Link's 3D Printed Wooden Sword
Created by Ruiz Brothers

https://learn.adafruit.com/links-3d-printed-wooden-sword

Last updated on 2023-08-29 02:49:13 PM EDT
# Table of Contents

## Overview
- Project Expectations
- Parts
- Tools & Supplies

## 3D Printing
- Clean Up

## Assembly
- Skinny sticks
- Glue Parts
- Hilt
- Pommel

## Staining
- Sanding
- Multilayer wood stain
- More Layers
- Wood Filler
Overview

Link from the Legend of Zelda, sports an iconic wooden sword used to thwart off enemies. In this project we’re 3D printing his sword in bambooFill.

BambooFill is filament from Colorfabb that uses recycled bamboo fibres mixed with PHA/PLA. It prints just like PLA so it works pretty good on most FDM 3D Printers.

In this tutorial we'll walk you through the process of 3D printing, assembling and finishing the sword using post-processing techniques.

The grip overlay was printed in Ninjaflex flexible filament. We used the grass and caramel colors and the change filament option to make a multi colored part.

It’s really squishy and slips right on the dowel. The feel is really nice and grippy!
Project Expectations

This project is geared towards makers who have basic 3D printing skills and access to a 3D printer. The 3D parts were designed for medium build platforms. You can also edit our files for smaller printers. Printing these parts can take up to 18 hours and about 1 full spool of material.

Parts

Below is a full list of parts needed to build this project. Be sure to check out the featured products on the right sidebar.

- **Bamboo Filament** (http://adafru.it/2475)
- **Ninjaflex Filament**
- **3D Printer**
- **Blue tape** (http://adafru.it/2416)

Tools & Supplies

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

- **Flush diagonal cutter**
- **Knife jimmy** (http://adafru.it/2414), **Spatula** or **Palette Knife**
- **Skinny Sticks** 5 3/4' x 1/4'

3D Printing

<table>
<thead>
<tr>
<th>STL File</th>
<th>PLA Type</th>
<th>Infill</th>
<th>Layer Height</th>
<th>Print Speed</th>
<th>Travel Speed</th>
<th>Build Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>swordTop.stl</td>
<td>@230 PLA</td>
<td>15%</td>
<td>0.2</td>
<td>60mm/s</td>
<td>120mm/s</td>
<td>6 hours</td>
</tr>
<tr>
<td>swordBtm.stl</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4 hours</td>
</tr>
<tr>
<td>swordGuard.stl</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 hours</td>
</tr>
<tr>
<td>swordEnd.stl</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 hours</td>
</tr>
</tbody>
</table>
Printing a 600mm sword is a bit too big to print in one piece so the sword was broken up into four pieces.

We used the Printrbot Plus to print this project because it has a max z-height of 250mm - which is perfect for printing really tall things like swords. You can also edit our source files to fit the parts on smaller printers.

Clean Up

Retraction pieces and blobs left over from printing are easy to clean up. Most of the retraction pieces peel off by hand. You can then use a metal flat end like the iJimmy to smooth out edges. Use flush cutters to remove any blobs from the surface of the parts.
Assembly

Skinny sticks

We've used craft sticks in our previous Gun Blade project as internal supports. This is an easy way to join parts together.

These sticks are inserted into the slots and marked for measurement - these need to be cut down so everything fits and looks flush.
The tolerances for the slots are going to vary depending on your printer, but you can trim off the sticks corners to fit them into place - just try not to break them by jamming them in, because that could be bad!

The cross guard has two slots that go near the bottom of the blade. These sticks help to align the blade while keeping them from rotating.
Glue Parts

You can use E6000 adhesive to permanently bond the parts together.

Allow the glue to fully cure for about a full day.

You don't have to glue the sword if you plan to travel with it. Just make sure the tolerances are tight enough so the blades don't fall apart while in battle.
Hilt

To make the hilt of the sword, we’re using a 7/8th wooden dowel - those are just the right diameter for a grip, so we can use real wood with our 3D printed wood...which is like, meta.

Pommel

The pommel has an opening in the bottom and fits into the dowel. You’ll need to cut the hilt down to size to fit your hands - we measured ours so that it can fit two hands.
You can insert the dowel into the printed parts and mark them to get the measurement of the hilt.

So there you have it, extruding wooden filament to make wooden cosplay props. Again, this is BambooFill - Bamboo PLA filament from the guys at Colorfab.
Staining

BambooFill is real wood, so we can use wood stains to finish off the parts!

Any wood stain should work, but the MinWax brand worked for our tests. You can find these at your local hardware shop.

You can stain with different colors or even layer them on top to create a multilayer stain.

Sanding

We'll start off by sanding all of the parts down with a 320 grit sand paper. Make sure to get into all of the small spaces.

You'll notice that sanding brings out the chalky white characteristics of the PLA, but it darkens up once we apply the stain.
Multilayer wood stain

We'll start off with a dark walnut for the first layer. Stir and use a cloth to apply a textured stroke to add those wood grain patterns. Don’t apply a lot of pressure, just gently glide the cloth across parts. Fold the cloth into a small shape that can fit around smaller pieces.

More Layers

Let it dry for about 5 minutes and then use an 80 grit sand paper to remove any blotches. This also helps to get that weathered look. After applying a second coat of a red oak color, we'll sand it down again and then apply a small amount of green. Once applied, quickly wipe it off. This will give it just a hint of green in the wood. To finish off, switch back to the 320 grit sand paper.
Wood Filler

Just like real wood, you can you fillers to plug in gaps. Wood putty worked great for filling in the top part of the blade tip. Apply after staining, let it dry and then sand off any left overs.
You can really see a difference when compared to an unfinished part. Definitely worth the effort to post process wooden prints.