Art Metals Class: Implementation and Curriculum

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Port Washington High School

Art Metals

The goal of Art Metals is to bring together diverse groups of students to share skill sets and design concepts.

This hands on approach to learning will allow for higher level thinking and planning as students push the limits of the materials and creative expression. Students will create and communicate solutions to the visual problems presented.

Timeline

- 2018-19 School Year
  - Introduced the idea to our curriculum director
- Summer 2019
  - Ran an enrichment summer school program as a pilot.
- Fall 2019
  - Received board approval to add course to 20-21 school year course book

Course Logistics

- Approved for two teachers during the same hour
- 24 students minimum, 28 students maximum
- One semester long
- Supplies pulled from both tech and art department budgets.
- Roughly $500 per year for supplies (sheet steel is donated)
- Added roughly $1500 of new equipment

Description:

Art metals is designed to allow students in both Technical Education and Art classes an opportunity to utilize industrial equipment and technologies to create three dimensional projects. Students will learn and apply welding, casting, and coding applications for 3D printing and CNC plasma cutting to create unique works of art.

Prerequisite:

Welding and Fabrication

Sculpture or Ceramics

https://lacrossetribune.com/news/local/education/metal-arts-class-bringing-together-a-diverse-group-of-students/article_72462729-9c24-51d4-97e5-2d2b0669642a.html

Project 1
CNC Plasma: Name Plate

LEARNING TARGETS

1. Sketches and Research:

Students will research CNC designs, Letter fonts and Name Crests/Plates. Students will develop 3-4 unique sketches.

2. Tools and Techniques

Students will use the CNC Plasma table to cut their final design. Cleaning front, back and edges using chisels and grinders

3. Design

Students will create an original cohesive design using fonts and imagery that represent the name displayed.
Students will develop a high contrast image to be converted into DFX.

4. Finishing

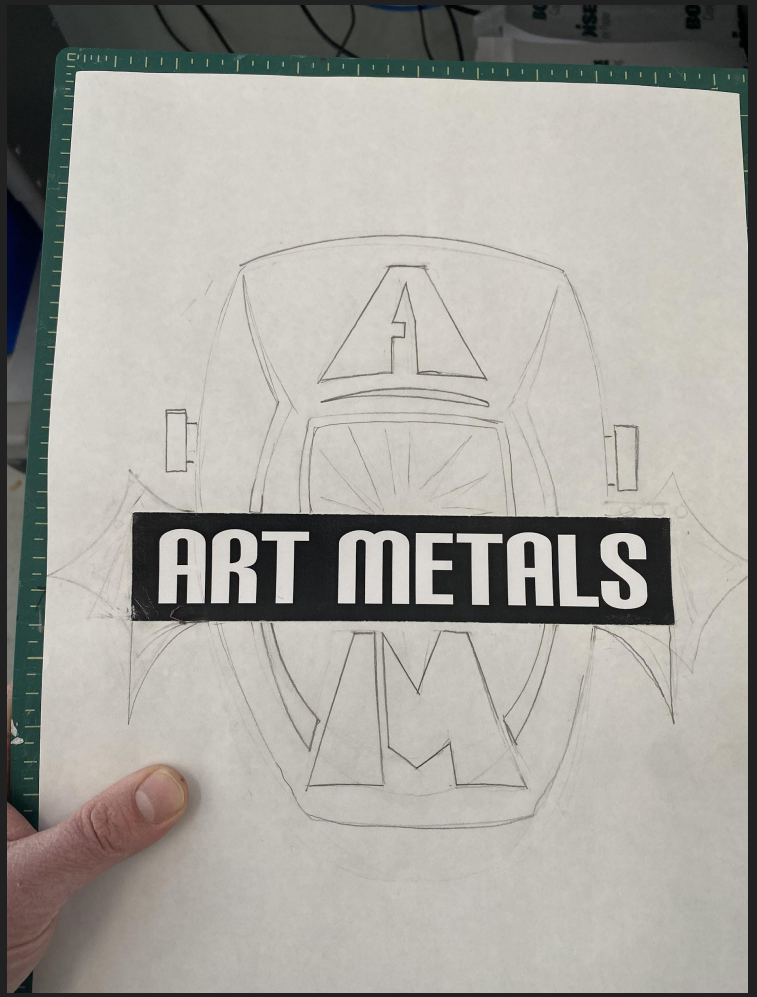
Students will finish their piece using surface textures and sealing the piece with clear gloss enamel.

FONT

- Do not find only one font!
- Play around with multiple fonts, different spacing, and CAPs.
- Choose a black background with white letters
- Play with the design of the background (rounded corners of the black rectangle.
- PRINT MULTIPLES TO PLAY AROUND WITH DIFFERENT

LINE ART

- Must be original, but can be inspired by other images.
- Avoid thin areas of loops, as the plasma cutter may ignore them.
- Do not place loops too close together.
- Check for double loops

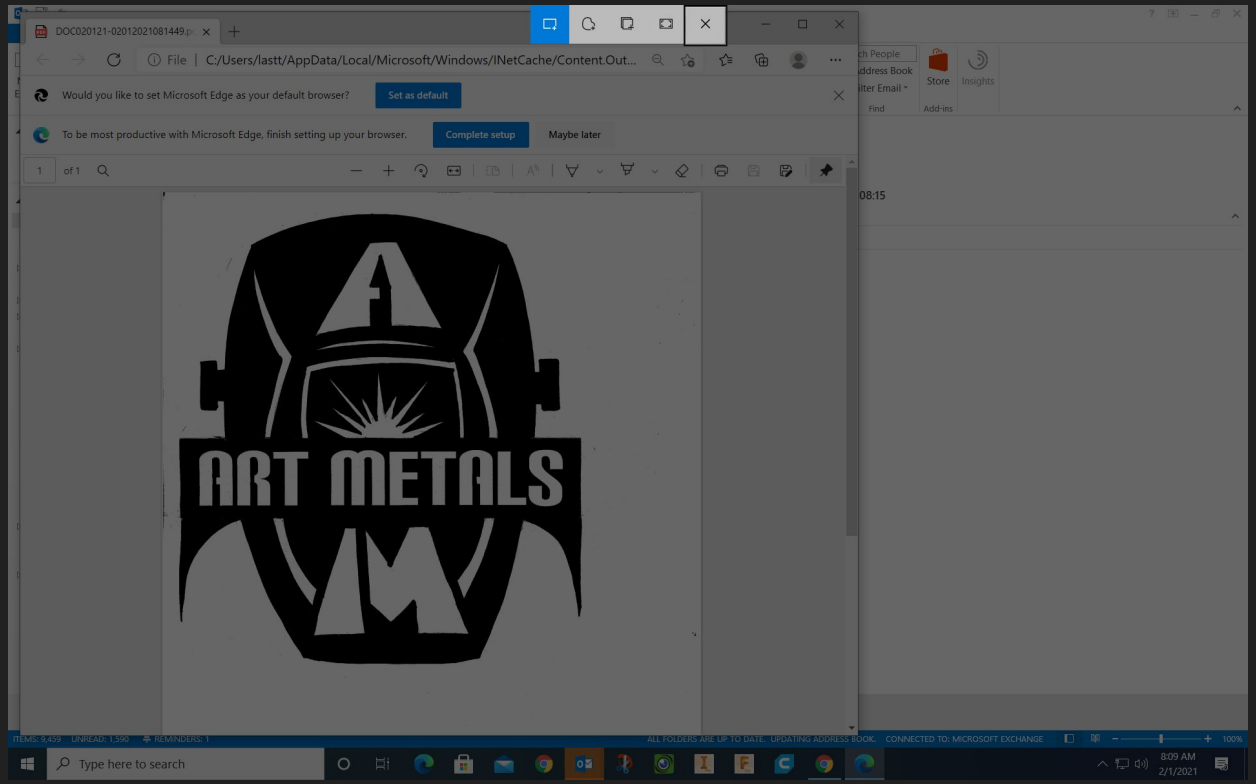


BLACKOUT

- The DXF Converter will create lines, or cut paths along all black/white boundaries.
- The black will be metal, white will be the drop-outs
- Allows for better visualization of the end product.

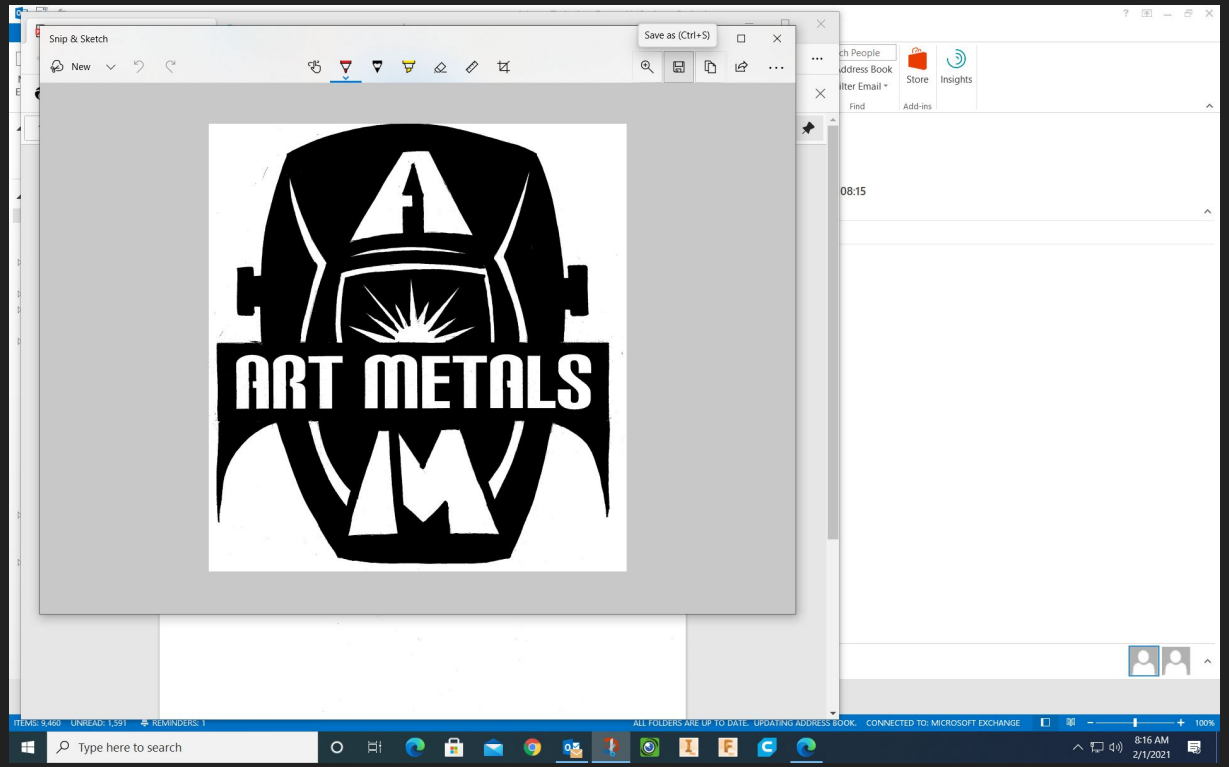
SCAN TO PDF

- Open the PDF that was scanned and sent to your email.
- Press the “Windows Key”, “Shift Key”, and “S” together.
- This opens the snip tool. Click and drag the box just over the image.



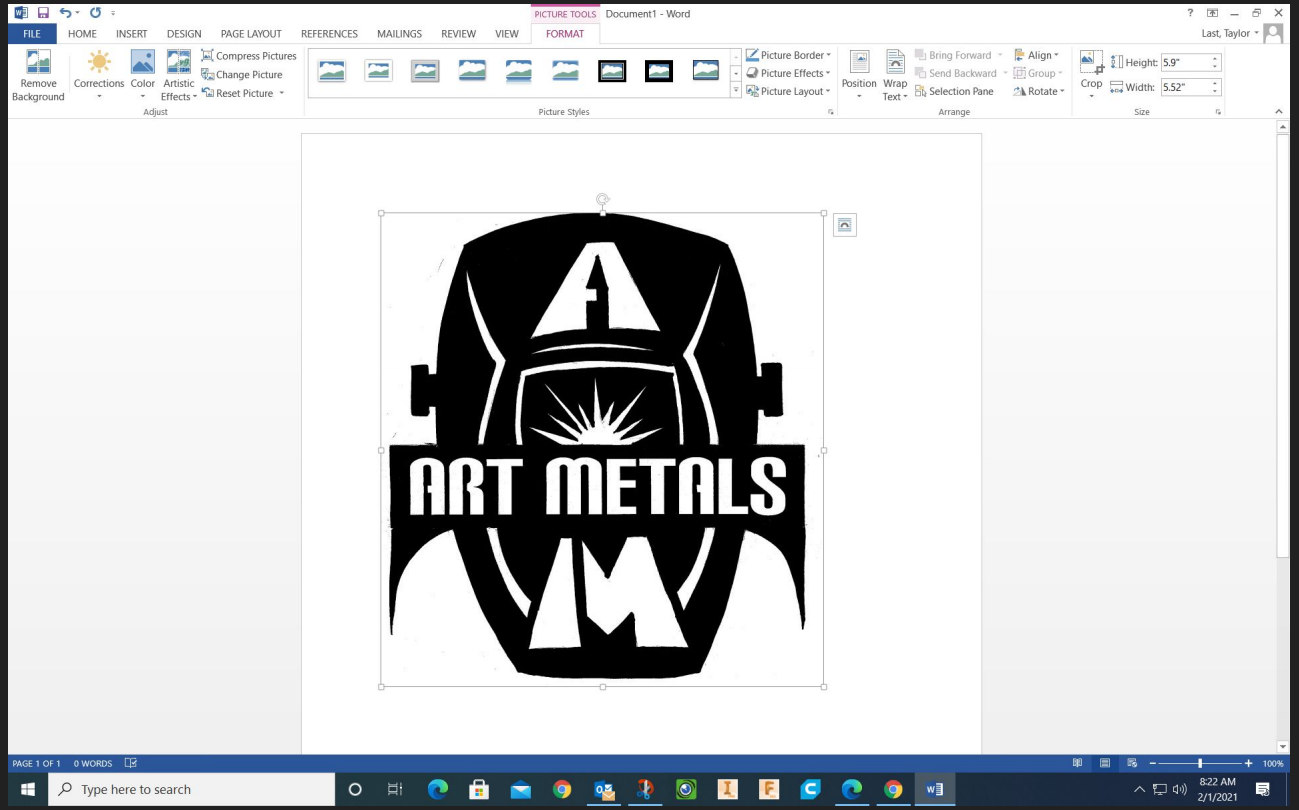
SAVE AS JPG

- After snipping the image, it will pop-up in a different window.
- Open the window and choose to save to your “My Folder” as a JPG.



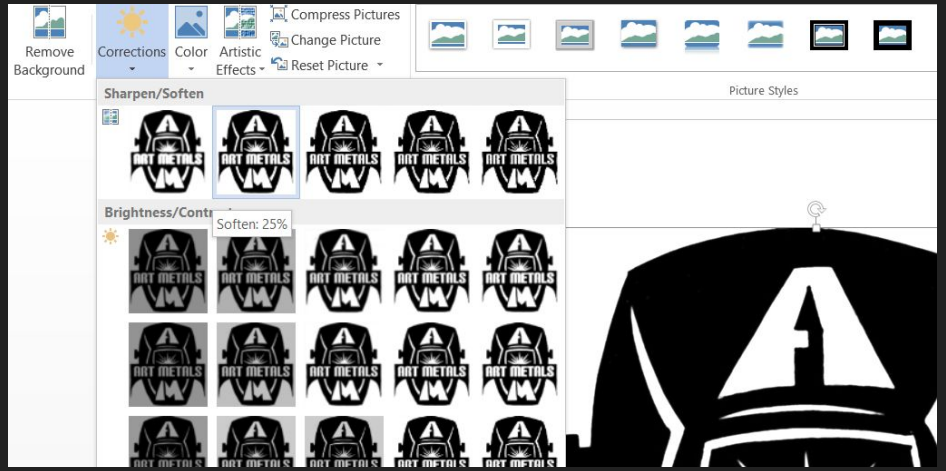
EDITING IN WORD

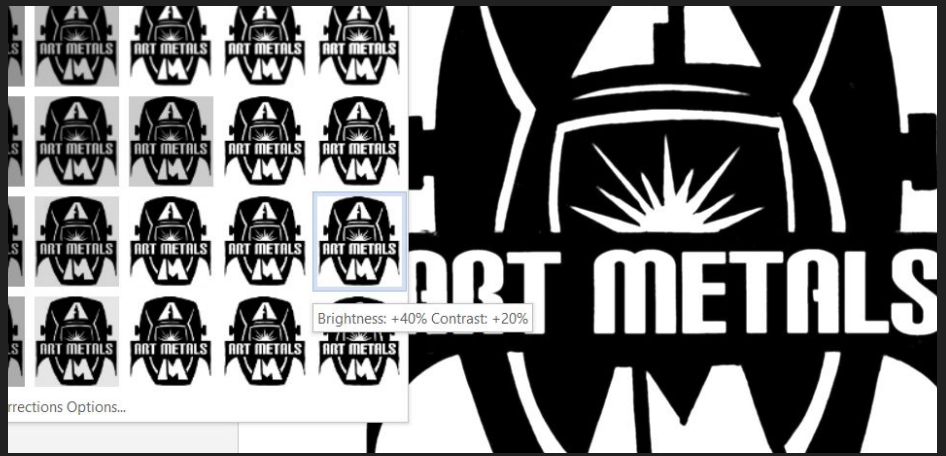
- Open a word document, go to “insert”, “picture” and find your JPG.



EDITING IN WORD

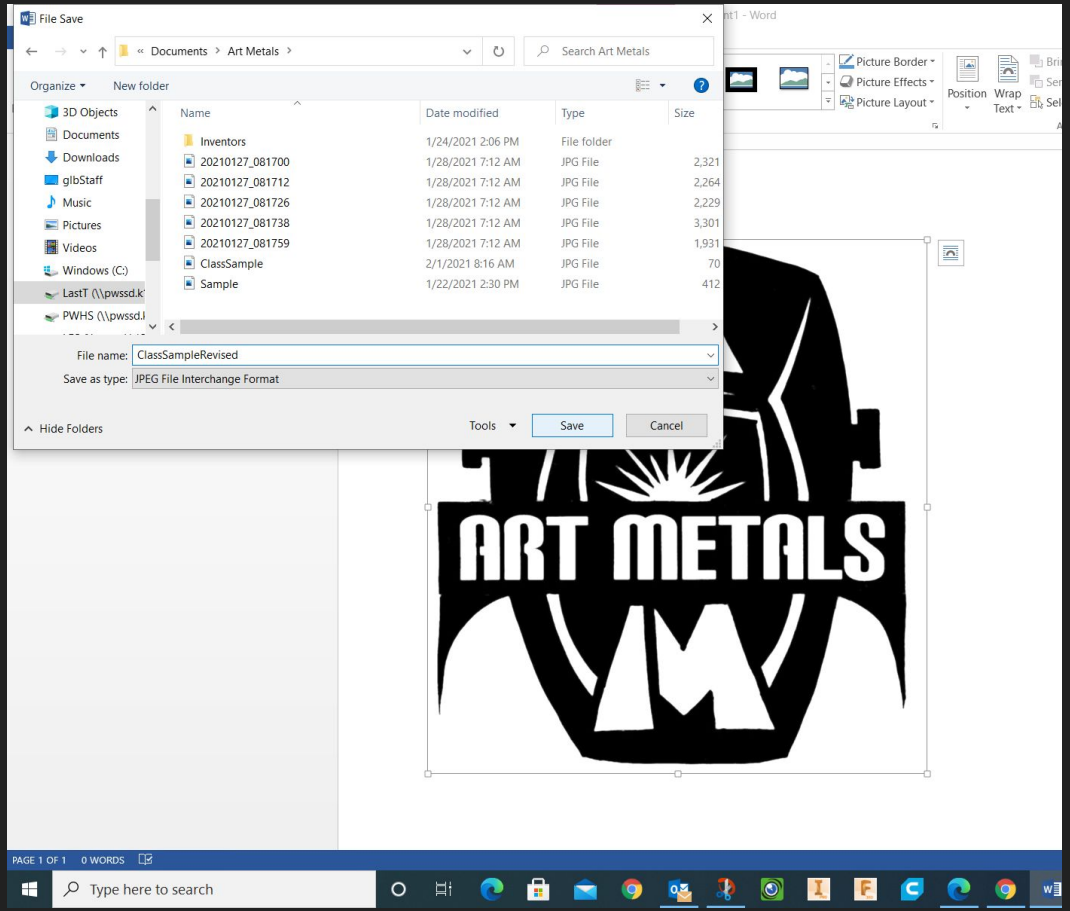
- Softening to different percentages will smooth choppy lines
- Also, change brightness and contrast to darken any greyscale, and “white-out” any unwanted marks.





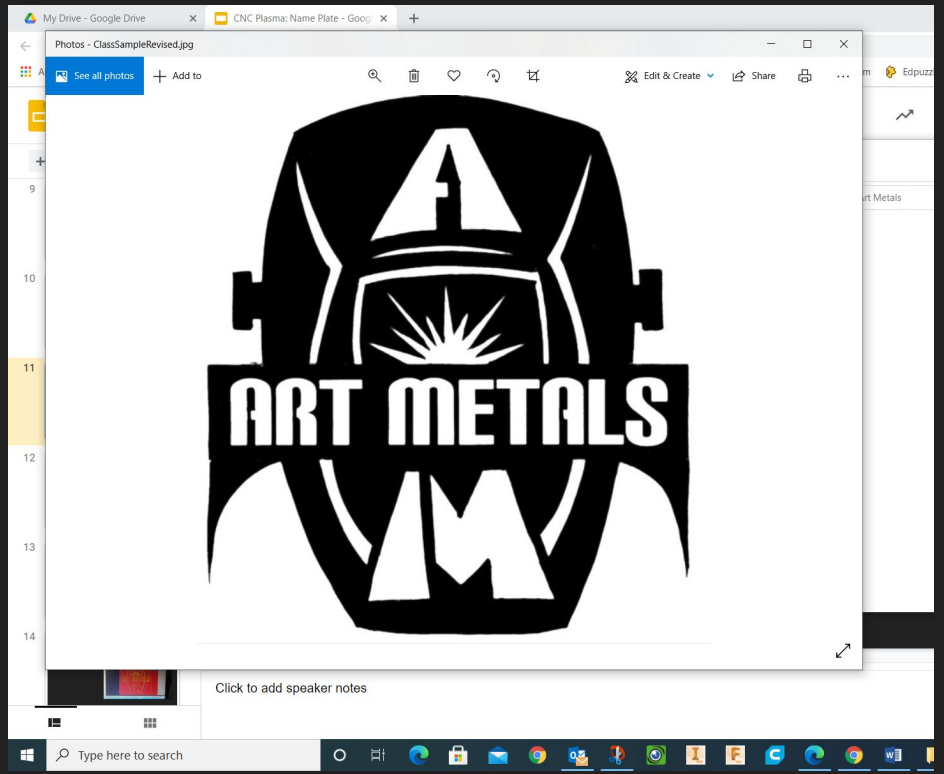
SAVE AS NEW JPG

- Right click and select “save as picture”
- Save with “revised” in the name to ensure you select the right version.
- Can be saved as either JPG or PNG



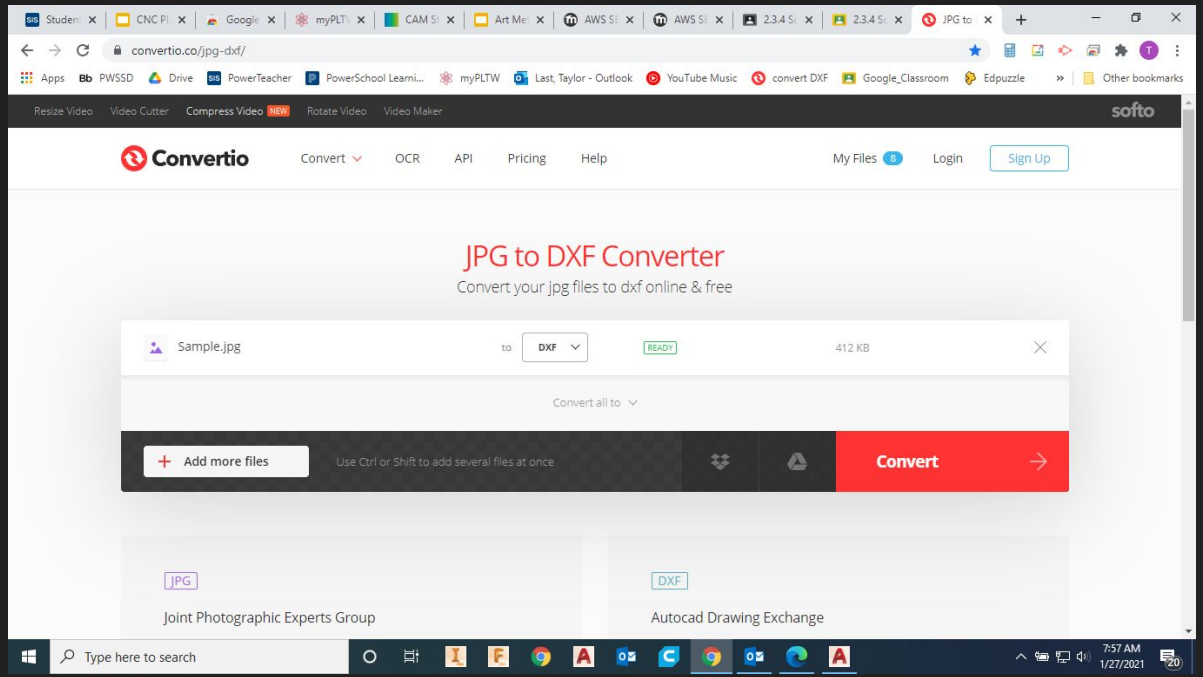
CHECKING PICTURE

- Open the picture to ensure it saved correctly before converting.
- DXF Converter will pick up on very minor differences in greyscale.
- Also, use this step to check for any double loops



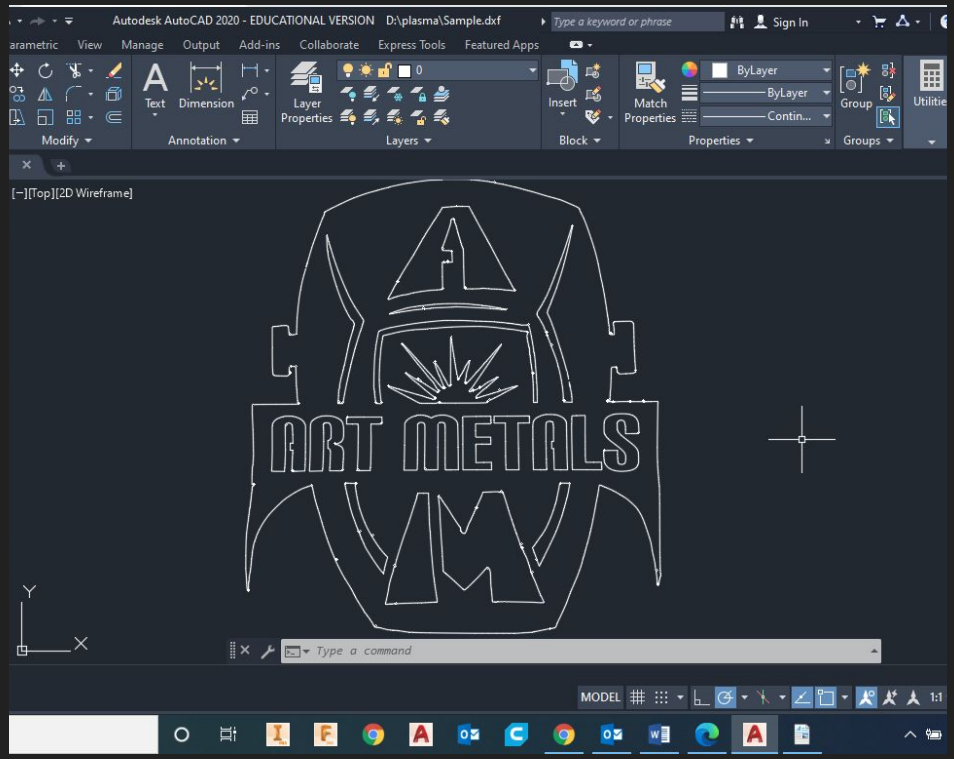
JPEG TO DXF CONVERSION

- https://convertio.co/jpg-dxf/
- Scan image or take a picture of an image to get the original file.
- If it is not in JPG format, the converter has other choices.
- Download and save the DXF file produced



AUTOCAD DXF FILE VERIFICATION

- Check for any open loops, or crossed lines
- Be sure there are no double loops (loops within loops, such as the circle inside of an “A”
- Refining edges and minor modifications can be done.
- Final scaling to the desired size

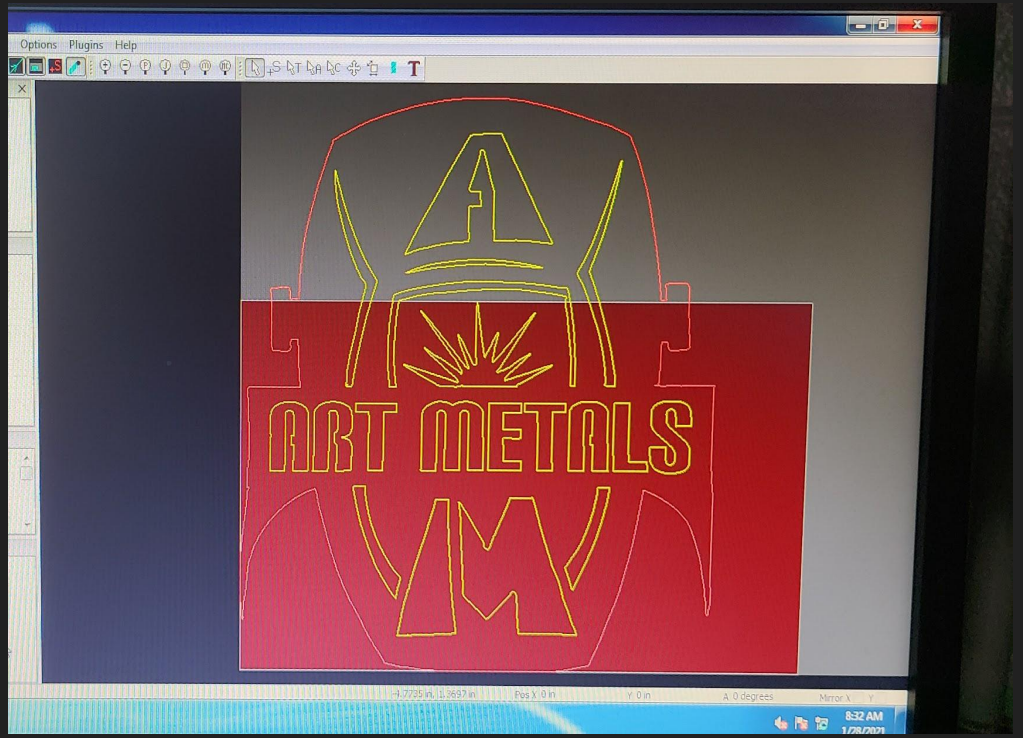


SHEETCAM DXF IMPORT

PWHS Programs
- Tech Ed 21-22
  - SheetCAM TNG

File - Import Drawing
- Change File type to DXF
  - Import your DXF

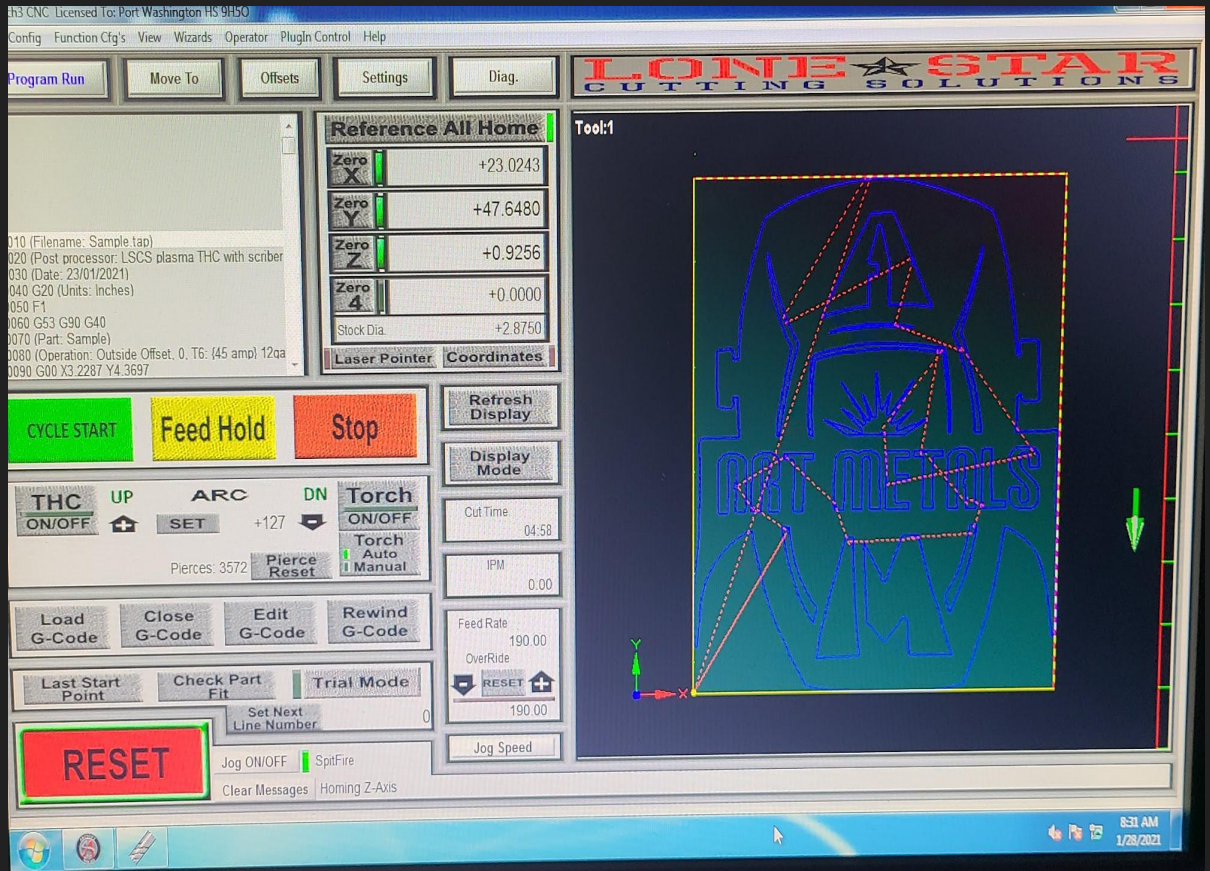
Outside contours are red, inside are yellow, open contours are white



SHEETCAM TOOLPATH CREATION

SHEETCAM TOOLPATH CHECK

CNC CONTROL SOFTWARE

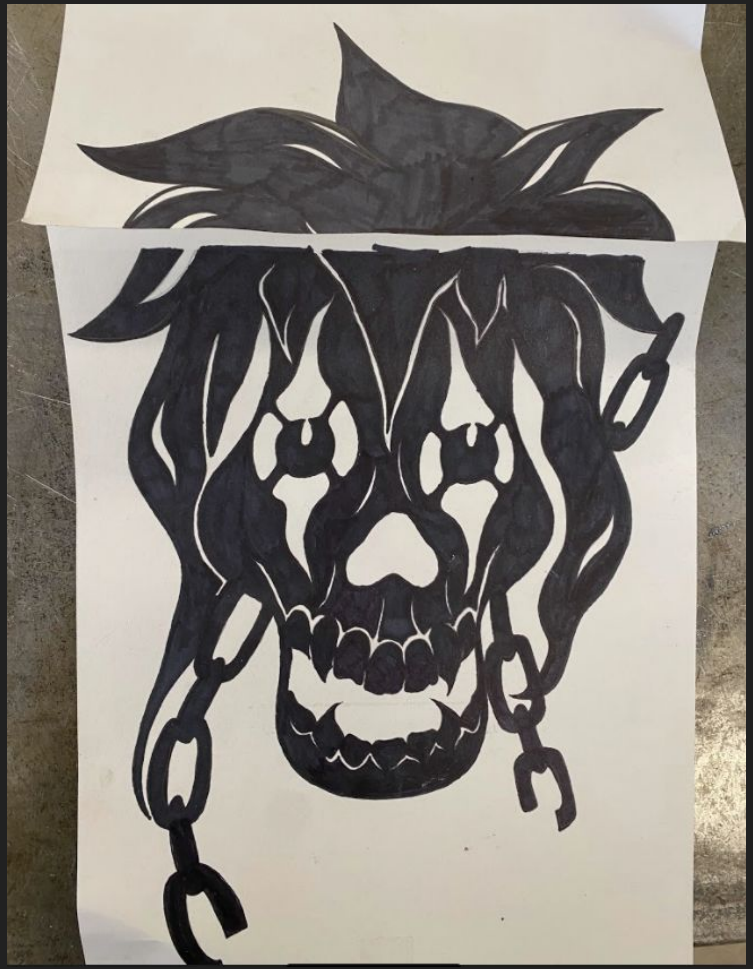


CUT


SHARP


PIERRON
TAXIDERMY


PIERRON
TAXIDERMY



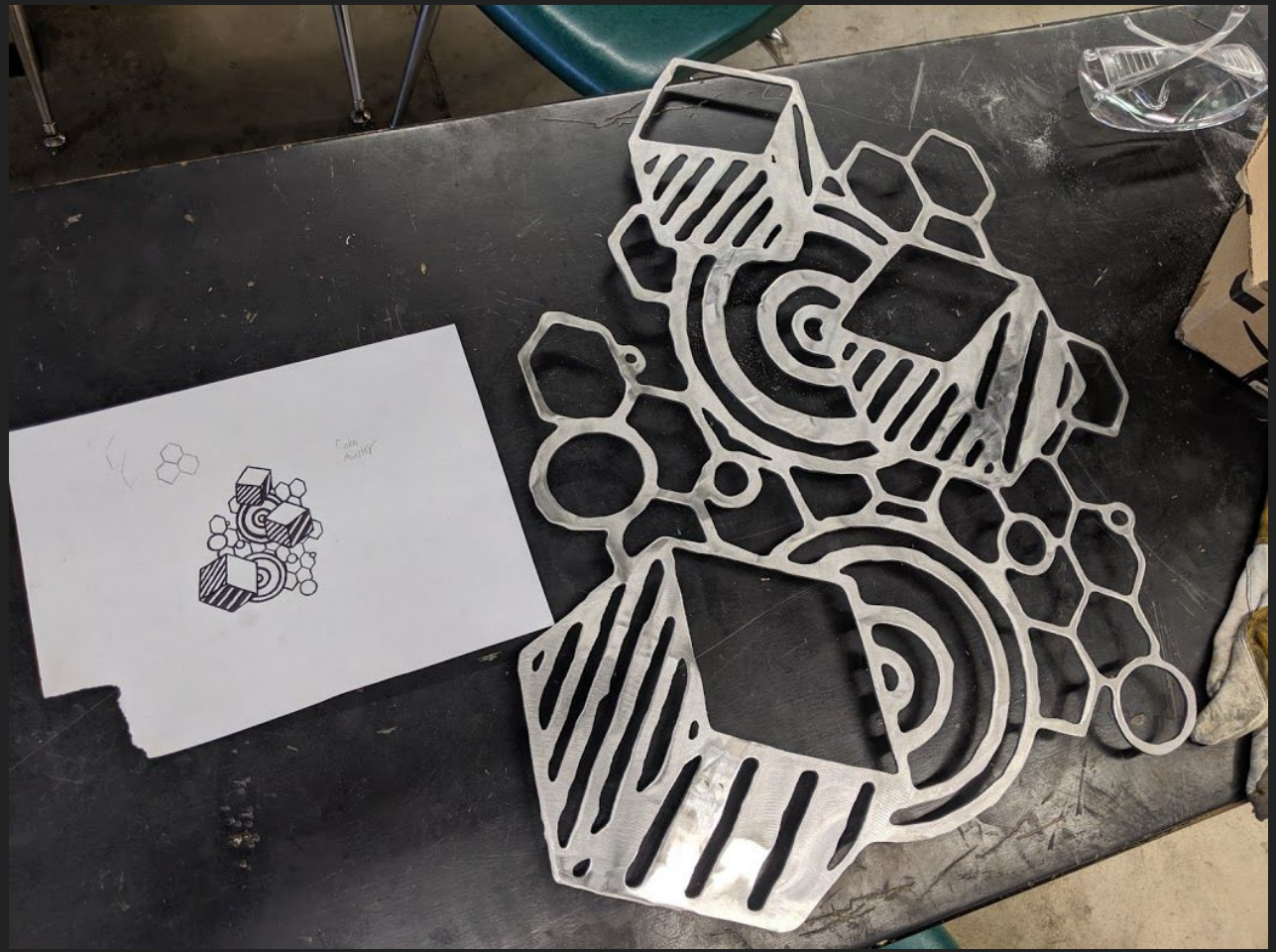

森


ASSORTED FRUITS


SHERIFF

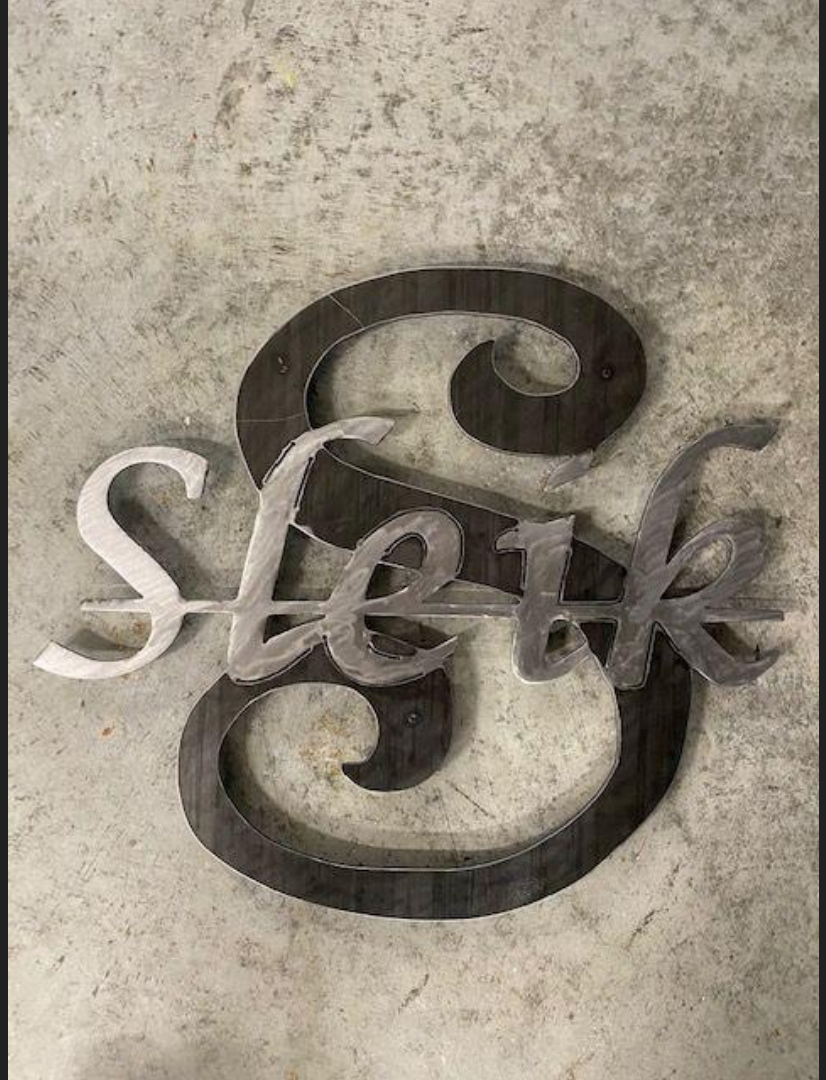

EST.1995

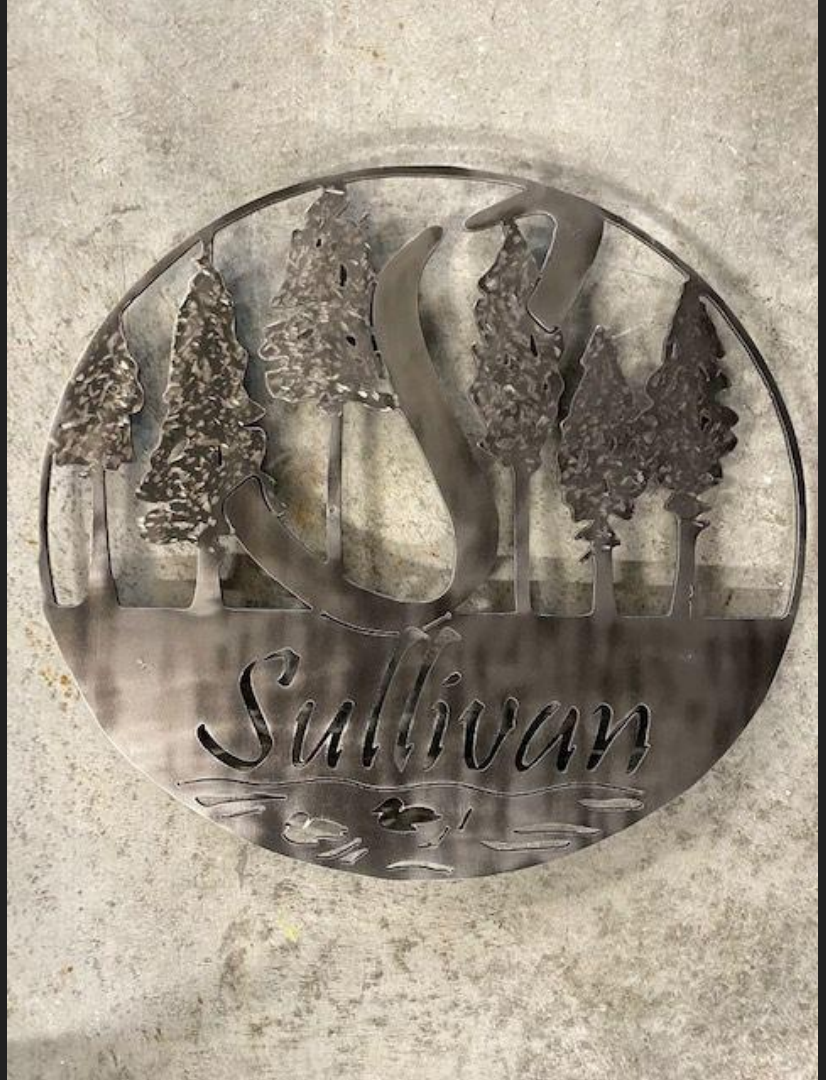

Streicher




Scheftgen


SURFER 82


Stek


Sullivan


Jon's
Patio


Jon's
Patio


Jon's
Patio
NIRVANA


Stiv

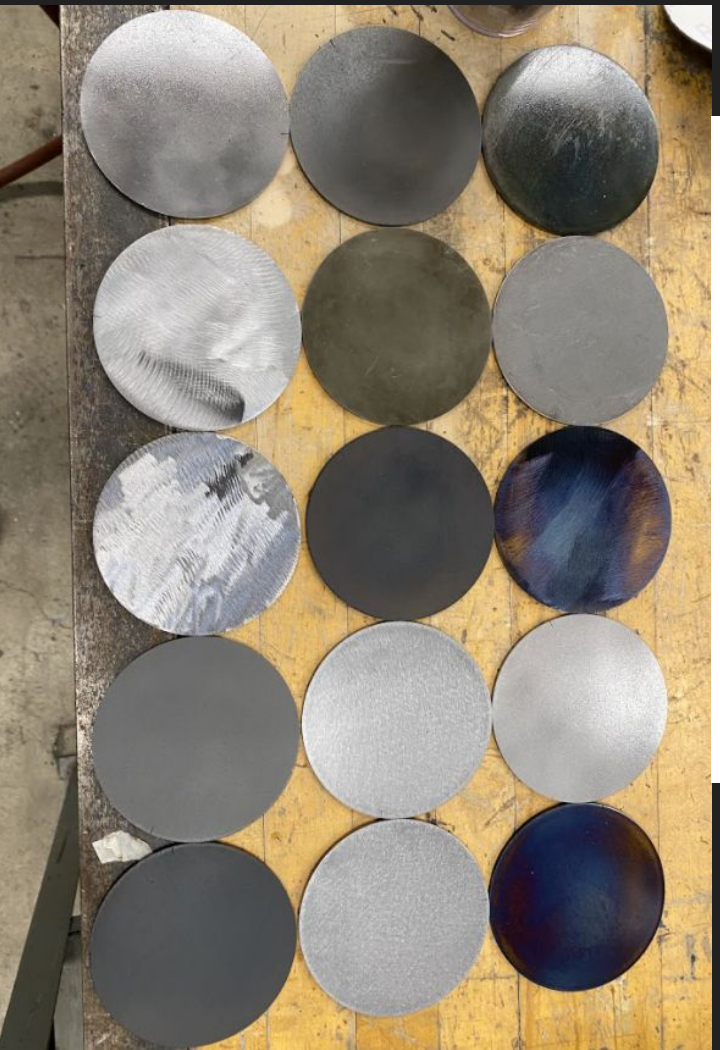

Krueger

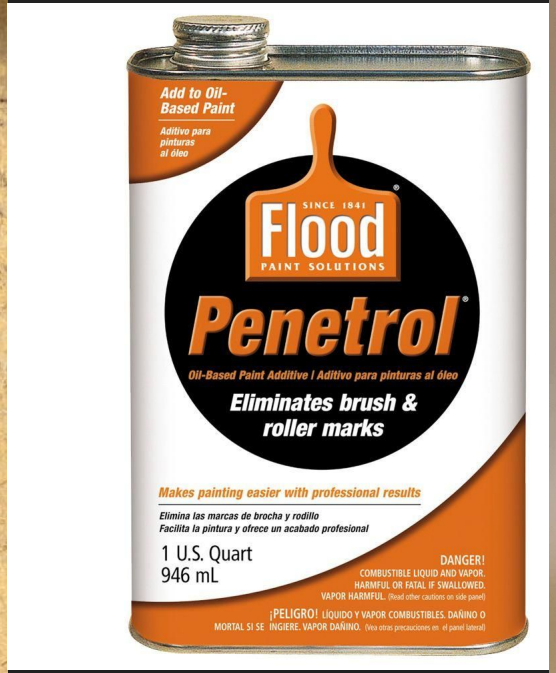

Born


Anderson
Restoration Shop
GREASE AND WAX REMOVER
KW-901


EXIT
Gourley


Gourley

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Flood
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Penetrol
Oil-Based Paint Additive / Aditivo para pinturas al óleo
Eliminates brush & roller marks
Makes painting easier with professional results
Elimina las marcas de brocha y rodillo
Facilita la pintura y ofrece un acabado profesional
1 U.S. Quart
946 mL
DANGER!
COMBUSTIBLE LIQUID AND VAPOR.
HARMFUL OR FATAL IF SWALLOWED.
VAPOR HARMFUL. (Read other cautions on side panel)
¡PELIGRO! LÍQUIDO Y VAPOR COMBUSTIBLES. DAÑINO O MORTAL SI SE INGIERE. VAPOR DAÑINO. (Vea otras precauciones en el panel lateral)


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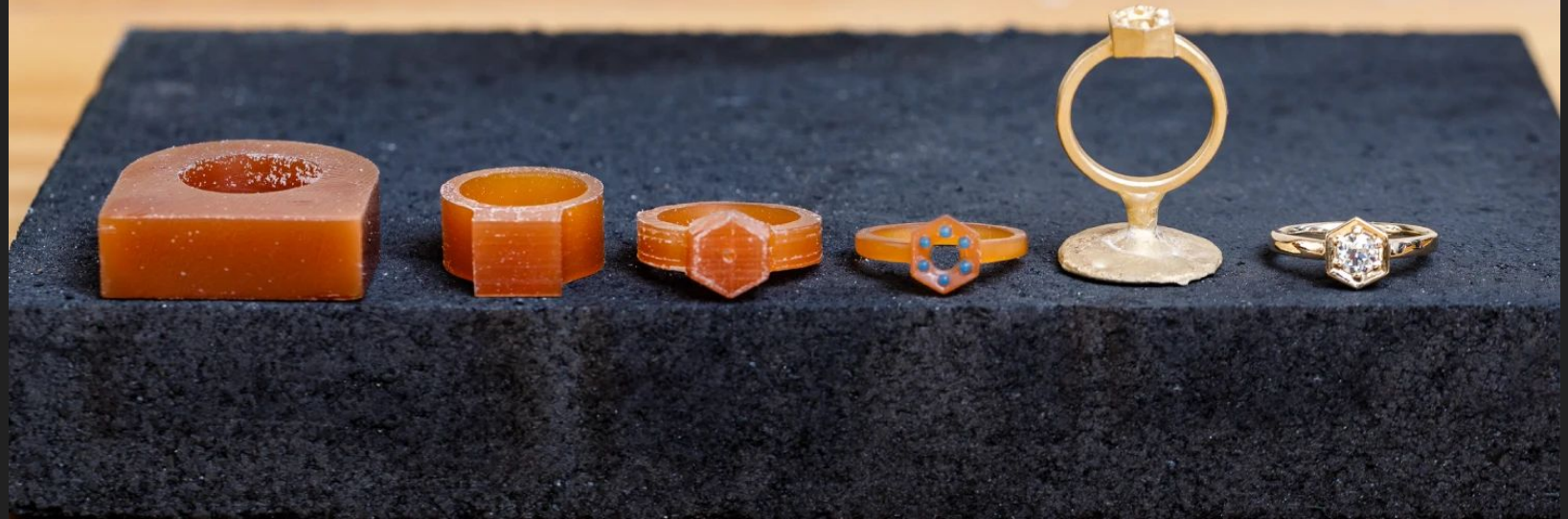
Project 2: LOST WAX CASTING

HOW IT'S MADE: LOST WAX CASTING



Ring Blank

Carving/Sculpting

Wax Sprue

Flask

Slurry

Wax Burnout

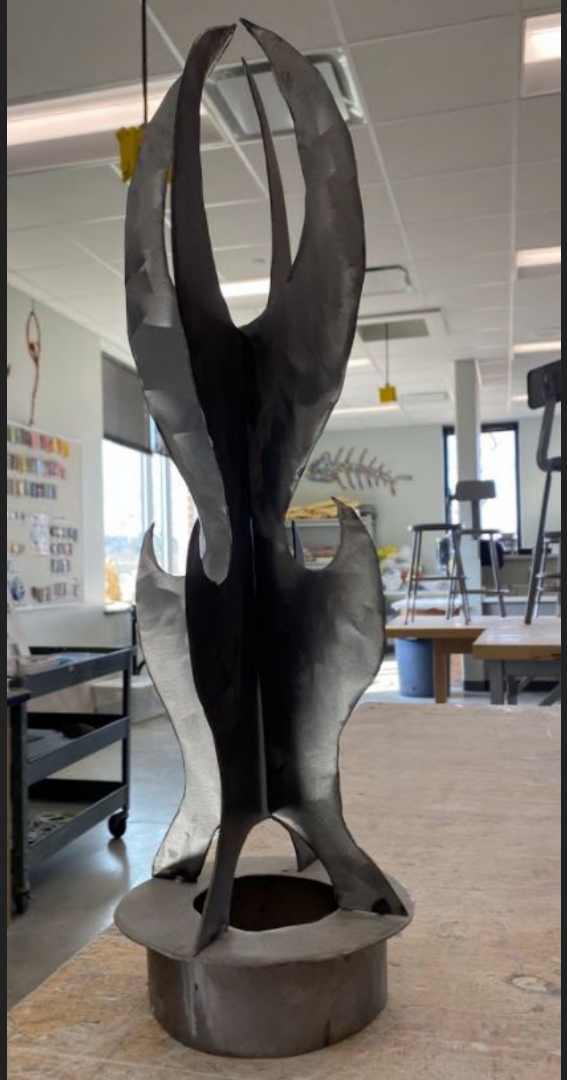
Metal Pour

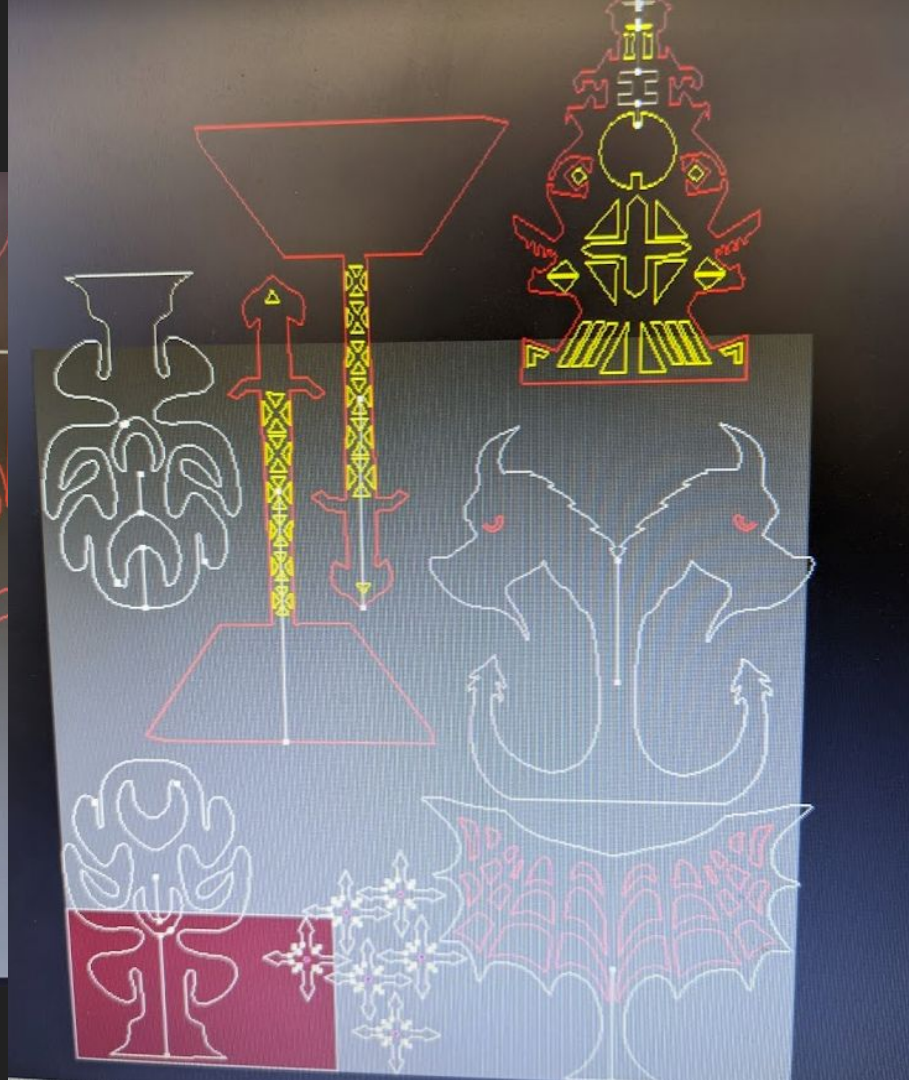
Slurry Remova

Finishing

Wax Investment Casting

Project 3: Symmetrical Design





Project 4: Personal Narrative

Students get to use a new process or expand off of an already used process

Sculptural Welding