3D Printed Gunblade

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https://learn.adafruit.com/3d-printed-gunblade

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Overview

GunBlade is the iconic weapon from Final Fantasy 8 - wielded by Squall Leonhart, it's a fusion of a sword and a gun.

In this project we'll walk through customizing and 3D printing this massive prop. It's light weight, fun and easy to wield at your next cosplay event.

Parts

We have all the lovely components and tools to build this project. Be sure to check out the featured products on the right sidebar.

- PLA Filament (https://adafru.it/dtp)
- 3D Printer

  (https://adafru.it/tkf)

# Tools & Supplies

You'll need a couple of hand tools and accessories to assist you in the build.

- Hakko Flat Pliers (https://adafru.it/dil)
- Flush diagonal cutter (https://adafru.it/dxQ)
- Scissors (https://adafru.it/dQj)
- Knife jimmy (http://adafru.it/2414), Spatula (https://adafru.it/cUv) or Palette Knife (https://adafru.it/ewf)
- Chain, Clasp and medium split rings
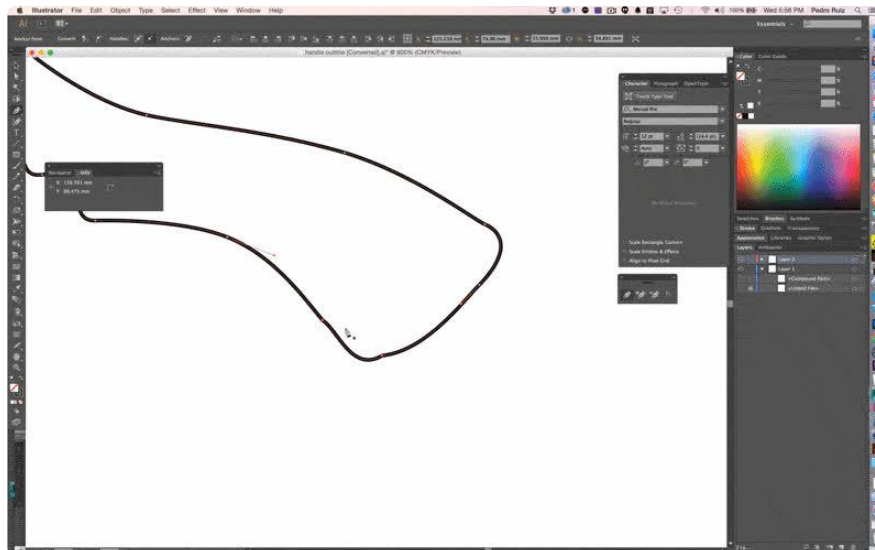- Skinny sticks (5 3/4 x 1/4 in - 146mm x 6.35mm)
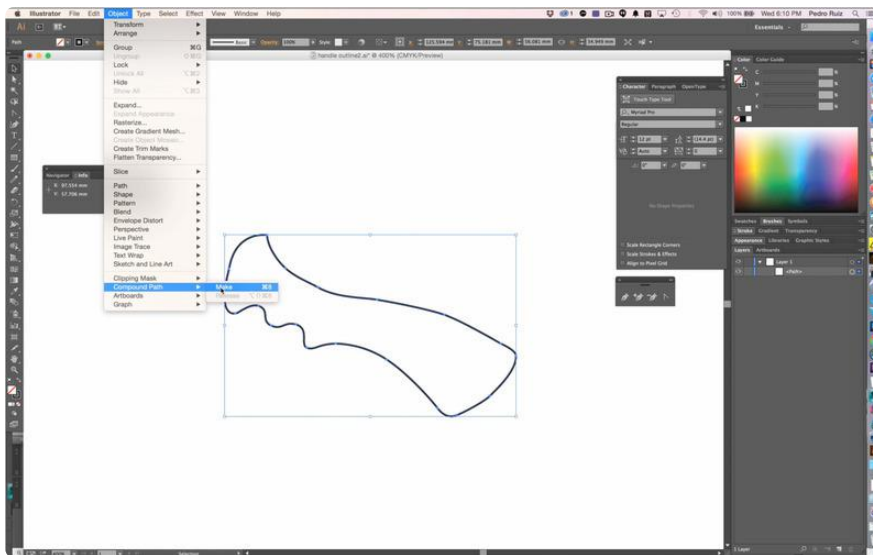
Customize
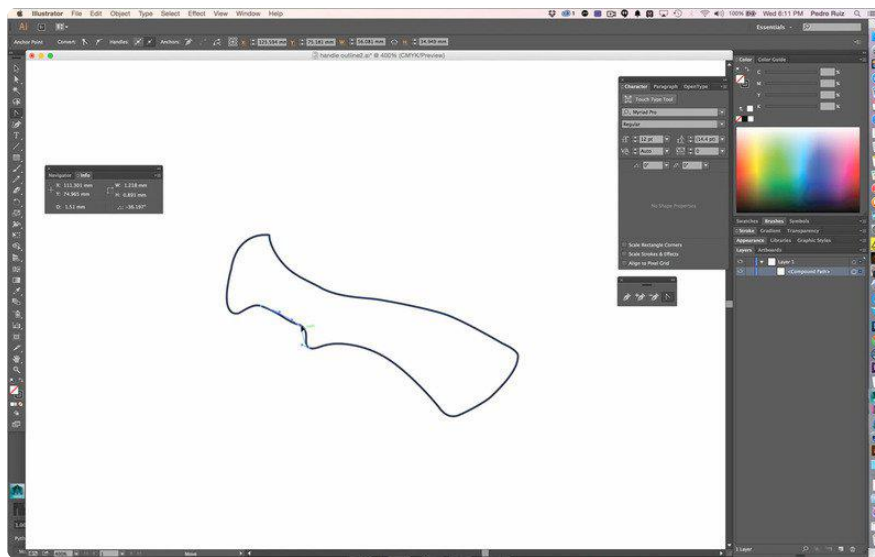
Adjust Handle

Download the vector files to change the feel of the handle by measuring how wide your hand and fingers are while making a fist.
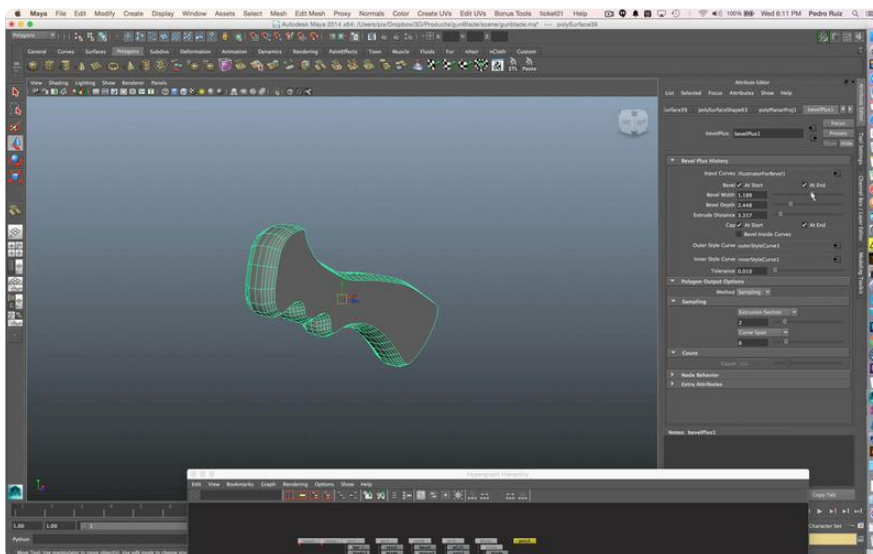

Smooth Out Curves

Make sure all vector points are smooth and without any sharp curves or waves. Use the convert point tool to adjust the bézier curve. Watch gif above for an example.
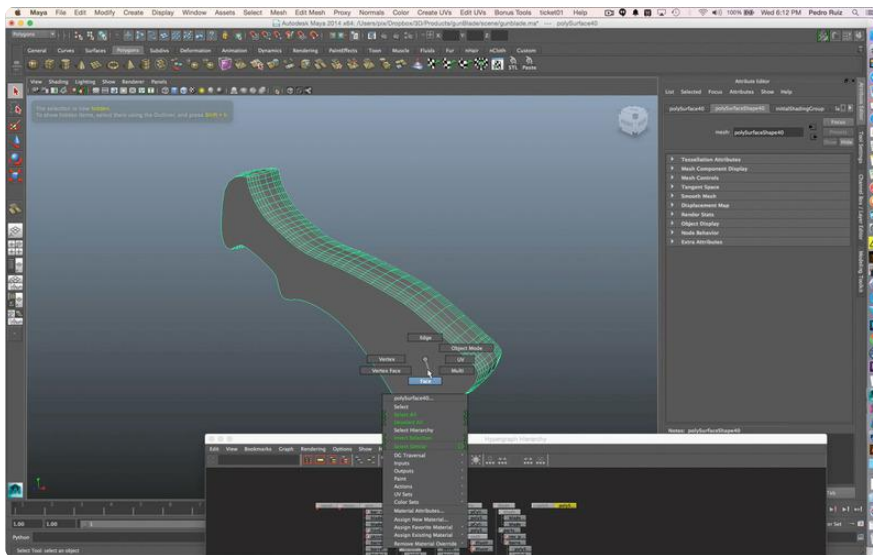
Convert Curves

Once you're happy with the measurments and curves, convert the outines into a compound path.

Extrude Handle

Use your favorite modeling software to extrude and adjust the bevel features. We used Maya's bevel plus options to add bevel width and depth based on our hand measurements.

Creating NinjaFlex Grips

We'll create the geometry for the flexible handle grips by extracting and extruding the geometry from the flat side of the handle.
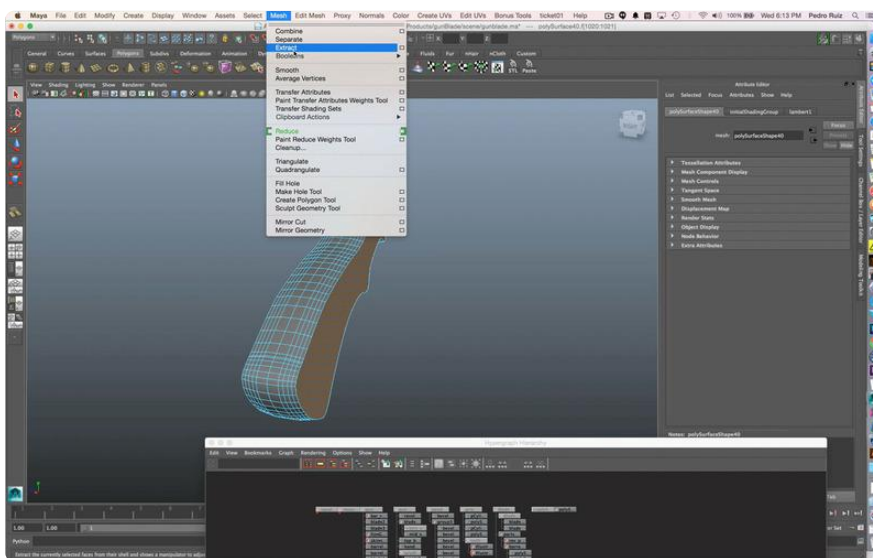
Extract Face

Select a copy of the handle and then selecting the front face of the handle model. Select the extract option to seperate the face from the rest of the geometry.
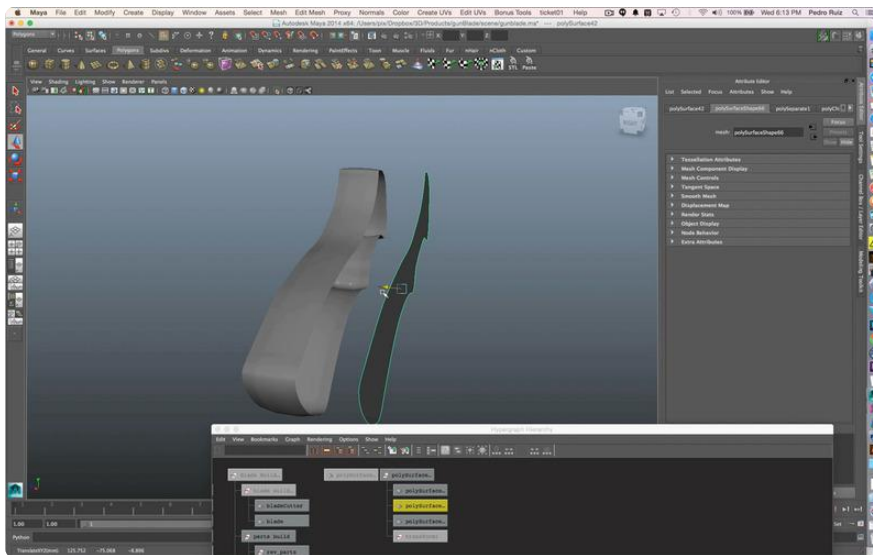
We'll use this face to create the surface for the NinjaFlex grips.

Delete the rest of the faces. We can duplicate a mirror of the grip once we finish adding the bevel features.

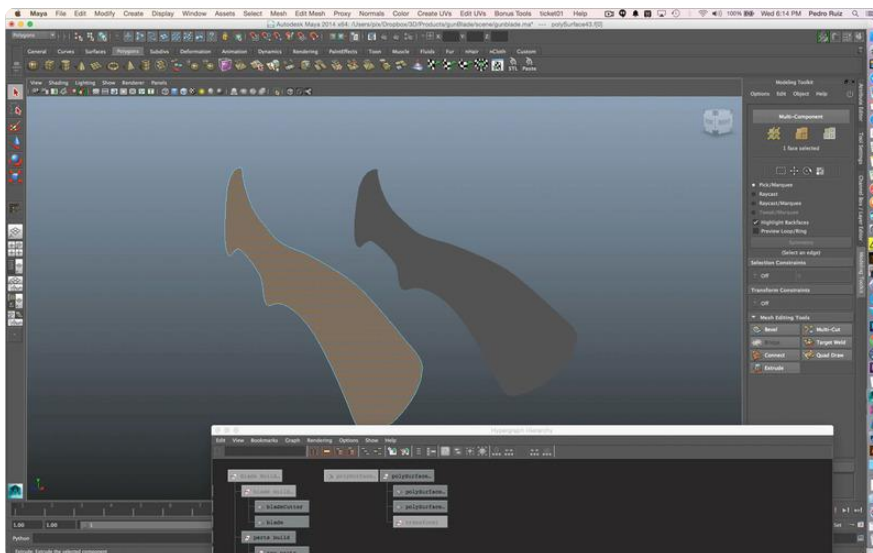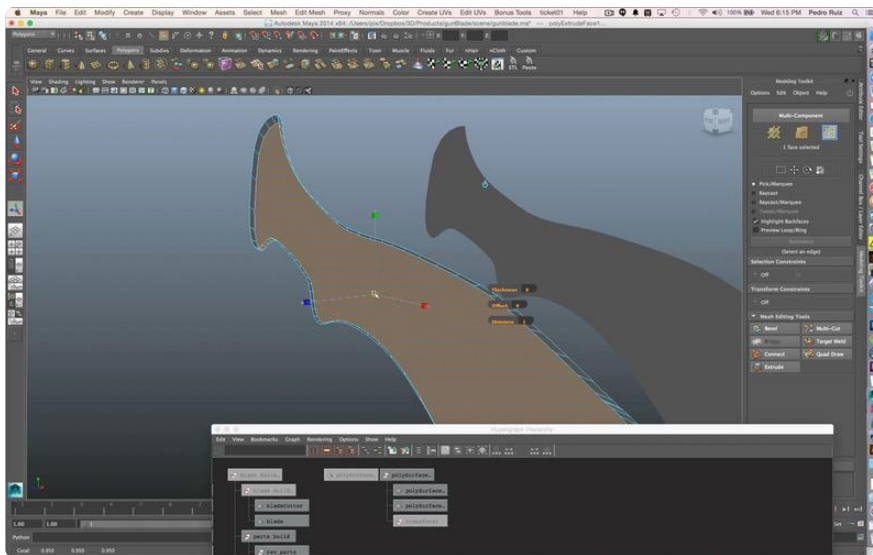## Bevel Surface

With the face selected, click on the extrude option. Click on the middle modifier handle and scale the face down a tad bit.
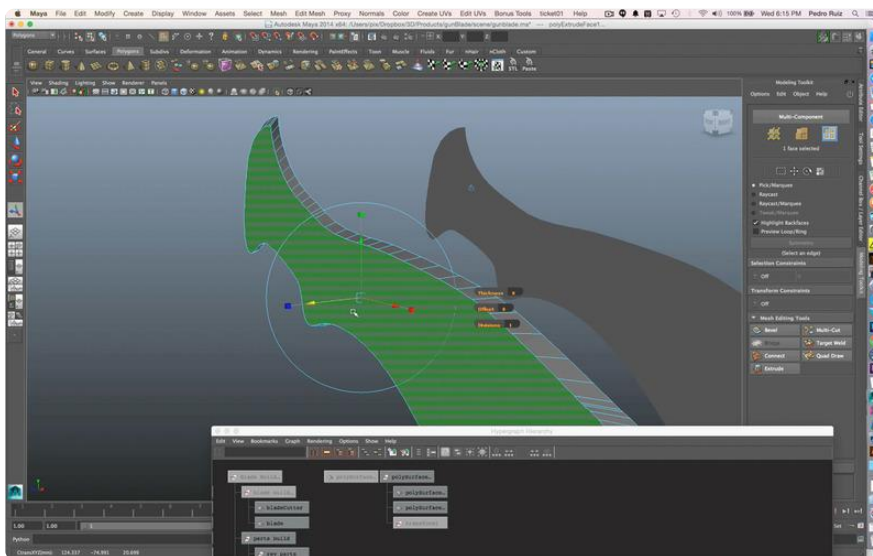
While still selected, move the extruded face foward to create the first bevel curve.
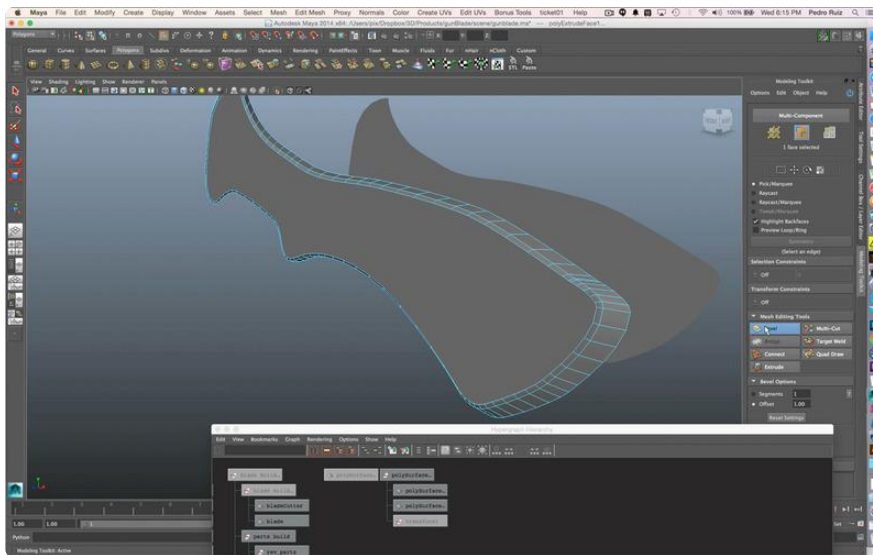
Bevel edges

Use the modeling tool kit to add bevels to the sides of the handle.
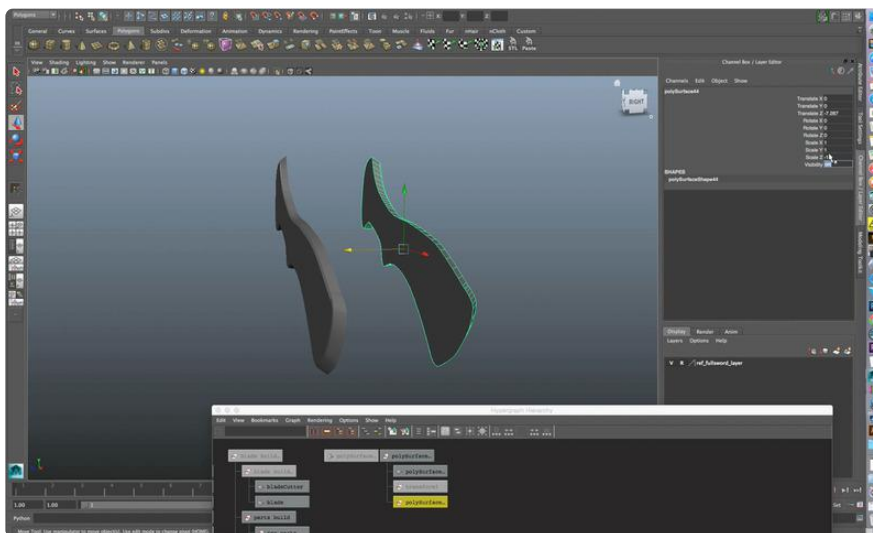
Mirror Copy

Once you're happy with your design, duplicate the model using the mirror geometry option or just scale negatively along the Z axis.
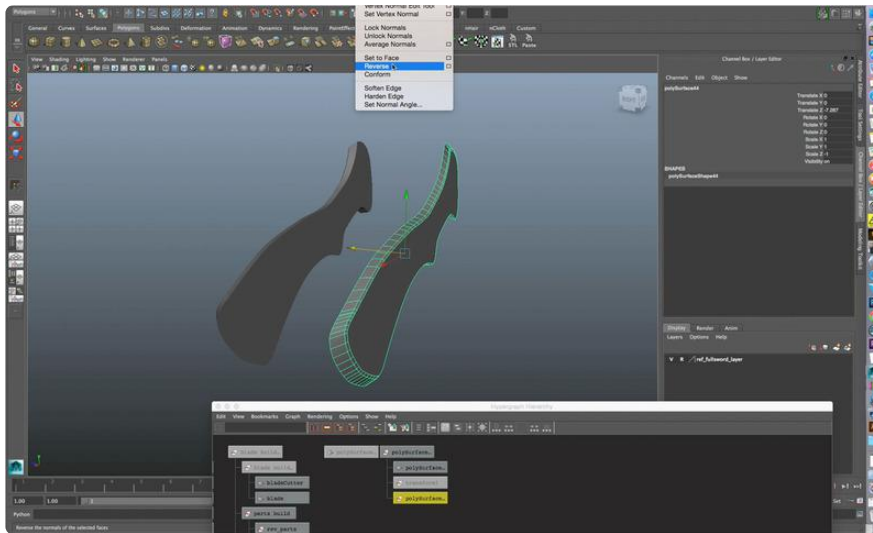
Check Normals to avoid geometry issues when slicing your model, make sure that normals are all pointing outwards.
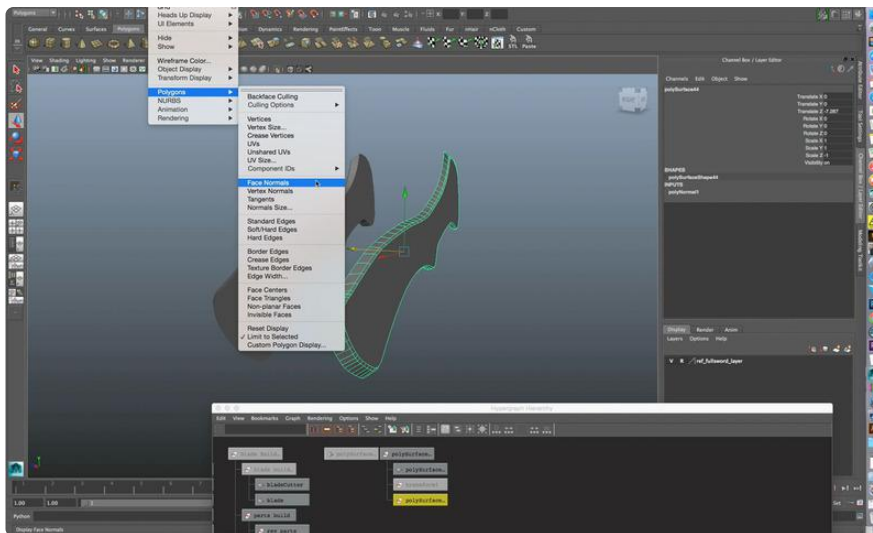
In Maya you can check which way the normals are pointing under: Display > Polygons > Face Normals.
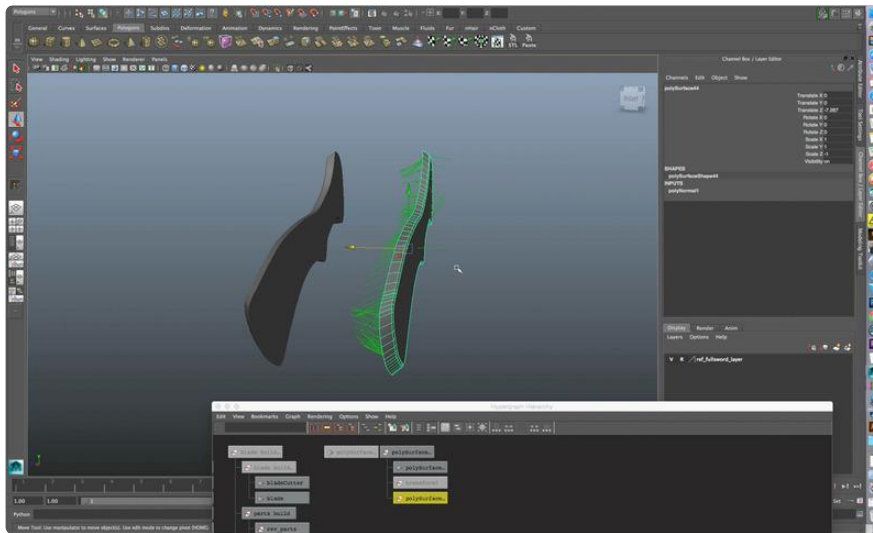
Normals should all point outward or your slicing program will not properly render the geometry correctly.
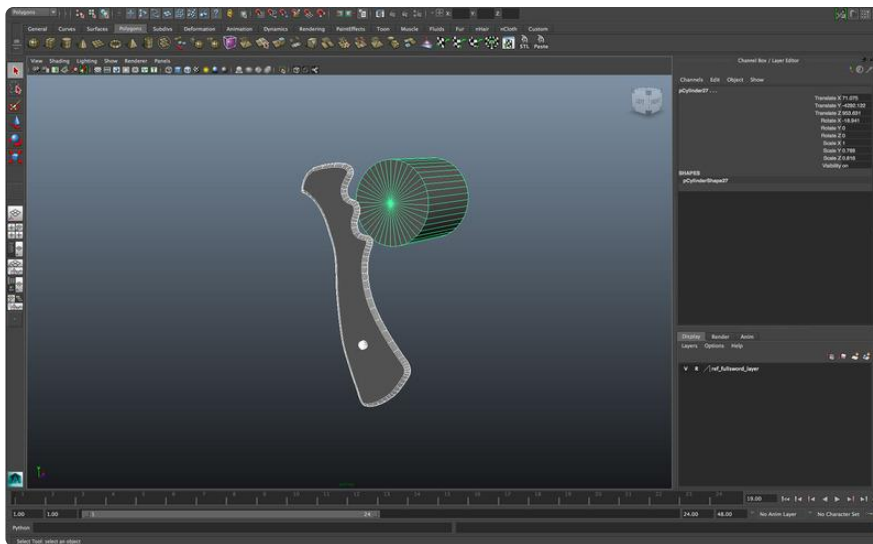
Grip detail

Now we can add the curved indent on the grips by subtracting out half of the surface using a cylinder. Use an additional smaller cylinder to add the screw detail into the grips.

Combine handle

Select the revolver, triger, handle and preform a union boolean to combine these objects into one piece.
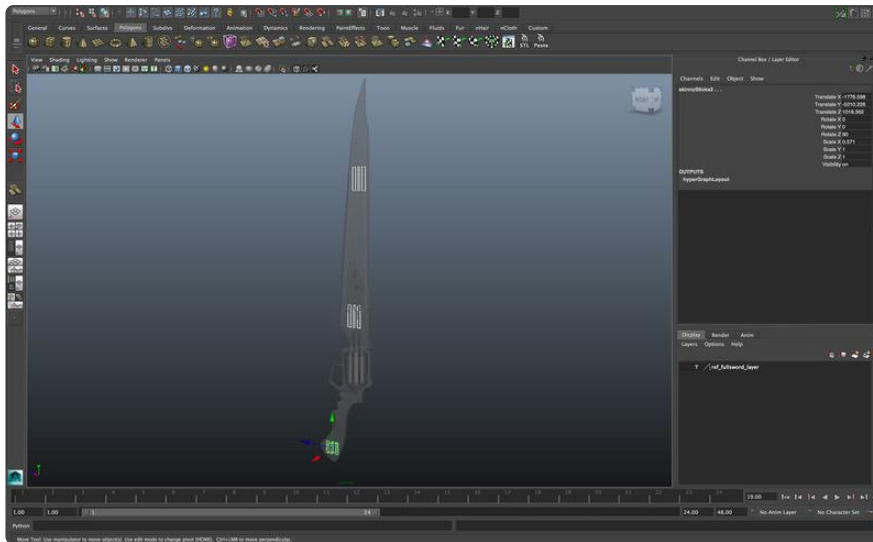
Split Parts for Printing

Measure how large each piece will need to be to fit on your printers platform.

Move the included skinny stick geometry to were the pieces will need to be split. Use the stick geometry to cut out the areas were the wooden skinny stick will hold the piece together.

Now we can export the model along with the handle to print!

3D Printing

No 3D printer? 3D Printing Services

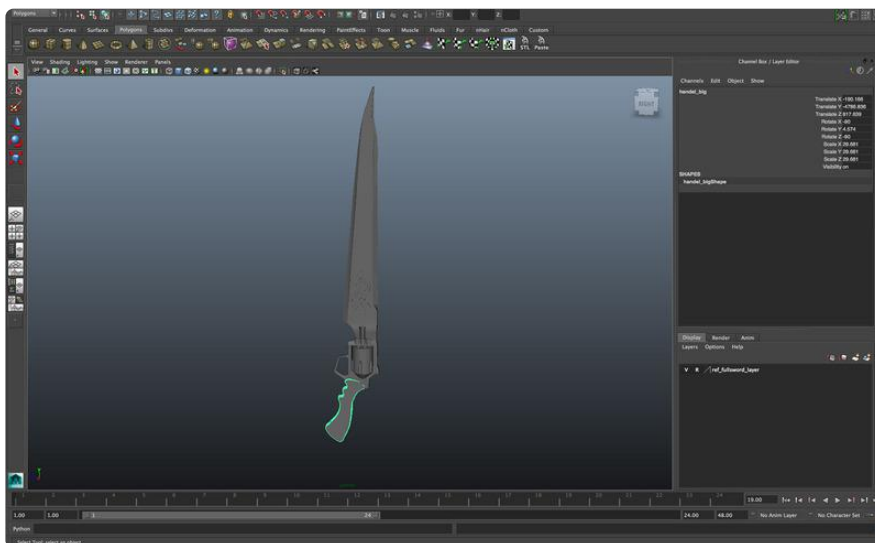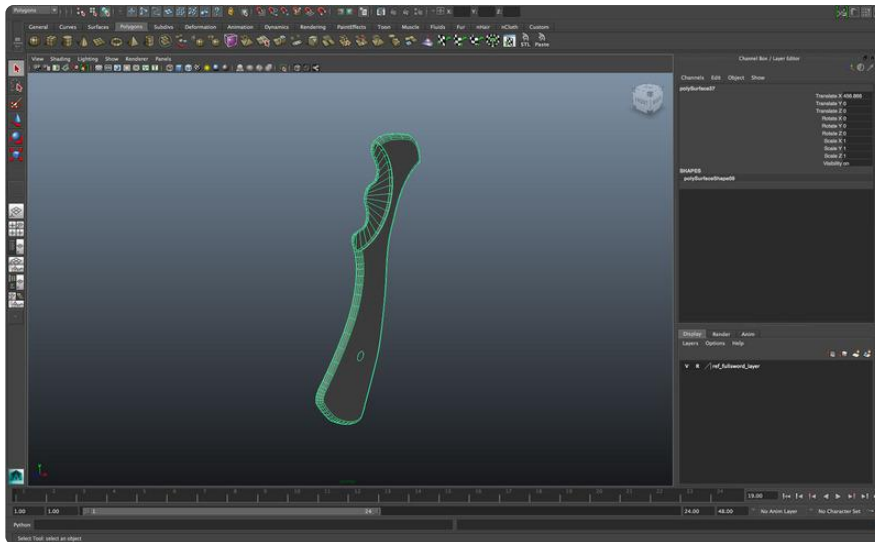Check out your local maker/hacker space, library or community collage for access to a 3d printer locally. Check out 3Dhubs.com (https://adafru.it/iNA) or makexyz.com (https://adafru.it/CeA) for a directory listing of local 3d printing operators to get your parts printed for reasonable prices! Search from dozens of makers and see reviews and printed samples.

PLA Filament

These parts are optimized for printing in PLA material. The parts print best with custom supports around the tigger gaurd and around the small blade body barrel.

SemiFlex

The handle grip part will work and feel best printed in semiflex Ninjaflex TPE material.

- GB-grip1&2.stl

GB-Handle.stl GB-HandleTip.stl GB-Blade.stl GB-BladeTip.stl GB-grip1&2.stl GB-charm1&2.stl	@235 PLA 8% Infill 0.2 Layer Height 2 Shells 60mm/s Print Speed 120mm/s Travel Speeds	about 3 days to print all parts

Slicing Software

The recommend settings above should work with most slicing software. However, you are encouraged to use your own settings since 3D printers and slicing software will vary from printer to printer.
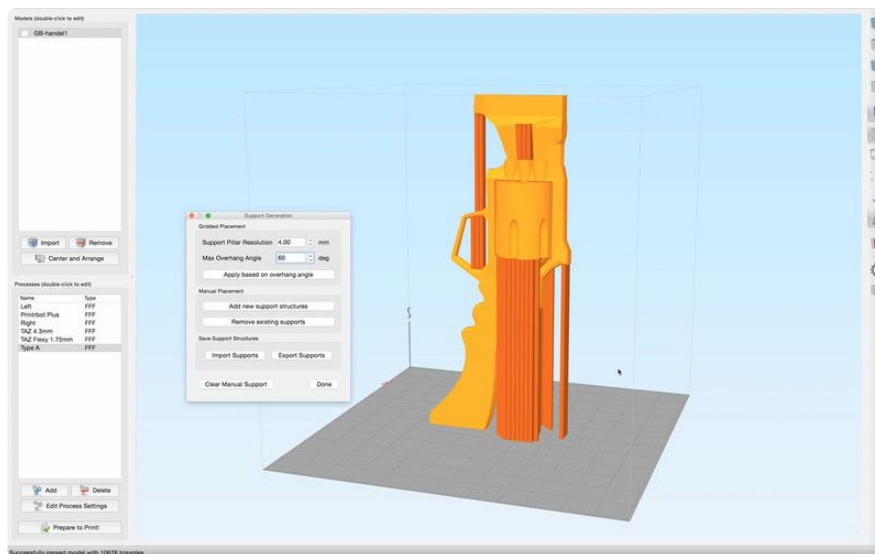
Support structures

Orient the model with the handle on the platform. This will give the top of the barrel a cleaner look.
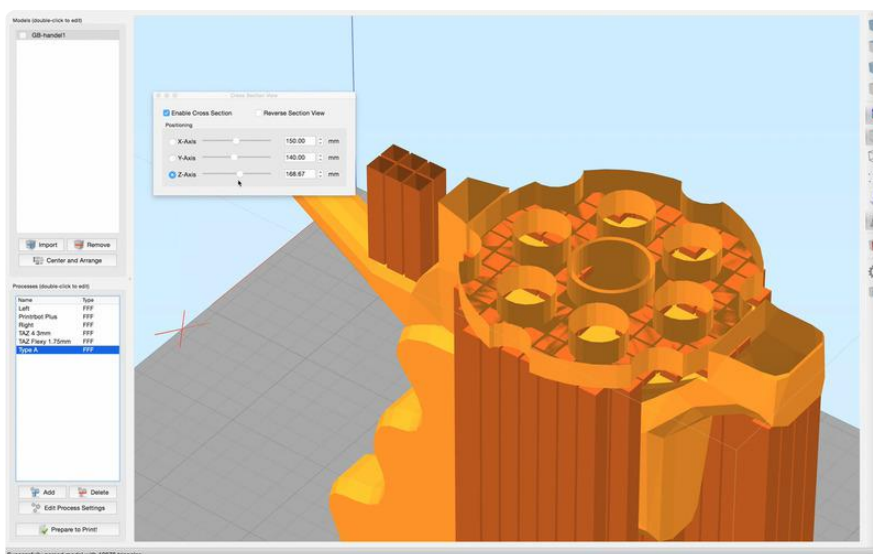
You'll want to use custom supports for the GB-Handle.stl part.

Apply supports at a 60° with a resoultion of 4mm. The horizontal offset from part distance is set to .3mm.
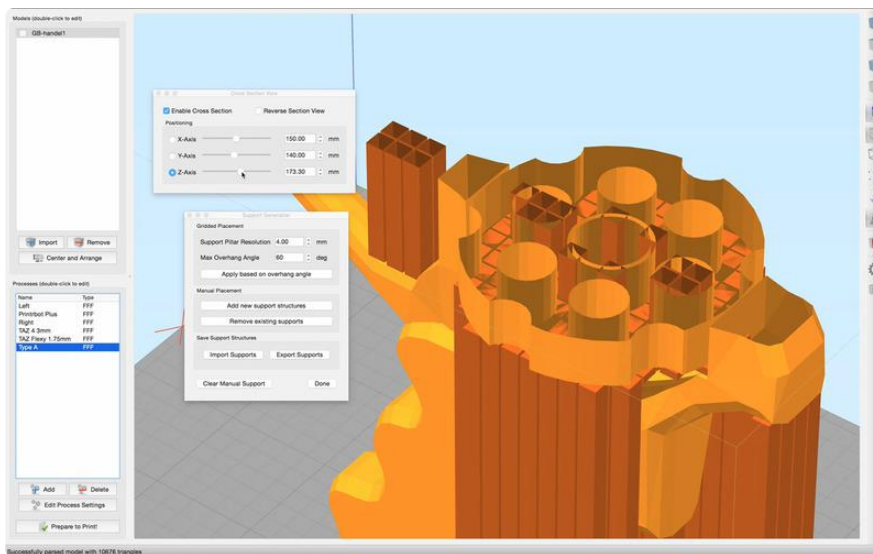
Adjust supports

Use the cross section view to look inside of the barrel. Remove the supports inside of the cylinder holes to make removal easier.

Double check no extra support is left inside of the barrel cylinders.
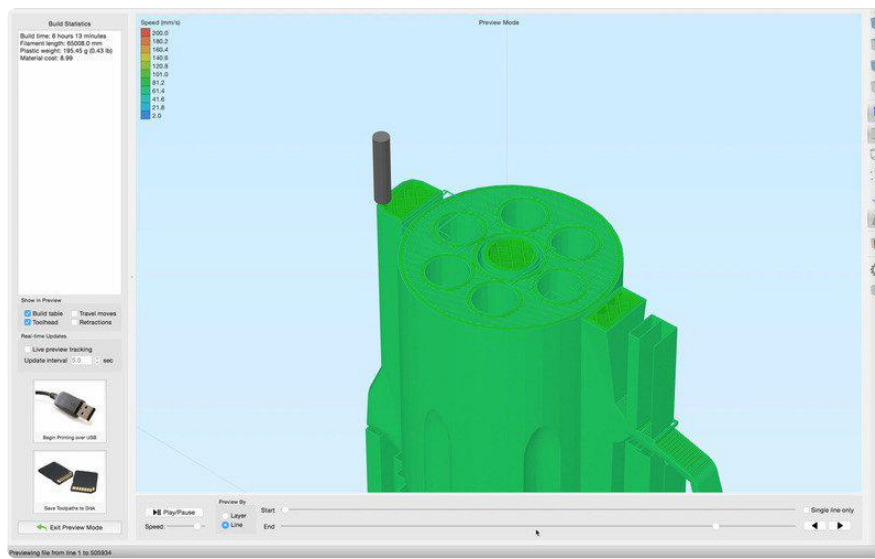
Check simulation

Playback the simulation to insure the support structures will print as intended.
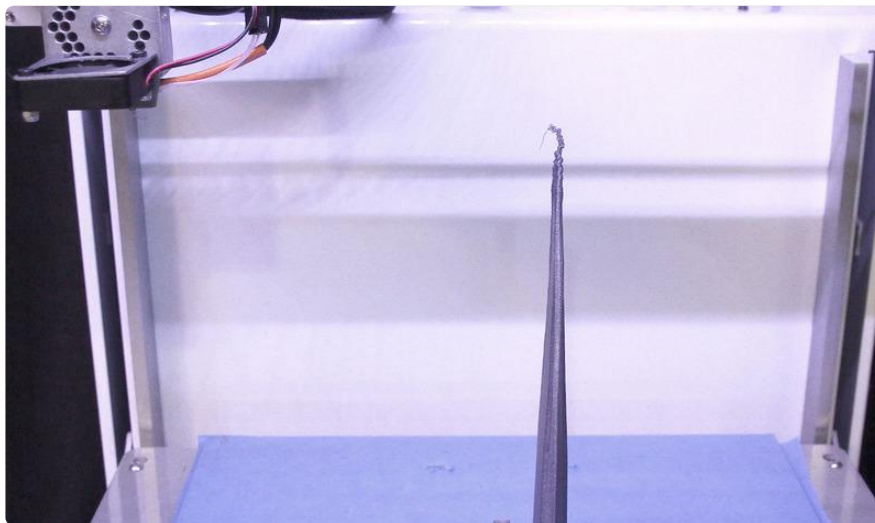
Printing the tips

When printing small pointy objects, heat from the hot nozzle spreads throughout the object. This doesn't allow layers to cool and the model ends up looking melted.

Print two models spaced on opposite sides of the bed. This will give the layers enough time to cool by moving the nozzle away from the spot and giving it plenty of time to cool. You can also print a small throw away cylinder if you don't need two models.
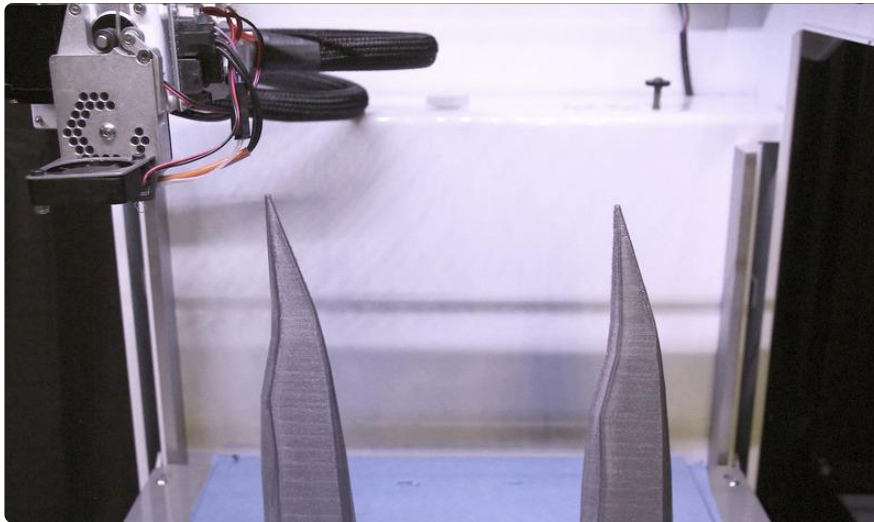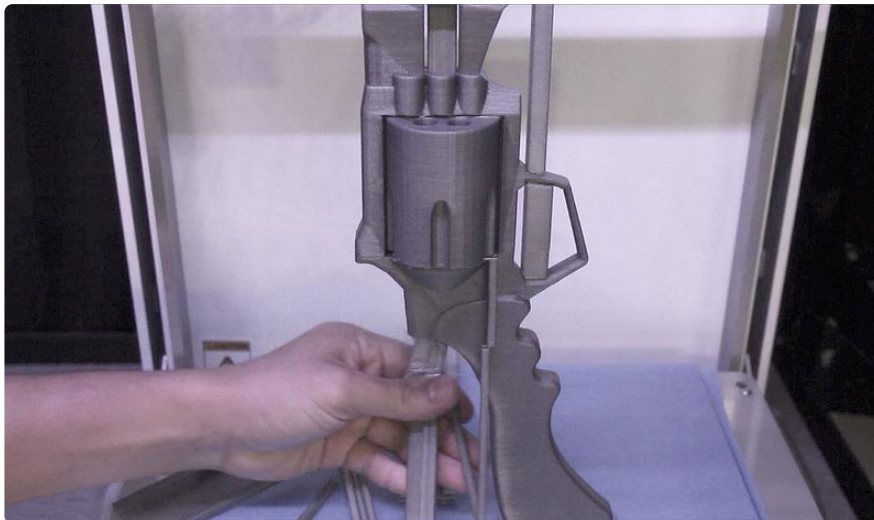
Support removal

Outer supports break away with ease. Supports holding the trigger gaurd required a little more force to remove. Use pliers to grip the middle of the structure and twist the supports off.
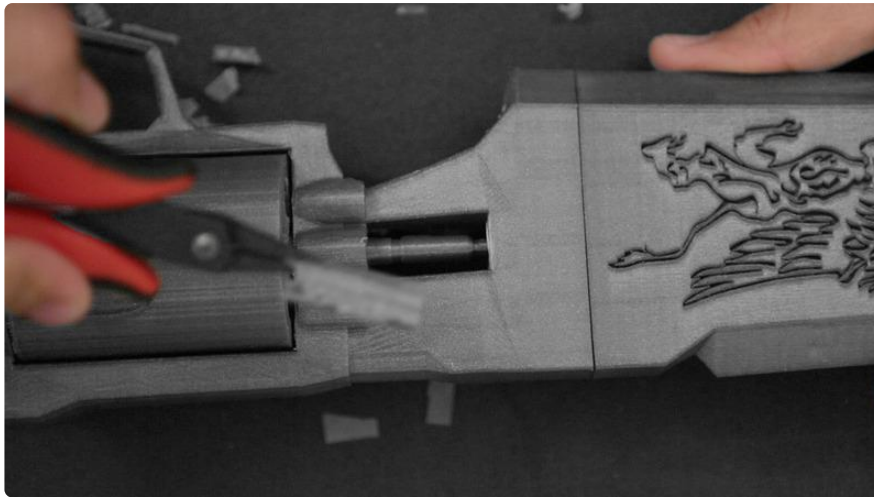
Carefully remove the supports around the small cylinder barrel.

Barrel support

Use a small spatula (https://adafru.it/cUv) or Palette Knife (https://adafru.it/ewf) to break away the support material inside the barrel. Carefully rotate the barrel so the knife can break off any material as you spin the barrel.
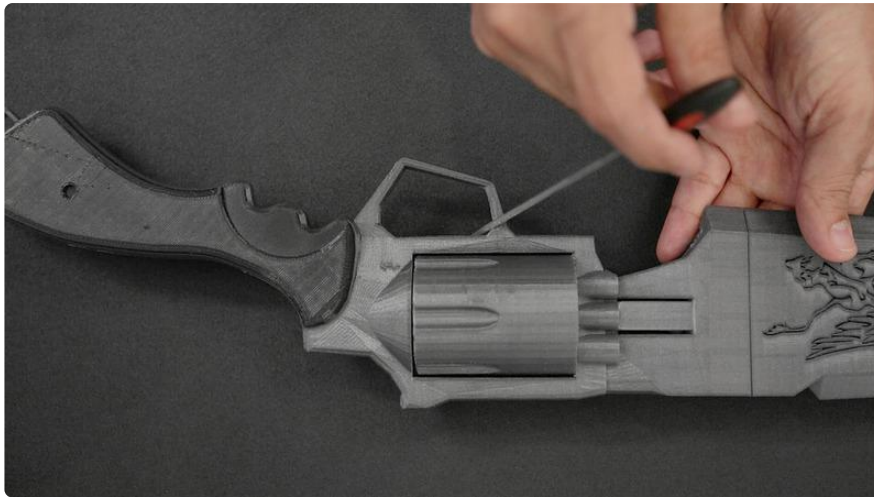
Filing trigger gaurd

Make sure the trigger gaurd is completely smoothed out and cleaned by using a hobby knife and then a file tool to remove any left over support material.

Assembly

Skinny Sticks

To hold the blade pieces together, we'll use these flat wooden skinny sticks. These flat sticks will give the blade internal structural support.

Measure and Cut Sticks

Cut six pieces of sticks down to 42mm and three pieces down to 23mm, making a total of nine segments. The smaller sticks will connect the tip of the handle and the longer pieces will hold the blade parts together. Make sure to have straight clean cuts. Use flush diagonal cutters to assist you.

Dry fit

Test fit each skinny stick and ensure that the lengths are all equal. Shave off any excess, we don't want the sticks too long or short. We want each piece to have enough room to close any gaps between the two pieces.

Clean Grips

Use flush diagonal pliers to clean up all of the bits around the edges.

Test Handle Orientation

Take note which direction the handle tip connects to the gun's handle. It should point downwards with the chain and charm pendant.

Using Adhesives

Get yourself in a well ventilated area and prepare your workspace for gluing all the pieces together. Use gloves to aviod skin contact.

Apply drops in each slot and around the areas where each part will connect. Insert the skinny sticks into each slot and then spread even amounts of glue on each side of the sticks. Now we'll coat the connecting parts, add glue in each slot before piecing them together.

Grips

Coat the flat bottom of the NinjaFlex grips with glue and carefully lay on top of the handle.

Adjusting and curing

Gently move the grips around the handle until all sides are aligned. Make sure curves are not over the edge. Try gently holding it in your hand to feel for any misaligned edges.

It takes about a full day to completely cure, check back to ensure the handle hasn't moved. Using clamps to hold the grips down could leave pressure points or marks behind. Use a large flat piece of material to hold down the grips while they cure, if needed.

Pendant charm

Glue the two printed parts together. Use a vice or a big binder clip to hold the pieces while the glue cures.
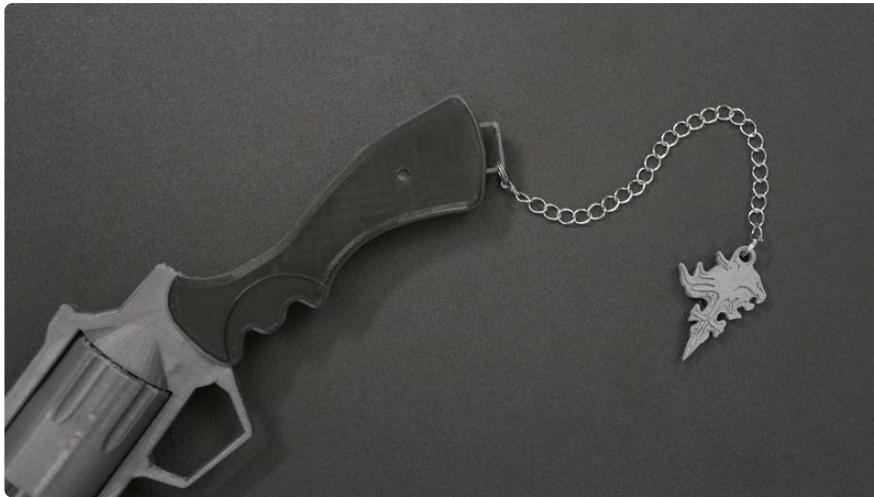
Add a medium sized split ring to the hanlde loop. Use flat pliers to bend the ring open and then carfuly wind the ring around the handle loop.

Add a clasp to a small chain to connect the charm to the handle. This makes it fast to disconnect it when in combat!

Cure Time

After the handle grips have finished curing, continue gluing the rest of the blades.

Allow the blade to completely cure for a full day before swinging it around!

Complete

Once all of the pieces are completely cured, you are done!

It's light weight, fun and easy to wield for your next cosplay event!