LED Noodle Snowflake

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https://learn.adafruit.com/led-noodle-snowflake

Last updated on 2024-06-03 03:44:27 PM EDT

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Overview

3D Printed Glowing Ornament

Build a glowing snowflake ornament with Adafruit nOOds LED noodles! Use four strands of LED noodles and a coin cell battery holder to create a light up ornament.

Coin Cell Powered

This battery holder houses two CR2032 coin cells and is conveniently secured to the back of the snowflake so you can quickly get to it.

The battery holder has a built-in switch so you can easily turn it off to preserve the batteries.

Prerequisite Guides

Take a moment to review the following guides.

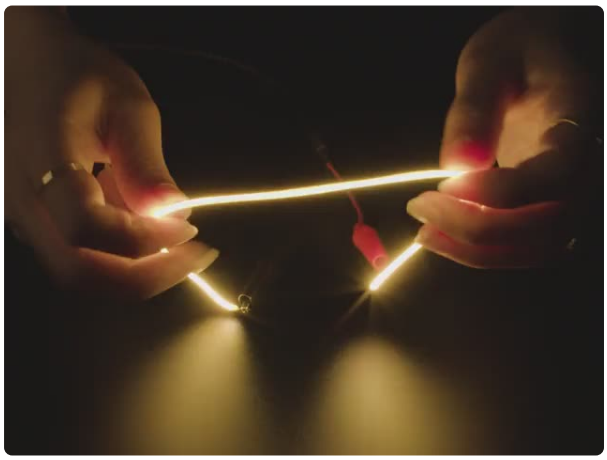
- All About LEDs (https://adafru.it/e3K)
- LED Noodles Uber Guide (https://adafru.it/18cs)

Parts

nOOds - Flexible LED Filament - 3V 300mm long - Warm White

Our favorite food when hacking on code or electronics is a hot bowl of noodles - and around NYC these are often called 'noods'! What we've got here are flexible LED...

https://www.adafruit.com/product/5503



nOOds - Flexible LED Filament - 3V 300mm long - Yellow

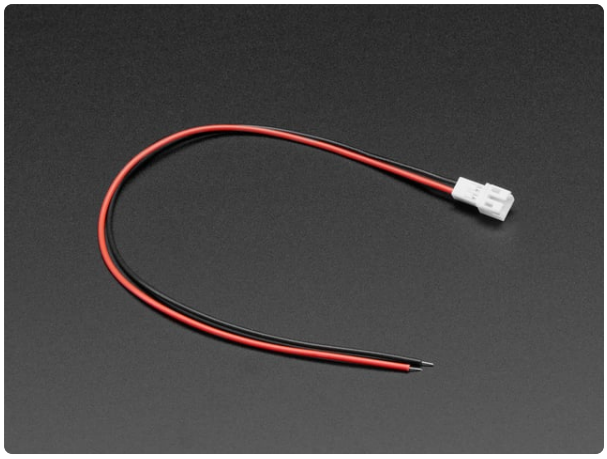
Our favorite food when hacking on code or electronics is a hot bowl of noodles - and around NYC these are often called 'noods'! What we've got here are flexible LED...

https://www.adafruit.com/product/5509

2 x CR2032 Coin Cell Battery Holder - 6V output - On/Off switch

This tiny coin cell battery holder is ideal for small portable or wearable projects. It holds two 20mm coin cells (2032 or CR2032 are the most popular size) in series to generate 6V...

https://www.adafruit.com/product/783



JST PH 2-Pin Cable – Male Header 200mm

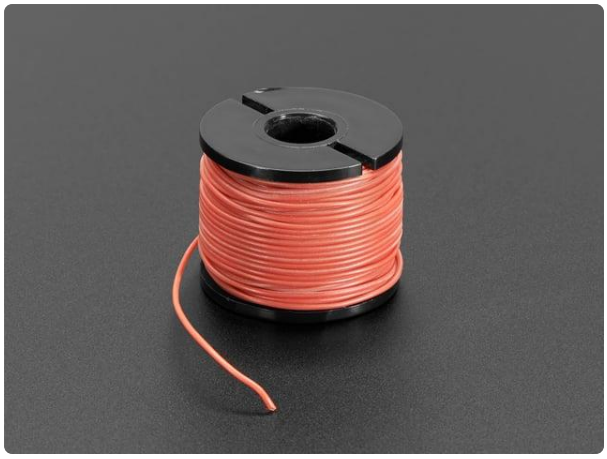
For a really long time we assumed that the JST PH didn't have a free-hanging male header version. But then we found this JST-PH 2-pin Male Cable, and we were...

https://www.adafruit.com/product/3814

CR2032 Lithium Coin Cell Battery

A perfect match for our sew-able coin cell holder. This non-rechargeable coin cell is CR2032 sized: 20mm diameter, 3.2mm thick. It...

https://www.adafruit.com/product/654



Silicone Cover Stranded-Core Wire - 50ft 30AWG Red

Silicone-sheathing wire is super-flexible and soft, and its also strong! Able to handle up to 200°C and up to 600V, it will do when PVC covered wire wimps out. We like this wire...

https://www.adafruit.com/product/3165

50ft 30AWG Black

1 x Silicone Cover Stranded-Core Wire — https://www.adafruit.com/product/3164

50ft 30AWG Black

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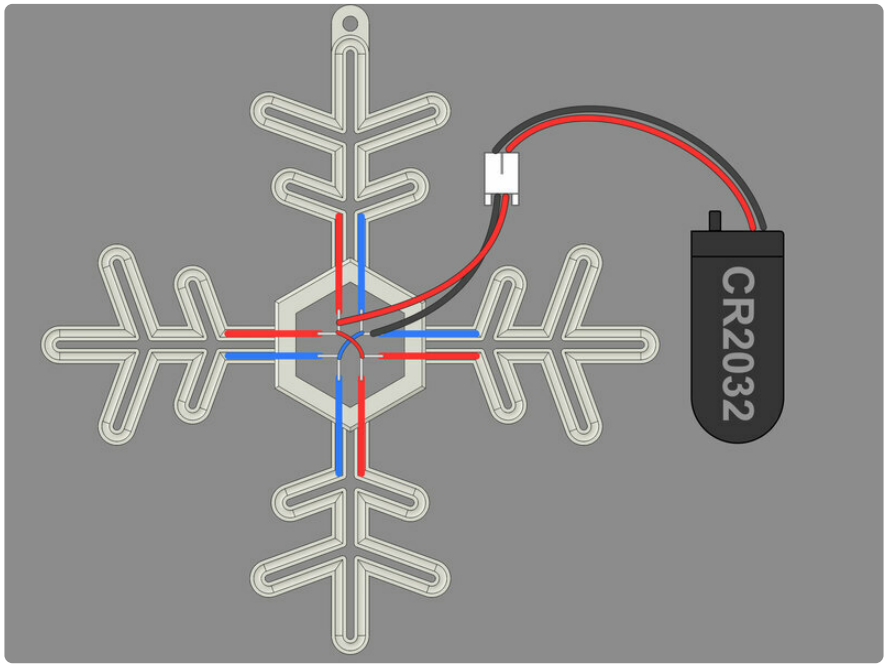
1 x M2 Hardware Kit — https://www.amazon.com/gp/product/B07D78PFQL/

Assortment of screws, nuts and standoffs

Circuit Diagram

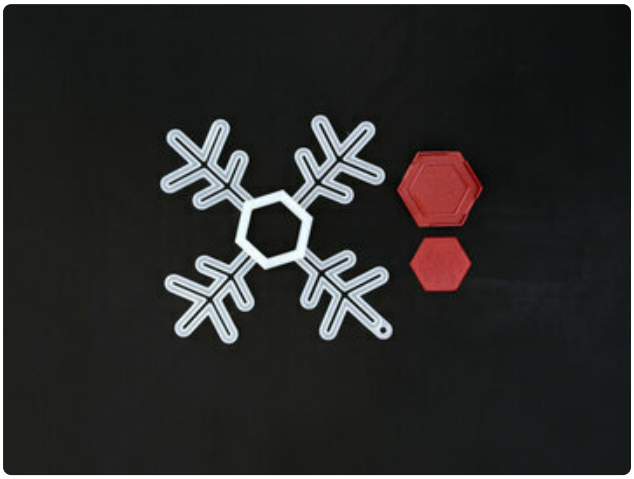


The diagram depicts routing of the LED noodle Vcc and GND wires. The various wires are press fitted into the channel of the 3D printed holder.

The LED Noodles are wired in parallel, with the voltage and ground wires connecting together.

The red and blue lines represent wires that will be connected to the LED noodles pins.

CAD Files



CAD Parts List

STL files for 3D printing are oriented to print "as-is" on FDM style machines. Parts are designed to 3D print without any support material. Original design source may be downloaded using the links below:

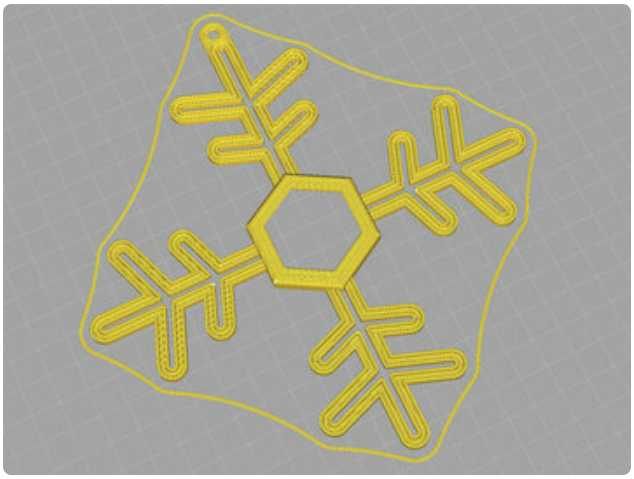
Snowflake Back Cover.stl
Snowflake Front Cover.stl
Noodle Snowflake.stl

Download STLs.zip

https://adafru.it/18jE

Download CAD Source

https://adafru.it/18jF



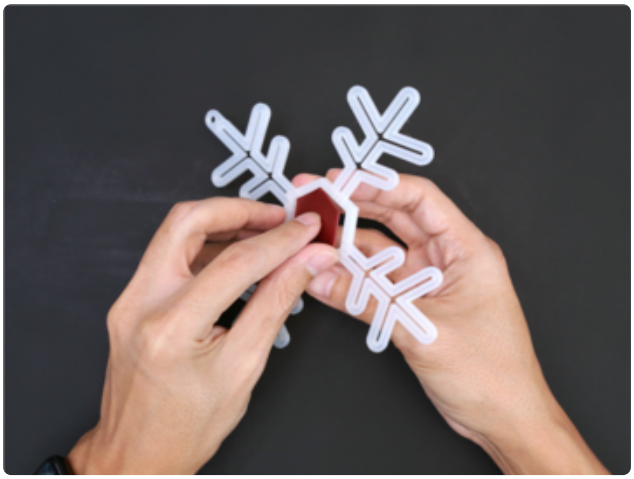
Build Volume

The parts require a 3D printer with a minimum build volume.

172mm (X) x 172mm (Y) x 50mm (Z)

Learn how to design a custom 3D printed sign for LED Noodles in Autodesk Fusion 360

Assembly



Install Front Cover

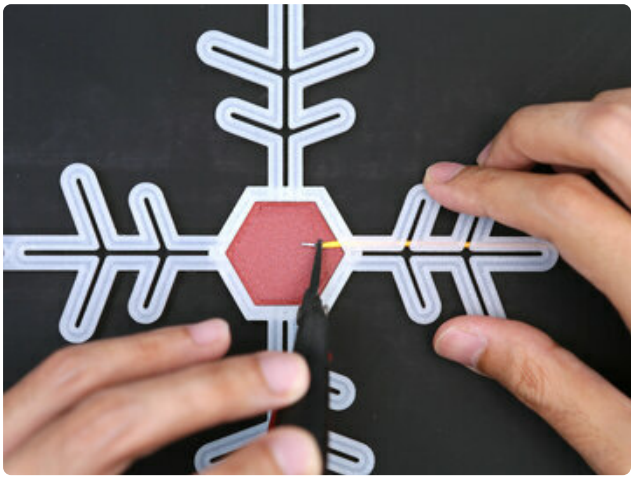
Insert the front cover into the center of the the snowflake with the chamfered edges fitting together.

The angled edges will prevent the front cover from falling out of the front of the snowflake.

Front Cover

With the front cover fully seated, the holes should be accessible for the LED noodles.

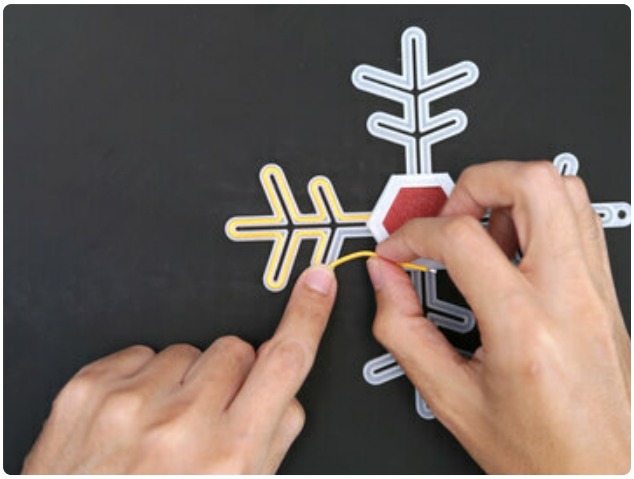
The pins from LED noodles will be inserted through these holes so it's important they are not blocked by the front cover.



Install First Noodle

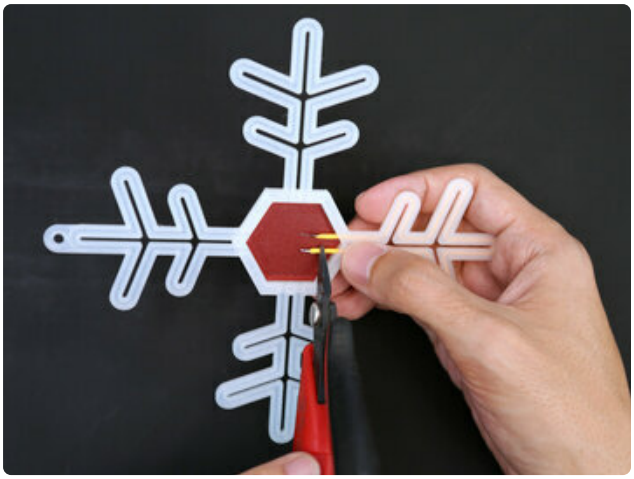
Begin inserting the pin from a noodle through one of the holes.

Using flat nose pliers, carefully pull the end of the noodle through the hole.



Press Fit Noodle

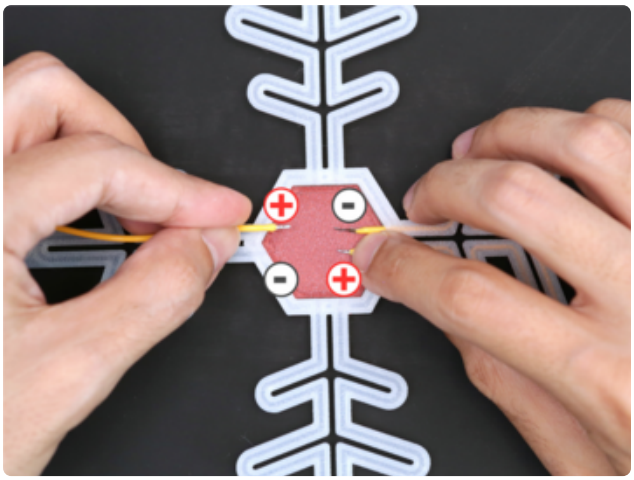
Flip the snowflake and begin pressing the noodle through the channel to create the first branch of the snowflake.



Installed First Noodle

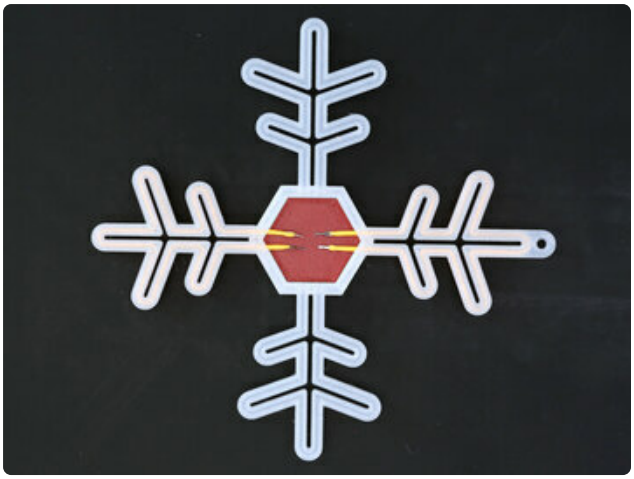
Carefully fit the other end of the noodle through the second hole in the branch.

Use flat nose pliers to assist in carefully pulling the end of the noodle through the hole.



Noodle Pin Placement

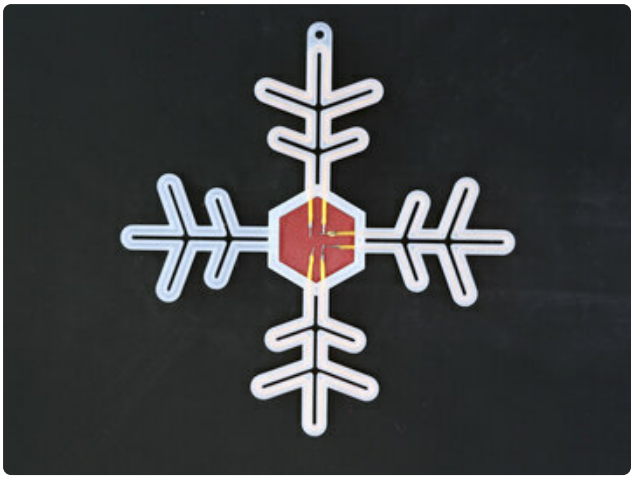
Reference the image for noodles' best placement. The four noodles will be wired in parallel and will share voltage and ground connections.



Polarity Checkpoint

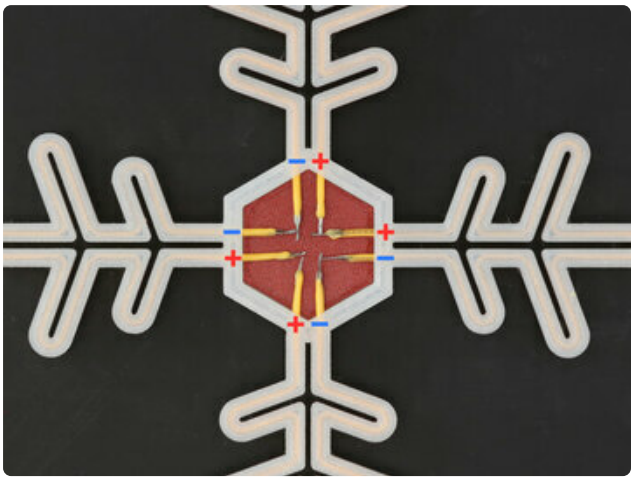
Proceed to install the second noodle into the second branch of the snowflake.

Double check the pins are in the correct orientation for wiring in parallel.



Third Noodle Install

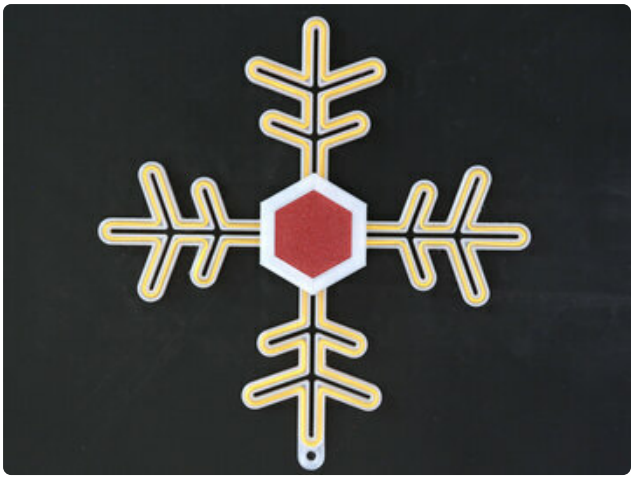
Continue to install the third noodle into the branches.



Fourth Noodle Installed

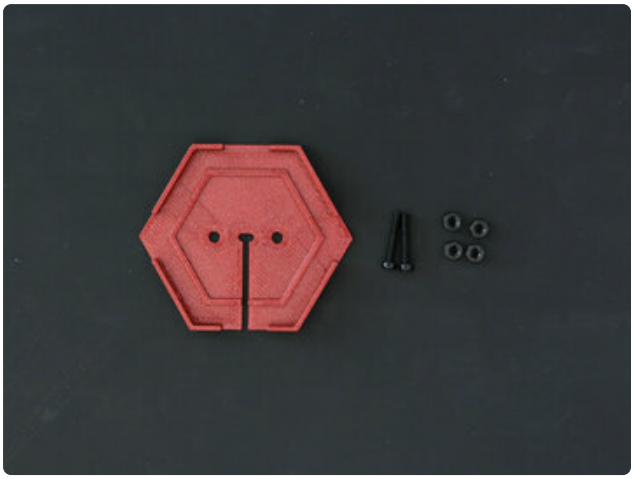
Take a moment to inspect all of the pins of each noodle.

The voltage (+) and ground (-) symbols are denoted on the image to show correct placement.



Assembly Checkpoint

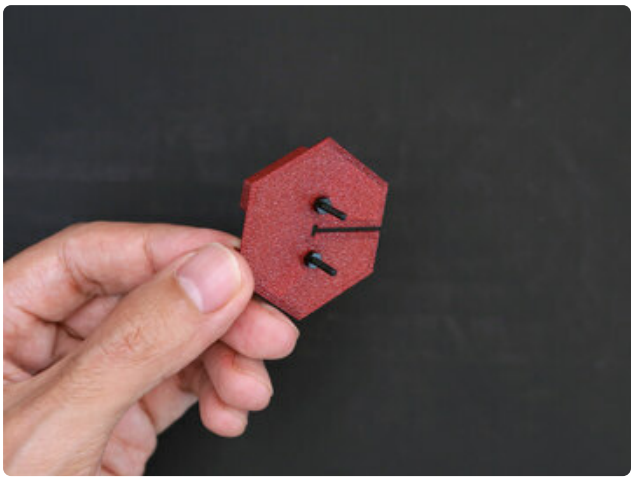
Ensure the noodles are properly fitted into all of the channels of the four branches.



Hardware for Back Cover

Use the following hardware for the back cover.

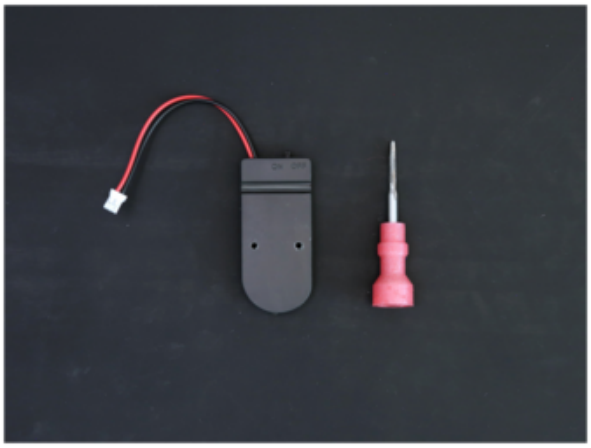
2x M2 x 12mm long screws
2x M2 hex nuts



Install Hardware to Back Cover

Insert M2 screws through the holes with the screw heads facing the top and threads are facing the bottom.

Use the two hex nuts to secure the M2 screws in place.

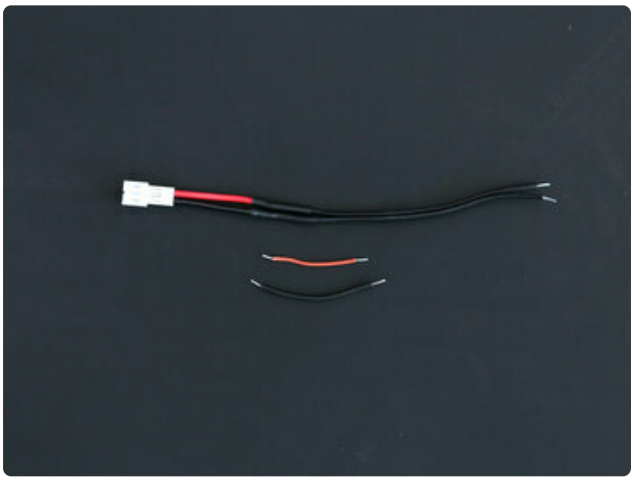


Create Holes in the Battery Holder

The coin cell battery holder already has mounting holes but they need to poke through the top cover. A screw tap can assist in drilling out the holes.

Use an M2.5 size screw tap to create holes for securing the battery holder to the snowflake's back cover.

Wiring

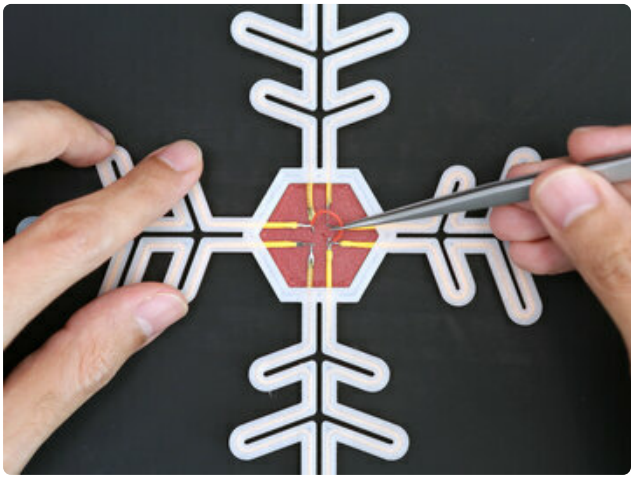


Wires and Cables

Measure and cut the 2-pin JST cable so it's about 3in (76mm) in length.

Cut two wires (red and black colored) so they're about 1in (25mm) short.

Use wire strippers to remove a bit of insulation of the tip of each wire. Tin the wires with a bit of solder.



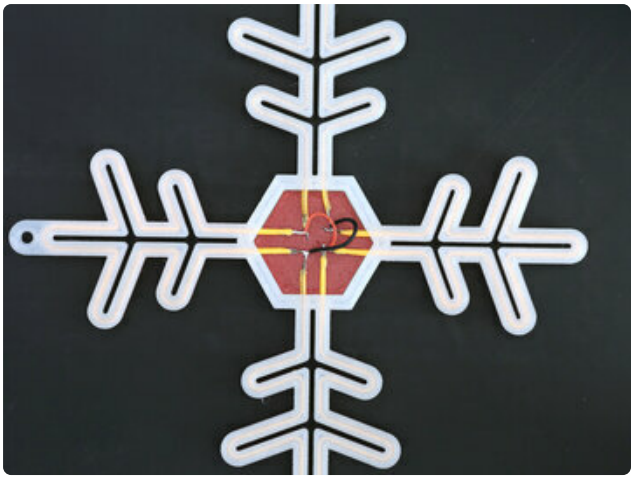
Solder Voltage Pins

Carefully solder together two voltage pins from two of the noodles.

Proceed to solder together the second set of voltage pins.

Then, solder in-line the red voltage wire to connect both sets of voltage pins.

Tweezer can help assist in soldering.

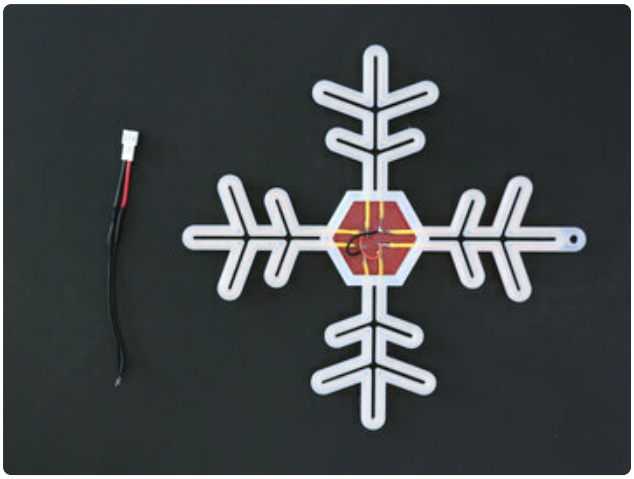


Solder Ground Pins

Carefully solder together two ground pins from the noodles.

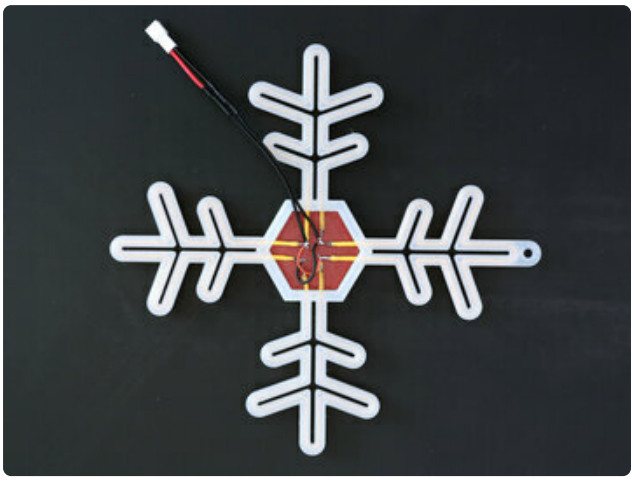
Proceed to solder together the second set of ground pins.

Then, solder in-line the short ground wire to connect both sets of ground pins.



2-pin JST Cable

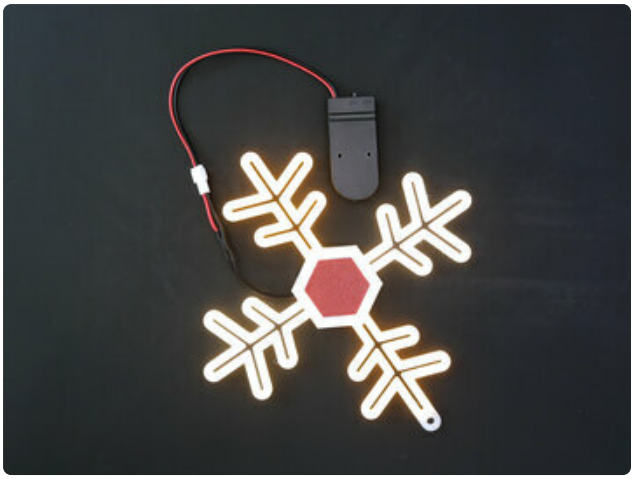
The 2-pin JST cable will be used so any battery with an accompanying cable can be used like any of the lipo batteries in the shop.



Solder JST Cable

Carefully solder the black wire from the cable to one of the ground pins.

Then, solder the red wire from the cable to one of the voltage pins.



Battery Test

Proceed to connect the coin cell battery holder to the LED noodle snowflake.

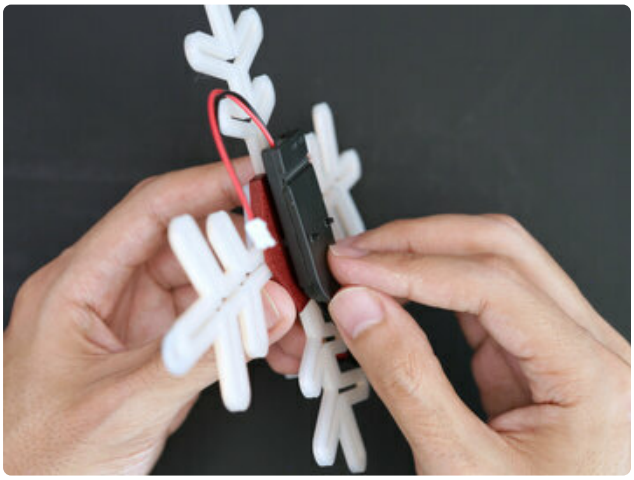
Use the on/off switch to test the circuit.

Install Back Cover

Begin inserting the JST cable through the slit in the back cover.

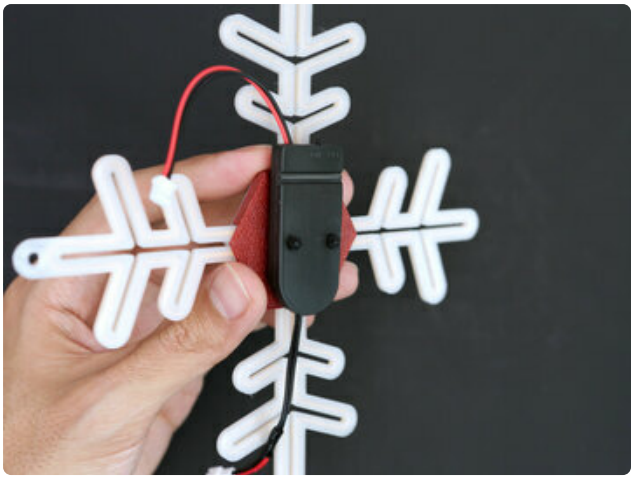
Then, line up the back cover with the snowflake and press to snap fit together.

Make sure the wires are not being kinked.



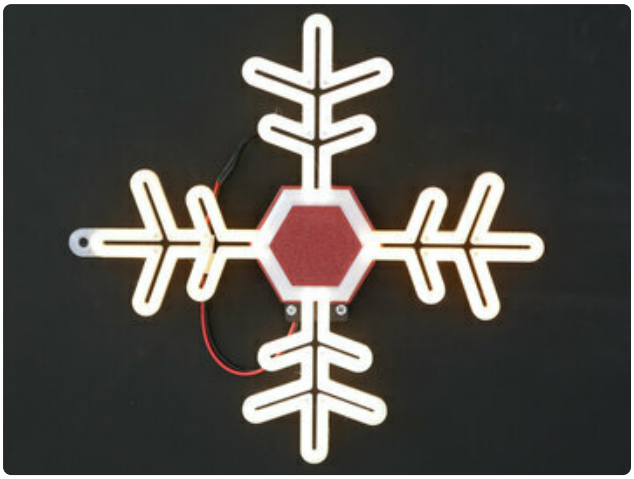
Install Coin Cell Battery Holder

Place the battery holder over the back cover and press together so the screws are fitted through the mounting holes we made earlier.



Secure Battery Holder

Use the hex nuts to secure the battery holder to the back cover.



Connect and Power

Proceed to connect the JST cables together. Use the switch to turn the circuit on and off.

Congratulations on your build!