

# Floating Chair

**Alex Sammulu**

# Problem Definition: floating chair

## Primary Functionality:

- Holds itself with tension
- Securely holds someone's weight

## Constraints:

- **Size:** must be big enough to hold someone
- **Weight:** must be durable but also not that heavy
- **Improv mat:** could start with popsicle sticks

## Secondary Functionality:

- Easy to move around/light weight
- Easy to set up
- One to two people at once

# Floating chair diagram



Leverage to support itself

tension

# Tensegrity (Floating) Chair

## Overview:

- it's close to the design that I want to do
- It's simple

## Pros:

- its half of the size
- Simple design

## Cons:

- A lot smaller
- It's not that strong

## Takeaways:

- The concept of the design
- The seat shape



# Floating chair #2

## Takeaways:

- It's similar to the design that I want to do
- It's a good prototype

## Pros:

- It's a simpler design of what I want to do
- It's a go starting point

## Cons:

- This won't support that much weight
- This won't support that much weight

## Takeaways:

- Maybe the design of this
- The structure



# Floating chair #3

## Overview:

- This is the design that I want to do

## Pros:

- This is wide and would be able to hold a lot of weight
- Very sturdy

## Cons:

- It would take awhile to build this chair
- It would cost a lot to make this

## Takeaways:

- A lot of support on each corner and in the middle
- A lot of the designs I've seen use this triangle shape



# Takeaway summary / Thoughts

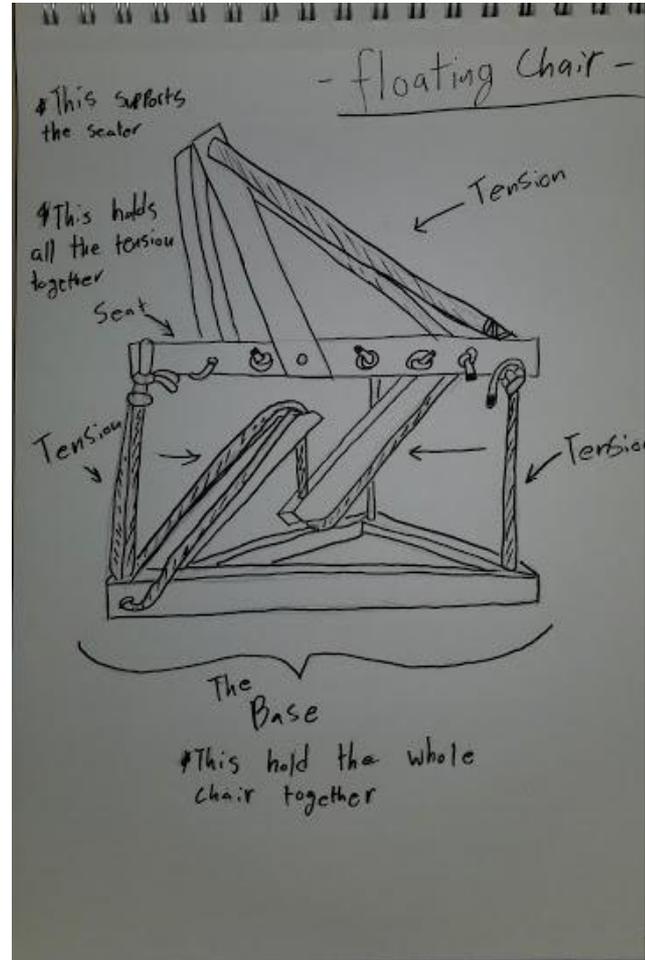
- The building process won't be that easy
- There's a lot of similar building designs
- Rope is the primary thing that holds everything together
- Need to figure out what the first prototype will be made of
- Need to find the right tools
  - and how much it would cost to make this\
- There's a lot of instructions/videos on how to build a floating chair

# Ideate & Design

By Alex Sammulu

## Key Features

This is what my end goal would want to look like by the end of this class.



# Prototype Design

## Prototype Goal:

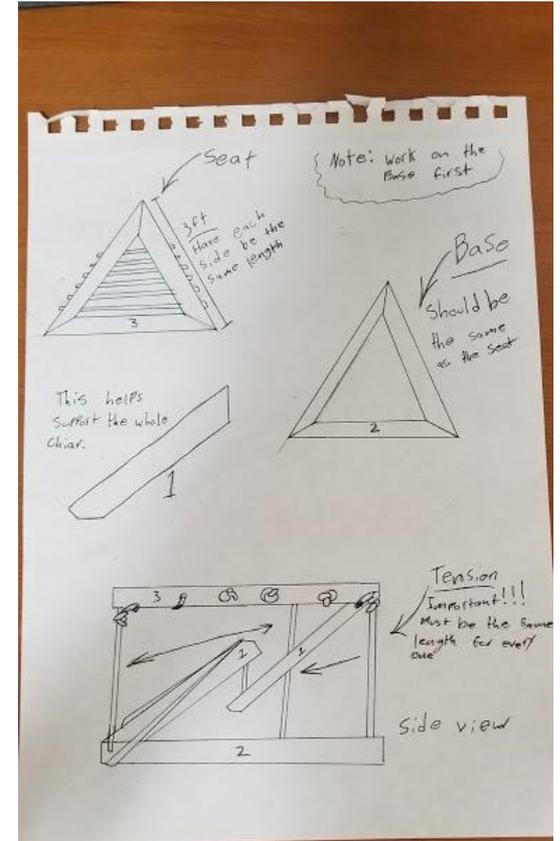
- Make smaller replica of my main design
- Try and find better or newer ways of build this chair
- Make multiple to see if i could make each one better

## Approach:

- Start of small like using cardboard and string for my prototype

## Materials:

- Cardboard and string
- Then move my way up in materials



# Build, Test, Evaluate Prototype

3.17.21

# Prototype Build

## ***Approach:***

- Small prototype made from cardboard
- Small but sturdy
- Wide to hold big objects

## ***Something I liked:***

- It turned out the way I wanted it to
- It works
- Its supports small objects

## ***Something I will not do again:***

- Everything work out well so there's nothing that I wouldn't do again



# Prototype Test

## ***Test objective:***

- To hold objects ( big or small)
- To hold itself up with tension

## ***Test method:***

- Put light objects first then work my way up with weight
- See how much it could hold before falling over

## ***Test criteria for success:***

- It holds the object I put on it
- It doesn't fall over when in use



# Phase 1 Prototype Evaluation

## *Aspects of my prototype that I like:*

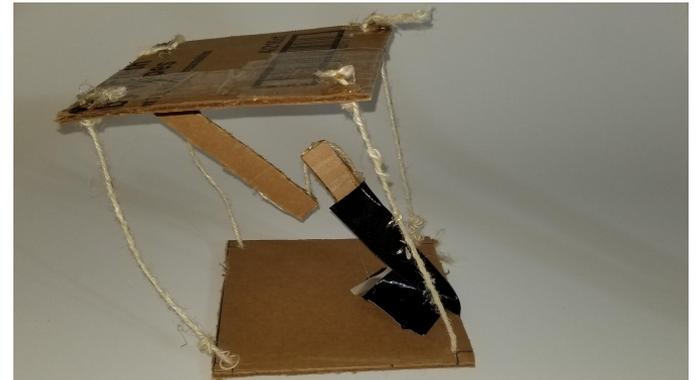
- I like how it could hold small objects
- It could stand up on its own
- It turned out the way I wanted to

## *Aspects of my prototype that I did not like:*

- It became uneven when I put everything together
- Everytime I tried fixing the string the other side would become uneven

## *Improvements for the next iteration*

- Be Careful when putting everything together
- Make sure everything is even before assembly



# Rough Draft

By: Alex Sammulu

# Rough Draft Design

## Changes:

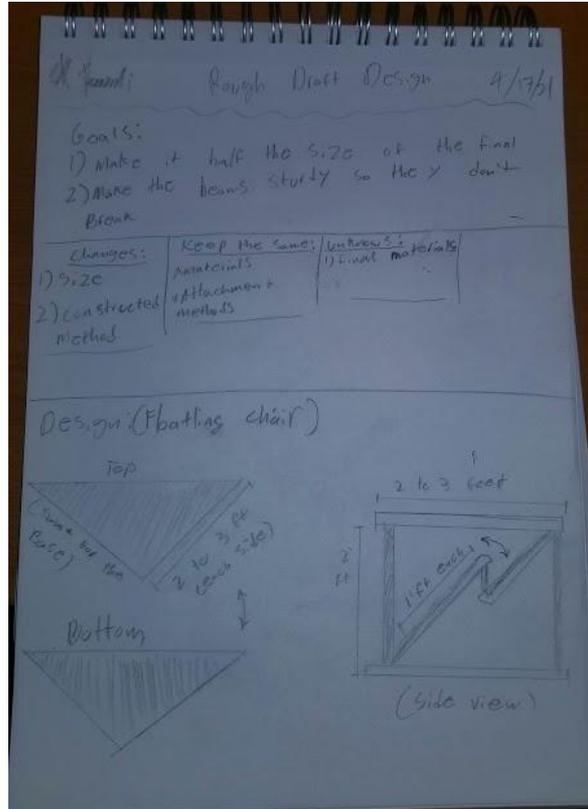
- 1) Size
- 2) Construction method

## Keep the Same:

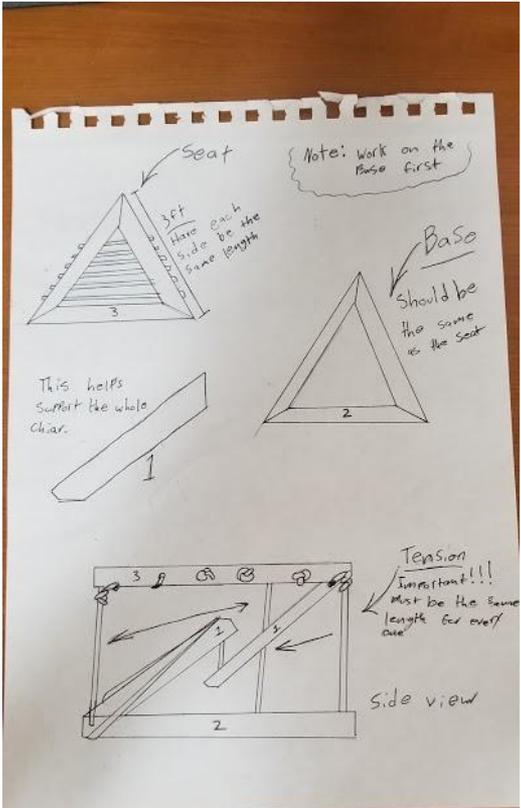
- 1) Materials
- 2) Attachment method

## Unknowns:

- 1) Final use of materials



# Rough Draft Design



# Rough Draft Build

## ***Approach:***

- Get a sturdy structure
- Have multiple layers so its stronger
- Have everything symmetrical

## ***Something I liked:***

- How the end result looked
- It wasn't was challenging to put everything together

## ***Something I will not do again:***

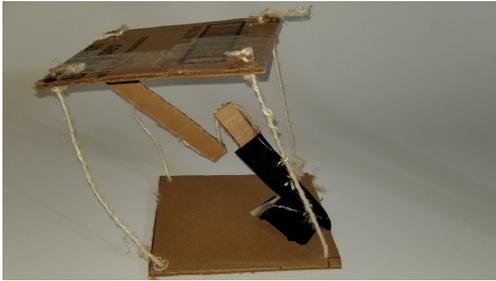
- Rush through cutting everything
- Make sure everything isn't uneven

# Floating Chair Final Build

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# Design

-My Final design turned out to be a table/stool instead of a chair but that's alright because it had the same concept of floating.



-The idea came to mind when I saw a video of a guy building a floating chair awhile back and I found it really interesting on how it holds itself up with just tension.

-In the beginning of the project I imagined that I would build a chair that I could sit on and it would hold me up but that slowly drifted away, what I mean is that when I built my first prototype it looked more like a table instead of a chair and so I continued using that design until the end.

-The main key features in this build would be the tension that holds everything together. This is the most important feature in the project because if one side of the build is uneven the whole thing wouldn't work.

(There were many designs that I wanted to do but with this design was a good first attempt project.)



# Build

-I built a floating table/chair. It was a quite challenging process through the builds.

-Some steps that I took through the process of building were looking at many different designs and seeing which one was best and I did this through each build.

-Something that went really well was the final project because I learned from my previous build that it's not easy making the whole thing balanced so I took all the fails and turned them into success.

-something that went bad was the tension between each build because no matter how tight you knot the rope became loose and that kept messing up the build.

-Something that surprised me was the outcome of the project because it was sturdy to hold a certain amount of weight and it doesn't easily fall over.

(Building was the toughest part about this project it was more of a challenge with getting the ropes even.)



# Testing

-I'm testing whether or not it could hold itself up and if it could hold a certain amount of weight before collapsing.

-Something to answer if it could hold weight was I put light stuff on top at first then started to put more and more until it either collapsed or just barely held up.

-The main criteria of success during this build was knowledge because I needed to know a lot about what was the best way to approach the floating chair and to see if I could make something better with the next build.



(Testing helped me learn from my mistakes improved my build in the final.)



# Evaluation

-There were a lot of ups and downs with this project but I managed to get through them all complet an amazing project. In the beginning there was a lot of research to do to find the right idea for me. When building the first prototype I thought it was going well until everything was becoming uneven more and more so I had to look into that for my future builds. In the final build it all went well cutting everything, measuring, and building. The only problem was the rope it kept stretching with the more weight you put on top and so it became uneven fast.

-I really liked the way it turned out and the structure is really sturdy.

-One thing that I would change about this project is try and build a chair that would support my weight or more.

-My final project accomplishes both primary and secondary functionalities of the ones I listed except the one where it securely holds the sitter in this case it couldn't hold anyone.



# Successes and Mistakes

**There was a lot of both through this project.**

-There were more successes in the middle of the project this is because in the middle I had more time to look over my mistakes and fix them and so that helped me with my final project.

-There were only a few mistakes, with the first prototype and end. In the beginning the I didn't have the best idea of how to put a floating chair together so it didn't really look good. With the final I kept putting weight on top and that would mess up the rope and make it uneven.

# The Process

(Pictures)

# The Process

(Pictures)



# The Process

(Pictures)



# The Process

(Pictures)



# The Process

(Pictures)





1st Prototype:

to



Final: