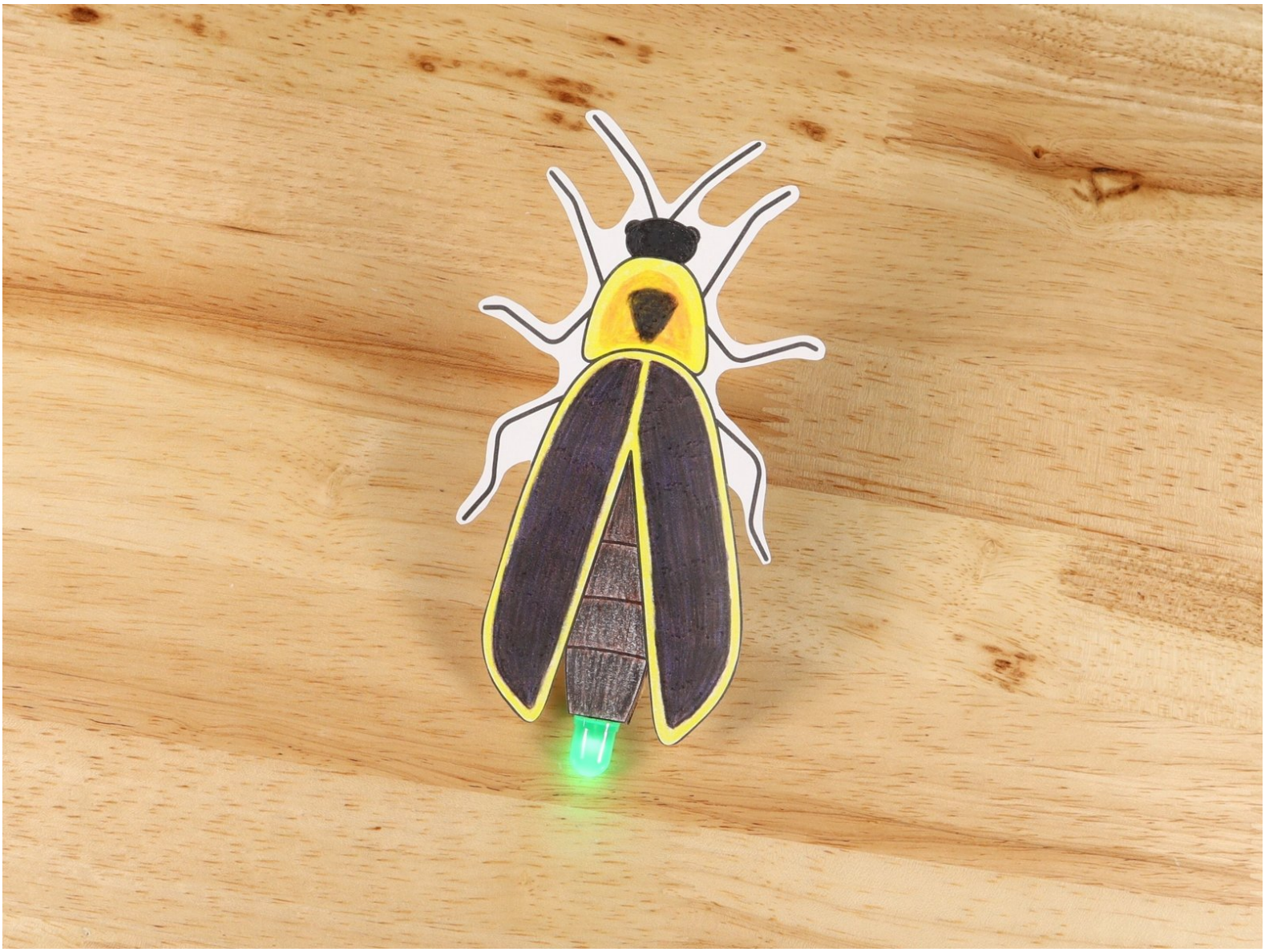
Firefly

Use cardboard, an LED, a CR 2032 battery, and Maker Tape to make a firefly that can flash!

Written By: Amanda Etim



INTRODUCTION

Use cardboard, an LED, a CR 2032 battery, and Maker Tape to make a firefly that can flash!

You can make this project (and many more!) with our Paper Circuits Kit.

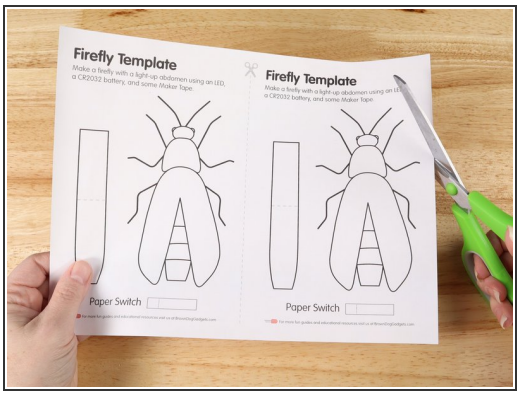
TOOLS:

- Scissors (1)
- Black Magic Marker (1)
- Clear Tape (1)
- Markers, Crayons, or Colored Pencils (1)

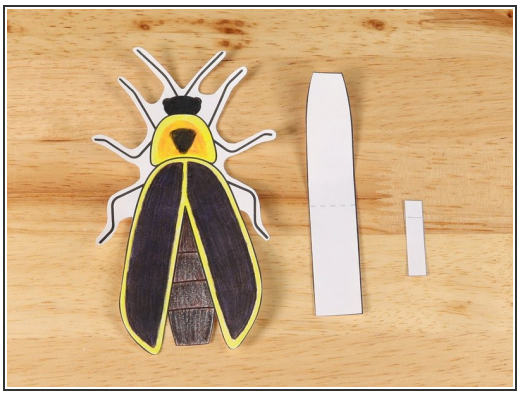
PARTS:

- Paper Circuits Kit (1)
- Cardboard (1)

Step 1 — Print, Cut, and Color Template



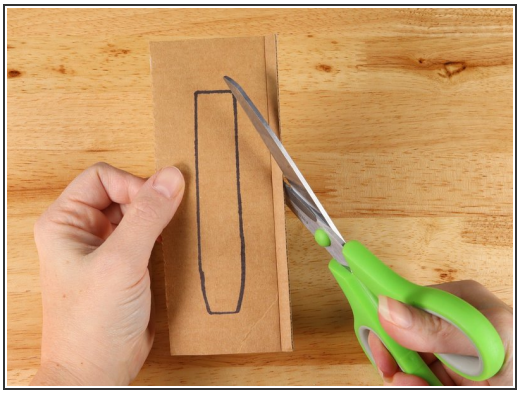


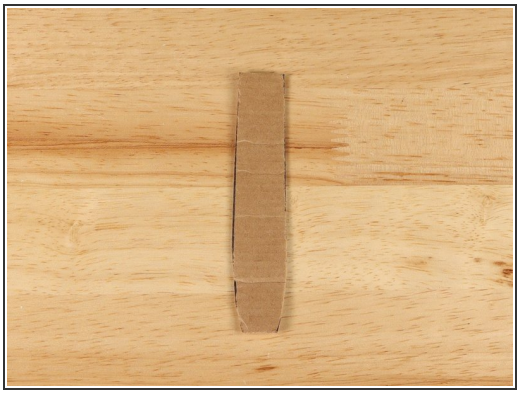


- **Print out the template** on regular copy paper. While most of our guides specify printing on heavy cardstock, this guide doesn't need that since the circuitry will be on the cardboard.
- **Cut** out each part of the template.
- **Color** the firefly.

Step 2 — Trace and Cut Cardboard





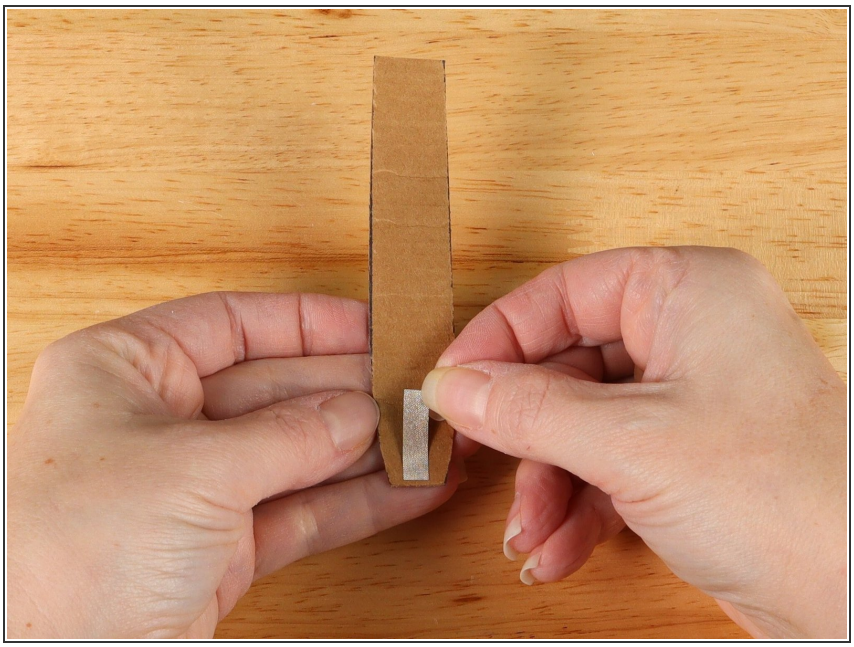


- Use the template to **trace the handle** onto a piece of cardboard.

ⓘ In this guide we used the lid to a box of paper (that's why one side is brown and the other is white.) You can use any cardboard you have around. Cereal boxes would also work.

- **Cut** out the handle.

Step 3 — Add Maker Tape to Front

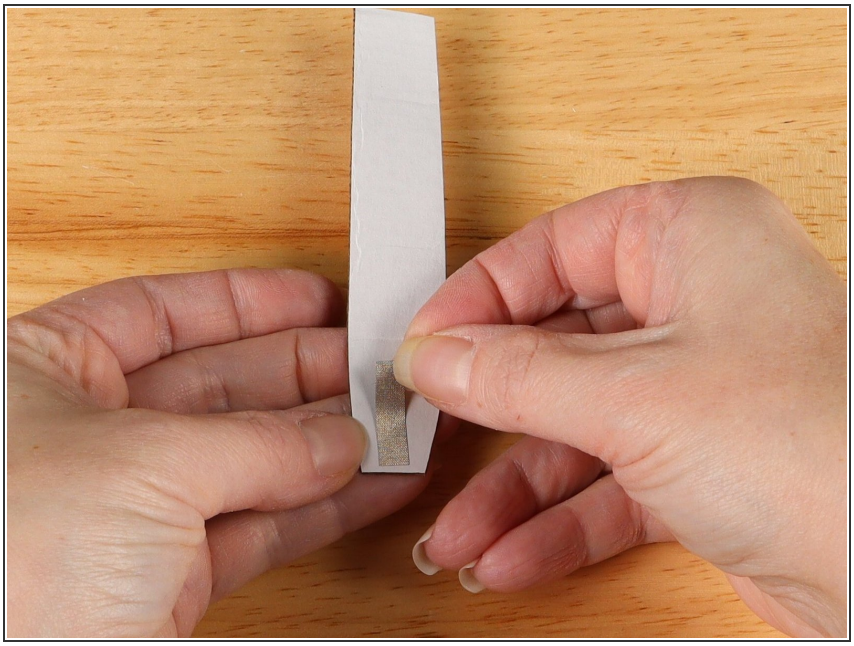


- **Add a small piece of Maker Tape** to the front of the handle at the bottom on the end that curves inward slightly.

⚠ The tape does NOT wrap around the bottom edge of the cardboard.

ⓘ This tape will be underneath one of the LED legs to ensure a good connection.

Step 4 — Add Maker Tape to Back

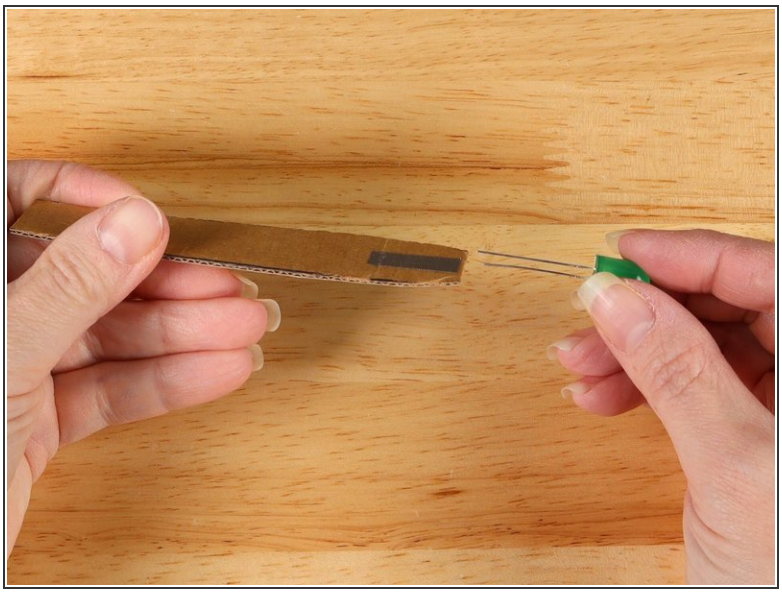


- Flip over the handle and add a small piece of Maker Tape to the back of the handle at the bottom.

⚠ The tape does NOT wrap around the bottom edge of the cardboard.

ⓘ This tape will be underneath the other LED leg to ensure a good connection.

Step 5 — Add LED





- **Slide an LED** onto the handle so the cardboard goes in between the two LED legs.

ⓘ The **Long Leg (Positive +)** should be on the front of the handle and the **Short Leg (Negative -)** should be on the back side of the handle.

ⓘ The LED legs should be on top of the Maker Tape that was added in steps 3 and 4.

Step 6 — Add Maker Tape to Front





- **Add a long piece of Maker Tape** to the front of the handle. The strip of Maker Tape should cover the LED and go all the way to the opposite end of the handle.

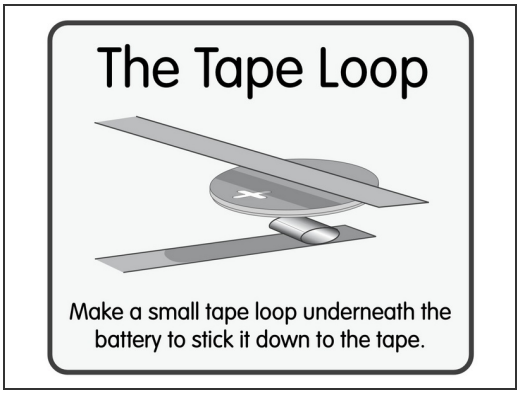
Step 7 — Add Maker Tape to Back

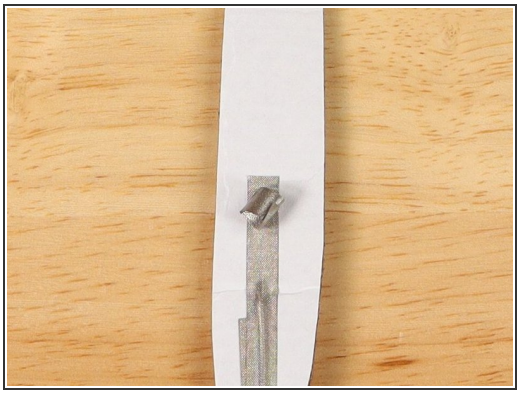


- Flip the handle over and **add a small strip of Maker Tape** on top of the LED leg.

Step 8 — Add Tape Loop



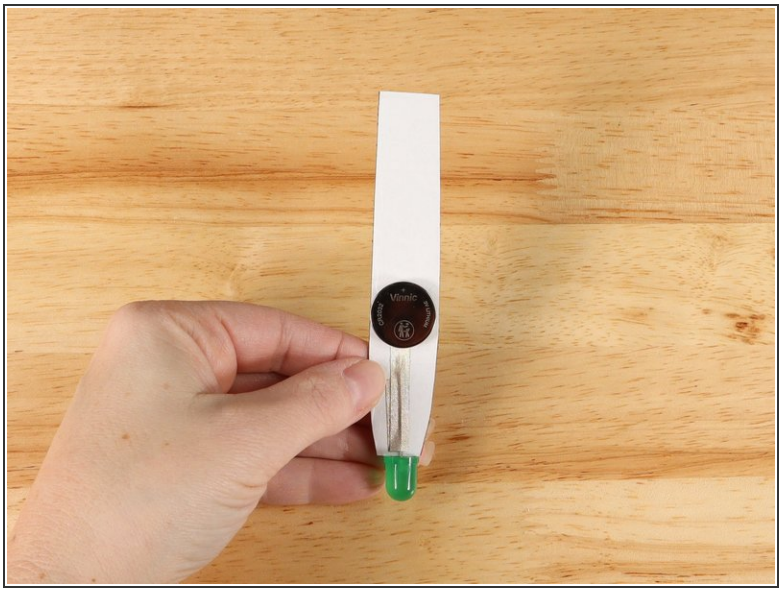




- Make a **loop of tape** (sticky side out) using a short piece of Maker Tape, and stick it atop the end of the path coming from the short (**Negative**) LED leg.

Step 9 — Add Battery

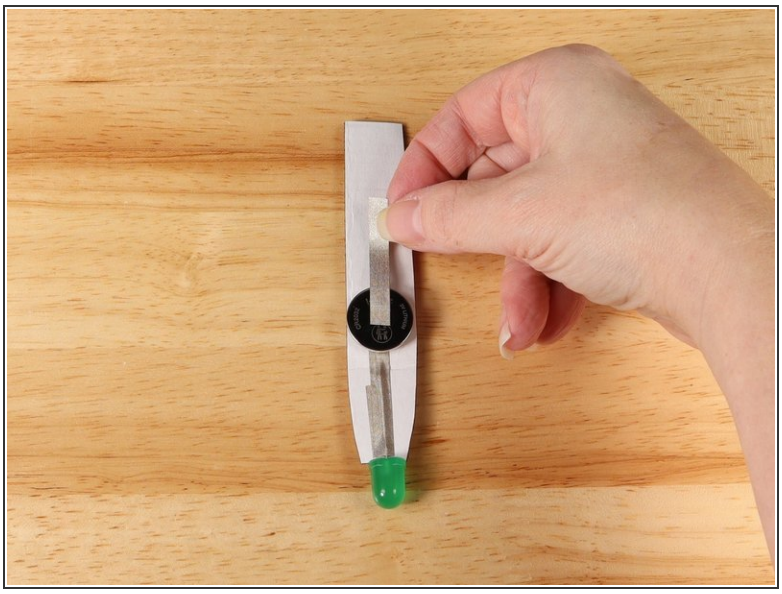
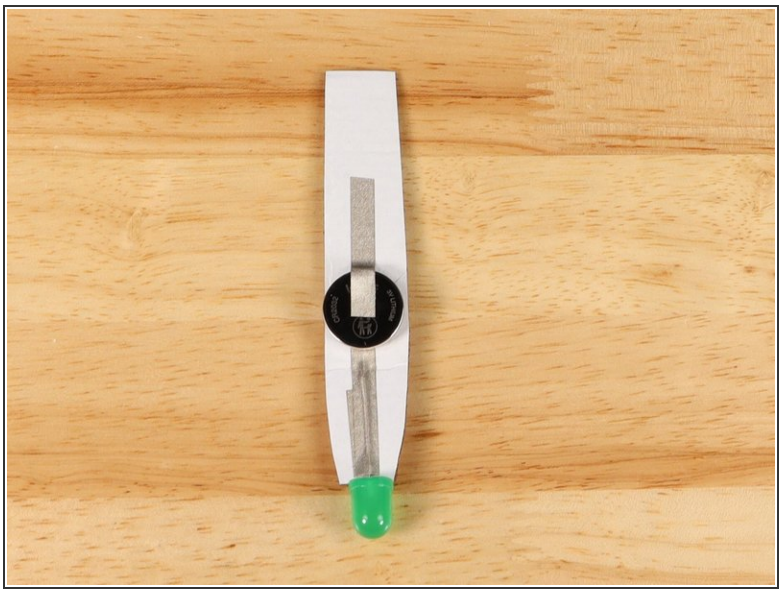




- Once your **Tape Loop** is in place you can add the **Battery** to it.

- Make sure the **Positive** side of the Battery is facing upwards, with the **Negative** side stuck down to the tape.

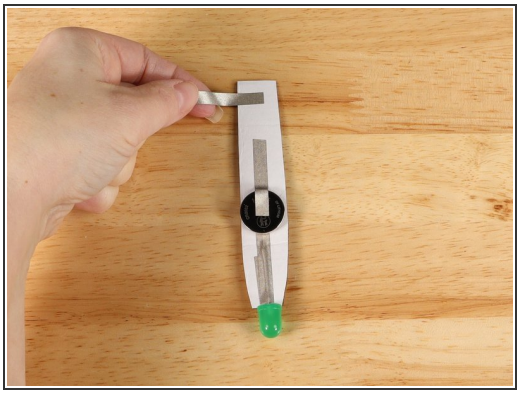
Step 10 — Add Maker Tape

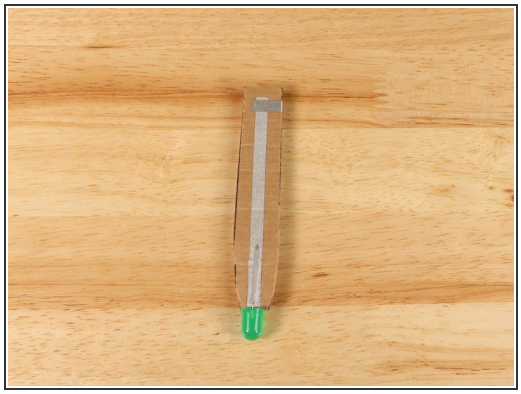



- **Add Maker Tape** to connect the top (**Positive**) side of the battery to the handle.

⚠ This path should not go to the end of the handle. We will add a switch to control the firefly.

Step 11 — Add Maker Tape



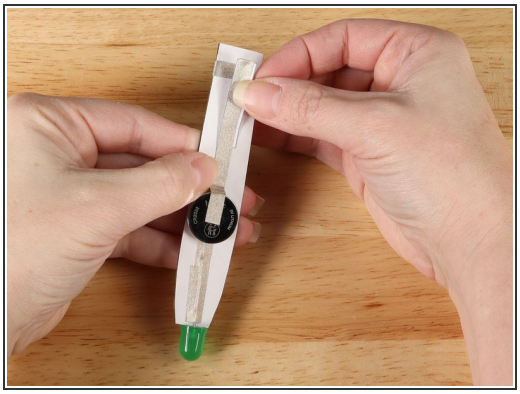


- **Add a piece of Maker Tape** that starts on the back of the handle and wraps around to the front of the handle.

⚠ The strip of tape should NOT touch the path of Maker Tape on the back of the handle, but it SHOULD overlap with the piece of Maker Tape on the front side of the handle.

Step 12 — Add Switch





- If you haven't made a paper lever switch yet see the guide: Switch - Lever Switch
- **Add the paper switch** to the end of the path coming from the battery. The other end of the switch should come in contact with the strip of Maker Tape that wrapped around to the front from step 11.

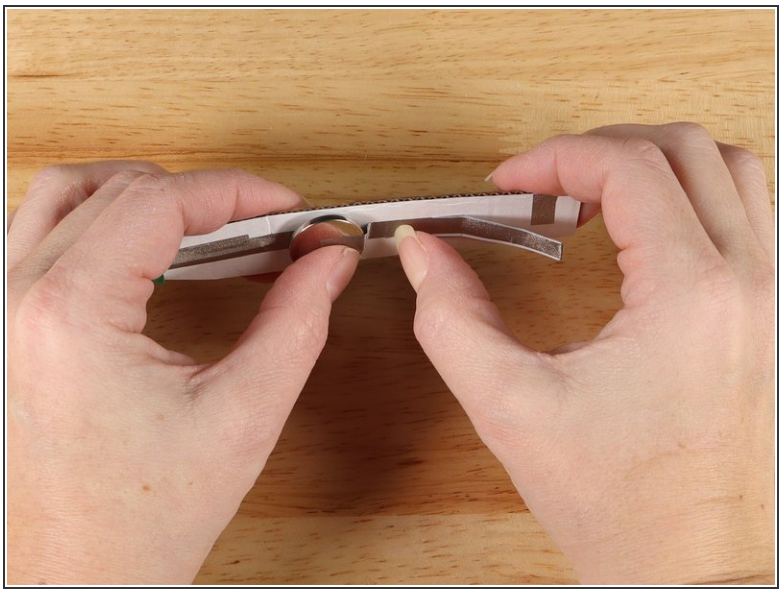
ⓘ If the switch does not reach you can adjust and add more Maker Tape as needed.

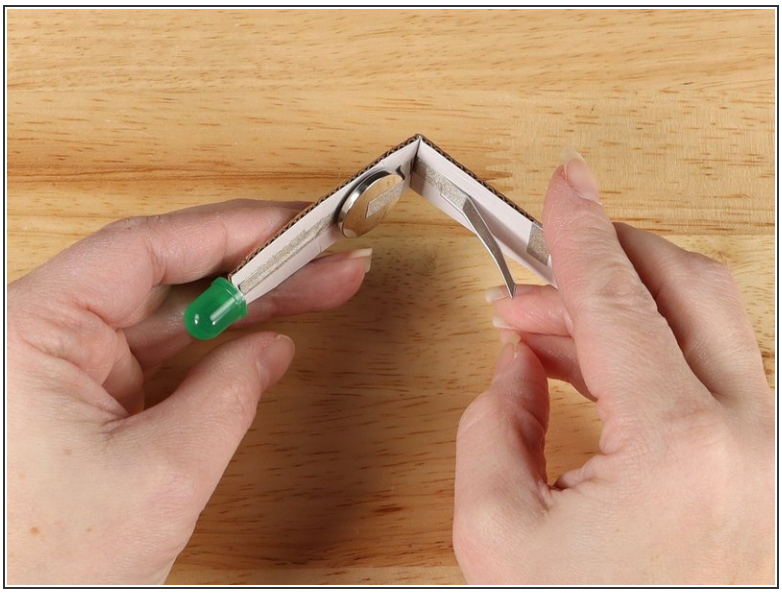
Step 13 — Test Circuit



- At this point you should **test the circuit** to make sure it works. When you press down on the switch the LED should light up.
- If it does not light up...
  - Make sure that your switch is making contact.
  - Make sure the polarity of your LED is correct with the **Short Leg (Negative -)** leading to the **Negative** side of the battery and the **Long Leg (Positive +)** is leading to the **Positive** side of the battery. You may need to peel back the tape paths and flip your LED orientation.

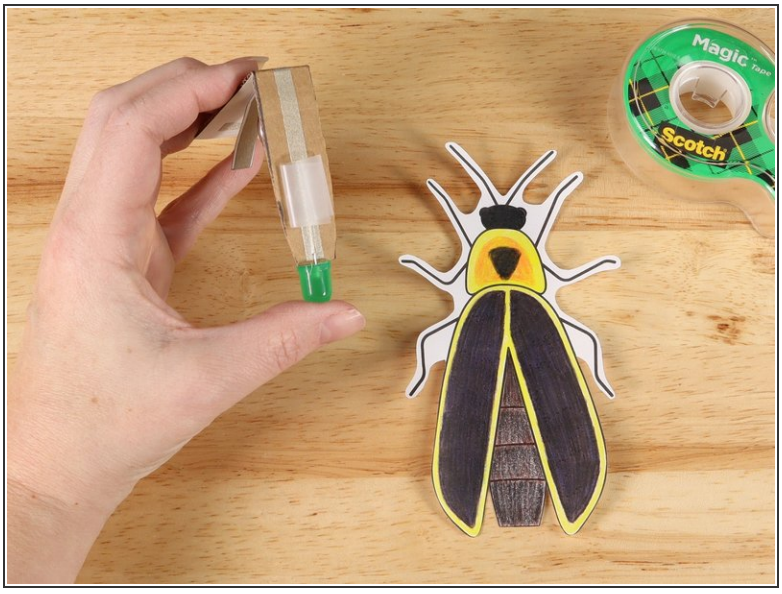
Step 14 — Bend Handle





- With the battery facing you, gently **bend the cardboard** somewhere between the battery and the switch.

Step 15 — Add Firefly





- On the front of the handle, **add a tape loop of clear tape** right above the LED.
- **Add the Firefly template** onto the clear tape loop, lining up the LED and the bottom of the Firefly.

Step 16 — Firefly Assembled



- Your Firefly craft is assembled and ready to light up the night sky!

Step 17 — Literacy Connection



- Check out Firefly Song for a great read-aloud to connect to this project!