

# Drawing for Prizes

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- Name on a slip of paper to win a prize
  - Donated by IASCO.

# Plastics Technology

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Waterloo High School

Mac Chopin

[chopinm@waterloo.k12.wi.us](mailto:chopinm@waterloo.k12.wi.us)

# Waterloo High School

Mac Chopin

chopinm@waterloo.k12.wi.us

Teaching since 2004 at Waterloo

School of about 260 students

Single teacher in the department

Facility includes:

Metals

Woods

Computer Lab

Photography Studio



# History

- Was taught by George Sable of Johnson Creek High School.
- I taught with George in 2003 while long term subbing.
- He had been teaching this plastics class there for a while.
- I proposed it for my second year at Waterloo.
- I have been slowly modifying it over the years.

# Why add another class?

- Add to the Technology Education offering.
- Can be started using equipment already in a Wood Shop.
- Has been a very successful class for Waterloo. Useable take home projects.
- Students that enjoy working hands on, like an alternative to wood or metal.
- Maybe not a class, hopefully you will find a project you would like to add.

# Acrylic Plastic

- Can be mostly done with equipment in wood shop
  - Bandsaw, scroll saw, sanders
- Fairly inexpensive to get supplies.
  - Industrial Arts Supply Co. has many of the supplies needed.
  - GM Grade pg. 62
- New equipment
  - Buffer Low Speed - \$250
  - Strip heater - \$150 pg. 42



# Acrylic Plastic

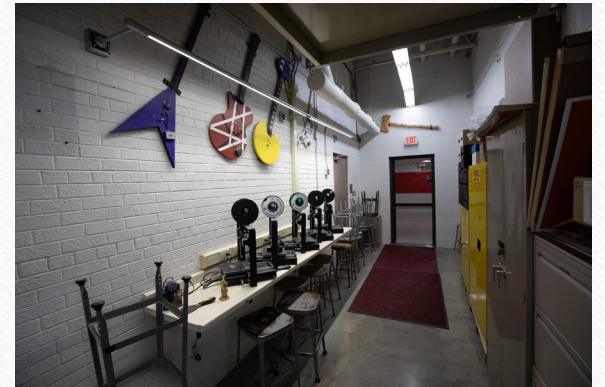
- We make a desk set. Pen holder, letter holder, letter opener.
- Cell phone holder.
  - Layout and design template on CAD.
  - Print and test with paper.
- Ice Scraper
- Projects are rough cut with bandsaw or scroll saw
- Glued with Weld-On 3 for Acrylics
- Sanded up to 220, then wet sanded up to 600 or 1000
- Finally buffed



# 3D Printing

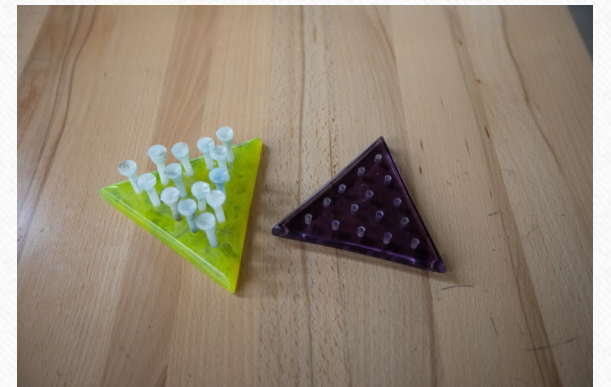
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- Most Technology and Engineering Departments have 3D Printing
- Use CAD software to design parts.
  - Key Chain – I have metal key chain part.
- We mostly use Monoprice lllP, only \$300 printer
  - We have 5 of these printers
  - We have one large 3 color 3D Systems printer



# Epoxy Molds

- Two part liquid mix that hardens and is workable.
- We use E-Z-Cast clear polyester resin. Pg. 54
- We normally do all pouring on one day when we can be outside.
- Has a pretty strong smell, needs proper PPE.
- Once dry, there is no smell.
- Can be mixed with color, transparent and opaque.
- We use normal sanders and hand sanding to finish.
- Original Tees purchased online, for bulk prices.
- Molds are very cheap, \$4 each. Or make them with vacuum former.





# Expandable Bead Mold

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- Polystyrene Expandable Beads pg. 43
- Beads expand and melt together around 205 degrees F.
- Molds cast around 50 dollars each.
- Inexpensive hot plate.
- Large pots I purchased from Goodwill.
- Rolling boil for around 15 minutes.
- Molds take paint very well, we use acrylic paint.
- Purchased molds slowly from year to year.



# Vacuum Forming

- I purchased Nichols Model 10-B Therm-O-Vac \$1399.00
- I use polystyrene sheets.
- I use a quarter sheet adapter to save money.
- Pink foam board insulation can be used to make the buck.
- We have a hot wire foam cutter, but students just prefer the bandsaw.
- The foam bucks can be sanded and formed by hand quickly.
- Can also make molds for epoxy.



# Injection Molds

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- Through a grant we were able to get an air powered injector. Pg. 54
  - About 2900 dollar grant through The Milwaukee Society of Plastics Engineering Education Foundation.
- Currently use it to make Tees for the epoxy mold game.
- Machining 2 students are currently designing molds they will CNC out.



# Thermal Screen Printing

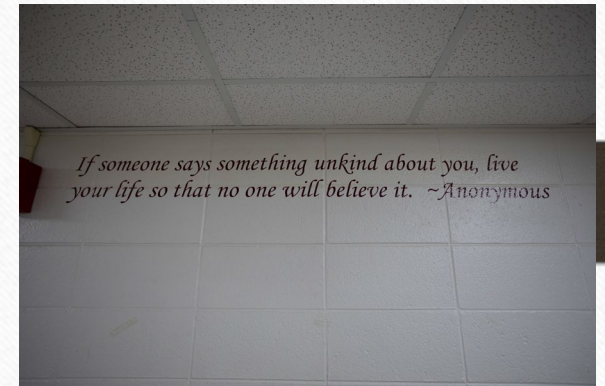
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- We use an old thermal imager – Seems to be at least 1500 dollars for similar today.
- Transfers a laser printed design to thermal screens
- Thermal screens then attached to frames
- Then typical screen printing process.
- We print on red rags for Engines class.
  - They can also print on something they bring in.



# Vinyl Decals

- We use a 12 Roland cutter, was a little of \$1200.
- Students use different CAD and design software to make their designs.
- I let them use 12 inches of vinyl and can pick what they put on it.
- We also have been doing lettering on the walls of classrooms and halls through out the school.
  - Teachers contact me, I send students to fulfill the requests.



# Pens

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- Mostly same as wood pens.
- Carbide tools last longer.
- Can wet sand and polish.
- Blanks
  - Pre-made
  - Built up from Acrylic
  - Poured from Epoxy
- Plastic drill bits



# Questions?

- Please take a IASCO catalog.

