

Shelf for Collectables

Problem Definition: Shelf to place collectables

Primary Function:

- **Holds Items to show**
- **Secure**(it won't break)
- (or Fall)
- **Multiple layers** (or floors)

Secondary Function:

- Easy to clean**
- Easy to paint** (If wanted)
- Lights Around it** (Not needed)

Thoughts:

- It would help organize items
- It is not too easy nor too hard of a project
- I can add creativity into the design.

Research of existing solutions

Functionality:

This shelf is mostly for holding books

Pros:

Simple design

Very neat

Cons:

Requires some power tools that I don't have right now

Takeaways:

Although I don't have some power tools to make this, I really like the design and the walls on the sides to prevent things from falling.



Functionality:

Multi-use shelf

Pros:

I haven't seen this design before and I like it.

It's multi level like I want mine to be.

Cons

Uses a frame

Have to buy it online



Takeaways:

This shelf comes in a package that you can order online, which is out of the picture. However once again I like the design and might incorporate it into mine.

Functionality:

Another multi use shelf



Pros

Can hold multiple objects

Multiple floors/ levels

Cons

Requires power tools

Takeaways

This is the simplest shelf of the ones that I researched and I believe that I can take a lot of inspiration from this design

Takeaway Summary

- There are a lot of designs that I can combine together for my own
- I will need some basic power tools which I would not have a problem with getting
- I think I might reach out to peers for help throughout the process
- During the research I found what I was looking for in terms of tools, and designs.
- This project will be a lot of fun to make and I will be able to implement and come up with my own designs
- I will need to shop for some materials

Designing

Keys and Constraints

Primary Functionality

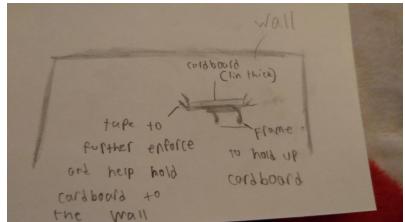
- Holds multiple object to show
- Secure(Won't break, or fall)
- Creative, grabs people's attention

Constraints

- a. The size should be approximately 7' X 20' X 1
- b. It should be able to hold approximately 10lbs
- c. Or hold 10 small objects
- D. Made from cardboard, tape, paperclips, Metal frame?

Key Features

- a. Carlf (cardboard shelf)

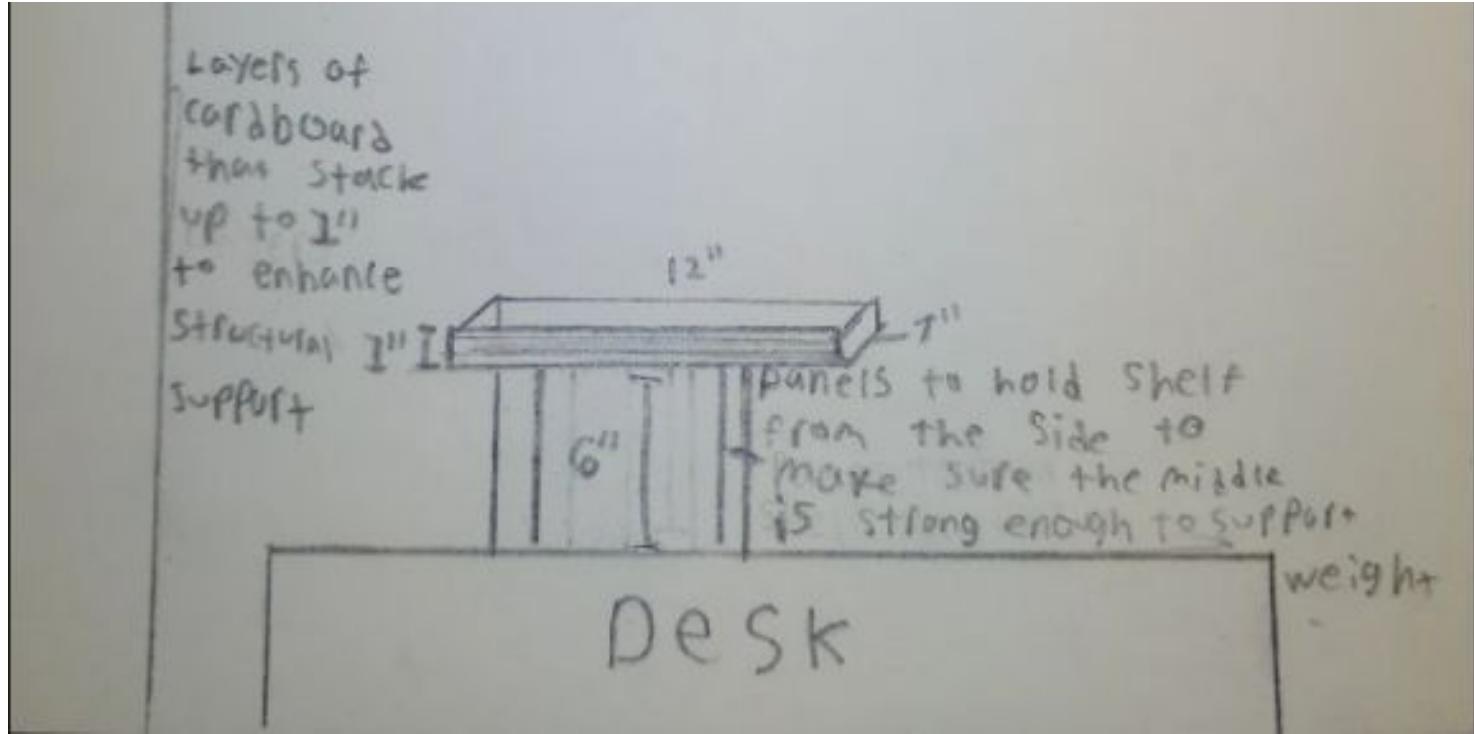


- b.

- C. Good structure, creative and safe

Prototyping

Prototype 1 Design



Building Phase 1 Prototypes

I learned that using just glue to bind the cardboard is good however, I think that I could find something stronger, or combine another factor with glue.

I really like the thickness and although I have not tested this out, it looks very strong and seems that it can support a lot of weight.

I do not think that I will make the stands the same way. It was very difficult to glue it to the cardboard, and difficult for it to maintain balance.



Phase 1 Prototype Test

What is the purpose of the prototype

- To test the Maximum amount of weight supported

How did you test your prototype (User Testing, Simulated Test, and/or Visual Evaluation)

- To test my prototype I used 1lb weights and 2lb weights and stacked them on top of each other on my prototype. (One at a time)

Results

- My prototype supported without any difficulty all of the 1lb weights, meaning that it held 4lbs. It also supported well the first 2lb weight, and it seemed that it would support a second, but the support gave out.



Phase 1 Prototype Evaluation

What aspects of your design and/or build do you like?

- I really liked the amount of weight supported.
My prototype was able to hold 6lbs, which is a lot more than what I need.



What aspects of your design and/or build do you not like?

- I like how much it holds but perhaps I can sacrifice support, in order to save materials.



How are you going to improve your design?

- I will probably make it thinner and experiment with the aesthetic aspect.

Rough Draft

Rough Draft Build

Something I learned was

- Wood is the best material to use

Something I liked was

- Sturdiness
- Weight (light)

Something I will not do again

- I actually liked all about this rough draft



Rough Draft Test

Strength was my number one priority for this project. After the success of the first prototype that used cardboard, I decided to upgrade the material to wood. Therefor I did not test the rough draft, as it seems obvious that wood is stronger than cardboard.

After I cut the wood, I focused on the visual aspect, and painted it



Rough Draft Evaluation

What aspects of your design and/or build do you like?

- I really like how the paint job worked out
- Also despite wood being heavier than cardboard, the rough draft is very light

What aspects of your design and/or build do you not like?

- The cut was pretty clea, however there were some rough edges

How are you going to improve your design?

- For the final product I want to focus on making sure I am able to hang it on the wall, otherwise it would just be a plank of wood



Final Iteration

Height of shelf - Area of Focus

I chose to focus on this area because

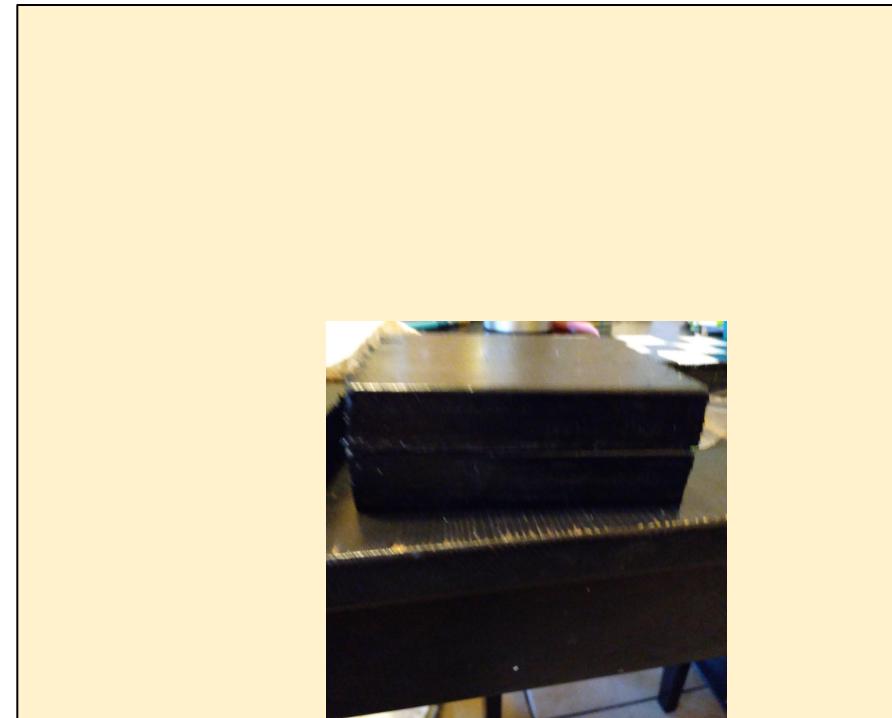
- Having just one plank of wood did not seem very interesting

My approach

- I changed the design and added two levels and came up with a podium like design

The results

- The final product looks a lot more creative and interesting.



Color design - Area of Focus

I chose to focus on this area because

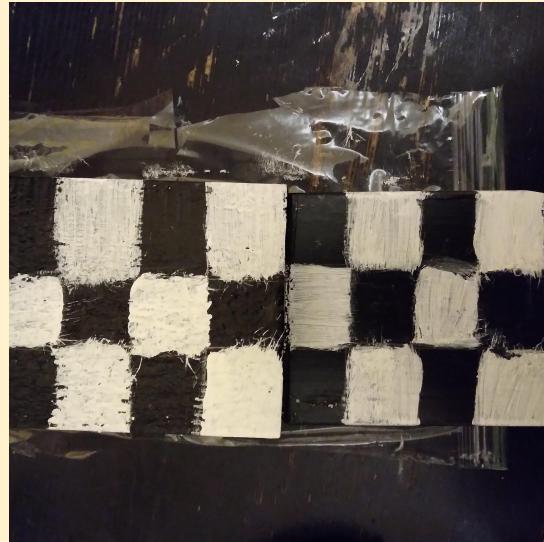
- After I had the idea of a podium design, I came up with an idea that would compliment the design properly

My approach

- I chose to paint a design much like a chequered flag in motorsport.

The results

- I think that the color goes well with the design and fits well.



Sanding - Area of Focus

I chose to focus on this area because

- Some of the cuts were not very clean and I don't think it looked good and it wasn't really safe

My approach

- I Used sandpaper to smoother all of the rough edges and sides.

The results

- After the sanding the wood was a lot smoother and looked better.



Project Functionalities

Primary Functionalities

Primary Functionality 1 (SAFETY)

- The safety features were successful as I just connected it to the wall and was able to stay without falling.



Primary Functionality 2 (Quantity)

- I wanted my shelf to hold multiple objects and I believe I succeeded as the podium design allows for three objects to be displayed.



Primary Functionality 3 (Aesthetics)

- The chequered flag goes well with the podium design and the black and white color scheme is simple but effective.

Secondary Functionalities

Secondary Functionality 1 (Objects can be changed)

- The podium design allows for three objects to be displayed and easily changed because the objects are not glued or detained by anything

Secondary Functionality 2 (Levels)

- My design has three levels, although there is not much difference between each of them, it is still noticeable.



Concluding Thoughts

Project Reflection

Aspects of my project that I like

- I really like how the final product looked. It is very simple and effective. And most of all I like that did not fall.

Aspects of my project that were difficult

- Getting the measurement of the holes to put it into the wall was the most difficult part and I might have put some unnecessary holes in the wall :/

What I would do differently next time

- Next time I would use different tools, as the cuts I made were not as straight I would've wanted, even though you can not really see it in the photo.

