



# Candle Flicker Hair Bow

Created by Becky Stern



<https://learn.adafruit.com/candle-flicker-hair-bow>

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# Overview

Make a twinkling accent for your updo! This tutorial will teach you to make a ribbon bow and simple LED circuit. One Adafruit LED Sewing Kit has enough supplies for two bows, so make this project with a friend! The included LEDs contain a tiny chip that flickers the LEDs to simulate a candle's glow, so all we have to do is power them up!



Before beginning this project, check out our [LED Sewing Kit \(https://adafru.it/c2L\)](https://adafru.it/c2L) guide!



Glamour shots by johngineer  
Tutorial photos by Risa Rose

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# Tools & Supplies



For this project you will need:

- [Adafruit LED Sewing Kit \(http://adafru.it/1285\)](http://adafru.it/1285) with candle flicker LEDs
- 28-inch piece of 2.25" wide [pewter grosgrain ribbon \(https://adafru.it/c2y\)](https://adafru.it/c2y)
- Small piece of trim/ribbon or colorful ribbon cable
- Small piece of heat shrink tubing
- Hair clip

Tools:

- Scissors
- Hot glue gun (keep a bowl of ice water nearby for burns)
- [Pliers \(http://adafru.it/146\)](http://adafru.it/146)
- Permanent marker
- Standard cotton/poly thread
- Lighter (or wood burning tool/old soldering iron)
- Clear nail polish



Verify the parts and test your [LED Sewing Kit using our guide \(https://adafru.it/c2z\)](https://adafru.it/c2z)!

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## Ribbon Bow

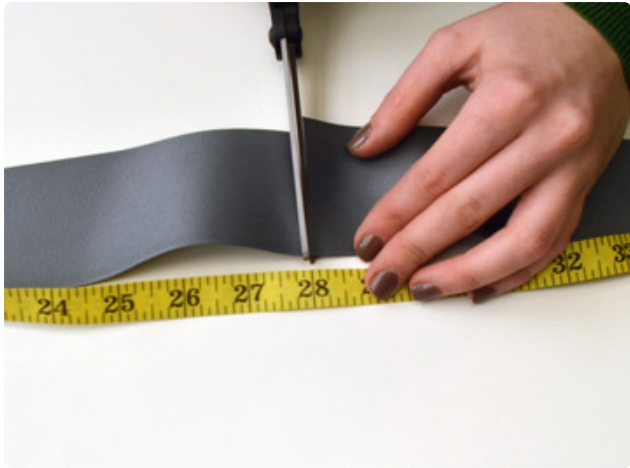


Square up the end of your ribbon spool, and heat-set the edge with a hotknife, lighter, or the barrel of an old soldering iron.



Grosgrain ribbon (pronounced "grow-grain") is polyester, so slightly melting the edge prevents fraying.





Cut a 28" length of ribbon and heat-set the cut edge.



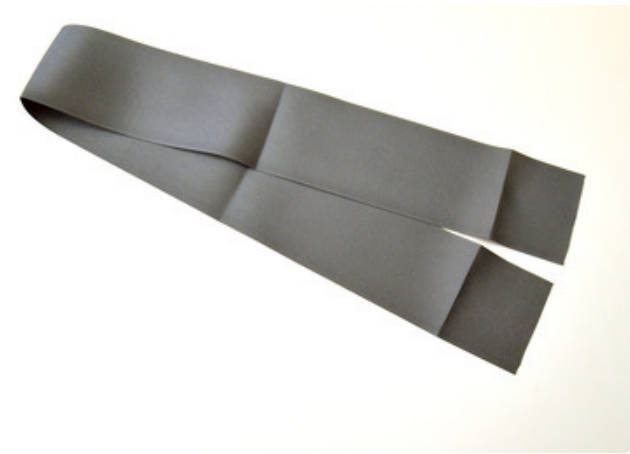
Fold the ribbon in half and make a crease.



Fold the cut ends up 2" and make a crease.



Fold the ribbon in half again, matching the center fold to the end fold you just made. Crease the quarter fold.



Unfold your ribbon.



Next we'll use the creases to align the loops of the bow.

Fold one ribbon end over and align the first two creases. Pivot the cut end 45 degrees, keeping the two creases' center points intersected.



Take up the rest of the ribbon and swing it over this first loop. Align the ribbon's center crease atop the first two layers in your hand, pivoting 45 degrees in the opposite direction from above.



Loop the ribbon slack away from you, and insert the next crease between the top two layers and the bottom layer. The crease should be parallel to the bottom layer's crease.



Keep pinching at your overlap junction for a tidy bow-- it can feel a bit like shuffling a deck of high-friction cards.

Be sure to check out the video that goes with this guide, which shows you exactly how all these folds are made!





Loop the small remaining slack back over the front (thumb side) of the bow. This last loop should be parallel with and overlap the very first loop.

Fold the bow in half lengthwise, then turn down the folded sides (accordion fold) to make a pleat.





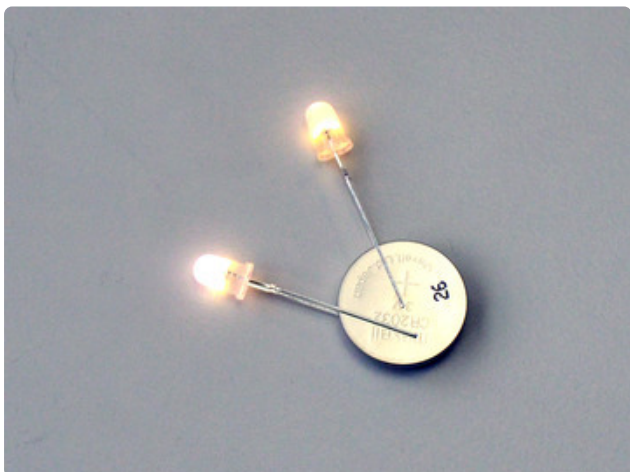
Pinch the pleat and make a stitch with plain thread through all the layers of ribbon to hold them in place.



Practice makes perfect.

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## Stitch Circuit

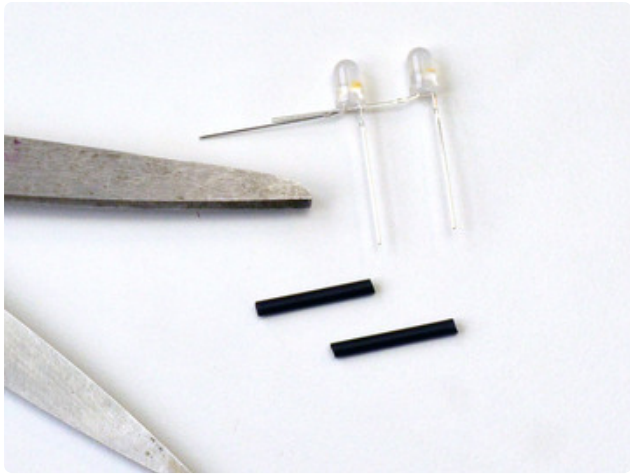


Follow the instructions in the [LED Sewing Kit guide \(https://adafru.it/c2z\)](https://adafru.it/c2z) to be sure you have all the right components and your LEDs all light up!

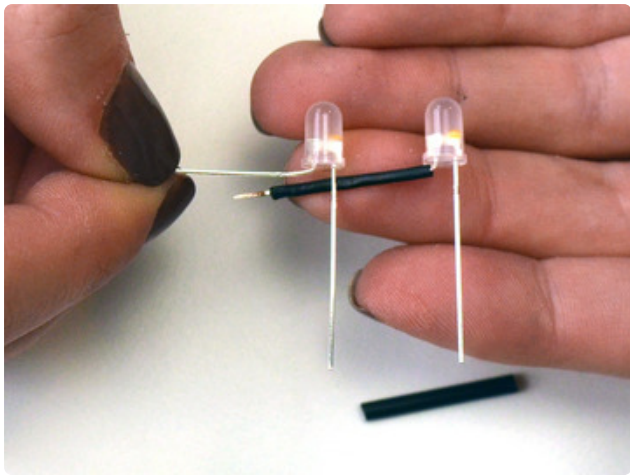
Identify the positive leads of the LEDs-- they'll be longer and will appear on the + side of the battery when glowing.



Use pliers or your fingers to bend the positive leads of two LEDs 90 degrees.

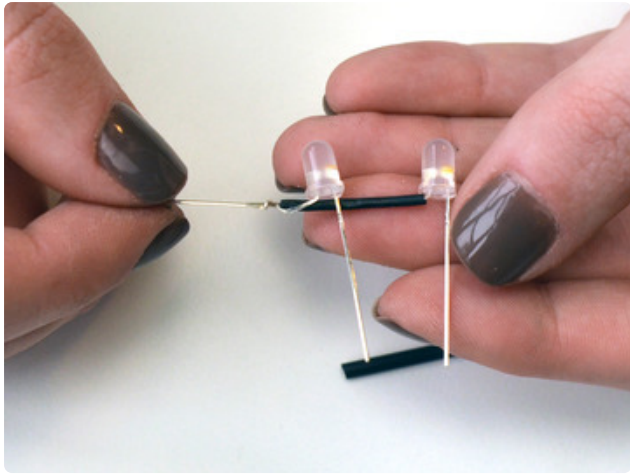


Cut two small pieces of heat shrink tubing, long enough to cover most (but not all) of a lead.

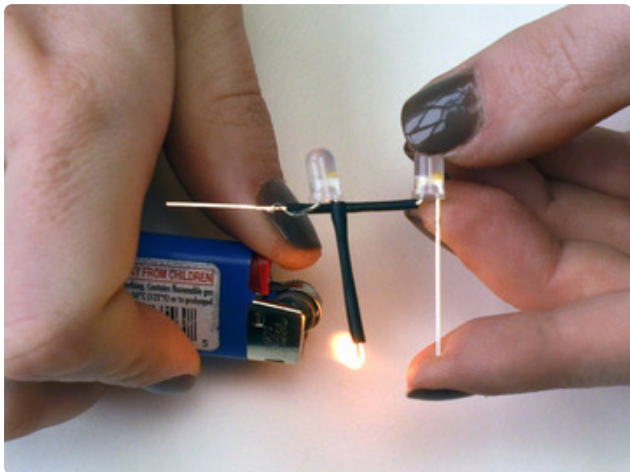


Place one piece on one positive lead and shrink the tubing with a heat tool or lighter.

Align the LEDs as shown.

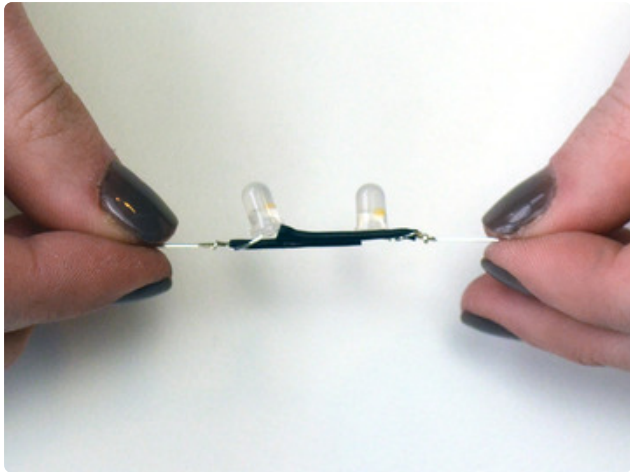


Twist the uncovered positive lead with the end of the covered lead.



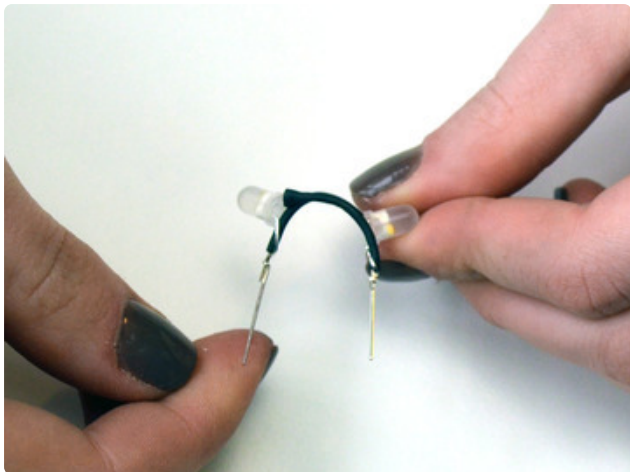
Place and shrink the other piece of heatshrink on the negative lead of the left LED.





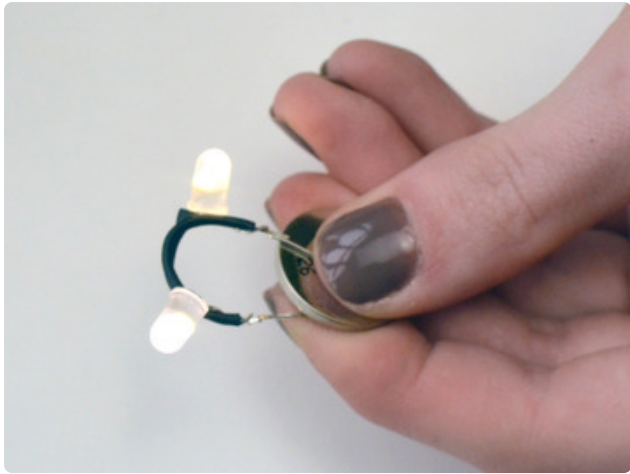
Bend the negative leads of both LEDs 90 degrees, at an opposing angle to the positive leads.

Wrap the negative leads together in the same manner as above.



The heat shrink tubing allows the LEDs to be space apart without shorting the positive and negative sides of the circuit!

Gently curve this assembly around on itself temporarily.



Pinch the assembly on a coin cell battery. If it doesn't light up immediately, flip it around and try the other way. LEDs only allow current to flow in one direction, and hooking them up backwards won't damage them.



Mark the positive lead with a marker.



Use pliers to twirl the ends of the LEDs into small spirals. These loops will be easier to sew to than a flat wire.



Place the LED assembly in the pleat of the hair bow.



Use a piece of trim or ribbon around the center of the bow. We found this scrap of rainbow ribbon cable and thought it was perfect.

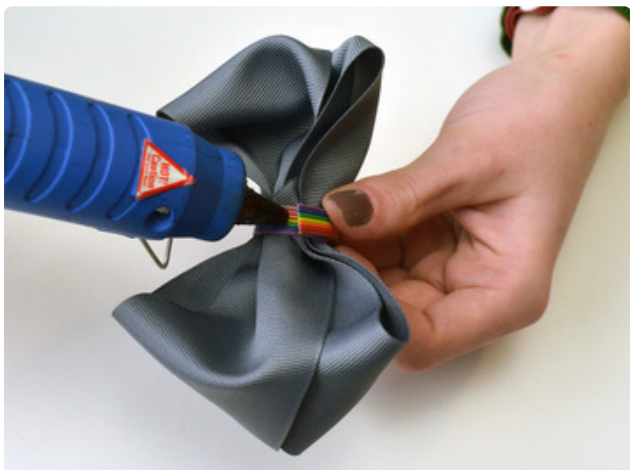


Dab a small glob of hot glue in the center of the pleat.

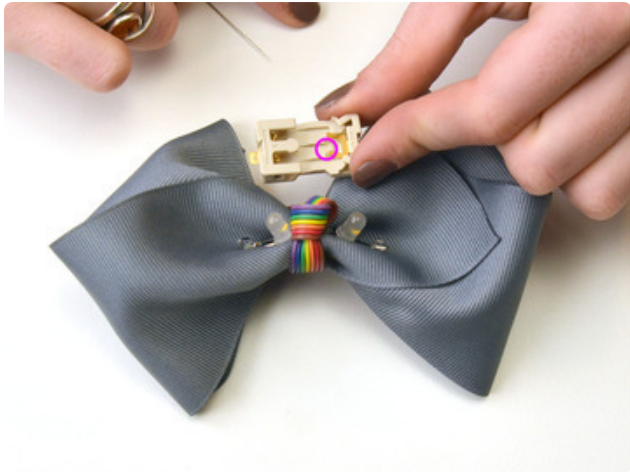


Stick the knotted accent to the glue glob.

Apply glue to the back of one ribbon tail and wrap it tightly around the hair bow's center until it is set. Trim the other tail to end at the back of the bow and glue it down as well.







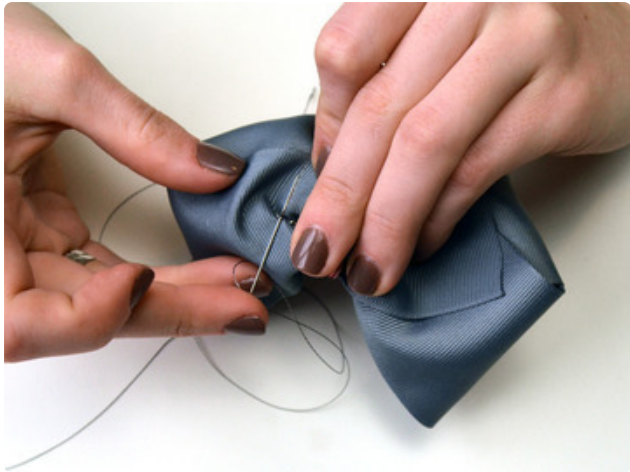
Now it's time to stitch on the battery holder, but it has to go the right way!

Look inside the holder for a tiny (-) sign (the pink circle in the photo). You will connect the positive side of the battery holder to the twirled lead with the mark (positive side of LEDs), and the negative side to the negative twirled leads.



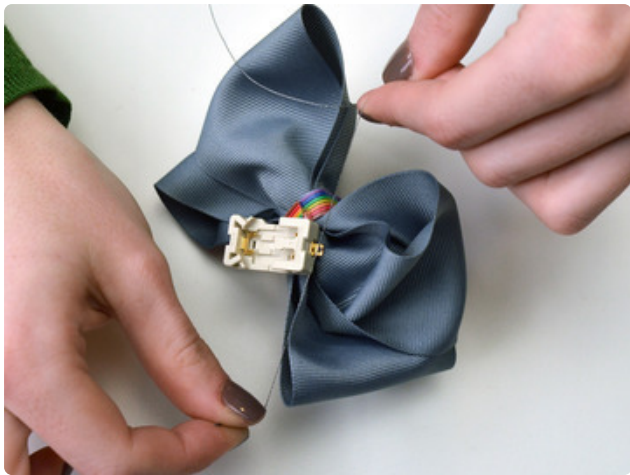
Center the battery holder at the back of the bow and pierce your needle with conductive thread straight through one of the golden tabs and also through the entire bow, surfacing inside the pleat on the front of the bow. Pull the thread through leaving at least a 4" tail at the back.

For more info on [conductive thread](https://adafruit.it/c2A), check out our guide (<https://adafruit.it/c2A>)!



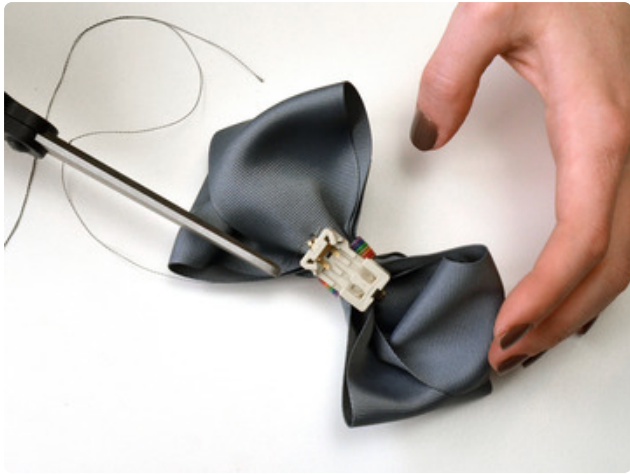
Stitch through the LED assembly's twirled end a few times so the steel thread makes good contact. Then return the needle to the back of the bow.





Stitch the battery holder's tab a few times into the ribbon below it, then tie off the thread and seal the knot with clear nail polish.





Cut the thread tails short and repeat the stitching process to secure the other side of the battery holder to the remaining LED leads.



Pop the battery into the holder and see if your LEDs light up! If they don't, check to see if your battery holder was installed backwards.



You can position the LEDs to point in the direction you like, just don't wiggle them too much or the leads could break off!





To add a hair clip, slather its end in hot glue and pinch it between the hair bow's center and the battery holder. This also serves to secure the battery holder even further, so be sure to apply glue to both sides of the hair clip.



We think these bows would also make great shoe accents!



Let the glue completely dry/cool before putting it your hair!



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## Wear It!



Consider different colors and widths of ribbon, and use a shorter length to achieve smaller bows perfect for shoes. Stitch it onto a headband or your bag-- make it your own and come show it off on our weekly [Show & Tell](https://adafru.it/showtell) (<https://adafru.it/showtell>)!

Special thanks to Kelly & Risa for modeling!

