LED Cuff Bracelet

by **bitwiseOwl** on November 3, 2013

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Part engineer, part crafter, I teach electronics through sewing by designing e-textiles kits.

Intro: LED Cuff Bracelet

Sew your own LED bracelet and wear it!
Your bracelet will light up when you snap it together and close the circuit.
Sew your circuit, and then decorate it how you like!

Kits are available for preorder in my Etsy shop .

I would like to thank Kylie Peppler of Indiana University for her inspiration and collaboration.

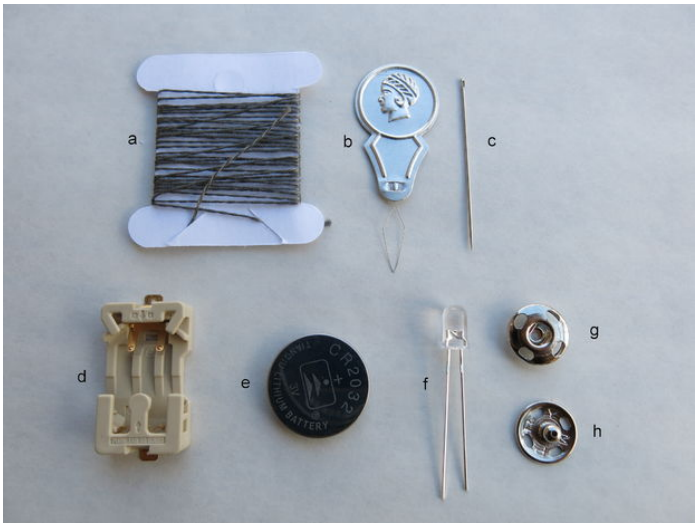
Step 1: Gather Materials

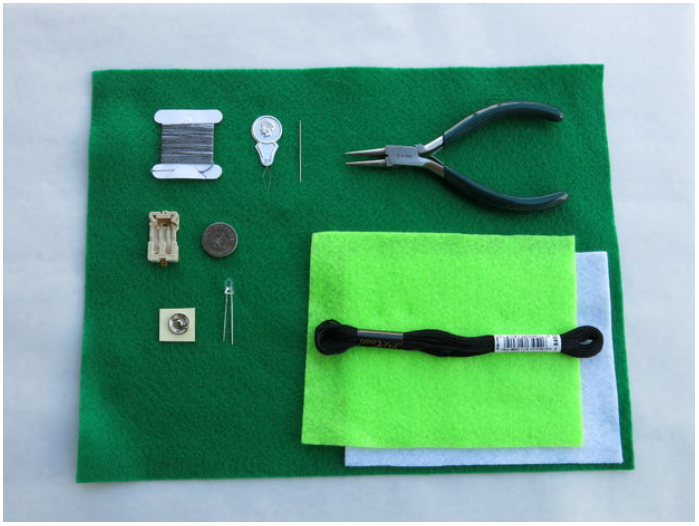
Materials
a - conductive thread, 2 yards
b - needle threader
c - sewing needle (embroidery size 7)
d - battery holder
e - CR2032 coin cell battery
f - LED
g - hole snap ("innie")
h - prong snap ("outie")

Felt, 1 sheet for bracelet body (and 1 contrast color for embellishment)
Round nose pliers
Scissors
Ruler

Embellishments (optional)
Fun shapes for embellishment
Regular thread or embroidery floss
Beads and buttons
Fabric glue

Additionally, you may use clear nail polish to prevent the conductive thread from fraying.





Step 2: Test the Circuit

The LED, battery holder, and battery have polarity.
That means there is a positive (+) and negative (-) side to each component.

LED

- positive (+, longer): The positive leg of the LED is longer.
- negative (-, shorter): The negative leg of the LED is shorter.

BATTERY HOLDER

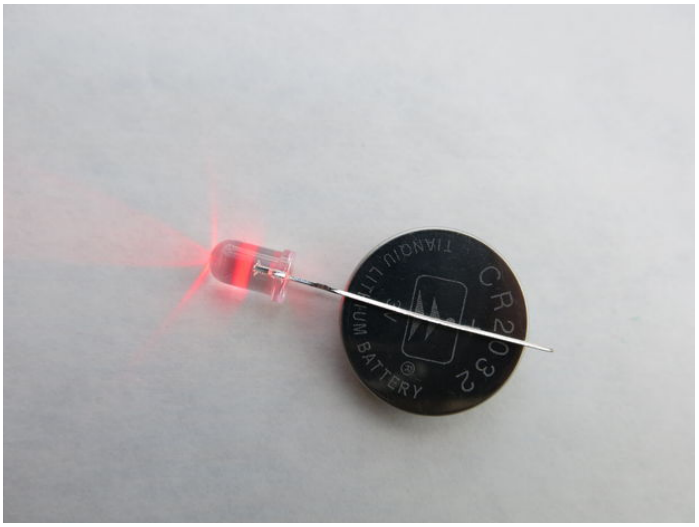
- positive (+, "E"): The positive end of the battery holder looks like an "E" shape.
- negative (-, with slot): The negative end of the battery holder has a slot.

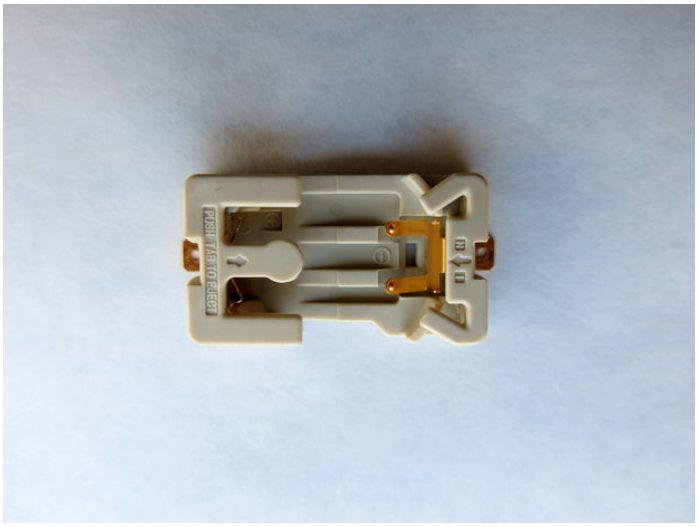
BATTERY

- positive (+, with writing): The top side of the battery has writing on it.
- negative (-, blank): The bottom side of the battery is blank.

To test the LED and battery:

1. Touch the LED positive (+, longer) leg to the battery positive (+, with writing) side. See the LED light up!
2. Touch the LED negative (-, shorter) to the battery positive (+, with writing) side. It won't light up.

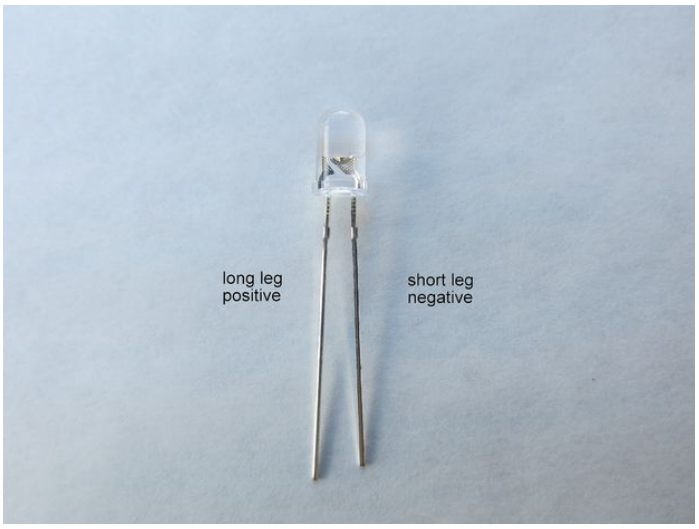


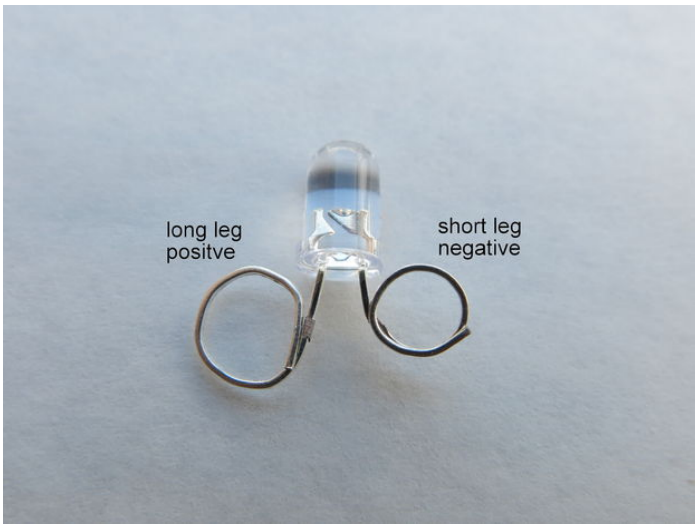


Step 3: Twist the LED

To make your LED sewable, twist the legs into circles with your pliers.

1. Twist the LED positive (+, longer) leg into a larger loop.
2. Twist the LED negative (+,shorter) leg into a smaller loop.





Step 4: Cut the felt

Cut the felt so that it fits your wrist, about 2 inches by 8-9 inches. The bracelet should overlap about an inch when worn.

Step 5: Lay Out the Components

Lay out your components as shown below.

1. Make sure that the LED negative (-, smaller) loop matches the battery negative (-, blank) side.
2. The prong (outie) snap will be sewn on the top of the bracelet, nearest you.
3. The hole (innie) snap will be sewn on the bottom of the bracelet, away from you.

Step 6: Sew the Components

Advice on Sewing

1. Sew all of the parts tightly, with small stitches. Use running stitch (sew in and out).
2. Avoid long stitches: Longer stitches will make your circuit too floppy, and the connection may be bad.
3. Try it on so you can check the length of the bracelet, and make sure that the length is sufficient for the circumference of your wrist.

How to Sew the Circuit

Start sewing on the top of the bracelet:

1. Thread the needle with conductive thread, and tie a knot in the loose end of the thread, opposite of the needle.
2. Position the prong (outie) snap on the top of the felt, facing you. The second picture shows a close-up of the prong (outie) snap, after sewing.

From prong (outie) snap to LED positive (+, larger) loop:

1. Start sewing with conductive thread at the prong (outie) snap.
2. Sew from the prong (outie) snap to the LED positive (+, larger) loop.

3. Sew through the LED positive (+, larger) loop three (3) times.
4. Knot and cut the thread.

From LED negative (-, smaller) loop to battery holder negative (-, with slot) end:

1. Make a new knot on the loose end of the conductive thread, opposite of the needle.
2. Start again at the LED negative (-, smaller) loop, sewing through the negative loop three (3) times.
3. Sew from the LED negative (-, smaller) loop to the battery holder negative (-, with slot) end.
4. Knot and cut the thread.

Start sewing on the bottom of the bracelet:

1. Make a new knot on the loose end of the conductive thread, opposite of the needle.
2. Position the hole (innie) snap on the back of the felt, away from you. The hole (innie) on the snap should face out so the snap (outie) prong can fit in it.

From battery holder positive (+, "E") end to hole (innie) snap:

1. Start sewing again at the battery holder positive (+, "E") end.
2. Sew from the battery holder positive (+, "E") end to the hole (innie) snap.
3. Sew the hole (innie) snap on to the back of the felt, away from you.
4. Knot and cut the thread.

Step 7: Testing

Test out your bracelet!
Does it turn on when you snap it together?

If not, let's trouble shoot.
Do you have thread running across any component?

- The LED positive (+, larger loop) should **not** be connected to the LED negative (-, smaller loop).
- The battery top (+, with writing) should **not** be connected to the battery bottom (-, blank).
- If they are, then cut the thread, and resew each point.

Does your circuit flicker?

- Your stitches may be making intermittent contact.
- Add some short stitches between components, or sew more stitches to tighten them down.

Are your components floppy?

- Add stitches to tighten them down.

Step 8: Finishing

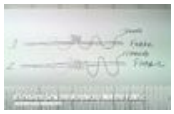
All done?
Decorate your bracelet with shapes, thread, beads, and buttons.
Add a flap to cover your battery holder, and leave room so you can change the battery!

If you enjoyed this tutorial, check out my other e-textiles kits at www.bitwiseetextiles.com .

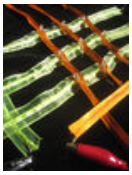
Related Instructables

eTextiles: Making LED Sequins (video) by Lynne Bruning

eTextiles: How to Sew LEDs and Resistors to Fabric (video) by Lynne Bruning

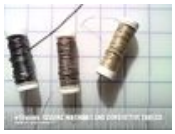


eTextiles: Sew thru your hardware, not your fabric! (video) by Lynne Bruning



flexible LED eTextile ribbon array by Lynne Bruning

eTextiles: How to Sew a Matbotix Range FInder to Fabric (video) by Lynne Bruning



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Comments

2 comments **Add Comment**

emilyvanleemput says:
Oh, these are nice!

Nov 24, 2013. 12:48 AM **REPLY**

bitwiseOwl says:
Thank you!

Nov 24, 2013. 12:52 AM **REPLY**