



# Custom 3D Hat Graphics

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<https://learn.adafruit.com/custom-3d-hat-graphics>

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# Overview

Custom embroidery? Nah, custom 3D printing! Bring your hat's style into the 21st century with this easy printing+sewing project.

You will need:

- [blank cap \(\)](#) or other accessory to mod
- access to a 3D printer
- flexible filament like [NinjaFlex \(\)](#) ([SemiFlex \(\)](#) preferred)
- OR [PLA filament \(\)](#) + hot water and a rotary tool
- [sewing needles \(\)](#) + pins
- thread to match your filament
- scissors





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## 3D Modeling

### Customize 3D Model

Check out our tutorial video about using the text tool in 123D Design for changing the text and customizing your own model.

### Download Files

We've shared our source file which includes the original solids for creating the sew tabs. Use the existing sketch to change the text and extrude to make it yours!

[Download Model](#)

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## Printing Parts

### Ninjaflex TPE Filament

Check out our video [and guide \(\)](#) on Ninjaflex for printing tips, finishing techniques and recommend slice settings.

## Slice Settings

Ninjabflex material works best with direct-drive 3D Printer. Use the recommended settings below to slice your 3D files.

Extruder Temperature: 230c

Print speed: 30mm/sec

Top & bottom layers: 4

Infill: 10%

Shells: 2

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## Extra Steps for PLA



If you don't have flexible filament, you can use regular PLA instead, with a few extra steps. To curve the letterforms, dip in just-off-the-boil water for a few seconds, then lay the part on your hat.

Keep in mind that parts heat unevenly, and don't expect to get more than a general curve out of this step. This is not a precise process. =D

You may also have to drill out the sew holes with a small bit and rotary tool to enable the needles to pass through.

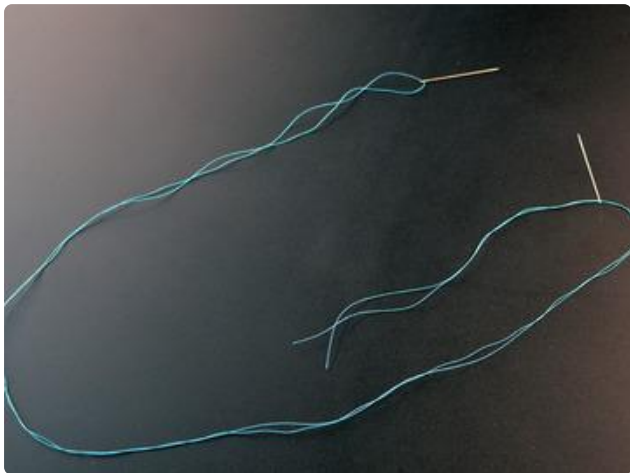


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## Affix to Hat



While not strictly necessary, pins are very handy for determining the placement of your parts on your hat.



Thread two needles onto your thread, one on each end (or one at the center with the thread doubled, as shown, with the other needle threaded onto both tails).



Pierce through the sew tabs with both needles, bringing the ends to the inside and leaving a clean loop securing the part to the hat on the outside.







For a flush fit, it helps to keep the pins in place until the knot is tied at the inside.



Tie off at each tab and snip the thread tails short.



Don't like your placement or design? No problem! Just snip the threads with scissors or a seam ripper and reposition or replace your design.