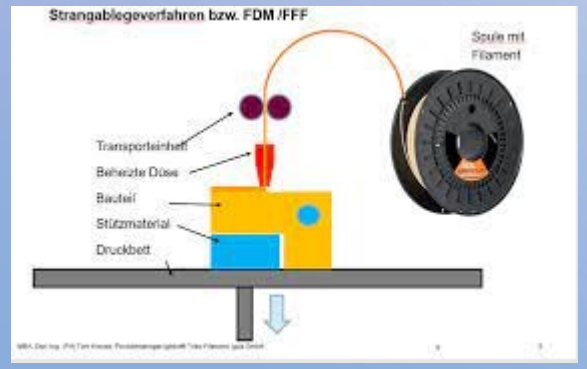
3D PRINTING FOR COSPLAY

DEADLEGATO ANIME DETOUR 2024

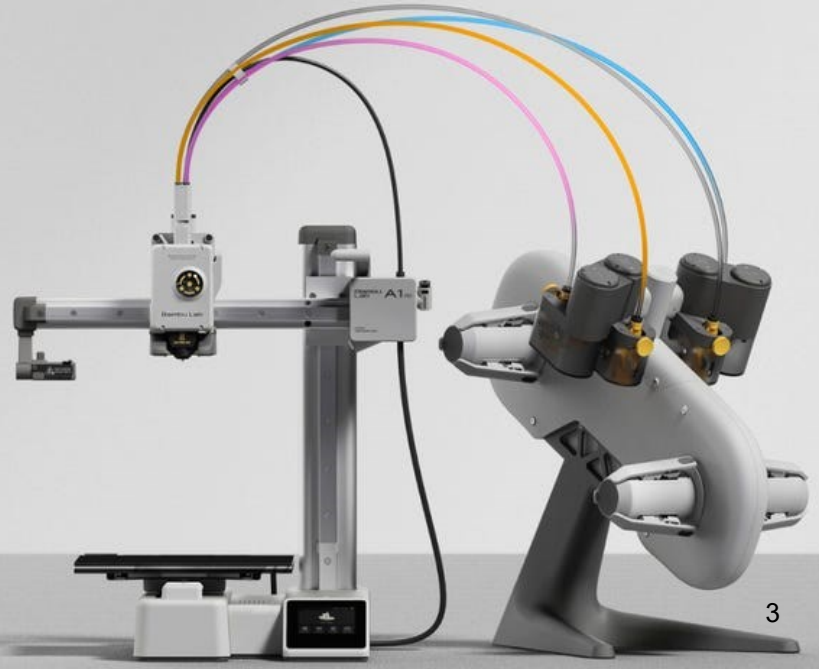
WHAT IS FDM 3D PRINTING?

- Fused deposition modeling (FDM), also known as fused filament fabrication (FFF)
  - What it says, it uses filament to print
  - As opposed to resin printing, which will not be covered in this panel
- Why?
- Because resin 3d printing requires specialized containment and ventilation which I don't have space for



WHAT PRINTER SHOULD I GET?

- That depends on <u>you</u>
- More expensive printers usually require less mechanical knowledge
- Cheaper printers tend to require more mechanical knowledge
  - IE, Bambu printers require very little knowledge to set up but cost more. Creality are cheaper but require a lot of work on your end to get running. I use Bambu and Elegoo myself and can speak to those brands.
- How much space? How big do you want to print?
  - You don’t have to print things in single pieces




6a
7
6
1
8e
1a
8f
8g
8d
3
8a
8b
8c
2a
3a
4
9
5
2

WHAT KINDS OF FILAMENTS ARE OUT THERE?

- PLA is the basic filament. It's largely safe, easy to work with, and cheap.
  - PLA+, PLA Silk, Light Weight PLA, ect ect ect are all variants on PLA
  - There are also reinforced filaments (Carbon fiber, glass fiber)
- And weird filaments like marble or wood
  - The weirder filaments including glow in the dark are very abrasive, so you'll have to switch nozzles more often.
- ABS is stronger but can give off fumes when being printed
- PETG is also stronger and gives better clarity for translucent prints, but is harder to work with
- TPU is flexible
- Keep in mind these are still all thermal filaments, so leaving them in places like your hot car can melt your work. Also, not all printers can print all filaments

HOW DO I PRINT?

- You’re going to have to start with something to print
- Common file formats are STL and OBJ
- Not all 3d files are meant for printing

WHERE CAN I GET PRINT PATTERNS?

HTTPS://CULTS3D.COM

HTTPS://THINGIVERSE.COM

HTTPS://THANGS.COM

HTTPS://SKETCHFAB.COM

HTTPS://PINSHAPE.COM/

HTTP://WWW.3DSHOOK.COM

HTTPS://GRABCAD.COM

HTTPS://WWW.CGTRADER.COM

HTTP://WWW.TURBOSQUID.COM

HTTPS://3DEXPORT.COM/

HTTP://WWW.YEGGI.COM/

HTTPS://WWW.REMIX3D.COM/

HTTPS://FAB365.NET/

WWW.TINKERCAD.COM/THINGS

WWW.CGTRADER.COM

WWW.FORGE.ZHENG3.COM

WWW.STLFINDER.COM

WWW.TRINPY.COM

WWW.DIGIBLE.NET

WWW.SHAPEWAYS.COM

WWW.YOBI3D.COM

WWW.YOUMAGINE.COM

WWW.3DWAREHOUSE.SKETCHUP.COM

WWW.3DCADBROWSER.COM

WWW.123DAPP.COM/GALLERY/CONTENT/ALL

WWW.LIBRE3D.COM

WWW.3DSHOOK.COM

WWW.3DEXPORT.COM/FREE-3D-MODELS

WWW.TF3DM.COM

WWW.TREATSTOCK.COM/3D-PRINTABLE-MODELS

WWW.OPEN3DMODEL.COM

WWW.ARCHIVE3D.NET

WWW.3DCONTENTCENTRAL.COM

WWW.SHAPETIZER.COM

GUMROAD.COM

HTTPS://WWW.STLFINDER.COM/

HTTPS://3D-GALLERY.XYZPRINTING.COM/EN-US/PROMOTION

HTTPS://3DPRINT.NIH.GOV/

HTTPS://3DEXPORT.COM/

HTTPS://REPABLES.COM/

HTTPS://WWW.INSTRUCTABLES.COM/

HTTPS://LIBRE3D.COM/

HTTPS://3DKITBASH.COM/

HTTP://WWW.RINKAK-SERVICES.COM/EN/

HTTPS://LIBRARY.ZORTRAX.COM/

HTTPS://FAB365.NET/

HTTPS://POLAR3D.COM/

HTTPS://FREE3D.COM/

HTTPS://WWW.THREEDING.COM/MOBILE

HTTPS://NASA3D.ARC.NASA.GOV/MODELS

HTTP://ZHENG3.COM/FORGE/INDEX.PHP?ID=-4

HTTPS://WWW.REDPAH.COM/

HTTPS://DIGILAB.DREMEL.COM/RESOURCES/LESSON-PLANS

HTTPS://WWW.3DAGOGO.COM/

HTTPS://ALL3DP.COM/.../FREE-STL-FILES-3D-PRINTER-MODELS.../

HTTPS://WWW.MALIX3DESIGN.COM/?M=1

HTTPS://DTRSTUDIO3D.WIXSITE.COM/WEBSITE

HTTPS://WWW.ZSCULPTORS.COM

COOKIE CASTER - HTTP://WWW.COOKIECASTER.COM/

LITHOPHANE - HTTP://3DP.ROCKS/LITHOPHANE/

INSTRUCTABLES - HTTP://INSTRUCTABLES.COM/

3D WAREHOUSE - HTTPS://3DWAREHOUSE.SKETCHUP.COM/

SMITHSONIAN - HTTPS://3D.SI.EDU/

SHARECG - HTTP://WWW.SHARECG.COM/

ALL3DP - HTTPS://WWW.ALL3DP.COM/

3DEXPORT - HTTPS://DE.3DEXPORT.COM/

3DCONTENTCENTRAL - HTTPS://WWW.3DCONTENTCENTRAL.COM/

3DSHOOK - HTTP://WWW.3DSHOOK.COM/

3DEXPORT - HTTPS://DE.3DEXPORT.COM/

NASA - HTTPS://NASA3D.ARC.NASA.GOV/MODELS/PRINTABLE...

3DCONTENTCENTRAL - HTTPS://WWW.3DCONTENTCENTRAL.COM/

PRINT A BRICK (LEGOS) - HTTPS://PRINTABRICK.ORG

REPABLES - HTTPS://REPABLES.COM/

SKETCHFAB - HTTPS://SKETCHFAB.COM/

TINKERCAD - HTTPS://WWW.TINKERCAD.COM/

EVERMOTION - HTTPS://EVERMOTION.ORG/DOWNLOADS/

BLENDSWAP - HTTPS://WWW.BLENDSWAP.COM/

3DMODELFREE - HTTP://WWW.3DMODELFREE.COM/

YOBI3D - HTTPS://WWW.YOBI3D.COM/

THREEDSCANS - HTTP://THREEDSCANS.COM/

BLANKREPOSITORY - HTTPS://WWW.BLANKREPOSITORY.COM/

3DDIGITALDOUBLES - HTTP://3DDIGITALDOUBLES.COM/

PIXELLABS - HTTPS://WWW.THEPIXELLAB.NET/FREEBIES/

DO3D.COM

3DMAG.ORG

PRINTABLES.COM

MAKERWORLD.COM

PATREON

THANKS TO **D ANTHONY PAUL ON FACEBOOK FOR COMPILING THIS LIST**

MAKE YOUR OWN STL FILES

- 3D scanners
- TinkerCAD
- FreeCAD
- Blender
- Fusion360
- Moar?

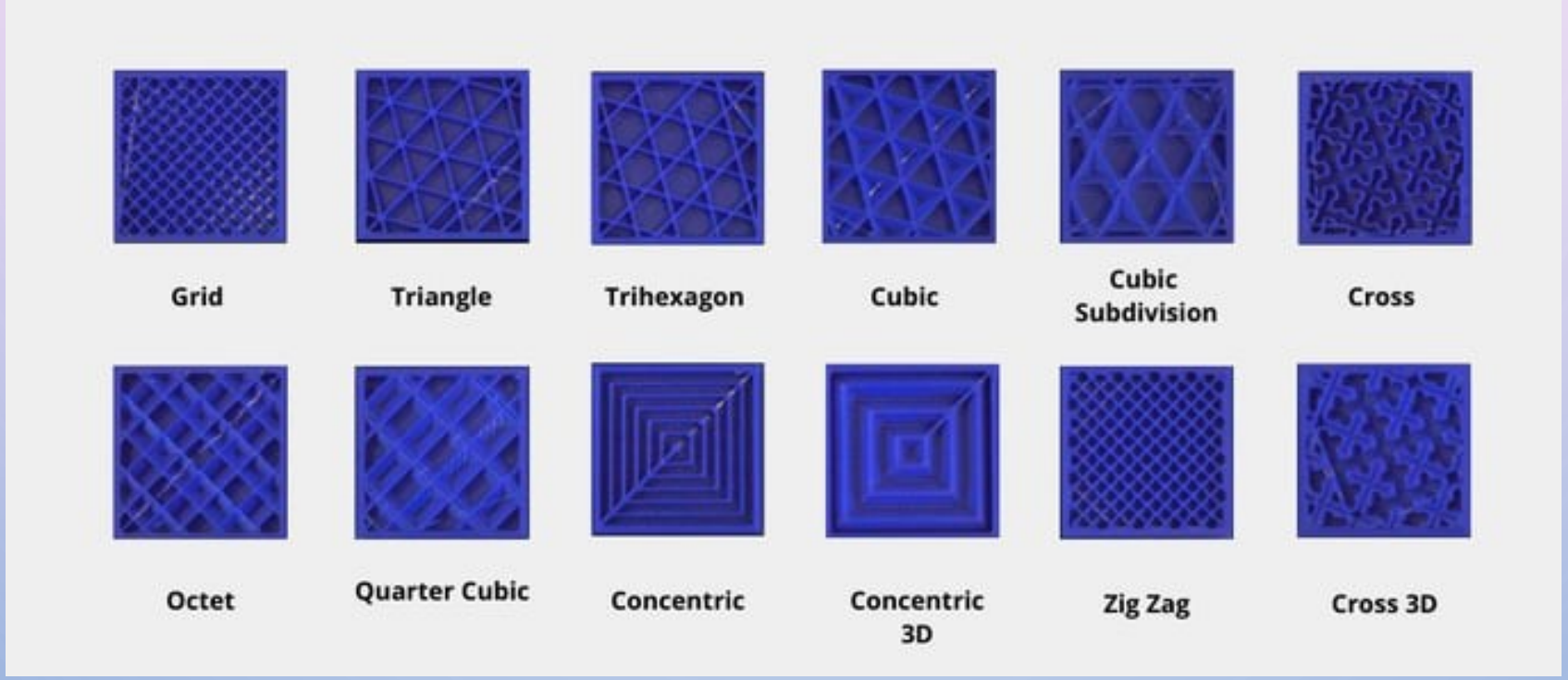
I DOWNLOADED AN STL AND PUT IT IN MY PRINTER BUT IT WON'T PRINT WHY

- You have to slice it first!
- Slicing is dividing the print object into the layers it will be printed in
- You need a slicing program to do this with
- The one you pick will depend on you and your printer
- Cura, OrcaSlicer, Bambu Handy, PrussiaSlicer

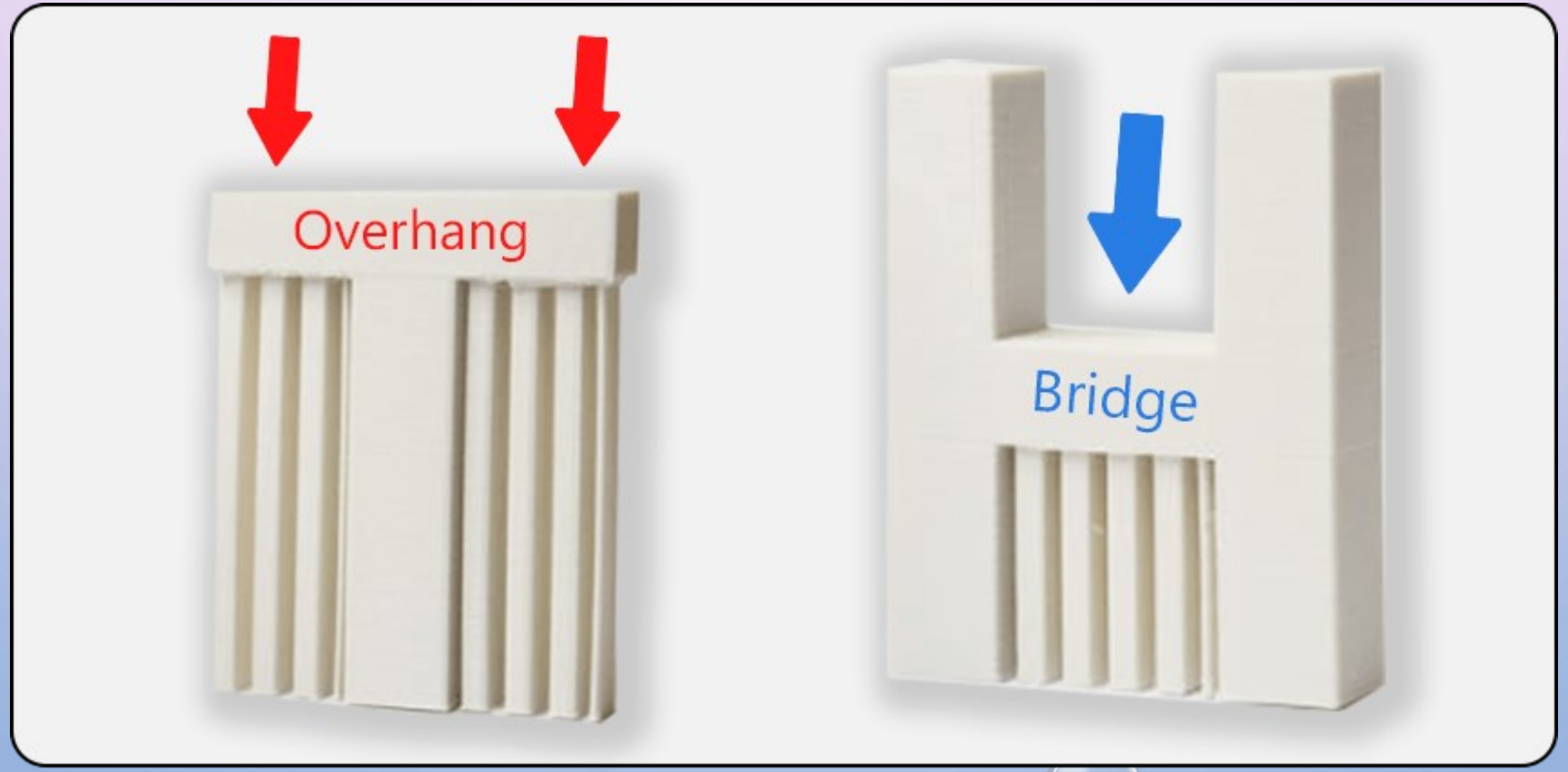
SLICER SETTINGS

- Thickness of the layers (thinner = more detail but more time, may also depend on your nozzle size)
- Walls (outer layers)
- Infill
- Supports
- Bed Adhesion
- Ect Ect

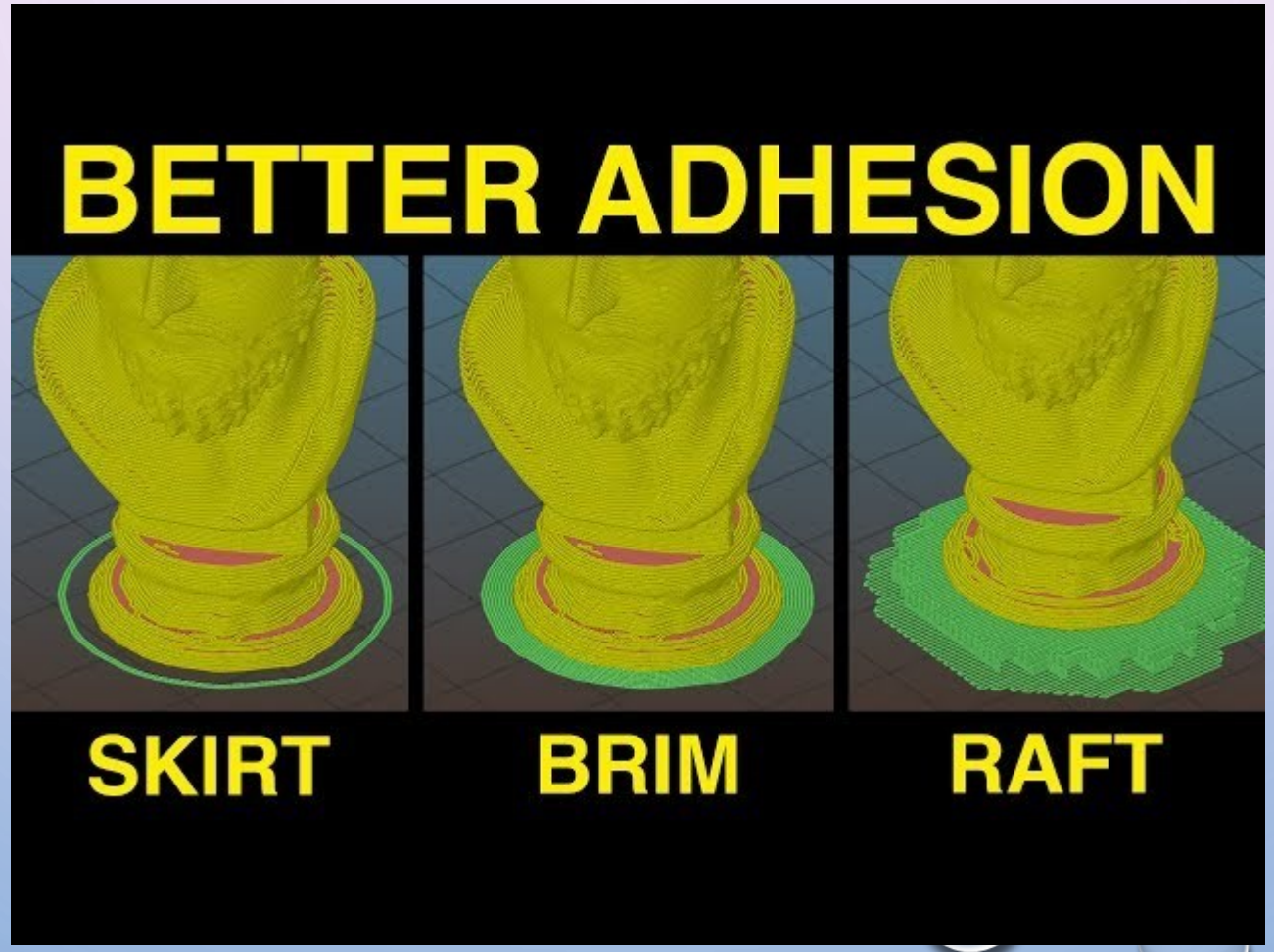
INFILL??


Grid
Triangle
Trihexagon
Cubic
Cubic Subdivision
Cross
Octet
Quarter Cubic
Concentric
Concentric 3D
Zig Zag
Cross 3D

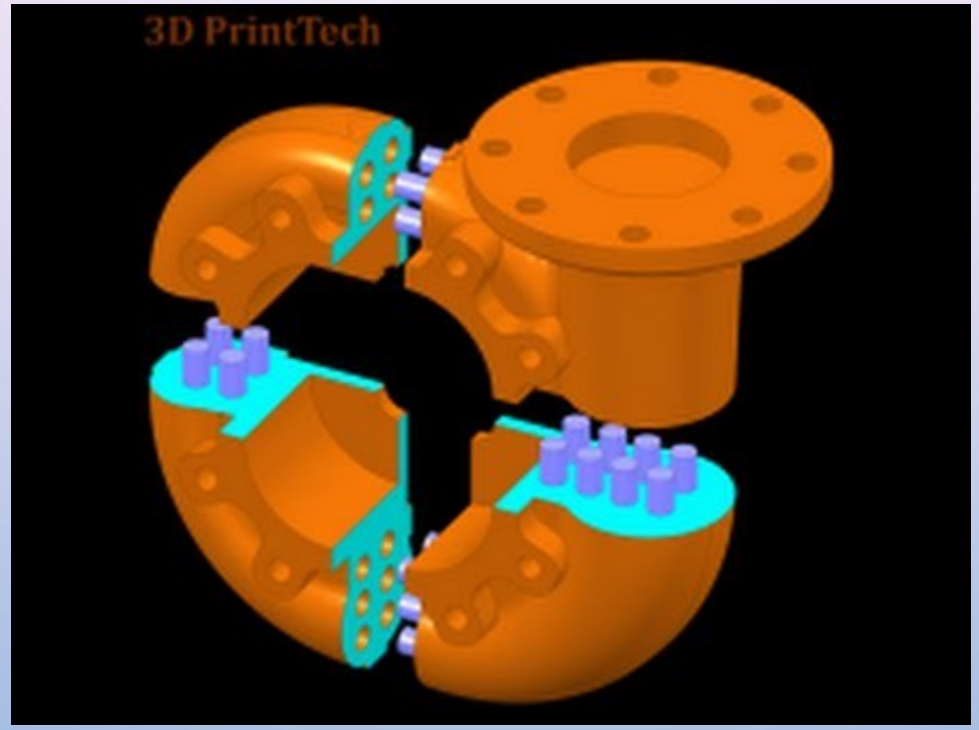
SUPPORTS



BED ADHESION



SPLITTING FILES



GCODE

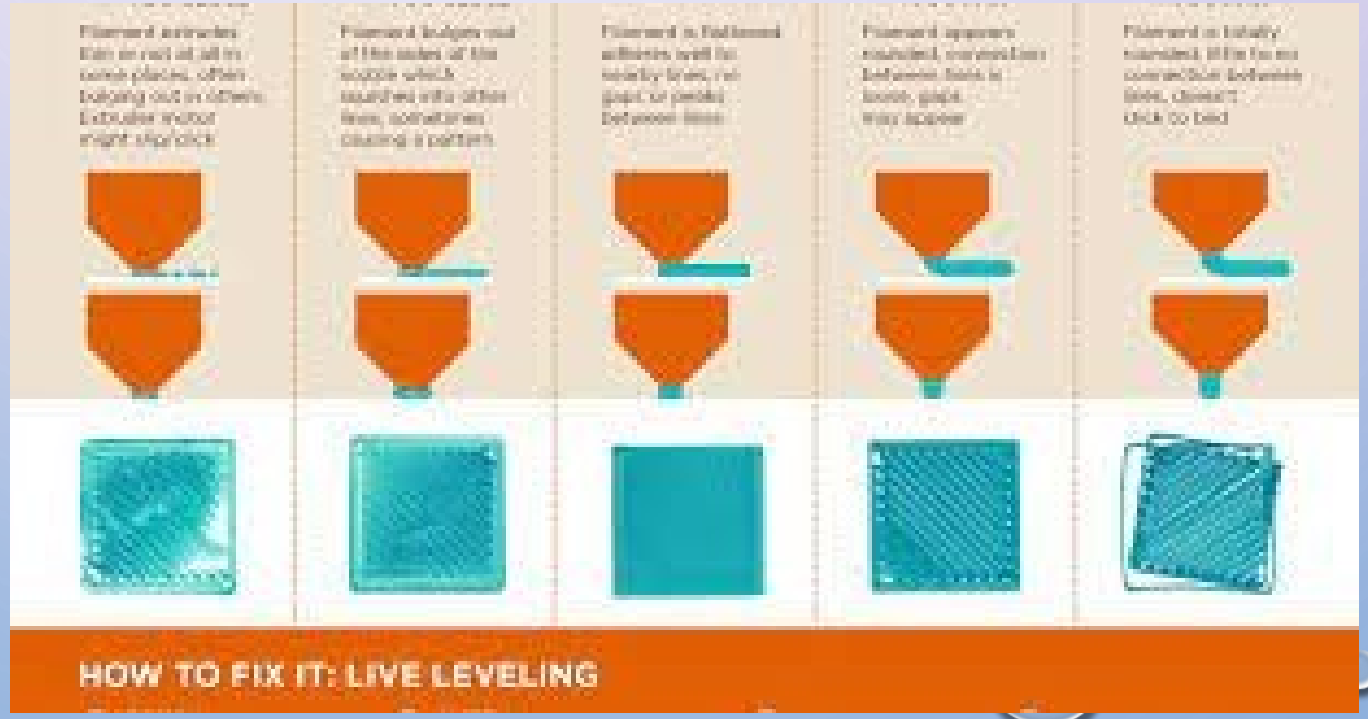
- Gcode is the actual programming instructions given to the printer to tell it how to print
- Gcode is editable if you know what you're doing

G-code Sample

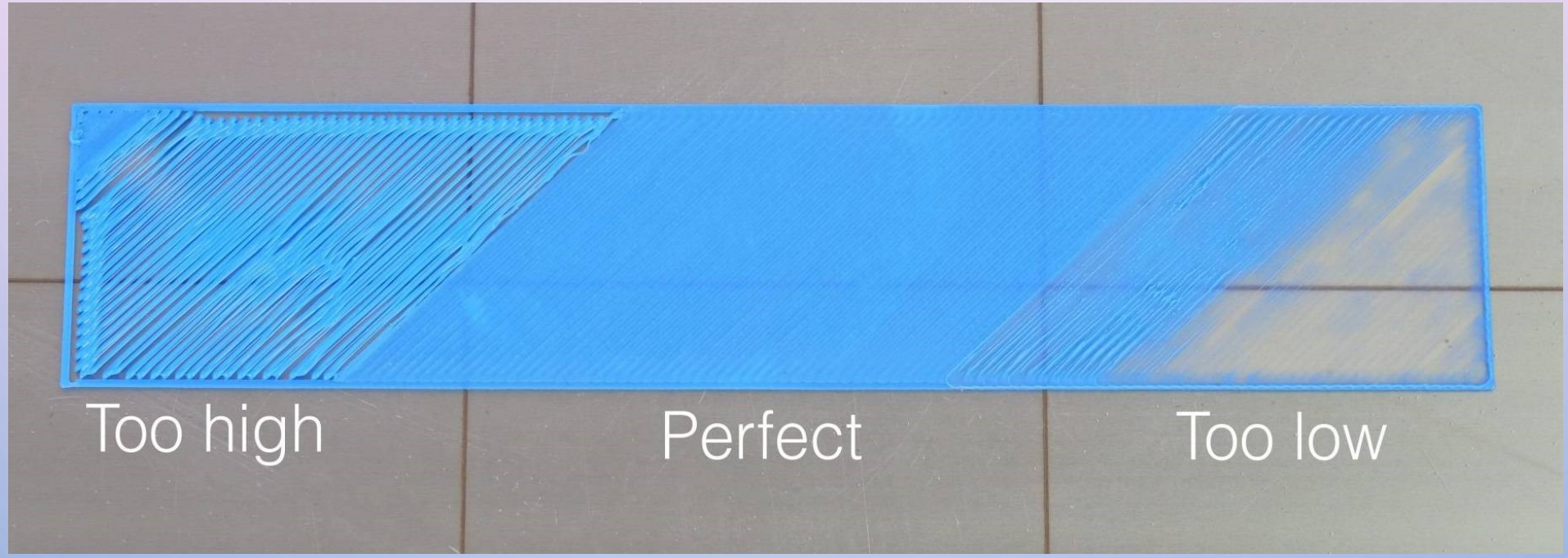
```
M190  S60                ; wait for bed temp
M109  S215               ; wait for extruder temp
G29                      ; mesh bed leveling
G1    X10 Y-3.0 Z0.5 F6000.0
G92   E0.0
G1    X60.0 E9.0 F1000.0       ; intro line
G1    X100.0 E12.5 F1000.0     ; intro line
G92   E0.0
```

BED LEVELLING

- Has nothing to do with levels
- It means adjusting the distance between the nozzle and the bed to be uniform
- Auto levelling options



INITIAL LAYERS



BED LEVELING

BY BILLIE RUBEN

Bed leveling is, quite literally, the foundation of any successful print, and one of the biggest hurdles newbies must overcome in order to avoid the dreaded plastic spaghetti.

But never fear! I've put together this handy guide to help you! ♥

INCORRECT BED LEVELING CAN CAUSE:

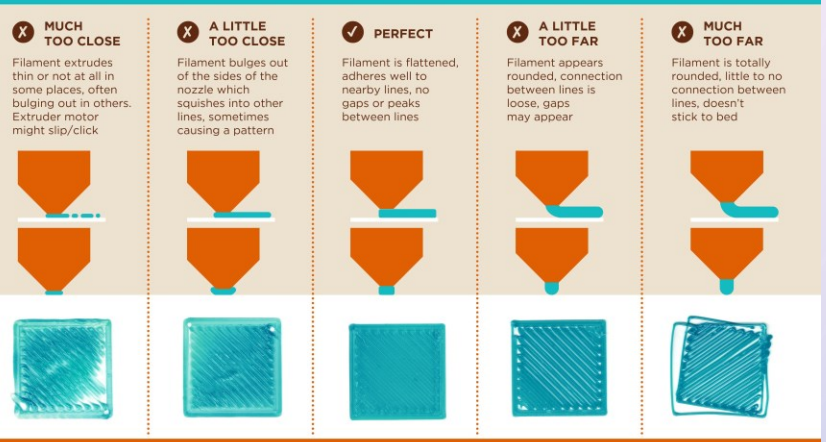
POOR ADHESION
Making first layers hard to lay down

FAILED PRINTS
Resulting in plastic spaghetti

UGLY FIRST LAYERS
That have gaps or weird patterns

WARPING
Ruining the accuracy of your prints

It occurs when the nozzle is not aligned properly to the bed. This is more accurately called 'tramming' (as nothing is being leveled to the ground), but 'leveling' is the common verbiage.
As beds are usually leveled at 3 or 4 points, you may see any combination of the below in your first layer.



HOW TO FIX IT: LIVE LEVELING

1 ROUGH LEVEL, VISUALLY
Move nozzle to lower left corner of bed, adjust leveling knobs until nozzle & bed touch, then turn it back just a bit little until a gap barely appears. Repeat for each knob on your bed

2 SLICE A LEVELING HELPER
In your slicer, resize a rectangular prism so the base is almost as large as your print bed. Give it a nice wide brim, and set the bottom layer pattern to concentric. First layer should look like a square spiral

3 LIVE LEVEL
Print it. As it's laying down the first layer adjust the leveling knobs so that the lines it's extruding look like the perfect example above, then cancel the print

4 MAINTAIN IT
Your bed is now level. To maintain the level, print all future models with a skirt (or brim) and watch it lay the brim down, adjusting leveling as required as it prints the skirt

FURTHER HELP:

If the above instructions aren't working for you, it could be one of these issues;

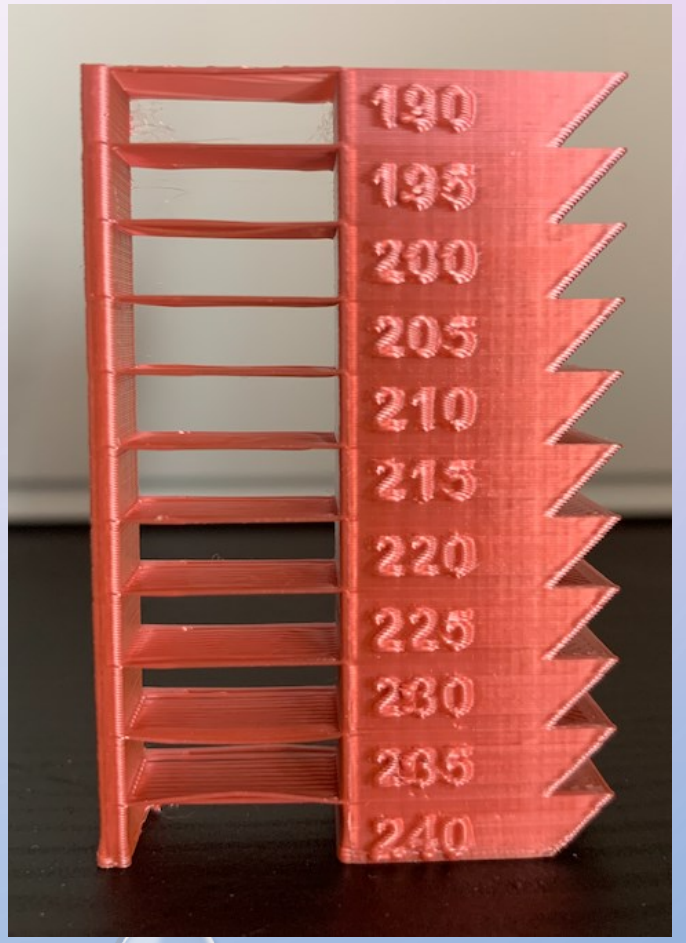
- Your bed surface may need to be cleaned, or you may need to add some glue to the surface (esp. if cold)
- Your temperature may be wrong (bed usually should be around 60°C and nozzle 200 °C for PLA)
- The axis your nozzle travels on may not be level, seek instructions specific to your machine
- If you have leveled the edges but the middle is too high or low, your bed is warped, seek a replacement
- Your z (up/down) axis end stop may be too high or low, try to move it, or print an adapter
- Your speed may be too high. Seek a slicer settings profile from a trusted source (or use the slicer defaults)

To solve these issues you might need some further help from other printer folk.
I help mod the largest 3D printing communities on **Discord (discord.gg/B4tp8MH)** and **reddit (reddit.com/r/3Dprinting).** We'd be happy to help you there!

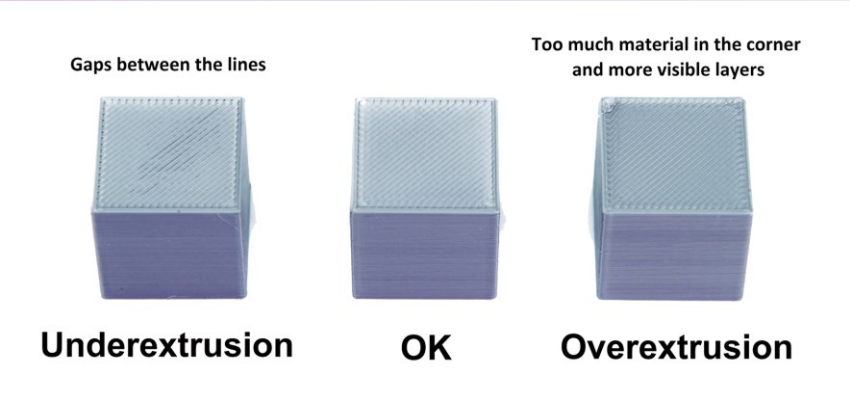
If you'd like more of these guides, I'll be posting them to my Twitter **@BillieRubenMake** (in addition to reddit and Discord). Happy Printing! ♥ **Billie**

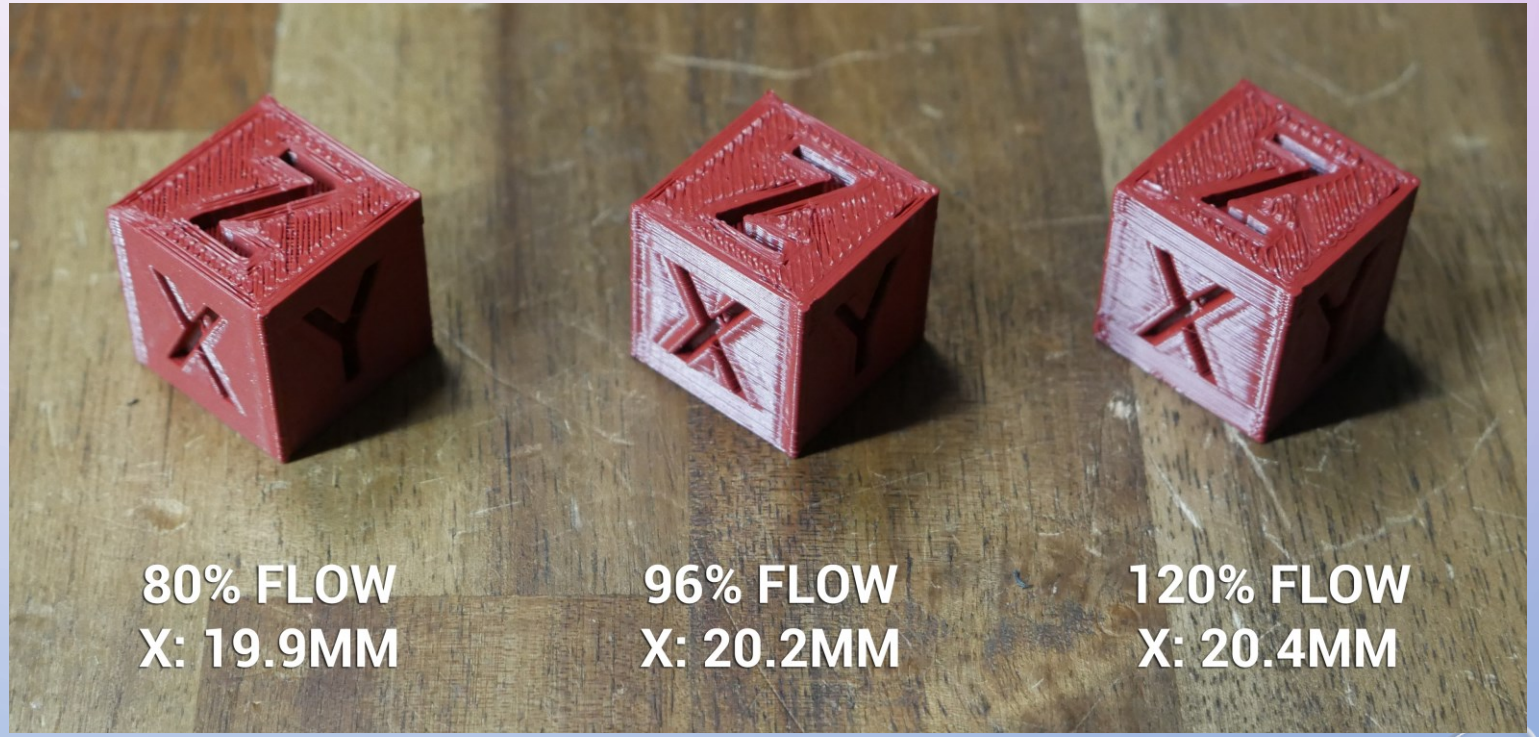
BENCHY

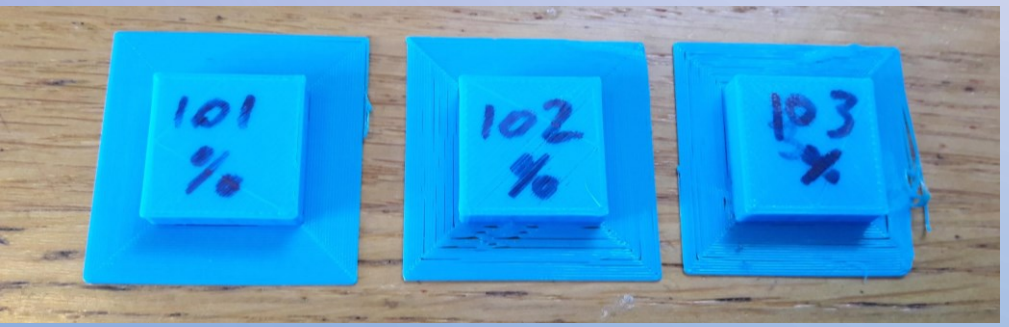
CALIBRATION: TEMPERATURE



CALIBRATION: EXTRUSION

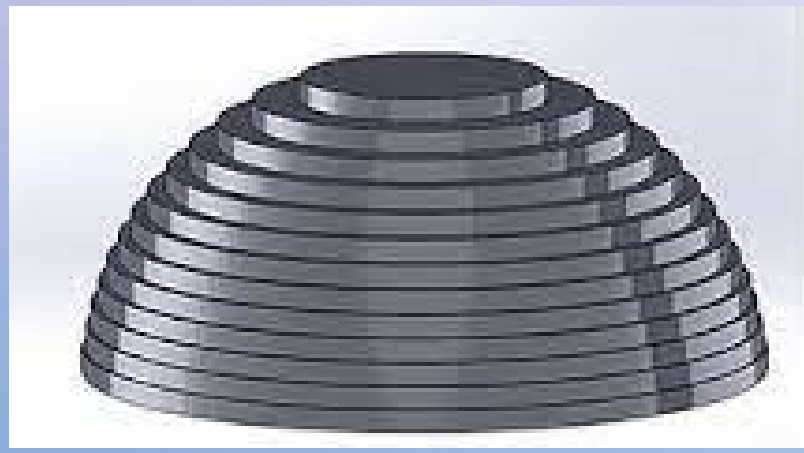






SURFACE FINISHING

- Any FDM printing will have layer lines. If you want a smooth surface, be prepared for lots and lots of sanding!
- You can also get primers that will help reduce lines



AMS (MULTICOLOR PRINTING)

ADHESIVES AND PAINTING

- https://all3dp.com/2/gluing-3d-printed-best-ways-bond-3d-prints/
- https://www.wevolver.com/article/your-guide-to-painting-pla-3d-prints