Light it Up with a Closed Circuit
5th Grade

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References:

- http://butterfly.ctl.sri.com/pals/tasks/5-8/ME122/print.html

Benchmarks:

- PS 3- Describe that electrical current in a circuit can produce thermal energy, light, sound and/or magnetic forces
- PS 4- Trace how electrical current travels by creating a simple electric circuit that will light a bulb

Objectives:

As an introduction to electricity, students will learn how to create a complete circuit. After creating a circuit and lighting their light bulb, they will need to draw the circuit in their science journal.

Materials

D batteries
Battery holders
Alligator clips
Light bulbs

Initial Observation/Demonstration:

This is the first time we have discussed electrical energy (other than its conversion into thermal energy) so the topic will be introduced by asking the students to give some facts about electricity. After this, I will give a brief introduction of electricity (i.e.: electricity is a form of energy, it can flow or move like water does, it goes very, VERY fast etc.) Then the students will be given all the materials they need to complete a circuit, and they will be given time to figure out how to light the bulb without any instruction.

Initial Observations:

Students should find that the color of wire does not matter. They should also see that it does not matter which (+) or (-) lead touches the light bulb at a certain spot, as long as they are both in contact. They will describe what a "closed circuit" is.

Initial Model:

The students should already know that the current will not flow if there are any breaks in the circuit. They should be able to find potential problems in the circuit (i.e.: the alligator clip is not clipped tightly to the battery).

Procedure:

After the initial introduction to electricity, the students will be given all the materials they need to complete a circuit, and they will be given time to figure out how to light the bulb without any instruction. This inquiry based method should allow the material to sink in a little more than the teacher describing how to make a circuit to them.

Discussion/Summary:

The students should find that lighting the bulb is easier than they thought it would be. They should also find that any small gap in the circuit causes the current to stop flowing at that point. They should also be able to recognize that all of the materials used are electrical conductors. A science journal question might be "Why does electricity flow through the alligator clips even though they are covered in plastic?" This will be discussed as we get more in depth with electricity.