

Elementary Electricity Lesson Plan

TITLE: Brown Bag Science

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GRADE LEVEL: Appropriate for grades 1-5

OVERVIEW: This is a hands-on science investigation on electricity. Students learn through the discovery method how electricity works. The student's natural curiosity and sense of exploration will enable them to explore and learn on their own with little input from the teacher.

PURPOSE: The purpose of this investigation is to introduce students to the concept of electricity and dispel any fears they may have that they don't understand the concept.

OBJECTIVES: As a result of this activity, the students will:

1. Be able to draw and explain how an electrical circuit works.
2. Be able to define and use vocabulary associated with electricity.

Vocabulary: circuits, electrons, force, conductors, switch, insulation

3. Be able to construct a simple circuit and a parallel circuit.
4. Be able to make an electrical motor work and add a switch to turn it on and off.

RESOURCES/MATERIALS: All items can be bought very inexpensively at Radio Shack or from Edmond Scientific Elementary Catalogue.

ACTIVITIES AND PROCEDURES:

1. The teacher will prepare ahead of time a kit for each two or three students. If students work in larger groups, some will not get hands on experience. Each kit will include a brown lunch sack, one C cell battery, two insulated copper wires, one battery holder and two brass battery clips, one small flashlight bulb and socket. All these items must be separate and in random order in the bag. The bag must be closed, sometimes I close it with one of the copper wires like a twisty.
2. Give each pair of students a bag and allow 10 minutes for exploration. During this time the teacher must remain quiet unless asked a question. The students will be very busy trying to find out what to do with the contents of the bag. Do not give any clues as to use of contents. This is exploration time.

3. Before the 10 minutes are up some students will have undoubtedly have made a simple circuit with the contents of the bag. At this time you can stop for discussion. Have the students explain what they did so others can follow. You can now talk about the concept of electricity, the flow of electrons through a conductor, discuss what things are conductors, etc. Discuss where the electricity comes from and where it goes, how does it make the light bulb light. Discuss how the battery stores electricity. How do we know that electrons are flowing?

4. After all students have been successful with the simple circuit, each pair must draw what they have done in their science log or on a piece of paper. Older kids will label all the parts of the circuit, etc.

5. At this time, I give each pair of students a second battery and let them experiment. Does the second battery change anything? Does the light get brighter or dimmer? Does the way the batteries are connected make any difference in the way the light works. Try different ways of connecting the batteries. Some students will make a parallel circuit. At this time stop and have the students tell what they did. Discuss the concept of parallel circuits. Each pair of students draws what they have done.

6. A follow up activity if you have time is to have switches available. For those students that finish quickly, they get a switch. See if they can connect it into the circuit to make the light come on and off. Discuss how electricity flows. Why does the electricity not cross over the switch when it is open? Does electricity jump? Again, each pair must draw what they have done. This completes the thinking process and makes the learning more personal.

7. Electrical motors can also be added. Students enjoy making small fans out of the motors. Each pair of students can exchange their light bulb and socket for a small electric motor and try to connect it into the circuit. Torn or cut paper makes great fan blades. Let the students experiment to find the best size and shape to make the fan go very fast.

8. The role of the teacher in this activity is to be a facilitator. Please refrain from your urge to teach. In this activity, students discover the concept of electricity. The less you show and tell the better.

TYING IT ALL TOGETHER:

1. Check each pair of students diagrams and leave small personal messages so they will know that you have looked at what they have done.

2. Encourage all students to share what they have learned with other students and parents.

3. I have done this activity with students in grades 1-5 and all have learned and had great fun doing so. For the younger students their drawings will be less sophisticated

and you do not need to dwell on vocabulary. With older students, they will need to label and use the vocabulary correctly. Most students are so eager to get hands on experience in science and with this activity, all students can experience success.