



DnD Mini/ Artistic 3d Printing



by memphisaltt

Hello, It is me again. this will be a guide to resin printing. I picked up a resin printer just under a month or two ago and after a few failures I had lost motivation. this challenge helped me get back into it a learn more about resin printing. I will be going over a project I have been working on for a while of 3d printing a dice with a fdm insert

fyi this guide was written for by memephis, the same person who wrote all 3(4 including this hub page) of the 3ds of 3d printing instructable. I wrote it in 3 parts for organizational reasons and I didn't feel the need to publish all of them to the contest.

Supplies:

you will need a resin printer and some resin. there will be steps advising you on what to buy. You will also need a respirator and nitrile gloves. vinyl gloves will not work as the resin will eat through them.





Step 1: Getting a Printer

For resin 3d printing, there are two main companies. elegoo and anycubic. both are very good companies and sell good products. personally, I bought the elegoo mars 2, which, so far, has been treating me well. I don't think there is a huge difference between the two, but I am not super familiar with all this stuff yet, so it might be worth doing your own research.

Step 2: Resin

resin comes in many different colors and with different chemical properties. so far, I have found 3 amazing types.

normal resins - normal resins require washing with IPA, which can get expensive when you factor in the amount you need to wash everything.

water washable - water washable resins can be washed using water instead of IPA, which can be a great way to not need to buy another thing. personally, I love them. however, **water washable does not mean you can pour it down the sink. it is still toxic and will hurt the fish when it gets to open water.**

eco resins - eco resins are similar to normal resins, but they are made from plants opposed to fossil fuels. this is better, but they are still just as toxic.



Step 3: Resin Safety

resin safety is a huge part of the hobby. this stuff is nasty and will mess you up. if resin gets on your hands, it will get absorbed into your skin and slowly destroy parts of your immune system. this will lead to resin sensitization, or side effects from being around resin. the fumes will also contribute to the sensitization. it is very important to air out your

room after working directly with resin and to use a respirator. this is the one I have
https://www.amazon.com/gp/product/B08L3YYLMQ/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1

a general rule of thumb is that if you can smell it, you are doing it wrong. another very important part is eye protection. it sounds obvious, but resin in the eye is very very bad for you.

I would also recommend getting a UV flashlight like this one just so you can check around for random drops of resin to make sure nothing got dropped on accident.

<https://www.amazon.com/Flashlight-Vansky-Ultraviolet-Blacklight-Eliminator/dp/B01A5KLUG2>

One more thing, you can buy mini air purifiers to go in the printer. they are sold by elegoo and have some great reviews. I have just ordered one and will keep this updated on how they work out. this is definitely something to look into if you plan on being in the same room as the printer

<https://www.amazon.com/ELEGOO-Purifier-Activated-Universal-Printer%EF%BC%88Pack/dp/B086277CNQ>

<https://www.elegoo.com/products/elegoo-mini-air-purifier> (amazon wont sell them to california, but elegoo will)



Step 4: Slicer

first off, here is a picture of my slicer settings. the slicer I use is chitubox, this is the same program as for the anycubic photon. there is not a whole lot to go over settings wise or support wise. on the support side, I generally will click add auto support and then check for any islands, or parts that will print without any support or anything connecting them to the build plate. if you see something like this, add supports as it will cause a print failure, either in that spot or overall depending on what it is.

The screenshot shows a software interface for configuring a 3D print. On the left, there are buttons for '+', a trash icon, and 'Default'. Below these is a blue button labeled 'ELEGOO MARS 2'. The main area has a 'Profile' dropdown menu and a toolbar with icons for file operations. Below the toolbar are four tabs: 'Machine', 'Resin', 'Print' (which is active and highlighted in blue), and 'Advanced'. The 'Print' tab contains the following settings:

Parameter	Value	Unit
Layer Height:	0.05	mm
Bottom Layer Count:	4	
Exposure Time:	6	s
Bottom Exposure Time:	60	s
Light-off Delay:	7	s
Bottom Light-off Delay:	8	s
Bottom Lift Distance:	5	mm
Lifting Distance:	10	mm
Bottom Lift Speed:	60	mm/min
Lifting Speed:	140	mm/min
Retract Speed:	210	mm/min

Step 5: Work Flow: Print Removal

this step is pretty simple. you take the build plate off the printer, be it with a screw at the top, or a flexible print bed, and then you scrape it off the plate with the metal spatula that came with the printer.



Step 6: Work Flow: Wash and Cure Stations

wash and cure stations are a great product, but for the most part they are around 150 ish. these stations will wash your

print and then cure them. they do a great job at both and can be a good investment if you plan on getting really into the hobby, but they can also be made yourself with a bucket filled with water or IPA depending on your resin, and a water pump. the cure station can be a UV lamp in a foil lined box.

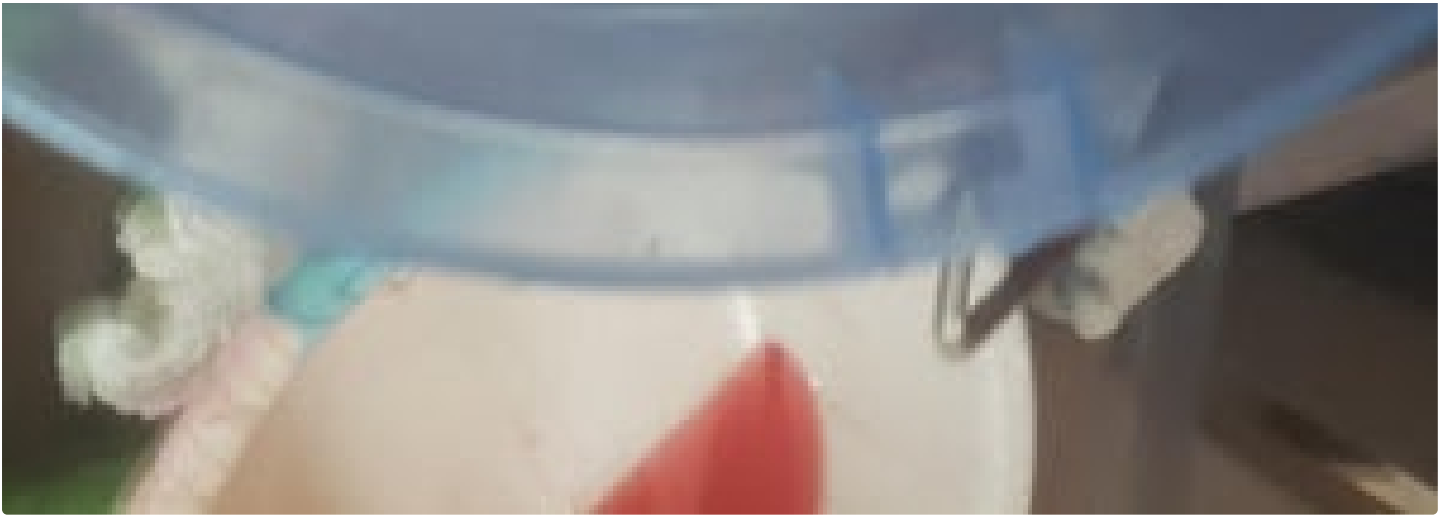
Step 7: Work Flow: Washing and Support Removal.

after it is removed from the print bed, you have to wash all of the excess resin off of the print. this can be done by taking the print and washing it around in some water or IPA depending on your resin. it can be very helpful to have a old toothbrush for some of those hard to reach spots. I also recommend removing the supports now while the print is not fully cured and is somewhat soft.









Step 8: Work Flow: Curing

curing the resin is one of the most important steps. what I have found to work the best is keeping the print in a cup of water under a UV lamp for a few minutes. curing it in water like this can not only drastically reduce the amount of time you need to cure it for, but it can also help spread out the light and get it to hit some of those hard to hit spots. this means shorter cure times but a more full cure. if you don't wanna do that, you can also leave in under the big UV lamp in the sky for a couple of hours and it will cure. this will not work super well depending on how sunny your area is, and UV lamps are like \$20 so I would recommend just buying one, but you can cure it in the sun if need be. as a general tip, if you can scratch the resin with your fingernail, then it is not fully cured and you should go wash your hands.









Step 9: Trouble Shooting

trouble shooting with resin printers is really easy. you either need to check your settings to make sure they are ok, check your film(the clear part at the bottom of the vat) to make sure it is not to banged up, or make sure your resin is not to cold. you want to make sure your printer is staying at above 68 f ish or 20 C depending on your resin.

Step 10: Cool Tips

resin printers have some really amazing things you can do with them. the next few steps will be showcasing some of them.

Step 11: Additives

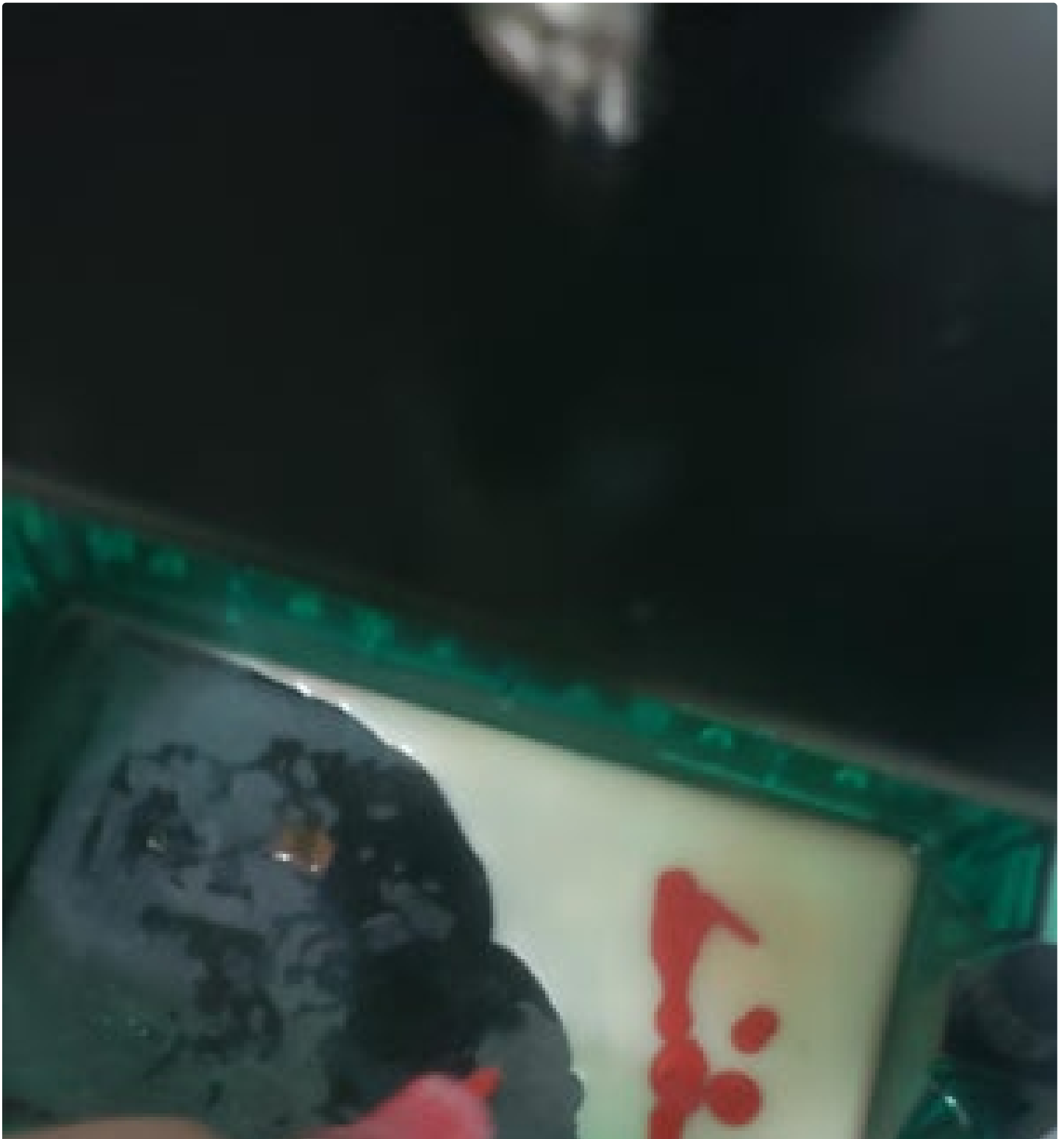
resin printing is really nice because you can put a lot of things into the resin and it will still print. you can easily put glitter or dye into resins to make them different colors or a little sparkly. because of this, **it makes no sense to buy resin that is**

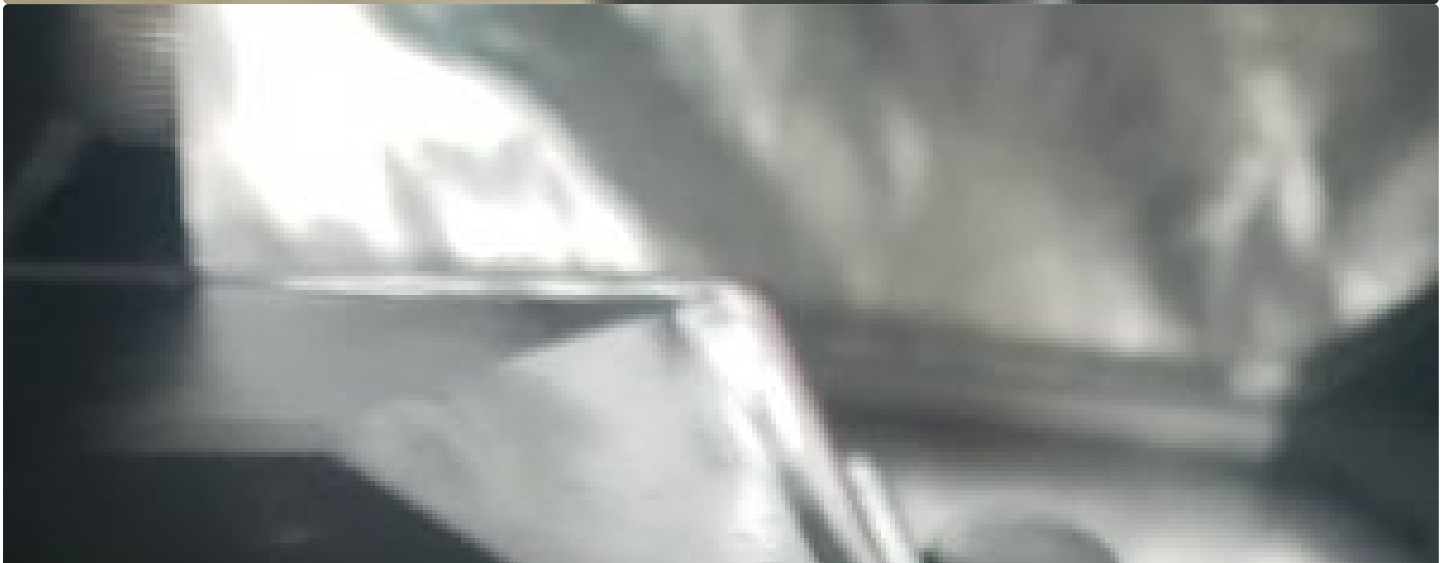
not white or clear. you can very easily find clear and white resins of any kind, but here are the ones I have. also the amount of dye in the first picture was way more than needed. one or two drops is enough to make a vat of clear resin into a solid color. this is what allowed me to make multiple colors on the dice

dye set - <https://www.amazon.com/Alcohol-Ink-Set-Alcohol-based-Concentrated/dp/B082G557CR/>

water washable white resin -https://www.amazon.com/dp/B08PFL6DSJ?ref=nb_sb_ss_w_as-ypp-rep_ypp_rep_k0_1_14&crd=1ZE7OV14EOJ6V&sprefix=water+washable

clear water washable - https://www.amazon.com/SainSmart-Washable-IPA-Free-UV-Curing-Transparent/dp/B089KV693J/ref=sr_1_3?keywords=sainsmart+clear+water+washable+resin&qid=1645987304&sr=8-3









Step 12: Inserts

first, you need to get what you are going to put in the print. I used a fdm print for a venasaur from pokemon. next, make sure your model has enough space to insert the object. after that, slice the print and make sure to take note of what layer the object needs to be inserted at. you can then move the print below the bed in the slicer until it is around the same height. this will help to get an idea of how much time it will be before you need to pause the print and insert the object. next, start the print and set a timer on your phone. when the timer goes off, pause the print and watch for the layer where you need to insert the object. make sure that you do not use too much dye as it may cause your print to become too opaque and if you are also changing the color of the print, pause it a few layers earlier as to let it print a few layers of the new color as to give you a outline. place your object inside the outline from the different color, or just try to line it up from both directions and pray. it should pick the object up as you print and leave you with a really nice print. this was the main part of this dice and I wish it had turned out a little better, but I am still happy with it.

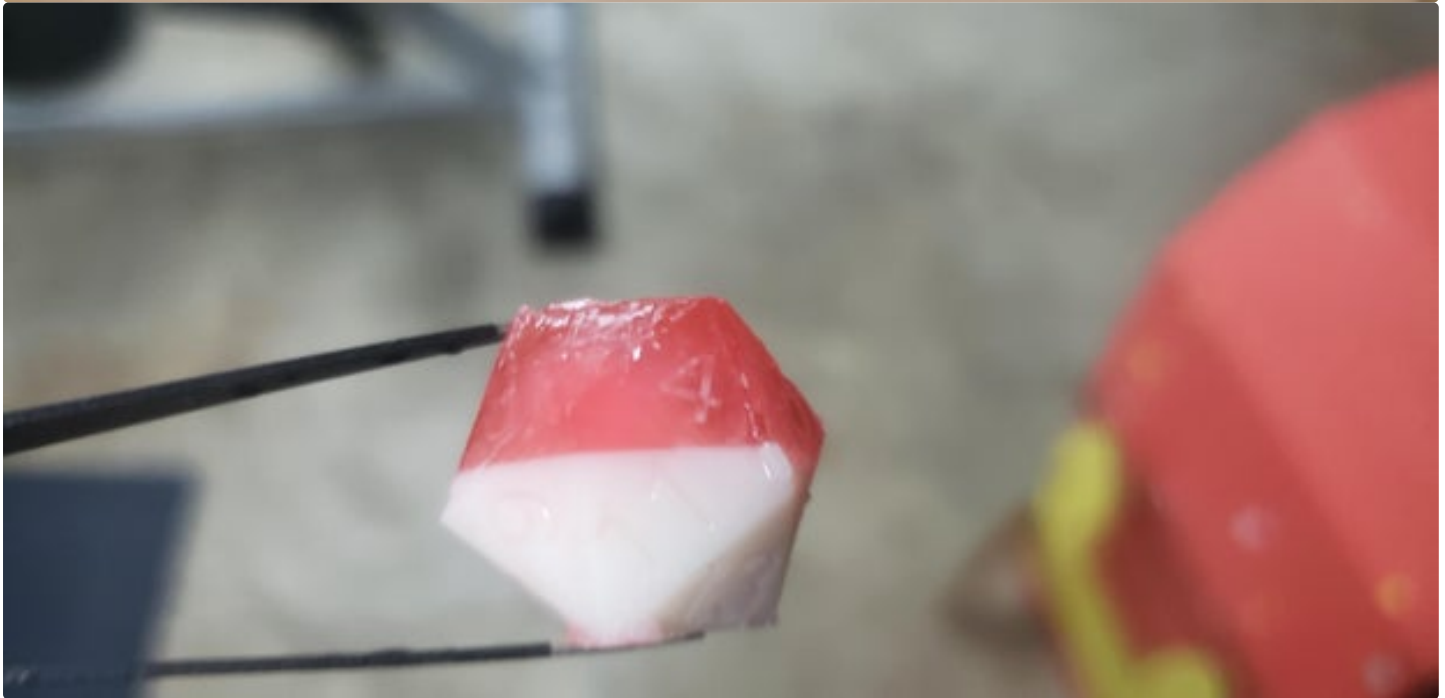




Step 13: Making Clear Parts

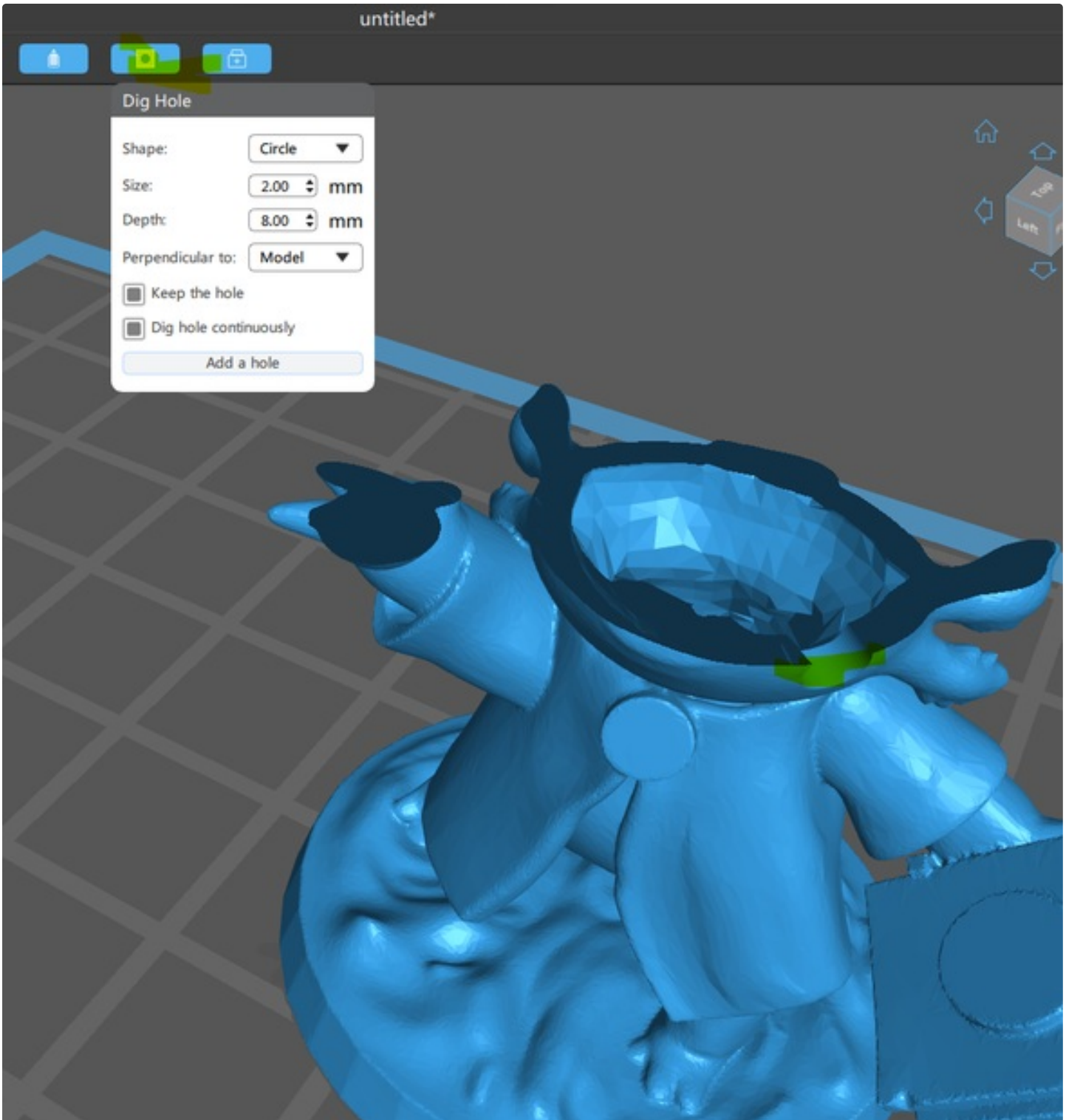
making clear parts can be really annoying. this is because clear resins come out cloudy from printing. to counter act this, you need to finish up the surface really well. you can either sand it down, or do a top coat. doing a top coat of clear resin is much easier, but it requires working with more toxic resin. the basic idea is that you brush extra resin on top of the clear parts and cure it right on. to do this, I recommend a UV flashlight like the one discussed in the resin safety step, and some cheap paintbrush that you do not care about. make sure you go into a well ventilated shady area. make sure to put on all your safety equipment. you could go into a sunny area to get the resin to cure as you are applying, but I think it

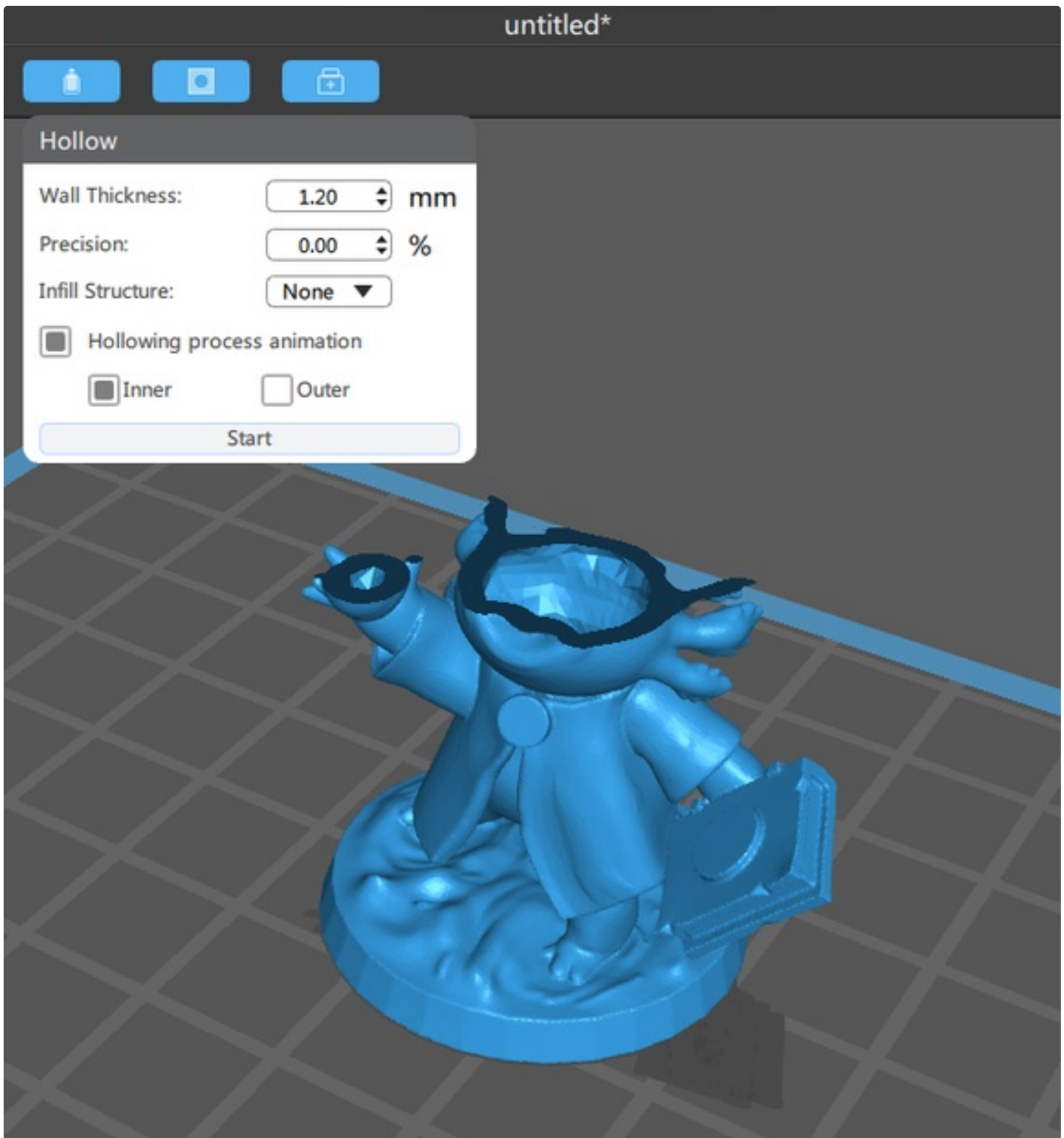
would be better to go into the shade so your resin doesn't cure as well on the brush and in your container. pour a little bit of resin into a bowl and apply with the paint brush, making sure to cure it either as you go or at the end. the before and after pictures do not look to good on the camera, but it does work.



Step 14: Hollowing Drain Holes

drain holes are both a great way to make some fun parts and save resin. the basic idea is that you hollow the part using your slicers hollow tool and add a hole for any resin that got trapped to escape. however, once you have this internal cavity, you can fill it up with a dark liquid. this can give some parts some really nice contrast while still leaving some of the clear bits.





Step 15: Extra Resources

zack freedman is a funny youtuber that does all sorts of engineering videos, including some on resin
<https://www.youtube.com/c/ZackFreedman>

this is a link to voidstar labs (zack freedmans discord). its a super helpful discord for all sorts of engineering including resin and fdm 3d printing - <https://discord.gg/BvvUS5VD>

uncle jessy is a great channel that does a lot of resin 3d printing content -<https://www.youtube.com/c/UncleJessy>

rybonator does lots of great resin dice making videos, most of which are casting resin not UV, but here is a play list of his good resin 3d printing videos -

<https://www.youtube.com/watch?v=QDKDEIzbMRU&list=PLvGBzJpe10Uhvaqlghld1cqRuYjS7w4nk>

goobertown hobbies is a good channel with lots of videos on minis and mini painting -

<https://www.youtube.com/c/GoobertownHobbies>

makers muse is an amazing channel with lots of 3d printer product reviews and tips for beginners -

<https://www.youtube.com/c/MakersMuse>