

## PHYS 115

### Example Summary

#### E01-Batteries and Bulbs

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The purpose of this experiment was to show how current flows in an electrical circuit using a battery, wire, and light bulb. My partner and I were asked to arrange these pieces in a way that would make the bulb light. Our first attempt was to connect the positive end of the battery and the light bulb together using the wire, which we found did not light the bulb. We realized that this setup could not work because a closed path is needed for current to flow. As a class we talked about how current is the movement of electric charge through a material. Much like a human's circulatory system where blood flows in a complete, closed path, electricity needs a closed path in order to flow. If the path is not closed, the electric charge will be stuck where it is and have nowhere to go, which is why the bulb won't light. We tested our assumption by connecting one end of the wire to the negative end of the battery, and had the other end of the wire touch both the positive end of the battery and the light bulb simultaneously. We thought that this would make a closed path, but we still did not see any light from the bulb. This confused us since it appeared that we had a complete circuit.

When we discussed the experiment in class, we learned what the issue with our circuit design was. A light bulb, just like the battery, has two ends—we called these “terminals”. In order for the bulb to light up, it must be connected with the battery so that the bulb is part of the closed path. One of the terminals of the light bulb was the bottom of the bulb, while the other terminal was the outside casing. We only had one of the terminals connected to the circuit at first. Sure enough, when we touched the bottom of the bulb to the positive side of the battery, one end of the wire to the casing of the bulb, and the other end of the wire to the negative side of the battery, we saw the bulb light up. Our initial guess was confirmed. The bulb will only light if there is a closed path for the electrons to flow, from one end of the battery, through the light bulb, and back to the other end of the battery.