

Circuitry

Activity 4—Light-Up Art: Make a Paper Circuit

Materials Needed:

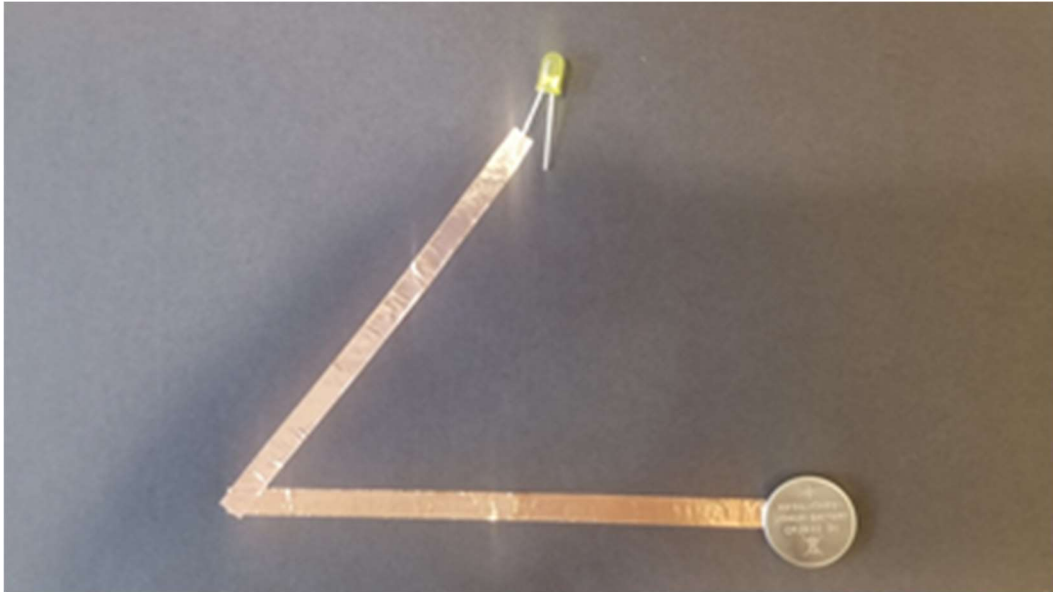
- heavy paper (such as construction paper or cardstock)
- LED light(s) (1 provided)
- copper tape (provided) or aluminum foil (provided) and tape
- pens, markers, crayons, etc. to decorate
- 3V coin cell battery (provided in kit)
- non-conductive tape such as Scotch tape
- scissors

What To Do:

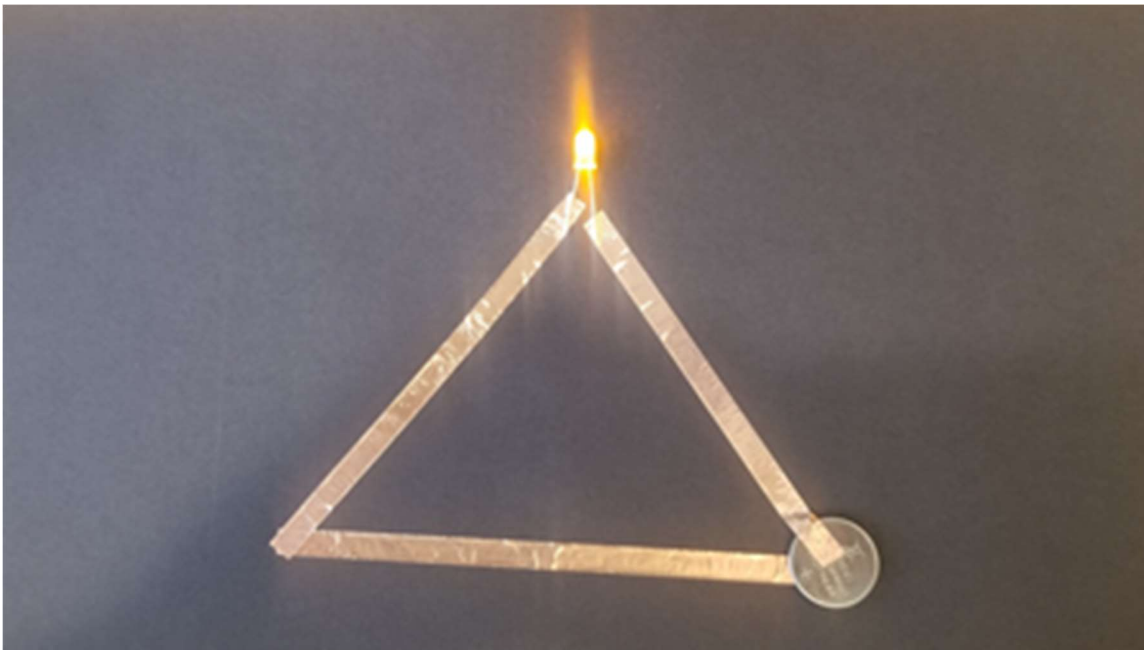
1. **Pick out a heavy piece of paper and drawing/coloring supplies to make your project.** Any kind of heavy paper will work, like cardstock or construction paper, and any writing utensils (markers, crayons, colored pencils) can be used to decorate.
2. **Using the copper tape, attach your 3V coin cell battery, negative (textured) side down, to the paper.** If you fold the end of the tape so that some of the adhesive is face-up, you can place your battery. You can add a small piece non-conductive tape (like Scotch tape) if it isn't sticking well enough.



2. **Make a line with the tape or foil to the LED's negative (shorter) lead—the anode.** Note: you will need to tape down both the battery and LED with Scotch tape if using foil. To create your circuit, you need to connect the battery's negative side to the LED's negative lead (anode—the shorter prong). The picture below shows that you can use different designs with the copper tape, as long as you overlap the pieces of tape so the battery's power can flow continuously.



3. **Complete the circuit by using the copper tape or foil to connect the LED's positive lead, the cathode (longer prong) to the positive (smooth) side of the battery.** Notice how the copper tape connecting the underside of the battery does not touch the copper tape attached to the top of the battery. If the copper tape is used correctly and connecting the leads to the correct pole of the battery, your LED should light up!



4. **Take it further: get creative!** How else could you incorporate lights and circuits into your arts and crafts? You could make decorations for different holidays, special greeting cards. How else can you use these concepts to design other things?

Tip: You can create your circuit on the back of the paper to light up your LEDs, then poke a hole through to the front to let them shine through into your artwork!



STEAM Connections

Circuits don't just make great science, technology, and engineering activities: you can also make STEAM-inspired arts and crafts with simple circuits! If you've ever seen a greeting card with lights or music in it, chances are there is a tiny coin cell battery and metal wiring or tape creating a circuit. When you open the card, a small metal switch closes the circuit, activating the lights or music. Now you can do this at home, too, with this activity (at least, the version with lights)! You now can make your homemade cards extra special with some technological know-how. Imagine the possibilities!

This activity extends the science topics learned while making the simple circuits (how to make a closed circuit) and using the Energy Stick (conductivity). It also uses some of the same items and principals from the flashlight activity so that you can become more comfortable working with these *components*.