# Tetra Table

by **gabrieldunne** on October 13, 2014

**Table of Contents**

**Author:gabrieldunne** gabrieldunne
Gabriel is an interdisciplinary artist and designer.

## Intro: Tetra Table

Tabletop:

- Inner Triangles: **Mahogany**
- Inner Triangle Edges: **Purple Heart**
- Outer Middle Parallelograms: **Mahogany**
- 3x Hexagon Edge: **Walnut**
- Outer Octagon: **Red Oak**

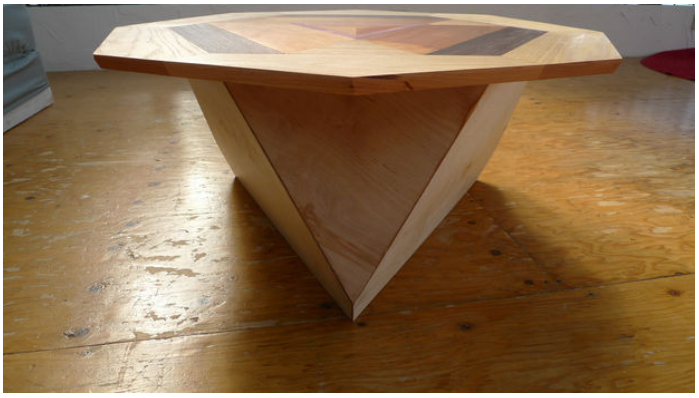
Table Base:

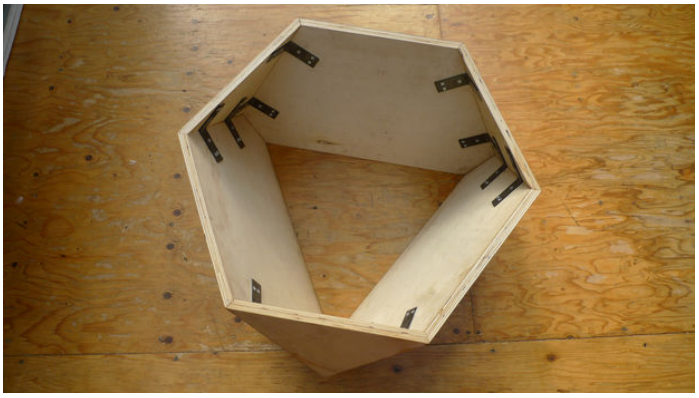
- 3/4" **Birch Ply**
- **1" Steel Bar** Custom Brackets

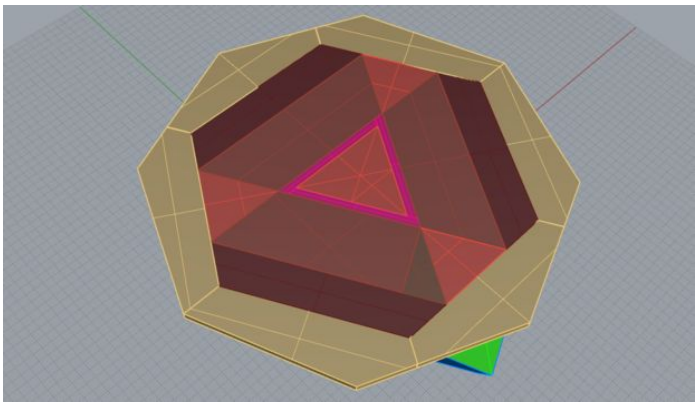
Designed in **Rhinoceros 3D**

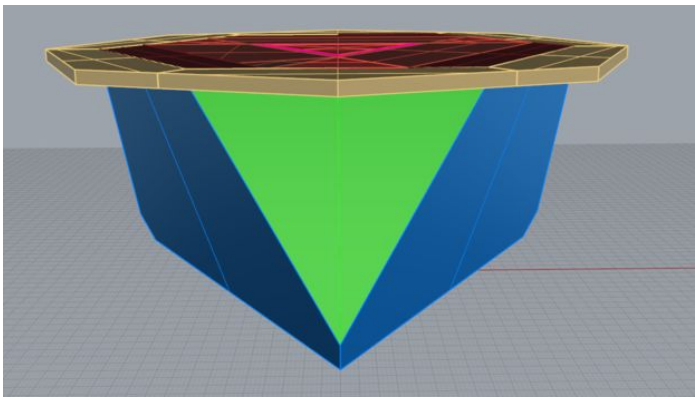
The concept for this tabletop came from a floor design for a geodesic dome. I wanted to geometrically transition from 3 (the triangle in the middle), to 8 (the octagon on the outside). I started by cutting shapes from scrap materials, and the project transformed into the following table design with a complimentary base. I consider the base a prototype, as I'd love to redo it in a nicer wood someday. If I were to build a similar design again, I would definitely consider attaching the table-top pieces with biscuits for added strength.

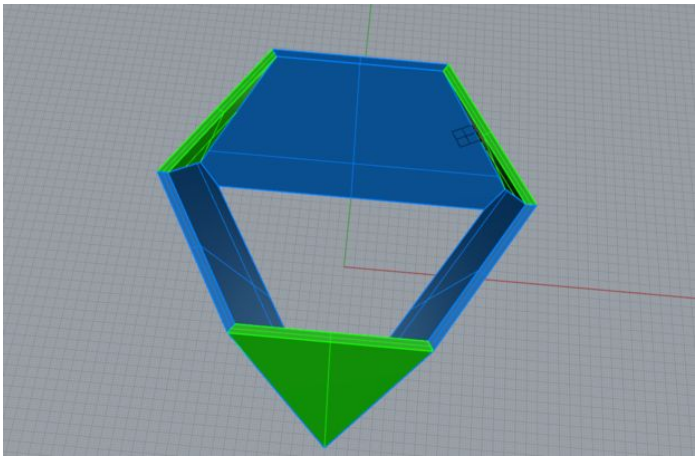
Enjoy!





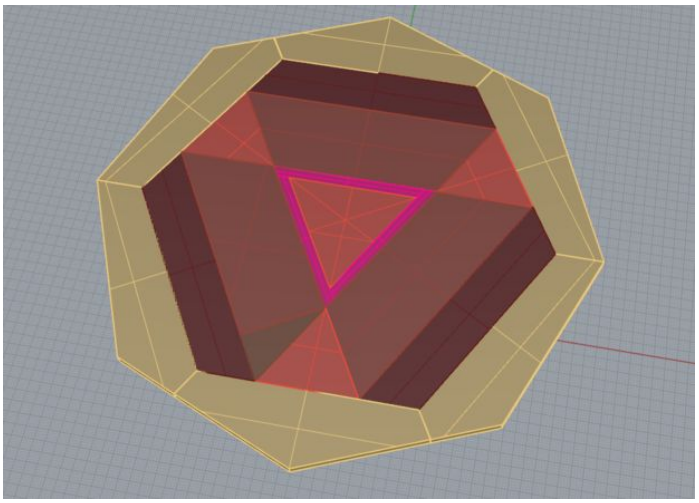






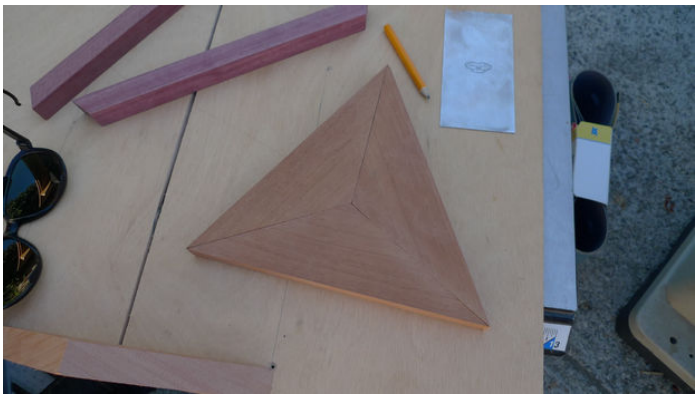
## Step 1: Table Top Design

No fancy code or algorithms used. The geometry is all designed by hand, using Rhino's snapping tools.



## Step 2: Mahogany Interior Triangles

Cut w/Table Saw Jig



## Step 3: Purple Heart Triangle Edge and Mahogany Pieces

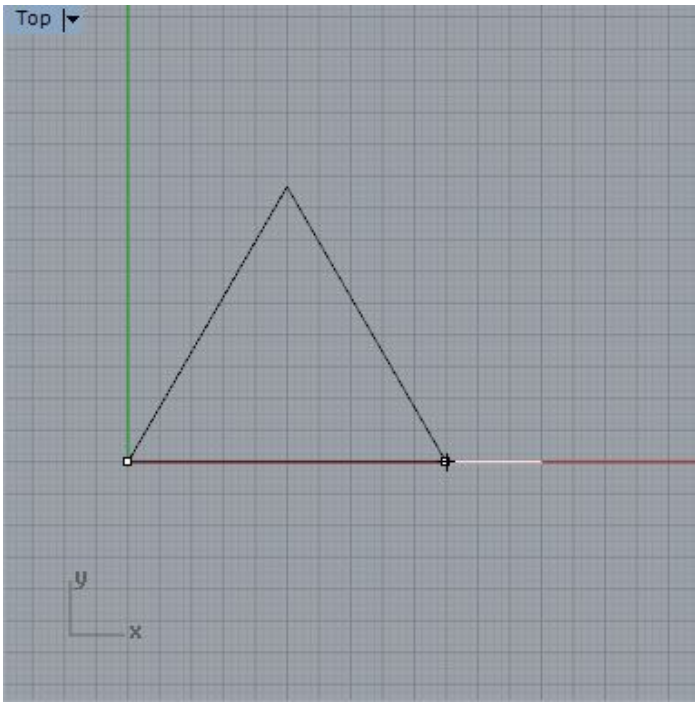
Cut w/Table Saw Jig

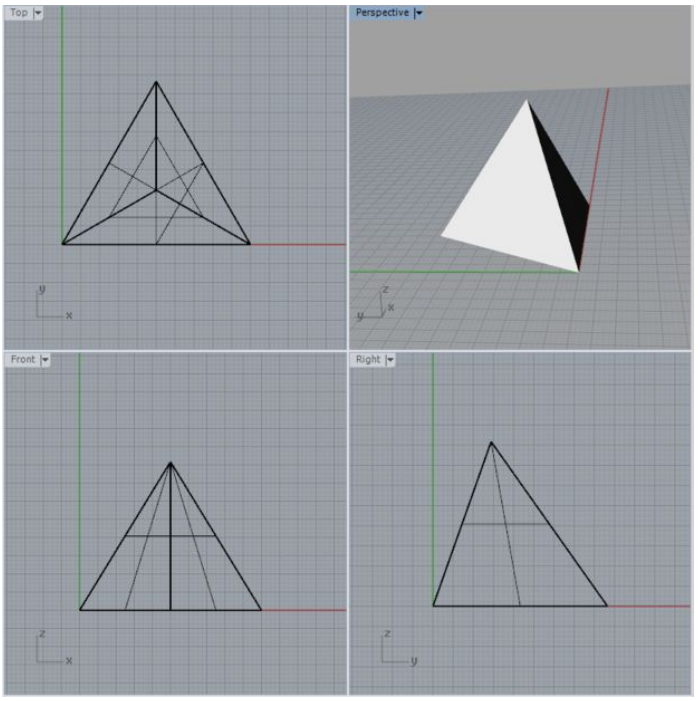
## Step 4: Ratchet Strap for Setting/Gluing.

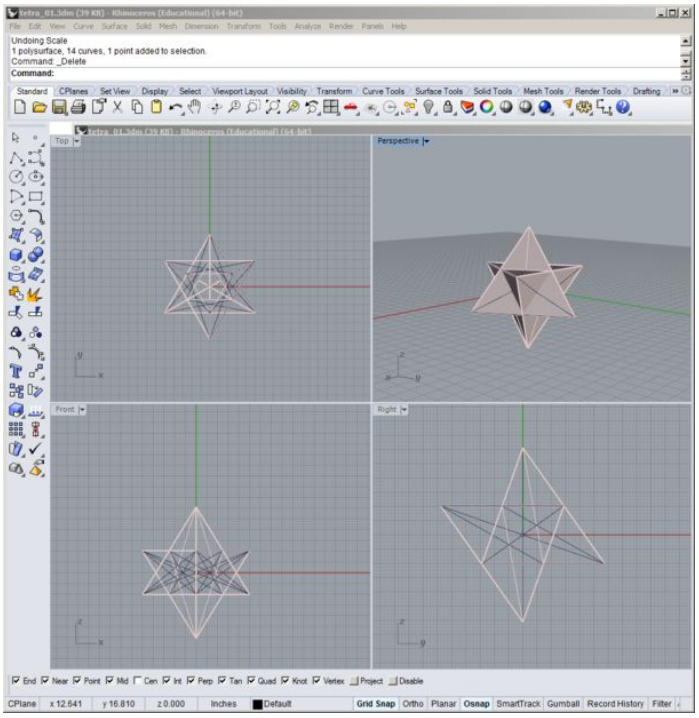
## Step 5: Table Base Design

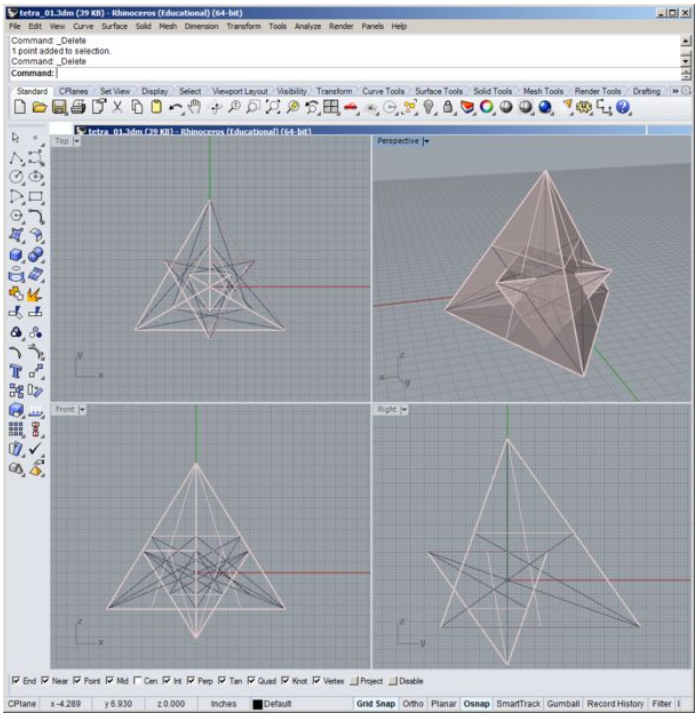
Truncated Tetrahedron

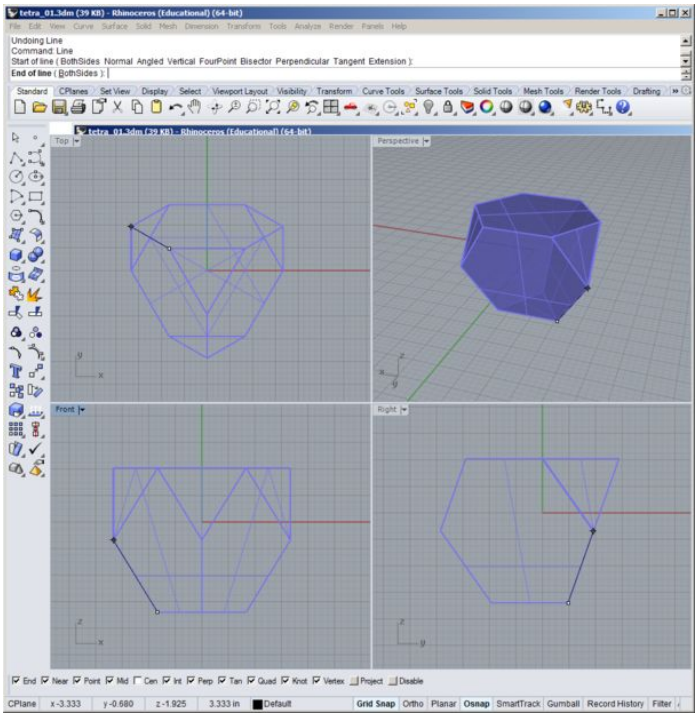
Created by intersecting two tetrahedrons (3-sided pyramids), and removing the bottom with a boolean plane.

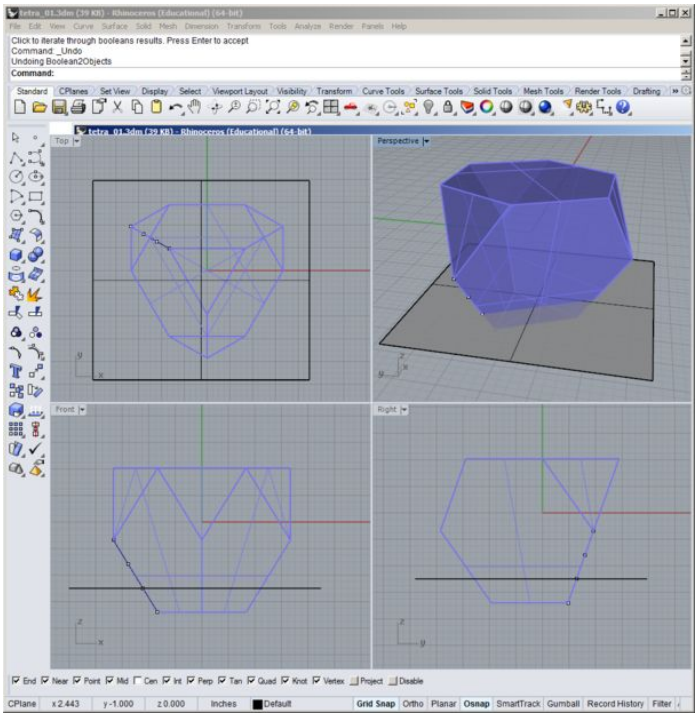

Top
y
x

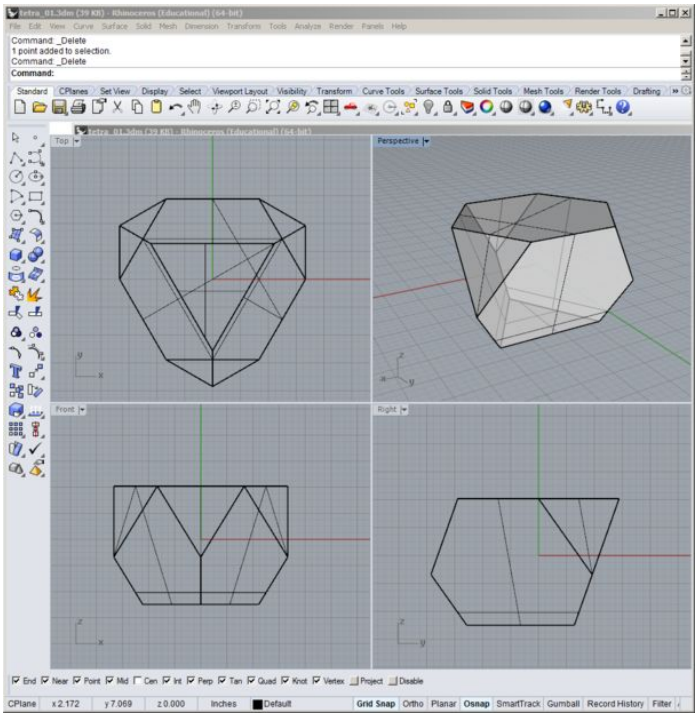

Top
Perspective
Front
Right


Undoing Scale
1 polysurface, 14 curves, 1 point added to selection.
Command: _Delete
Command:
Top
Perspective
Front
Right


Command: _Delete
1 point added to selection.
Command: _Delete
Command:
Top
Perspective
Front
Right

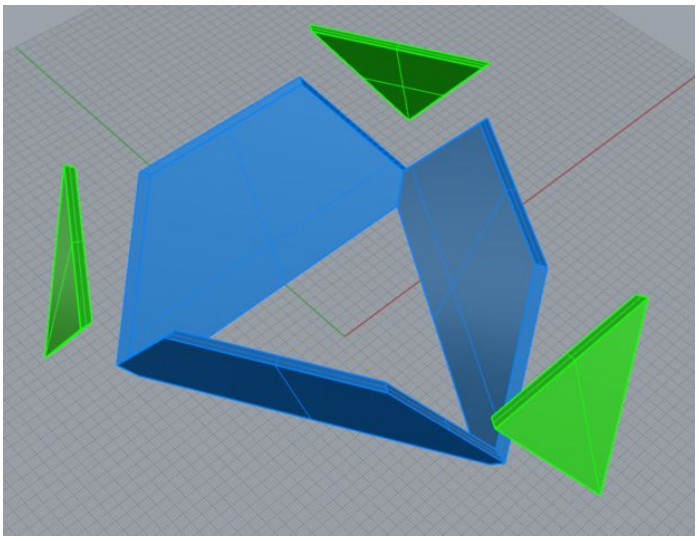


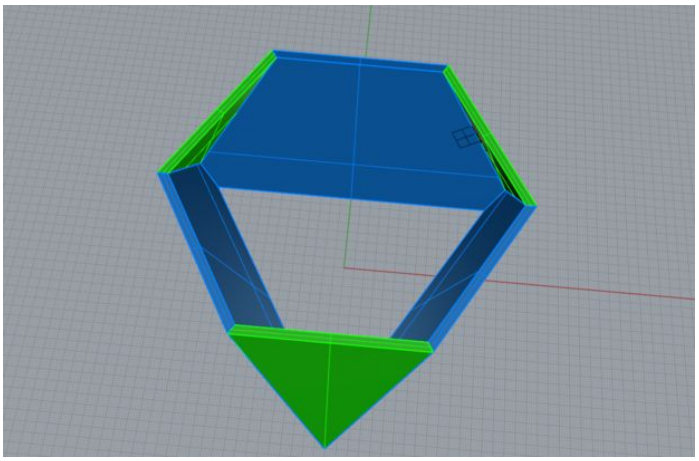


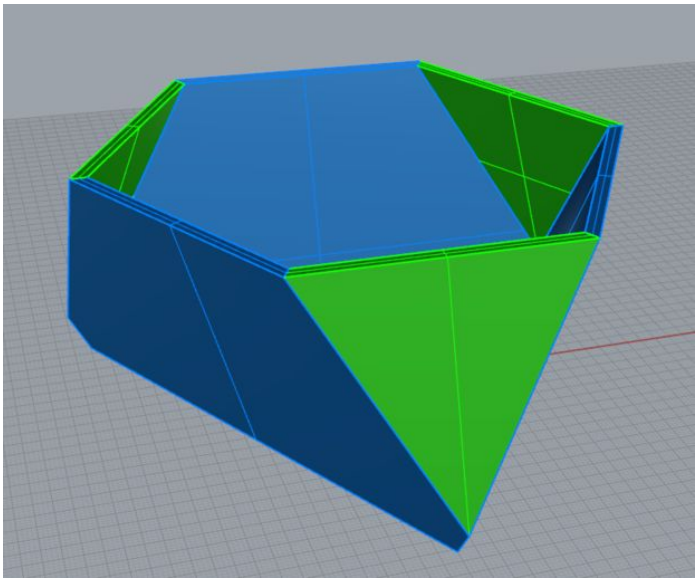


## Step 6: Adding Thickness

Using the 'extrude' tool, I thickened the pieces.



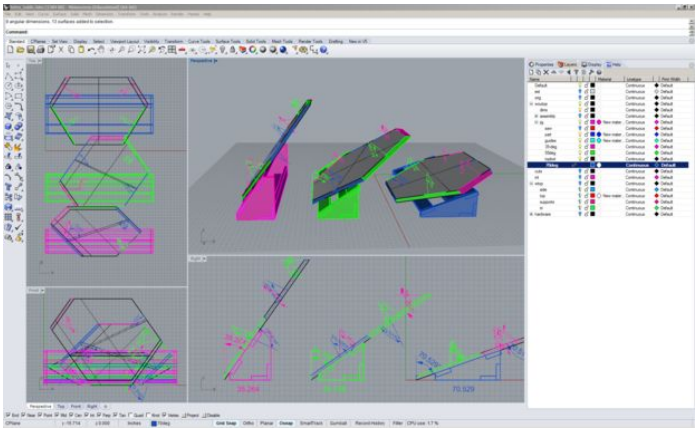




## Step 7: Tablesaw Jig Design for Mitre Cuts

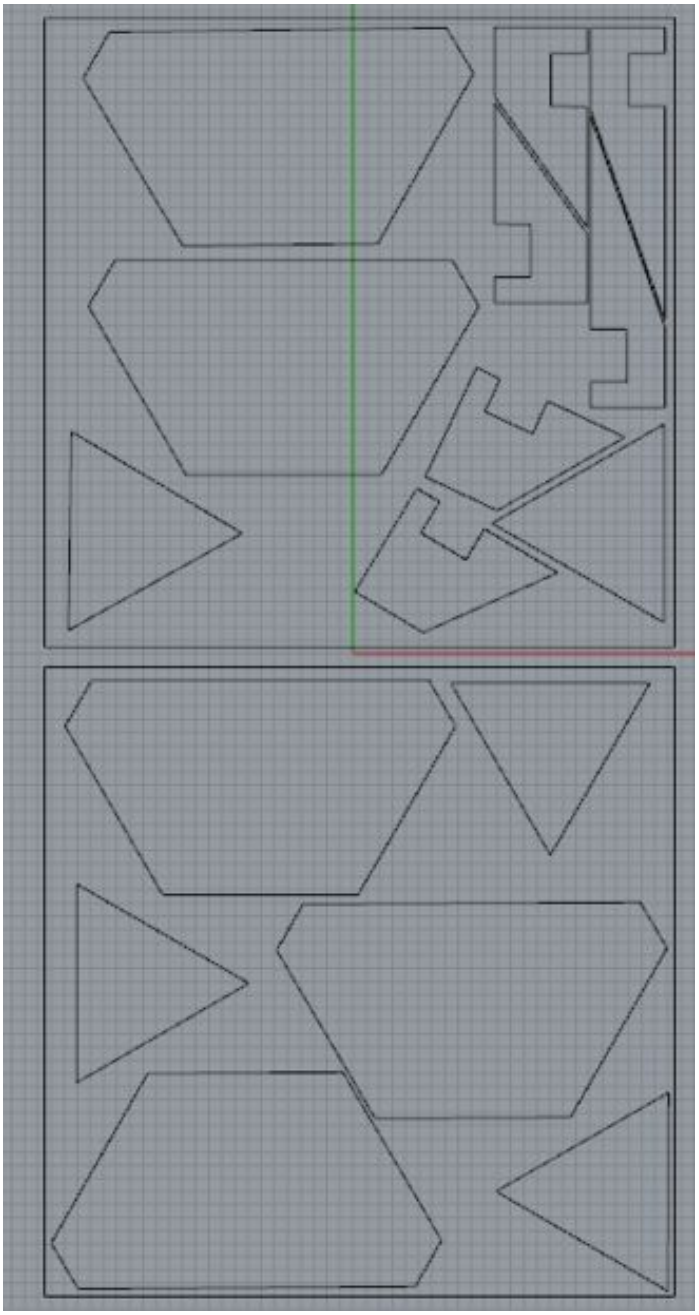
I measured the angles between the pieces with the Angle tool, and designed some mitre jigs explicitly for the form. I aligned the mitre-edge to the vertical table saw blade, and then engineered the jig to support the workpiece with clamps as it gets cut.

I could have also utilized the mitre-angle of the table saw, but it's more precise and less confusing to leave the blade at a vertical 90 deg.



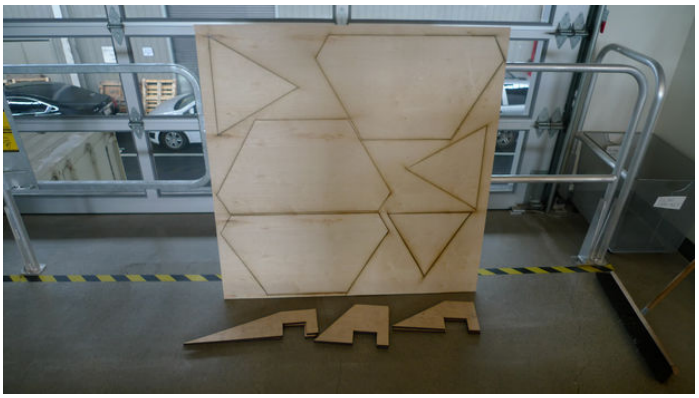
## Step 8: Cut File

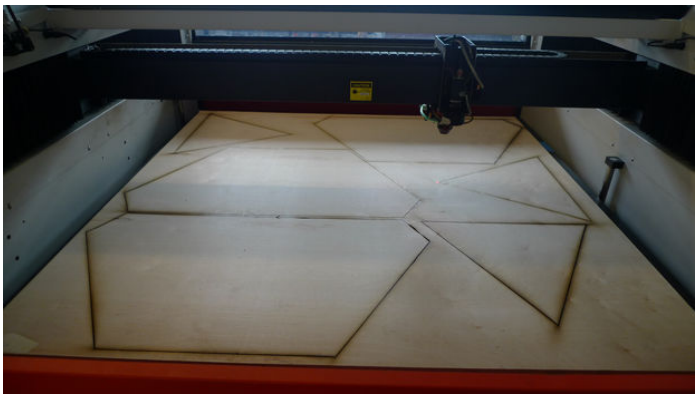
W/Jigs included



## Step 9: Laser Cut Forms and Jig Pieces from 3/4" Birch

Using the Metabeam at Pier9, cut from high quality 3/4" ply.





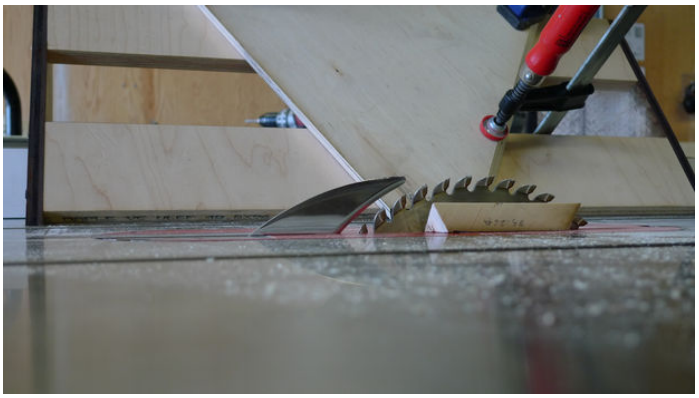
## Step 10: Sanding Laser-Burnt Edges Off

## Step 11: Jig Assembly

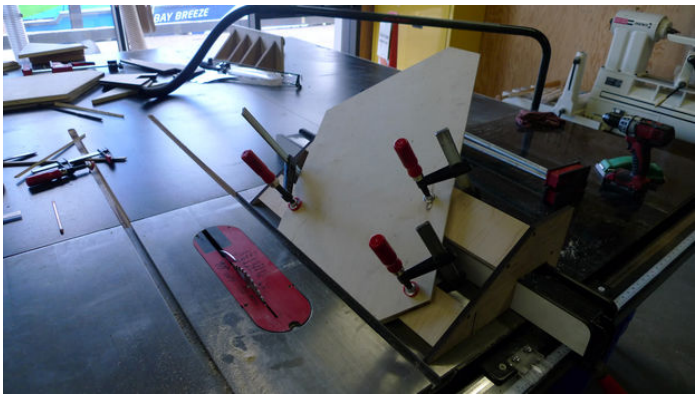
Cross members made from 1/2" ply.

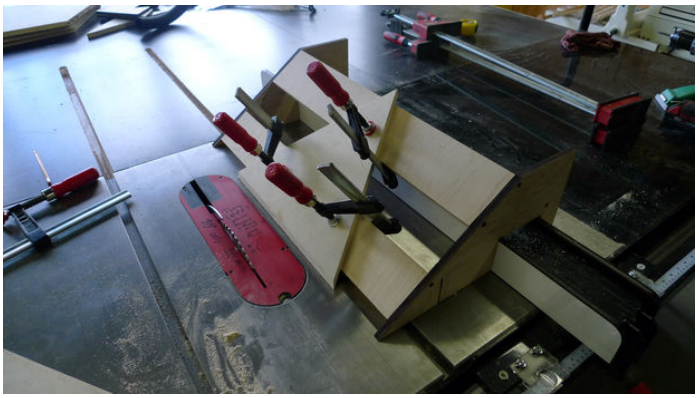
## Step 12: Cut Mitres With Table Saw Jigs

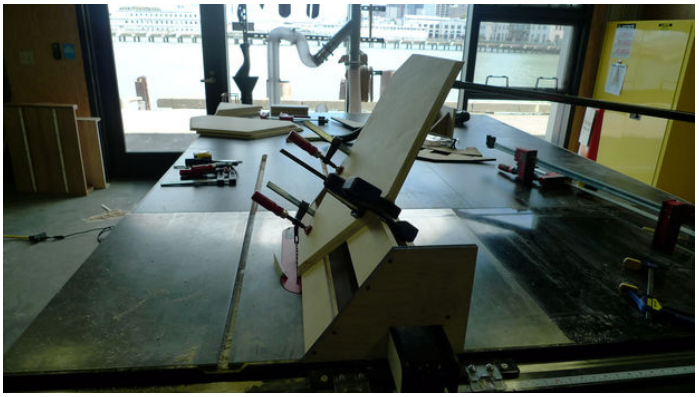
I attached each piece to the jig after I labeled each edge so I would stay organized. I pushed each jig through the saw by hand after attaching the workpiece to the jig with clamps.




70° only

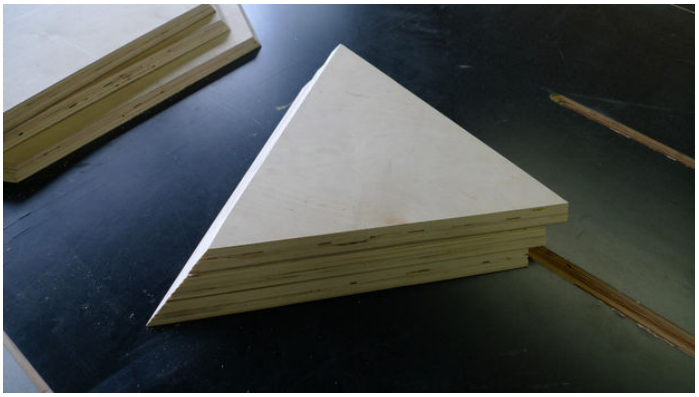

BAY BREEZE

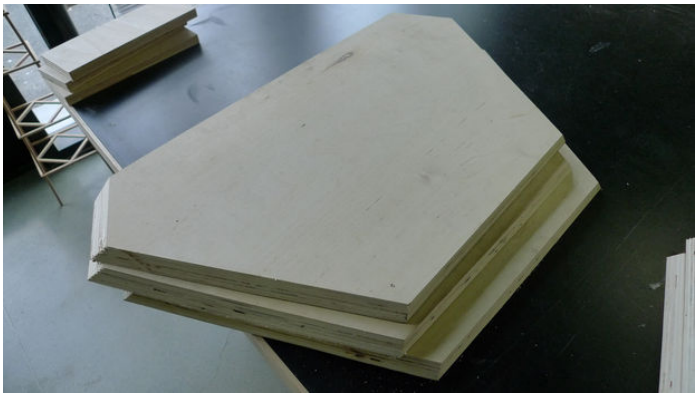


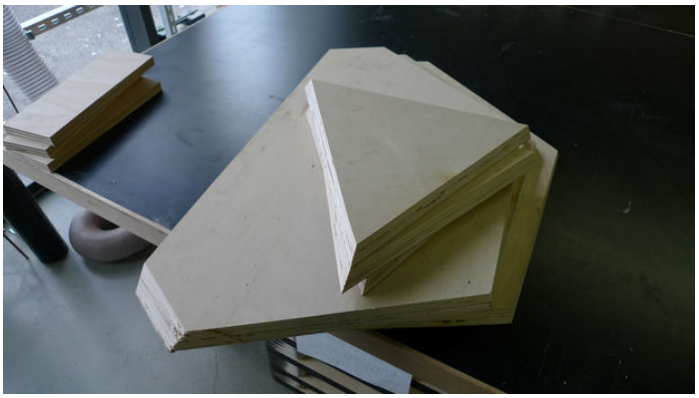


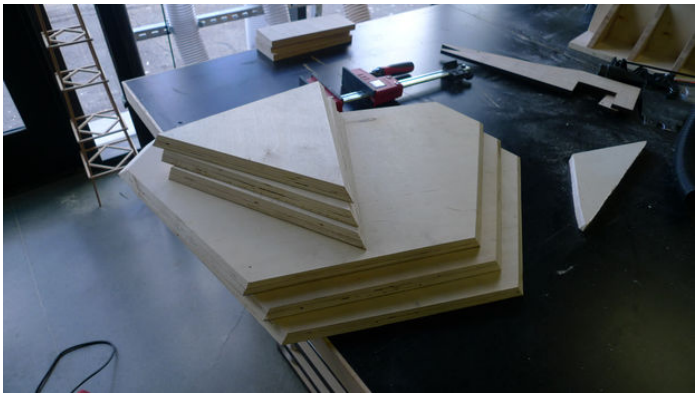
## Step 13: Finished Mitre Cuts

Fresh cuts



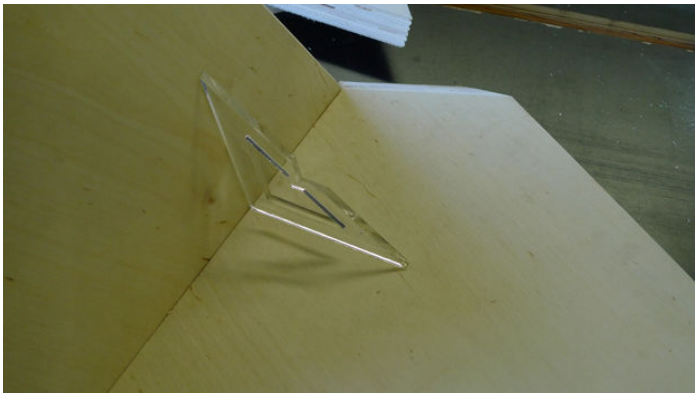






## Step 14: Measure Interior Angle with Laser-Cut Angle Template

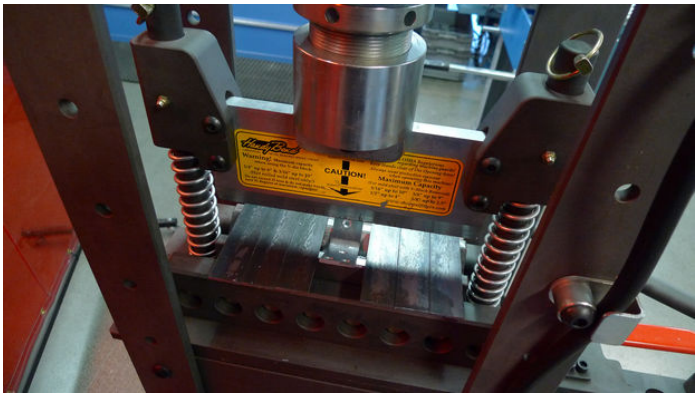
Angle calculated from CAD file, laser cut on an Epilog laser cutter at Pier9. There is only one angle to measure, which makes it easy.

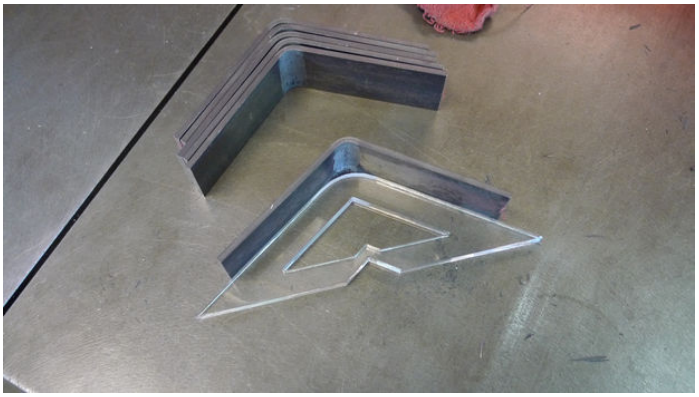


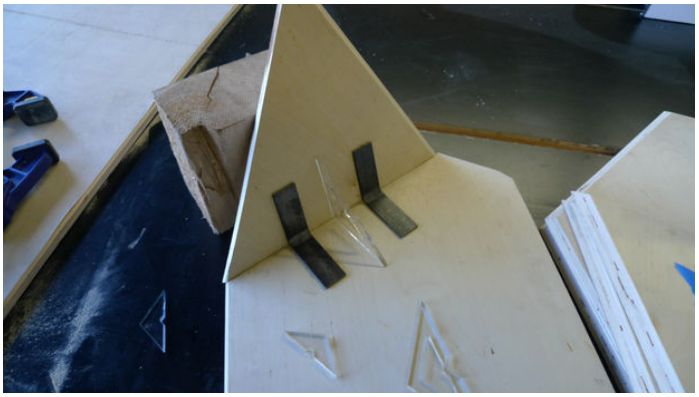
## Step 15: Cutting, Breaking/Bending

Using the laser-cut angle template, I used the metal break to match the angle I needed.

Since the form is a tetrahedron, all the interior angles are identical.





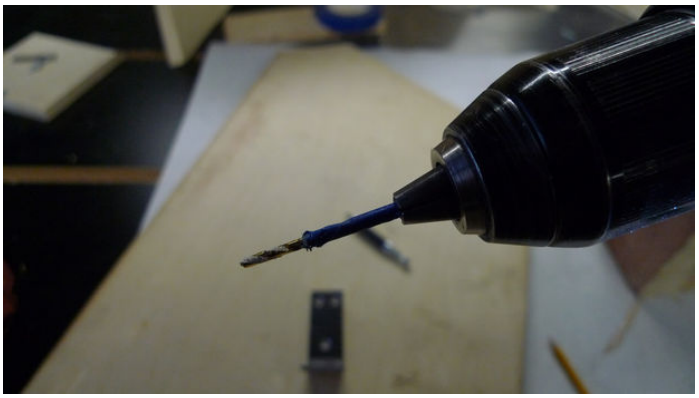


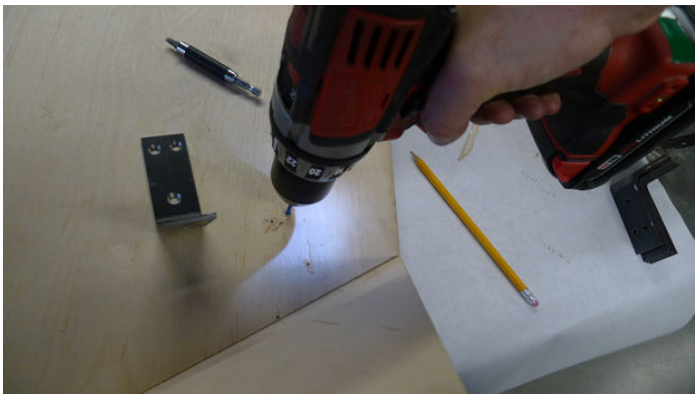
## Step 16: Drill Holes, Countersink Brackets

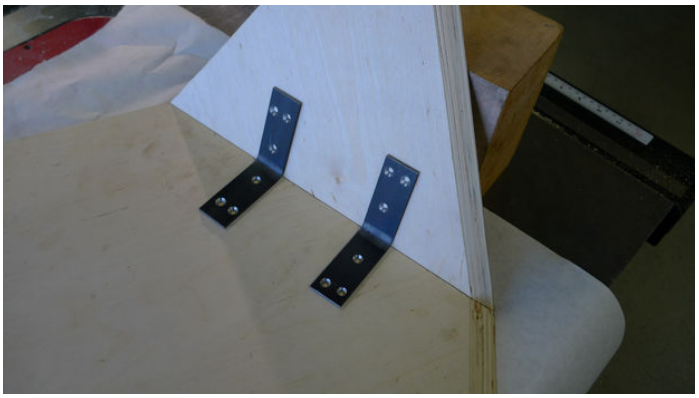
In the metal shop at Pier9

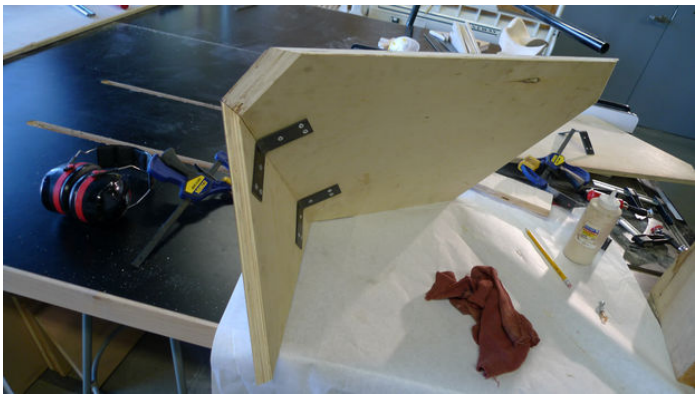
## Step 17: Pre-drill holes, and Attach Brackets w/Wood Screws

A little piece of tape on the drill bit keeps from plunging too far.



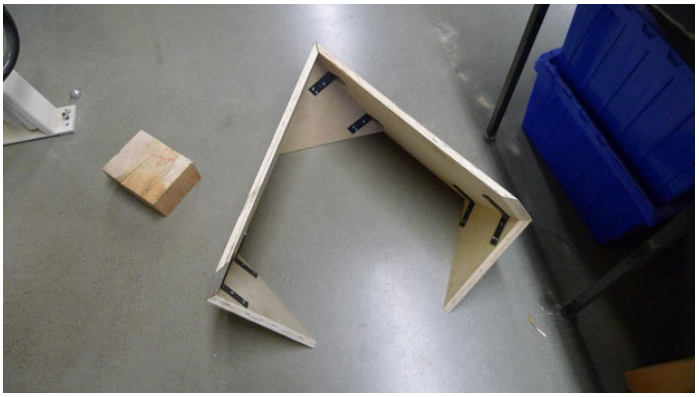


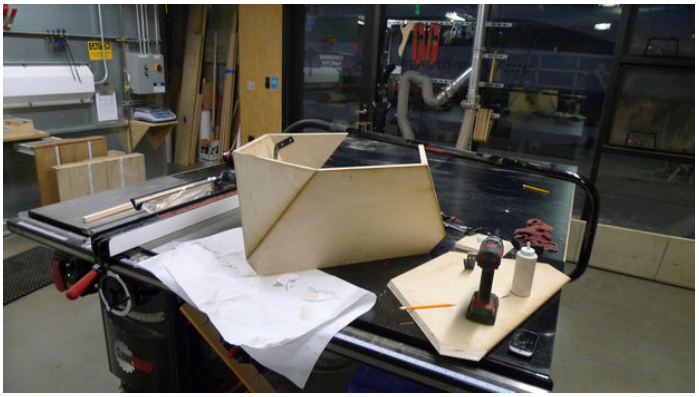


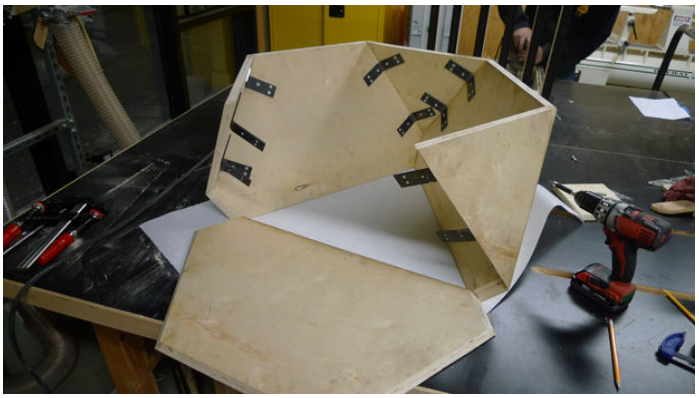


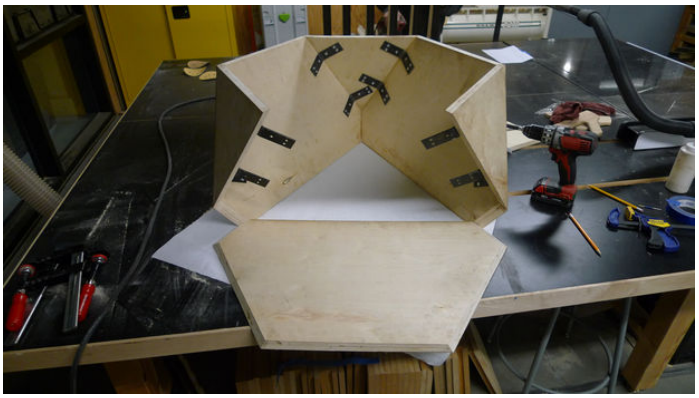
## Step 18: Bracketed Panel Assembly

I loved this part. It was satisfying knowing that I got the mitre cuts right.

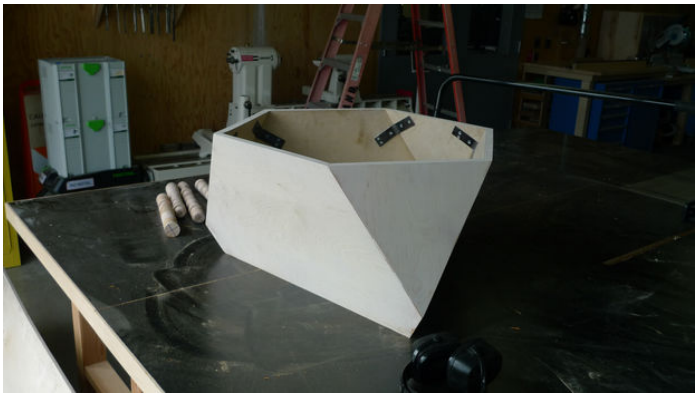








## Step 19: Base Assembly Finished



## Step 20: Sanding Down Tabletop

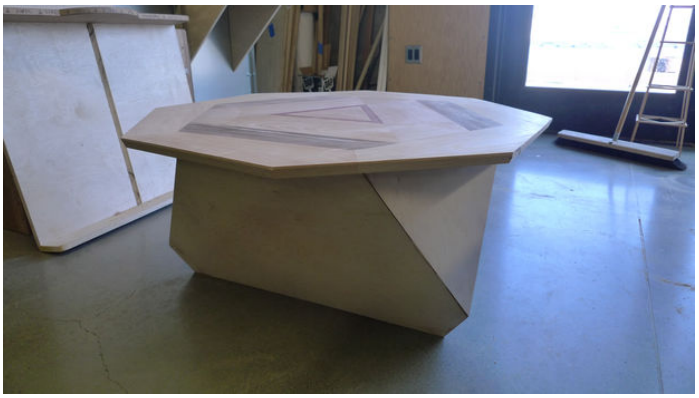
Lots of dust.

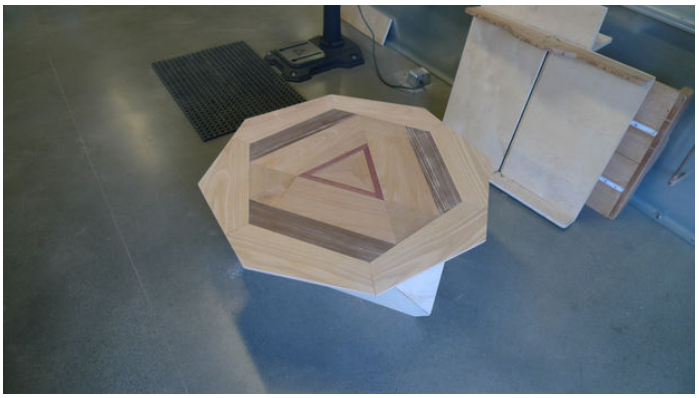
## Step 21: Mitre Tabletop Edges

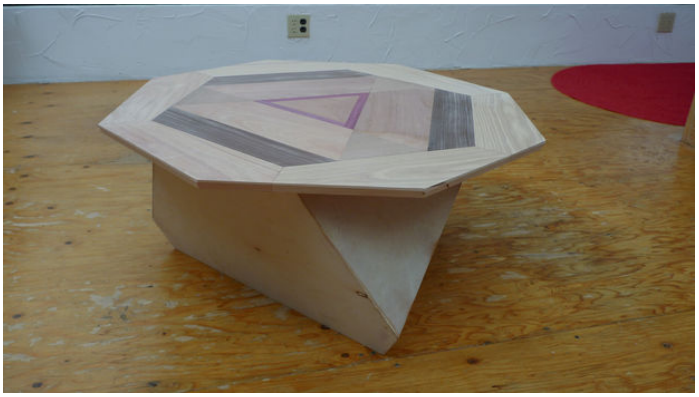
One last finishing move.

## Step 22: Assembly

Not Pictured: I added small walnut feet on the underside of the tabletop to keep it from shifting around.





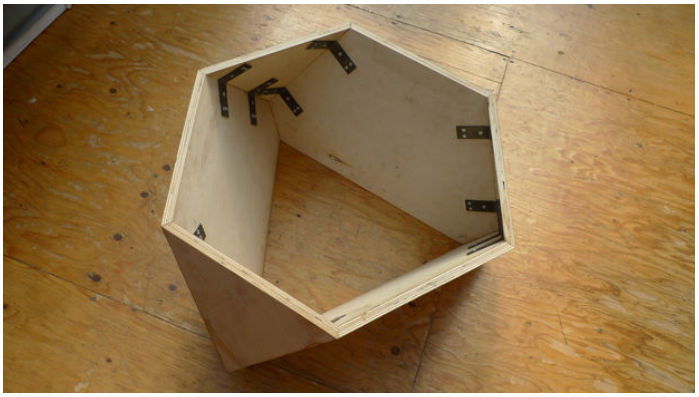


## Step 23: Finishing w/Beeswax

Non-toxic, orange oil and beeswax.


## Step 24: Complete

Thanks for looking!



## Related Instructables

**Variable-width mitre box** by timmolderez

**Easy and Precise Table Saw Sled** by domino88

**Retro Shadow Box with Splined Mitres** by s_scotti

**Workshop portable work station** by tclamp

**Expanded Mitre Fence with Flip Stop** (video) by savvas_papasavva

**Circular Saw Mitre Box** by RandomIdeaMan

## Comments

**2 comments** **Add Comment**

**tomatoskins** says:
Wow! That turned out great! I love seeing beautiful wood pieces like this!

Oct 13, 2014. 7:28 PM **REPLY**

**gabrieldunne** says:
Thanks!

Oct 13, 2014. 7:42 PM **REPLY**