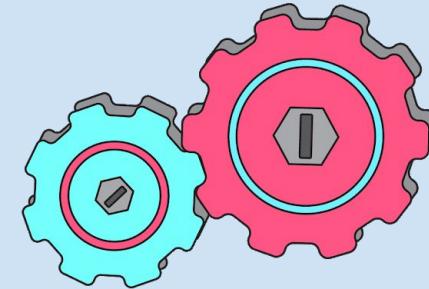
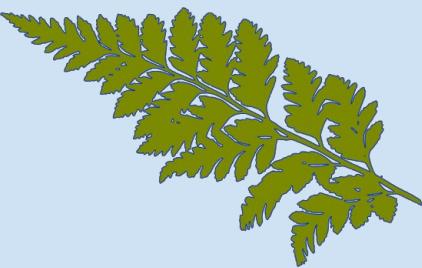


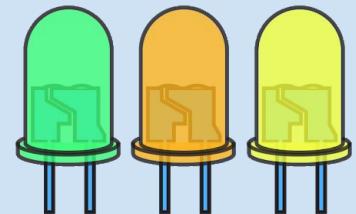
STEAM



WORK EXPERIENCE



PROGRAM



Tool Orientation, July 2nd 2019

STEAM Spaces on Campus

Makerspaces on Campus:

- TEB STEAM Room (TEB 119)
- Airway Sciences Room (TEB 121)
- Paragon Fab Lab (PAR)
- Interactivity Sonic Arts Lab (MAHB 223)
- AV/Virtual Reality Development Lab (MAHB 216)

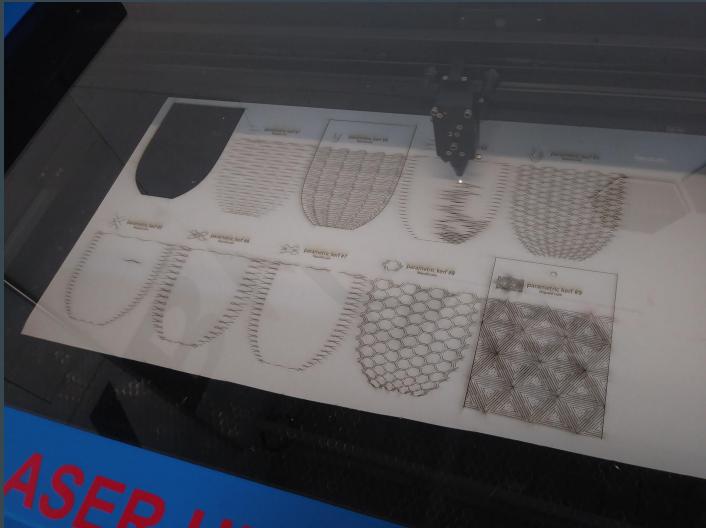
Computer Labs on Campus:

- Cascade Library
- Margaret Carter Learning Center
- Multimedia Computer Labs (MAHB 215, 217, 219)
- Mixing and Ableton Lab (TEB 215)

STEAM Tools in the Fab Lab and STEAM Room

- **Laser Cutters (45W/60W)**
- **3D Printers (x4)**
- **CNC Router**
- **Embroidery and Sewing Machines**
- **Vinyl Plotter**
- **Soldering and Electronic Fabrication Equipment**
- **2D and 3D Modeling Software**

60 Watt CO2 ULS Laser Cutter:



- Bed Dimensions: 32" x 18" x 9"
- Cut materials up to $\frac{1}{2}$ " thick (depending on material)
- Cuts and Etches Acrylic, Wood, Leather, Paper, Veneer, laserable rubber, fabric, neoprene, etc. Etches Glass, Anodized Aluminum, Ceramic, etc.
- Interprets vector and image files from Adobe Illustrator

Laser Cutter Applications:



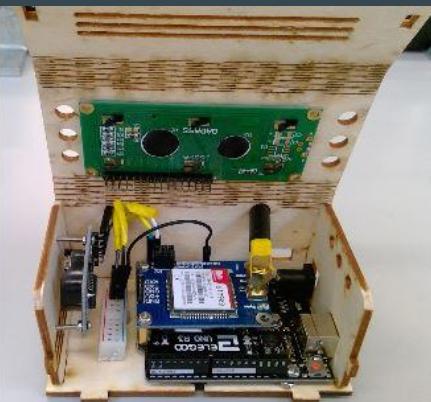
Art & Design



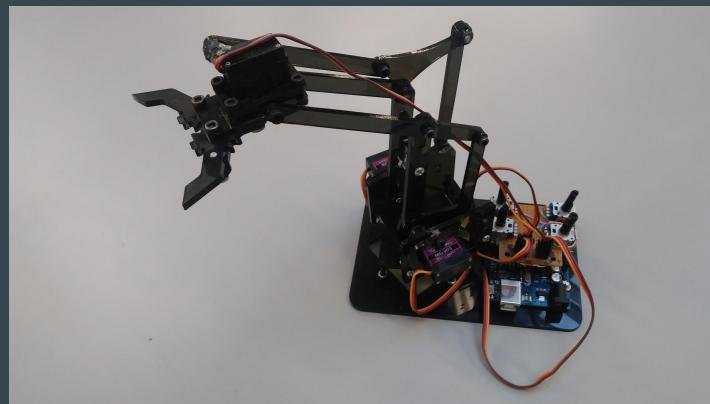
Signage



Stencils

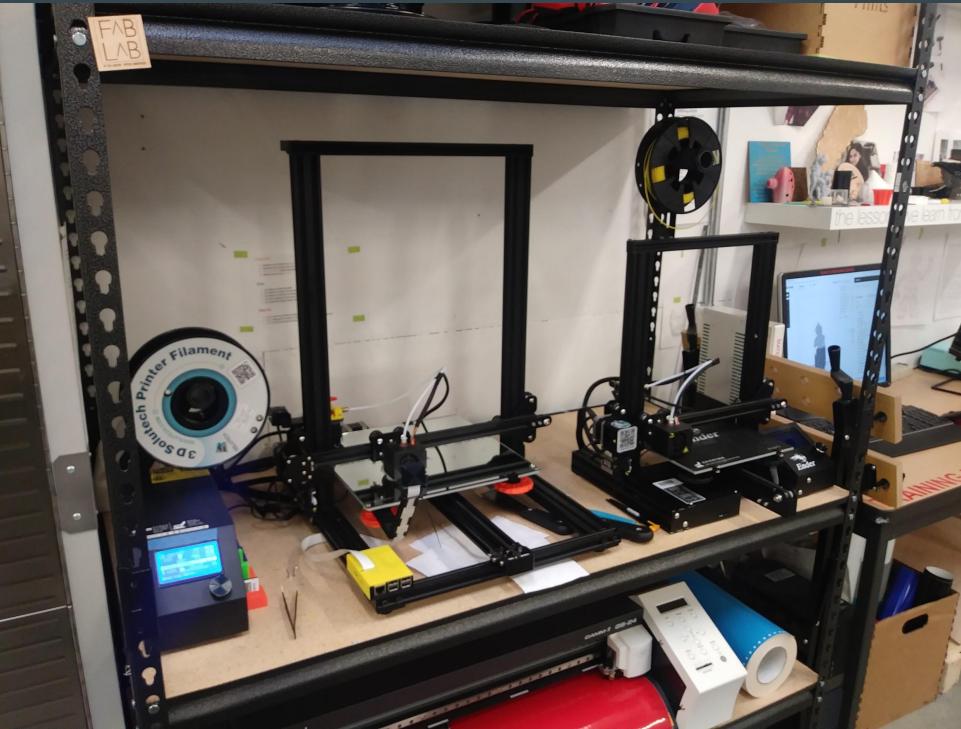
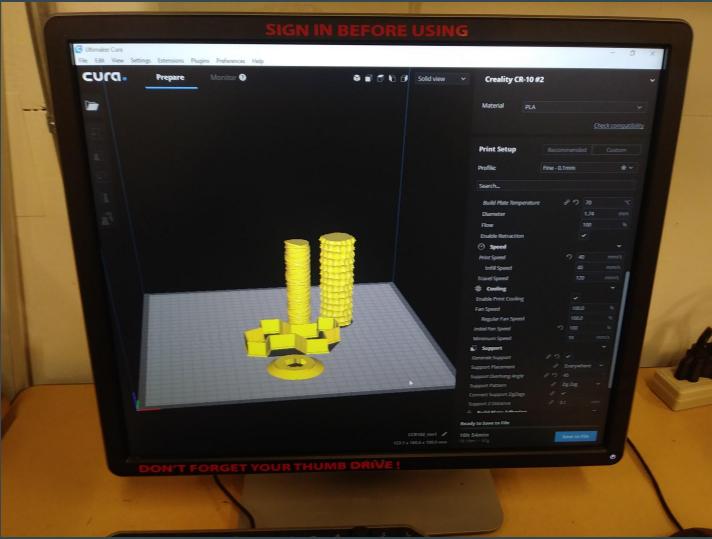


Project Enclosures



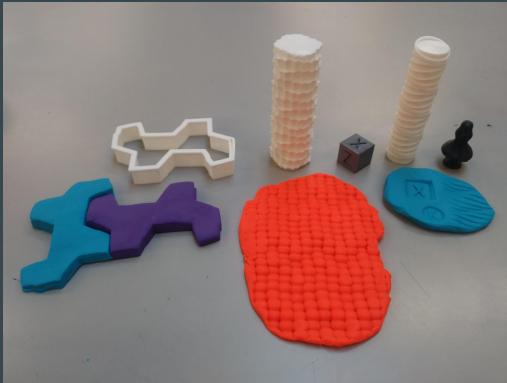
Mechanical Components

FDM 3D Printers



- Print Dimensions: 300mm x 300mm x 400mm (~12" x 12" x 15")
- Prints in PLA, PETG, ABS, and other plastics.
- Print in materials of every color (Primary, metallic, organic, translucent, etc.) and with custom properties (wood, flexible, conductive, glow-in-the-dark, magnetic, etc.)

3D Print Applications:



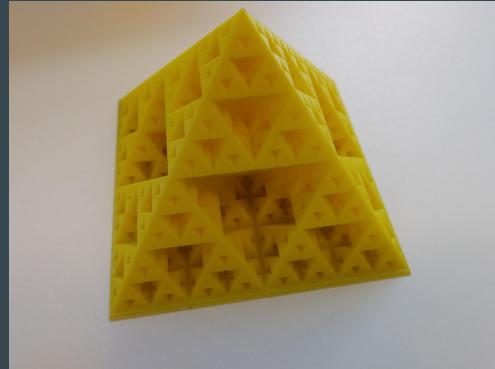
Tool Creation



Replacement Parts & Functional Prints



Print-From-3D-Scan

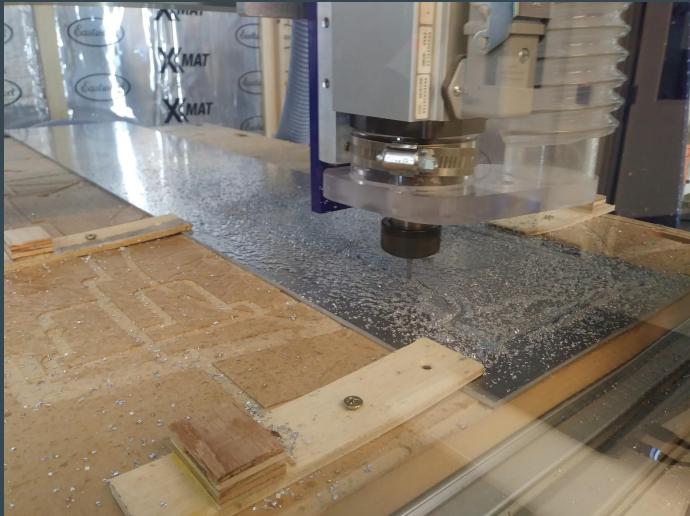


Complex Geometries with voids



Digitally Sculpted Models

ShopBot DesktopMax CNC Router

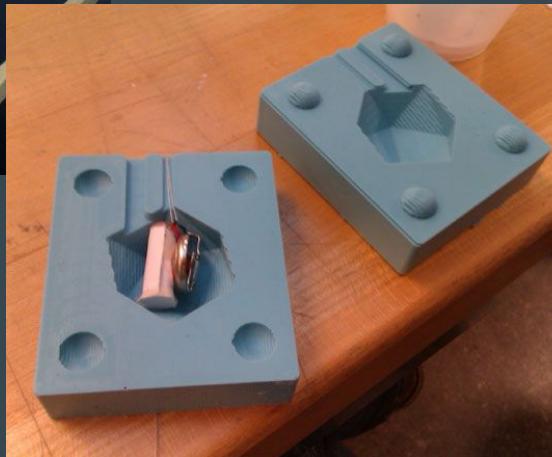


- Bed Dimensions: 24" x 36"
- Cuts wood, plastic, foam, and non-ferrous metals (Aluminum).
- Features a spindle with swappable endmill bits to achieve a variety of cut styles
- Can be programmed from 2D vectors files (VCarve Pro) or 3D models (Fusion 360)

CNC Applications



Signage & Engraving



Mold-Making



Furniture & Structural Pieces

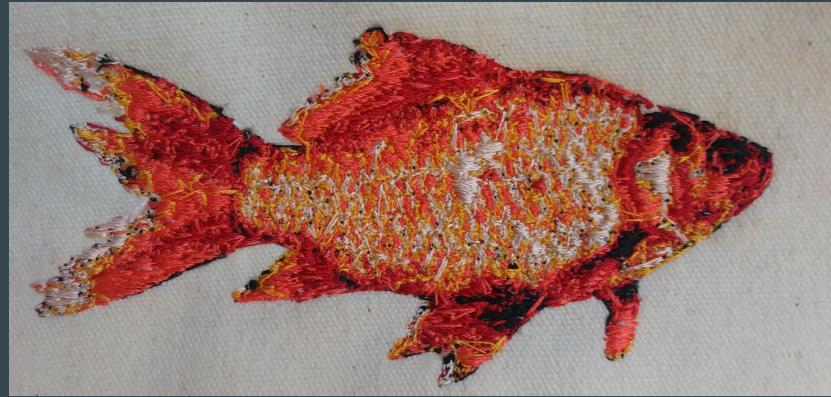


Brother SE-400 Embroidery Machine

- Embroidery Dimensions: 100mm x 100mm (~4" x 4")
- Embroider a variety of fabrics with any number of unique thread colors
- Generate custom designs from photographs or vector graphics.
- Control every textural property, from stitch density to pattern infill.

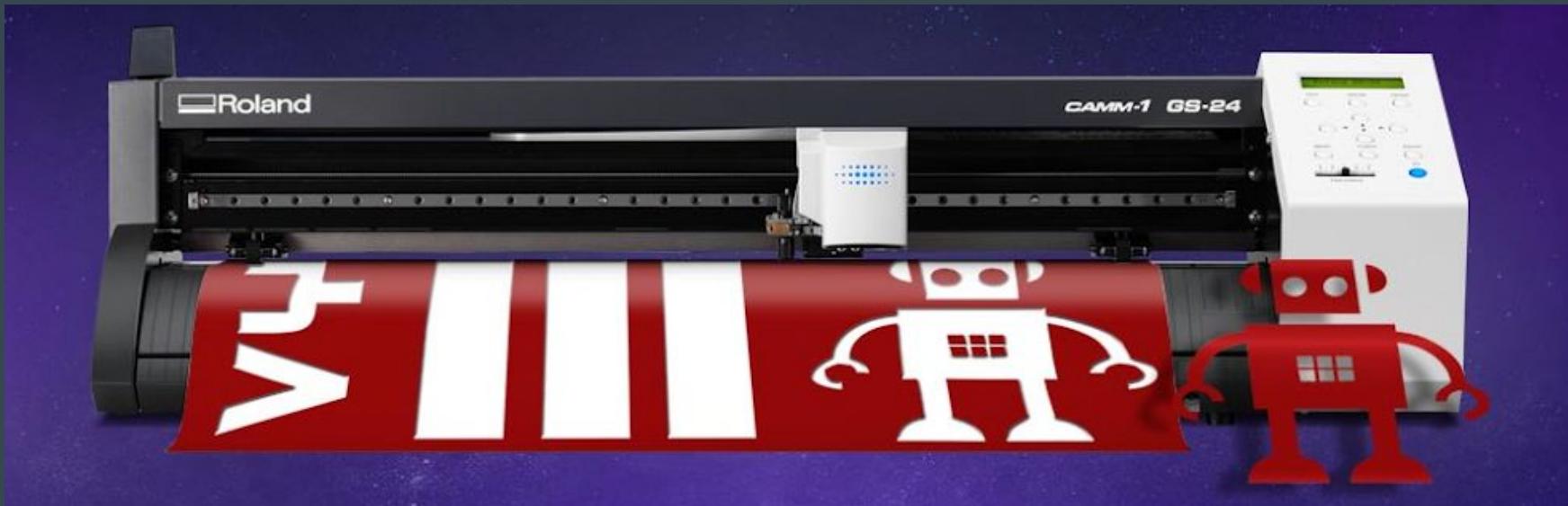


Embroidery Applications



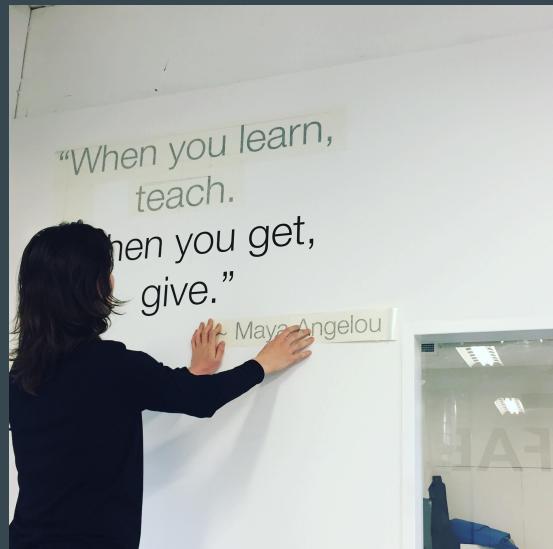
Patches, Clothing Labels, Fabric Art, etc.

Roland GS-24 Vinyl Plotter



- Cut Dimensions: 24" Wide, Any Length
- Cuts adhesive vinyl sheeting, copper sheeting, paper, other thin materials
- Generates cuts from vector files (Illustrator/Inkscape)
- Create Stickers, labels, window art, etc.

Vinyl Applications:



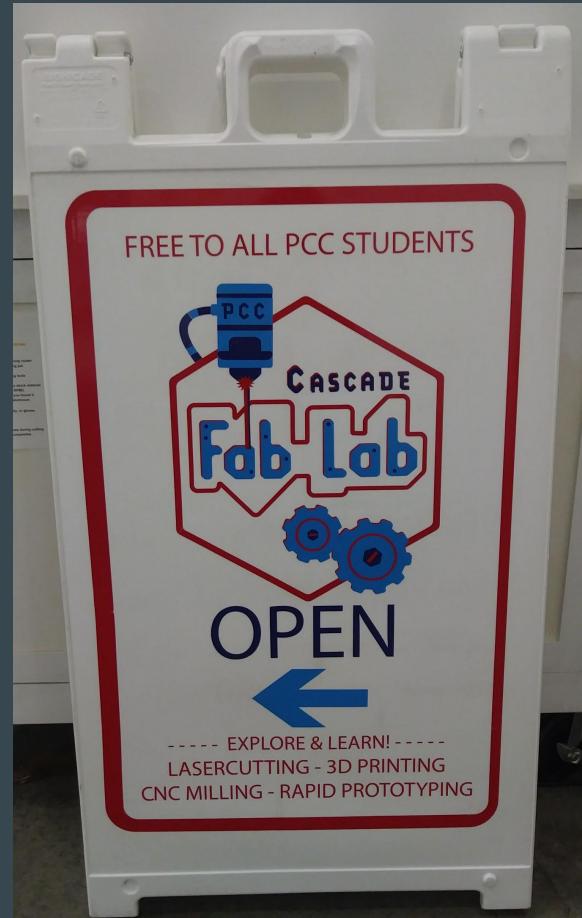
Wall Art



Labels

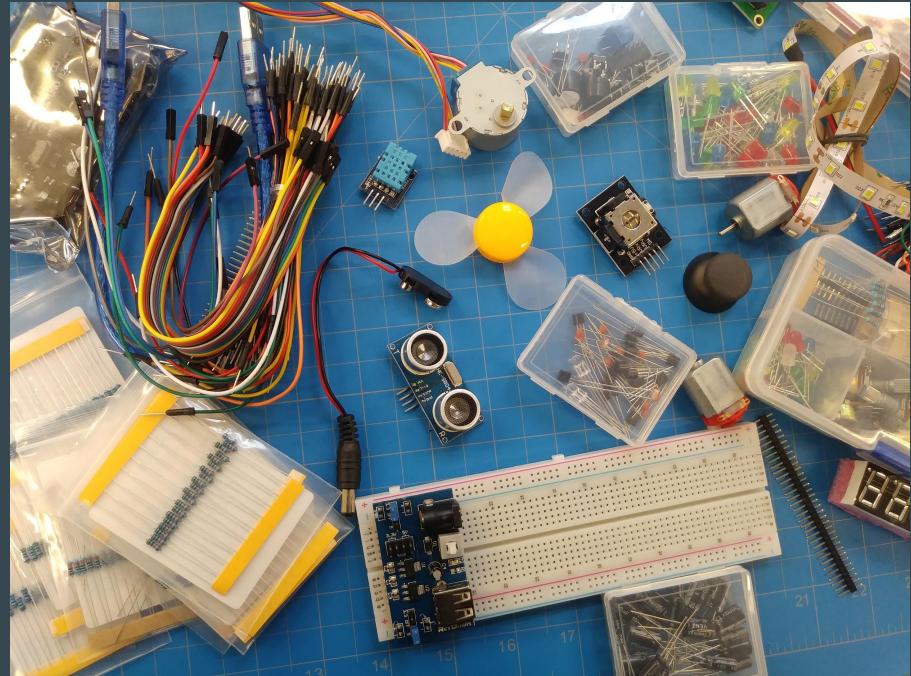


Window Art



Signage

Soldering & Electronics Equipment



- 4 Weller WES51 Soldering Stations & Fume Extractors
- Solder, wire, resistors, and various electronic components and sensors for microcontroller and circuitry prototyping.

Software Tools

*Paid Software

Fusion 360 3D Modeling Software



Cura and Slic3r 3D Slicing Applications



Arduino & Processing for Programming



Embroid* Embroidery Software



VCarvePro* & Fusion 360 CAM Software



Inkscape, Adobe Photoshop* and Illustrator* Image Software



*Access to and support for
these software available at
the Fab Lab*

Additional Tools:

In addition to modern prototyping tools, the Fab Lab is equipped with a range of traditional fabrication tool including:

- Electric Jig Saw & Hand Drill, manual Hand Saw, Vices & Clamps
- Traditional Sewing Machine, Serger Sewing Machine
- Calipers, measuring tapes, x-actos, fabric scissors, etc.
- Tape, Glue, & Adhesives for Acrylic, wood, fabric, etc.

Additional Materials:

The Labs keep a stock of a variety of materials for experimentation and prototyping, so students can get a head start on their projects. Examples include:

- Plywood, Veneer, Felt, Neoprene Rubber, Vinyl, Cardboard Acrylic, etc.
- Adhesive-Backed Copper Sheeting, Magnetic tape, Conductive Ink & Thread
- Wood Screws, Machine Screws, Stand-offs, Armature Wire, etc.
- 3D Printer Filament (Multicolor, Glow-in-the-Dark, Conductive, Flexible, etc.)
- Microcontrollers, breadboards, LEDs, knobs, resistors, motors, etc.
- Dozens of thread colors & Base fabrics.
- There is also wood and acrylic available for purchase in the bookstore.

Multimedia Applications:

Combine Lab tools to create unique projects!

Waveform Chess Set



Lasercutter, Audio Recorder, Fusion 360, 3D Printer

Polar Drawbot



3D Printer, Soldering Station, Electronics, Arduino, Processing

Color-changing LED Brooch



Lasercutter, Vinyl Plotter, Sewing Machine, Soldering Station, Electronics