

How to Use the 3D Printers With CSDTs

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This guide will take you through the steps to print off your virtual designs using a 3D printer. If you have any questions about this guide, or come across any issues, please contact our staff software developer, Andrew Hunn (ahunn@umich.edu).

Note: At the time of writing this, we are focused on using the Ultimaker 2+ and the Ultimaker 3. The instructions are for the 2+, but there are similarities. We also have Lulzbot Taz 6 printers as well, but they are out of commission for the time being. Once those are fixed, the only main difference is the software you need to download, noted below in “Before You Start”.

Before You Start

Download the 3D printing software for the printer you are working with:

- Taz 6: [Window](#) / [Mac](#)
- Ultimaker: [Window/ Mac](#)

For the purposes of this guide, we will be using the Ultimaker, but will note any adjustments/changes that are needed for the Taz 6.

For initial setup of the software, both should be set to default settings. The Taz 6 is a single extruder, and the Ultimaker is a 2+.

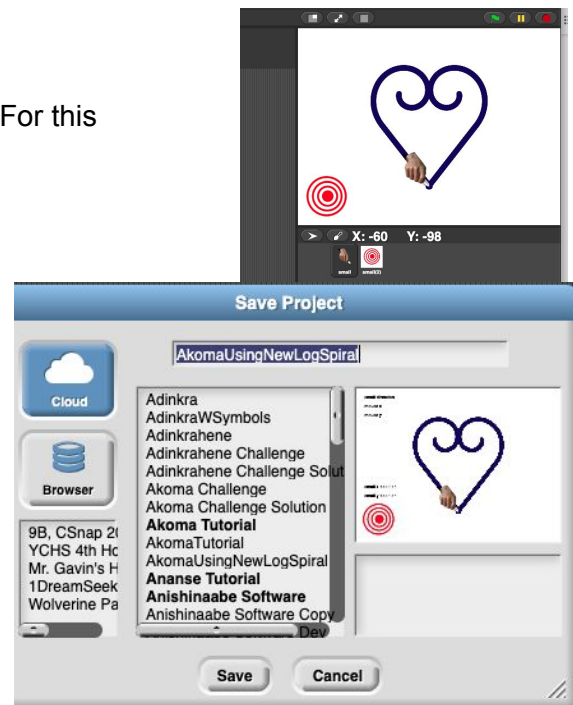
Create Your Design

First thing, create your virtual design using a CSDT. For this example, we will be taking a look at [Adinkra](#).

Save Your Design

Once you have your design finished, make sure you save it!!

File > Save as... > Click on Cloud > Then name it something and save.

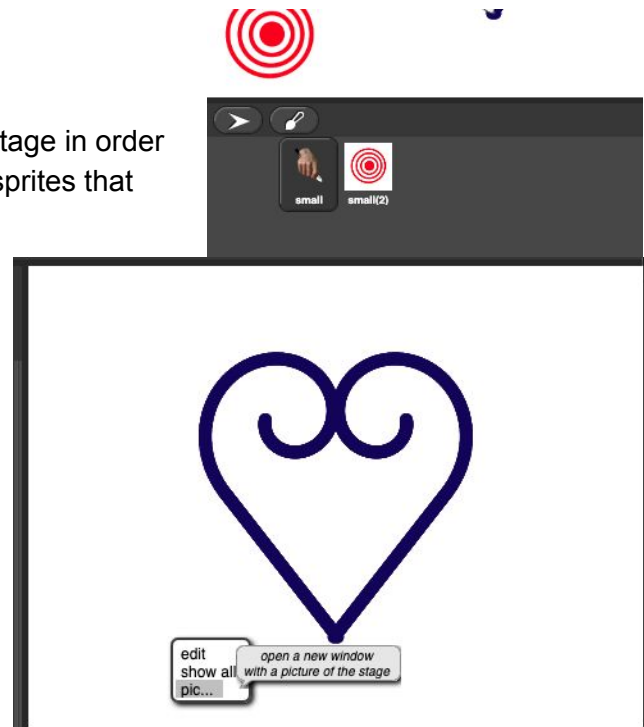


Export Your Design

Now that it is saved, we need to clean up the stage in order to save the image. Go ahead and delete both sprites that appear here (Right click and click delete):

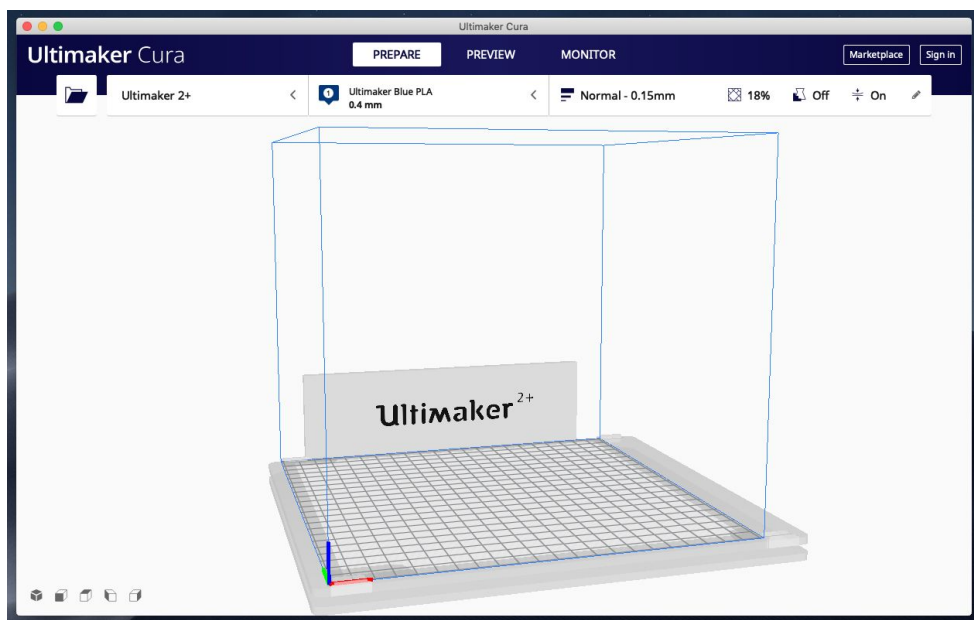
You should have just your design now. Right click the stage, and select Pic... This will download the stage as a .PNG to your downloads folder.

(You can also use the 'Hide' costume block and just attach it to the end of your script, and run it once more)



Importing Your Design Into Cura

Go ahead and open up your version of Cura (the 3D printing software that you downloaded in the [Before You Start](#) section).

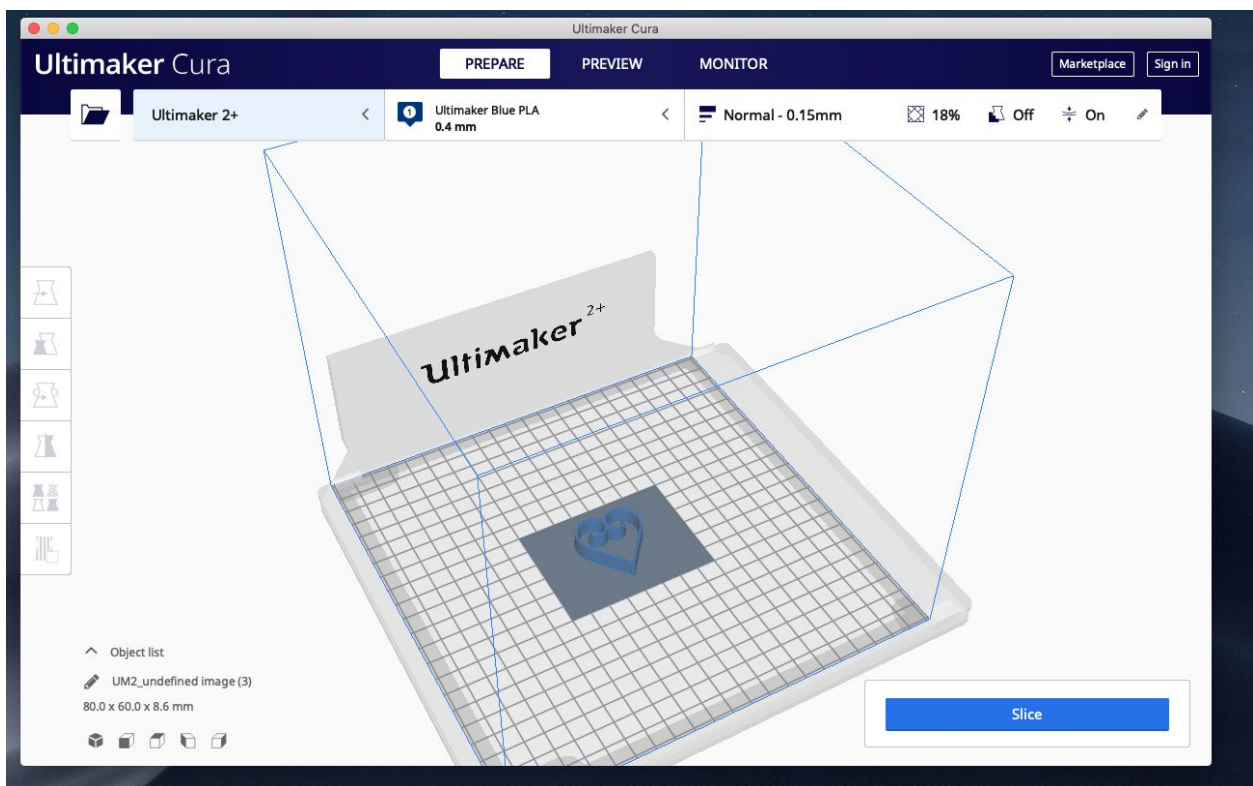
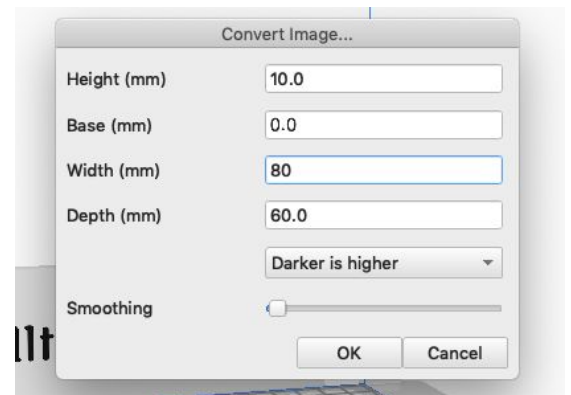


Click on the folder icon in the top left of the screen



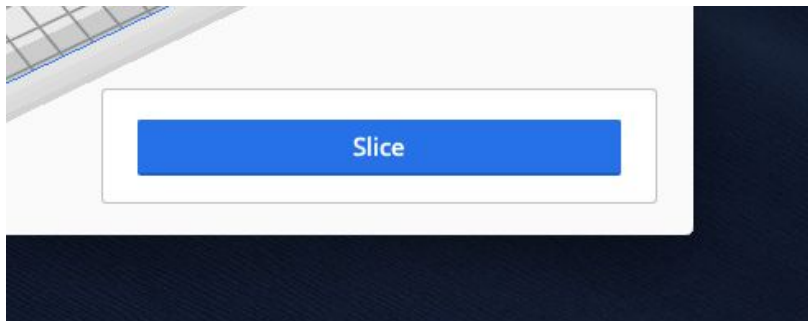
Select your design that you exported, and click import. You should be greeted with this popup. This will convert the image from a 2D image to a 3D object. These settings are up to you, but we recommend that you select 0 for the base at least. Once you have it set up how you wanted, click OK.

You should now have your 3D object!

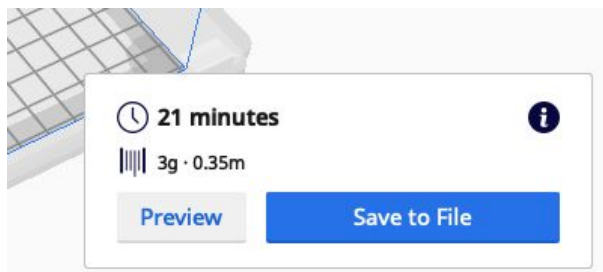


Printing Your Object

Once you have your image, you can go ahead and click Slice in the bottom right of the screen.



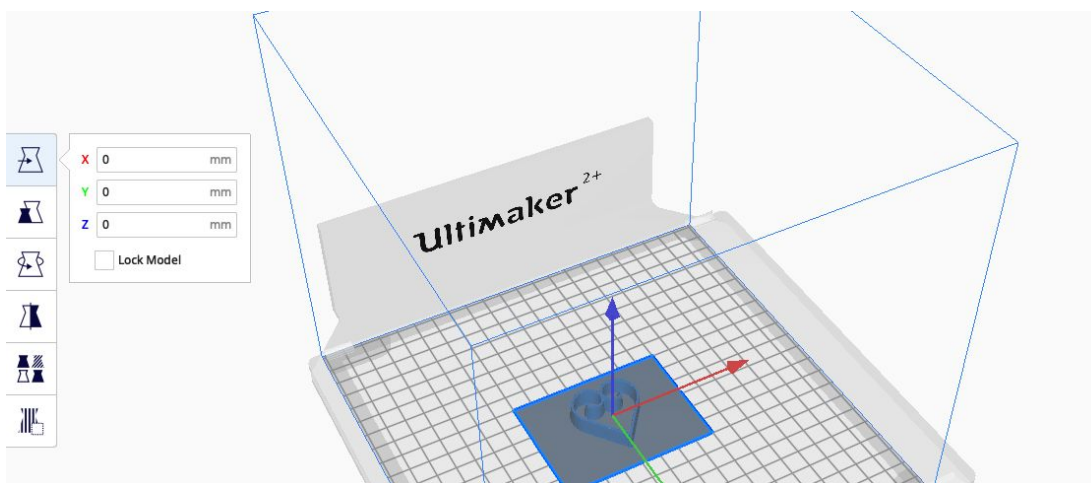
It will prep your current object/s for printing. Once that is finished, you can either save the file to an SD card to print from the printer, or print directly to the printer via USB cable from here:



Things to Know

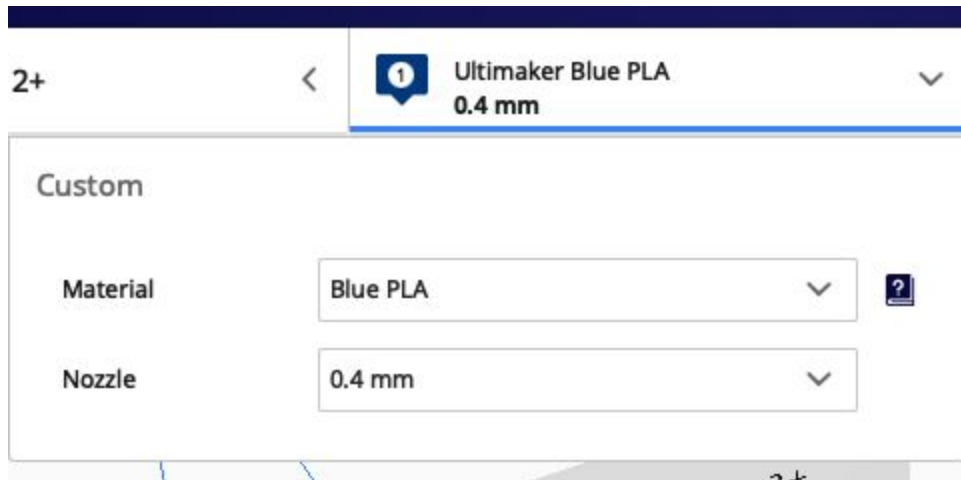
Now that you got the hang of things, here are a few things to know about the Cura software.

First, you can change the size, scale, rotation of your object using the buttons on the left hand side of the screen:

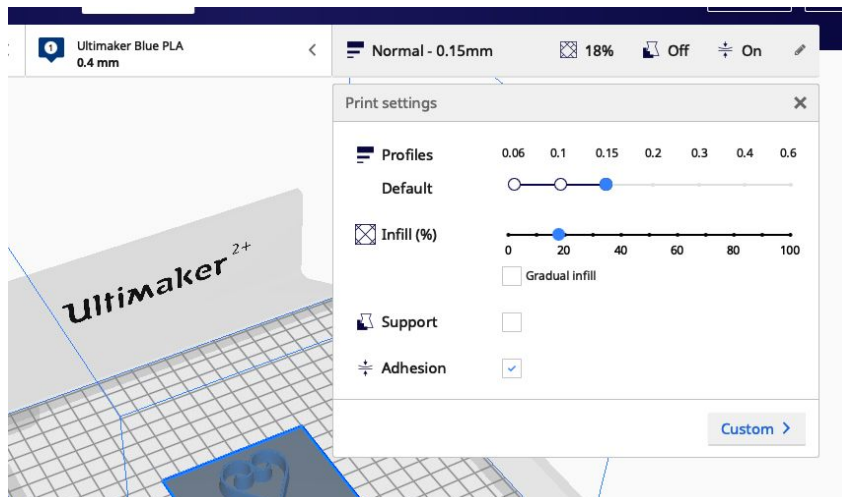


You can also have multiple objects on the same plate. You just need to organize them to fit them all. Right click your object and select “Multiply the selected model...”. Experiment with the different features to better suit the model you are working with.

Second, make sure you have the correct filament type. 9 times out of 10, we will be working with a common filament called PLA. It is a sturdy plastic that comes in a variety of colors. Unless stated otherwise, make sure that your filament is set to PLA. Color shouldn’t matter, just make sure that the type and nozzle match this:



Lastly, you can customize the detail of your object. The thinner the layers, the slower it will go, but the more detailed it will be. The thicker the layers, the faster it will go, but the layers will be more noticeable. For our purposes, having the profile set to normal is just fine.



You can keep the default infill to 20, and you can add support if you plan on printing something massive. Lastly, adhesion generates a structure around the object that you can remove when it is done printing. It just adds extra adhesion to the object to keep it on the plate while printing. You can also use plain old stick glue to also achieve this. It is up to you.

Once again, if you are having issues with using Cura, or transferring your designs from CSDT to the software, please contact Andrew Hunn (ahunn@umich.edu) with your questions.