



Activity 12: Resisting My Circuit

What happens when we add a resistor to a circuit?

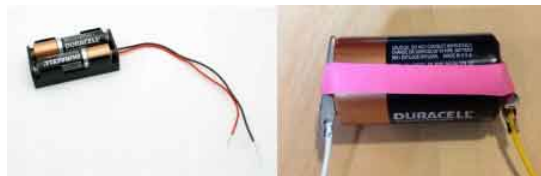
Materials

- Electricity Kit Items: battery holder, light bulb, light bulb holder, one connecting wire
 - two AA batteries
 - Graphite Resistor Observation Chart
 - Paper Circuit
- <https://www.youtube.com/watch?v=FpUdQopj1Lg>
- piece of paper
 - ruler
 - #2 pencil (The softer the pencil the better, so if you have a 2B art pencil or softer, use that.)
 - optional if you do not have the light bulb (LED light) and three connecting wires

Instructions

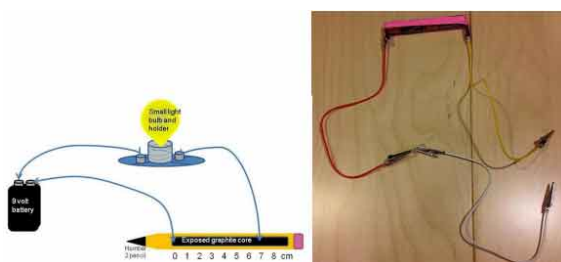
1. Add two AA batteries to your battery holder. Or, connect two AA batteries end to end and tape together. (Be sure you connect the positive end of one battery to the negative end of the other.)

(Start by connecting two wires to the taped-together AA batteries, one connecting wire on each end. Use the heavy rubber band to hold the ends of the wires to the ends of the AA batteries. Put the rubber band on the battery first, and then slide the wire end underneath.)



2. Construct your circuit. Connect one wire to the light bulb holder and connect another wire to the other side of the light bulb holder.

Or, connect a free end of one of the wires to one of the metal pegs of the LED. Use another connecting wire to attach to the other metal peg of the LED. You should now have an open loop that has three connecting wires, two AA batteries taped together, and a LED all connected together.



3. Test your circuit by touching the free ends of the connecting wires together. (If the LED does not light up, disconnect it and reverse it. (LEDs work in only one direction in circuits.))

4. On a piece of paper, use the pencil to draw a rectangle about 4 cm long and 0.5 cm wide. Fill the rectangle completely with pencil - be sure the rectangle is very dark and heavy with the graphite from the pencil.

5. Press the end of one wire to one end of the pencil rectangle. Press the end of the other wire to the other far end of the pencil rectangle. What do you see?
Record what you saw in the *Graphite Resistor Observation Chart*.

6. Press the end of one wire to one end of the pencil rectangle. Press the end of the other wire to the other far end of the pencil rectangle. Now slide the end of the second wire slowly back and forth, closer and then further away from the first wire. What do you see?
Record what you saw in the *Graphite Resistor Observation Chart*.

7. Having trouble getting results? Try watching the video **Paper Circuit**, then trying Steps 5-7 again.

8. When you have completed writing observations in the *Graphite Resistor Observation Chart*, write an explanation for what you observed.

Graphite Resistor Observation Chart	
Placement of Connecting Wires	What Do You See?
Connecting wires far apart on pencil rectangle	
Connecting wires close together on pencil rectangle	
Connecting wires move slowly back and forth on connecting wire	
Explanation	