will demonstrate the rules related to the safe use of electricity.
2. Materials
 - a. *What Your First Grader Needs to Know*, edited by E. D. Hirsch, Jr., Doubleday, 1997. pg. 303.
 - b. O.G.& E. video, "Safety Rules"

- c. "Knucklehead's Electric Safety" video, WileySquidProductions, 1994.
 - d. crayons, paper
 - e. pictures of safe and unsafe conditions using electricity
 - f. magazines for pictures
 - g. newspapers
3. Key Vocabulary
- a. safety
 - b. shock
 - c. electricity
4. Procedures/ Activities
- a. Show video "Safety Rules" and "Knucklehead's Electric Safety."
 - b. Display chart of safety rules and read aloud to students.
 - c. Students will draw pictures showing safe use of electricity.
 - d. Students will cut pictures from magazines and construct a classroom safety collage.
 - e. Have a scavenger hunt through the school looking for things that use electricity.
 - f. Find pictures in the newspapers of safe and unsafe conditions using electricity.
5. Evaluation/ Assessment
- a. Role play safe conditions in the use of electricity.
 - b. Teacher-made test with pictures showing safe and unsafe conditions. Students indicate those that are safe and those that are unsafe.

E. Lesson Five: Static Electricity

1. Objectives/ Goals
- a. Students will be able to describe characteristics of static electricity.
 - b. Students will observe static electricity.
2. Materials
- a. "Scienceland." Volume 16, No. 128. Scienceland, Inc., New York, 1992.
 - b. Piece of fur
 - c. Carpet
 - d. Brushes
 - e. Balloons
 - f. Saran Wrap
 - g. Playing cards
3. Key Vocabulary
- a. static

- b. shock
- c. attract
- 4. Procedures/ Activities
 - a. Using "Scienceland," discuss with the students the meaning of static electricity. Static means "not moving." Everything carries some electricity.
 - b. Students will rub the fur with the brush the wrong way (against the grain) to demonstrate electricity.
 - c. Students will blow up a balloon, rub it several times on the carpet, and touch it to the wall. It will stick to the wall.
 - d. Students will rub a piece of Saran Wrap on their clothes, then hold it above their head. It will attract their hair and cause it to stand on end.
 - e. Students will rub a playing card on the carpet several times and it will stick to the wall.
- 5. Evaluation/ Assessment
 - a. Students will participate in all activities in centers while teacher observes.
 - b. Students will share what their favorite activity was, what happened, and what the activity demonstrated.

F. Lesson Six: Thomas Edison

- 1. Objectives/ Goals
 - a. Students will be able to identify Edison's inventions.
 - b. Students will be able to assess the value of Edison's discoveries.
 - c. Students will demonstrate an understanding of what Edison meant when he said, "Genius is about one percent inspiration and ninety-nine percent perspiration."
- 2. Materials
 - a. Poster board
 - b. Markers
 - c. Writing paper
 - d. Video: "Thomas Edison and the Electric Light."
- 3. Key Vocabulary
 - a. Thomas Edison
 - b. inventions
 - c. electric light
- 4. Procedures/ Activities
 - a. Show the video and discuss the inventions of Edison.
 - b. Students will draw pictures of Edison's inventions and, in small groups, make a mobile.

- c. Students will write a letter to Thomas Edison thanking him for their favorite invention.
 - d. Students will draw a picture and tell what Edison's quote means to them.
5. Evaluation/ Assessment
- a. Teacher observation of the mobiles showing knowledge of Edison's inventions.
 - b. Individual student/ teacher conference reviewing their letters.

VI. Culminating Activities

- A. Students may make an alphabet book of the things that use electricity.
- B. Have an "Invention Fair."

VII. Handouts/ Worksheets

VIII. Bibliography

Books:

- Electrical Energy*. Macmillian/ McGraw-Hill, 1993
- Bains, Rae. *Discovering Electricity*. Troll Associates, 1982.
- Berger, Melvin. *All About Electricity*. New York: Scholastic, Inc., 1995
- Berger, Melvin. *Switch On, Switch Off*. Harpers & Row Publishers, 1989.
- Challand, Helen J. *Experiments With Electricity*. Chicago: Children's Press, 1986
- Hirsch, E.D. Jr. *What Your First Grader Needs to Know*. New York: Dell Publishing, 1997
- Martin, Patricia Miles. *Thomas Alva Edison*. Putnam, 1971
- Scienceland*. Volume 16, Number 128. New York: Scienceland, Inc., 1992

Videos:

- "Knuckleheads Electric Safety," WileySquid Productions, 1994
- "Safety Rules," Oklahoma Gas & Electric Co., Oklahoma City, OK, 1995
- "Thomas Edison & the Electric Light," Irving, Texas: Living History Productions, 1993
1-800-452-4485

Cassettes

- "Science Rock," Schoolhouse Rock