



LED Friendship Bracelet

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<https://learn.adafruit.com/nautical-led-bracelet>

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Overview

Light up those warm nights at the beach or summer camp with this simple soft circuit bracelet.

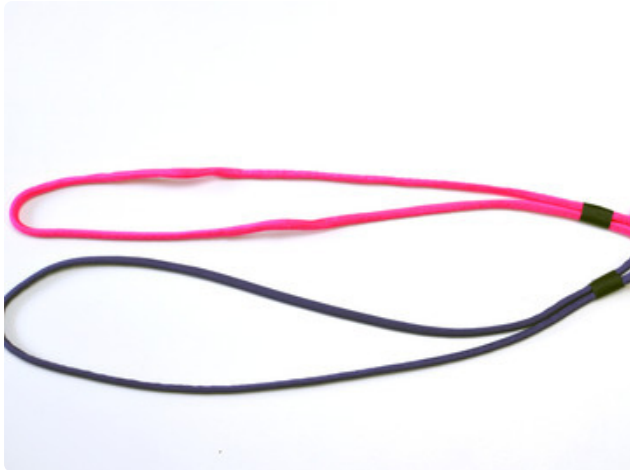
We were inspired by [Etsy's nautical knot bracelet tutorial \(https://adafru.it/dHE\)](https://adafru.it/dHE) and when we read the word "rhinestones" we immediately substituted LEDs. Read on to stitch up your own illuminated friendship bracelet!

For this project you will need:

- paracord or rope
- 2x LED sequins (we recommend [white \(http://adafru.it/1758\)](http://adafru.it/1758) or [blue \(http://adafru.it/1757\)](http://adafru.it/1757) for brightest effect)
- [2x CR1220 coin cell batteries \(http://adafru.it/380\)](http://adafru.it/380)
- [2-ply conductive thread \(http://adafru.it/640\)](http://adafru.it/640)
- [magnetic clasp \(https://adafru.it/dHJ\)](https://adafru.it/dHJ)
- embroidery floss
- [sharp sewing needle \(http://adafru.it/615\)](http://adafru.it/615)
- blunt tapestry needle
- thread to match paracord
- scissors
- tape (masking or gaffers)



Create Knot



Start with two pieces of cord, each about 24 inches long. Double them over and tape the ends together.



Loop one of the cords over itself as shown, with the fold end on top to make a fish shape.



Overlay the other folded cord over the body of the fish, then loop it around the upper tail fin and lay it over the lower tail fin, forming a U shape.





Weave the cut end of the U shaped cord under the belly of the fish, over itself, and then under the top of the fish's head.





Tighten the knot by pulling on all four cord ends.

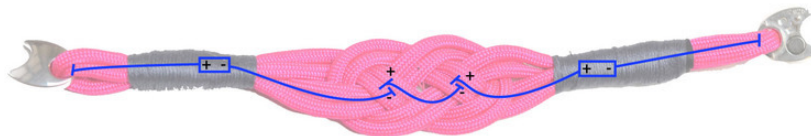




Use a matching color thread and sharp needle to stitch a straight line through the center of the knot, tacking all strands of cord together. This will stabilize the knot so it doesn't fall apart when we selectively loosen parts of it in the next step.



Circuit Diagram



Click to enlarge. The circuit is two batteries and two LED sequins in series, and the clasp acts as a switch to complete the circuit.

Stitch Battery Contacts



Start by loosening one side of the knot, and thread your needle with an arm's length piece of conductive thread. Starting along one looped end, insert the needle into the cord and exit at the point where that strand crosses its other end.

Bring the thread to the interior of the knot and begin stitching the two pieces of cord together and building up stitches that will make contact with one side of the battery.





When you have a few stitches built up, tie a knot by catching and pulling the thread through a stitch's loop before it's been tightened.

Then bury the thread tail by stitching it into the cord back the way it came (toward the looped end-- where you exit with the needle doesn't matter so much), then trim the tail.



The knot makes a sandwich for the battery, see how the conductive thread acts like ketchup or mustard in the sandwich? Pull the knot tight again to double check the conductive thread sits where it should.



Loosen the knot again and mark with a pen where the conductive thread touches its crossed-over cord. This is where the next battery contact goes.



Begin with a new thread and stitch from the center of the knot towards this marking.



Make some stitches as before to build up a contact pad, and tighten the knot to check that the two battery contacts line up with one another.



Bring the thread through the center of the paracord knot and over to the other criss-cross. Loosen that side and stitch another contact! Refer back to the circuit diagram if you're unsure where to place it.



If you accidentally mis-wire this section, it's easy to fix later by flipping one of the batteries, so don't worry! Tie a knot and bury the end of this thread back towards the center of the knot, then cut.



The last battery pad comes from the other looped end-- repeat the first step to bring a thread up the cord to the criss-cross, and build up some stitches that will align with its mate. When you're finished you should have a knot with two conductive threads dangling out!

Attach Clasp



Thread one looped end through one half of the magnetic clasp and fold it over towards the knot.





Use tape to connect the looped end to the cut end, trimming one or both if necessary.



Wrap a scrap piece of cord around your wrist to measure your desired length, then use that cord to hold up to your bracelet as you affix the other half of the clasp to the other side of the bracelet.

Remember that one piece of the clasp will have the smooth side facing out and the other will have the smooth side facing in. Try on your bracelet to check the fit.





Next grab your embroidery floss and begin wrapping at the side of the knot. At first, also wrap around the loose conductive thread tail, then after a few wraps fold the conductive thread back and finish wrapping down to the clasp.





When you get to the end, you can thread the floss onto a tapestry needle and bury the leads under the wrapping. Snip the tails.





Nice bracelet, get ready to add the LED sequins!

Stitch LED Sequins



Thread one of the conductive thread tails onto your needle and use it to stitch down one side of your first LED sequin. Make several stitches for good electrical contact, then tie a knot and bury the thread tail back towards the knot.



With the remaining piece of thread (or a new one if the remaining piece is too short), stitch to the other side other side of the LED sequin. Travel with the thread down towards the clasp by burying the needle under the floss and through the center of the paracord.





Stitch around the metal clasp a few times, then tie a knot and bury the thread tail. Repeat the whole sequin-sewing process for the other side! Pay attention to the positive/negatives when sewing the second sequin (refer to the circuit diagram) so you don't sew it on backwards.





Time to test it out! Slide your batteries into their "holders" at the knot criss-crosses. Just hold them in place for now to test if the circuit lights up when you fasten the clasp.





If it does, congrats! All that remains is to stitch the batteries in place with some thread that matches your cord.



If it didn't light up, first check the polarity of everything against the circuit diagram. You can always flip a battery upside down if you stitched the middle connector incorrectly. If your polarity is all good, check to see that your stitches are snug against all components!

Wear it!



Your bracelet is now ready to wear or give! For transport, stick a piece of paper or fabric between the magnets of the clasp to keep from draining the batteries.

The bracelet works great as a flashlight inside your beach tote, and is super fun at

concerts and summer camp! Keep your new bling out of the rain and the lake, and the batteries should last for a few nights of fun before they'll need replacing.

