

□

## Circuit Playground Yoyo

Created by Ruiz Brothers



Last updated on 2016-09-14 02:46:13 PM UTC

# Overview



## 3D Printed NeoPixel Yoyo

This project is a derivative of [Morgan Stewart's Circuit Playground Yoyo](http://adafru.it/qiF) (<http://adafru.it/qiF>) (Watch her demo it on [Adafruit's Show & Tell](http://adafru.it/qjd) (<http://adafru.it/qjd>)). In this remix, we'll encase a single Circuit Playground board and a lipo battery in 3D printed parts to make a yoyo. The NeoPixel LEDs can shine through the cover, making cool glowy effects. Most of the yoyo parts are 3D printed, and no hardware (machine screws, hex nuts, etc) are required. They feature threads that allow the pieces to be twisted together.



## History of the Yo-Yo

From Wikipedia:

A **yo-yo** (also spelled **yoyo**) is a [toy](http://adafruit.it/riA) which in its simplest form is an object consisting of an [axle](http://adafruit.it/riB) connected to two disks, and a length of string looped around the axle, similar to a slender [spool](http://adafruit.it/riC). It is played by holding the free end of the string known as the handle (usually by inserting one finger into a [slip knot](http://adafruit.it/riD)) allowing gravity or the force of a throw to spin the yo-yo and unwind the string (similar to how a [pullstring](http://adafruit.it/riE) works), then allowing the yo-yo to wind itself back to one's hand, exploiting its spin (and the associated [rotational energy](http://adafruit.it/riF)). This is often called "yo-yoing". First made popular in the 1920s, yo-yoing remains a popular pastime of many generations and cultures. It was first invented in [ancient Greece](http://adafruit.it/qja).



## Expectations

This is a fun project but is not intended to replace a professional yoyo. Because a yoyo relies on perfect balanced weight, it can be challenging to evenly distribute the weight on both sides - That being said, it can be done. I personally was able to get it to sleep for about 2-3 seconds which allows enough time to do tricks like *Rock The Baby*.

# Assembly



## Install Axle

Insert **cp-yoyo-axle.stl** into **cp-yoyo-a-side.stl** with the thread going in first. Press until hex side mates with coupler.





## Align Side Ports

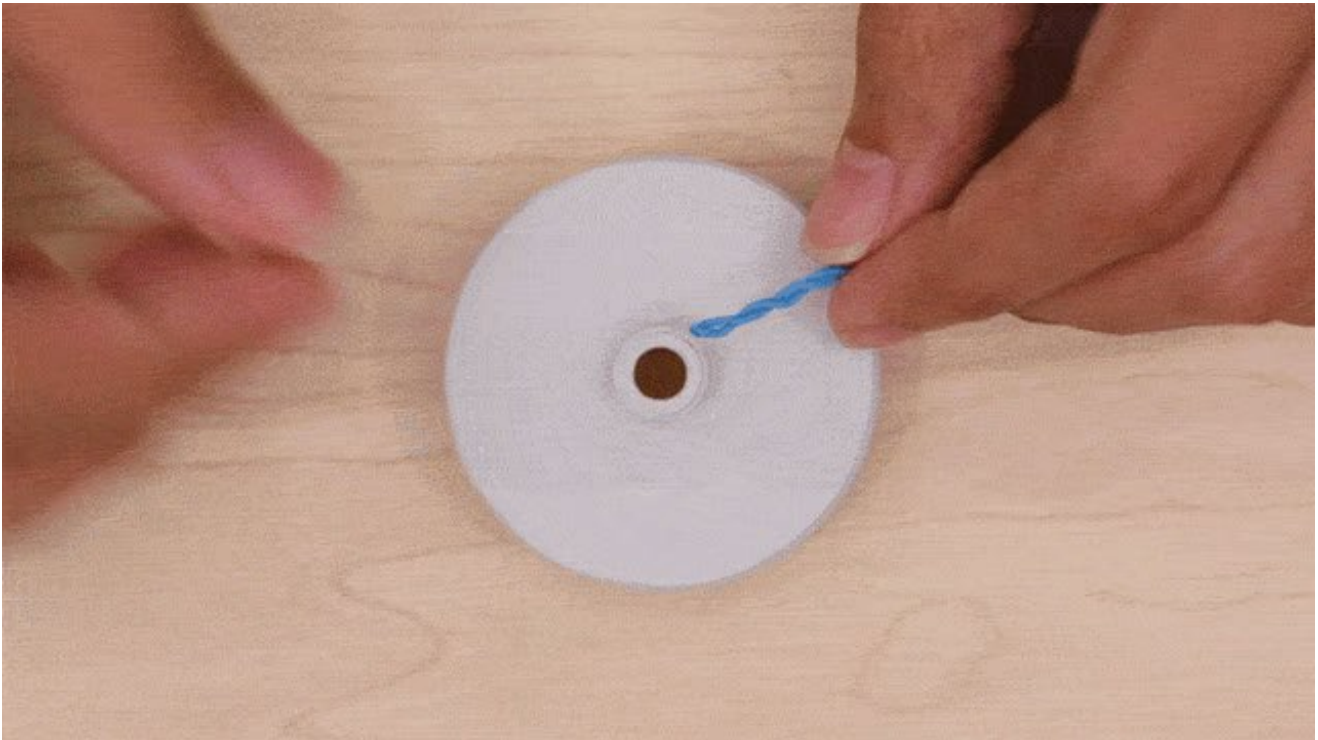
Insert **cp-yoyo-b-side.stl** onto **cp-yoyo-axle.stl**. Hold **cp-yoyo-axle.stl** while twisting **cp-yoyo-b-side.stl** tighten and reorient until ports of both sides are lined up.



## Clip Axle to Side A

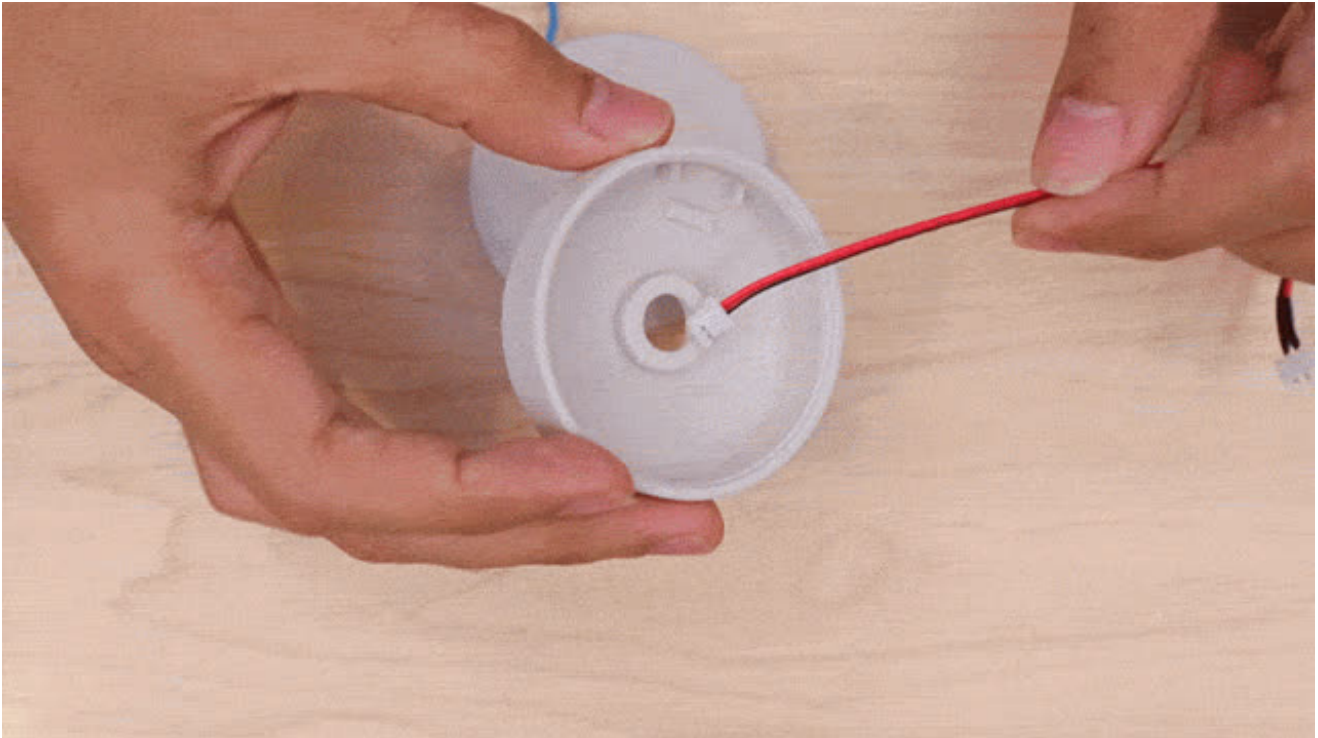
## Glue AXLE TO Side A

Hold **cp-yoyo-axle.stl** in place while applying super glue to the hex side. Hold together until glue full sets.



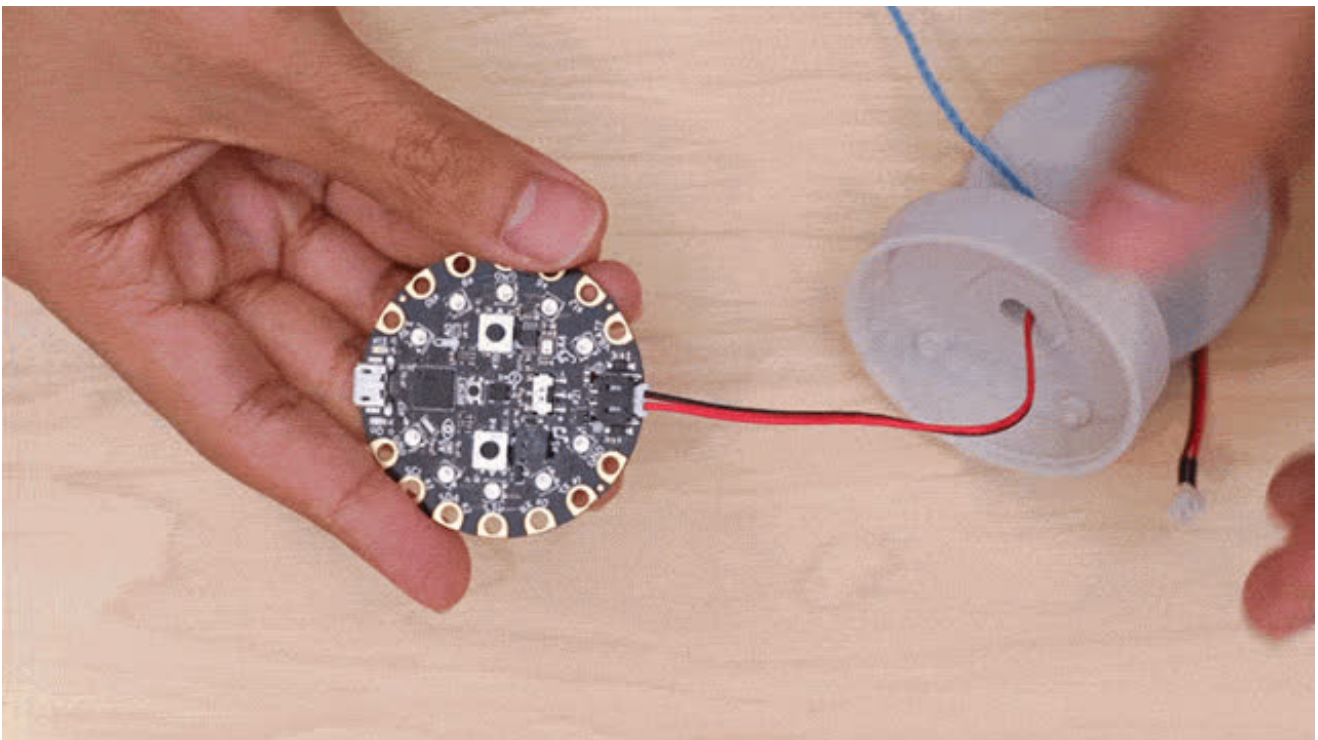
## Install Yoyo String

Untwist the end of the yoyo string and place it over the axle. The loop should slip into a groove on the center of the axle.



## Install JST Connect Circuit Playground

Insert the male JST connector and thread it into **cp-yoyo-b-side.stl**. Then, thread it through the **cp-yoyo-axle.stl** piece and pull it through **cp-yoyo-a-side.stl**.

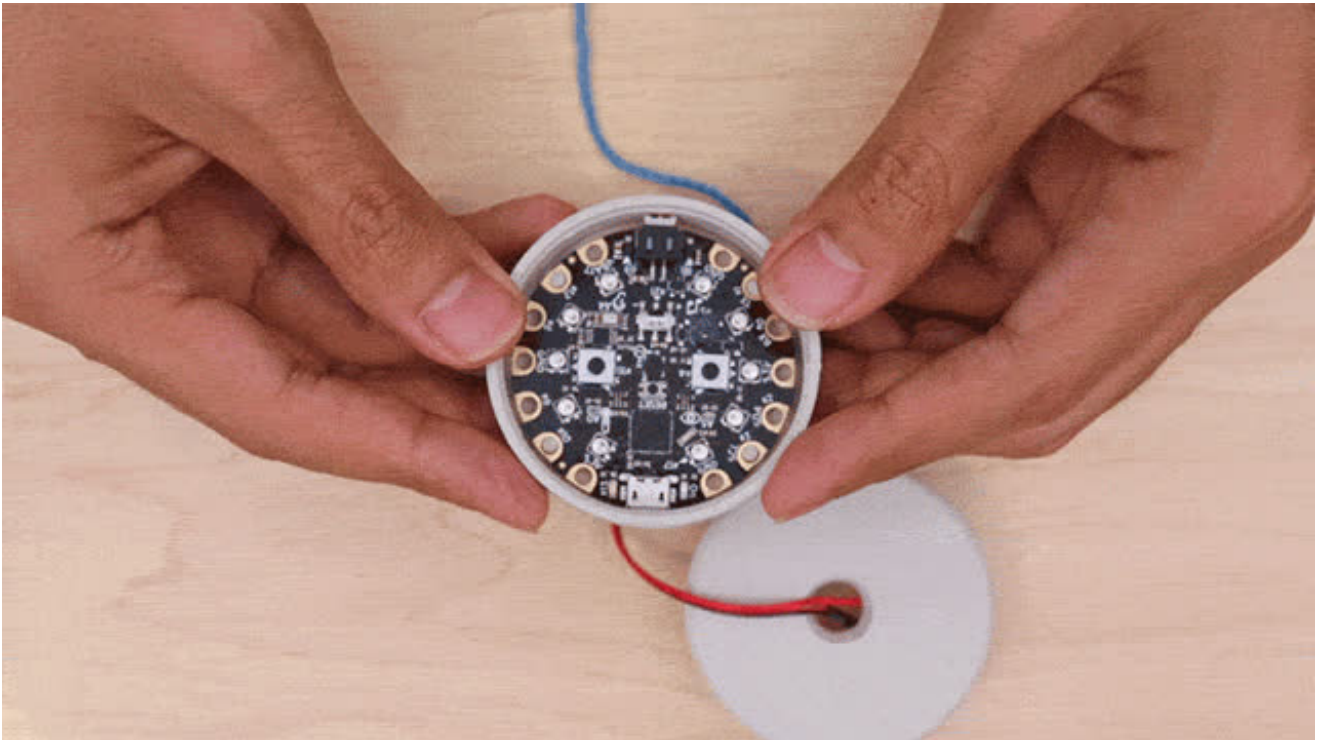


## Install Circuit Playground



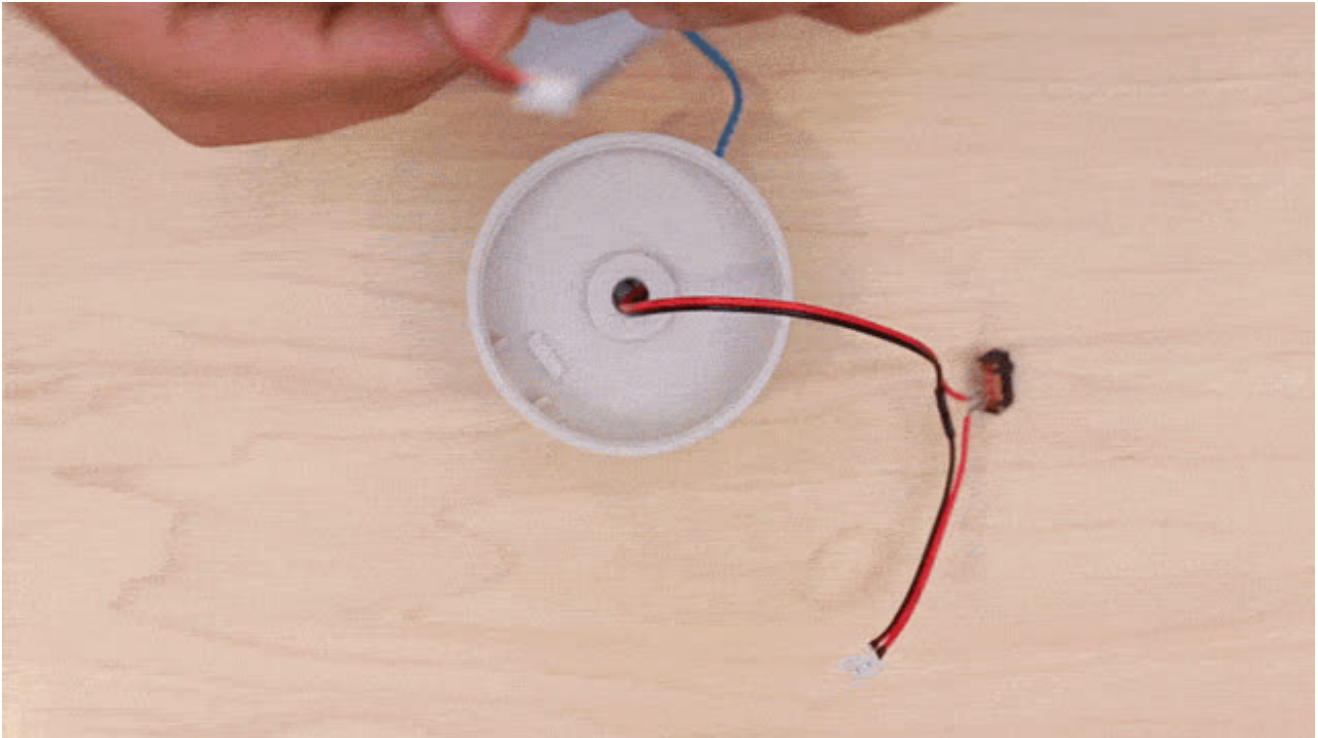
## Install Circuit Playground

Orient USB port of circuit playground with hole on **cp-yoyo-a-side.stl**. Then, lay circuit playground PCB onto the standoffs and press down until pegs snap into pins.



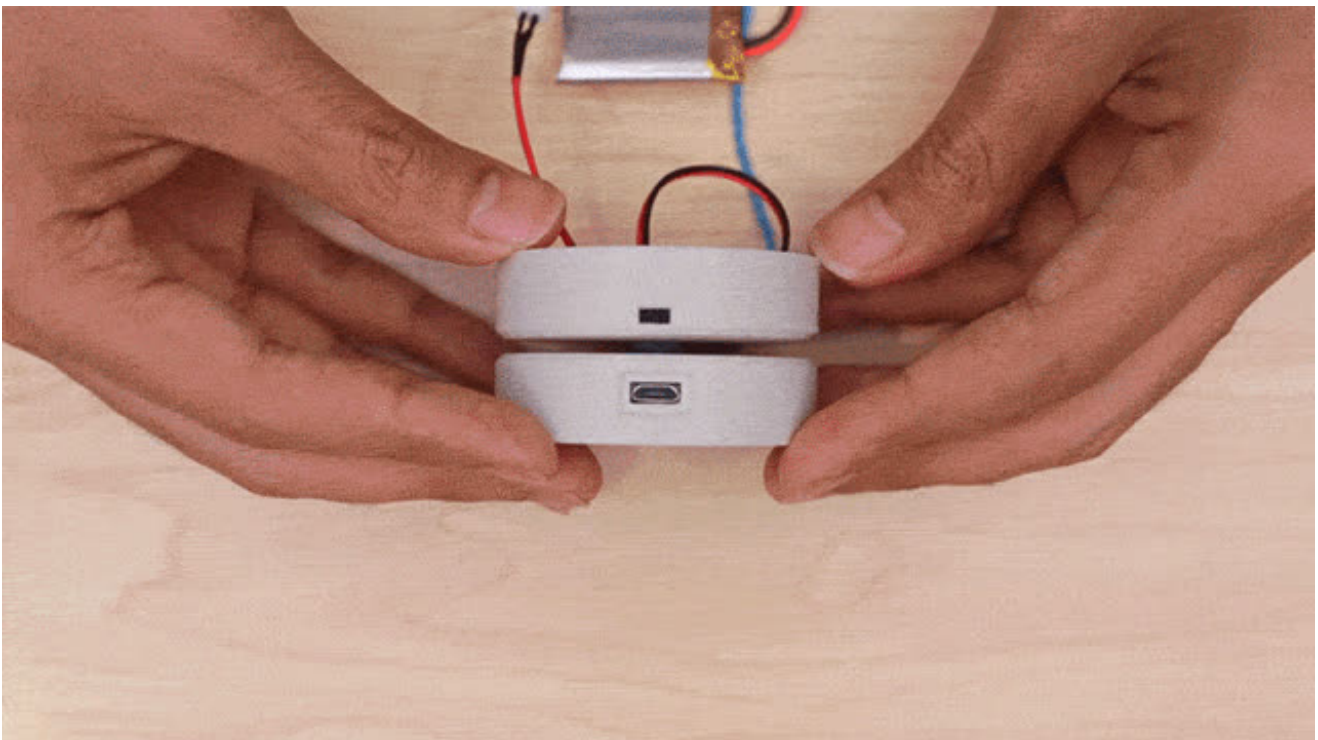
## Twist Yoyo Halves

Insert axle from Side A and twist it onto Side B. Tighten both halves together.



## Connect Battery & Install Switch

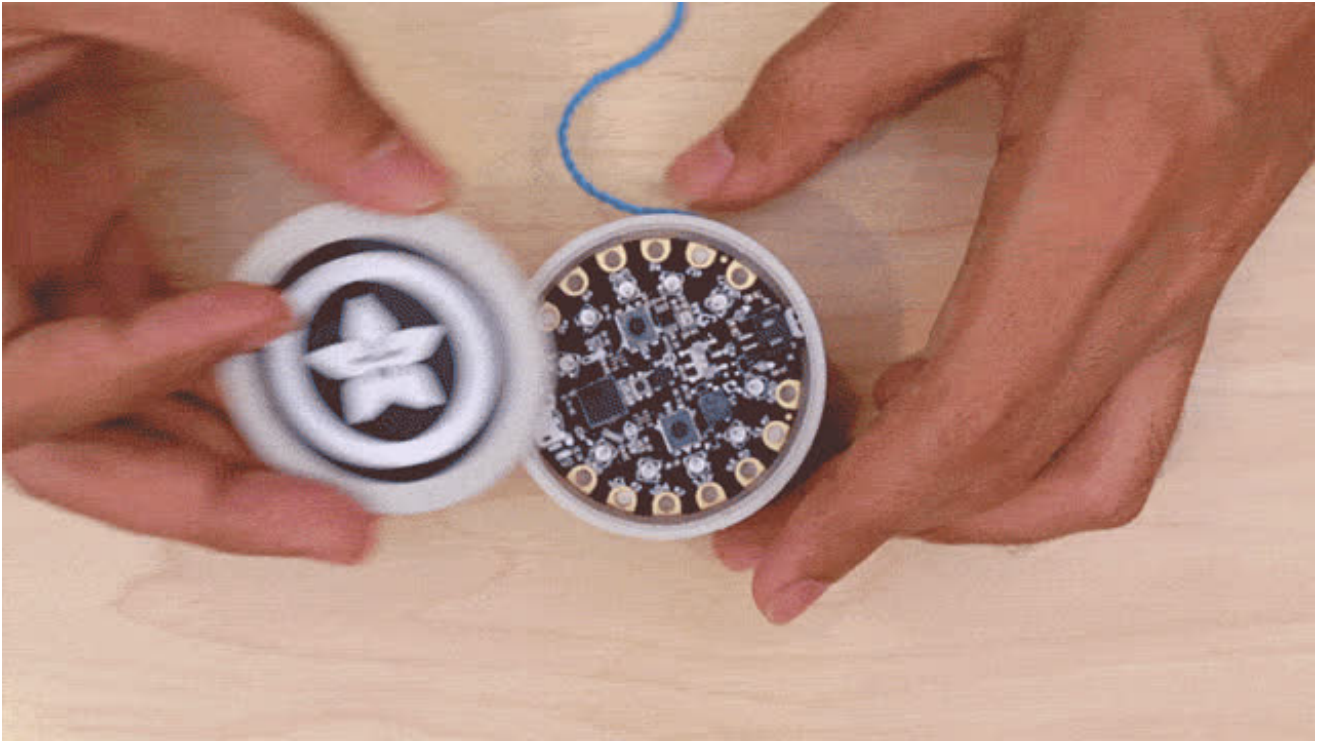
Plug in the male JST connector from lipo battery into female JST connector. Insert slide switch into clips on the side of **cp-yoyo-b-side.stl**.



## Mount Battery

## Mount Battery

Use a piece of mounting tack and stick it on the back of the lipo battery. Stick the lipo battery to the surface of **cp-yoyo-top-b.stl**. Press down on battery to secure it in place. Twist **cp-yoyo-top-b.stl** onto **cp-yoyo-b-side.stl** until fully tightened.



## Install Cover

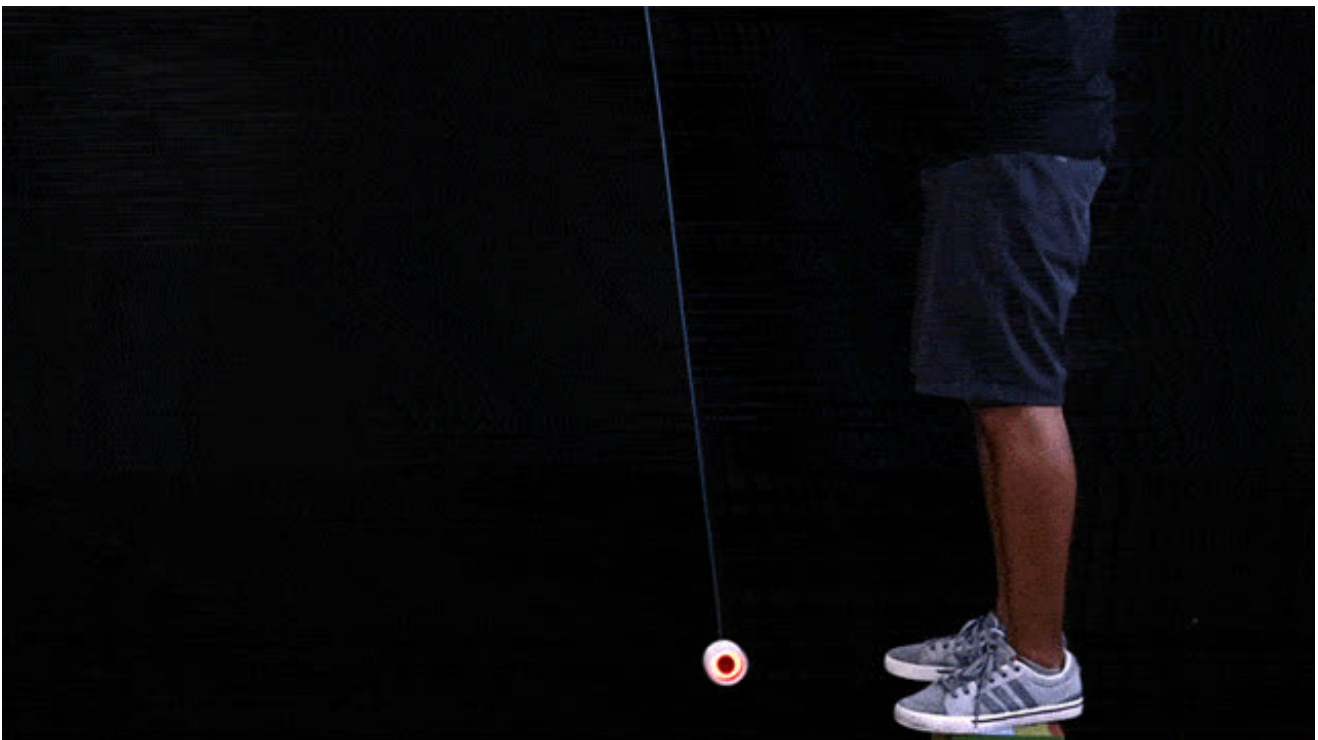
Twist **cp-yoyo-top-a.stl** onto **cp-yoyo-a-side.stl** until fully tightened.





## Wind up Yoyo String

Place finger over gap between halves and partially wind up the string. Remove your finger and then wind up the whole string. Now it's ready for a test spin!



## Do Some Tricks!



## DO SOME TRICKS!

I was able to get the yoyo to sleep for about 4 seconds until it came to rest. This should give you enough time to do some basic tricks like *walk the dog* or even *rock the cradle*.