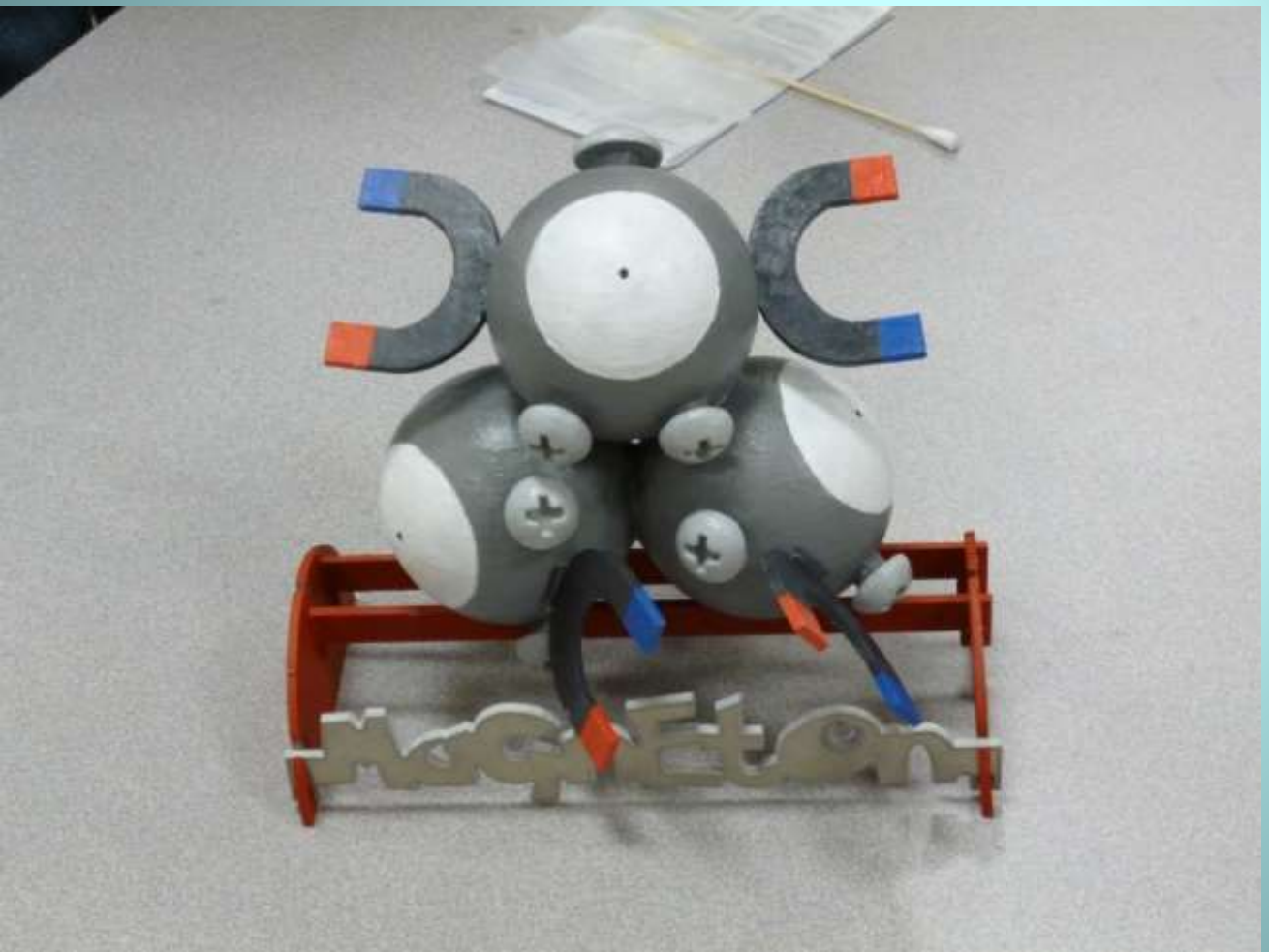
Project Magneton



Team Members:
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Pokemon created by Satoshi Tajiri; owned by Nintendo
image obtained from:
http://www.serebii.net/pokedex-bw/082.shtml

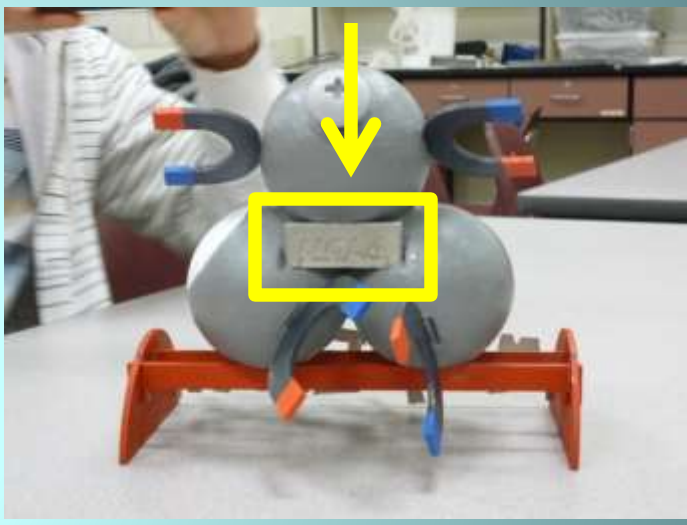
Motivation/Background

- Since everybody loves Pokemon, we almost immediately decided to construct one.
- What better to recreate than everyone's favorite magnet pokemon?
- Magneton is so much more appealing than that one electric mouse who stole Magneton's role as the mascot.
- We figured its associations with electricity and steel, which make sense in an engineering class, would warrant us some bonus points.

Components

spherical bodies (one piece)

UCLA stamp (used EDM on slab of aluminum formed by waterjet cutter)

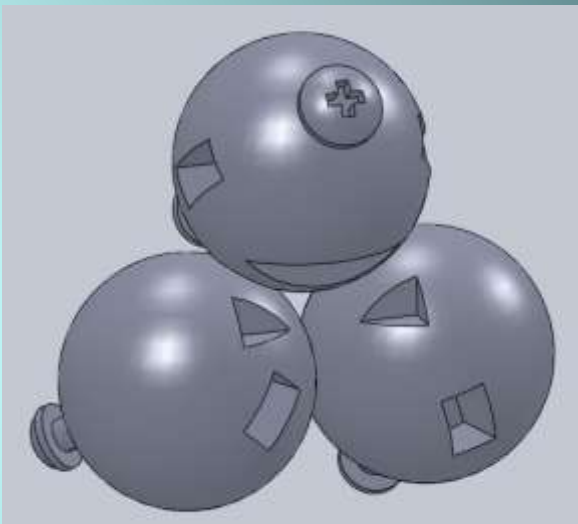


six magnets (formed by waterjet cutter)

stand

3D Printer- Spherical Bodies

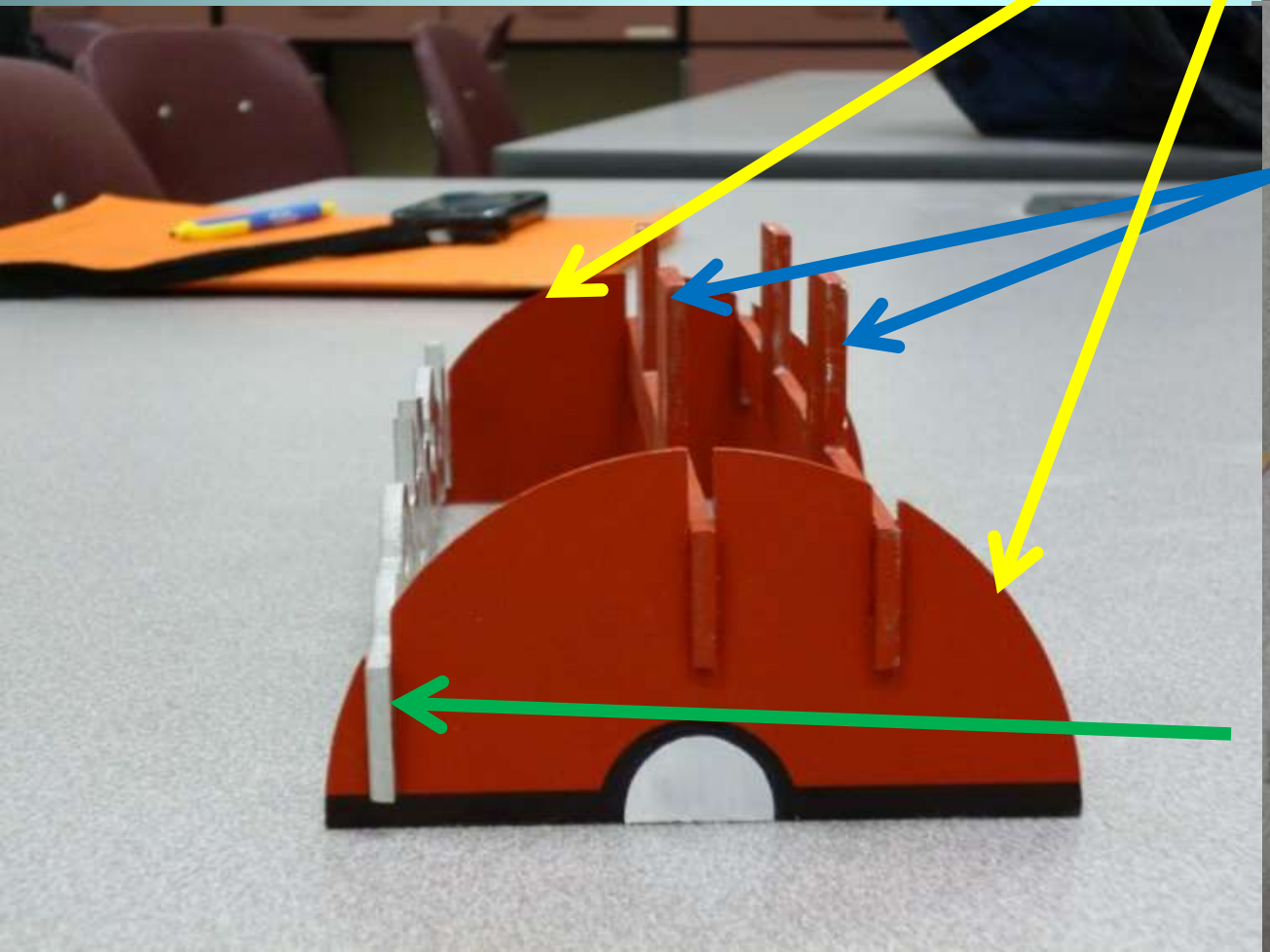
The three spheres were fabricated as one piece (including screws). Two holes in each sphere were reserved for magnet inserts.



Indents in the back were designed for the stamp to be placed within.

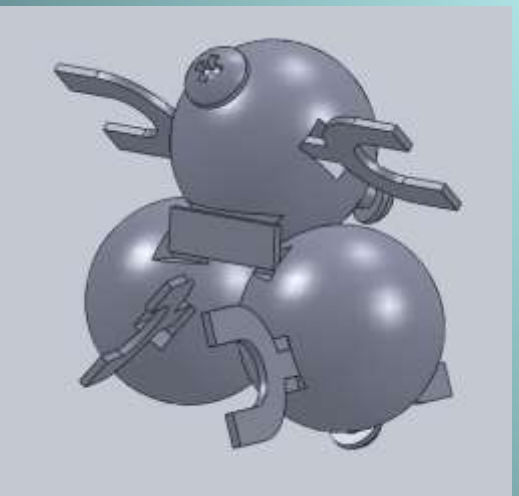
Holes on the bottom were designed for the stand to be inserted into.

Waterjet Cutter- Stand

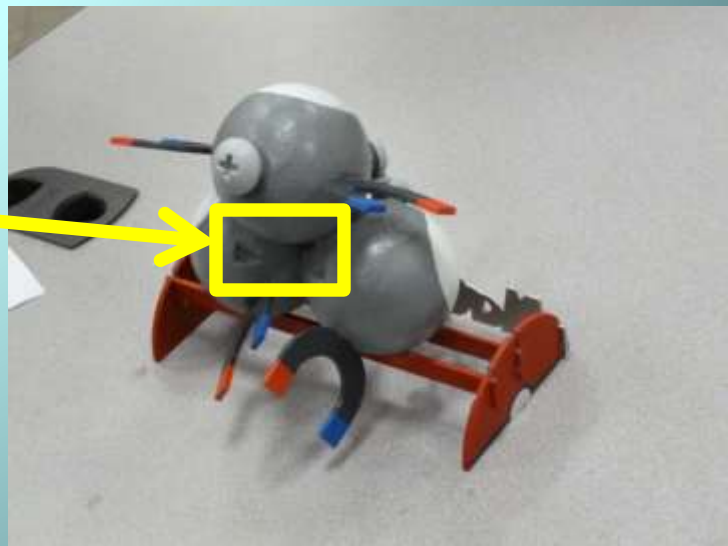


EDM

- Finding an area on Magneton's spherical bodies to apply a flat stamp on proved to be a challenge.
- We designed indents into the back of the spherical bodies for a rectangular slab of aluminum to fit inside.
- We used the EDM to apply the UCLA stamp on this aluminum slab.



indents

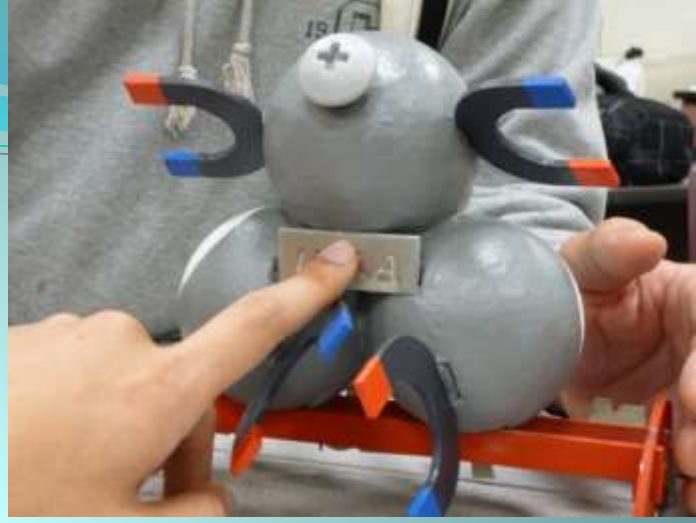


Painting/Assembly

apply primer to all parts to be painted

For the magnets, since the holes were too big, we applied multiple layers of tape over the part that stuck out and then just stuffed/squeezed it into the holes. Then we painted over the tape to cover it up.

apply paint over primed parts

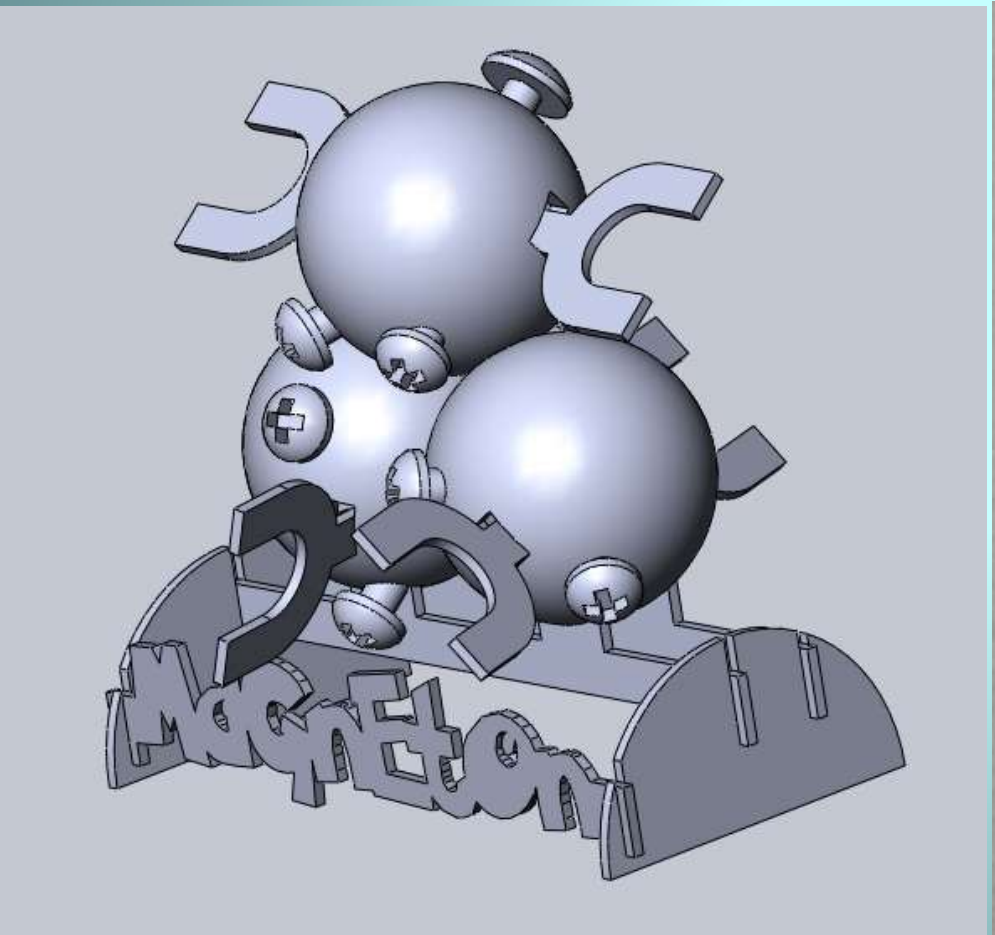


glue stamp between indents in the back

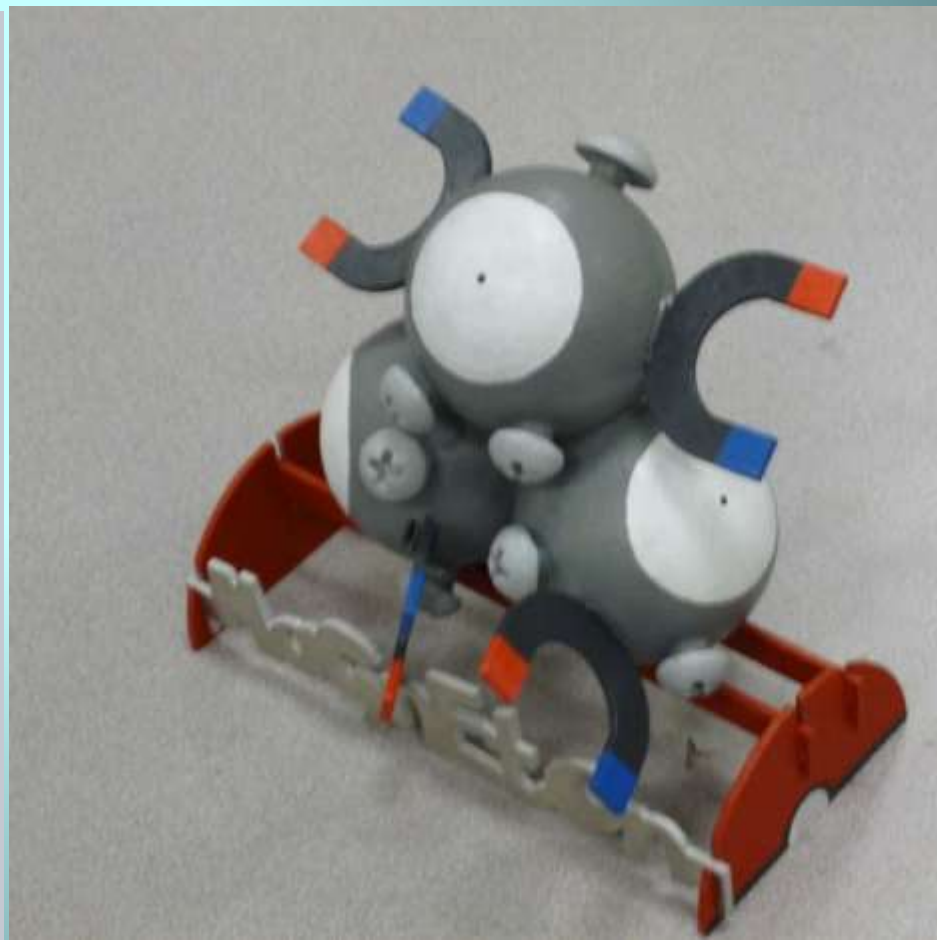
place spherical bodies onto stand (via inserts)

Finished Product

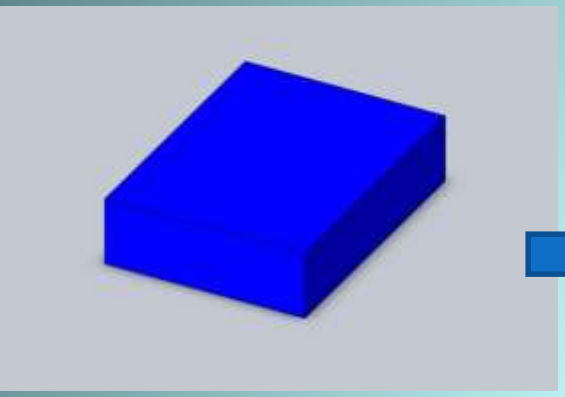
CAD



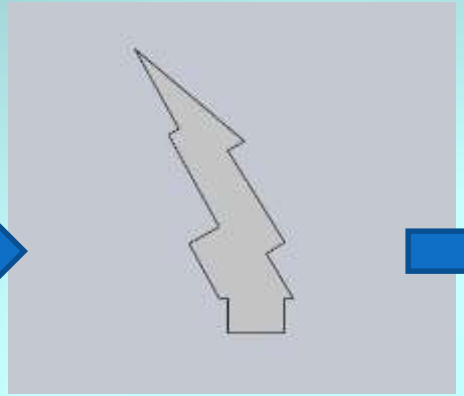
real life model



Process Flow for Hypothetical CNC Mill Part



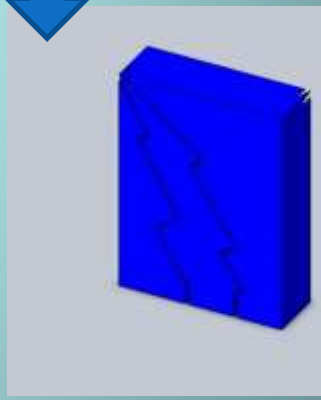
We are provided with one 3 x 4 x 1 inch wax block.



CAD Drawing

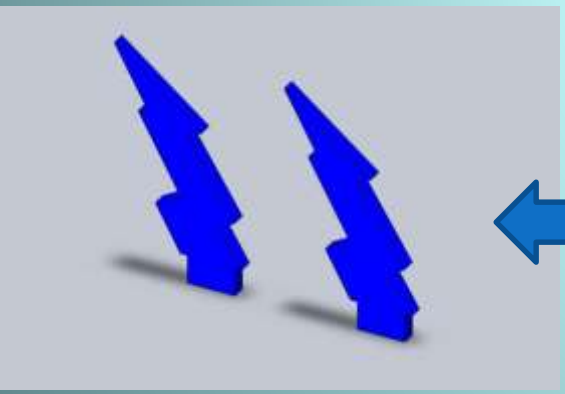
Set the CAM parameters:
- tool: 1/16 inch end mill
- depth of cut: ¼ inch
- rotational speed: 5000 rpm
- feed: 30 inches/minute
- pocket or contour: contour

Zero the x, y, and z dimensions



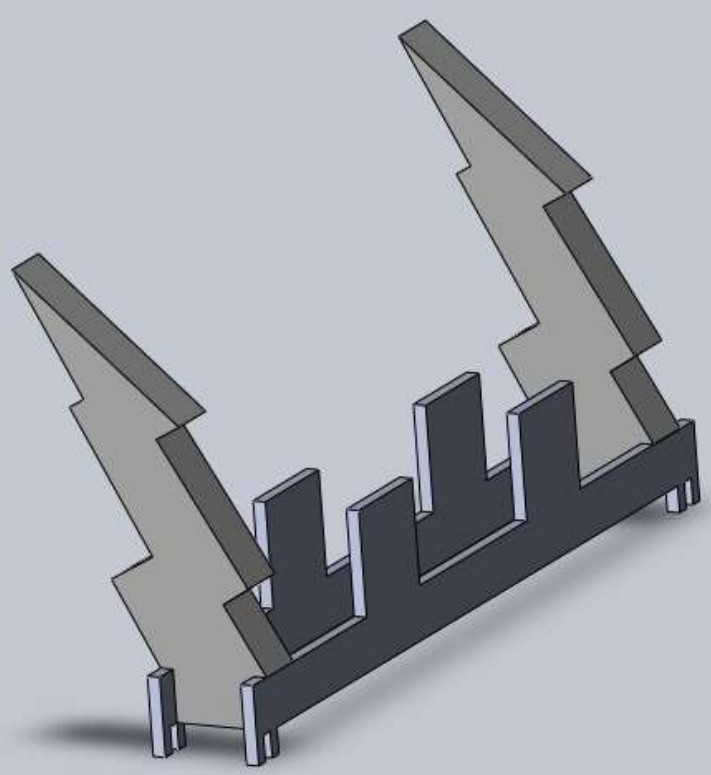
Etch ¼ inch thick lightning bolt onto 3 x 4 plane. Flip over to other side and perform a second etching.

Cut parallel to the 3 x 4 plane ¼ inch off along each side with a band saw. This results in two 3 x 4 x ¼ inch blocks with a lightning bolt etching. We can then push out the lightning bolt shapes out of each block to obtain our lightning bolts.

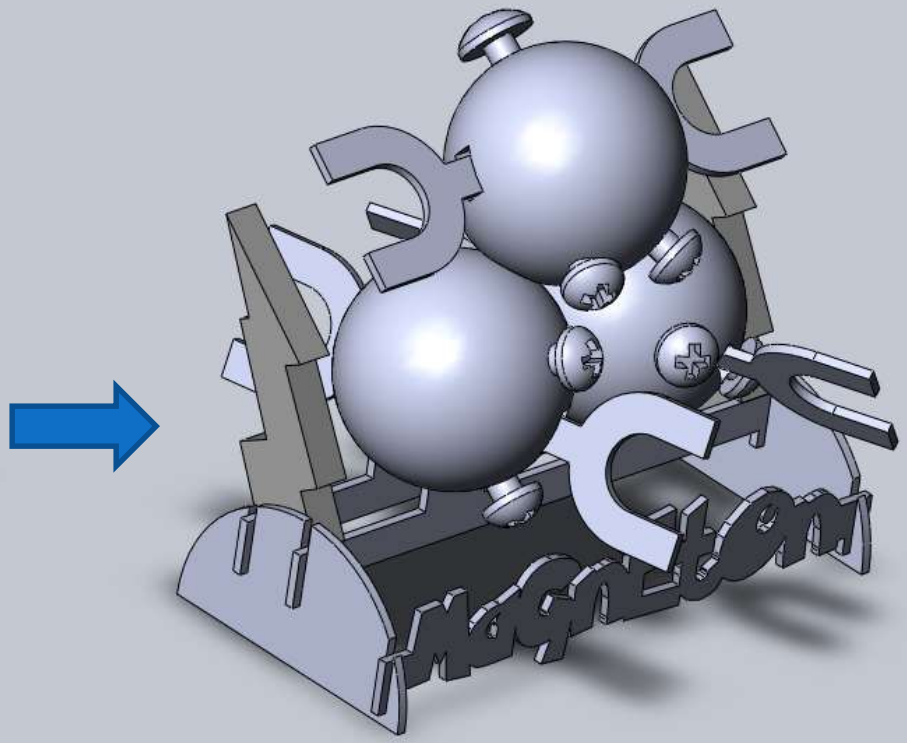


finished lightning bolts

Finished Product w/ Hypothetical CNC Mill Part



Fit onto stand and glue together



Final Assembly

Lessons Learned

- CAD:
  - resize dimensions to meet design constraints
- 3D Printer:
  - hollow parts provide complications
  - apply hardener evenly
- Waterjet Cutter:
  - conserve space on allotted aluminum sheet
- Painting/Assembly:
  - apply primer evenly

Questions?

Image obtained from: http://fc00.deviantart.net/fs22/f/2007/325/0/8/Pokemon__Confusion_by_Erk_kun.jpg