



LED Bracelets

Add some sparkle to your outfit! Explore how to make a closed circuit light up a stylist bracelet. Design a charm, add a small LED light circuit, and watch your fashion shine.

TEKS:

SCI 4.6 A: The student is expected to differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal.

SCI 4.6 C: The student is expected to demonstrate that electricity travels in a closed path, creating an electrical circuit.

SCI 5.6 B: The student is expected to demonstrate that the flow of electricity in closed circuits can produce light, heat, or sound.

SCI 6.9 C: The student is expected to demonstrate energy transformations such as energy in a flashlight battery changes from chemical energy to electrical energy to light energy.

Materials:

- 3V coin cell battery (CR 2032)
- 5mm LED light
- Pipe cleaner
- $\frac{3}{4}$ x 1 $\frac{1}{2}$ -inch rectangle of craft foam
- Scissors
- Small binder clip
- 2 x 2-inch square of craft foam

How To:

1. Use scissors to cut and create a charm out of the 2 x 2-inch foam piece that you would like to wear on your bracelet. Make sure to plan a place for your LED light to go in your charm.
2. Once your design is completed, poke the legs of the LED light through the foam piece. Then, keeping the legs of the LED as straight as possible, insert the coin cell battery so the positive side touches the longer leg of the LED and the negative side touches the shorter leg of the LED. This will complete the circuit and the light should glow!

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3. To keep your LED lit, fold the $\frac{3}{4}$ x 1 $\frac{1}{2}$ -inch piece of foam in half horizontally (hamburger style). Open the binder clip and place the folded piece of foam in it with the opening to the top, then clip the binder clip with foam over the battery and LED legs. This clip will hold your LED light's legs against the battery while the foam stops the metal binder clip from short-circuiting the light.
4. Attach a pipe cleaner to the silver arms of the binder clip and tie/twist the bracelet around your wrist.
5. To turn off the light, remove the battery from the binder clip.

STEM Explanation:

A circuit is a complete and closed path around which electricity can flow. It must include a power source, such as a battery, and a destination that requires electricity in order to work, such as a light bulb or fan. Materials that allow electric current to pass through them easily, called conductors, are used to link the positive and negative ends of a battery to the item that needs power, creating a circuit.

The bracelet you just made relies on a circuit for the LED bulb to light up. Electrical current travels from the battery through the legs of the LED light to complete the circuit. This flow of energy happens from the positive side of the coin cell battery to the LED and back to the negative side of the battery. The legs of the LED need to be connected correctly for the circuit to function. Removing the battery from the light opens the circuit and stops the electrical current from reaching the bulb. The binder clip needs to be insulated with an additional piece of foam to avoid the electricity traveling in the wrong direction and shorting the circuit.

Career Connection:

Circuit designers work with small-scale circuits that are put in larger products. They are given requirements to follow, need stay on budget, and meet deadlines. Their circuits are used in cell phones, TVs, toaster ovens, computers, and many other devices.

Resource:

<https://www.instructables.com/id/LED-Pipe-Cleaner-Bracelet/>

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