

Lesson Plan for Homemade Calculator

Introduction/Background Info

How do electronic devices such as remote controls, calculators, and cell phones work? All of these devices use batteries as a source of power, and contain circuits made up of wires, light bulbs and other items. In the language of electrical engineering, the battery is called an energy source because it provides energy and a light bulb is called an energy sink because it uses up energy. Metal wires are one example of electrical conductors, materials that allow electricity to flow freely. A circuit will work if it is "complete", which means that a path has been created that connects the positive end of the battery to the negative end of the battery.

Topics

Electrical engineering

Circuit: electricity, energy source, energy sink, electrical conductor, breadboard

Overview of Lesson Process

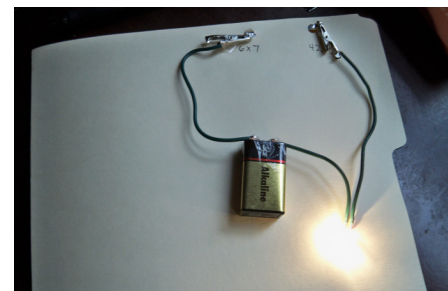
- 1) Introduce activity and topics of electrical engineering and circuitry. What are some electronics used in daily life? How do they work?
- 2) Break up into groups of students and mentors to create the homemade calculator.
- 3) Wrap-up, what have you learned today? Review and quiz students about electrical engineering and circuitry. Discuss electrical and mechanical engineering jobs that involve the design of electronic equipment.

Materials

Manila folder
LED Christmas lights
Wire
Wire cutter
Masking tape
Aluminum foil
2 alligator clips
Hole punch
Battery
Markers to decorate



BACK



FRONT

Procedures

1. Design the homemade calculator by sketching a circuit made up of a LED light, wires, battery, aluminum foil, and alligator clips. Also, write down a list of questions and answers that you would like to use in your calculator.
2. Punch two holes in your manila folder. Label one hole with a question, and label the other hole with the answer to this question.
3. Tape a strip of aluminum foil to the folder such that the two ends of the foil stick out of the holes.
4. Assemble the rest of your circuit by taping one wire to the positive end of the battery, and the other wire to the negative end of the battery (these wires should be attached to the LED light as well).
5. Attach the alligator clips to the free ends of the wires.
6. Test the circuit by connecting one alligator clip to each end of the aluminum foil. The LED should light up if your circuit is working correctly.
7. Create additional "questions" and "answers".

Tips:

- If aluminum foil is crisscrossing the manila folder, prevent contact between different strips of foil by placing masking tape between the layers of foil.

Resources: <http://www.eia.doe.gov/kids/energyfacts/sources/electricity.html>