3D printing workshop 1

By Friend

Workshops

1. Find a model, getting printing profile, slicing, removing item from bed, safety
2. Area explanation, safety, removing support, cleaning bed, changing filament, swapping extruder head, troubleshooting
3. Blender basics, stitching models together

If there’s a word you don’t understand in the slide, let me know and I’ll add it here

- .stl, .obj: common file types for 3D models
- Slicing: turning the model into printing instructions
  - You slice the model into layers of flat planes, stacked on top of each other, hence slicing
- Repository: a type of file organizer (can be online) that helps keep track of which version the files are
- OS: Operating system (ex: Windows, Mac, etc.)
- .gcode: common file type for 3D printing instructions

Find a model

- You'll get to print a small model today (yays!)
- Go to "thingiverse.com"
- Search for something you want
  - Some ideas: pen cap, loaded dice, lowpoly dog, low poly dog, utility knife, cable clip, cable wrapper

Find a model

- I did 3Dbenchy
- If you can’t think of anything, you can use this as well
- Scroll down until you find something you like and click on it

Find a model

- Scroll down and click on “Thing Files”

Find a model

- Scroll through the list and click on the one you actually want
- Make sure it’s either .stl or .obj
  - Those two formats are the easiest for Cura (and other printing software) to read
- Clicking on it will download it

Getting print profile

- Go to “github.com/rprakitpong/HIVE-3Dprinters”
- It’s a repository I use to keep things related to the printer at HIVE
  - There a lot of stuff on there for you to explore after the workshop
- Click on “Taz 6”
  - It’s the name of our printer

Getting print profile

- Click on “Setting” -> “whitePLA_standard.curaprofile”
- Plastic filament varies by type, brand, color, etc. so we develop our own settings for our own plastic
    - This is the setting for our generic PLA filament

Getting print profile

- Click on “Download” to download

Slicer set up

- Go to “lulzbot.com/cura”
  - Or in my case, google “cura lulzbot”
- Cura is one of the free, popular slicers
- Our printer’s company has their own version of Cura that works better with our printer

Slicer set up

- Click on “Download” -> “Cura (the OS you’re using)” -> “+ Download Installer” -> “Cura Lulzbot Edition: (the OS you’re using)”
  - Each click will bring you to a new page (except “+ Download Installer”)
- Save and run the installer

Slicer set up

- This window should pop up since this is the first time you open the software
- Select “Lulzbot TAZ 6”, “Single Extruder”
- Click “Add Printer”

Slicer set up

- This page should pop up
- It’s a blank that will show up every time you open Cura
- It might look a bit different from this since we might be using a different version of Cura

Disable automatic slicing

- Automatic slicing makes Cura slice the model everytime a model changes
  - Even when you make small reposition or rotation
  - Could slow you down significantly with big models/slow computer
- Go to toolbar and click on “Preference” -> “Configure Cura…”

Disable automatic slicing

- A window will pop up
- Untick “Slice automatically”
- Close the pop up window

Loading profile

- On the right sidebar, click on Material's drop down menu

Loading profile

- Change material to “PLA (Village Plastics)”
  - For a reason, we base most of our own settings on this default material

Loading profile

- Click on Profile's drop down menu, then click on "Manage Profiles…"

Loading profile

- This window should pop up
- Click on “Import”
- Find the PLA profile you’ve saved from earlier and select it
- A window should pop up once you’ve imported it successfully
- Click “OK” to close that pop up

Loading profile

- Click on “Activate” to activate the profile you’ve just imported
- Close the pop up after you’ve activated it

Loading model

- Click on the folder icon on the top left corner
- Select the model you've saved

Loading model

- The model should pop up in the middle of the bed
- Right mouse click to rotate view
- Middle mouse click to move view
- You can use the nozzle wiper and the bed calibration button to reference the position of your model

Loading model

- Click on the icons on the left sidebar to manipulate the model
- You'll mostly use the top three icons
  - Move
  - Scale
  - Rotate

If your model isn't flat

- If you're model isn't flat, it might be placed in an orientation that causes it to vibrate more/use more support
  - This happens often with organic shapes like body parts
- Cura has a neat way to rotate it in a way that makes it as flat as possible, so it doesn't vibrate as much/use less plastic for support
- Click on the rotate icon
- I'm using the pelvis model for this example

If your model isn’t flat

- Rotate it manually to the orientation it is approximately the flattest

If your model isn’t flat

- Rotate pop up as a lay flat feature
- Click on its icon to make it automatically lay flat

If your model isn’t flat

- Rotate pop up as a lay flat feature
- Click on its icon to make it automatically lay flat

If your model isn’t flat

- Rotate your view around to visually check that it’s actually flat

Slicing

- On bottom right corner, click on “Prepare”
  - This will start slicing the model
- Once it’s done, you’ll get print time, filament length used, and filament used estimates
- If it’s over ~30g, please find another model
  - Let’s save the plastic
- “Prepare” should be replaced by “Save to File” (or “Save to (SD card directory)” if you have an SD card connected to your computer)
  - Check if it saves as .gcode
- Save it to an SD card at the printer

Removing item from bed

- Normally, you can just tip the print to make it separate from the bed, or just pull it out
- However, some prints have a large surface attached to bed, so it sticks to bed more, and you can’t just pull it out

Removing item from bed

- But if your item has a large surface attached to bed and you can’t just pull it out:
- Knife (blue handle, found on bench) in one hand, glove in another
- Hold the item with the hand that has gloves
- Use knife to go under the print surface where the item attaches to bed
- Either flick it out (cantilever), or slice it out (glide blade along the bed)
- Be careful of damaging the print’s bottom surface when using a knife

Safety

- Since you'll be using a knife to remove stuff from bed, we have to talk about safety
- Key points:
  - If you have something sharp in one hand, put gloves in the other
  - Don't directly touch hot stuff
  - Don't hesitate to call me if there's any issues
    - My number: 778-927-7563

Safety

- If you ever forget, here's where you can find the safety sheets
  - github.com/rprakitpong/HIVE-3Dprinters under "HIVE-3Dprinters" -> "Taz 6" -> "Documentations" -> "Maintenance" -> "Info sheets" -> "Super simplified safety sheet pdf.pdf"
  - Also located above the printer

Starting a print

- Facing the printer on your left side (right side of printer), there is an LCD screen, a power switch, and a scroll knob
- Around the corner, there’s an SD card slot
- Put the SD card in

Image from youtu.be/lojprD2KvnU

Starting a print

- Turn on power switch and the power switch should light up red
- The LCD screen should light up like this

Image from youtu.be/lojprD2KvnU

Starting a print

- Press on the knob once to go to list of actions
- Turn the knob to scroll to “Print from SD”
- Press on the knob to click

Image from youtu.be/lojprD2KvnU

Starting a print

- Turn the knob to scroll to the .gcode you've save to the card
- Press on the knob to select it

Image from youtu.be/3xa5F_WooU4

Print started

- Your print is started!
  - There's a bit of information on the LCD
  - You don't have to worry about these
  - It's quite automatic once we have the right profile for the filament
- Good practice to watch your first layer being printed, for if…
  - Plastic doesn't stick to bed
  - Weird temperature bump (ex: heat bed automatically jump to higher temperature)
  - Plastic bits ripping up stuff that already stuck to bed