Construction 5 - Vibe Machines

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Introduction

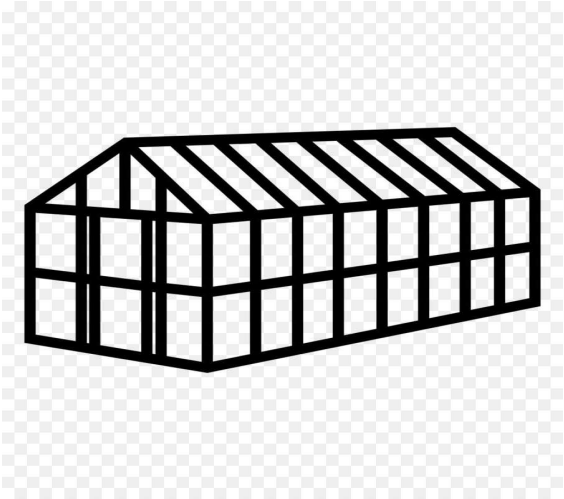
- Tasked with constructing Greenhouse

Needs Identification

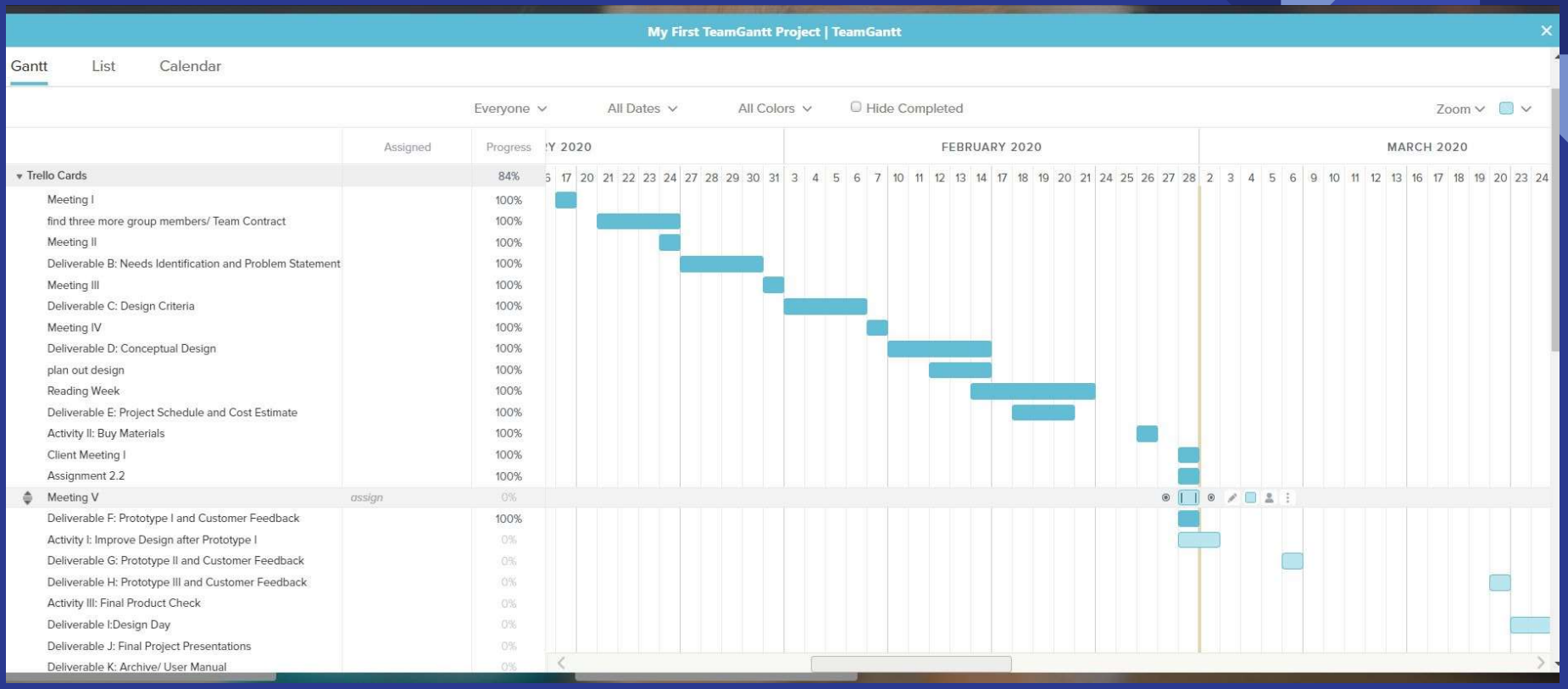
Needs	Weight (out of 5)
Water collection and reuse	5
Electricity generation	5
Durable to extreme weather conditions (ice, rain, cold)	4
Heat generation for cold months	3
Grow plants to feed up to 5 adults	5
Should not be harmful to wildlife	2
Protection from wildlife	4
Cost should be under 500 $	2
Must withstand weight of snow	4
Transportable	4
Minimal labour and low-cost maintenance	3
Educational for youth in the community	1

Problem Statement

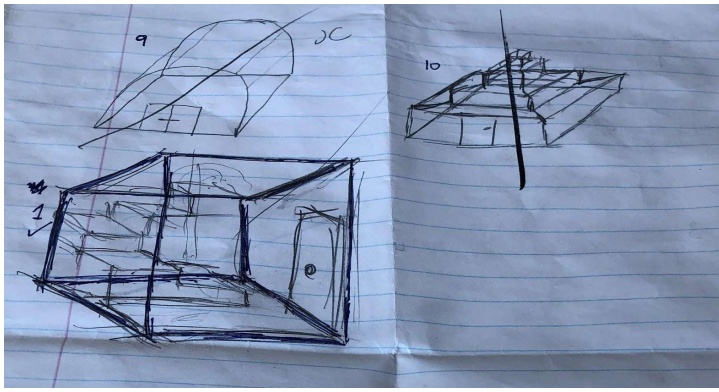
Our client requires a transportable, weather-resistant greenhouse that can feed up to five people while needing minimal maintenance, being self-powered, and automatically watered. The greenhouse should be low-cost while remaining easy to use.

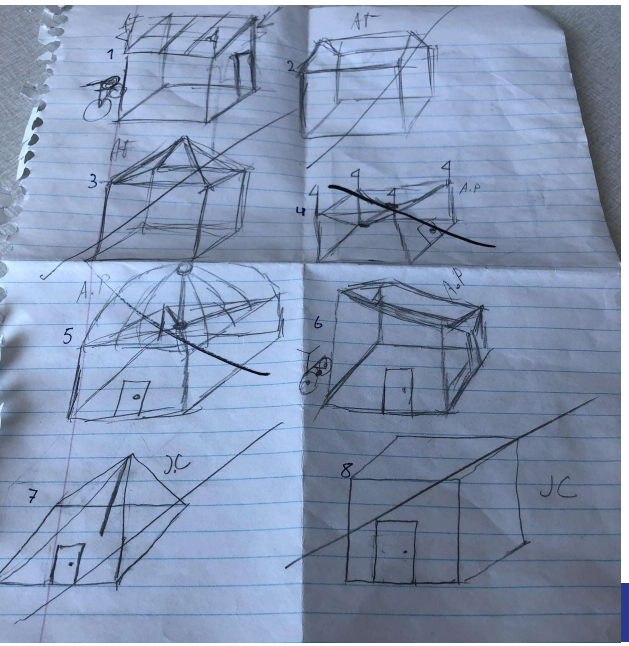


Project Timeline



Conceptual Designs

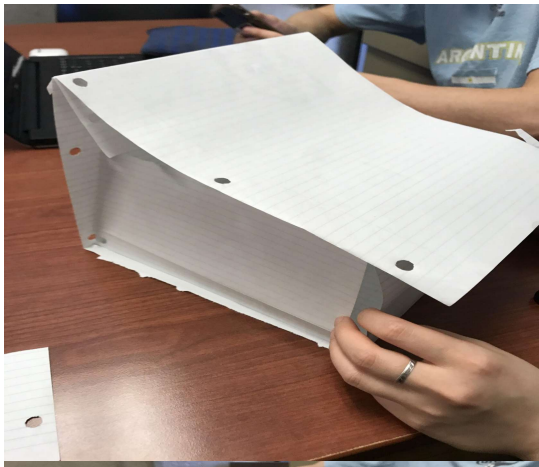


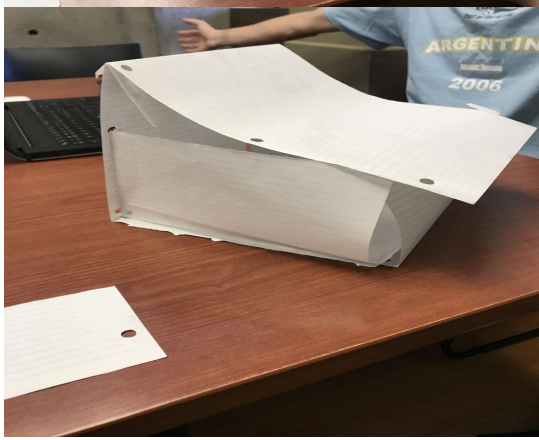


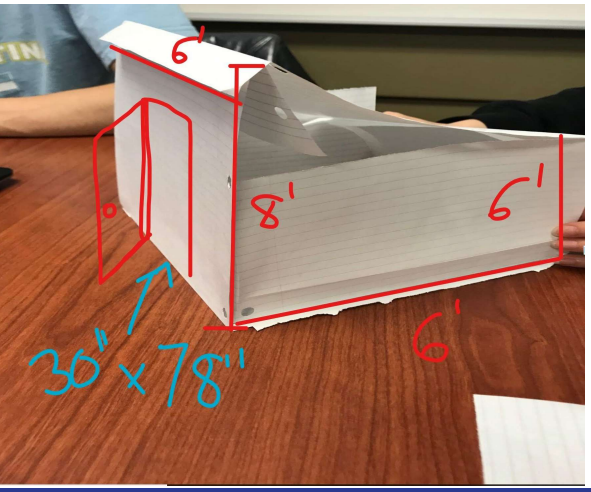
- Started off with multiple designs ranging in creativity
- All group members contributed at least one design
- Elminatinated designs we thought didn't fulfill all our needs
- Went with slanted roof design (1)

Prototype I

- Made of paper to give a rough visual of the design
- Wasn’t made to scale, just used to show rough shape
- Continued with the current design

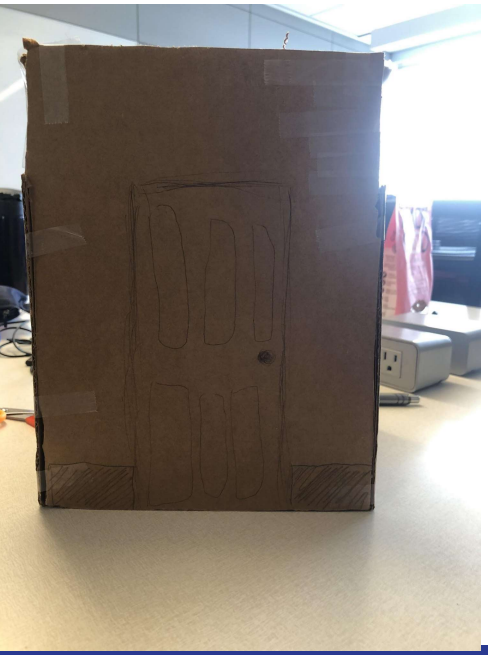




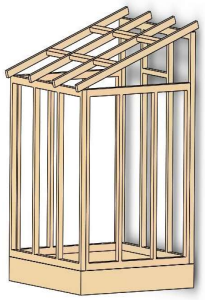


Prototype II

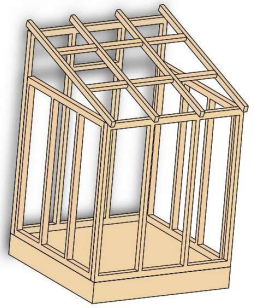
- Made more to scale of the Greenhouse
- Shows possible rodent protection
- Gives more detail than first prototype
- Very similar to final Greenhouse



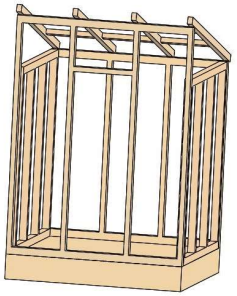
CAD Models of Greenhouse



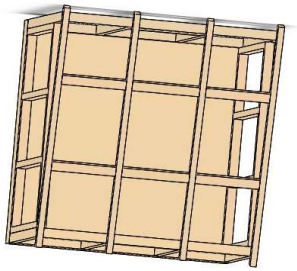
Side View



Front View

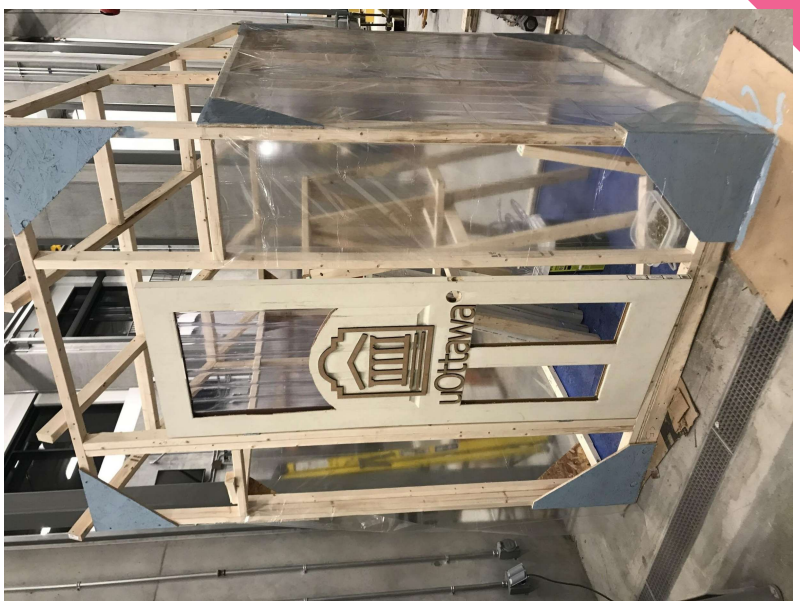


Back View



Top View

Construction Process/ Timeline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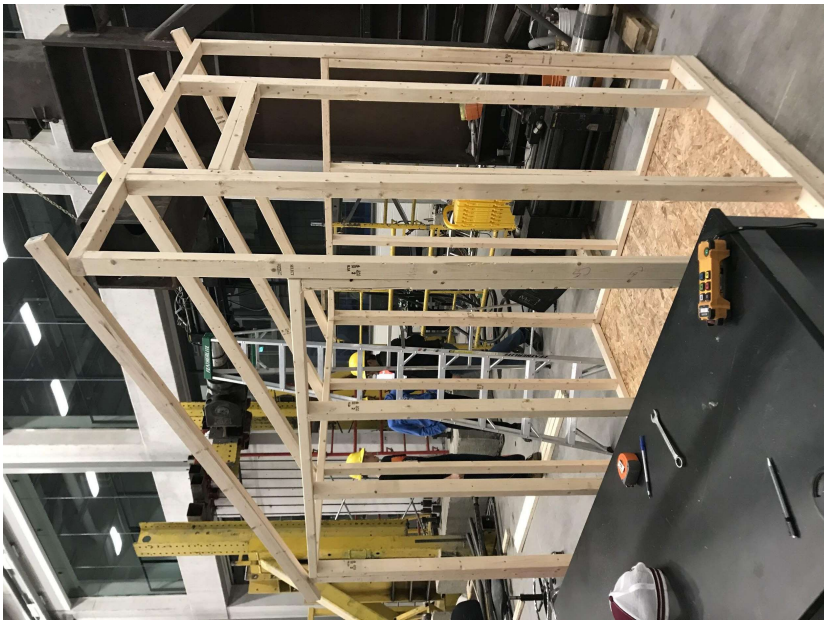
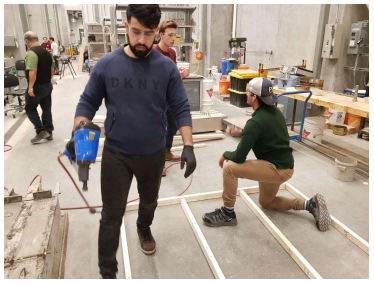
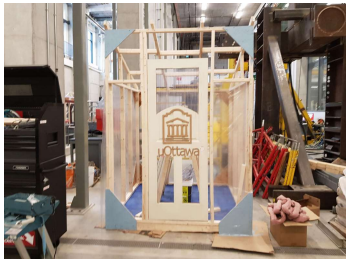


Project Timeline





Week 1: Found group members

Week 3: Started building platform

Week 6: Drilled walls onto platform + beams for the roof

Week 8: Added walls and door

Week 2: Brainstormed potential designs

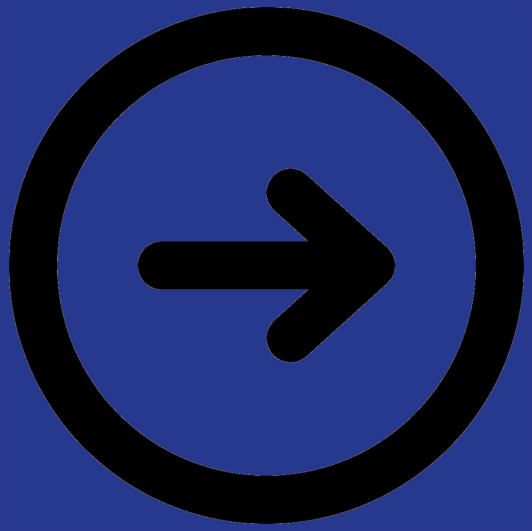
Week 4-5: Added floor+ started building wall and door frames

Week 7: Added supports for structure + painted

Cost Estimate

Product	Use	Size (Area/in^2)	Cost ($)
OSB	Base	432	10.74
Spruce Wood (2x3)	Building Structure	30 Boards	65.70
Spruce Wood (2x4)	Base Structure	6 Boards	17.94
Clear PCT Vinyl	Walls	1872	21
Corrugated Plastic	Roof	504	105.73
Door	Entrance	30x80	41.99
Screws and Nails	Fasteners	Approx. 50	10.00
Gutter	Water Collection	8 ft	8.49
Wire Mesh	Rodent Protection	288	57.00
			338.59

Project Completion : Next Steps



Project Completion : Next Steps

- Communication
  - Hydroponics
  - University administration
  - Client
  - Dr. Majeed
- Schedule construction time
- Finish door frame
- Staple remaining vinyl
- Place corrugated plastic

- Water collection system
  - Gutters
  - Openings in vinyl
  - Reservoir
- Wire mesh around base
- Help hydroponic team where needed
- Deliver Greenhouse

Conclusion

-Overall our design along with the whole process for our greenhouse went really well

- Simple design that was easy to follow

- Well under budget

- Pandemic setback

- Try to learn from future steps in mind and use this knowledge for our next endeavours.

Questions