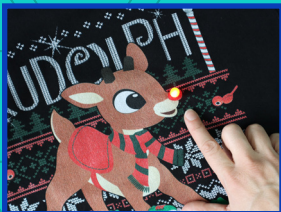
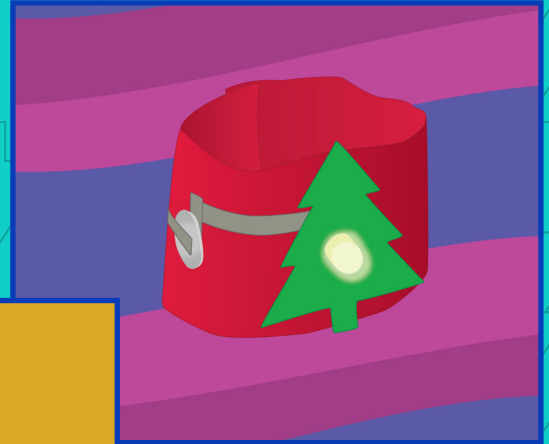


# Winter Wearable Circuits

## Project eBook



**BROWN DOG** *Gadgets*

[BrownDogGadgets.com](http://BrownDogGadgets.com)

# Winter Wearable Circuits

Each of the projects in this eBook can be made using Maker Tape and 10mm Jumbo LEDs, which can be found in our **Wearable Circuits Kit**. We recommend using stiff felt when creating these projects, as it is a bit easier to work with. You can also make most of these projects with paper if you prefer.

Guides for each of these projects (and many more!) can be found at [learn.BrownDogGadgets.com](http://learn.BrownDogGadgets.com)

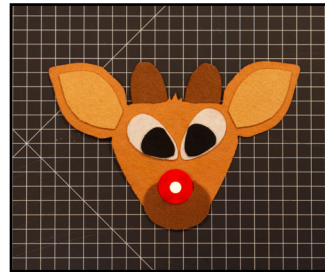


## Ornament

Pages 3-6

Requires: LED, Battery, Maker Tape, Felt, Scissors, Glue, Hole Punch

Time: 15 to 30 minutes



## Red Nosed Reindeer

Pages 16-21

Requires: LED, Battery, Maker Tape, Felt, Scissors, Glue

Time: 15 to 30 minutes



## Christmas/Holiday Tree

Pages 7-10

Requires: LED, Battery, Maker Tape, Felt, Scissors, Glue

Time: 15 to 30 minutes



## Snowman

Pages 22-25

Requires: LED, Battery, Maker Tape, Felt, Scissors, Glue

Time: 15 to 30 minutes



## Tree Bracelet

Pages 11-15

Requires: LED, Battery, Maker Tape, Felt, Scissors

Time: 10 to 30 minutes



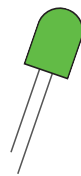
## More Projects!

Page 26

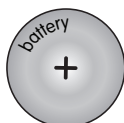
We've included a few more advanced projects you can find on our web site. We've provided a brief description and links (along with QR Codes) for each guide.



Maker Tape



LED



Battery



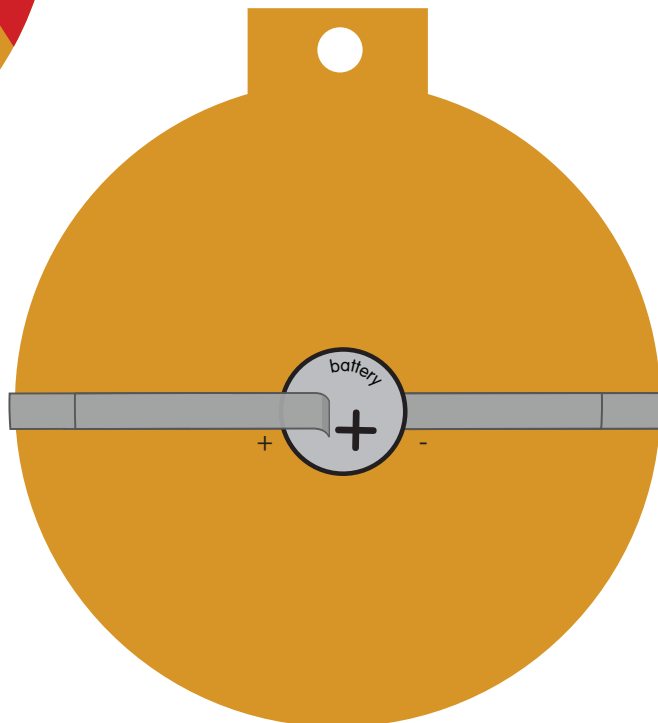
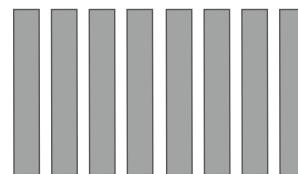
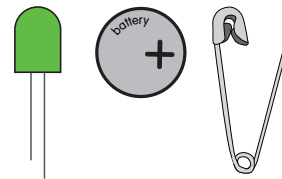
New to wearable circuits?  
Check out our *Getting Started with Wearables* video available at:  
<https://youtu.be/SED0wriXNZE>

# Felt Ornament

Make a holiday Ornament (that lights up) using an LED, a CR2032 battery, and some Maker Tape. You can find all these parts in our Wearable Circuits Kit. Just supply your own scissors, felt, and glue.

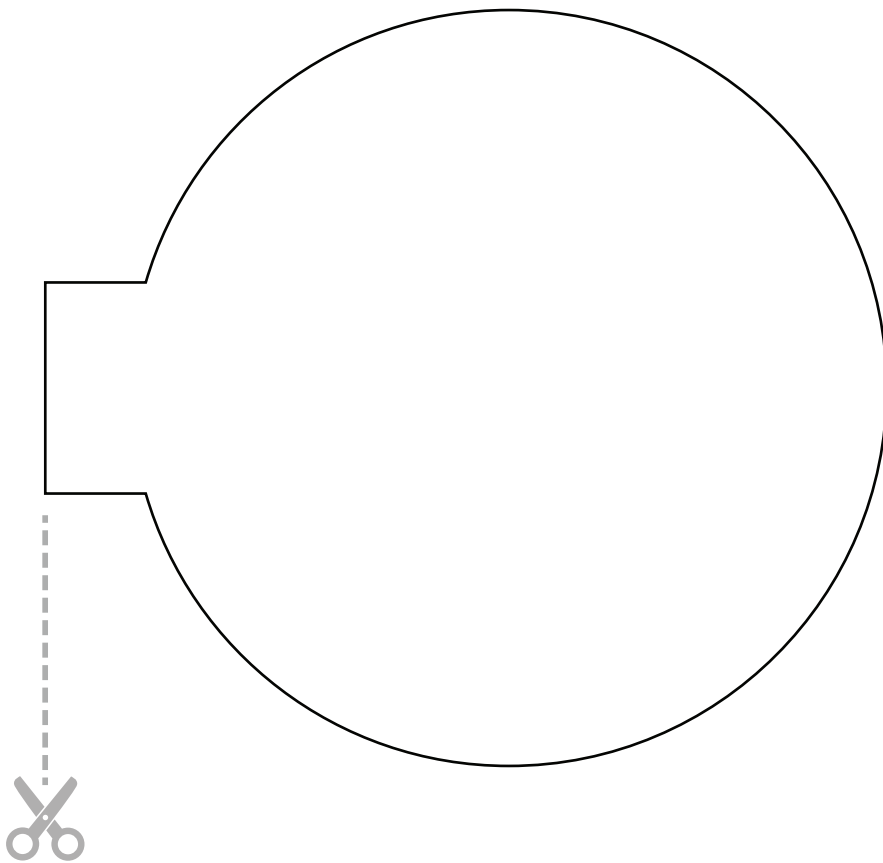
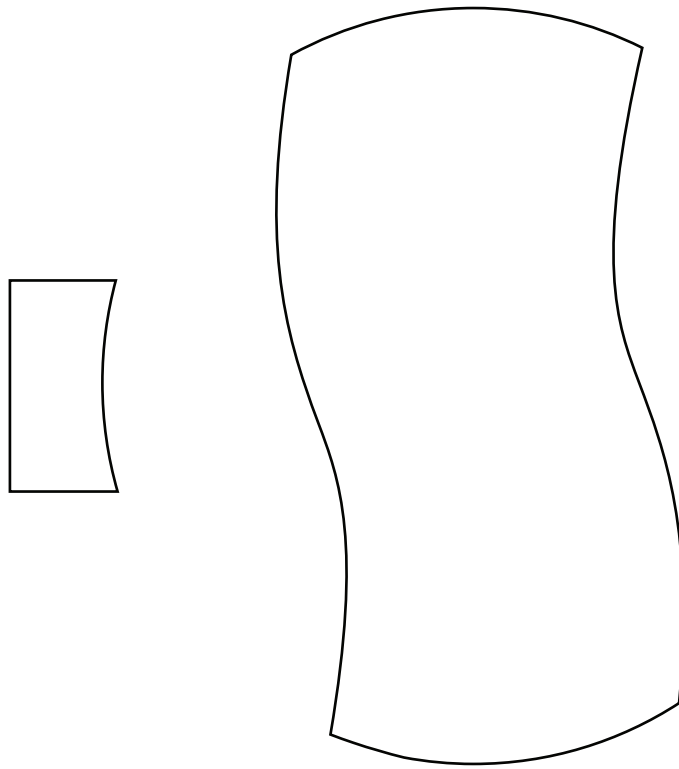


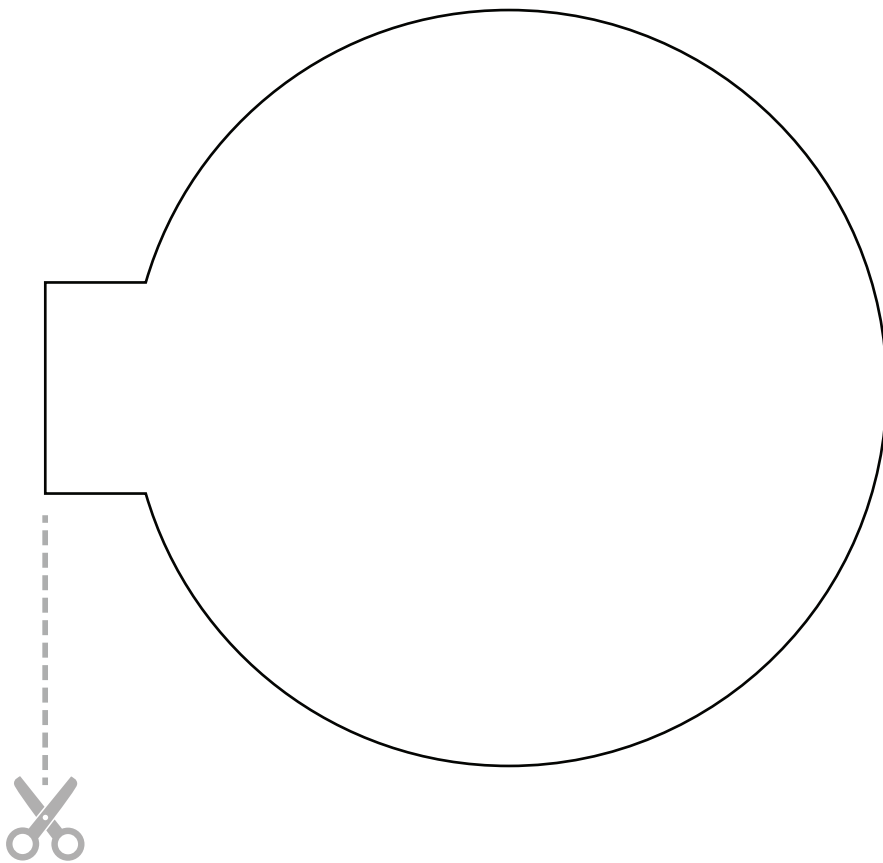
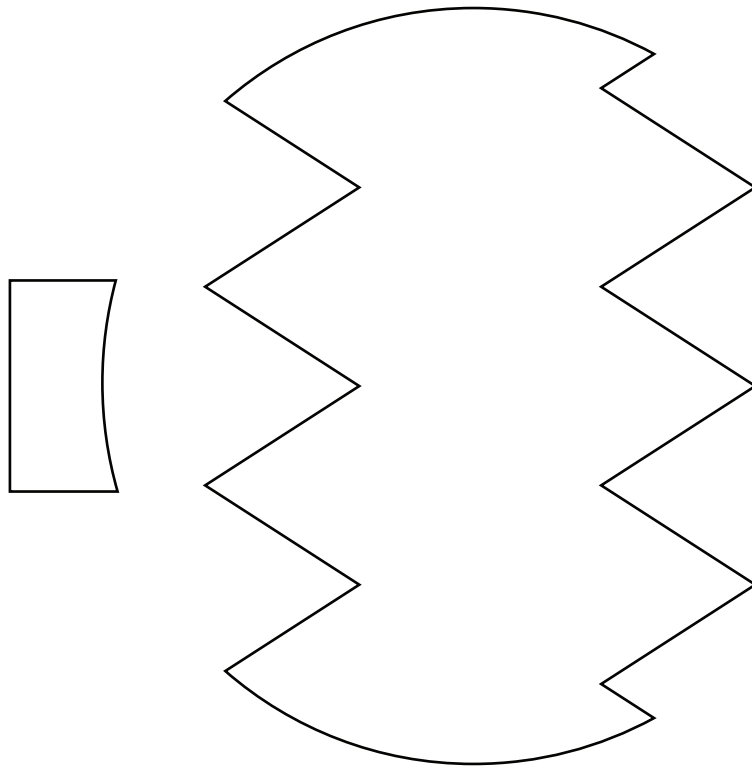
Front

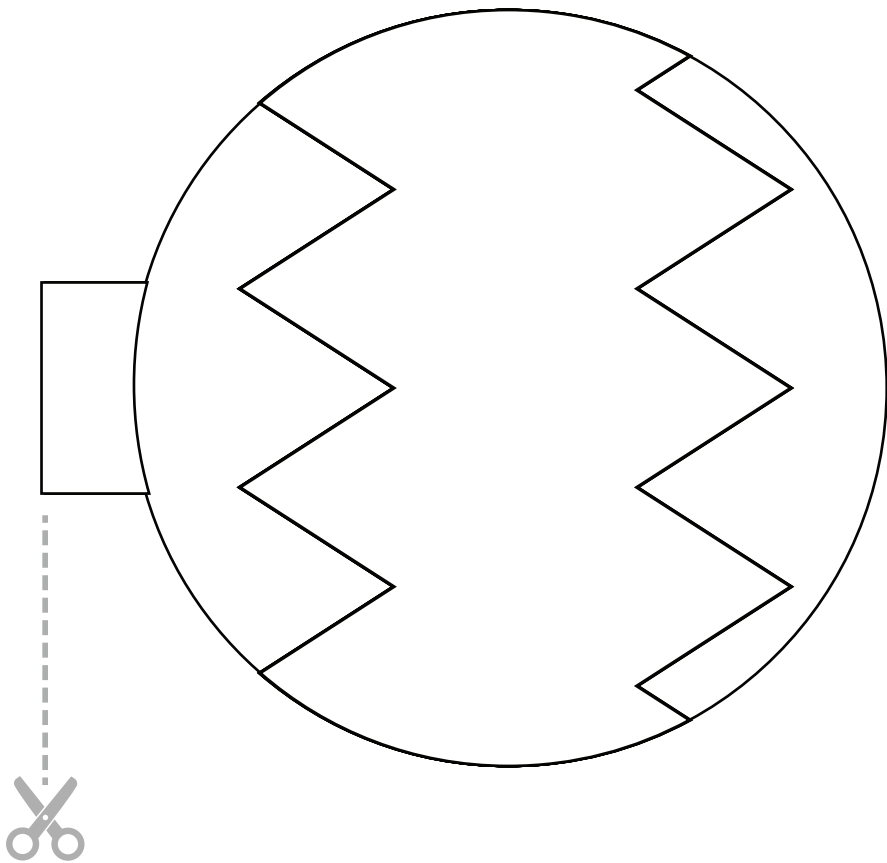
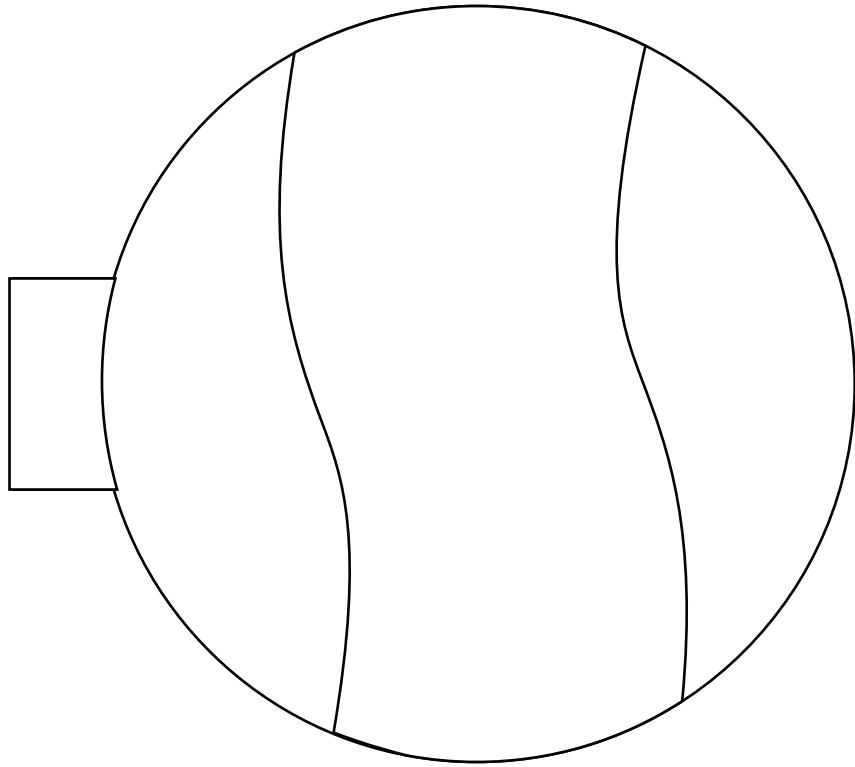


Back



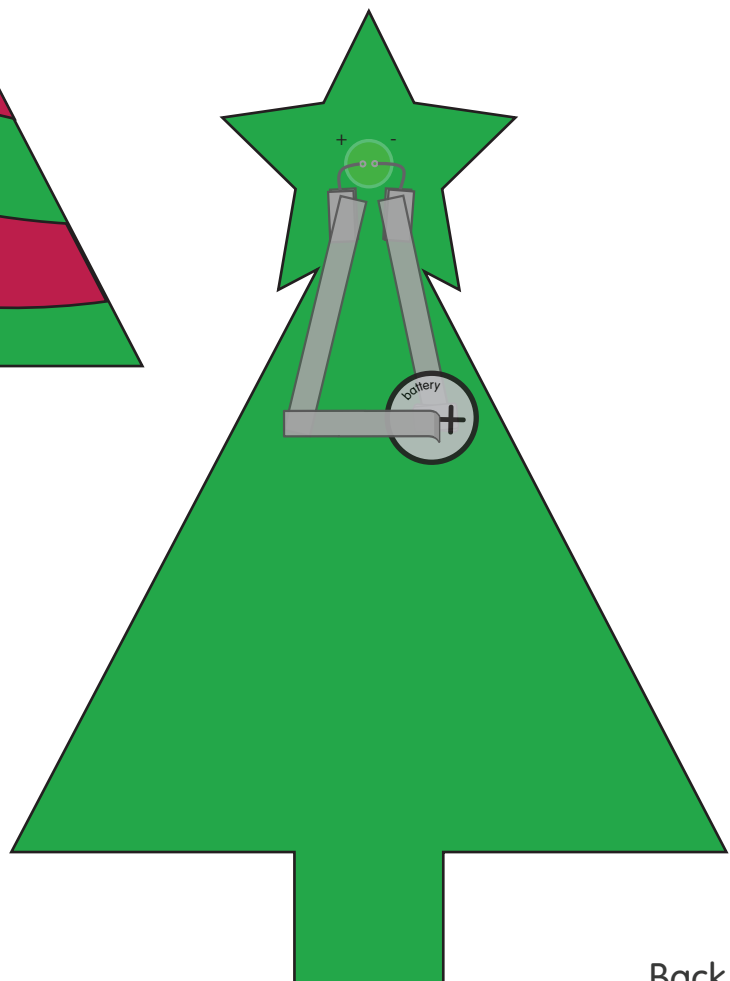
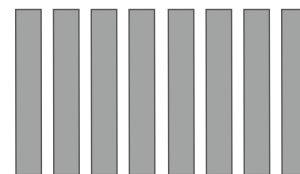
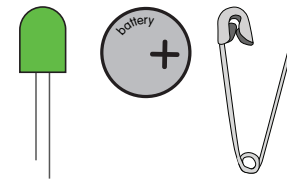


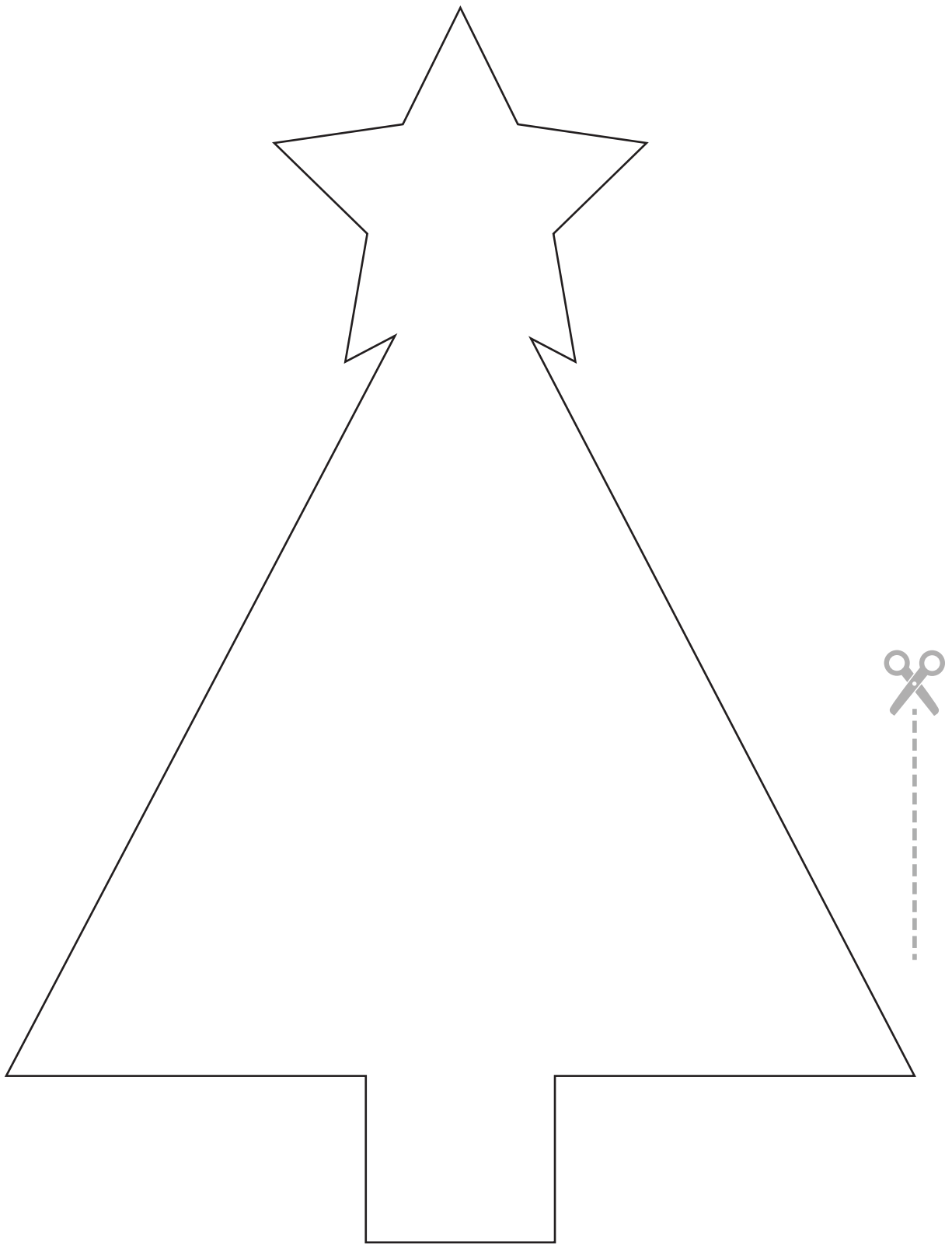




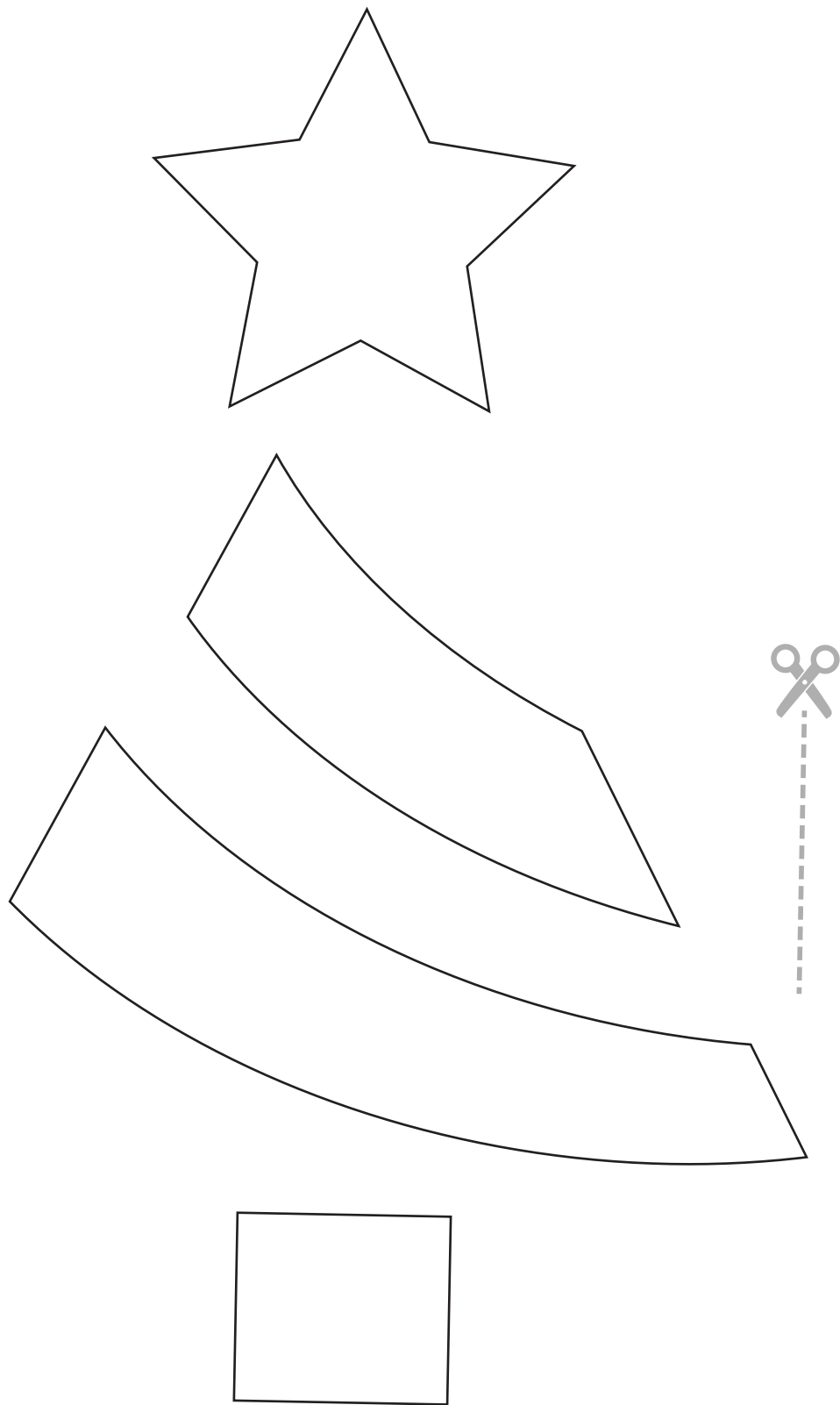
# Felt Christmas Tree

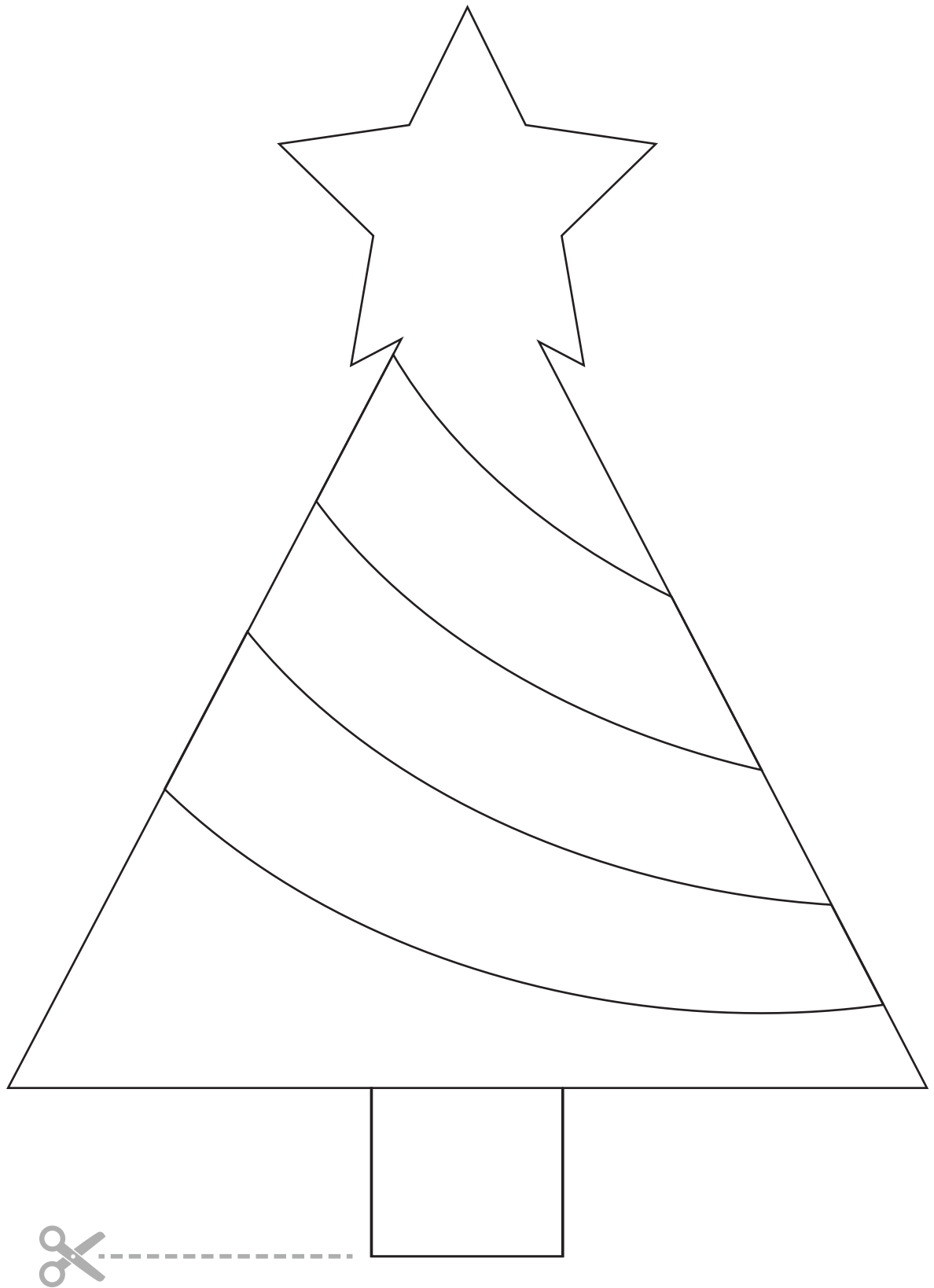
Make a Christmas Tree (with a star that lights up) using an LED, a CR2032 battery, and some Maker Tape. You can find all these parts in our Wearable Circuits Kit. Just supply your own scissors, felt, and glue.







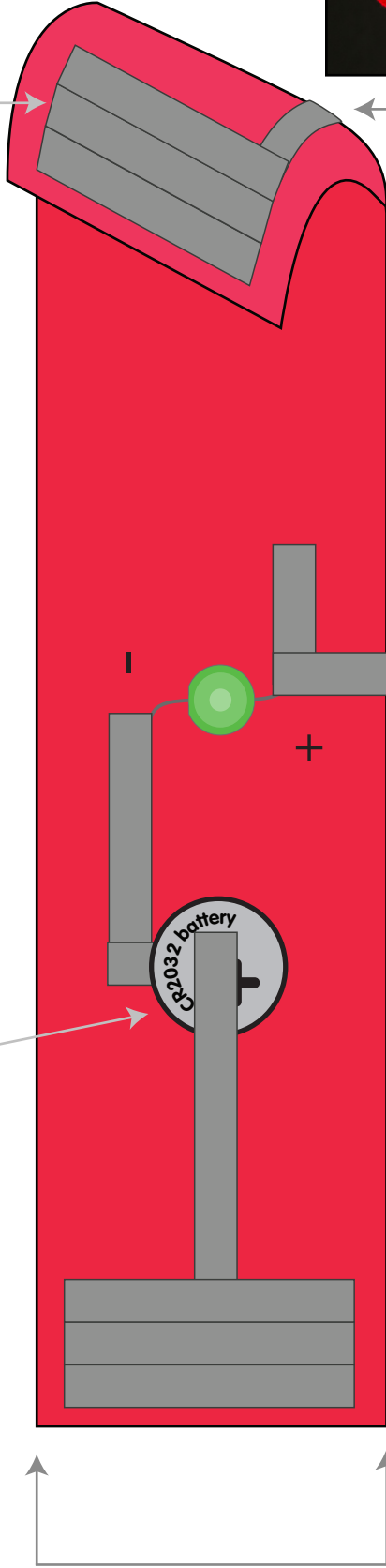
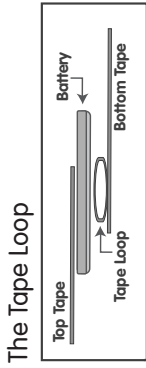




# No-Sew Christmas Tree Bracelet

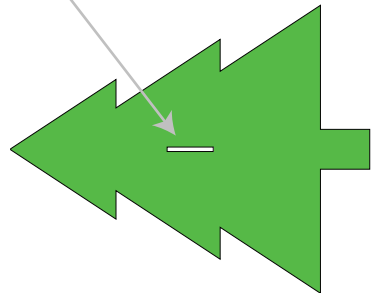
Make a festive Christmas Bracelet (that requires no sewing) by using ordinary felt with Maker Tape.

A few strips of Maker Tape (on the top of one side and the bottom of the other side) will act as a switch when you connect it with a tape loop.

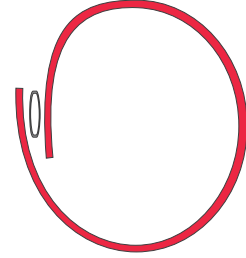


Make your bracelet at least 2" wide and long enough to go around your wrist.

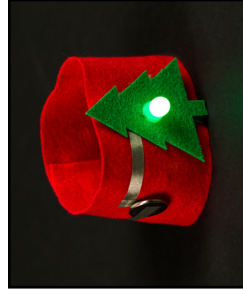
Tape connects on bottom

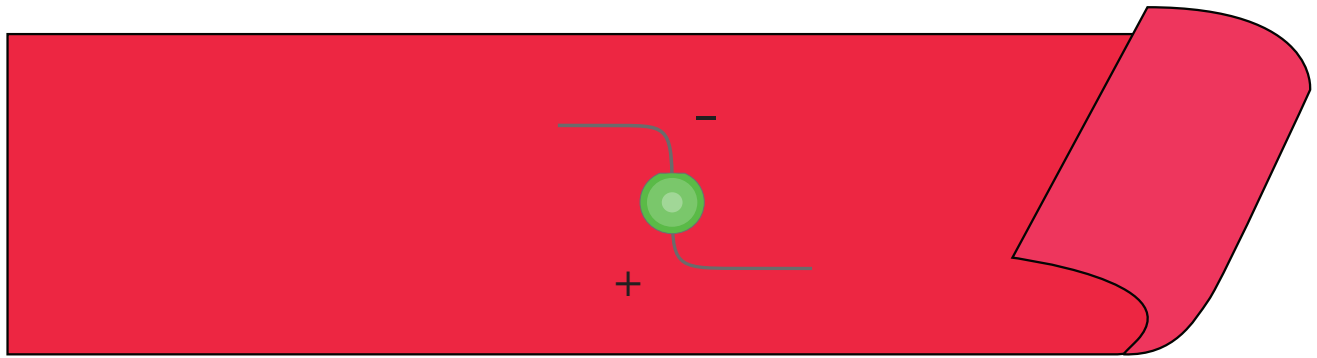


Cut out your Christmas Tree (or any shape you want) and cut a slit in the center just long enough to fit over the LED. You can easily cut the slit with scissors by folding your shape in half then making a slight cut. Start small and test it out, then make it longer if needed.

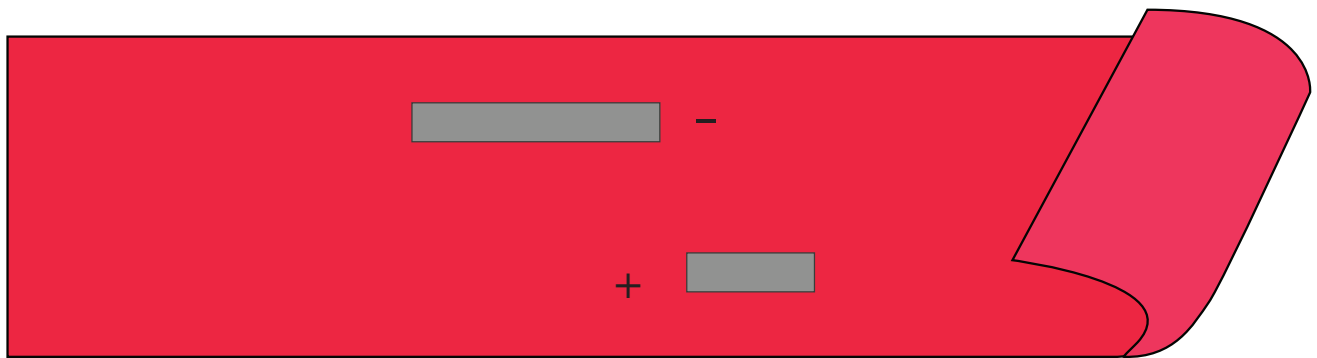


Wrap your bracelet around your wrist so the strips of Maker Tape are overlapping each other, and connect them with a loop of Maker Tape to secure them together and act as a switch for your circuit. Your LED will light up!

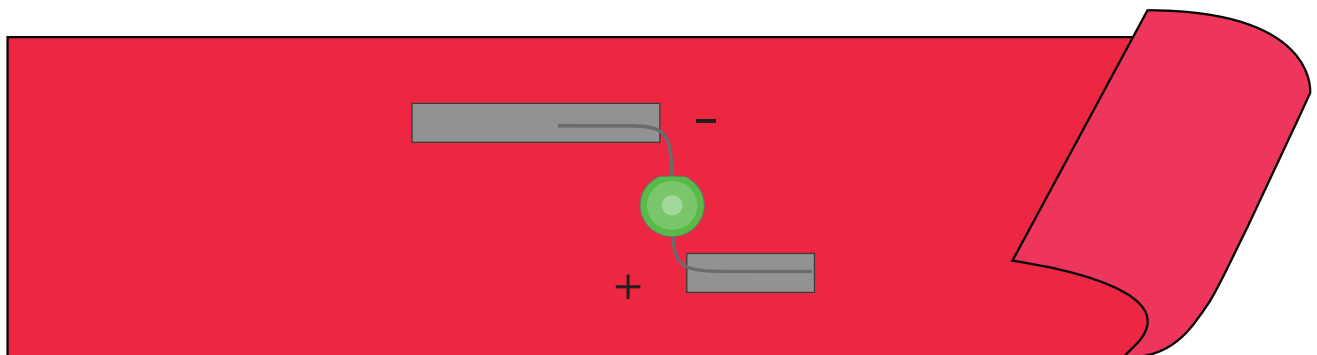




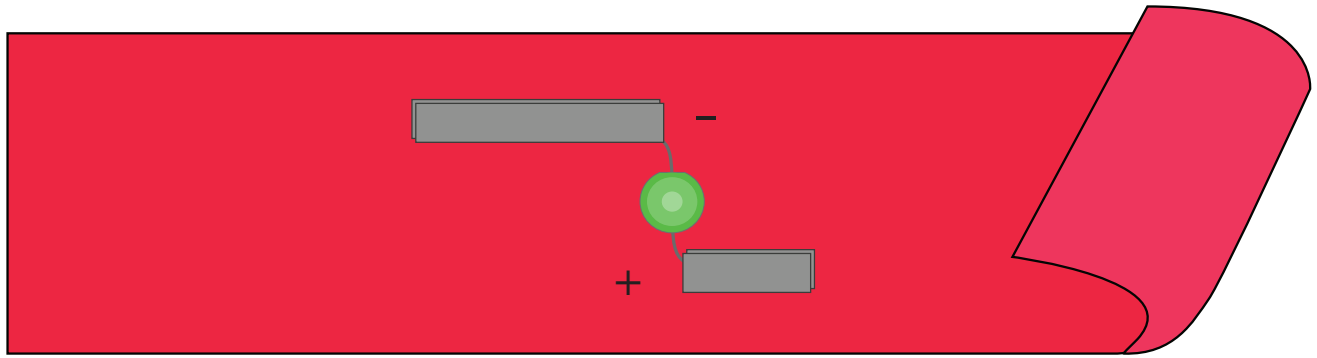
Cut a piece of felt into a strip about 2 inches wide and long enough to wrap around your wrist with about an extra inch at the end. Once you have your felt ready bend the legs of an LED as shown above, making note which leg is positive and which is negative.



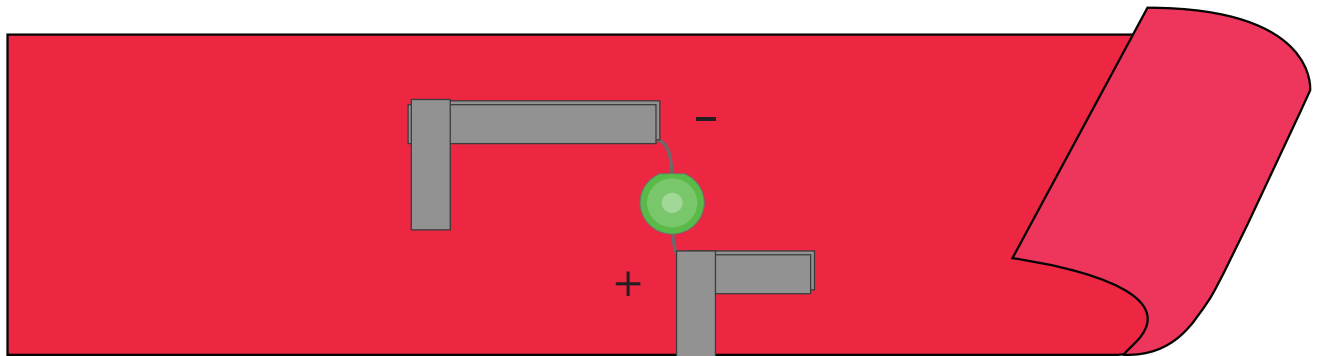
Place two pieces of Maker Tape onto the felt where the LED legs will go. This is the bottom layer of tape which will help make a solid connection to the LED legs.



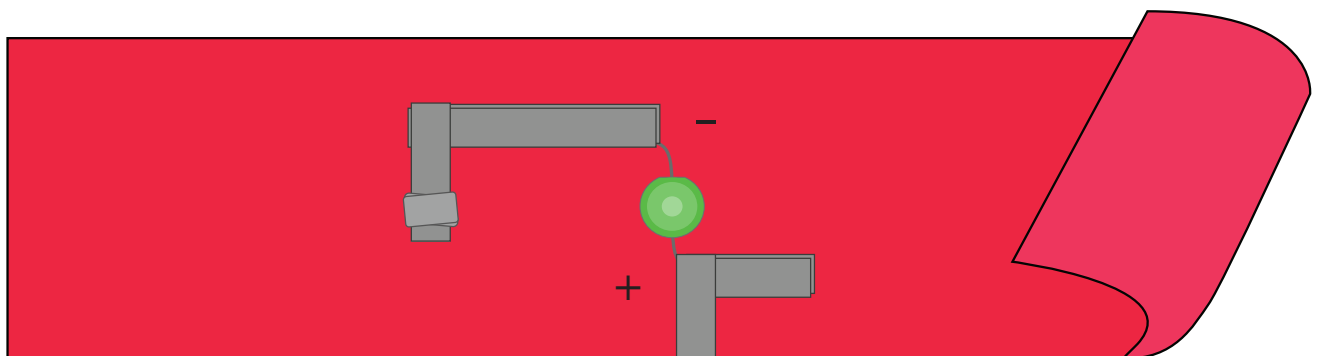
Place the LED on top of the bottom layers of tape, again making sure you've made note of which leg is positive and which leg is negative.



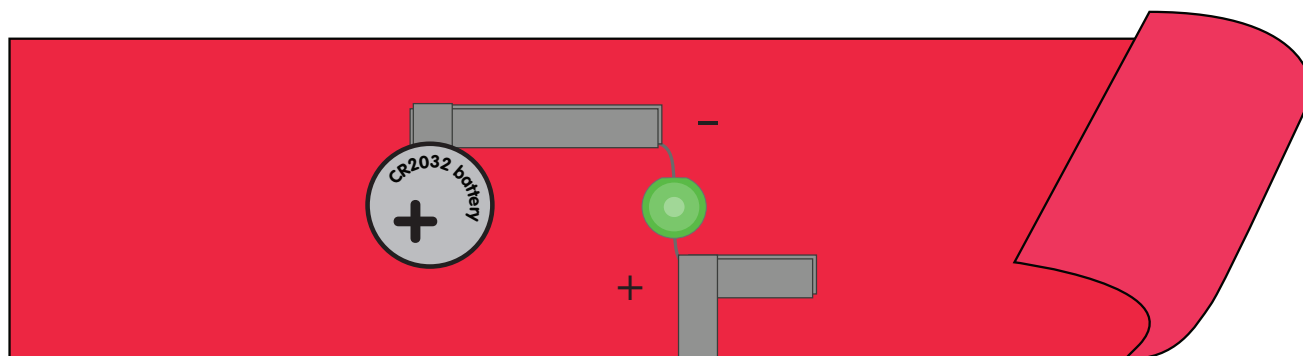
Place tape on top of the bottom tape pieces so the LED legs are sandwiched between the two layers. Press down on the tape to ensure a good connection.



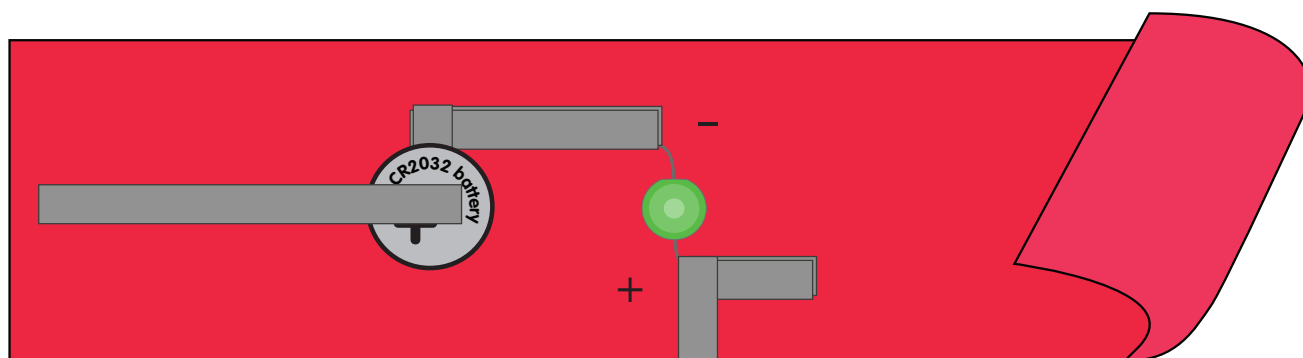
Add two shorter pieces of Maker Tape. The one connecting to the negative LED leg should go to about the center of the felt as shown. For the tape connecting to the positive leg we'll need it to wrap around to the other side of the felt about a half inch.



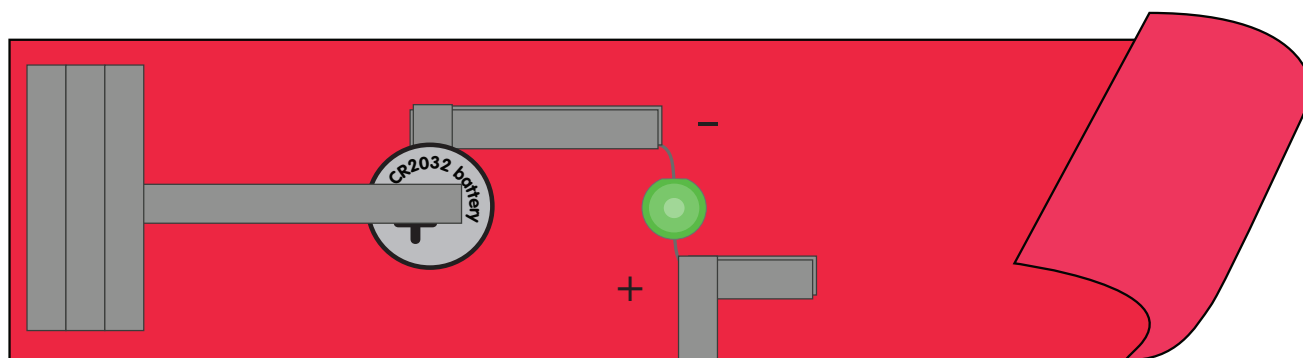
Make a tape loop using a small piece of Maker Tape and stick it down to the end of the tape coming off of the negative side.



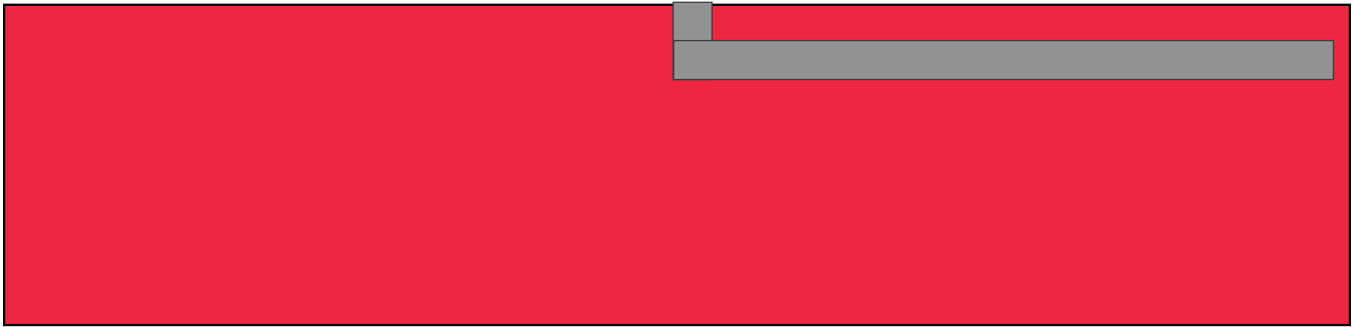
Stick the battery down to the tape loop. Make sure the positive side is facing up. (You should see a + sign on the battery.) If you put the battery in place upside down your circuit will not work!



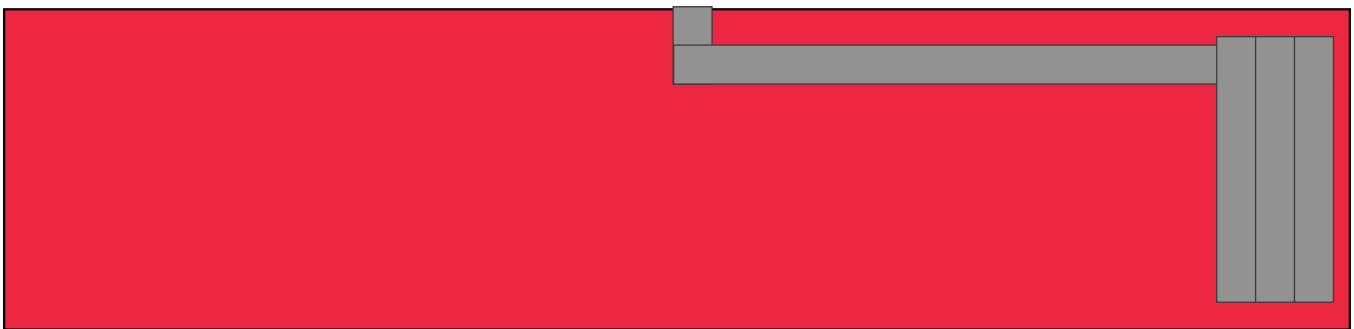
Run a piece of Maker Tape from the top of the battery to the end of the bracelet. This will be our positive side battery connection.



Run a few strips of Maker Tape (about two or three) over the strip added in the previous step.



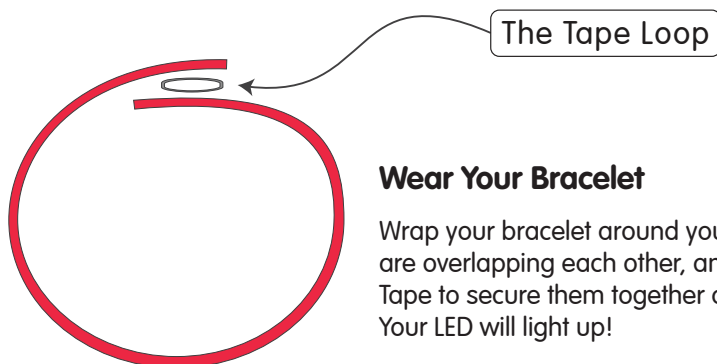
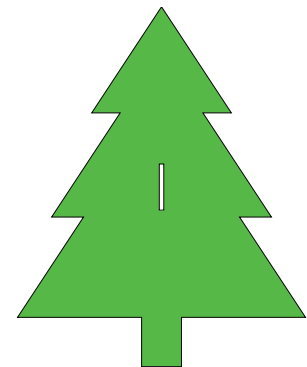
Flip your bracelet over and add a long strip to the short piece we wrapped around from the front. This will be connected to the positive side of the battery when we close the circuit.



Finally, add a few more strips of Maker Tape across the back side so they cover the longer strip of tape. Once this is done your bracelet is complete! If you want to add a tree, keep reading!

### Add a Tree

Cut out your Christmas Tree (or any shape you want) and cut a slit in the center just long enough to fit over the LED. You can easily cut the slit with scissors by folding your shape in half then making a slight cut. Start small and test it out, then make it longer if needed.

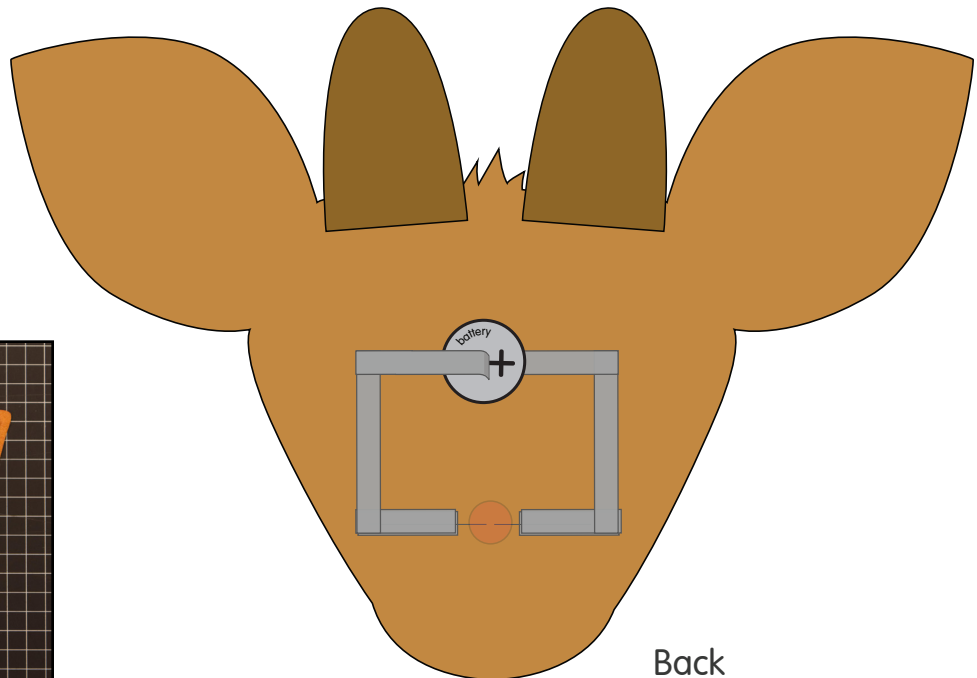
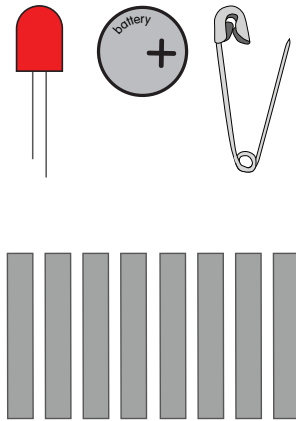
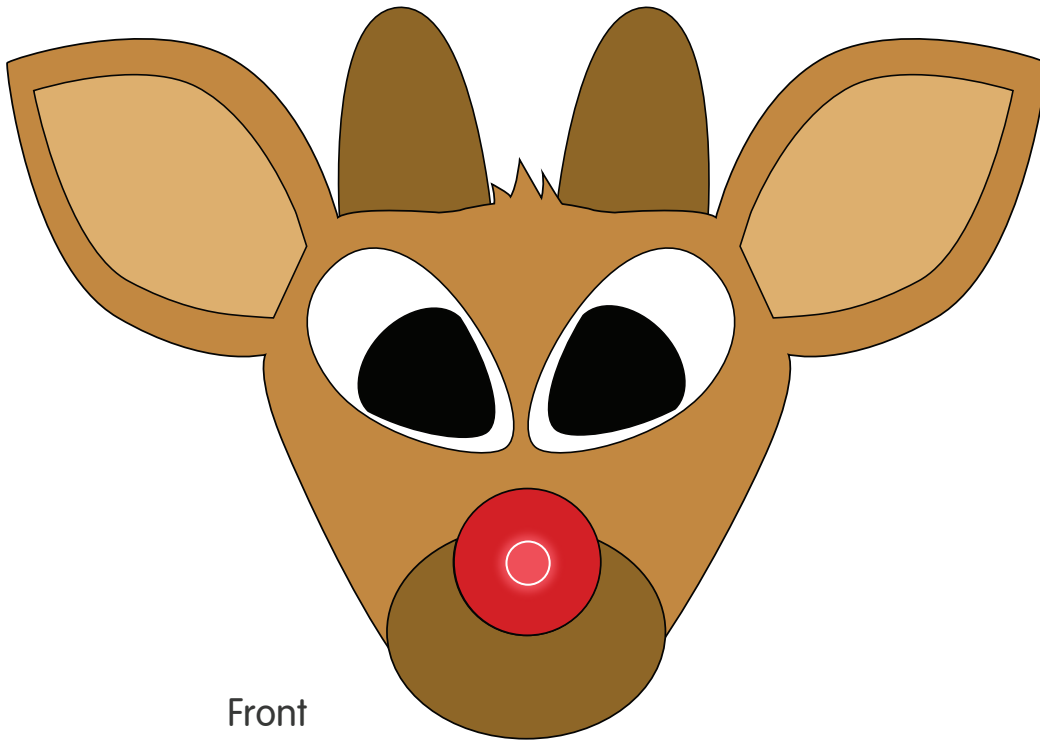


### Wear Your Bracelet

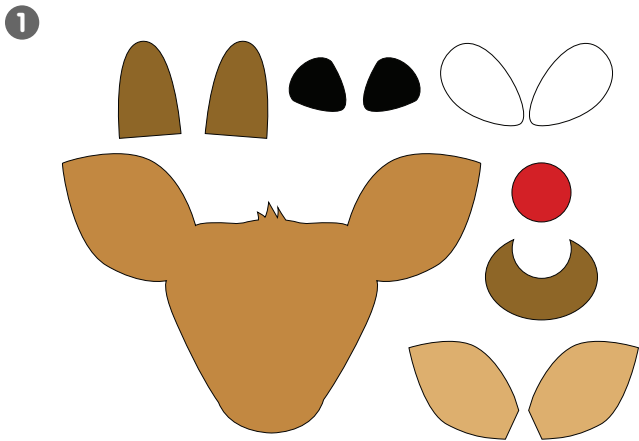
Wrap your bracelet around your wrist so the strips of Maker Tape are overlapping each other, and connect them with a loop of Maker Tape to secure them together and act as a switch for your circuit. Your LED will light up!

# Felt Red Nosed Reindeer

Make a reindeer (with a red nose that lights up) using a red LED, a CR2032 battery, and some Maker Tape. You can find all these parts in our Wearable Circuits Kit. Just supply your own scissors, felt, and glue.



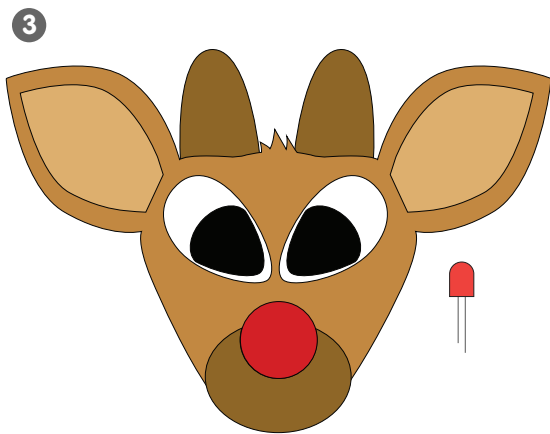




Print the PDF template pages and then use them to cut out felt pieces for your project.



Assemble your reindeer by gluing down the pieces of felt as shown. Once your reindeer is assembled you can start adding your circuit.



We'll need to poke two holes through the felt to put the LED legs through.



Since we need to go through two layers of felt we recommend using a safety pin or a push pin to make the holes.



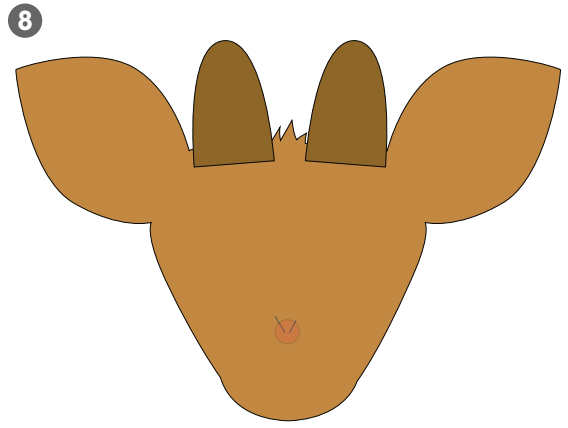
Add the LED by pushing the legs through the holes.



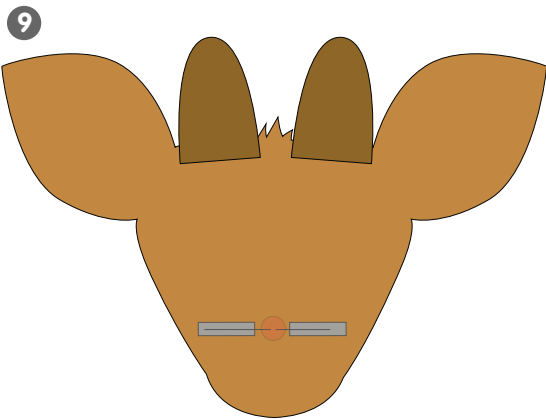
With the longer (positive) leg on the right side you'll need to remember that when we flip over the reindeer then the positive leg will be on the left side.



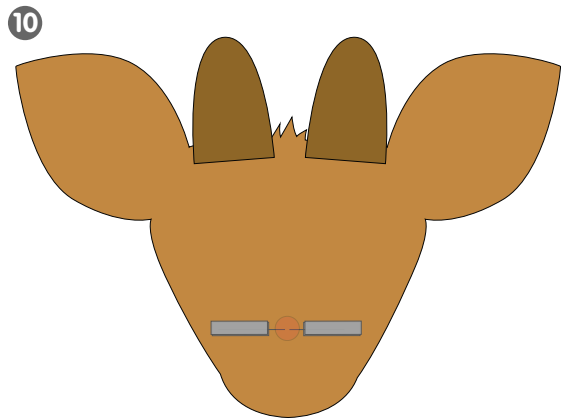
The LED should now be in place. It should be flush against the felt with the legs sticking out the back.



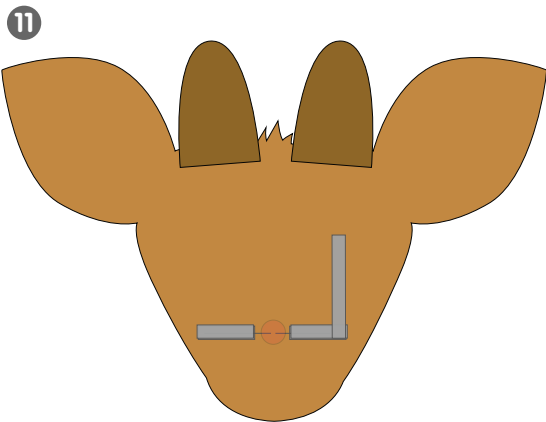
Flip over your reindeer and you'll see the LED legs sticking straight up. We'll need to bend them down flat, but before you do that we're going to add two pieces of Maker Tape.



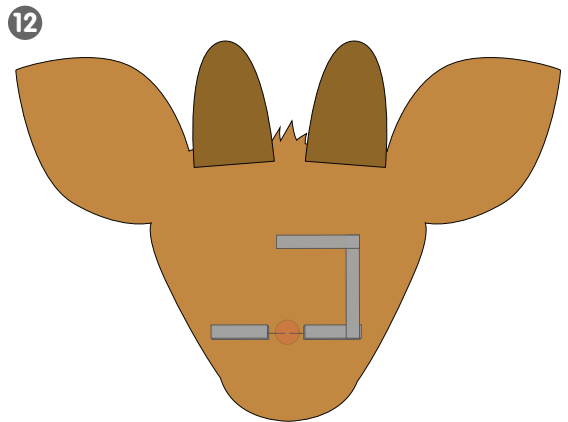
Add two pieces of Maker Tape (one for each leg) so that when you bend the legs down they make contact with the tape.



Once the LED legs are flat against the tape, add another layer of Maker Tape over the LED legs.

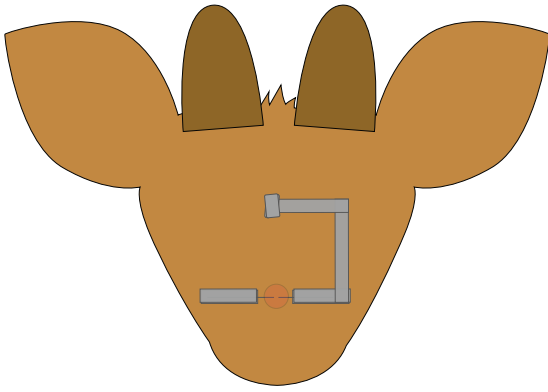


Add the negative piece of Maker Tape to the LED leg on the right side. (This will connect the negative leg to the negative side of the battery.)



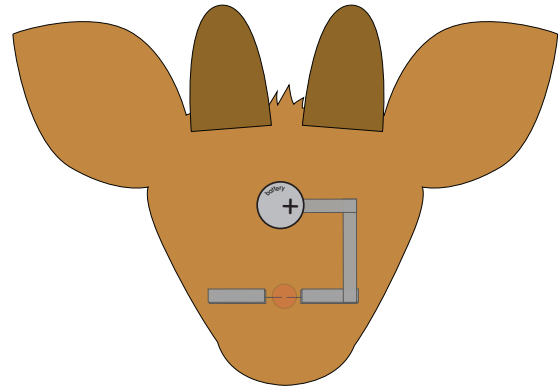
If you need to use more than one piece of Maker Tape to connect things that's fine. You can overlap Maker Tape and it will still work because it's conductive on both sides and all the way through.

13



Using Maker Tape, create a small tape loop.

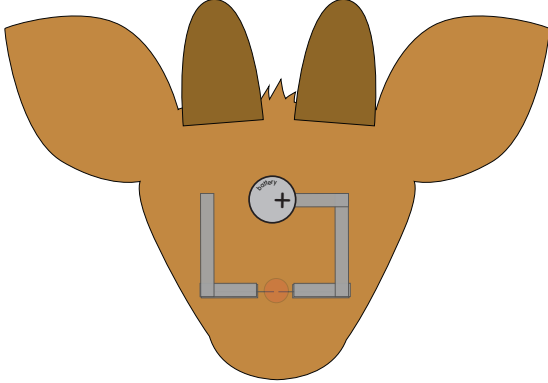
14



Add the tape loop to the negative piece of tape, then stick the battery down to it.

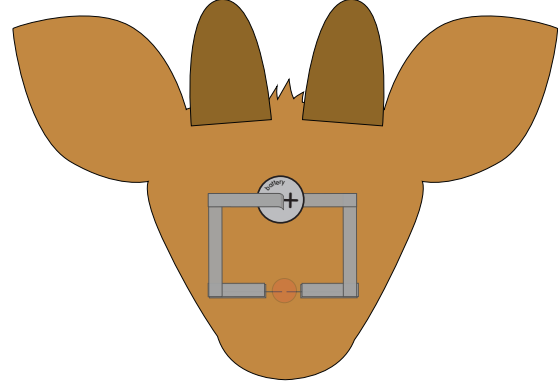
Make sure you stick the negative side of the battery down to the tape loop.

15



Add additional pieces of Maker Tape to connect the positive LED leg to the top of the battery.

16

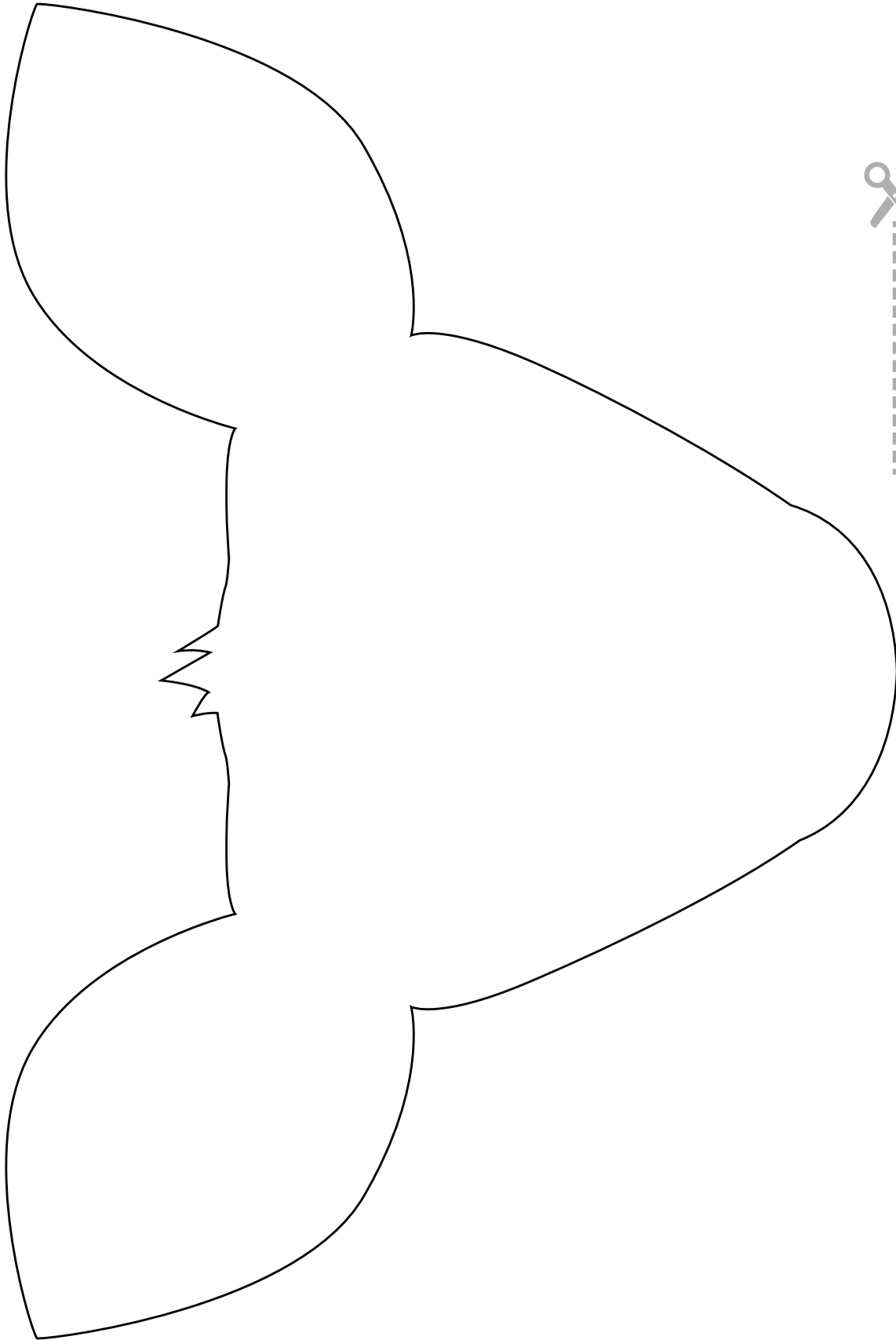


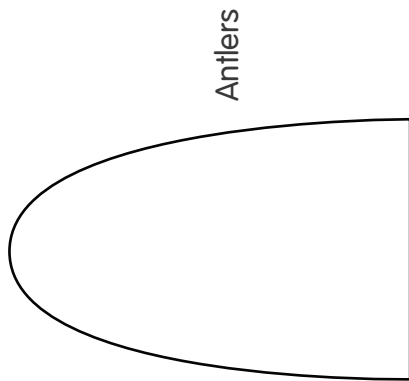
Add one more piece of Maker Tape to connect the battery to your circuit. That's it for the back!

17

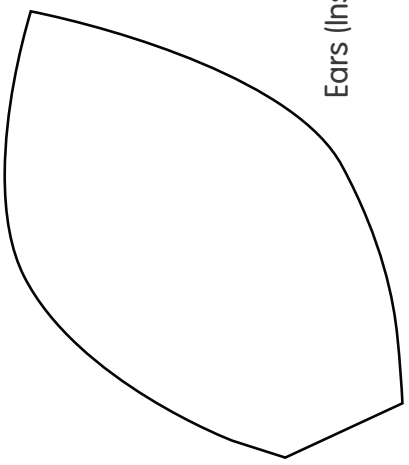
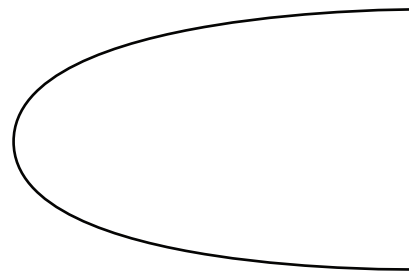


Your LED should light up as soon as you connect the final piece of Maker Tape!

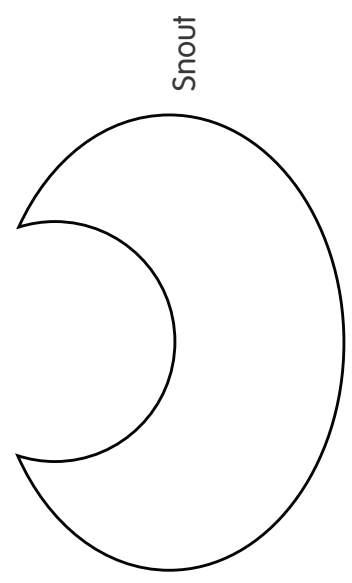
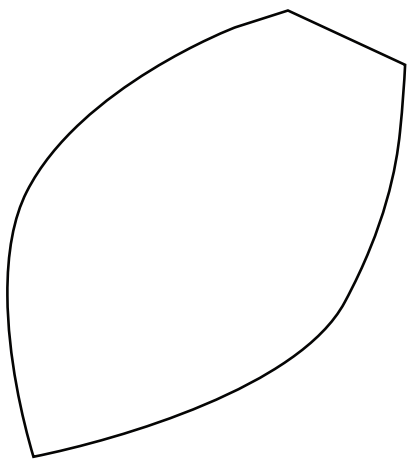




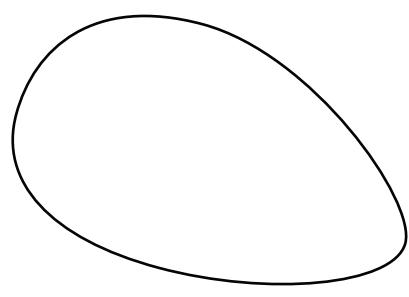
Antlers



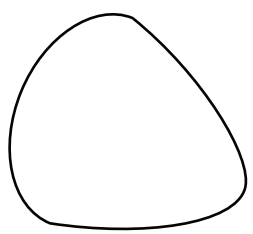
Ears (Inside)



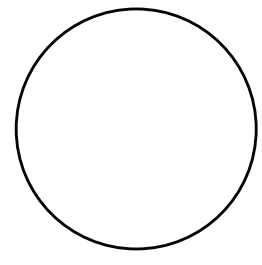
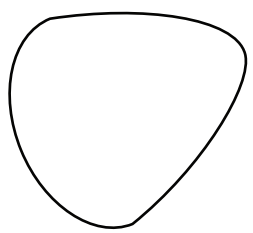
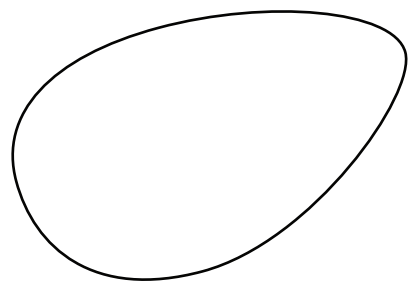
Snout



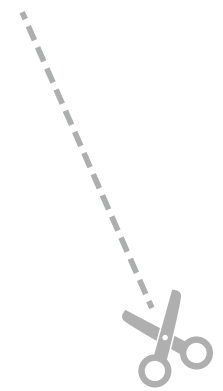
Eyes (Back)



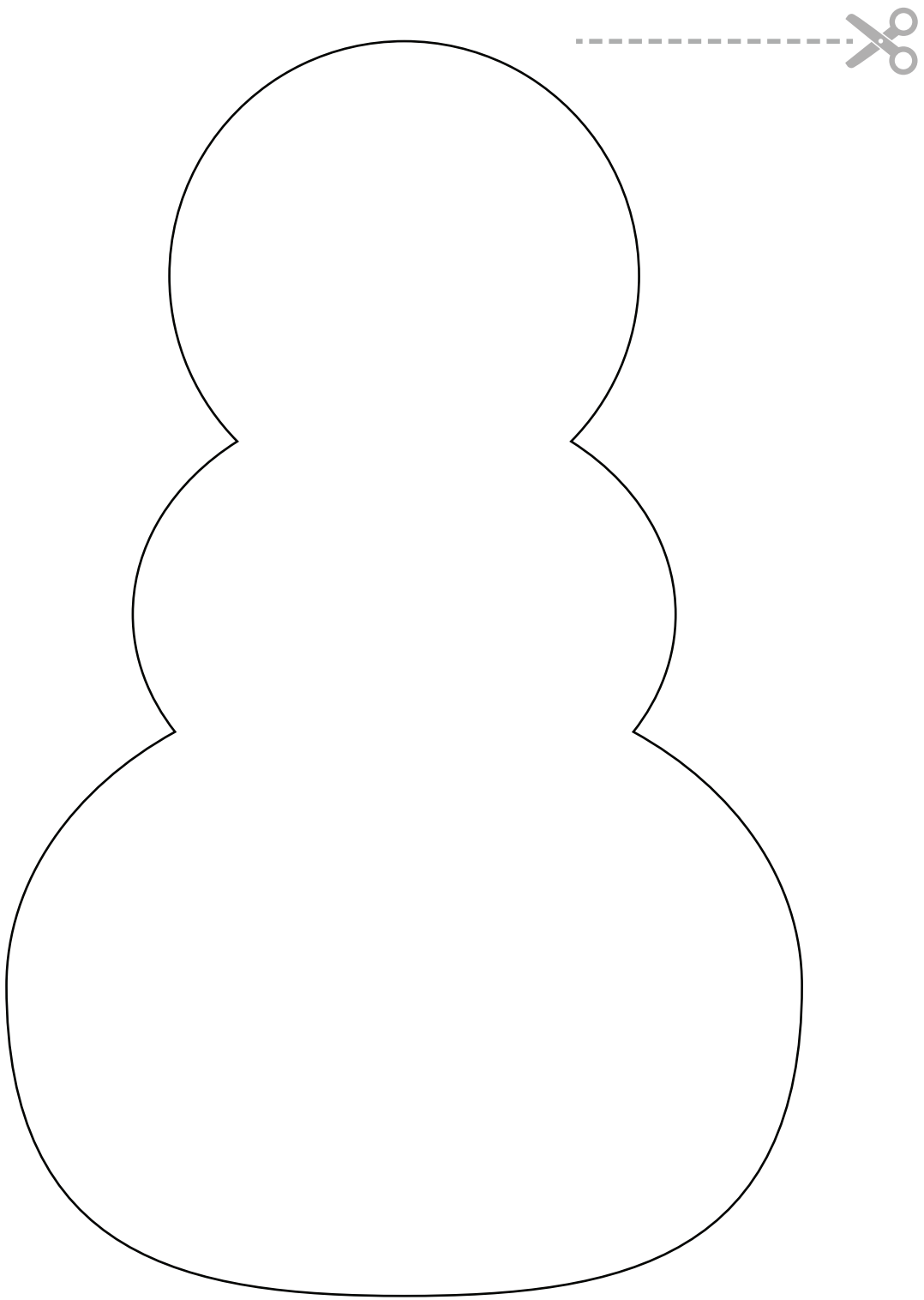
Eyes (Front)



Nose

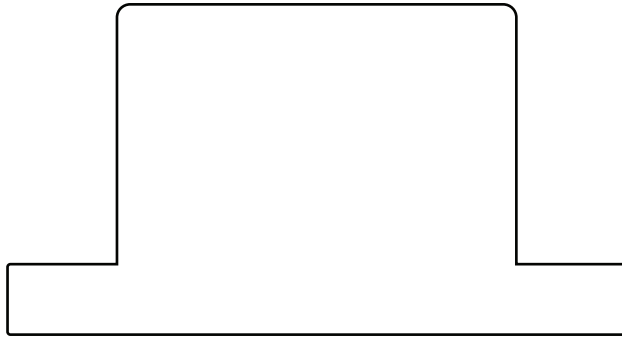








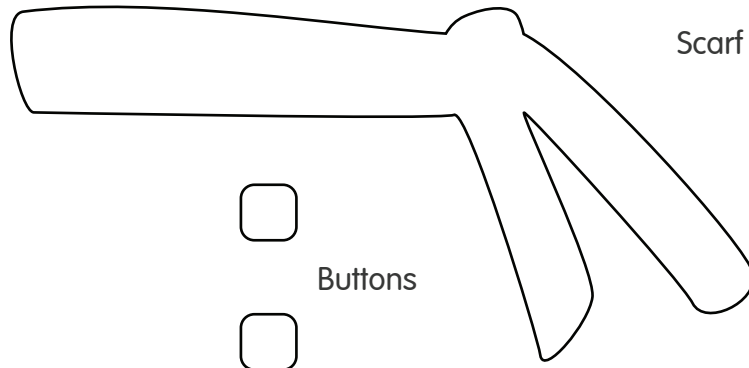
Hat Band



Hat



Eyes

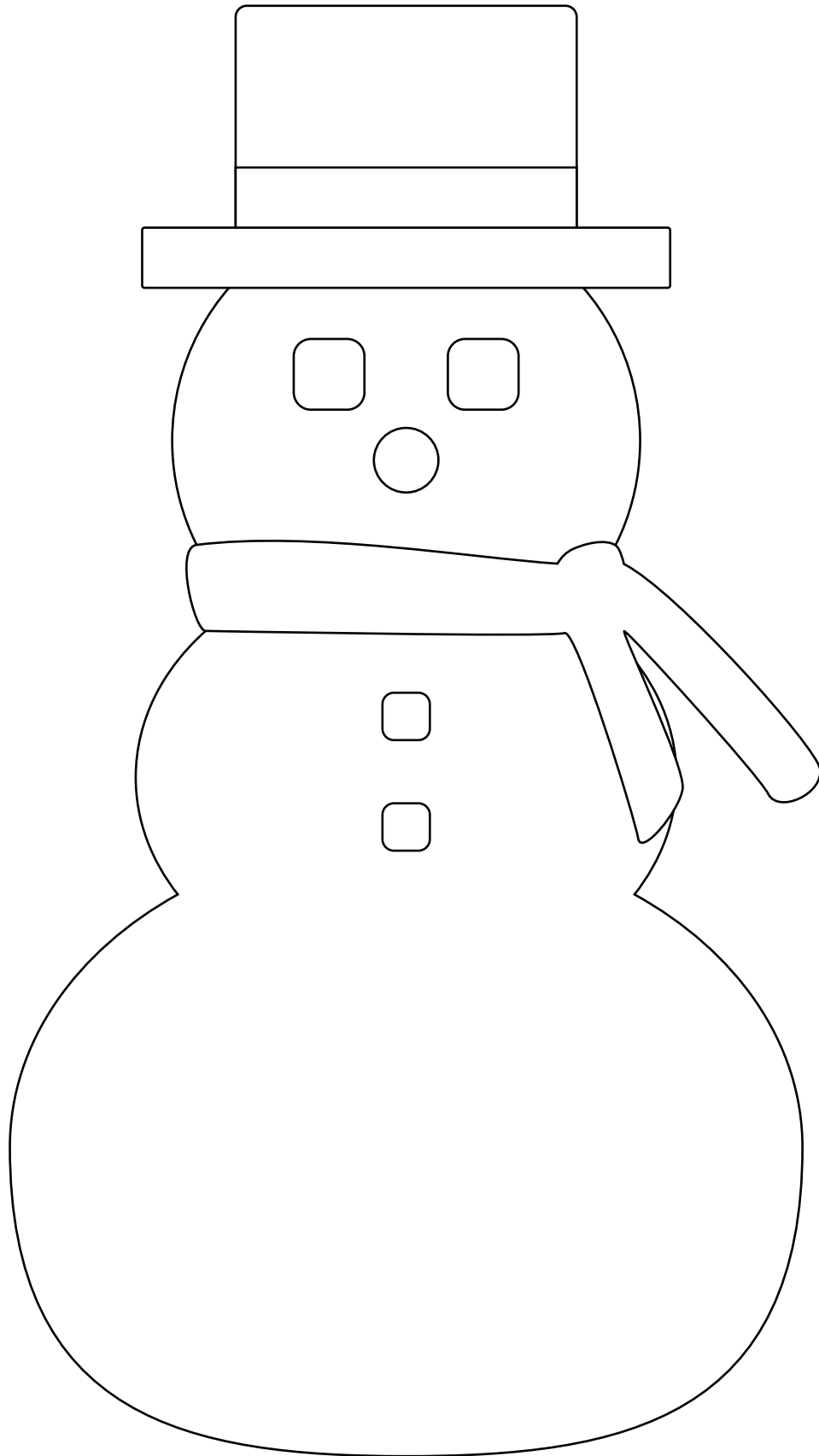


Scarf



Buttons





# More Projects!



## Super Simple Light-Up Christmas Sweaters

Yes, this really is “Super Simple!” A quick and easy project requiring just 10 minutes and two parts – an LED and a Battery – along with some tape, and you’ve got a light-up sweater for the holidays!

Check out the full-guide and video online:

<https://learn.browndoggadgets.com/Guide/go/511>



## Easy Light-Up Christmas Sweaters with Maker Tape

Slightly more advanced, this Light-Up Sweater project shows how to make more complex circuits using multiple LEDs and our conductive Maker Tape, which works great on fabric!

Check out the full-guide and video online:

<https://learn.browndoggadgets.com/Guide/go/510>



## Simple Light-Up Ugly Christmas Sweater

Get Crafty! For this “Ugly” Sweater you’ll be making your own tree, decorating it, and adding the circuit. It’s heavy on the crafting side of things but you’ll still add a circuit with multiple LED that light up.

Check out the full-guide and video online:

<https://learn.browndoggadgets.com/Guide/go/266>



## No-Sew Light-Up Holiday Stockings

Prepare to stuff some LEDs into these stockings! Add one, two, or more LEDs to an existing stocking to light up the night. Circuit diagrams will show you the way.

Check out the full-guide and templates online:

<https://learn.browndoggadgets.com/Guide/go/418>





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## Learn, Create, and Inspire—Even on a Budget

Creating a project from scratch can be difficult for the casual builder. Finding the right directions, the right parts, and the right tools—all at the right price—can be a major hurdle.

At Brown Dog Gadgets, we've created kits and projects for creators of all ages and budgets. Follow our step-by-step project directions and learn more with our classroom resources or find individual parts to dream up your own creations. No matter how or what you create, our products can help you learn the basics of electronics, circuitry, and solar energy.

Find additional eBooks, crafting guides, videos, directions, and educational resources at [BrownDogGadgets.com](http://BrownDogGadgets.com). Contact us for educational discounts and free professional development classes.

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