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Intro to 3D Printing & CAD

Technical Workshop #1!

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01

3D Printers

Where to start: Types of printers, filament? etc.



Types of 3D printing

Common Printers:



FDM

Fused Deposition
Model



SLA

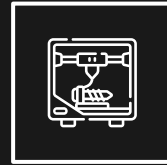
Stereolithography

Industrial Printers:



SLS

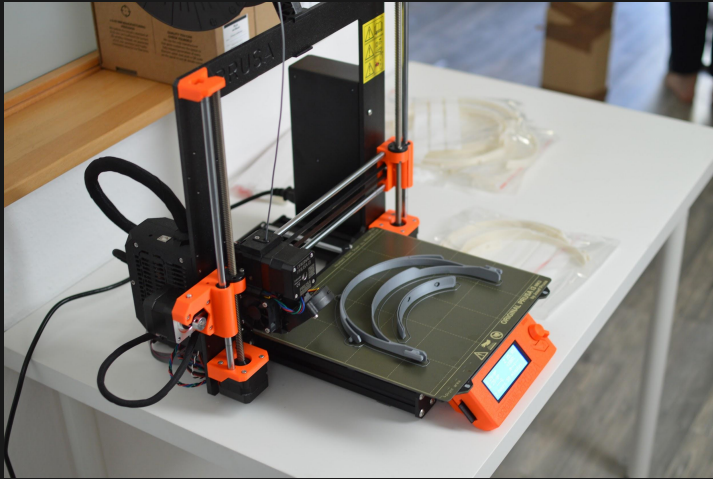
Selective Laser
Sintering



PBF

Powder Bed Fusion

Fused Deposition Modeling



These are the printers you see in Marston!

Functions by extruding material through a nozzle to print.

Requires polymer based filament since it heats up the material in order to extrude it.

Most popular form of 3D printing! Easy to set up and use

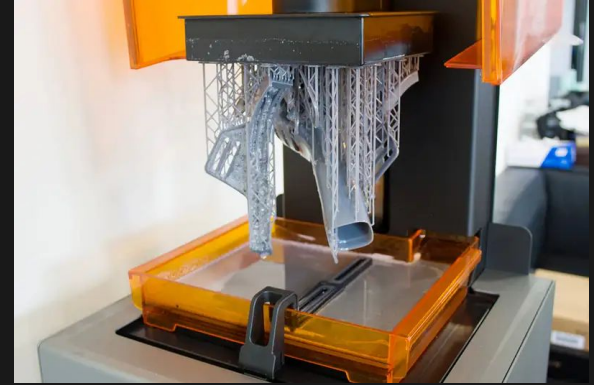
Material: PLA, ABS, Nylon, PET, TPU, PC

Stereolithography (SLA)

Uses ultraviolet light to harden a photosensitive resin as it rises.

Unlike FDM, SLA requires a liquid base, so the capabilities of the printer is reliant on the basin it has.

The benefits of using SLA is that it is the most precise, and it makes the most smooth prints.



Video:

<https://www.youtube.com/watch?v=8a2xNaAkvLo>

Material: Resin

Recommended Printer



Creality Ender 3 3d Printer

\$189 on Amazon

FDM Printer

Resume print functionality

Great open source community

Uses PLA



02

Onshape + Demo

3D modeling explanation and live demo



Onshape

Type of 3D modeling software similar to SOLIDWORKS, CREO, Autodesk, Fusion 360, etc. Web based instead of application based, for easy access and collaboration through the cloud.

Onshape - Basic Tools



Sketch

Make 2D sketches on a plane, with dimensions and constraints.



Extrude

Add depth to a 2D sketch. Can modify existing 3D parts by adding/removing material



Revolve

Uses a shape or profile as a base and revolves it around an axis.



Mirror

Duplicates/mirrors a part or surfaces across an axis/plane



Live
Demo!

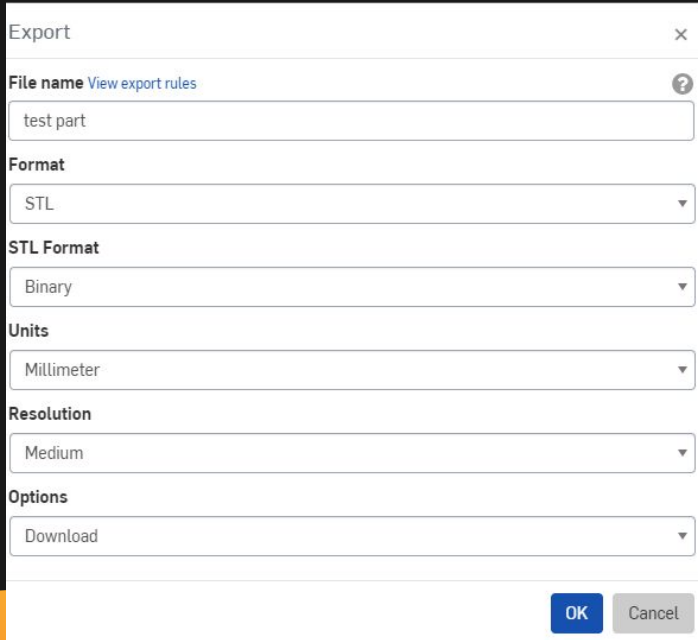


03

How to Print

Computer to printer & places to print on-campus

Printing your files



Export

File name [View export rules](#) ?

test part

Format

STL

STL Format

Binary

Units

Millimeter

Resolution

Medium

Options

Download

OK Cancel

- 1) Export the part to an STL file
- 2) Configure part on the 3D printer software
 - a) Cura, Simplify3D, etc. (depends on printer)
- 3) Transfer to SD card / connect to printer
- 4) Happy printing!

Or... submit STL file to an on-campus printing location :)

On-campus printing locations

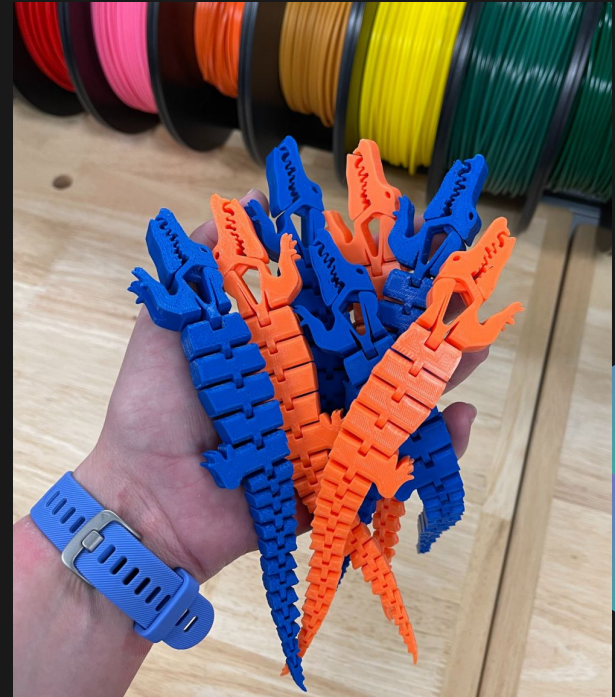
Libraries have 3D printing, costs \$.15/gram

- Marston Science Library
- Education Library
- Health Science Center Library

EGN2020C Lab in the WERT (for current students)

DCP Fab Lab: printing in metal, resin, etc.

MAE Rapid Prototyping Facility





Thanks!

For any questions or follow-up, please
contact Sharika or Tam through the
SASE Discord!

