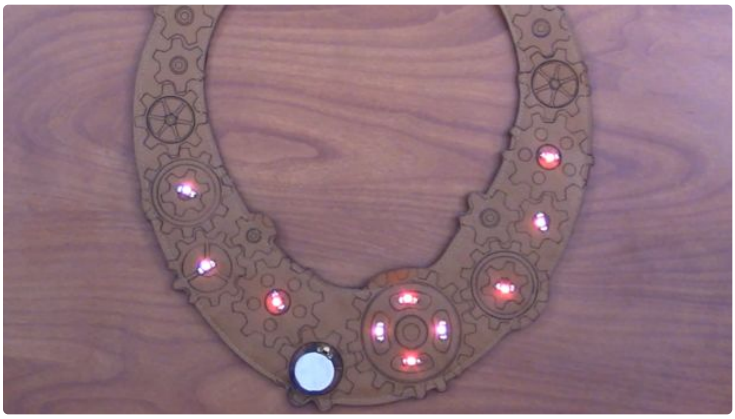
How to Laser Cut and Light a Steampunk Leather Collar

by greylightmay

In this tutorial I show how to design a leather collar in Adobe Illustrator, how to cut it on a laser cutter, and how to attach LEDs and a battery during assembly.



Step 1: Tools and Materials

Tools:

Access to a laser cutter

Design software (I use Adobe Illustrator)

Sewing machine with Teflon foot

Soldering iron

Mini binder clips

Materials:

Light to medium color thick but flexible leather

Ultrasuede

LED sequins from Adafruit

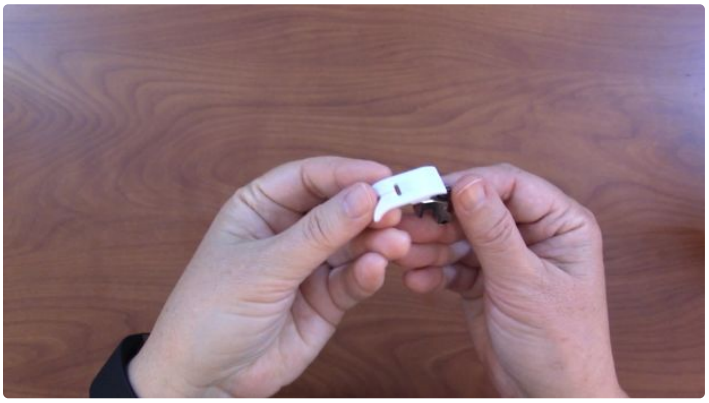
Necklace closure finding

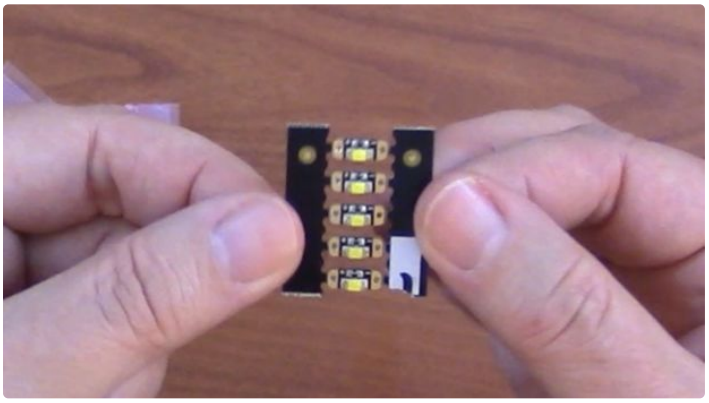
Coin battery holder

4" wide copper tape

Copper wire

Adhesive backed felt (optional)



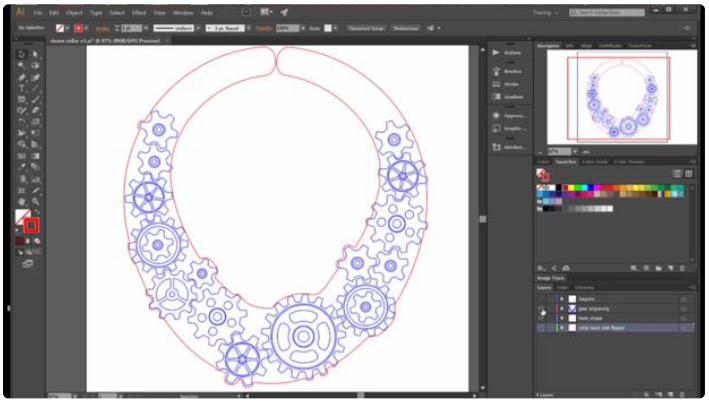


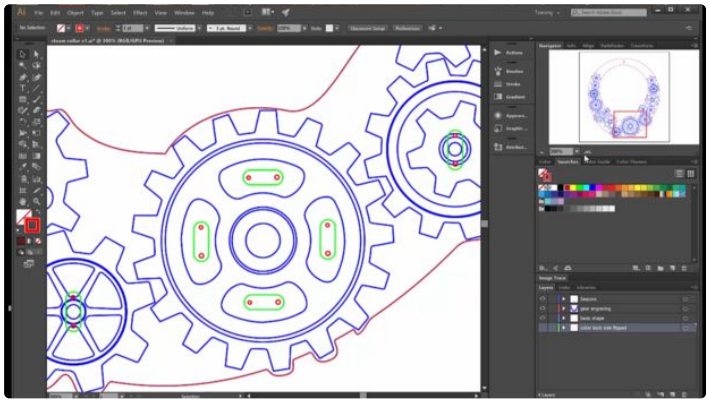
Step 2: Create Your Design in Adobe Illustrator

I started by using a leather collar necklace I owned to get the basic shape for my collar necklace.

I purchased a set of gear vector drawings and laid them out inside the basic collar outline, copying and scaling them to fit and letting some gears extend beyond the necklace outline. Then I used the pen tool to extend the outline of the collar around the gear shapes.

On my laser cutter, red is used for cutting lines and blue is for engraving. A green line shows but does not give the laser instructions, so it is useful for creating reference shapes. I created a green outline of an Adafruit LED sequin and use that to lay out the lights on the necklace and the red cutting holes for the sequin attachment and wiring.



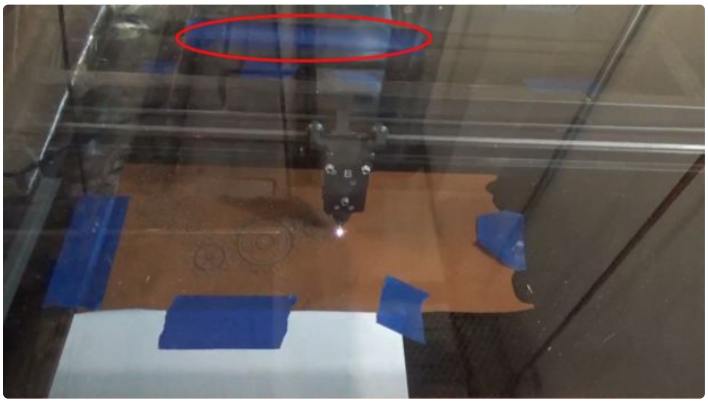


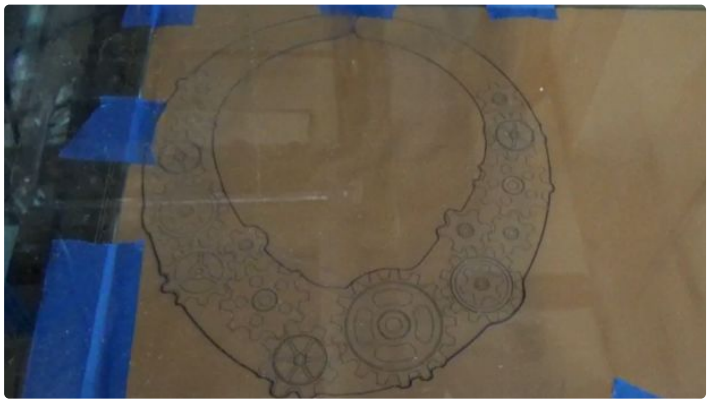
Step 3: Cut and Engrave the Leather

When using leather on the laser cutter, it is important to tape down the leather so it doesn't shift or blow away. It is also helpful to partially block the vent in the back (here I am using masking tape) because the cut leather can be sucked into the vent.

Lighter leather colors allow the engraved design to show up more clearly.

I also cut the outline of the necklace in the Ultrasuede, to act as a backing.





Step 4: Solder and Attach the LED Sequins and Battery Holder

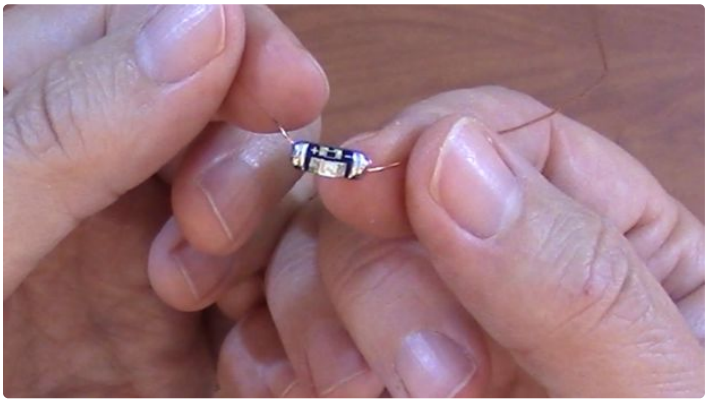
I started by soldering wires to each of the sequins. Since these are very lightweight, the copper wire is all that is needed to attach the lights to the necklace. I also solder wires to the battery holder.

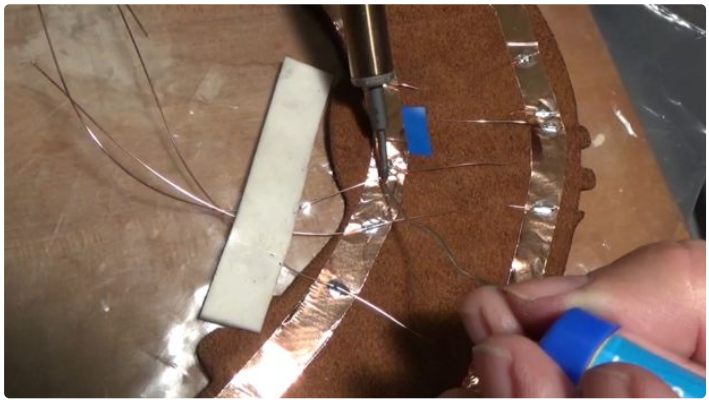
Then I cut two arcs of copper tape to fit the top and bottom of the necklace. Because I am using 4" wide copper tape, I can cut these to fit and they lay flat on the back of the necklace. I use one arc as the positive side and the other as the negative, and solder the sequins and battery holder into a circuit. Then I clip the wires close to the solder points.

I made a design decision to put the battery on the front of the necklace, as part of the 'steampunk' look, but the battery could have been positioned to the back of the necklace, near the clasp.

I hand sewed the battery holder to the collar, to firmly attach it, since I will be putting a battery in and out of it to turn on the necklace. An optional step is to apply a layer of adhesive felt over the wiring to keep it secure.

Always test the circuit before moving on to the next step! Once the collar is assembled the wiring will become inaccessible, so everything needs to be in good working order before moving on.



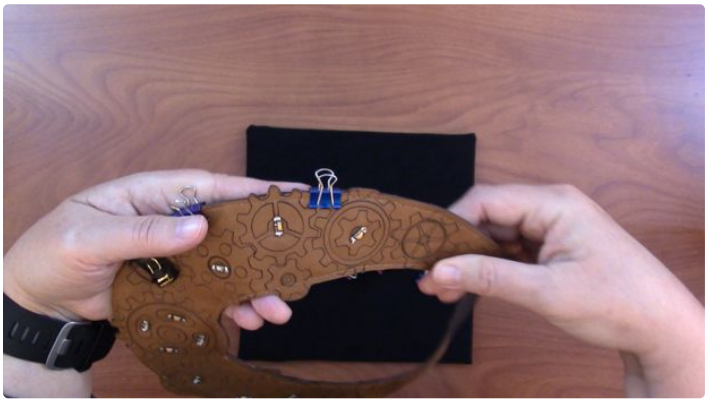


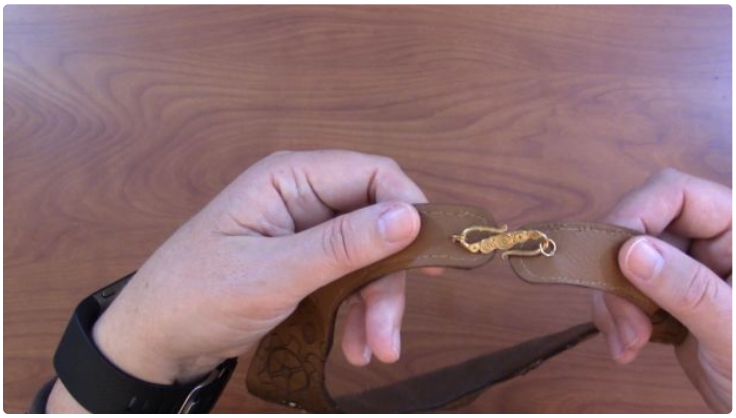
Step 5: Assemble the Necklace

Never use pins when sewing leather; they will leave holes. A good alternative is to use mini binder clips to clip the leather and the Ultrasuede backing together.

Sewing on leather can be tricky! This is where using a Teflon foot is very helpful; it keeps the foot from sticking to the leather. The Ultrasuede, however, should move smoothly on the needle plate. Sew the front and back together along the edges.

Hand sew a necklace closure finding on the back.





Step 6: This Video Shows the Whole Process

https://www.youtube.com/watch?v=XSVjY8u7wvo

That looks awesome :)