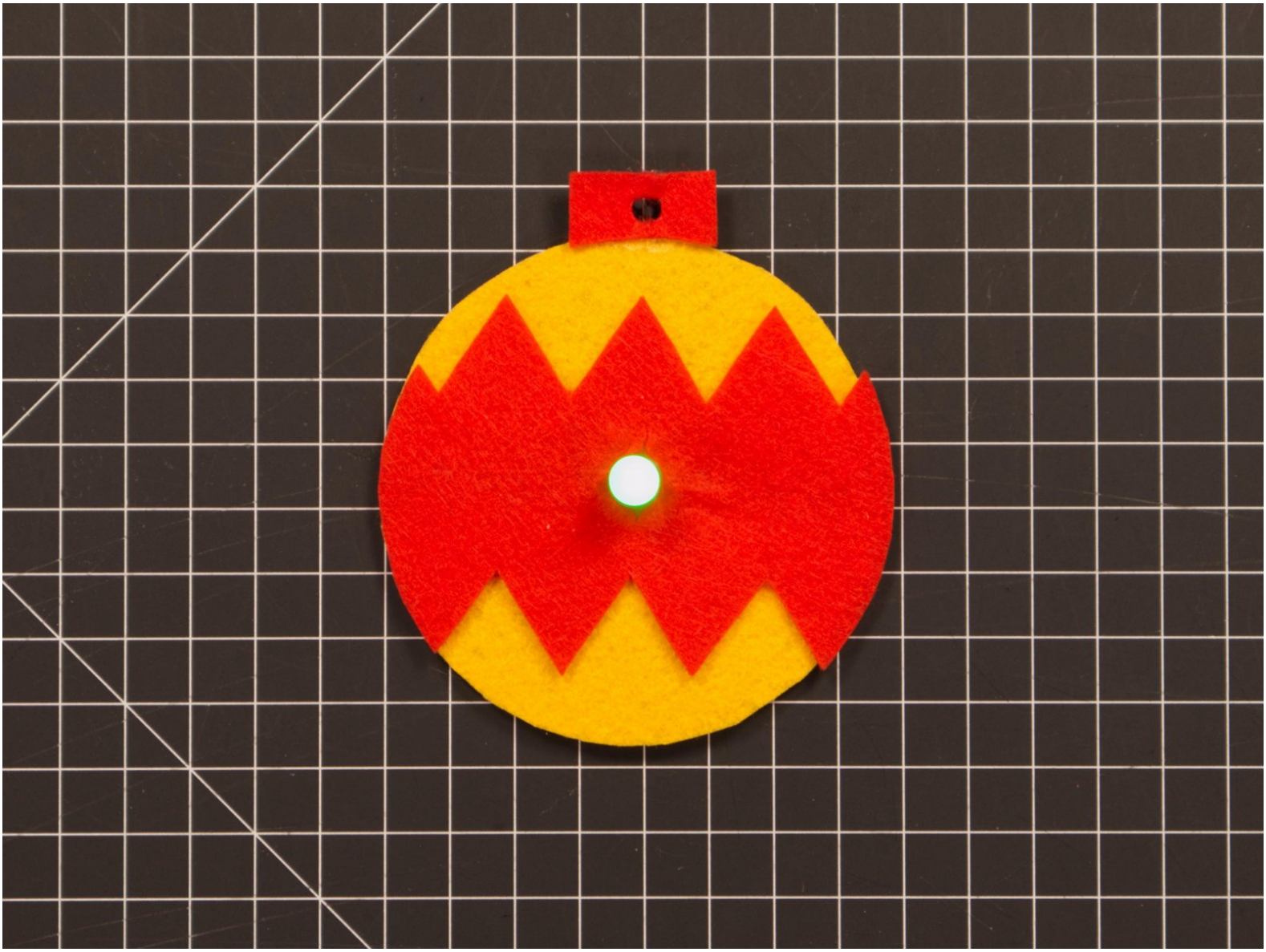
Felt Ornament

Make a Felt Ornament that lights up! It can be a fun holiday wearable, an ornament for a tree, or just a cool yule decoration.

Written By: Pete Prodoehl



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INTRODUCTION

Make a Felt Ornament that lights up! It can be a fun holiday wearable, an ornament for a tree, or just a cool yule decoration.

We made ours using stiff felt, but you can also make a paper version using construction paper or regular paper that you color yourself!

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

TOOLS:

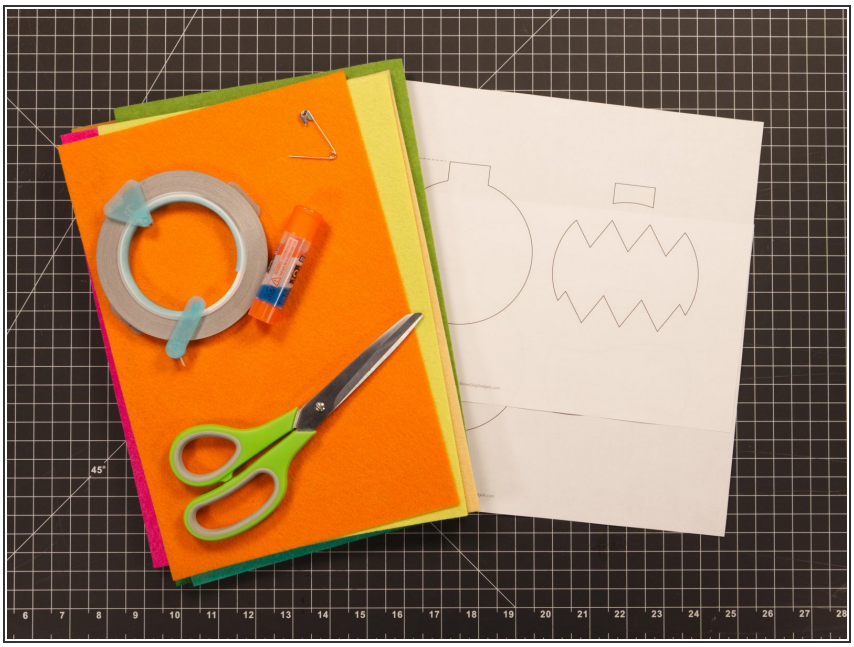
- Scissors (1)
- Glue (1)
- Safety Pin (1)

PARTS:

- Wearable Circuits Kit (1)
- Felt (1)

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Step 1 — Gather Your Materials



- For this project we're going to use stiff felt, one Jumbo 10mm LED, one CR2032 battery, and some Maker Tape. (You can choose any color LED for this project.)
- You'll also need a pair of scissors and some glue. (We'll discuss glue in the next step!)

Note: You can opt to make this project using paper instead of felt. Either use colorful construction paper or just color the pieces with colored pencils or crayons.

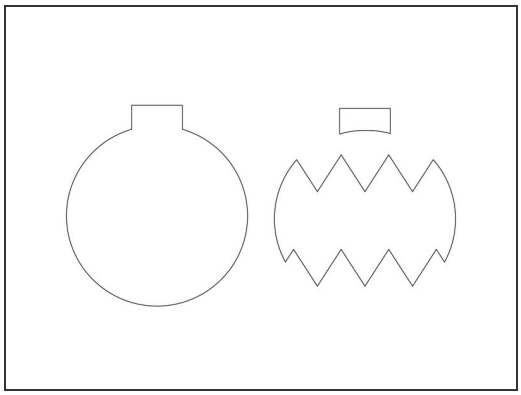
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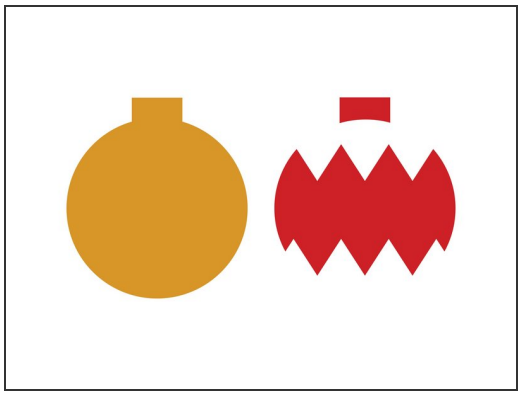
Step 2 — Choose an Adhesive

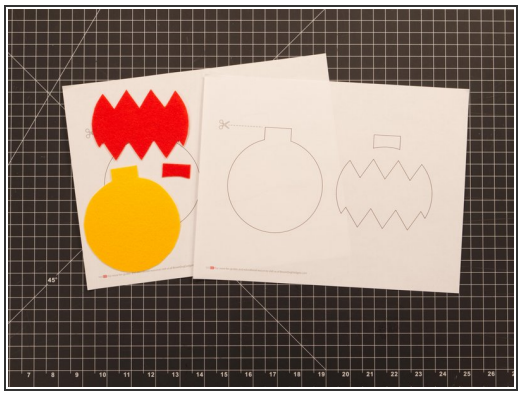


- There are a few options for assembling the project, so let's talk about glue.
  - **White School Glue** is a classic, and everyone seems to have a bottle. It's not great for felt though.
  - **Hot Glue** (and a hot glue gun) works great for adhering felt, but if you're working with kids there's safety to keep in mind. Hot glue burns are no fun!
  - **Spray Glue** is also great for adhering felt, but it's messy and without the proper ventilation we would not recommend it.
  - **Tacky Glue** is another great option for felt. It's not as common as some of the other choices though. (If you do have it, use it!)
  - **Glue Sticks** are pretty common, and can work for felt. It's not the best, but it'll do in a pinch, and it's pretty *kid-friendly*.
  - We'll use a Glue Stick for this project and share some tips along the way.

Step 3 — Print Templates and Cut the Pieces



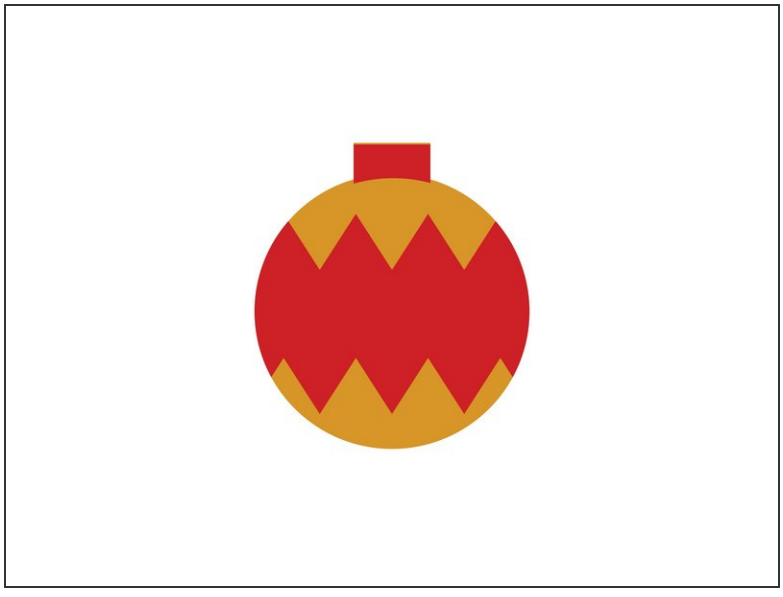


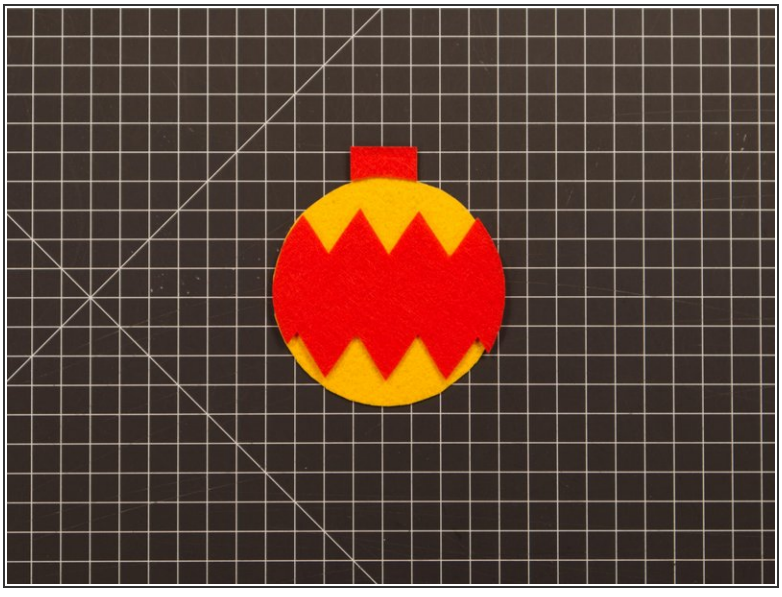


- Print the PDF template pages and then use them to cut out felt pieces for your project.
- If you get a pack of stiff felt you should have a variety of colors to choose from. Make the ornament your favorite colors!

ⓘ If you have access to a laser cutter it's an awesome way to cut felt! If you wanted to pre-cut a whole bunch of felt for a class or workshop a laser cutter is a great way to do it.

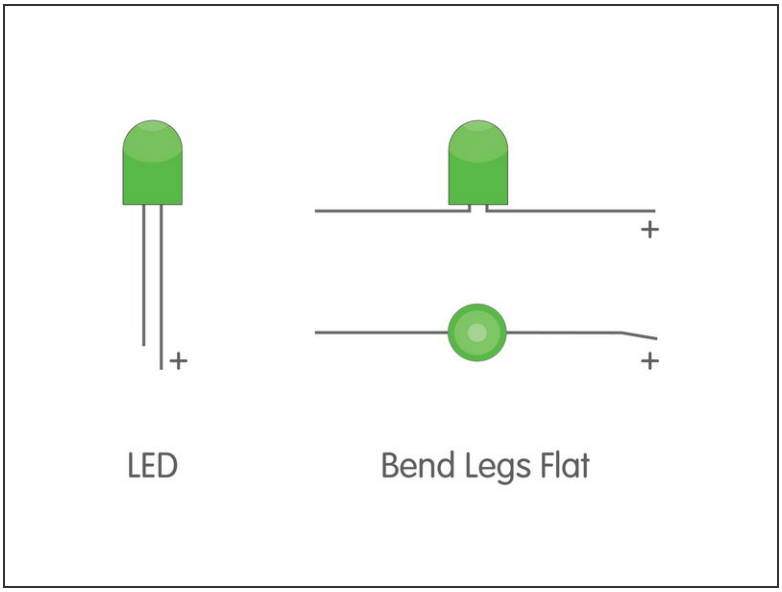
Step 4 — Prepare for Assembly

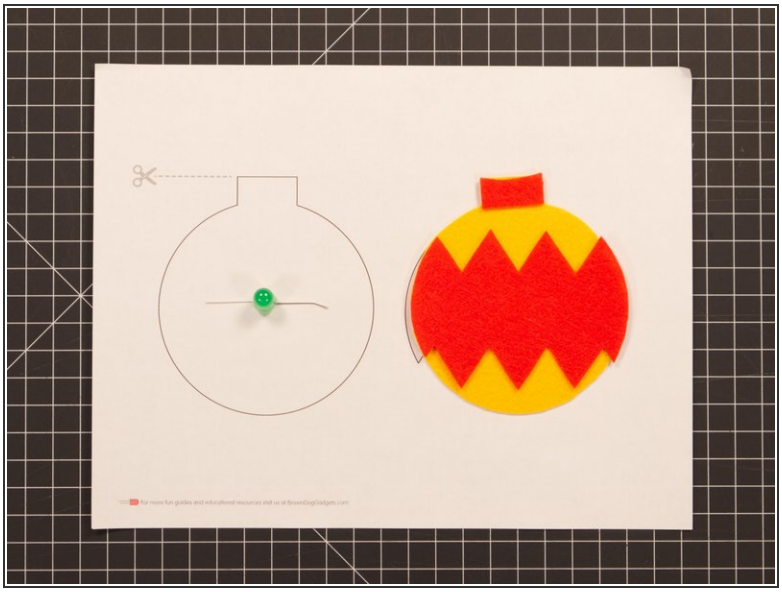




- With all of our felt pieces cut out we're ready to start assembling our project.
- We did a "dry fit" of all of our pieces to make sure none were missing and to figure out where everything would go.

Step 5 — Prepare the LED

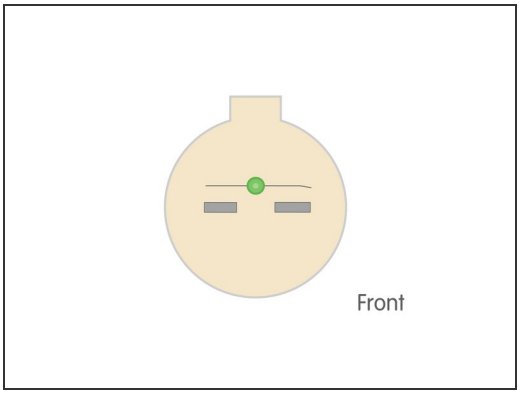


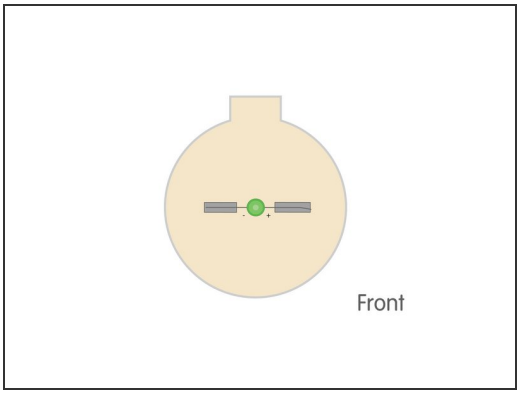


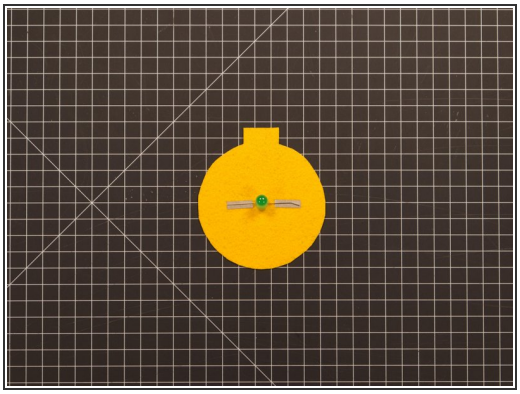
- We're going to place our LED flat against the felt, so we'll start by bending the legs flat.
- Remember! An LED has a positive leg (which is longer) and a negative leg (which is shorter). We'll need to keep track of which leg is which.

Note: One of the tricks we use is to add a little bend at the end of the positive leg so you can tell them apart easily after you flatten them out.

Step 6 — Add Maker Tape Pads

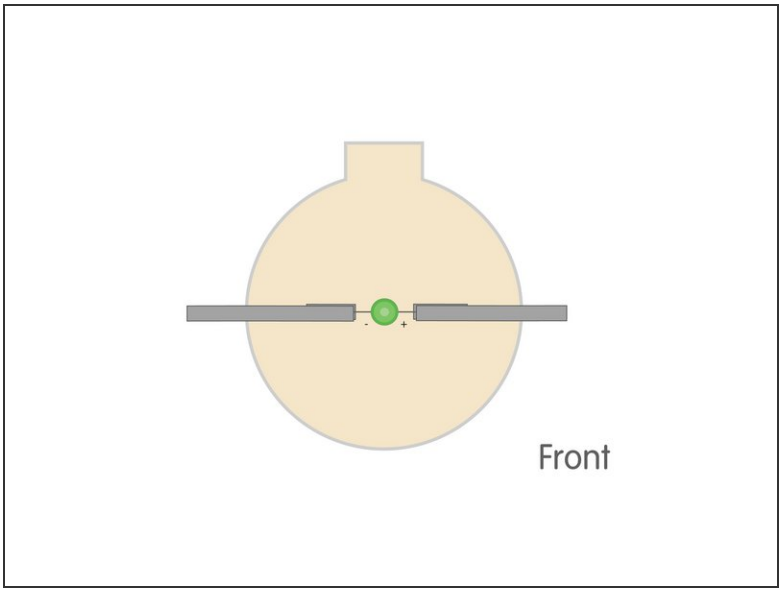


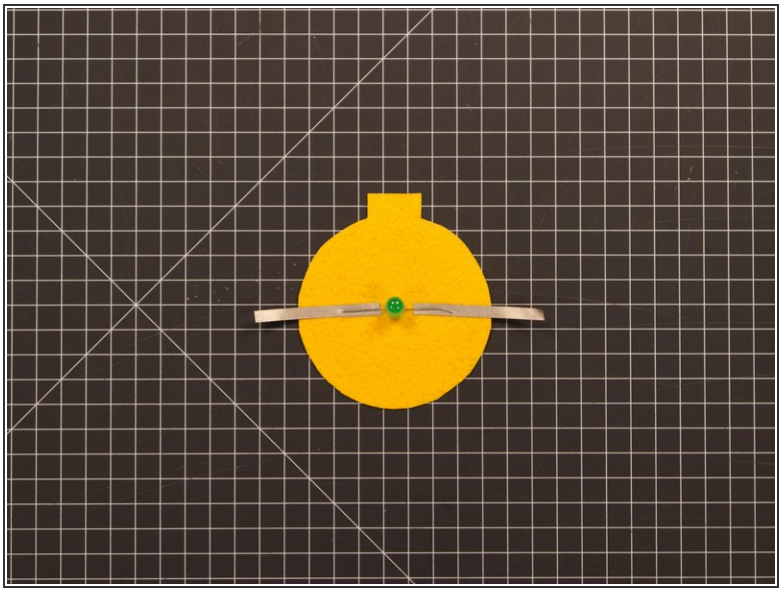




- We'll start by placing our LED on our ornament just above the center, with the positive leg on the right side.
  - This is just so we have a guide to put down our Maker Tape pads.
- Add two Maker Tape "pads" spaced as shown, then place the LED on top of the pads.

Step 7 — Tape Down the LED Legs



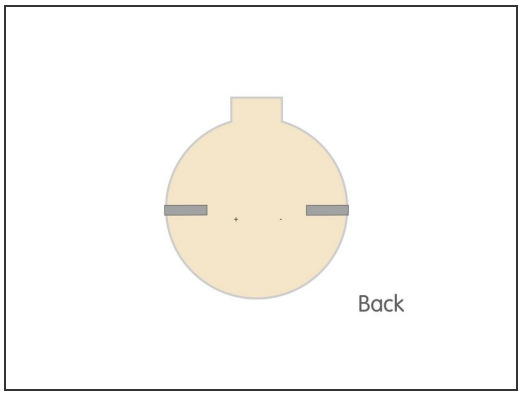


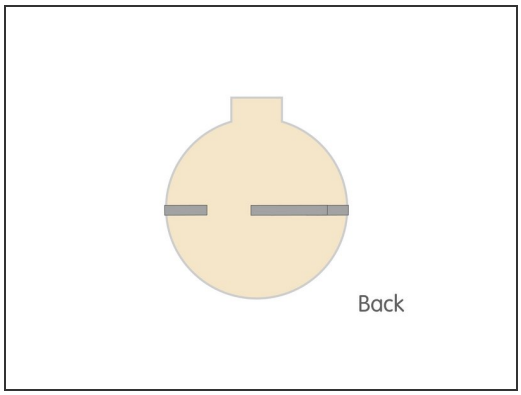
- Tape down the LED legs with Maker Tape. Use pieces long enough to fold over to the back side of the ornament.
- Press down well on the tape where it goes over the legs to ensure a good connection.

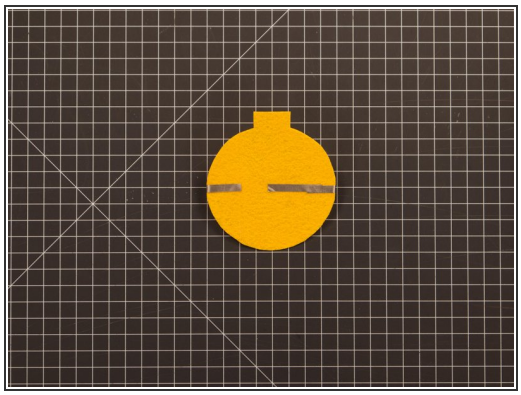
Two layers of Maker Tape create a "tape sandwich" with the LED legs in the middle. Since the felt isn't as flat as paper this will help create a better electrical connection.

If you need to use more than one piece of Maker Tape to connect things that's fine. You can overlap Maker Tape and it will still work because it's conductive on both sides and all the way through.

Step 8 — Add Negative Side Maker Tape



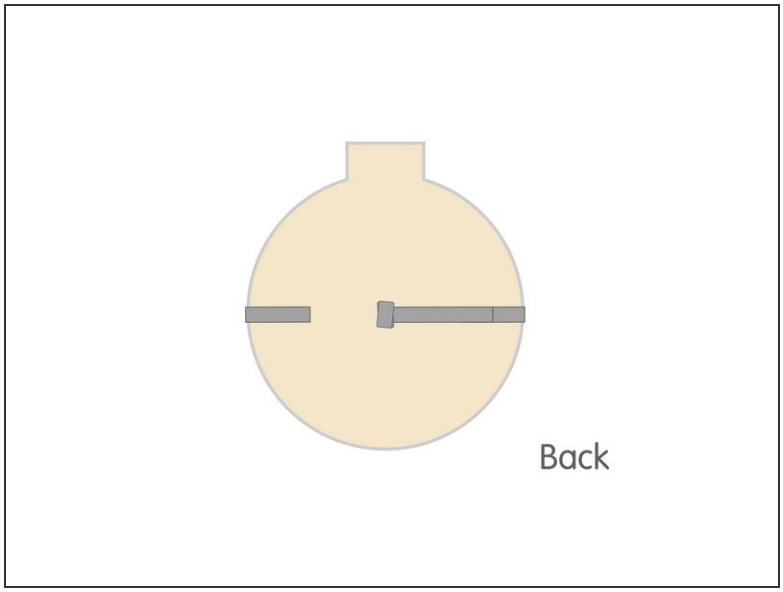


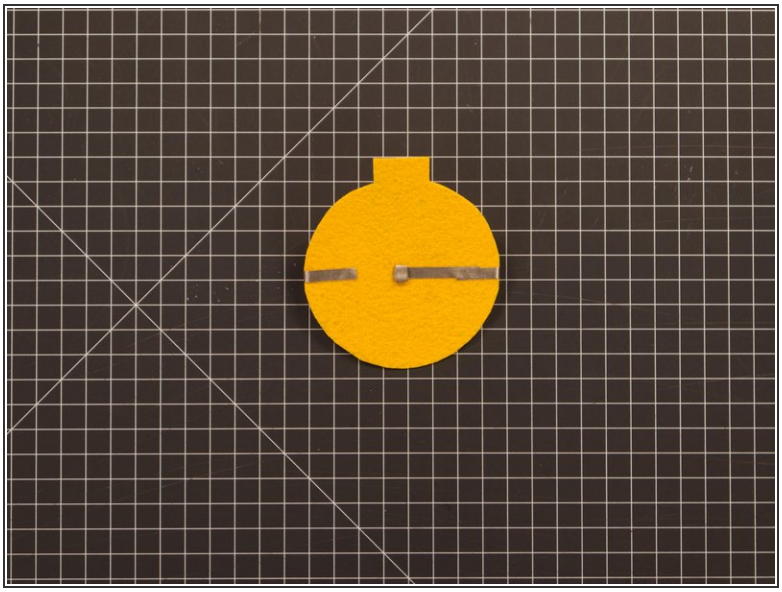


- After you fold down the tape on the back of your ornament add another piece to extend the negative side to the center.

Reminder! Now that we flipped over our ornament the *positive side is on the left* instead of the right.

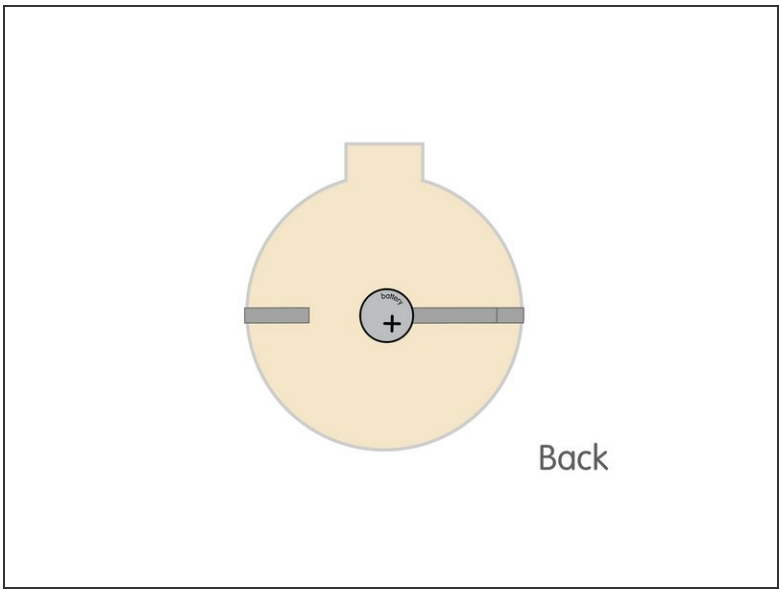
Step 9 — Add the Tape Loop

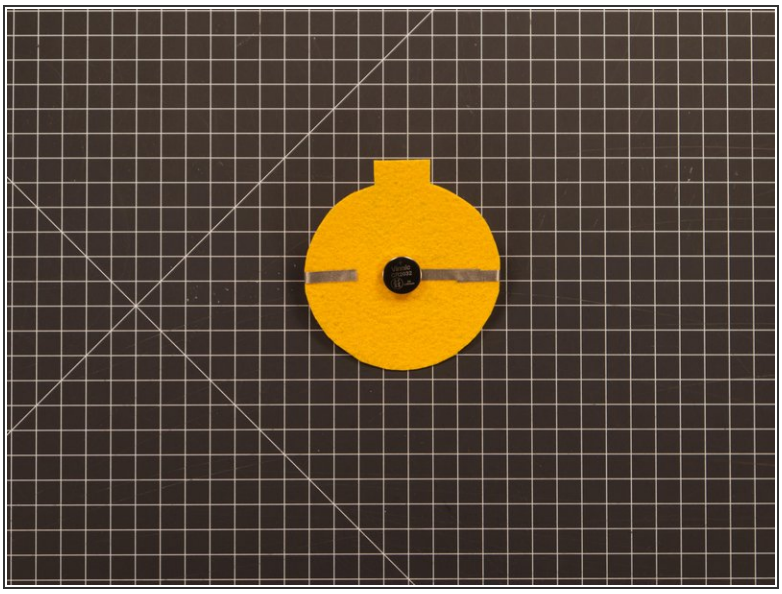




- Using Maker Tape, create a small tape loop.
- Add the tape loop to the end of the negative piece of tape.

Step 10 — Add the Battery

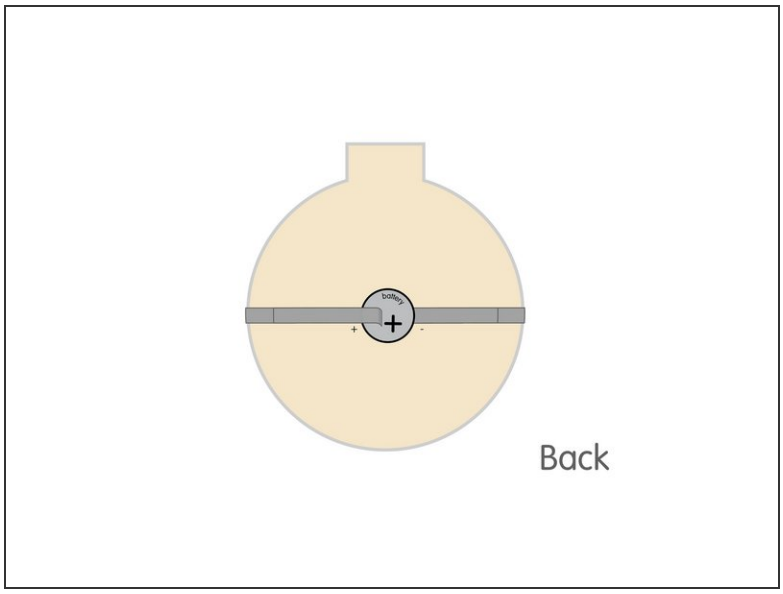


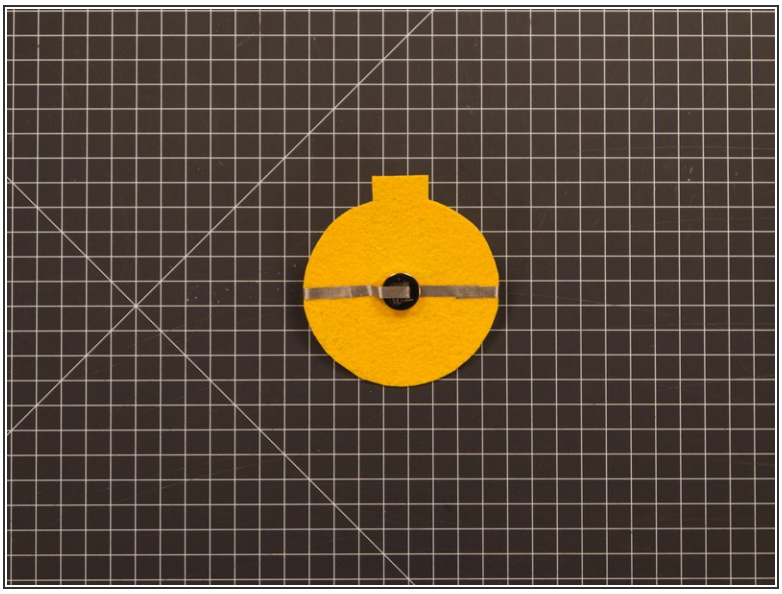


- Stick the battery down to the tape loop.

Make sure you stick the **negative** side of the battery down to the tape loop. The positive side should be facing up and show a **+** sign on it.

Step 11 — Add Positive Side Maker Tape





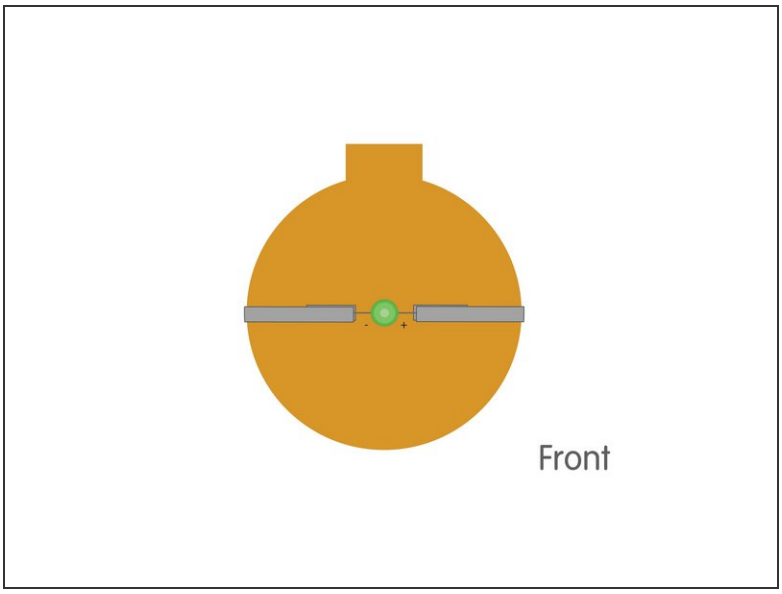
- Add a piece of Maker Tape to connect the positive side to the top of the battery.
- Your LED should light up as soon as you connect the tape!

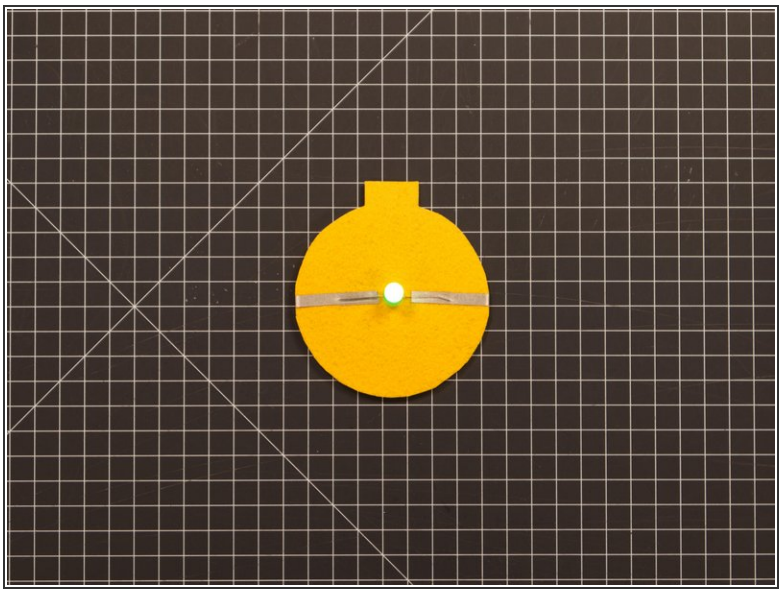
⚠ If your LED did not light up there are a few things you can try.

- Check that all of your tape is pressed down securely. If there is a piece not making contact that may prevent your circuit from working.
- Try flipping over the battery. If your LED is reversed you can fix your circuit by flipping the battery upside down to match the polarity of the LED.

- If you want to turn off your circuit you can just peel back the piece of tape touching the top of the battery. Once you "break" the circuit the LED will turn off!

Step 12 — Prepare to Decorate

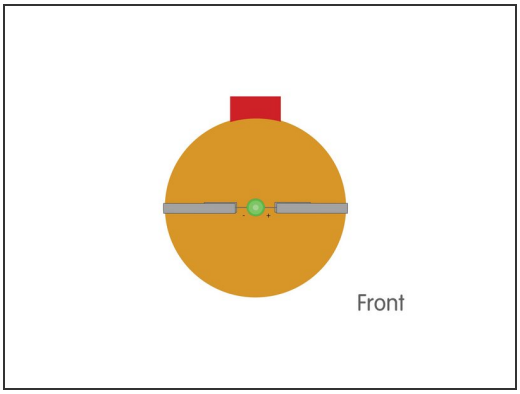


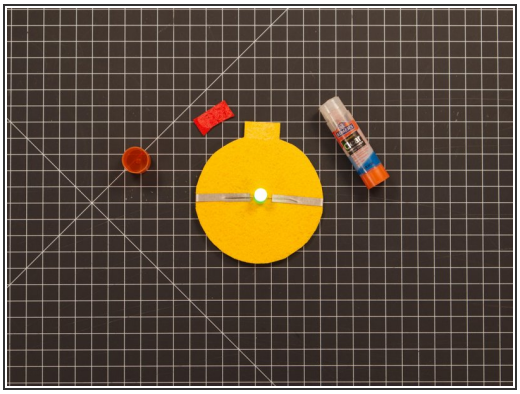


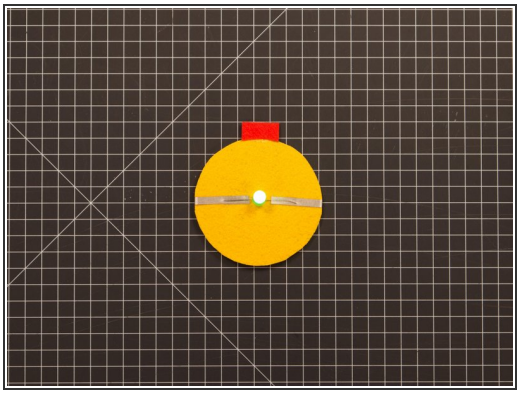
- Flip your ornament back over to the front side so you can decorate it.

If you left the positive piece of Maker Tape touching the battery on the back your LED should be lit up. If you disconnected the tape (acting as a switch) the LED should be off.

Step 13 — Add the Cap

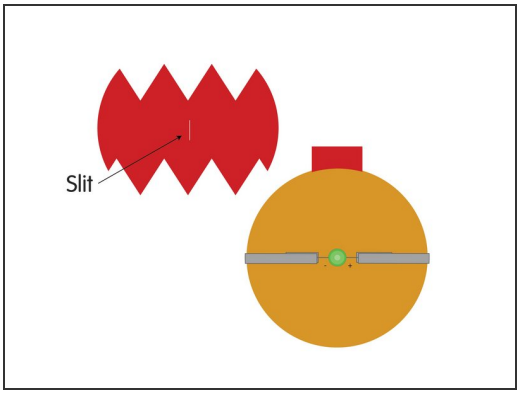


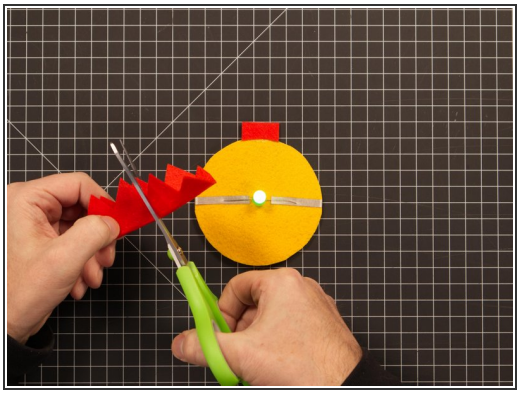


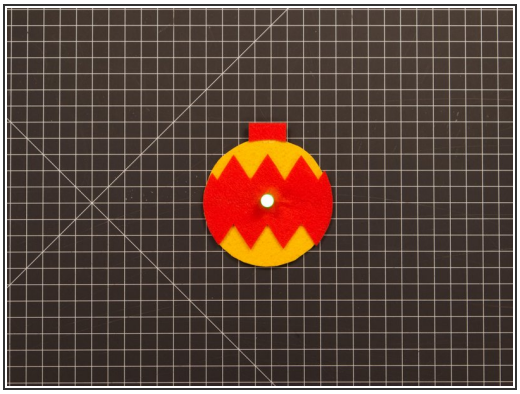


- Attach the cap (the small piece of felt) to the top of the ornament.
- We found that if you use a glue stick it is very helpful to put a bit of glue on both pieces. So cover the cap piece with glue and then put a bit on the area where it will attach.
- The glue stick takes a while to dry, so once you stick it down be careful not to let the felt piece move around. (You could help it stay in place with a few small pieces of blue painters tape.)
- With our glue stick we found that things stuck together really well after letting the glue set overnight.

Step 14 — Add the Decoration

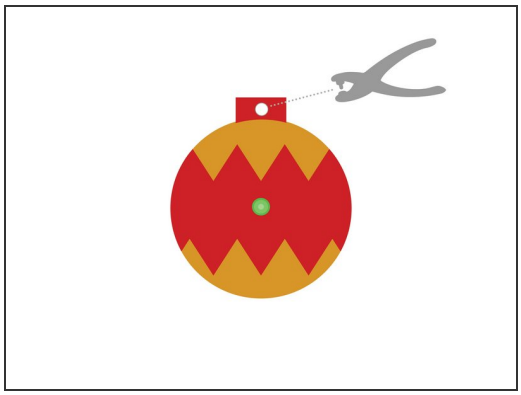


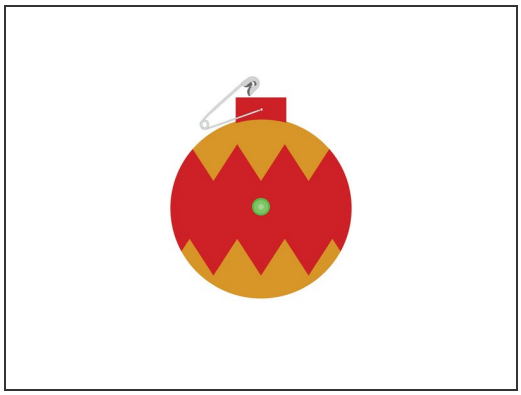


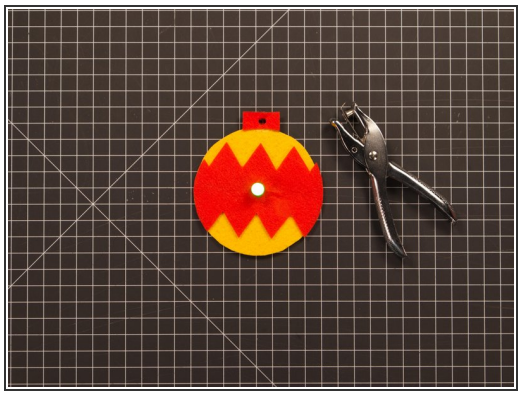


- Let's add the decoration! To do so you'll need to cut a slit into it so it will fit over the LED.
- You can easily cut a slit by folding over the decoration and making a small cut. (Start small, and try to fit it over the LED. If you need to make the slit longer, cut a little more.)
- You can choose to glue the decoration down or just add some tape loops behind it to hold it in place.
  - Tape loops might be useful in case you ever need to troubleshoot the circuit.

Step 15 — Add a Hole



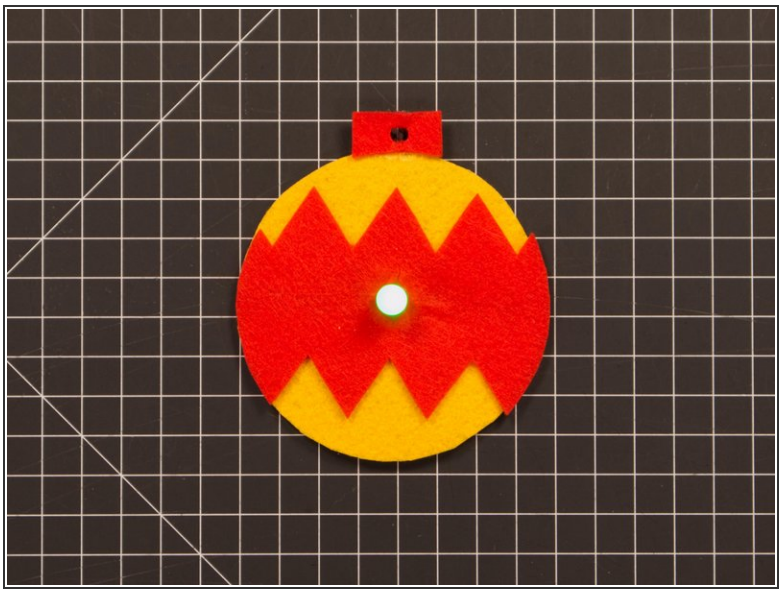




- If you're going to hang your ornament you have a few options.
- You can use a hole punch to make a large hole in the cap portion of the ornament.
- You can poke a small hole using a safety pin and then use an ornament hanger or a paper clip to hang your ornament.
- You can cut a small slit with scissors, just like we did for the decoration part.
- Or you can use the safety pin to make the ornament a wearable circuit! Pretend you're a tree and wear a whole bunch of light-up ornaments!

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Step 16 — Enjoy!





- Enjoy your Felt Ornament!