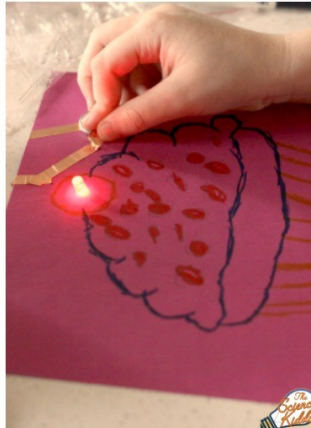
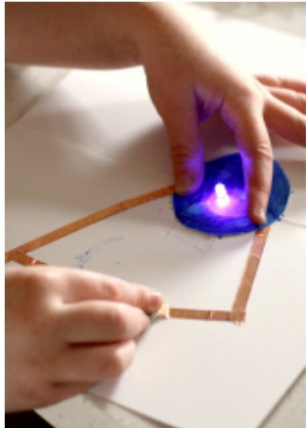




easy

# STEAM for Kids paper circuit cards



*\*Safety Note\* Button batteries are very dangerous if they are swallowed. Please be sure that the children making paper circuit art are old enough not to put objects into their mouths. After the paper circuit cards are complete, please instruct the children not to leave them in a location where a younger brother or sister can get to them.*

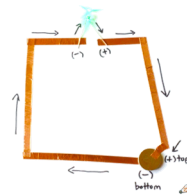
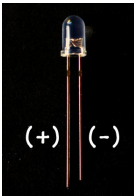
## You will need:

- Piece of card,
- Scissors
- Copper tape
- 3V lithium button battery
- 5mm LEDs

There's nothing too complicated about making a circuit that actually works. All you have to remember is that there must be a direct path from the negative end of the battery, through the light, and back to the positive end of the battery.

On a 3V button battery, the negative side is usually the bottom of the battery while the positive side is the top. It will be labeled on the battery.

If you look at the 5mm LED you will notice that it has two pins. One pin is slightly longer than the other one. The longer pin is the positive end and the shorter pin is the negative end. This matters! Do test the LED to make sure it works.



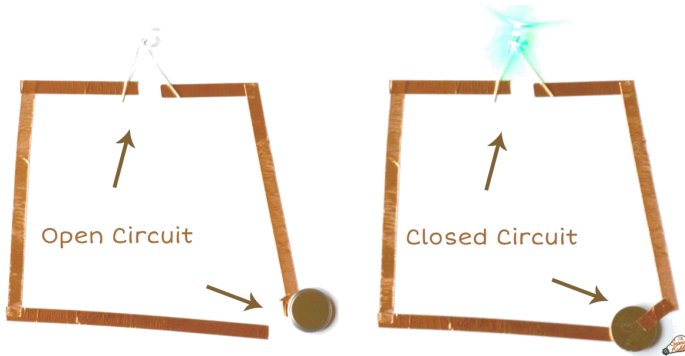
Electrons must flow from the negative end of the battery to the negative end of the LED. If the LED is oriented incorrectly it will not light up.

## Constructing Paper Circuit Cards

Making a simple circuit: place the copper tape on some card stock in the shape of a rectangle, leaving one small gap along one of the sides. Three of the corners of the tape were connected and a gap left between the ends of the tape in the fourth corner.

Use copper tape to attach each pin of the LED to either side of the gap. It's really important that the two pins don't touch each other and that there is a gap in the tape so that the light doesn't get short circuited.

Place a coin cell battery in the open corner so that it touches only one



end of the copper tape. Using another piece of copper tape, connect the top of the coin cell battery to the other end of the tape in the corner.

The LED should light up!

If the LED doesn't light up when you try this, simply flip the battery over and try again. Check all the connections to make sure there is a continuous path from the negative end of the battery, through the negative pin of the LED, out the positive pin of the LED, and back to the positive end of the battery.

You could try different shapes: a candle with the LED as the flame, a star with one of the points as the LED...