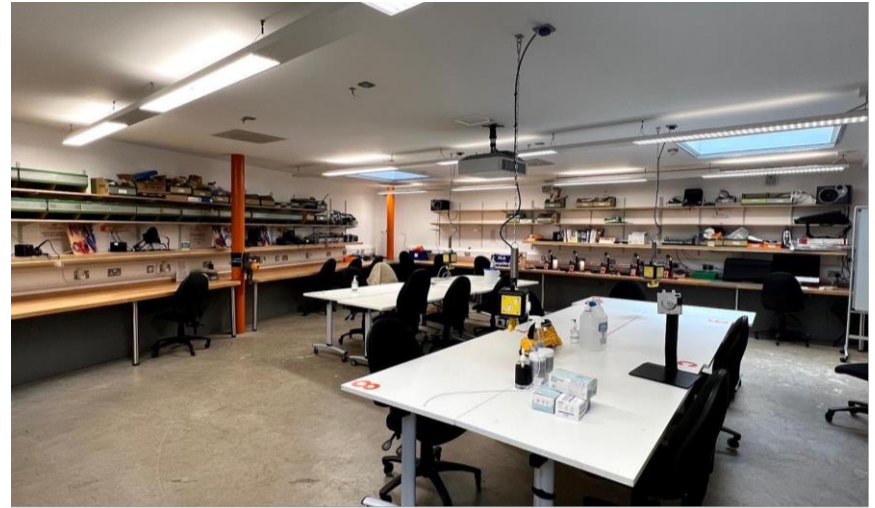


Welcome to HatchLabs!

- facilities.doc.gold.ac.uk/hatchlabs
- Opening times
- CoC + swipe access
- Tech office (HH2 down the road)
 - booking.doc.gold.ac.uk



HatchLabs
Technicians

HatchLabs rules highlights

- NO spray paint
- NO storage of hazardous items!
- Storage policy:
 - storage up to 2 k-bin/boxes



name:
username:
degree:
box: / 2 24-25

3D FDM Printing

These slides are available to download from
our website:

Low Risk Tools > 3D FDM Printing

<https://facilities.doc.gold.ac.uk/hatchlabs/>

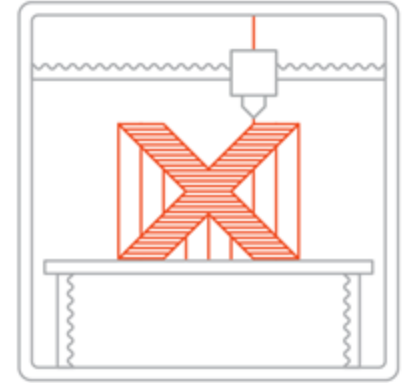
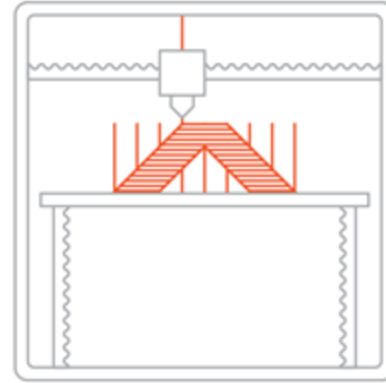


Do you have Prusa Slicer installed?

- www.prusa3d.com
- Click on Software

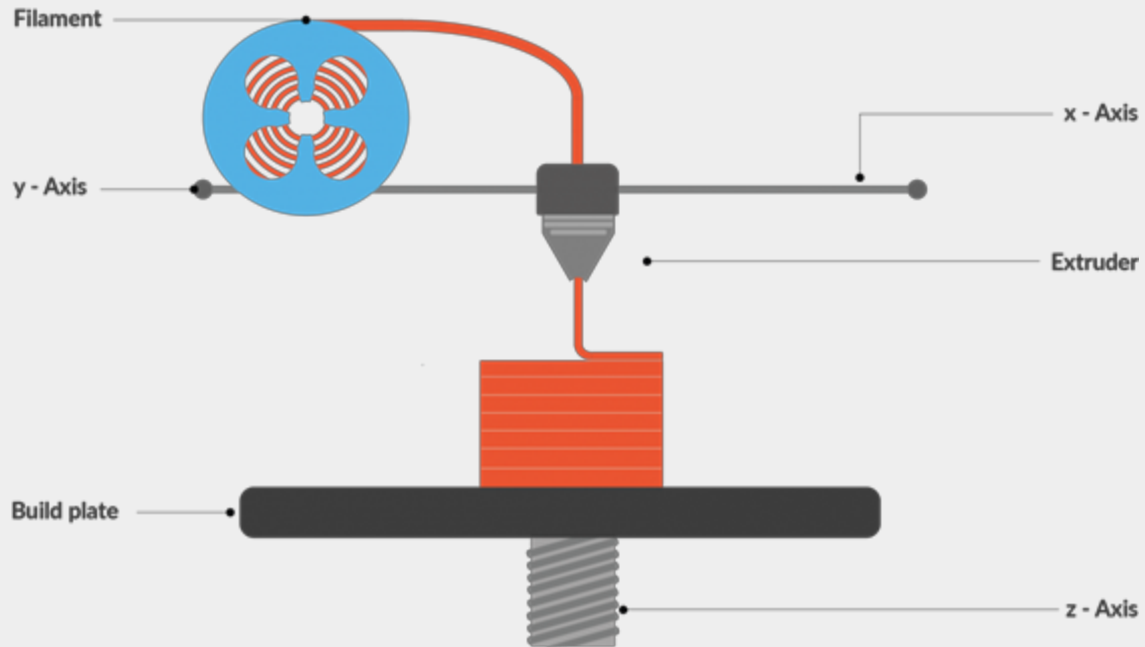
What is it?

- Fused Deposition Modelling (FDM)
- Digital model (.stl, .obj) -> 3D model
- Solid thermoplastic filament (PLA)
- Layers of deposited filament cool to become a 3D model (upcoming slide)





FDM



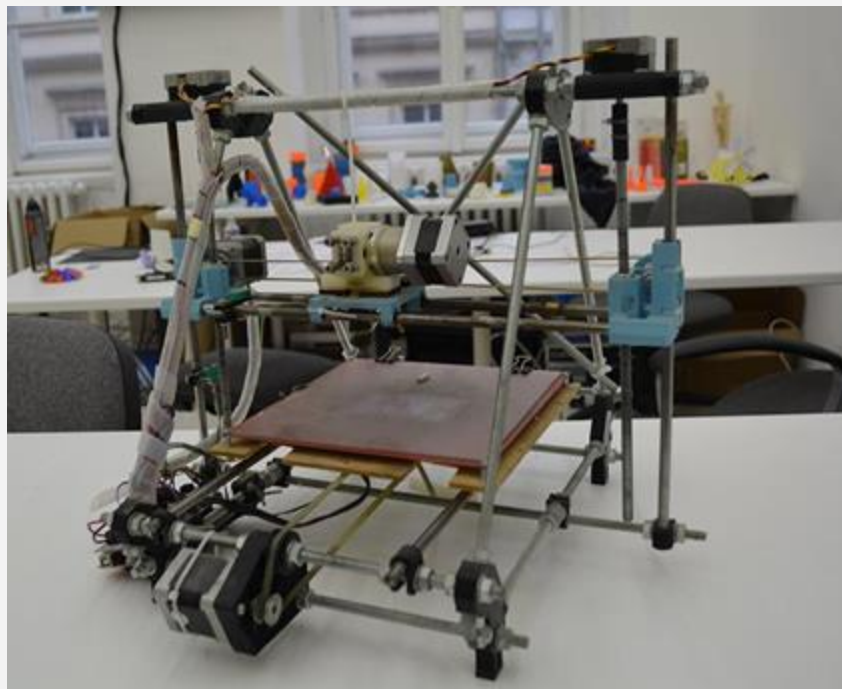
What can you make?



What can you make?



History of Prusa



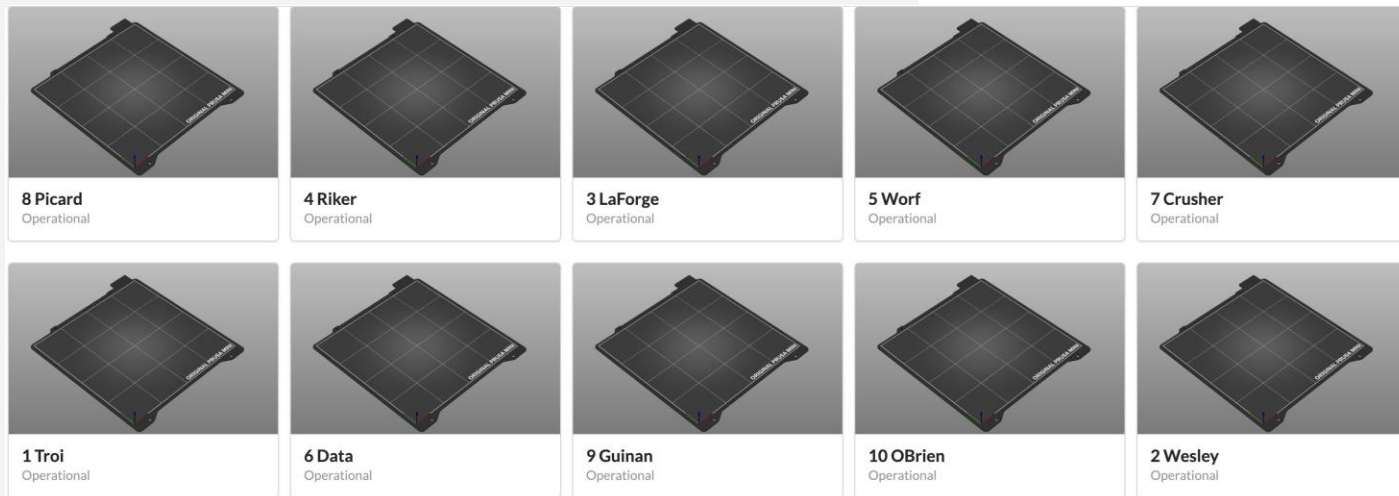
Important rules

- **No maintenance!**
- **Never print without the bed!**
- **No calibration!**
- **No glue/** adhesive on bed
- **Never change the filament**
- **Prints > 5h** must be agreed by HatchLabs staff
 - Speak to us if you'd like to buy/bring your own filament
- Ask HatchLabs staff before using multiple printers at once



Print Management System

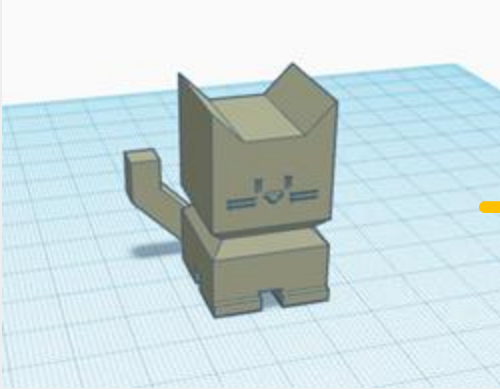
- We keep track of what is printing...
- If you print something and the printer never starts printing, it was probably stopped by one of us because it wasn't suitable and wouldn't print properly, or it was too long



HatchLabs step-by-step

Workflow

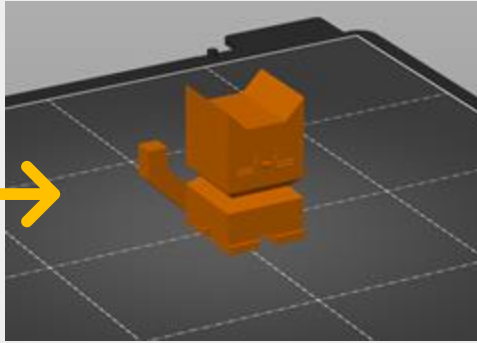
Modelling



Softwares: fusion 360,
tinkercad, onShape

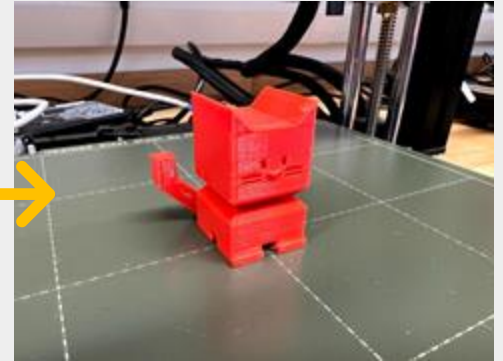
Ready-made models:
thingiverse, prusa prints

Slicing



Softwares: PrusaSlicer

Printing



Hardwares: Prusa Mini+,
Prusa i3MK3S

Printing your own keychain

- <https://printer.tools/qrcode2stl/>
 - Select **Text** (default is QR Code)
 - Dimensions:
 - Width: max 50mm
 - Height: max 20mm
 - Click **Generate 3D model** to see any changes
 - < 10 minutes print time
- **Measuring your prints:** how to use calipers

3D Code Generator

Export QR codes or Spotify codes as STL for 3D printing



QR Code



Spotify Code

A Text

Text

hatchlabs

Change the font for individual lines:

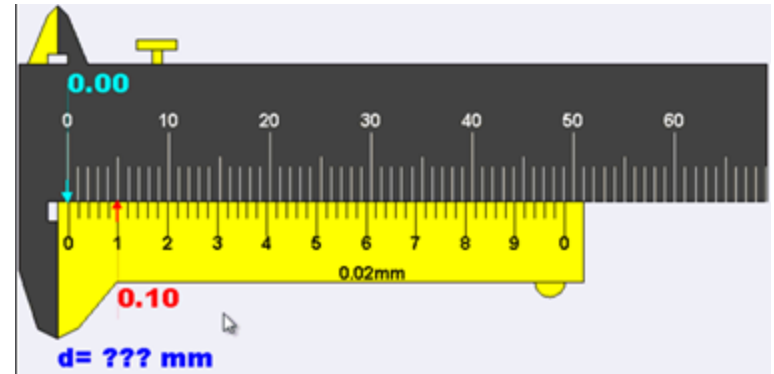
I *italics*

B **bold**

Text Size

6

mm



Glossary

Model: the 3D digital object (.obj, .stl file) we want to turn into a physical object

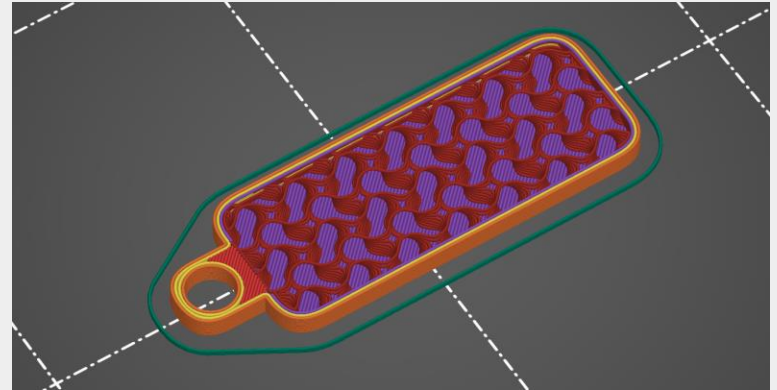
Filament: spools of plastic thread which we will use to print our model

Bed/ build plate/ platform: The surface we print onto

Infill: interior part of 3D printed object that is usually determined by pattern and percentage: 0% (hollow) to 100% (solid)

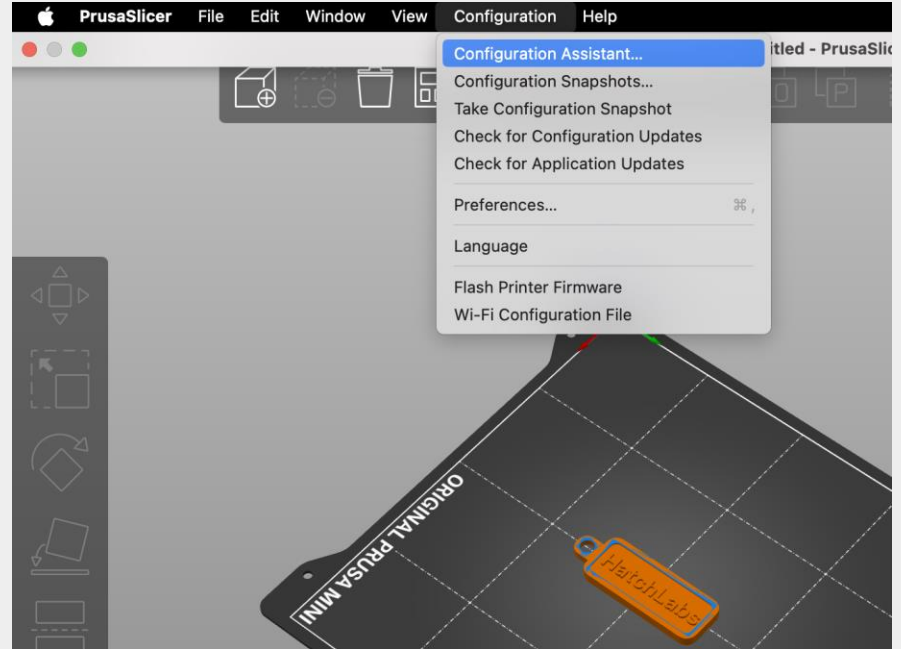
Slicing: process by which the “slicer” software (we use PrusaSlicer) converts our 3D model into “sliced” individual layers of filament, and tool path for the printer to follow (.gcode)

Layer: layers of filament made from concentric walls filled in with an "infill"



Open PrusaSlicer

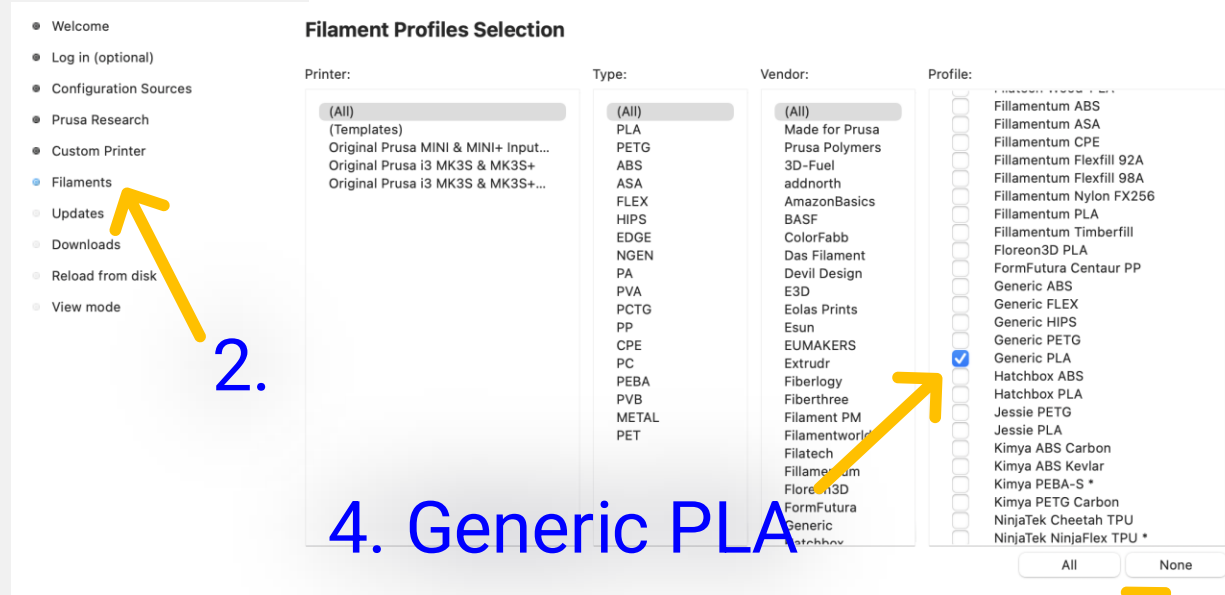
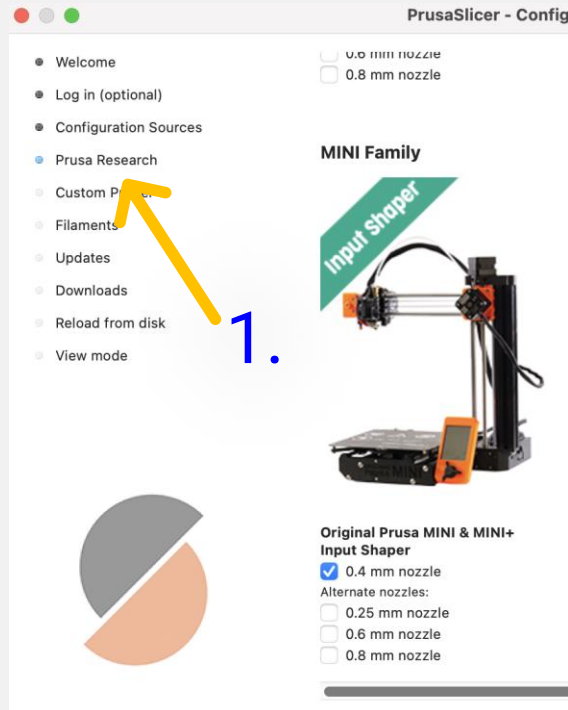
Go to:
Configuration >
Configuration
Assistant'



Prusa Research:

Only select the printer 'Original Prusa MINI & MINI+ Input Shaper'

- 0.4mm nozzle



3. Click 'None'

1. Add/ delete/ arrange/ copy/ paste

2. Interface modes

3. Editing tools

Move

Scale

Rotate

Place on face

Cut

5. layer thickness: 0.20mm

6. material: PLA

7. printer: MINI

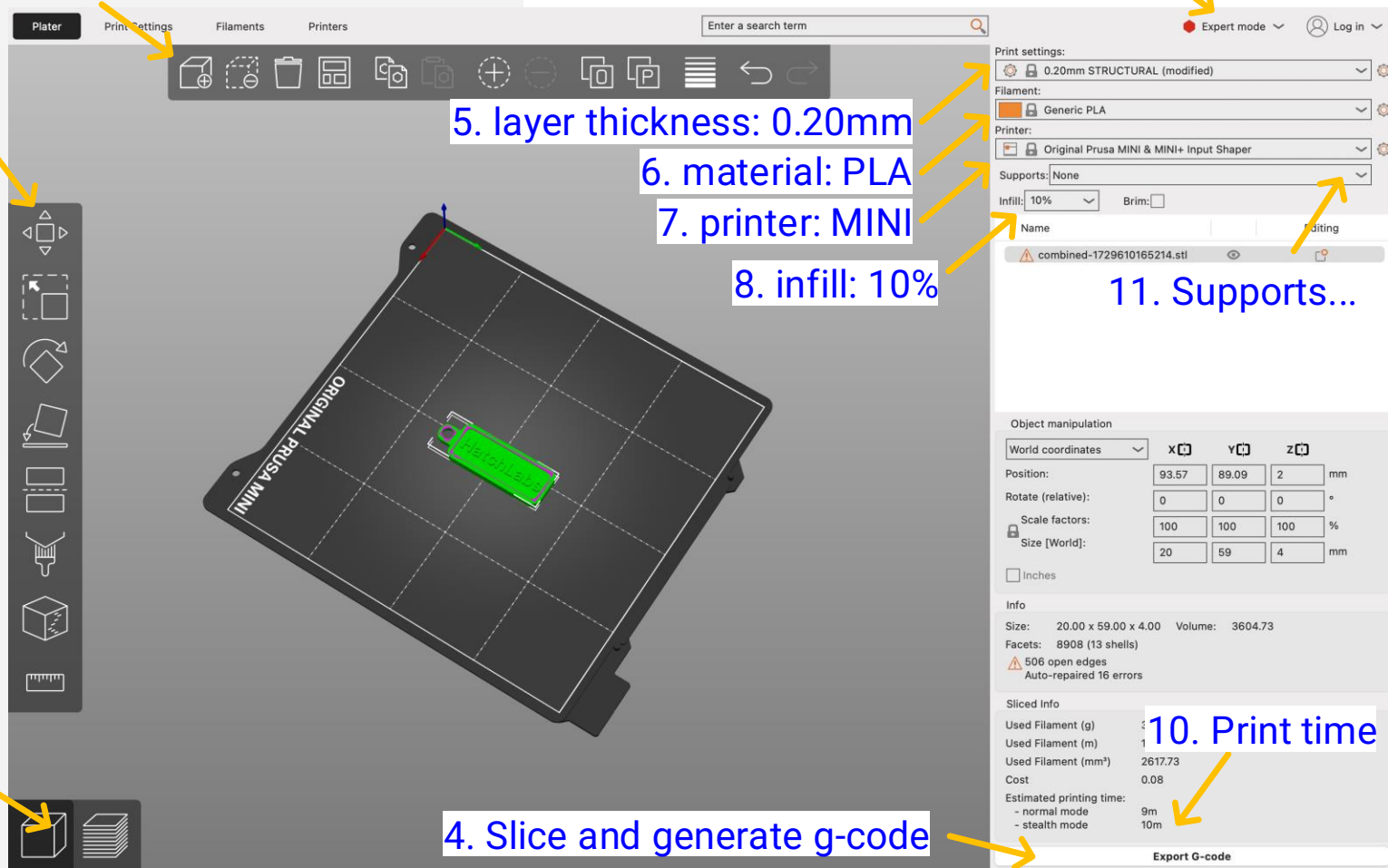
8. infill: 10%

11. Supports...

9. 3D editor view/
layers preview

4. Slice and generate g-code

10. Print time

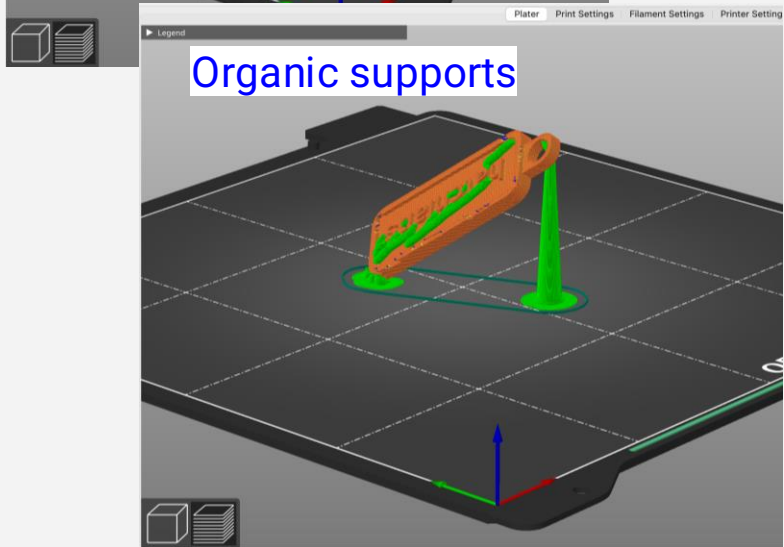
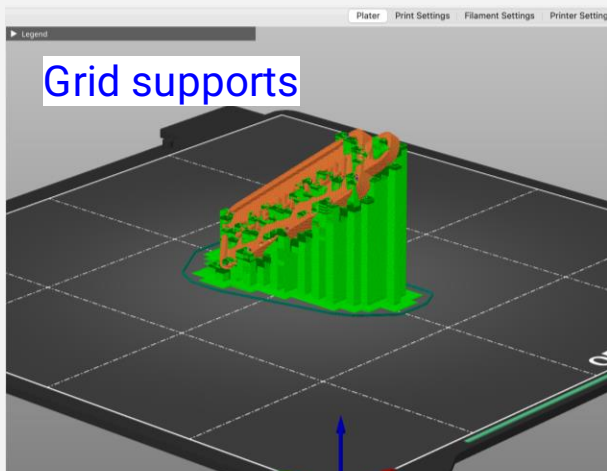


When will you need supports?



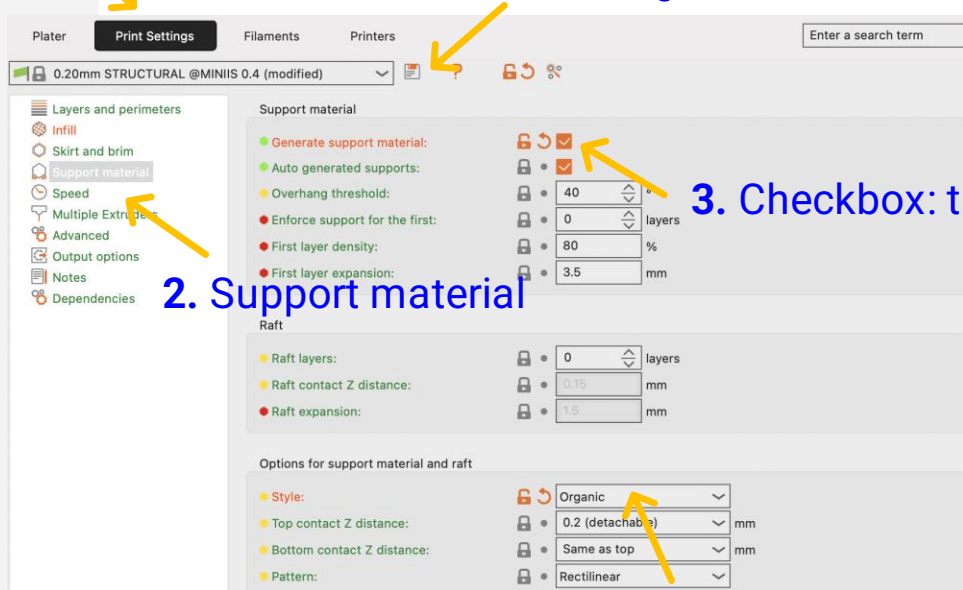
- **Y:** < 45 degrees
- **H:** bridge $> 5\text{mm}$
- **T:** > 45 degrees
 - **Q:** What is the best way to print these letters?





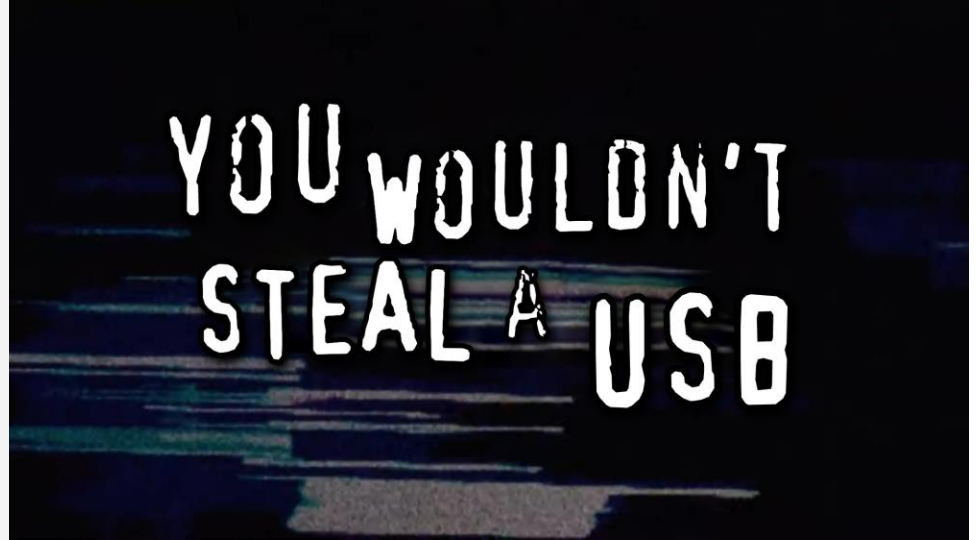
1. Print Settings

5. Save preset – include 'organic' in name



Printing your print

1. We have USBs available to use
 - Please don't remove them from the lab!
2. **Never remove a USB from a printer that is currently printing**
3. Always check the build plate is installed correctly and completely cooled!
4. Remove any test lines!



Removing your print

1. Only touch the side of the build plate
2. How to use the flex build plate
3. **Remove the test line!**
4. Re-install build plate in the correct position



Post processing

Measuring

Filing

Deburring

Sanding

Painting

Gluing

