Maker Skill: Paper Circuits- LED
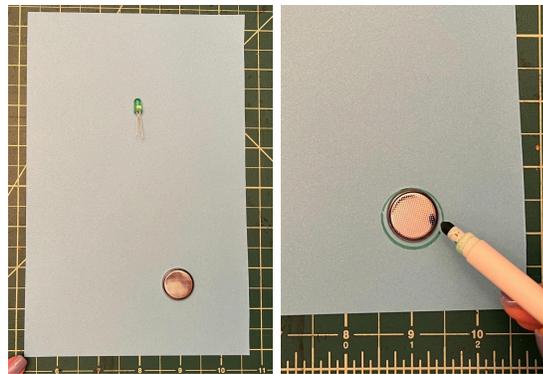
This technique uses a coin cell battery, and LED and copper tape to create a circuit on a piece of paper or other surface.

1. Decide where your LED and battery will go on the paper. The battery should be placed near a corner of the paper. Draw a circle where your battery will be placed.


2. Temporarily tape your battery in place by folding a piece of tape and sticking it to the back. Use a marker to color on the side of the battery that's showing. Quickly (before the marker dries) fold over the corner of the paper and press down on the battery, so that the marker on the battery leaves a mark on the paper where it touched. Unfold the paper and remove the battery.
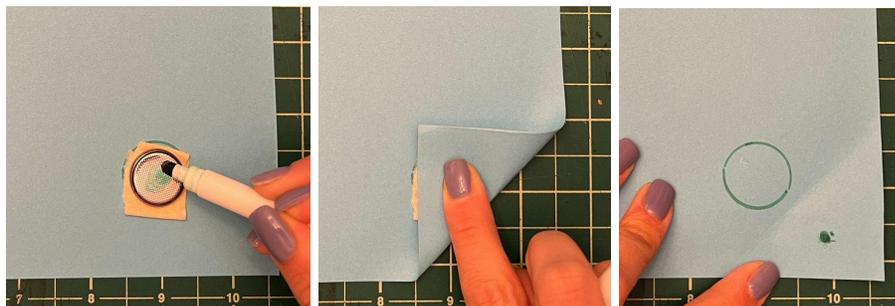
3. Draw a line from the spot where your LED will go all the way to the battery circle. Any turns in the line should be right angles, not curves. Mark a plus sign (positive) on both ends of the line.

4. Draw a second line from the LED's place to the mark left by the battery when you folded it over. Leave enough space between the start of the 2 lines for the LED to sit. Any turns in the line should be right angles, not curves. Mark a minus sign (negative) on both ends of the line.
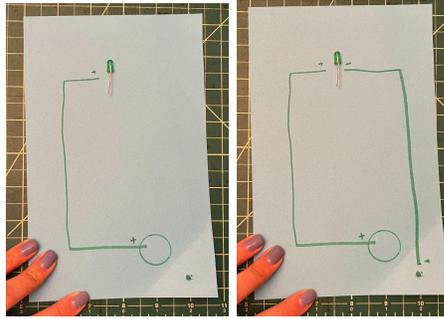

5. Begin applying copper tape to the positive line on your circuit. Peel the backing off the end of your copper tape to expose the adhesive side. Stick the end of your copper tape down into the battery circle. Slowly cover the line you drew with copper tape, peeling off the white backing and sticking down the tape as you go.
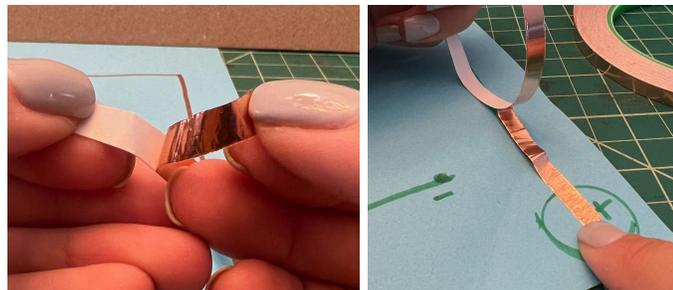

6. When you reach a turn in your line, do not rip your copper tape! Instead, fold the tape over in the opposite direction of the turn and press down to create a crease. The sticky side of your tape will now be facing up. Fold the tape over again, this time in the direction of your line, and press down to create another crease. Continue taping over your line.
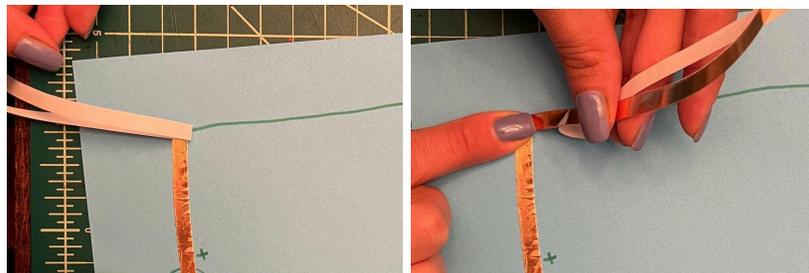
7. When you reach the end of your line, rip the tape with your fingers.

8. Cover the negative line on your circuit with copper tape in the same way.
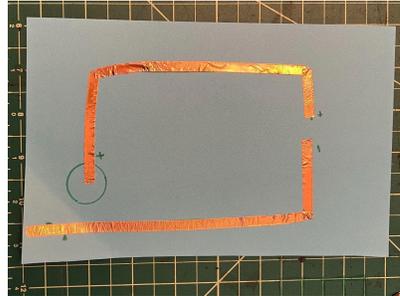
9. Find the positive side of your battery and tape it face down in the battery circle using scotch tape or masking tape. The positive side is usually shinier and smoother, and is marked with a plus sign (+). Ensure your tape doesn't cover the whole battery so that it can still make contact with the copper tape when the corner is folded over.
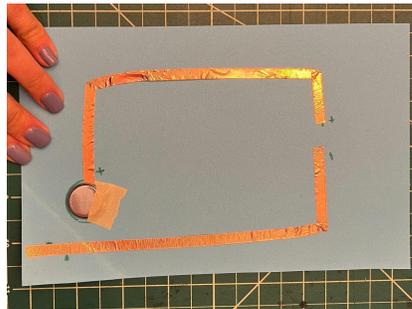

10. Find the positive and negative legs of your LED- the positive leg will be longer. Bend out the legs of the LED in opposite directions so they can connect the two sides of tape.
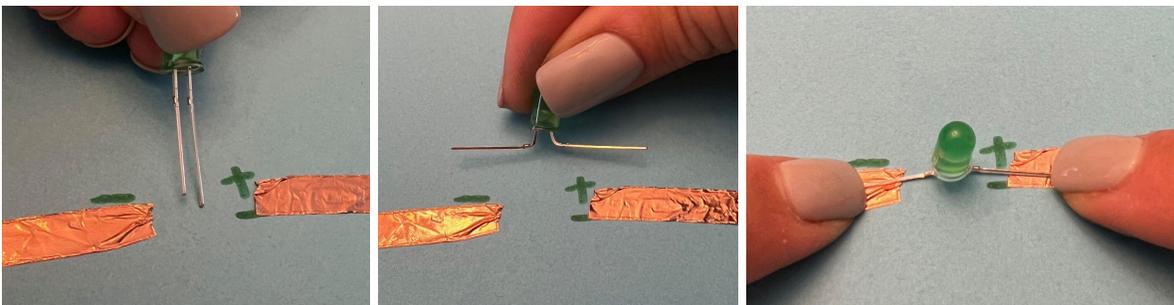
11. Tape the LED legs onto the copper tape.

12. Fold the corner of the circuit over so that the copper tape makes contact with the battery and closes the circuit. To keep the LED on, secure the fold with a paperclip or binder clip.
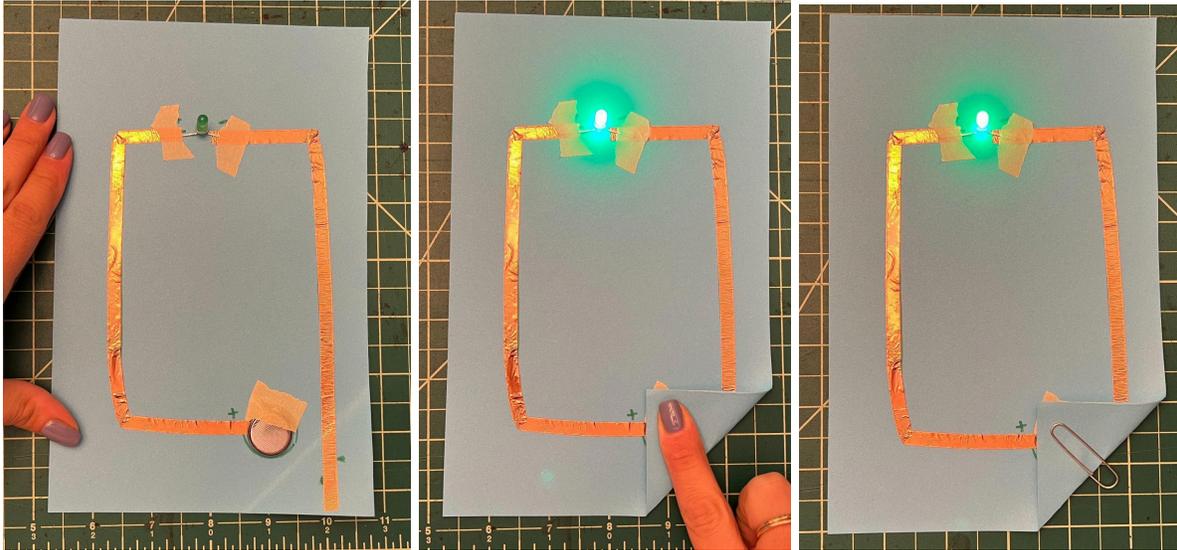
13. Troubleshoot the circuit. If the LED isn't turning on, ensure that each circuit component is making contact with the copper tape. Make sure there are no gaps in the copper tape connection. If it still isn't working, try flipping the LED around so that the opposite legs are connected to the positive and negative sides of the battery.