Glimmer & Glow
STAMP COLLECTION

How To Make A Simple Circuit & Switch

Our video tutorial at www.artgonewild.com shows how to make a simple circuit & switch, which you can view at www.artgonewild.com. The sample card shown in the video was created using NTSCS-001 Birthday Cupcake Clear Set.

Below are written instructions for the process of making light-up cards using the Chibitronics products in general, as well as tips that are specific to our cupcake card sample.

You'll need copper tape, a Chibitronics LED sticker, and one CR2032 (3V) battery.

These are the elements that we'll be using to create a circuit and make your card light up! Make sure the copper tape that you choose has <u>conductive adhesive</u>. Copper tape with non-conductive adhesive is more common. For example, you can get it at your local hardware store in the gardening section – it's used to keep snails and slugs out of gardens. The tapes may look similar, but they are very different when building circuits.

First, design (i.e., stamp and color) your card front, including a spot for the "press here" button.

By making your card front first, you'll know where to position the LED light and switch when you build your circuit on the layer underneath. **On the cupcake card, the LED light will be placed underneath the candle flame. The "press here" button will be located in the lower left, below the sentiment.**

Create a template for the layer underneath the card front.

This template is the panel that you'll build your circuit onto. Start with a piece of copy paper the same size as your card front. To figure out where the elements will be placed, hold the panel on top of the stamped card front, with a light source shining behind both pieces, and use a pencil to mark the spots where you'll want your LED light and switch to go. If desired, trim this template panel 1/8" around each edge (keeping the stamped elements centered on the panel), so that it doesn't show once everything has been assembled.

Another way to make this template panel is by using the MISTI stamping tool to stamp the same design onto the card front as well as a second, identical piece of cardstock. Once again, if desired, trim the second panel 1/8" around each edge (keeping the stamped elements centered on the panel), so that it doesn't show once everything has been assembled. ⬅ **This is the method we used for the cupcake card.**

Draw two paths for the copper tape (+ and -).

Now that you know where the LED light and switch will be placed on your circuit panel, you can figure out where the copper tape should be placed.

We will use copper tape to connect a battery to the LED light in a continuous loop to make a complete circuit. This happens when the "+" side of the LED sticker is connected to the "+" side of the battery and the "-" point of the sticker is connected to the "-" side of the battery with the copper tape.

Electrons only flow in "loops," and this complete circuit allows electrons to flow from the battery, through the LED light, and back into the battery. This round-trip flow of electrons through all the elements is called a current, which causes the LED light to turn on and shine.

To make the "loop," you can either place the copper tape in straight lines that turn sharp corners OR you can make curved lines when connecting the copper tape to the LED light and to the switch pocket. We've tried it both ways and each have our own personal preferences; we recommend that you do the same, and see which way you like better. **In the video as well as this class, we'll practice making straight lines that turn sharp corners. Therefore, our circuit "loop" is really a "rectangle" of copper tape, as shown on the pre-made templates.**

Always plan the layout so that your two paths of copper tape do NOT touch each other, but rather only travel to the LED light and the battery from both ends (+ and -). An accidental copper tape connection directly from the "+" to the "-" sides will create a short circuit, and the LED will not light.
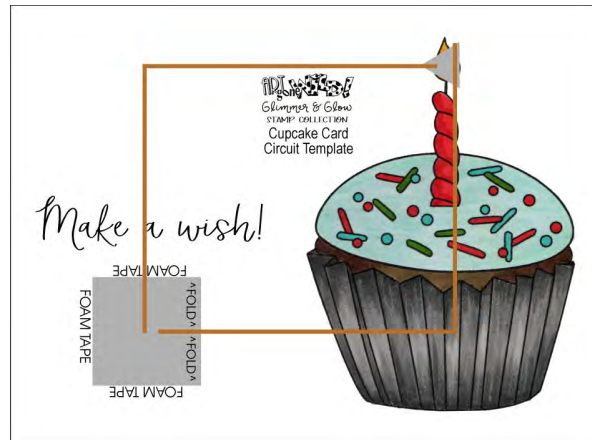
Template NOT Shown To Scale

## Make a "switch pocket" to turn the light on/off.

The switch pocket should be placed underneath the spot where you've put the "press here" button on your card front. To make the switch pocket, cut a 3/4" x 1 3/8" piece of copy paper. Fold one end 1/2" inward, so that you have a 7/8" square with a 1/2" flap. Attach the bottom of the switch pocket to the circuit panel, being careful not to get adhesive on the 1/2" flap. Also make sure the fold is placed so it overlaps one of the copper tape paths.

Place copper tape onto both paths of your layout.

Apply the copper tape as a continuous piece, rather than separate pieces, even when turning corners. This will give you the best electrical connection.

To turn sharp corners:
1. Flip your tape over opposite the direction you want to turn, so the sticky side is face up, and flatten.
2. Flip the tape back over in the direction of your turn.
3. Flatten the corner again and you've got a crisp corner!
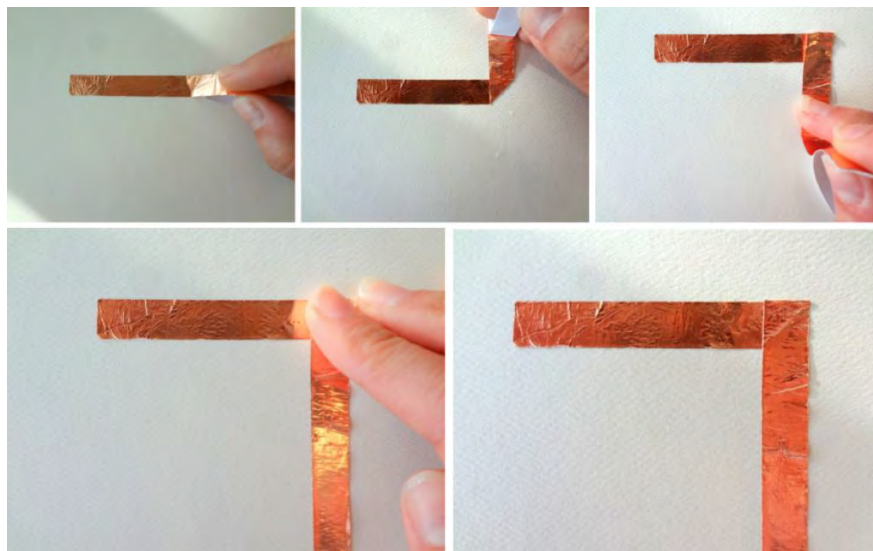
You may find it helpful to flatten the copper tape with a bone folder as you lay it down. Another option is to apply the tape with your fingers and then use a clean pencil eraser to press down the tape (and remove any fingerprint marks) when you're finished.

At the spot where the LED light sticker will be placed, you'll want to run the copper tape all the way across the parts where the copper on the LED will touch the copper tape, so that you make a full connection. Remember to make sure the copper tape paths don't touch on either end (at the LED light or the battery housing), and don't forget to overlap the 1/2" flap of the "switch pocket" with copper tape, wrapping it around to back side of the flap.
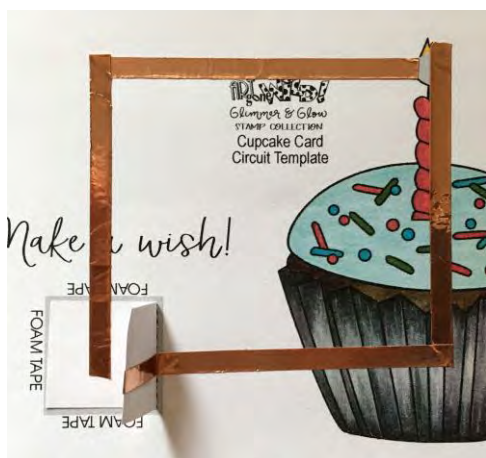
← Notice How Copper Tape Ends Don't Touch

Another View of Battery Housing

Add foam tape to the switch pocket so it will hold the battery in place.

Put thin strips of foam tape in a single layer around the outer edges of the switch pocket. The foam tape will act as a "gutter" to keep the battery enclosed within the switch pocket.


Stick the LED sticker onto the circuit panel.

The LED sticker is shaped like an arrow, pointing from + to -. The wide, flat metal pad is the "+" end and the pointy metal pad is the "-" end. Connections to the LED sticker are made by sticking the metal pads onto the ends of the copper tape so the pads/tape touch. Press firmly to make sure the LED sticker is adhered well to the circuit panel.

Add the battery and test your card.

Place the battery in your switch pocket and test the connection by pressing down the 1/2" flap with your fingertip. If it doesn't light up, turn the battery upside down (to match the "+" and "–" parts) and try again.
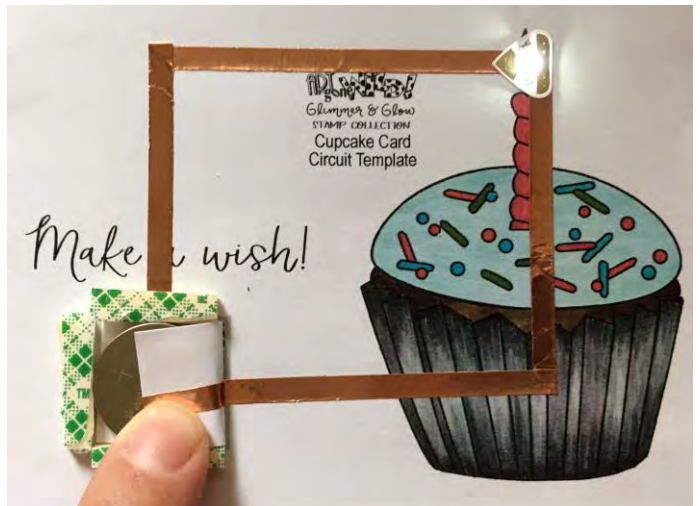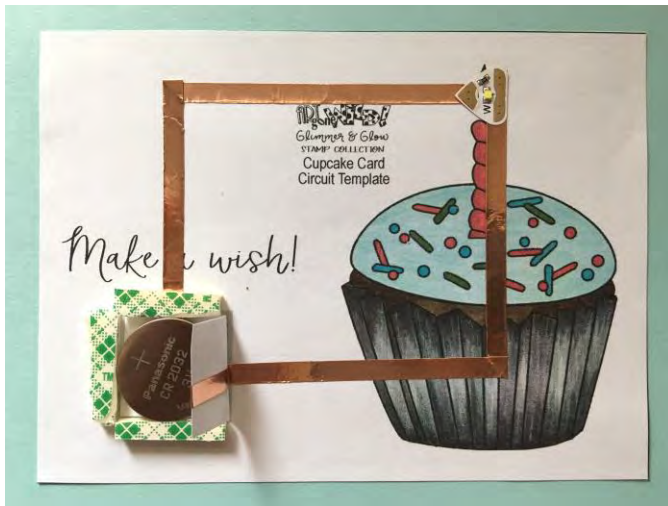
Use foam tape to raise the card front panel.

Place two layers of foam tape around edges of the card front panel on the "wrong" side. Adhere card front panel to your A2 card base (or whatever size you're making it). The extra-thick foam tape will allow the switch pocket flap to remain slightly elevated, so it doesn't make a constant connection with the battery and the LED light can stay off until you press down on the switch.

NOTES: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Make a Wish

Art Gone Wild Stamps:
NTSCS-001 Birthday
Cupcake Clear Set

Cardstock:
White
305061 Waterfall

From Darcie's
PAC1694 Dotty Red

Other Supplies:
Black Dye Ink Pad
Alcohol Markers
Chibitronics White LED
Circuit Sticker
CR2032 3V Lithium Coin
Cell Battery

Conductive Copper 1/8"
Adhesive Tape
MISTI Stamping Tool
Foam Tape
3/4" & 1" Circle Punches
Vellum Adhesive (Optional)

1. Fold 5 1/2" x 8 1/2" white cardstock in half to form card base, and adhere 4 1/4" x 5 1/2" Waterfall cardstock onto base.
2. Use the MISTI to stamp the cupcake image and "Make a wish" saying onto two pieces of 3 3/4" x 5" white cardstock.
3. Trim down one of the panels 1/8" on each side, so the image and saying remain centered. Layer panel onto base. (Alternatively, you can use the *Cupcake Card Circuit Template* below. Print it onto white copy paper, cut out and adhere the panel, and build your circuit directly onto the template.)
4. Follow the "How To Make A Simple Circuit & Switch" instructions, positioning the LED circuit sticker over the candle flame (on the template) and positioning the switch pocket so it's centered about 5/8" below the "Make a Wish" saying.
5. Color the slightly larger stamped panel with alcohol markers.
6. Place two layers of foam tape along the edges of the slightly larger panel on the back side, and carefully adhere to layered card base.
7. Notch one end of 1/2" x 2 1/2" Dotty Red cardstock, and adhere to card front as shown.
8. Stamp "Press Here" saying onto scrap white cardstock, and punch into 3/4" circle. Layer onto 1" Waterfall cardstock circle, and adhere to card front over the Dotty Red banner and switch pocket.