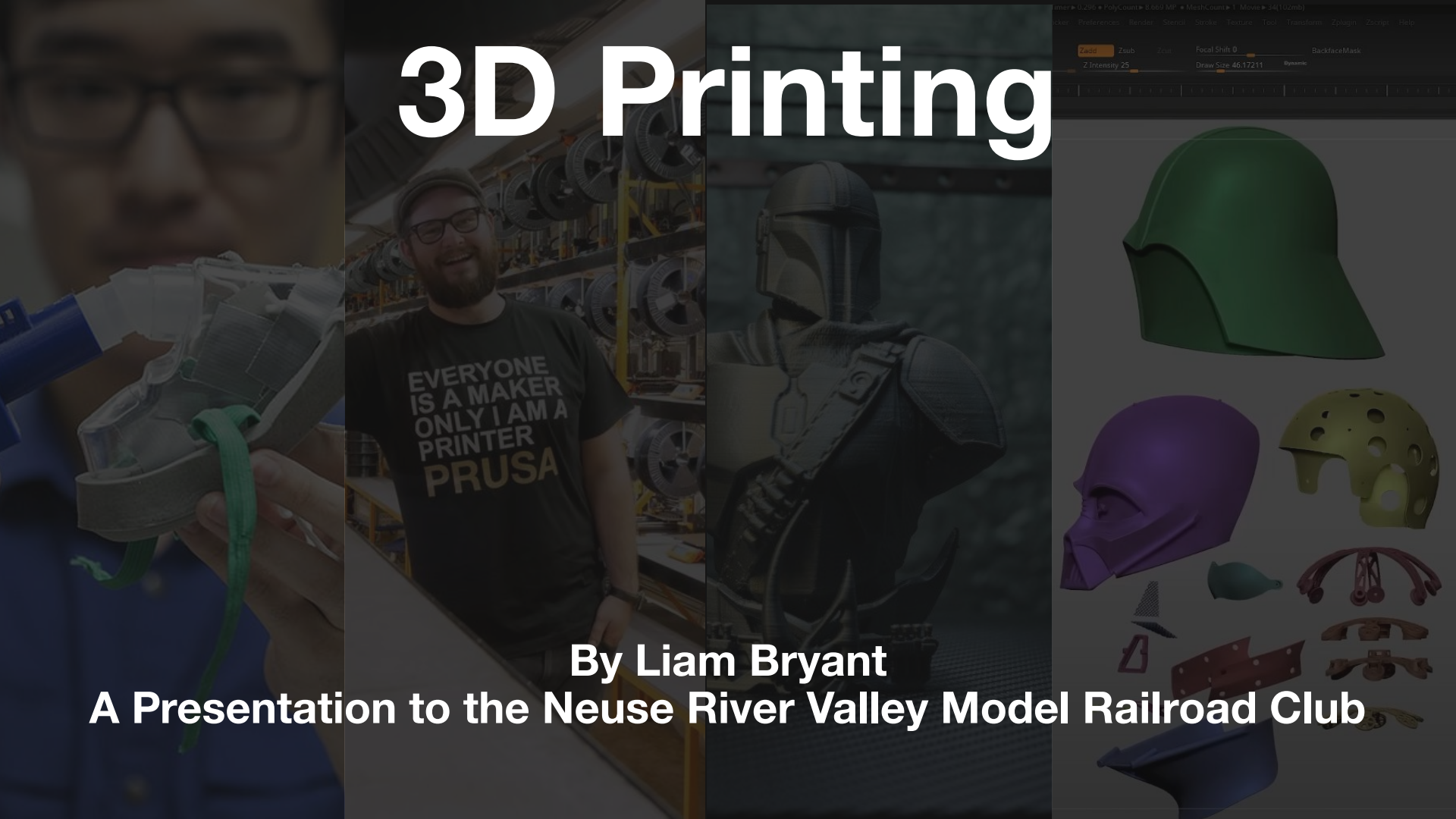
3D Printing



By Liam Bryant

A Presentation to the Neuse River Valley Model Railroad Club

What is 3D Printing?

3D printing is a technology which uses commonly available plastics such as PLA, TPU, and ABS / ABA and more to produce an object using additive manufacturing.

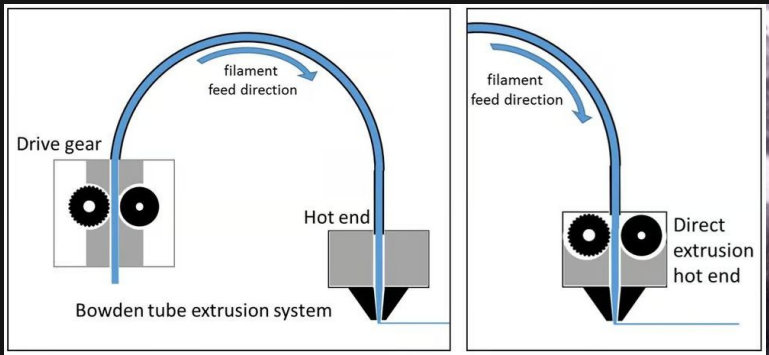
Thermoplastic polyurethane Acrylonitrile Butadiene Styrene / Acrylate

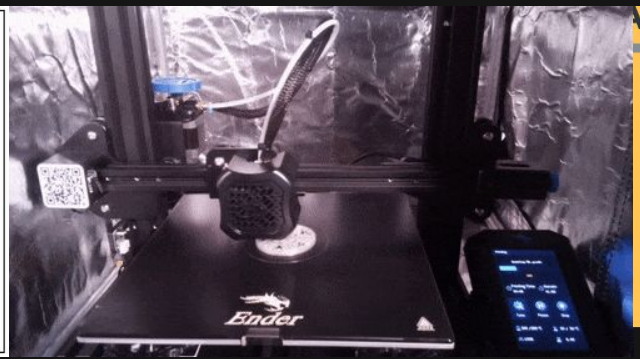
The plastic is wound into common 1 KG (Pounds not used in 3D printing!) Spools.

From here, the plastic is pulled by a stepper motor through an extruder to the ‘Hot End’

The Hot End is the business end. The plastic filament is heated until it is molten and

is now pushed on the bed on the printer, and rapidly cools to a desired shape.





Resin Printing

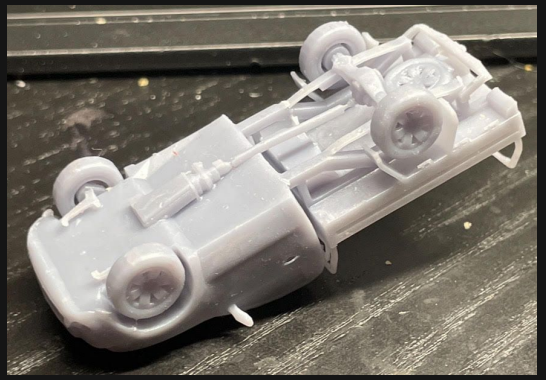
Resin printing is a similar technology to traditional FDM 3D Printing, and instead uses UV curing resin with a vat and UV screen to selectively expose the resin in the vat to the light, thereby curing it into shape.

From here, resin prints need to be washed in a bath of IPA.

After this, resin prints are finally cured to a state where they are safe to touch.

Resin printing is DANGEROUS. All hands are on deck in terms of safety.

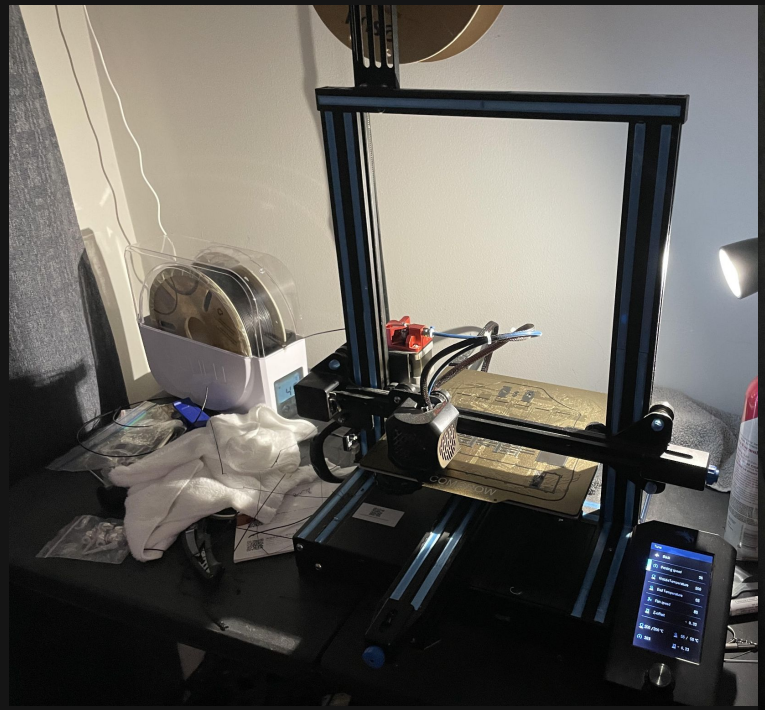
Respirator, gloves, eyeglasses, the works.

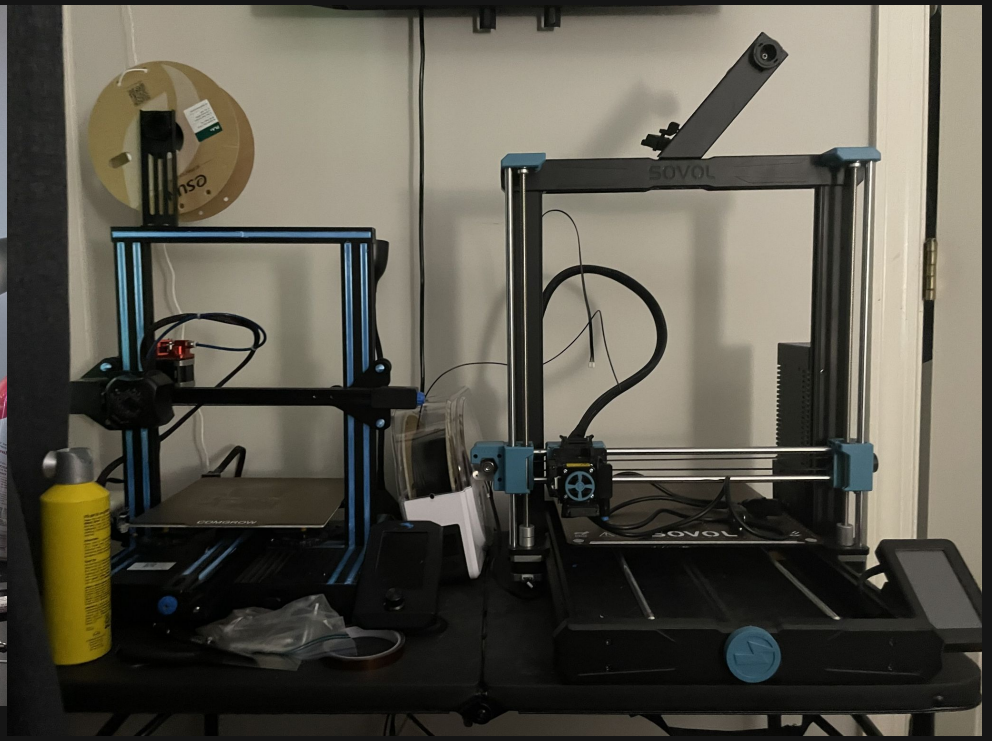


96.2% 3D PRINTED

My Printer

3D Printing is getting cheap. 3 years ago my printer cost nearly 300$. Now the same printer costs $99 with much more advanced printers being a fraction of the cost that I spent just those 3 years ago.





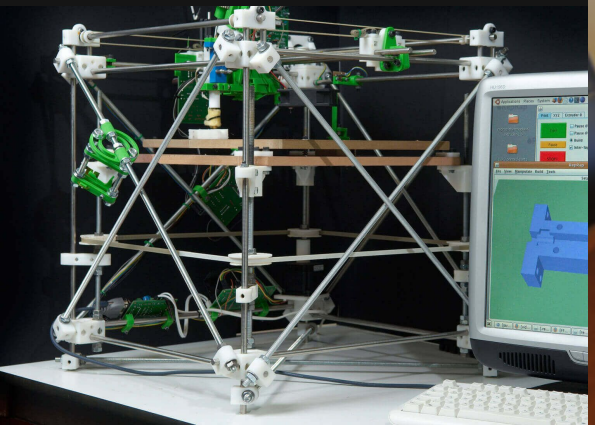
What is 3D Printing *good for*?

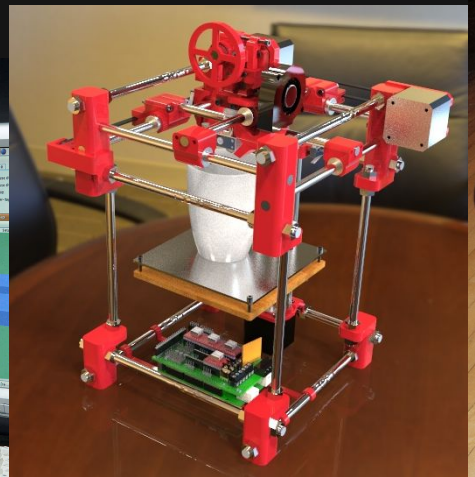
3D Printing has a wide community of tinkerers, creators, and makers who openly release files for people to use under any amount of licenses, as well as subscription style services which provide printable models or services.

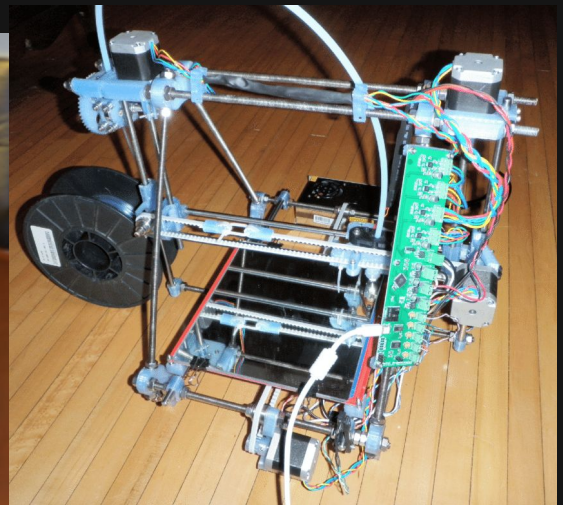
Reprap

3D Printing as we know it today is the success of a public open source project called Rep-Rap. 3D printing has been around since the 1980s but was locked away by corporate lock and key out of the public eye.

Due to the valiant efforts of these men and women they created the modern tools you see today.

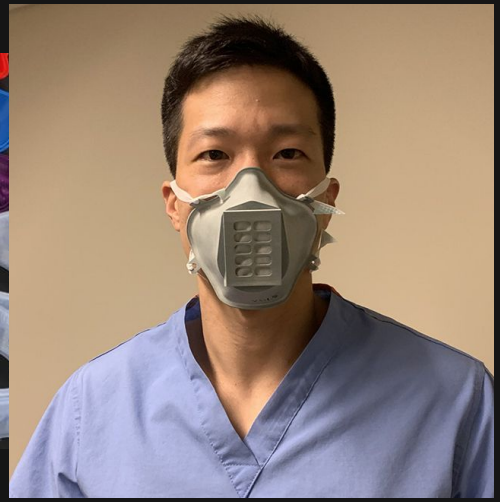






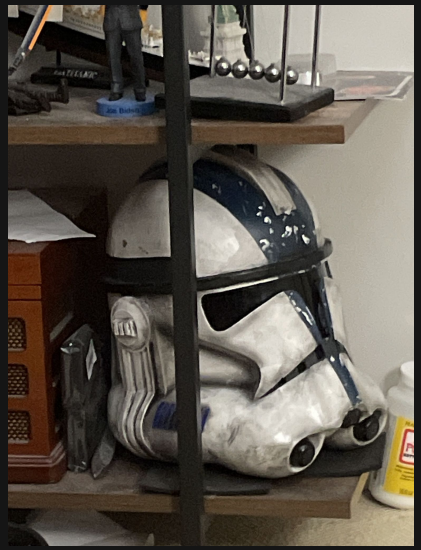
What is 3D Printing *good for*?

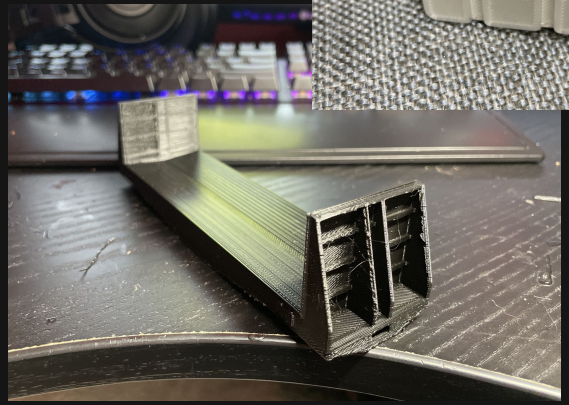
During the pandemic, tinkerers stepped up to provide hospital staff and essential workers with 3D printed masks, visors, and other essential items in the wake of a global supply chain crisis.

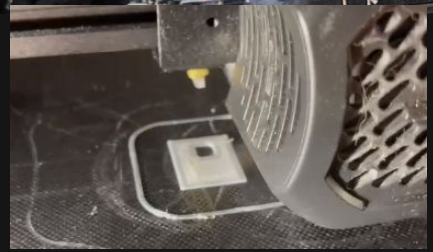


What is 3D Printing *good for*?

On the other side of the community, people, such as me, use 3D Printing for cosmetic props such as the Star Wars helmets and models in front of you, as well as practical print such as the 3D printed throttle holders littered around our very clubhouse.







3D Printed Trains

Perhaps the most interesting and on-topic thing I have done to date is

3D Printed models. At first, I had experimented with FDM printed (plastic) hopper cars, but when I came upon NCDOT passenger cars, it was clear that Resin Printing was necessary to achieve the detail I so craved.

Print to Finished Model / Prop

So I now have a model in my hands. How do I turn it into a model?

- **Smoothing using Bondo / Gap Filling**
- **Priming with Model Primer**
- **Painting**
- **Installation of windows, wheels, bogies, lights, couplers, brass details**

FINAL ASSEMBLY

Thanks for listening!

Contact me at liambryant2007@gmail.com for inquiries into 3D Printed models.