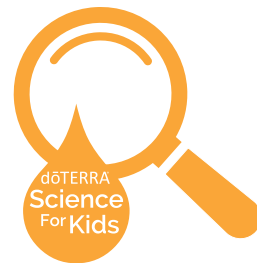


Electricity - Circuit



Note: This experiment involves the use of small amounts of electricity. Make sure you have the supervision of a parent or another adult to ensure appropriate safety measures are followed.



What You'll Need:

- 2 AA batteries
- A small flashlight bulb
(This should be an incandescent bulb that requires less than 3 volts.)
- Any kind of tape
- 16 inches of uninsulated copper wire
(You can find this at a local hardware store. Uninsulated wire does not have a plastic sheath around the wire.)



What You'll Do:

1. In this experiment, you will build an electric circuit. To begin, take your copper wire and cut two 8 inch lengths of wire.
2. Now, take one wire and tape one end of it to the metal on the positive side of one of the batteries. Look at the diagram from the dōTERRA Science for Kids unit on Electricity if you can't remember which side is the positive side.
3. Next, take the other piece of wire and tape one end of it to the metal on the negative side of the same battery.
4. Take the non-taped end of the wire that you connected to the positive side of the battery and tape it to the metal part of the light bulb just below the glass.
5. Take the free end of the wire connected to the negative side of the battery and touch it to the round metal on the bottom of the light bulb, but don't tape it. You just completed an electrical circuit! Take a moment to record your observations by answering questions 1 and 2 on your "What You Discovered" worksheet.
6. Now you are going to make another circuit. Remove the tape and wires from your battery, but leave the wire that's taped to the light bulb.

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7. Take the two batteries and set them back to back so that the positive end of one is connected to the negative end of the other. Then tape around them so that they stay together, forming a double battery that is twice as long as one battery.
8. Take the end of the wires connected to the light bulb and connect one wire to the positive side of your double battery.
9. Then take the other wire and connect it to the negative end of your double battery.
10. Take that same wire (which is not taped to the light bulb) and touch it to the light bulb. Do you notice a difference in brightness? Use your observations to finish your "What You Discovered" worksheet.



What Does It Mean?

In this experiment, you built an electric circuit! Circuits like these are in every electronic device we use, including your TV, computer, or telephone. AA batteries have a voltage of 1.5 Volts. When you put two batteries back to back, you add their voltages together and make a battery with double the voltage (3 Volts).

Remember that a higher voltage for electrons is like a steeper hill for water. A higher voltage can push electrons faster through a wire, just like a steeper hill makes water flow faster down a pipe. The light bulb got brighter because the electrons were flowing faster, since we had two batteries pushing electrons through the circuit. This is why many devices require multiple batteries to work.



What to Do Next:

- With your parent's help and supervision, keep experimenting with different batteries and circuits to see how the brightness of the light changes.
- With your parent's permission, share pictures of your circuit on social media using the hashtags #doterrascienceforkids and #featureme for a chance to be featured on the dōTERRA® Science Facebook page.
- Revisit the Science for Kids tab on the dōTERRA Science Blog for more fun science experiments and activities.



What You Discovered:

As part of your electricity #2 experiment, answer the questions below.

1. What happened when you touched the last wire to the bottom of the light bulb?

2. Draw a diagram of your circuit.

3. Was there a difference in the bulb's brightness in your second circuit? If so, what was the difference?

4. Can you explain why the brightness changed in your second circuit?

5. Draw a diagram of your second circuit.