

## Paper Circuits

### **Materials:**

- Image (In this case, a shamrock)
- 1 coin battery
- 2 red LED
- Copper Tape
- Scotch Tape
- Binder Clip
- Scissors

### **Directions:**

- Punch holes where you would like the LED to shine through.
- Lay your image over a blank sheet of paper and mark the holes.
- Trace your battery in the corner of the paper.
- Fold a corner over and trace the battery from the top (almost like how you would rub over it to make a circle).
- Mark the fold line.
- Plan your copper tape paths. Most run two pieces of copper tape parallel to one another.
- The Plus side of the battery and the plus side of the LED (longer leg) should correspond.
- The Negative side of the battery and the negative side of the LED (shorter leg) should correspond.
- Place the copper tape on the paths you planned, and connect the LEDs with Scotch tape.
- Fold the corner of your paper over the battery to complete the circuit and hold with a binder clip.

### **Standards:**

21st Century: Elaborates, refines, analyzes, and evaluates their own ideas in order to improve and maximize creative efforts

ISTE 4c Students develop, test and refine prototypes as part of a cyclical design process.

4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

**Resources:**

[https://tinkering.exploratorium.edu/sites/default/files/Instructions/paper\\_circuits.pdf](https://tinkering.exploratorium.edu/sites/default/files/Instructions/paper_circuits.pdf)

<https://www.makerspaces.com/makerspace-project-light-saber-paper-circuits/>

<http://www.covington.kyschools.us/userfiles/15/My%20Files/4th%20gr%20add%20chg/Using%20multimedia%20circuits%20to%20teach%20electricity%20in%20elementary%20school.pdf?id=4273>

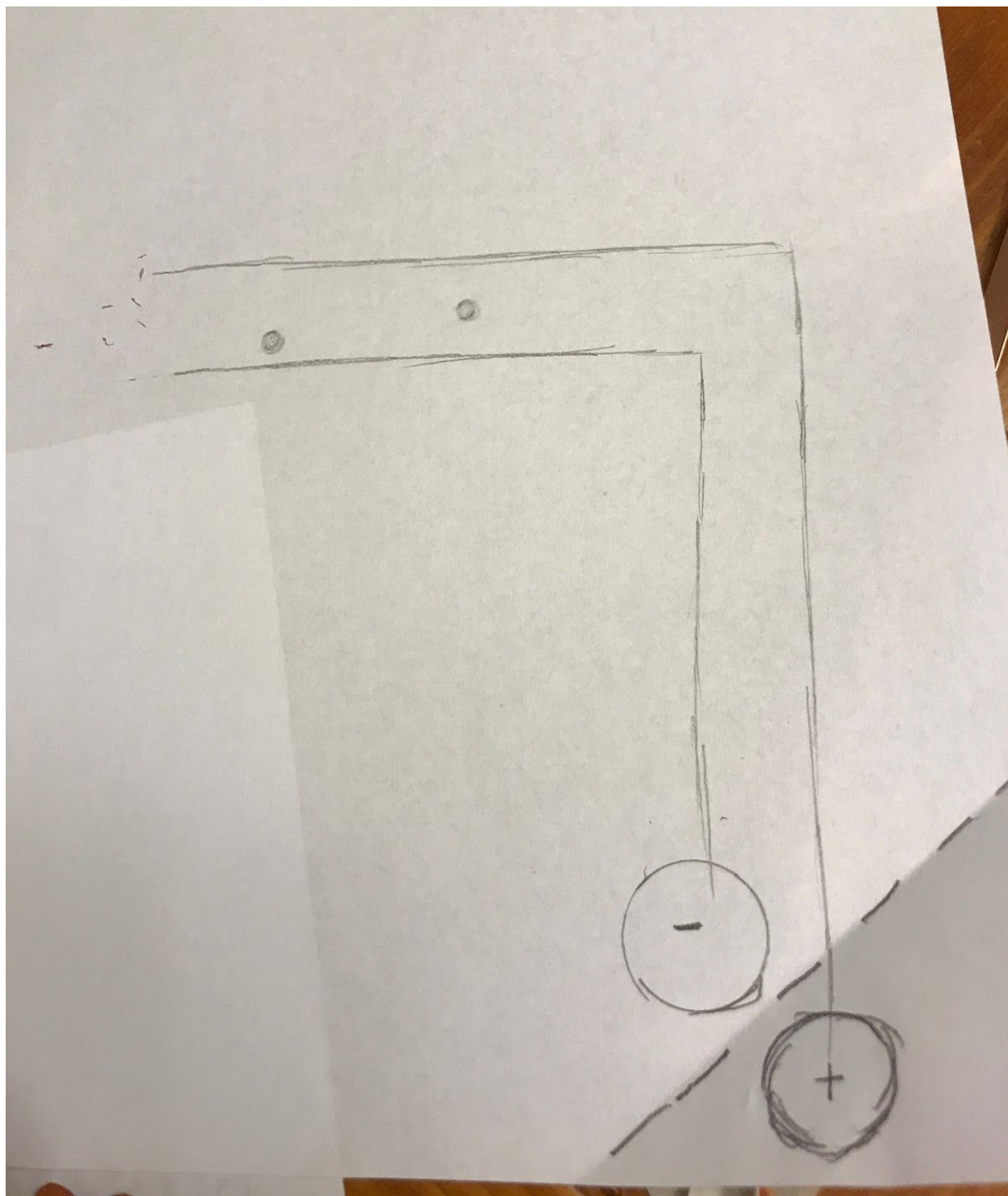
<http://ngss.nsta.org/DisciplinaryCoreIdeas.aspx?id=8&detailid=67>



Punch holes.

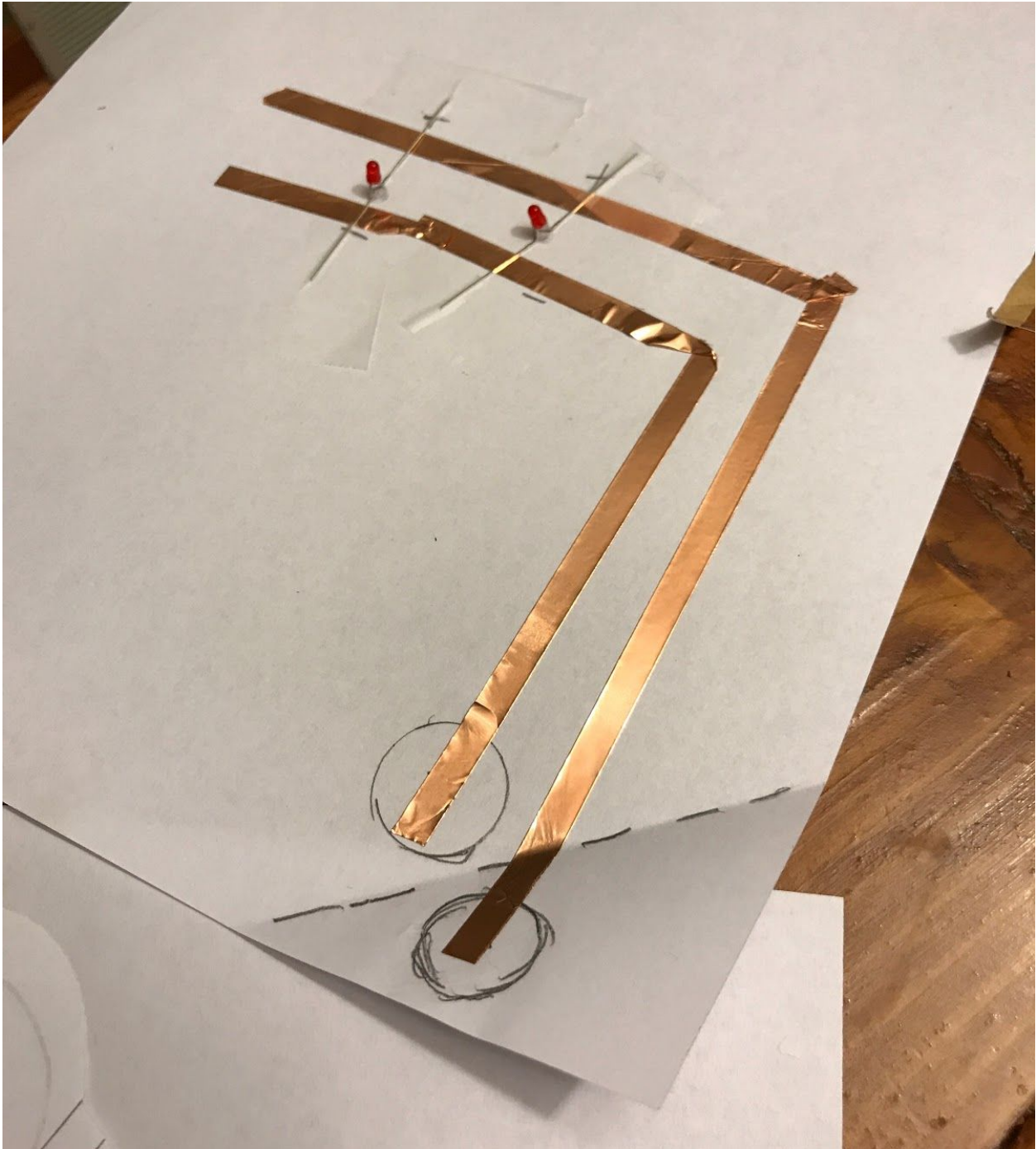


Trace punched holes. Trace battery. Fold corner and trace on opposite side.  
Mark positive and negative. Create paths for copper tape.

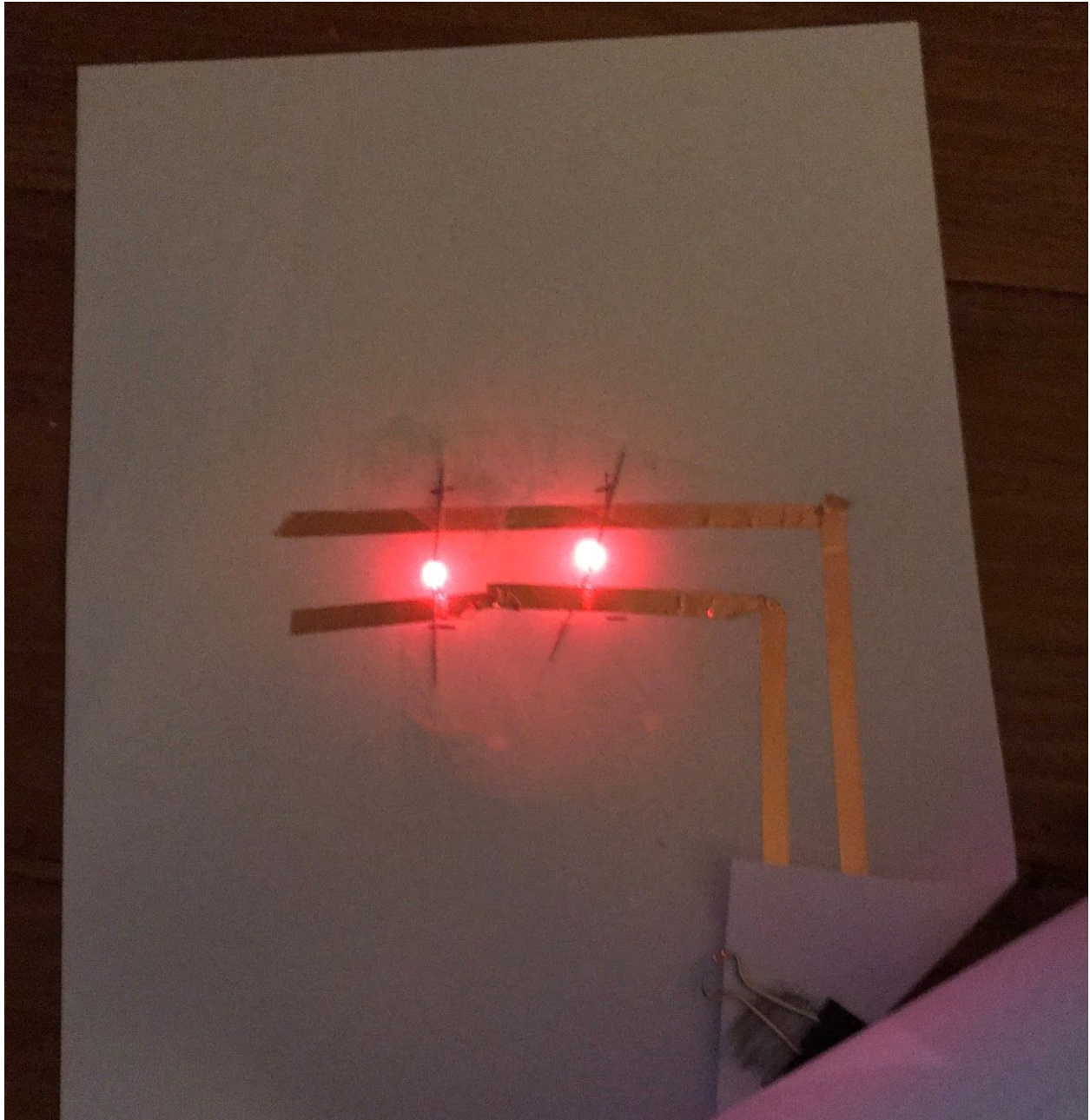




Place copper tape and LEDs. Be sure long leg of LED corresponds to positive side of battery.



Attach battery and hold in place with a binder clip.





Place image over paper circuit and enjoy!

