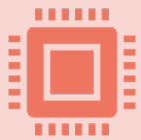


# Primer on 3D Printing & Integration into Craft Practices

Devin Valentine

# What is 3D Printing?



**Additive manufacturing** – objects are built **layer by layer** using a digital “computer aided design” (CAD) model

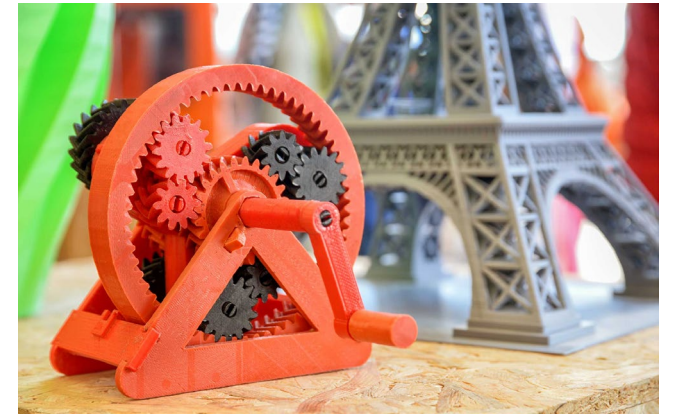


**Subtractive manufacturing**  
– objects are revealed by removing material e.g.:

*Milling*

*Turning*

*Carving*





## SLA (Stereolithography)

- Uses a liquid resin that hardens when exposed to UV light
- A laser or projector cures the resin layer by layer to build the object
- Produces highly detailed prints with smooth surfaces
- Ideal for fine craftsmanship, jewelry, miniatures, and intricate prototypes
- Requires post-processing: washing in alcohol and curing under UV light



## FDM (Fused Deposition Modelling)

- Uses a heated nozzle to extrude melted plastic filament layer by layer
- X, Y, Z controlled by motors moving the “hot end” or the printing bed
- Common materials: PLA, ABS, PETG, TPU and more
- Affordable and widely accessible, ideal for functional parts and prototyping
- Stronger but less detailed than SLA, with visible layer lines
- Minimal post-processing, though sanding or smoothing can improve finish

# Not Just for Toys...

## Weaknesses

- Temperature resistance
- Layer lines & print orientation
- Environmental factors

## Strengths

- Layer by layer
- Embedded features
- Impossible geometry
- Workshop assistant
- QC is up to you!
- Cheap & open source
- Environmental factors ...



# Getting started: What printer?

## Bambu Lab A1 / A1 mini:

### Pros –

- Cheap
- Easy to use
- Simple to maintain

### Cons –

- Closed source
- Potentially moving to subscription model!
- Proprietary “AMS” and filament



# Getting started: What printer?

## Creality Ender 3

### Pros –

- Very cheap (especially used)
- Open source
- Easily upgradable

### Cons –

- Requires tinkering
- Regular maintenance
- No automatic setup





## From idea to object

1. Model in 3D design software (Fusion 360, Onshape, etc)
2. Export model to .stl or .3mf file
3. Load model into “Slicer” program & adjust print settings
4. Print!





# Fusion 360

- Parametric vs direct modelling
- Models are based off 2D Sketches:
  - **Describe** your design using constraints – then give it **dimensions**
- **Design and Model with 3D printing in mind!**
  - Bridging
  - Supports
  - Layer orientation



# Slicer

- Turns the model into “g-code”
  - Co-ordinates
  - Pathing
  - Speed
  - Temperature
- Lots of variables:
  - Perimeters
  - Infill & infill type
  - Many more!



# 3D Printing & Modelling Resources

[Learn Fusion 360 in 30 Days](#)

[Every Feature in Fusion 360](#)

[3D Design for 3D printing](#)

[3D Printing 101](#)