Shelving Unit

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Centre Number: 62451 Candidate Number: 2022

DESIGN BREIF

Design Brief :

I aim to design **a shelving unit which is able to hang on a wall**. My design should also have **multiple functions.** The Target market is for teenagers and young adults who have limited living space in their home. I'm trying to make the floor covered with as little furniture as possible to maximize the space within their living environment. **Multi-fucntionality** would insure the space it takes up is optimized to its full potential.

Client:

My client would be the owner of a modern home with limited space in their living area. This product would be suitable for teenagers with parents willing to buy them furnishings for their room, it would also be suitable for students and young adults who live in relatively cramped living environments and are in the economic situation where buying quality affordable furnishings is an option. The client will also have a range of items which need to be displayed and stored for example: books and ornaments .

Problems with Existing Shelving Units:

Shelving units of today have a range of issues that I can address in this challenge and neutralize to make a better more optimised shelving unit.

Problem 1: Most Shelving units have feet which sit on the floor, this isn't very good for conserving space as if the shelving unit can be hung on a wall there is room underneath for numerous items.

Problem 2: Shelving units only have a single function (to shelve), they could be better optimised to their space if they had another function.

Problem 3: Shelving units are notorious for being basic, a stylised version would be more astatically pleasing in a modern home.

Solution:

My aim is to design an innovation for a product that combines a shelving unit with another function. It could be a solution for many different living spaces such as something in the bedroom which is able to hold all mandatory items. Or could be placed in a living room to allow books or dual -cases or other items to be placed on it. It should also integrate some sort of technology,

Target Audience:

The Audience I aim to attract the most is the teenagers and young adults demographic ranging form around the age of 16 – 25 years old. With limited living space in their home.

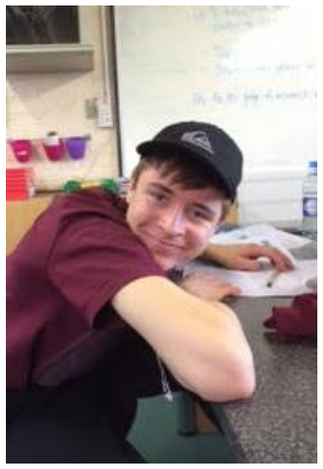
Manufacturing:

The product will have a reasonably low production. There will be a huge focus on keeping the product environmentally friendly. This will be done by making sure recycled materials are used to make it & that the materials its made from are recyclable.

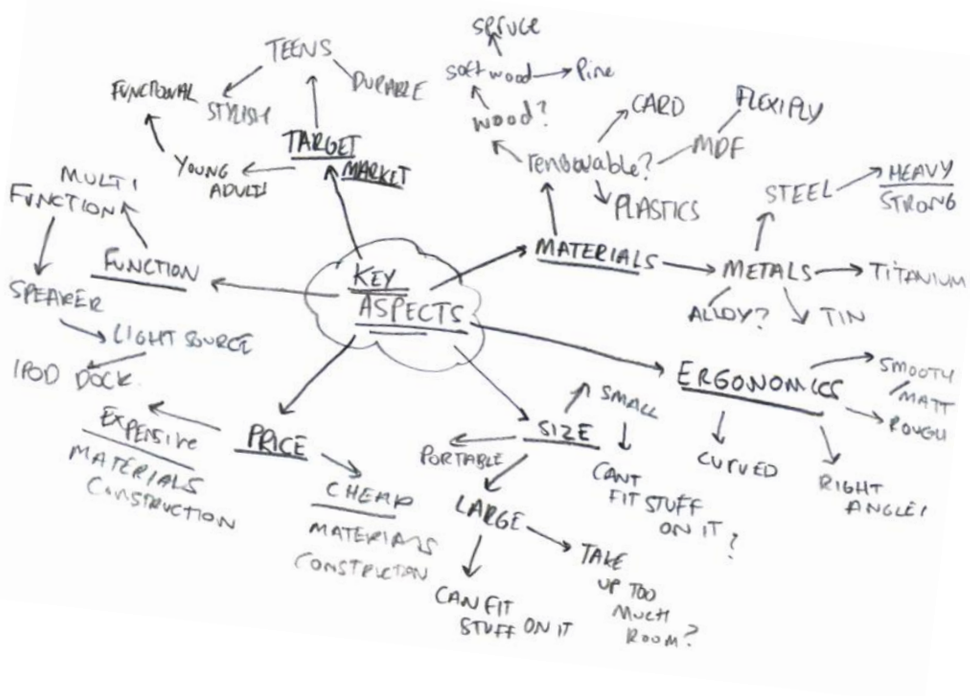
Marketing:

If the product is marketed correctly it will be very desirable to teenagers and young adults. For example the product shouldn't be advertised in IKEA or department stores as most young people won't be going to these places on a regular basis. They should be advertised on social media as this takes up a portion of time for the current generation.

Name: Jamie Wright
Age: 18
Occupation: Waiter and Student.
What is needed from the shelving unit: "I need a shelf that can stack all of my books, because currently they're in piles on the floor. Considering I've just moved house a easily transportable unit would've been helpful"



Name: Henry Priddey
Age: 16
Occupation: Domestic Assistant/Waiter/Student
What is needed from the shelving unit: "I want to make it so my bedroom can fit as much as possible in it, including settees but also I need room for my games and schoolwork"



Issues during design:

- Have to keep price under consideration.
- The size of the shelving unit.
- The materials it's made out of
- The amount of time taken to manufacture.

INFO, INSPIRATION & INFLUENCES PRIMARY RESEARCH – PRODUCTS FROM YOUNG DESIGNERS EXIBITION & IKEA

This desk has many sections **of different shapes allowing lenience for different objects**. Also there are **draw like aspects** where pieces can **be pulled out and pushed in** to place things inside. This would be good on my design for the ability to hold miscellaneous items like cables or things that need not be on show. However this design is **very boxy and unappealing**.

I found this design a good inspiration, mainly due to the fact it's **collapsible** meaning when not in use it **takes up minimal space** and also due to the fact the **materials are purely recyclable. This design wouldn't be able to hold anything of great weight.**

Positive/Negative

I enjoy this lighting fixture for similar reasons I found the design above appealing. This could be translated into a shelving unit some how. For instance having a central rotation point where the shelving unit can expand and contract around? The **lights could also be a good multi-function** because lights are needed and could be implemented into the design

This shelf **doesn't sit on the floor** which is right in my design brief. This is good as it **saves room** for floor room and uses up unused space on the wall. This design in particular has both **flat surfaces** and **rounded surfaces** adding to the functionality of the unit.

This IKEA shelving unit is good because it consist of many cuboid boxes which can be **moved around to make different structures adding customizability** to the unit. The cubes can be placed in different areas or stacked in other ways adding to replay value. **This design is boxy.** Perhaps if it was more shapely it could look nicer, as how it is It just looks like a bunch of boxes. It's **innovative**, but **boring.**

This shelving unit has fabric shelves. This is a good idea because it means that **objects without a flat bottom can be placed on it** and will have no problem with falling over**, however flat bottomed objects aren't very suitable for this unit**. The fabric of the shelves is a good inspiration because fabric is extremely flexible, this could be implemented into a design, **for easy storage or adjustable sized shelves**

INFORMATION, INSPIRATION AND INFULENCES

Positive/Negative

This shelving unit **conserves space** in a room as it's able to be used as a seat. The seat is also a **second function**. This means that there's **less room for storable objects** though .

This lamp shade is a good inspiration. I could **incorporate and adjustable structure** to the shelving unit I design. This would mean shelves can be changed into larger or bigger shapes, and the product would be able to be **compactable for storage**. **Moving parts are susceptible for breaking.**

This design gives a multiple functions to an already functional shelving unit. The fact that there's a secret compartment is **good for securing items** and this would be a good marketing feature as most furniture has no hiding places. **Essentially this is just a plank**.

An mobile docking station could be implemented into my design as well as some speakers. The younger generation has a lot of portable mp3 capable devices and this would **add great multi-functionality as music can be played and the device can be charged**. **However it will be a great electricity drain.**

This particular shelving unit brings together the shape of the room and the shelving. This is useful as in most house holds corners are occupied by one sided shelving units, whereas this **allows objects to be reached from too angles**.

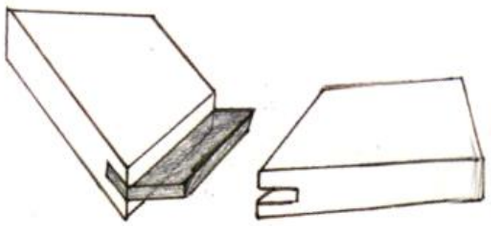
This design is circular it's good that they **hang on walls** and the fact that there are flat shelves inside of the design means that **objects can be placed in it**. However **things cant be placed on top** with the assured safety that it wouldn't fall off!

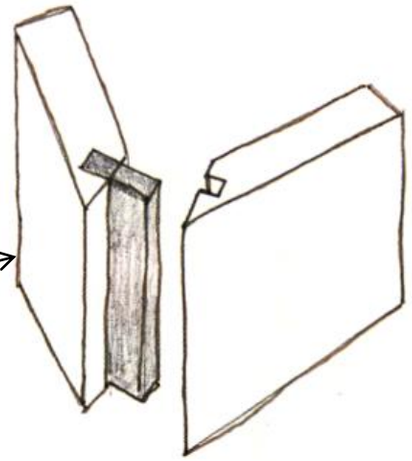
I like this abstract design. There's a **varying size of shelves** with different heights and lengths. This means a relatively large size **range of objects will be able to fit** on this shelving unit without trouble. It also has flat surfaces meaning **items can be placed on top.** However this **unit sits on the floor** meaning floor space is wasted

Lights are very useful in furniture. It makes it pop out in the room more and also acts as a **viable light source**! It will accentuate the objects placed on it as well. **This will use up a lot of electricity** meaning it should be able to be turned off.

This shelving has **compartments with fronts** to them meaning that the **items inside are protected.** For example items that aren't really stackable such as cables could be put in here. Glass fronted doors could protect more valuable things. However this design is **very boxy and uninteresting.**

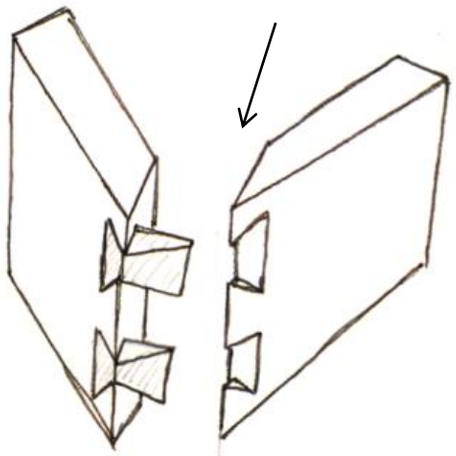
INFO, INSPIRATION & INFLUENCES - JOINTS

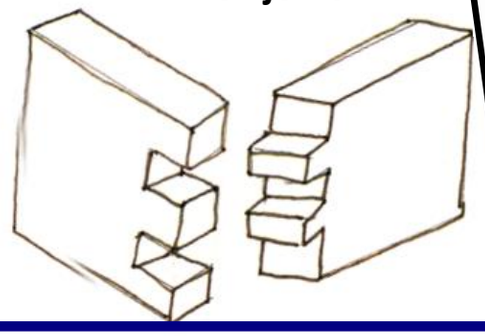




Mitered dowel joints

Box joint





Joints:

These joints are good because they add strength and structure to the design. They are limited to the fact that they're at a right-angle. This limits the design to a quite boxy shape which is not very desirable. But is good for practicality. One problem with joints like this is that it's not a very light weight option, there's a lot of weight involved.

Curves and Joints

Joint are not very useful on curved objects. They can be done but will cost a lot more time and are generally harder to do.

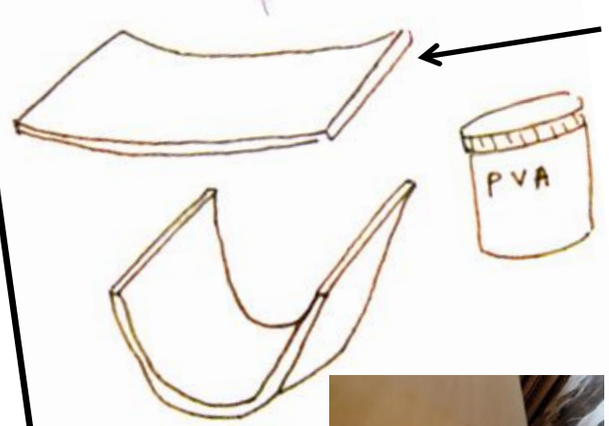
Clients Feedback:

Joints like this are extremely heavy. However they're simple to construct for a user and dont require glue.

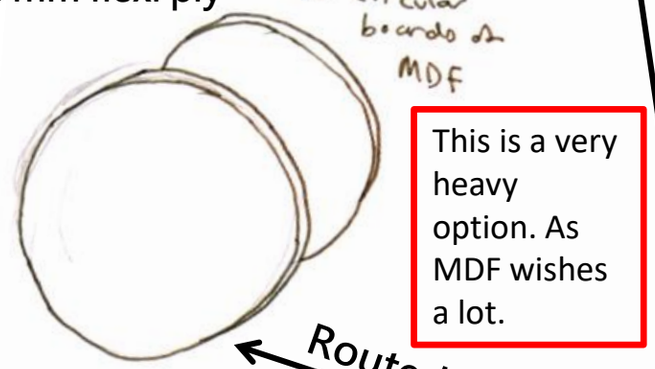
Strengths: Joints such as these are very strong and long lasting which means the product should last a life time and could be resold without a problem.

Weaknesses: These joints are complex and for a mass produced product would be very expensive to do. Using screws with nuts and bolts would be more price efficient. (also very heavy) Also lots of wood varieties are heavy.

Flexi-ply

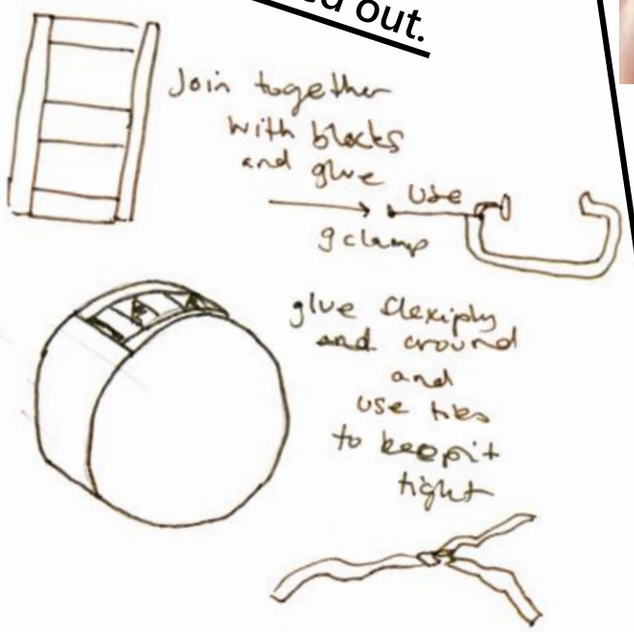


5mm flexi ply



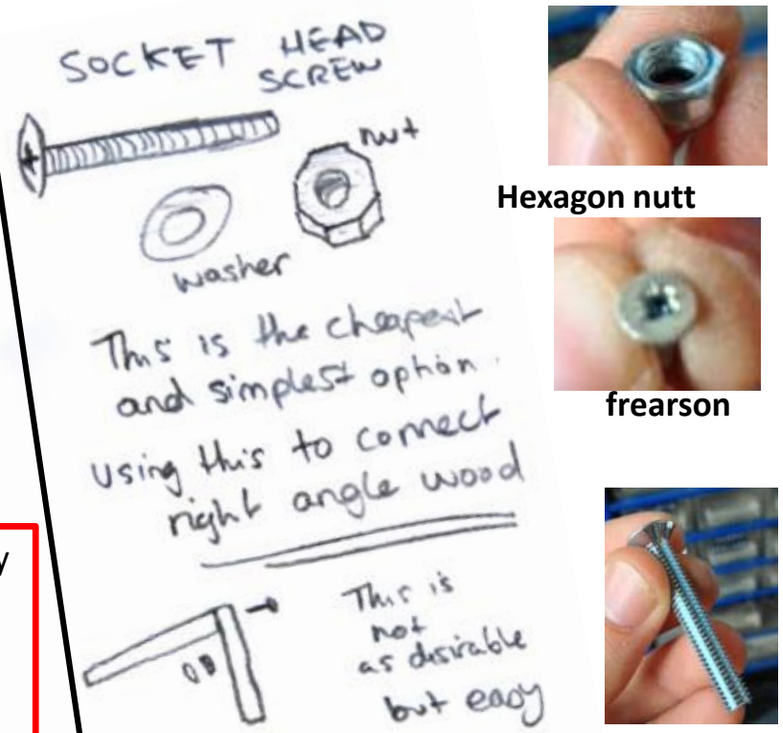
This is a very heavy option. As MDF wishes a lot.

Routed out.



Flexi ply:

Flexi-ply can be applied to a rounded surface to give it a curved shape. Not only should it just be used on circles but on a wide range of curves. At a certain point it will reach it tension limit and will



Hexagon nutt

frearson

Machine screw flat-head

washer

Strengths:

This is a cheap option a leaves the option for self construction which would be useful in a home environment meaning it would be easier to get into a living space.

Weaknesses:

However this option could be seen as a bit more "tacky" and may reduce the desirability

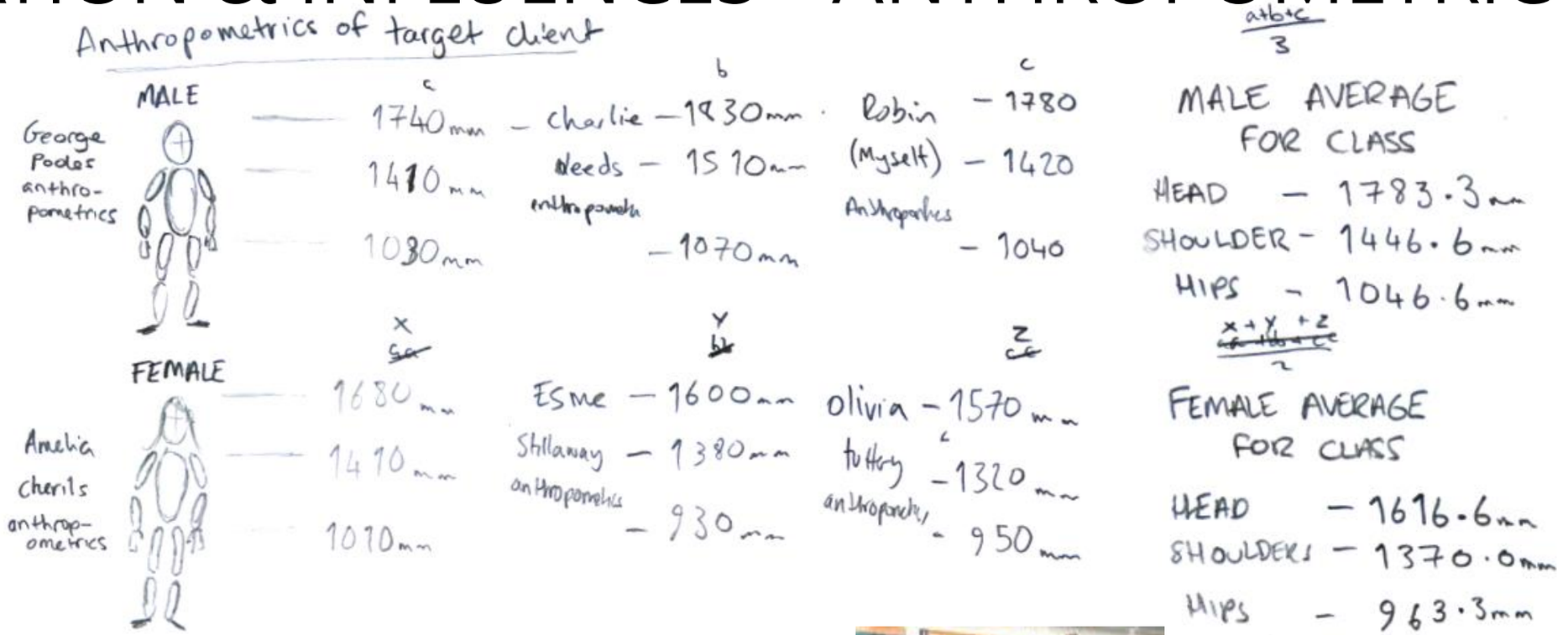
INFO, INSPIRATION & INFLUENCES - ANTHROPOMETRIC DATA

Anthropometrics:

The design of my shelving unit is really dependant on a humans ability to react with it. This means taking into consideration standing height, sitting height, width, Height of the eyes, length of arms etc. With this data pinned down for the average man and woman it will allow the product to better fit the client and have an overall more pleasing user interface.

Client anthropometric data:

My Client is from the age range of late teens to adults meaning that they'll be pretty much fully grown. Considering I'm in upper Sixth (Year 13) most of the people I know are pretty much fully grown. I couldn't find a reliable source on the internet for anthropometric data so I selected three individuals in my class both female and male so I could make a rough average. I did this by measuring them in millimetres, head, shoulders and hips. Then doing the correct calculations.



I made a rough average of an average person. This is useful due to my product being unisex so gender isn't needed, just the average between gender.

HEAD
1740mm

SHOULDERS
1410mm

HIPS
1030mm

This is me measuring my first in the anthropometric averages, George Poole.

Arms

One thing that needs to be taken into consideration is arm length of the arm. As things are going to need to be able to be reached for and grabbed and heavy use of the shelving unit has to be taken into consideration

I can speculate that the length of an arm is around the length between shoulders and hips . Keeping this in mind arms are about **600 – 700mm** taking into account the extra space taken up by hands. This means that the unit will have to be at a suitable height on the wall for optimum reaching by all users.

INFO, INSPIRATION & INFLUENCES - ANTHROPOMETRIC DATA PT2 - SURROUNDINGS

Now that the average standing height has been discovered an average height of a sofa/settee needs to be taken into account as well as the average height of a room. These two numbers are important because it gives us the measurements we need to decide how large the dimensions of the unit should be. Without these the final design could not fit correctly into a room with a sofa underneath it. Which would mean minimization of space-take up would have failed.

To get a rough average of the height of sofas seat I measured with a measuring tape all the sofas in my house and got these results. Then I did the required equations to figure out the average backrest height.

Sofa 1 = 470mm seat height
Sofa 2 = 430mm seat height
Sofa 3 = 420mm ~~Sofa~~ seat height

$$\frac{470 + 430 + 420}{3} = 440\,mm$$

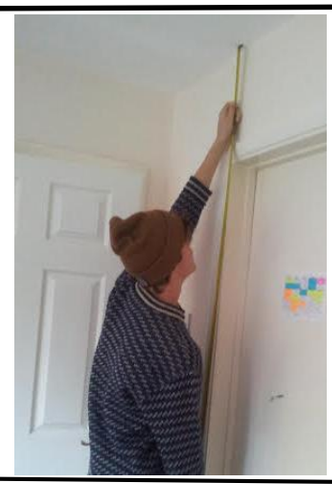
To get an average of the height of the sofas backrests, I did the same process but with the backs of sofas. Here's the result:

Sofa 1 840↑
Sofa 2 770↑
Sofa 3 =730↑

$$\frac{840 + 770 + 730}{3} = 780\,mm$$

Room 1 = 2430
Room 2 = 2450
Room 3 = 2460

To figure out the size of the average room I measured the height from floor to ceiling with a tape measure in my own houses living room. I measured different rooms in my house but all were pretty much the same so I went over to 2 friends houses and went in their living rooms and measured the height. I made an average from the results.



$$\frac{2430 + 2460 + 2450}{3} = 2446.6\,mm$$

I need to use my averages and come up with some limiting factors for my design.

I need to find the average hip to head height for the average person by doing some subtraction

1699.9mm − 1004.9mm = 695mm

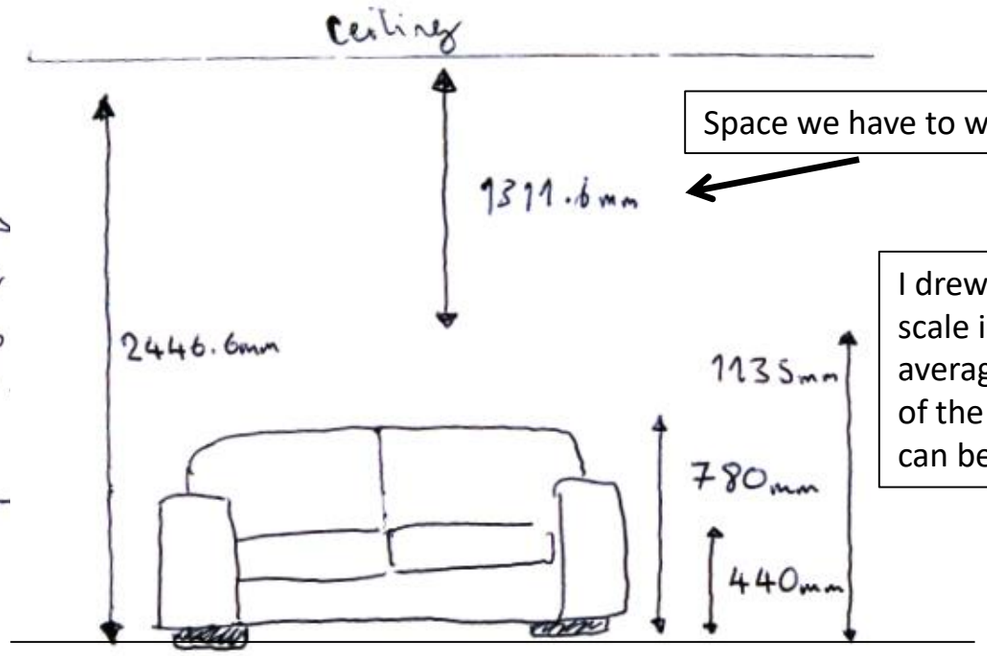
Adding this number to the seat height of a sofa/settee ...

695mm + 440mm = 1135mm

... makes the height the bottom of the shelf shouldn't go bellow

This subtracted from the height of a ceiling will be the limiting factors Maximum height bottom to top of unit

2446.6mm − 1135mm = 1311.6mm



Space we have to work with

I drew this not to scale image so the average dimensions of the surroundings can be seen

DESIGN SPECIFICATIONS

Target Market: T

- **My shelving unit should be suitable for a range of users both male and female.. Also of an age range from 16 to 30.**

This is in order to obtain a large target market and make the shelving unit more commercially applicable.

Manufacturing: M

- **I will manufacture The manufacturing process should be kept to a minimum to keep a low affordable cost. Environmental impact should also looked to be diminished.**

The product needs to have very little impact on the environment.
Sustainable, recycled and recyclable materials should be used when possible.
The product needs to have a low carbon footprint.

Functionality: F

- **The shelving unit must serve its function as a way to store items.**

It also must have at least one other purpose. This purpose needs to be suitable for the target market

Materials: M1

- **The materials for the shelving unit must be durable so that it is long lasting.**

Materials should also be strong enough to hold a varying weight of items. For long periods of time

Aesthetics: A

- **The design of the unit should be visually pleasing, people must need to take a second look. It should suit the target user so they'll want to purchase the product.**

This will involve selecting desirable colours for the design. The unit should sit in well with both modern and old trends like a timeless classic, whilst maintaining unique qualities.

Anthropometrics and Ergonomics: A1

- **The shelving unit needs to fit in with the average anthropometrics that I've recorded, for it to be easily usable for most people.**

The unit must be reasonably easy to use and not cause excessive strain on a user trying to access it.

Environmental Issues: E

- **The shelving unit needs to have a very minimal impact on the environment. It should use reused materials such as MDF and recycled metals (e.g. aluminium)**

For this to be possible few materials should be used in the products production.
Also waste should be minimised and what waste is created should be recyclable.

Commercial Viability: C

- **The product should have a unique selling points in order for it not to be drowned out in a dense market filled with similar products.**

If similar to other products it should be cheaper than the contender.

Cost: C1

- **The shelving unit should aim to be priced to be in the middle of the range around £100 - £200. This way it's not excessively expensive but still remains desirable.**

The unit should be made very cost effectively. Prices currently for shelving units vary greatly between £10 – Thousands of pounds. Costs are obviously dependant on the materials selected, the manufacturing process and the difficulty of the style. This needs to be taken into account to insure a low cost.

Safety: S

- **The shelving unit should be safe to use so injuries can be minimised.**

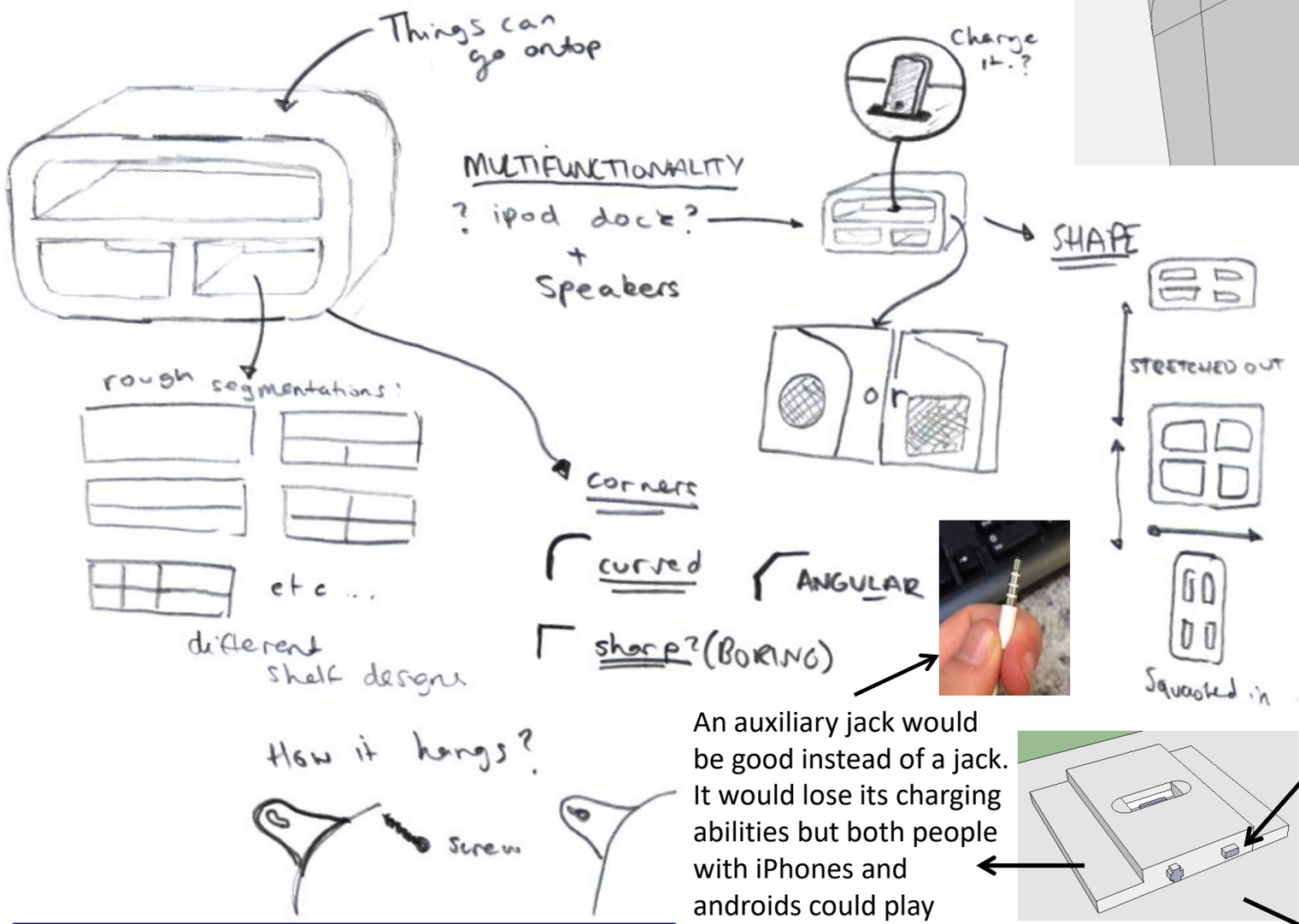
This means the unit shouldn't have any parts that could easily break, the design should be sturdy. It should also be out of reach from children or well suited to handle them. The product should also be secure so there's no chance of it falling, meaning that it should have strong connection to the wall it is on and the product should not be weak around the contact area .

Weight and Size: W

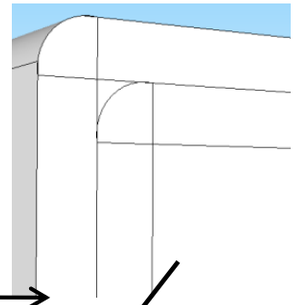
- **The shelving unit needs to meet a set weight and size. Which means it's not horrendously heavy or bulky. (e.g. it should be made out of the least amount of material possible and still be strong)**

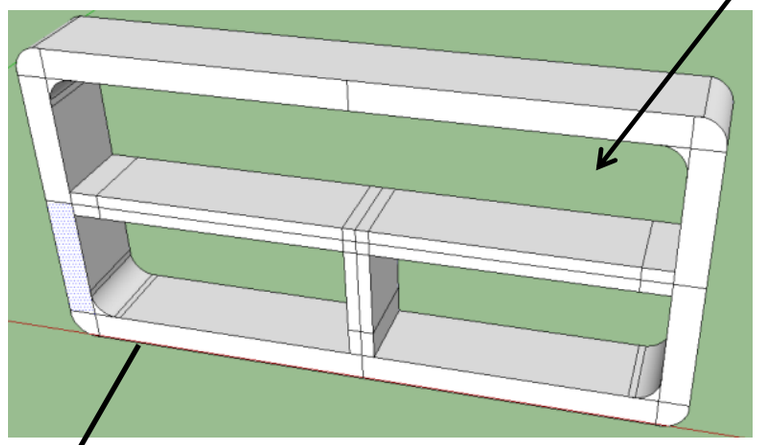
The units shouldn't be so heavy that it could fall off the wall, Items on it need to also be taken into consideration. It should also be able to hold a range of items.

INITIAL IDEAS #1

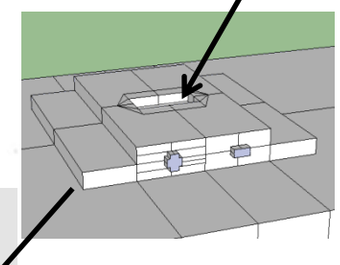


First I mapped out a square on Sketch Up and drew out lines to show out how wide the rim and shelves would be. I then extruded it. And deleted the area where the shelves would go



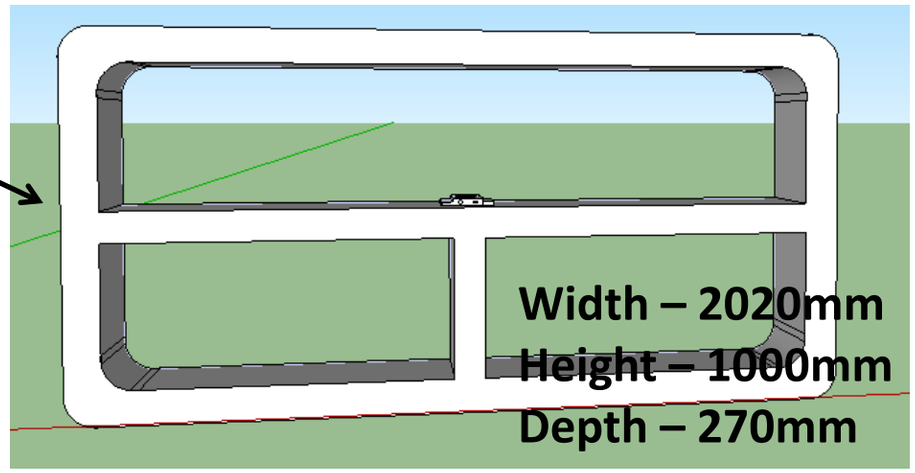


An auxiliary jack would be good instead of a jack. It would lose its charging abilities but both people with iPhones and androids could play music. Or both.



I used lines to be able to centre and track where the middle of the shelf would be then I started to design a structure, which is an iPod dock. This is where the multi-functionality comes into play. You can see where volume up/down buttons are

Finished, it looks like this.

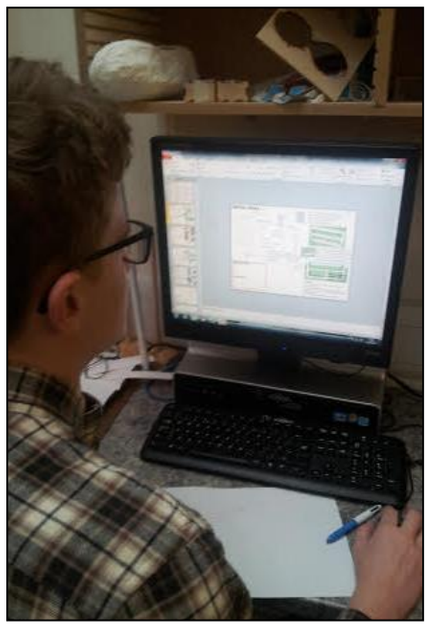


Clients Feedback:

The shelf is too large, for inside a commercial house, many wont be make it smaller.

My Response:

"I agree with what you say to a certain extent, however depending on the living space I think it would fit quite well, Perhaps I could design a smaller version as well."



Jamie Wright examining my design and thinking of improvements that could be made. He wouldn't like it in his own house as it is too large.

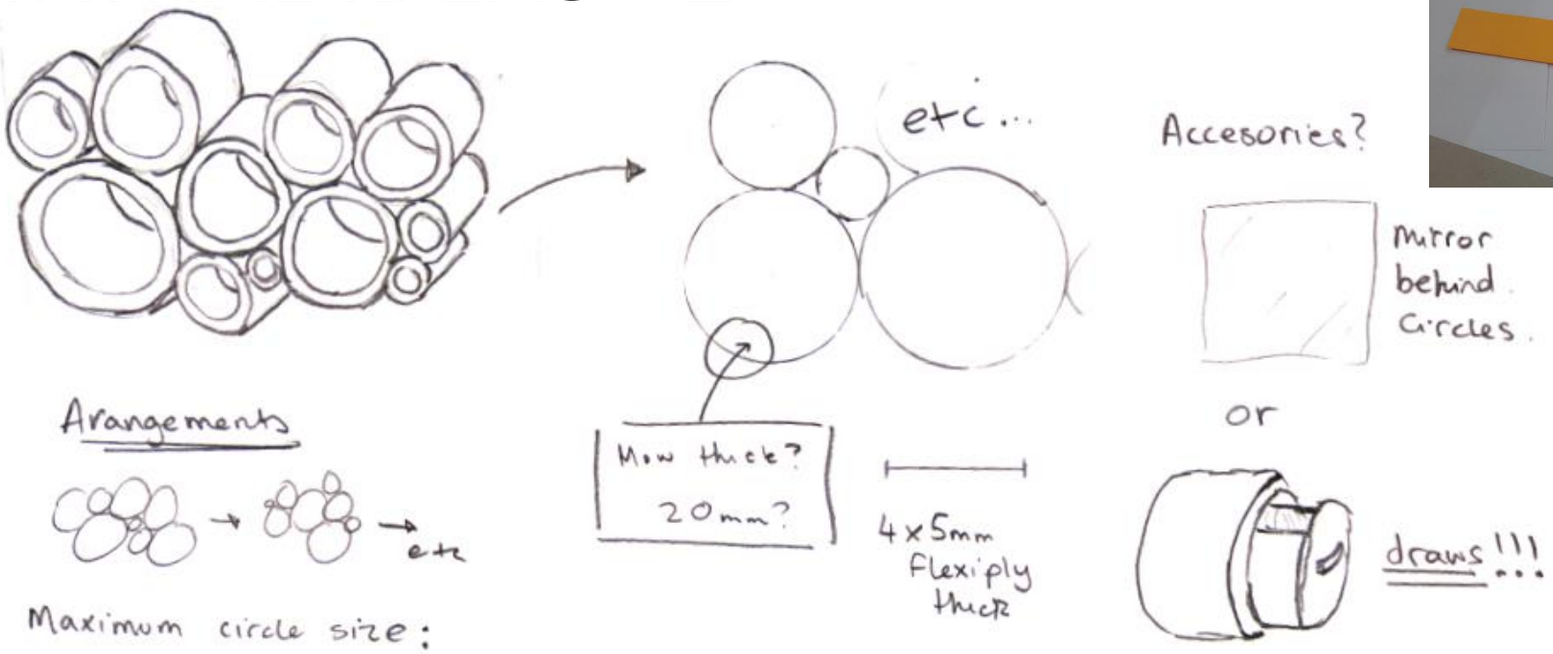
Problems:

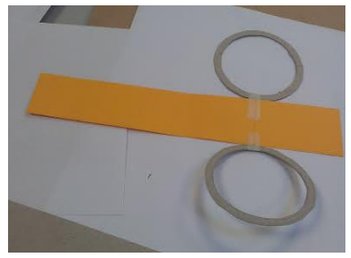
> Things could fall over onto the iPod in the dock breaking the iPod.

> The design would need to have implemented speakers where would they go? **80mm space for front facing speakers.**

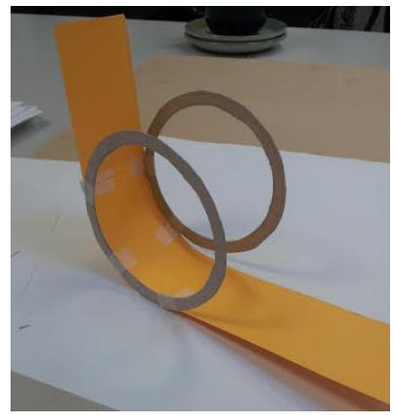
> Limited space for different heighted objects.

INITIAL IDEAS #2

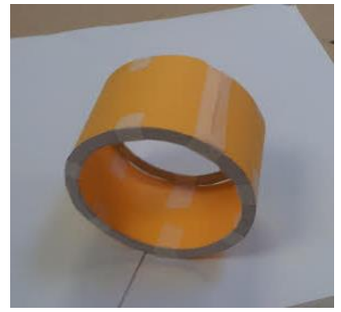


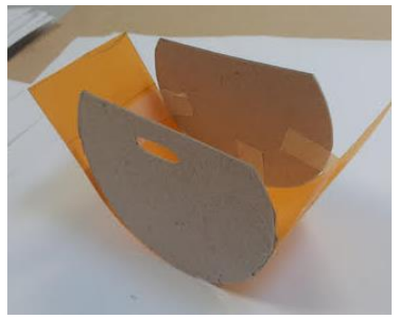


Firstly I cut out two circles using a compass and the cut out another strip of card. Using masking-tape I taped the circles down opposite each other.

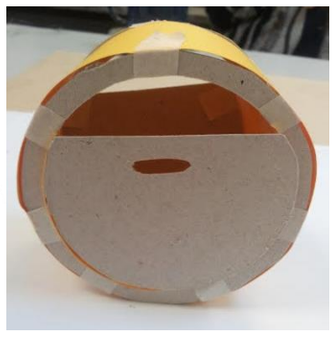


I proceeded to use tape at certain points all around the structure to give it an edge. Then finished the join with tape.

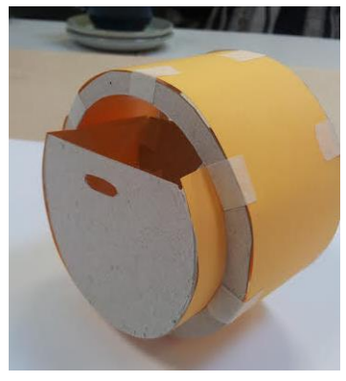




I began constructing the draw using the same method as the general shelving structure using masking tape and two types of card, curving it around and taping it to give it a curve. I used a box cutter to shape the handle hole .



Finally I fitted both pieces together. Now you can see the rough idea of how the shelving draws would work.



Clients Feedback:

The box is abit bulky so would be hard to fit on a wall.

My Response:

“ I couldn’t agree more. When I went into this design I was taking more into consideration the style and not the practicality, looking back now the thing as a whole would be too bulky.”

Jamie Wright
after looking at the design for a single shelf of this unit. He’s not too impressed and thinks that some major improvements would have to be made for this unit to be commercial.

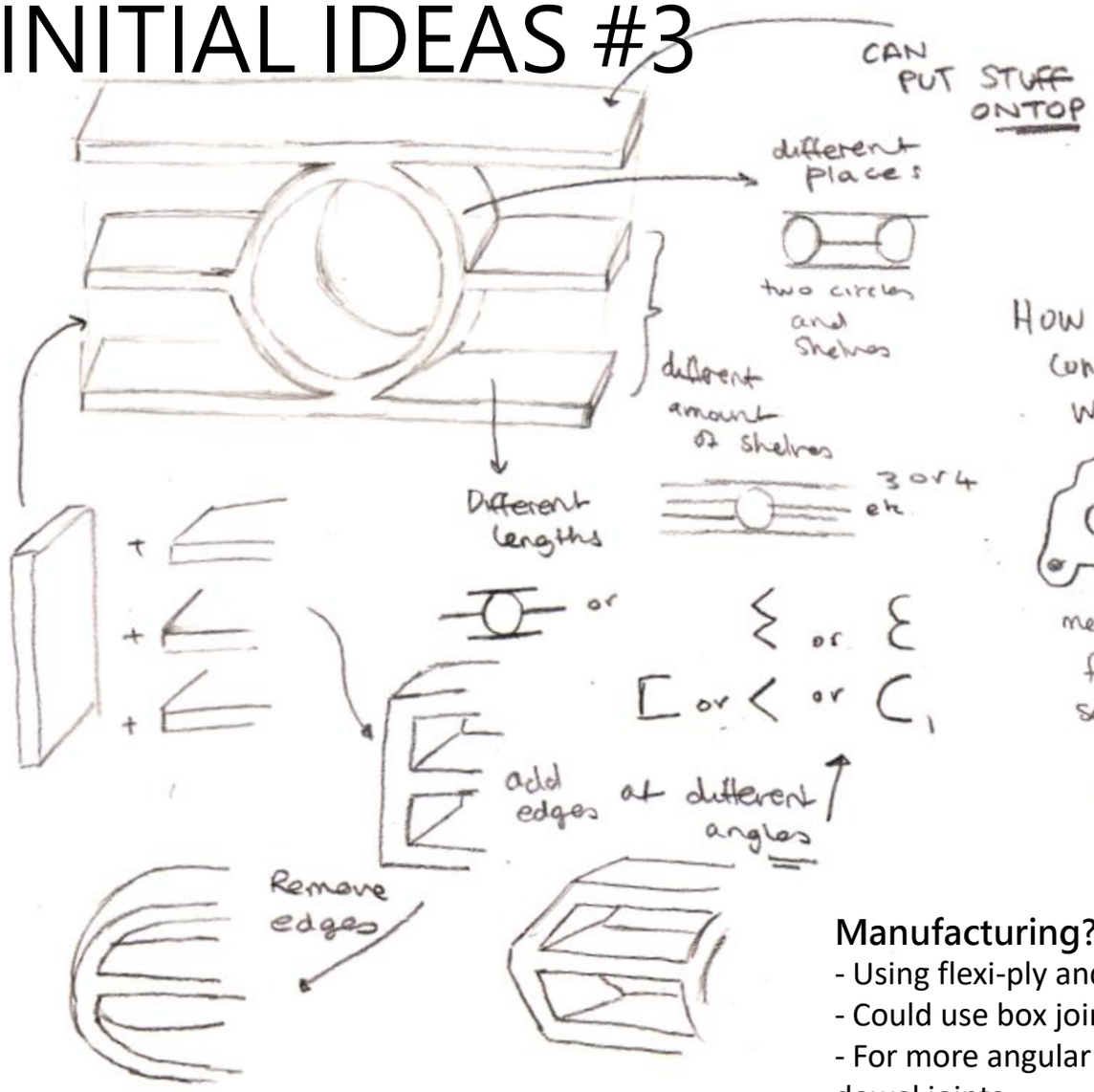
Problems:

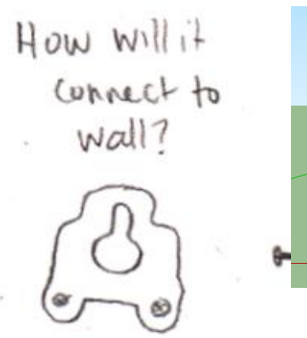
> How would each part of the unit connect and still look acceptable.
> A lot of Flexi-ply , MDF and other materials would be needed.

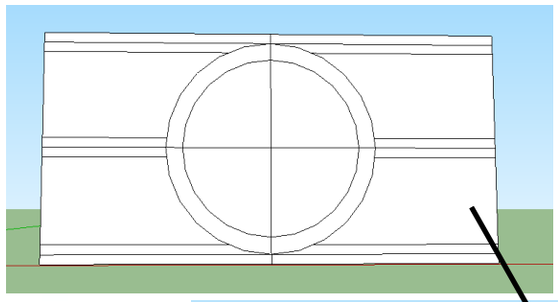
Multi-Functionality Ideas:

- Mirror at the end of some of the shelves.
- Has draws for storage not just shelves.

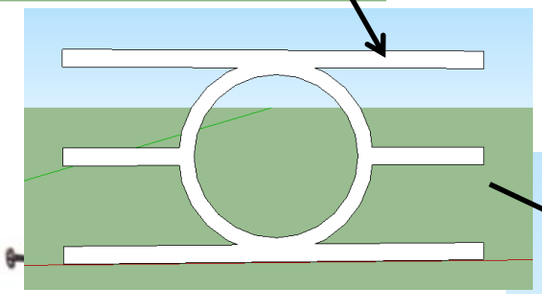
INITIAL IDEAS #3



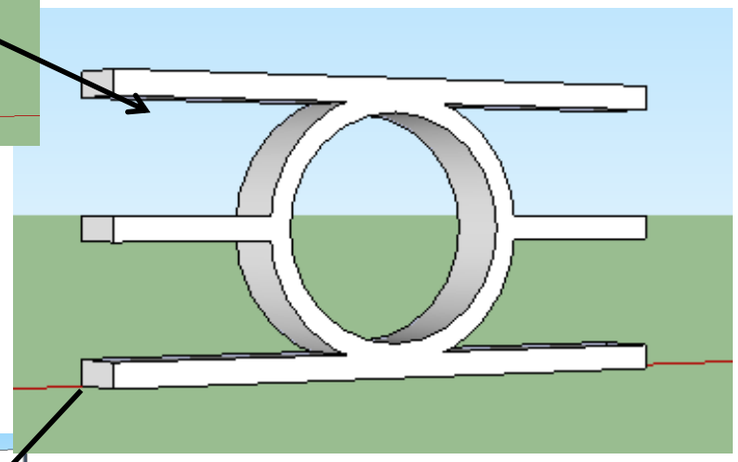




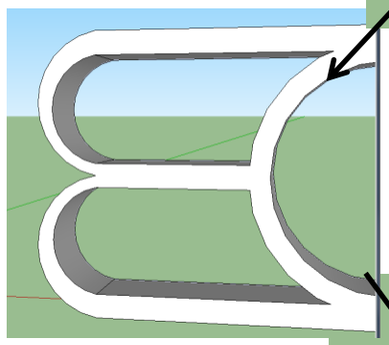
Firstly I mapped out a square on Sketch Up and the added in two rectangles either side to make it so I could add in the circular centre shelf. Using lines I could find the centre of the edges to design a symmetrical shelving unit.



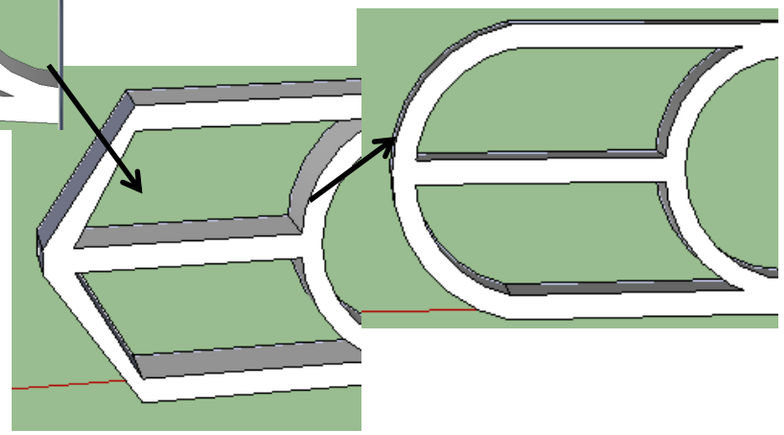
Then I deleted the spaces where the shelves would be and extruded it.



Without Additions:
Width– **1900mm**
Height – **960mm**
Depth – **230mm**



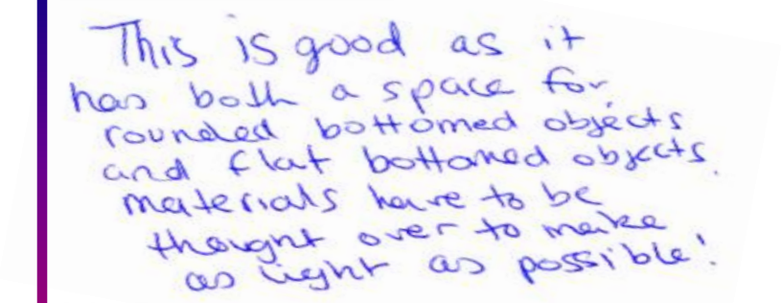
This is a reasonably solid design by its self. I decided to add in some extras to make the shape more interesting.



Manufacturing?

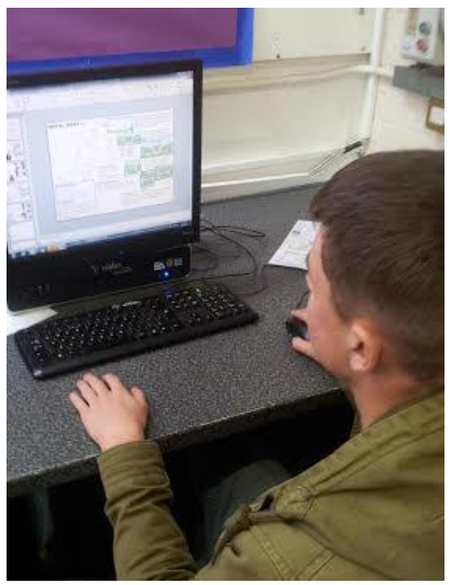
- Using flexi-ply and MDF.
- Could use box joints, for corners.
- For more angular corners metered dowel joints.

Clients Feedback:



My Response:

"Materials like MDF are very heavy, so to keep this design as lightweight as possible either it would have to use very thin sheets of MDF which would be weak. Or use another material. Possibly 5mm MDF."



Henry Priddey after inspecting the design on my computer screen. Thinking what could make it better.

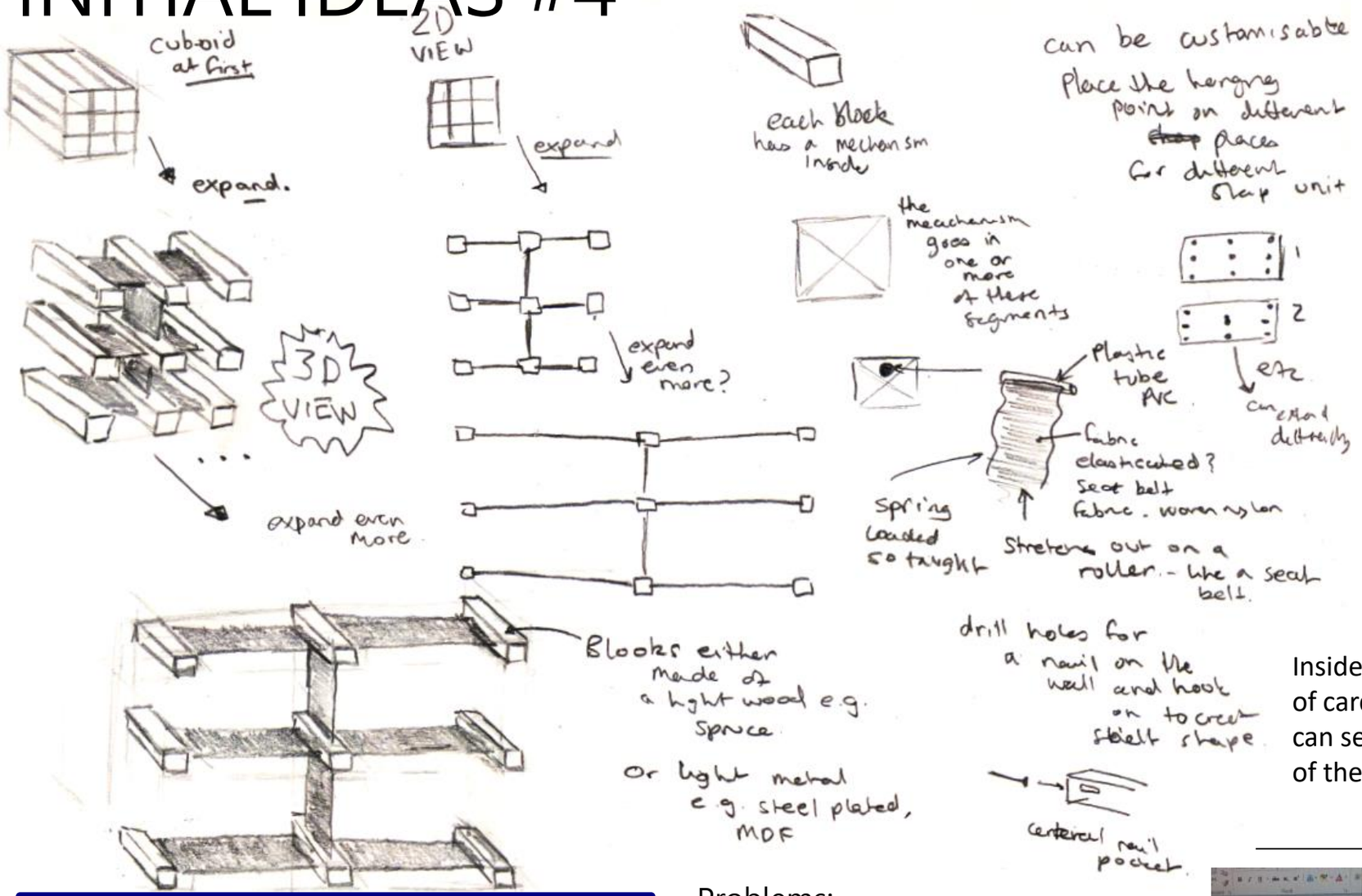
Multi-functionality Ideas:

- Centre circle could have a mirror implemented
- Lighting (Fairy lights, in the bottom of the shelf's facing downwards as to illuminate what is bellow)

Problems:

> Edge bits pretty pointless and could be considered to look ugly. (except for preventing objects from falling off)
> No multi-functionality.

INITIAL IDEAS #4



Clients Feedback:

I think this design is innovative but would be hard to manufacture except for that, think the idea is sound.

My Response:

"Thanks, the complexity of the build the down fall for this particular design. It cannot be modified otherwise it loses its essence as it is so based around the mechanism to change that would defeat its purpose."

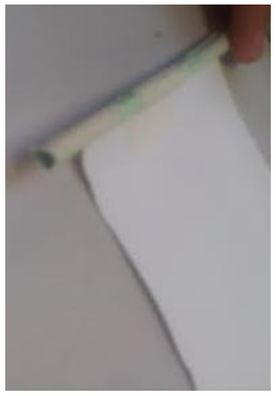
Problems:

> Lacks multi-functionality

> Complex to build with the amount of mechanisms needed. (16)

Henry Priddey
After he looked at my design for the mechanism. He then thought of a response.

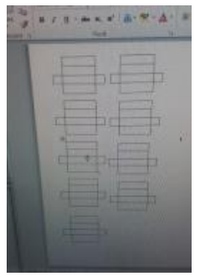
I decided to make a rough model of the mechanism that I'd be using in the shelving unit by making a net of a cuboid.



I added a slit in on side of the mechanism once constructed together using glue.

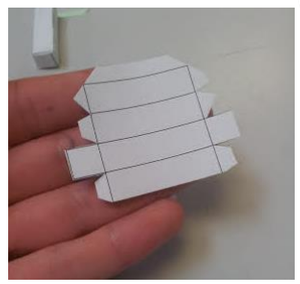
I rolled up a piece of card into a tube shape and cut out a strip of paper and used masking tape to attach it then rolled it around the tube.

Inside the mechanism I added a piece of card to signify a separation. As you can see there's space for another three of these retractable fabrics.



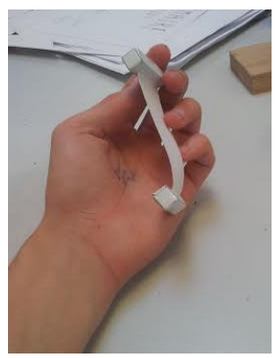
The completed mechanism. It has a fabric coming out of the slit. This is the shelf. These would be connected to another mechanism which has a spring in it so if not held in place would retract.

I made a smaller model so it could be seen how it would look like to have more than on mechanism connected to each other.

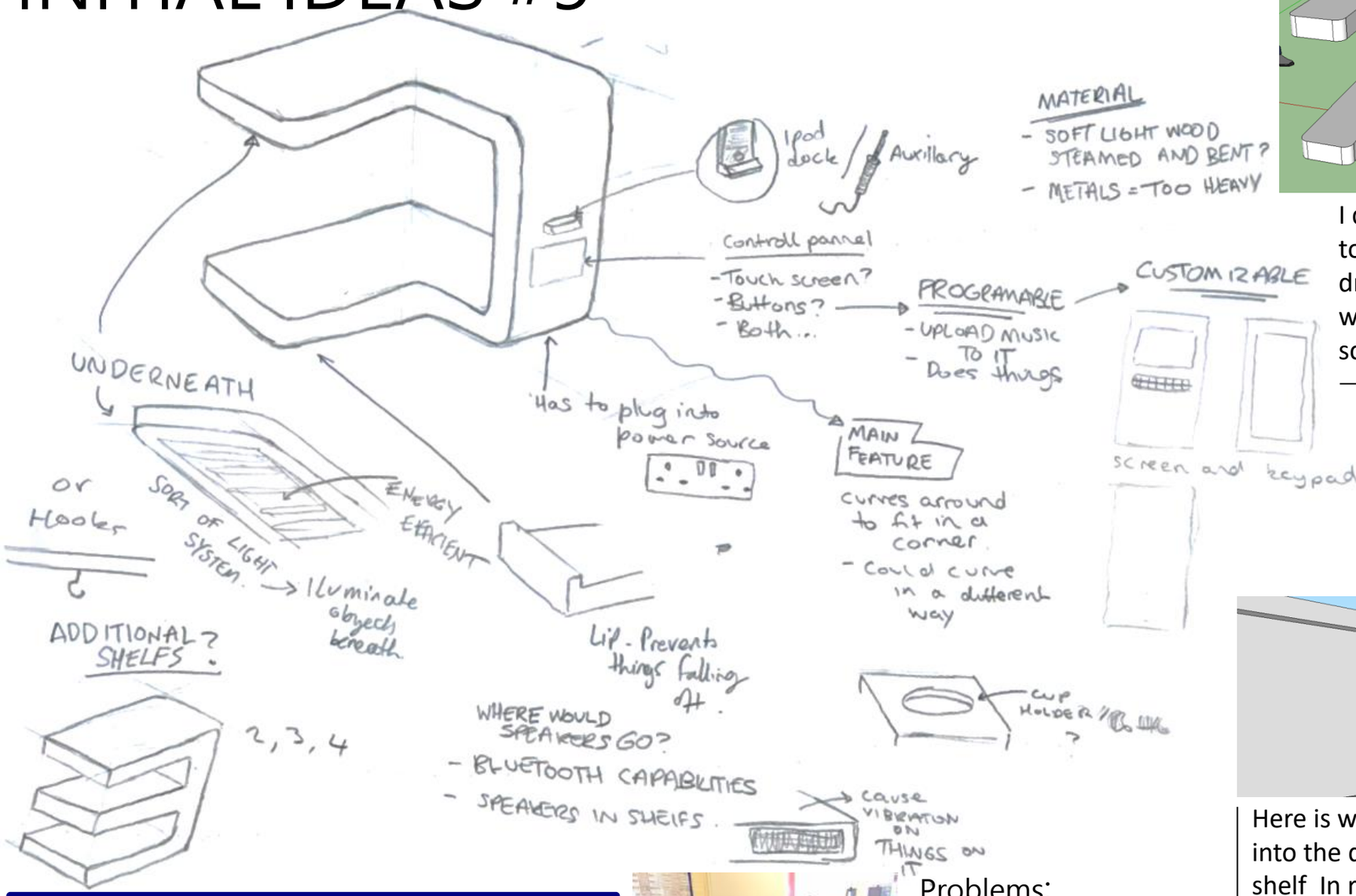


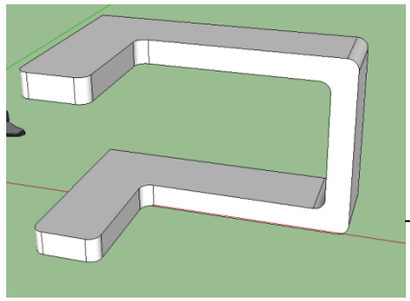
This is the net I cut for the cuboids.

Here you can see what two mechanisms together would roughly look like in my hand.

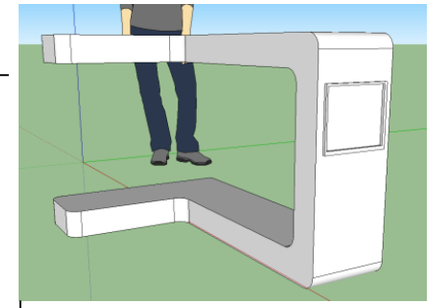


INITIAL IDEAS #5

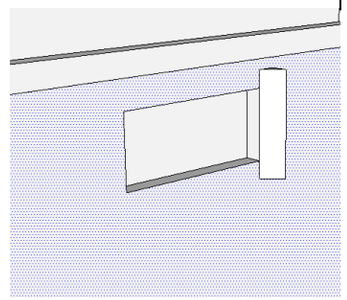




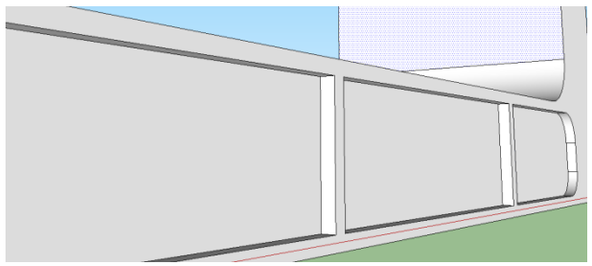
I replicated the design I drew on paper with Sketch Up and ended up with this. I did this by mapping it out.



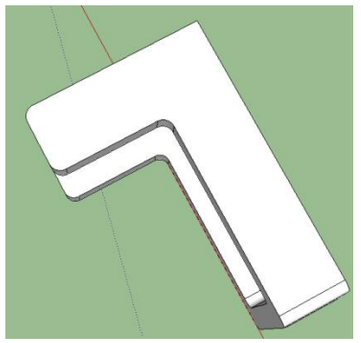
I drew where the supposed touch screen would go by drawing a square with a lip which would inside case the screen.



Underneath I mapped out a hole for where a smart phone could go so it hooks up with speakers and can play music that a user wants. This would hook up with the display.



Here is where the speakers would fit into the design. Along the bottom shelf In regular intervals. The whole design would have to be hollow as to allow the multiple devices to be connected up and to fit properly inside



This is how it looks from above. You can easily see how it would fit into the corner of a room

Clients Feedback:

This design is high-tech and would probably fit greatly in the modern home, however You haven't taken into account the price and the target market.

My Response:

"Completely right. My target market is late teens to early twenties and this demographic isn't likely to have enough money to spend on overly expensive devices."

Problems:

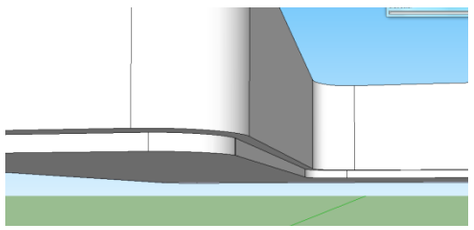
>This design quite boxy and unappealing the multi-functionality is the main thing going for it
>It would weigh a lot with all of the inside components
>how it would attach to the wall has not been considered

Jamie Wright

looking through my work on the screen and thinking of any improvements that could be made to the shelf.

Manufacturing:

Using a router and MDF 5mm to cut the corners and shell of design.

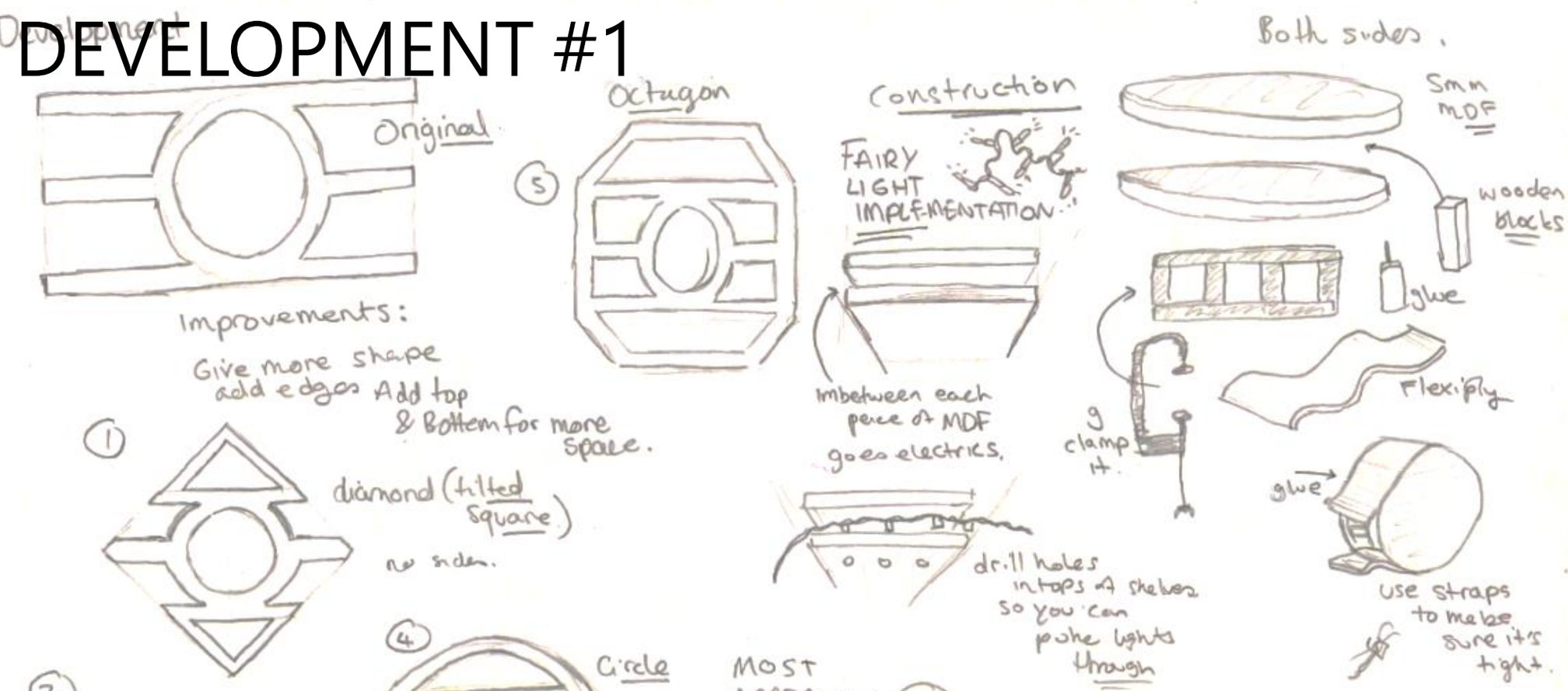


Marketing:

Out source the speakers and touch screen system from another company this way making a partner ship will give more publicity.

Here is the top shelf and you can see how a lighting fixture would be applied underneath. A screen of translucent glass with energy saving bulbs would be powered underneath it. It's would be removable as to allow replacements

DEVELOPMENT #1



To this side of my design page I've given a rough explanation of how the design 4 would be constructed. **Firstly**, two copies of the shape would have to be made and routed out. **Secondly**, spacing blocks would have to be placed between each copy and glued and pinned with nails. These have to be at the length of how wide the shelving unit needs to be. **Thirdly** the fairy lights would have to be implemented. And the wiring would have to be put into place. **Fourthly** the flexi-ply would be glued to the edge of the MDF boards and the scrap wood blocks. **Fifthly** straps would be putt around both sides and tightened up to make sure that the Flexi ply solidly fits to the design.

Weight and Size:

The down fall of this product is that it would weigh a lot. Due to the MDF and Flexi ply. To prevent this problem the manufacturing process will have to be precise.

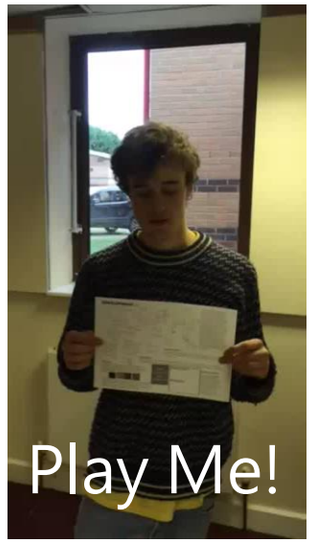
Manufacture:

To manufacture this I will send the schematics off to a company so I can get the exact correct shape routed, this would be more accurate than doing it manually. It is also more efficient for mass production.

Marketing

To give the shelving unit more desirability to different demographics in the age group. The most simple way of doing this is by having a varying amount of colours or patterns available.

Most desirable sort of styles currently are either traditional or minimalistic. With Minimalist that would mainly be just straight white or black. For more traditional designs a wood grain veneer could be an option as people like natural things.



Clients Feedback:

Henry Priddey:

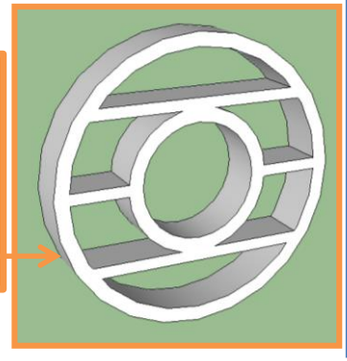
Out of all the designs I find number 4 the most apealing It'll look the best in a modern home.

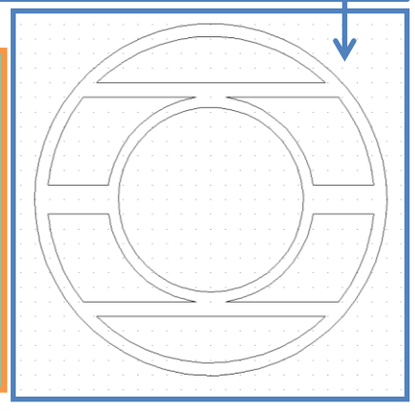
ROUGH 2D DESIGN

This particular design I made on 2Ddesign isn't large enough. For instance the space between the shelves isn't large enough to hold lighting. It also isn't drawn accurately with measurements in mind. It's purely just looks.

Sketch Up

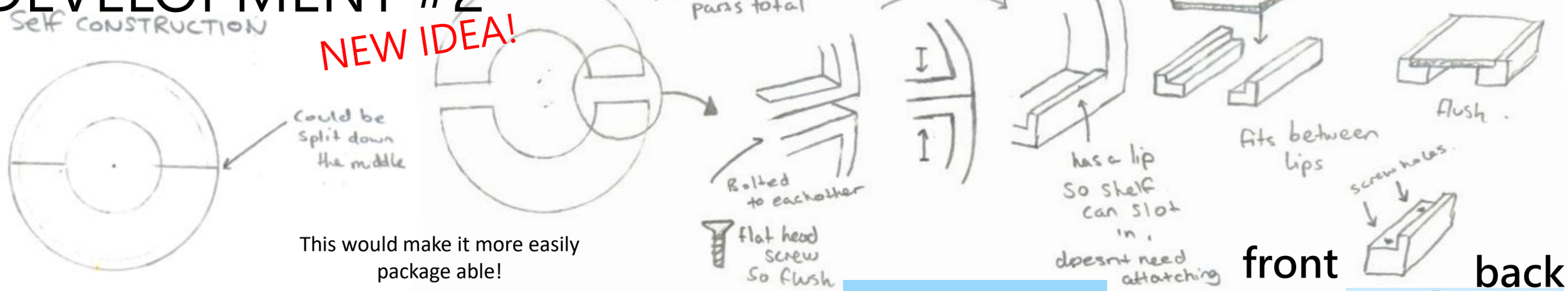
I made a 3D model of how the finished design should roughly look in white. Here the size between the shelves is more accurate than what I chose on 2D Design.



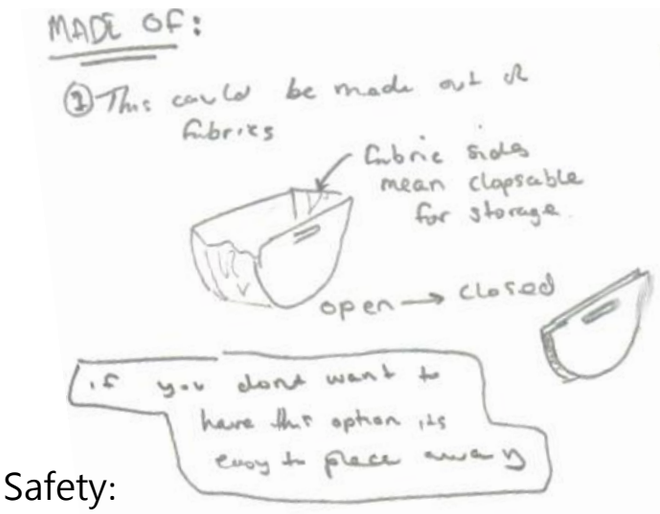


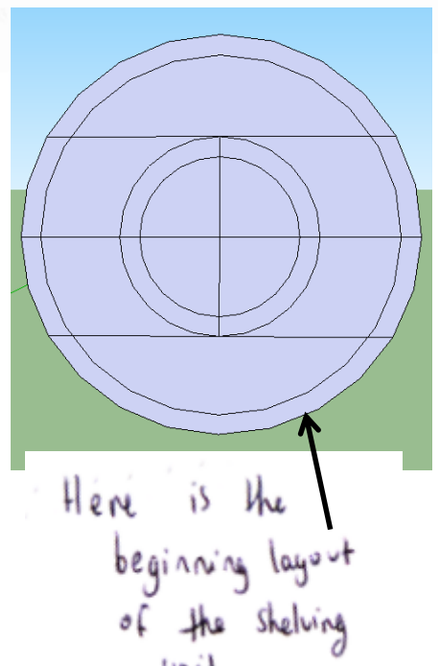
DEVELOPMENT #2

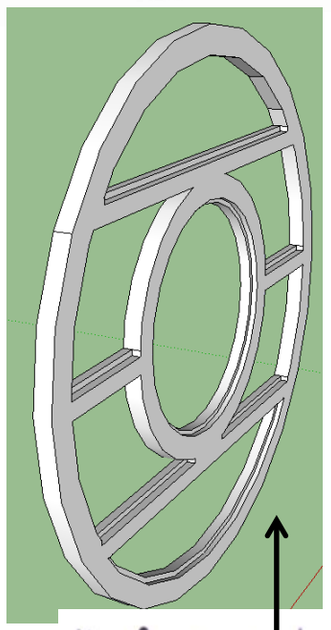
NEW IDEA!



This would make it more easily package able!







Safety:

if it's not constructed properly it could easily fall apart and cause damage to the user. To prevent this the construction process needs to be as simple as possible.

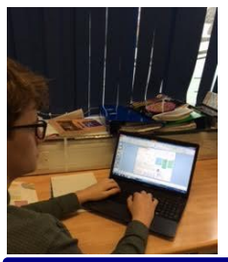
Self Construction:

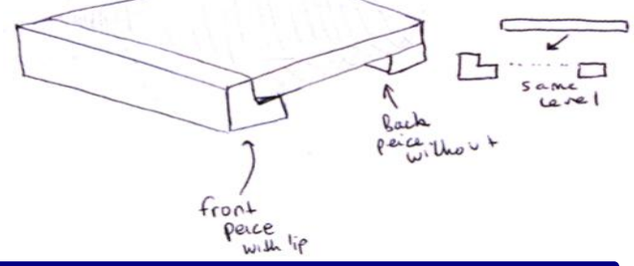
I have decided to make one of the main attributes of my shelving unit for it to be portable, and further more self constructible. This is so it's easy for storage if not in use and it will be cheaper to manufacture and distribute.

How Will I Manufacture This?

www.cncrouterservices.co.uk

I will send the schematics once completed to a company in Chalgrove called 'Contrax Furniture' They have the ability to route out the specific shape once put in the programme. They can do full sheets of 2440mm x 1220mm by using their machine 'The Stratos Sup Series' It's relatively quick and is most accurate method. If mass produced this would be how it's done so its valuable to do it this way.





Cost:

MDF is a relatively cheap material to use . I surfed **wickes.co.uk** hardware store and looked at the ranges of their MDF prices, I need to aim for the one that weighs the least but still needs to have strength. Here is three different thicknesses of MDF. (and flexiply)

MDF - PRICES

£17.99	£14.39	£10.99
Buy 3 for £15.50 each	Buy 3 for £12.90 each	Buy 3 for £9.30 each
Depth: 18 mm	Depth: 12 mm	Depth: 6 mm
Fire Retardant: No	Fire Retardant: No	Fire Retardant: No
Structural: No	Structural: No	Structural: No
Width: 1220 mm	Width: 1220 mm	Width: 1220 mm
Length: 2440 mm	Length: 2440 mm	Length: 2440 mm
Moisture Resistant: No	Moisture Resistant: No	Moisture Resistant: No
Type: Board	Type: Board	Type: Board
Weight: 40.187 kg	Weight: 26.791 kg	Weight: 13.396 kg

FLEXIPLY – PRICES

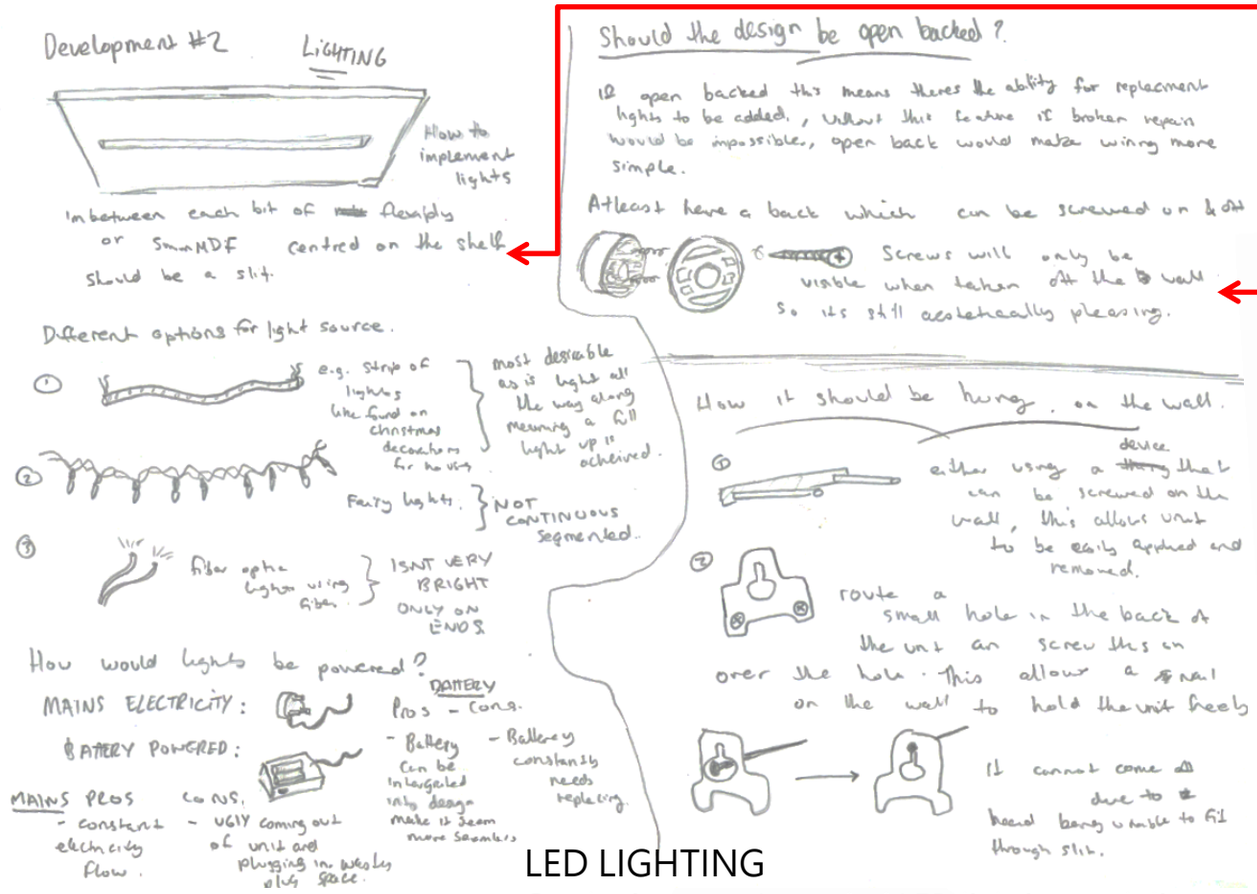
£14.39
£19.45 per SQM
Depth: 6 mm
Fire Retardant: No
Structural: No
Width: 607 mm
Length: 1220 mm
Moisture Resistant: No
Type: Board
Weight: 2.222 kg

Clients Feedback: Jamie Wright

Getting someone else to cut out your design for you will greatly increase the accuracy.

FURTHER DEVELOPMENT (e.g. #3)

In hindsight this isn't the best method for lighting as now I am going for a more skeletal design. This would take up a lot of resources and be heavy.



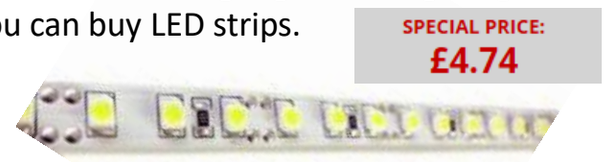
Type Of Lights – Colour of Lights

LEDs are a valuable option. This way settings added for colour change to be an option. LEDs are light emitting diodes which can consist of three colours Red, Green and Blue. RGB. When illuminated in the correct intensities and combinations it can give the illusion of a vast array of colours.

When objects are illuminated with the correct colour it can complement what objects on it.

LED LIGHTING

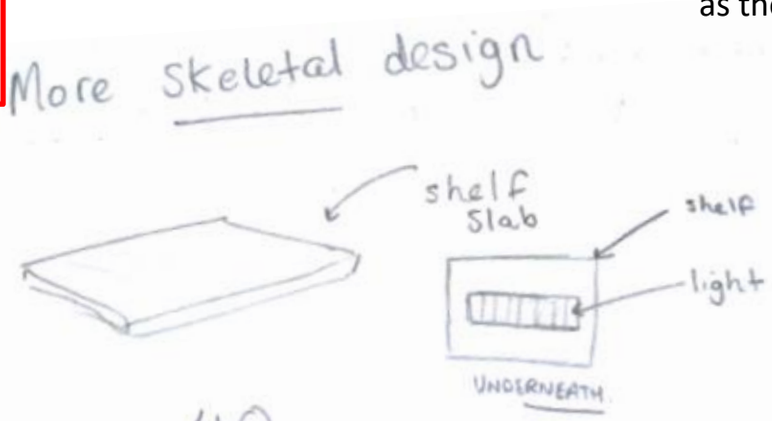
On the internet I googled LED lighting and discovered you can buy LED strips.



CRUMBLE

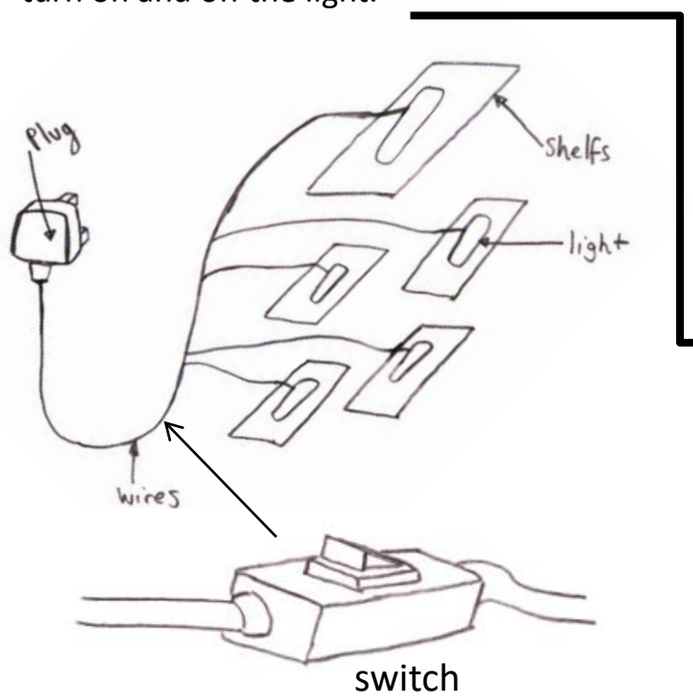
To fix the problem of the light sources I have decided to go with a LED lighting set up which can be programmable by this software called 'crumble' They would stick underneath shelves and are battery powered. However the programming allows you to make lights only come one at certain times

Co-worker Feedback:



IDEA!

Connect all of the lights up to one plug socket and then have the lights attach to the bottom of the shelves. This way batteries don't need to be constantly replaced. And Have a switch some where along the wire to turn on and off the light.



LIGHTING SOURCE

I 'googled' press lights because I've seen these before where you press on the light and it triggers a switch and turns on the light. This would be go as they are bright and simple to use.

NEGATIVES

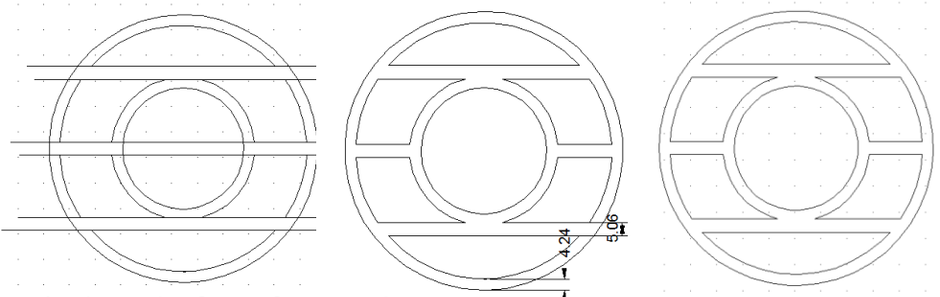
However, this is a bad idea as seeing the shelves are not securely in place it mean pushing up would be dangerous for the items placed on the shelf.

Also, this is good for short term but batteries would have to constantly be replaced. An option that plugs into the mains would be a better idea.

NEGATIVES

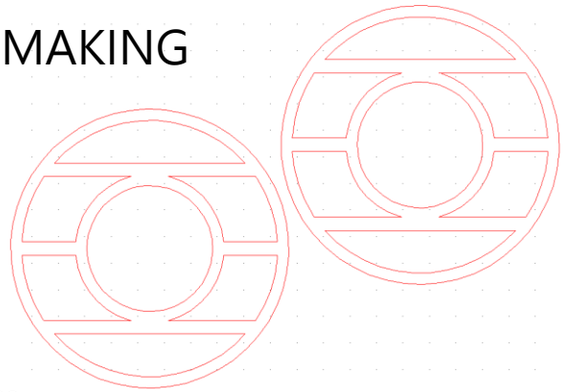
This would be a lot of effort to complete and would take up a lot of time and resources perfecting the circuitry. Also wires would not look aesthetically pleasing and would get stuck between the wall and the back of the design.

DEVELOPMENT #4 MODEL MAKING

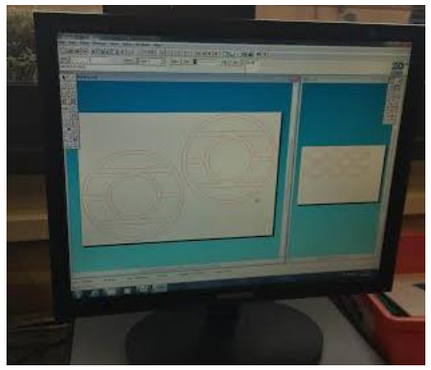


1) I drew the face of my product on 2D design, making sure to have each shelf the same height using a ruler.

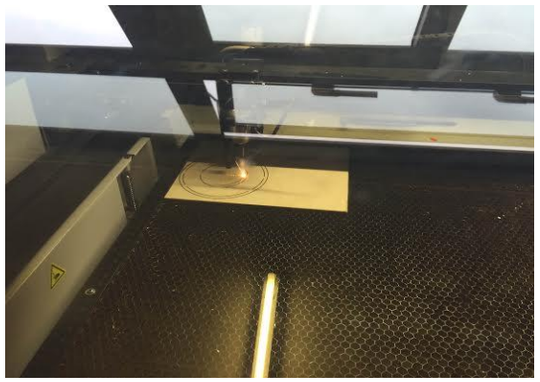
I then deleted all the excess lines so it was the shape I wanted. Once this was done I changed the line colour to red.



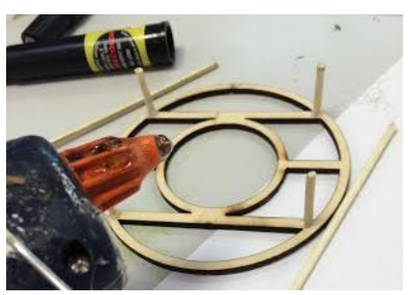
This indicated to the laser cutter that it's a part of the wood which is going to be cut out.



2) I took a memory stick with the file on it to the computer connected to the laser cutter. I then used the command to print it out.

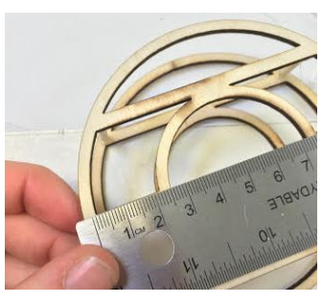


I waited around 5 minutes for both faces of my model to be cut out of laser ply. When it was finished the unwanted pieces easily fall out.



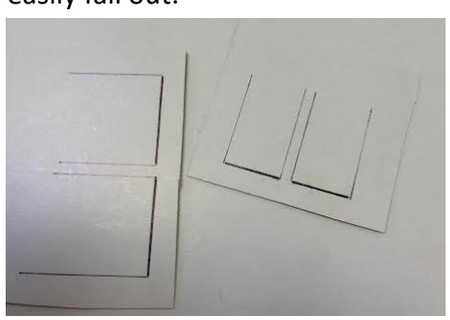
3) Once the faces were ready I began joining them together. I used bits of a kebab stick cut with scissors in place of the dowel rods which would be joining both sides together.

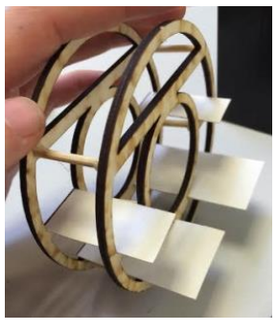
I used a hot glue gun to attach the kebab sticks to one side of the frame. Then I got two flat surfaces as to insure both sides we're attached parallel



After this I use the glue gun to glue all the kebab sticks on the tops then I press on the front face. Then I left to dry.

4) I measured out with a ruler the width of each shelf. Then I drew the length onto card and proceeded to cut out the shelves.





I made sure each one was the correct width and inserted them in and afterwards I cut them down so the depth of each shelf was flush with either side.

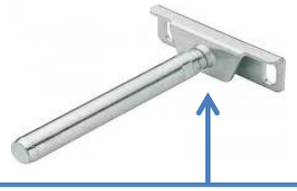
Models Materials

6mm MDF – Flat Surfaces
Flexi-ply – Curved surfaces
12mm MDF – Faces
Dowel Rods – Connect Faces
Flat Head Mirror Screws – Connect Faces

Co-worker Feedback:
In this video my co-worker George Poole who brings up how this model doesn't accurately represent how it would hang on a wall.

How would I hang it on the wall?

I would either a 'concealed shelf support bracket' which attaches to the wall with screws and then the shelving unit slots on.



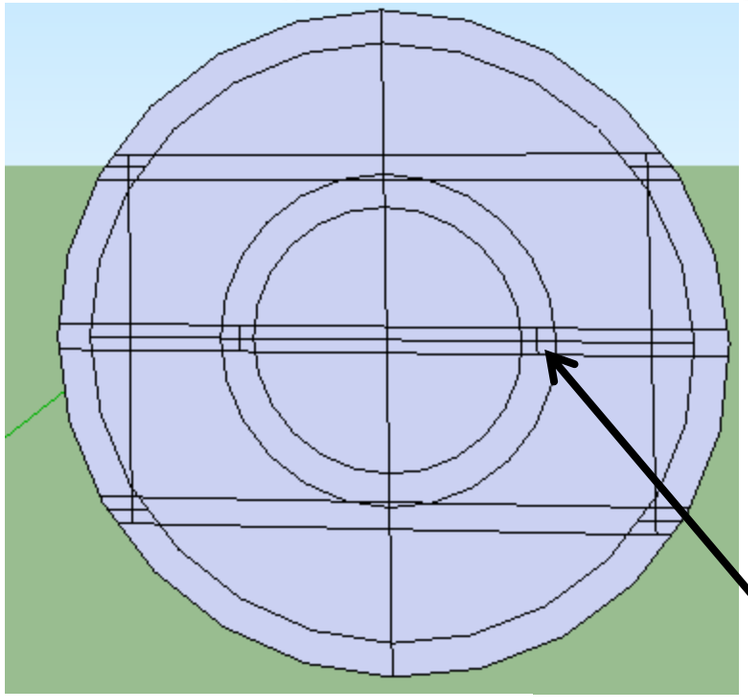
£2.44 each - SDS London Ironmongery

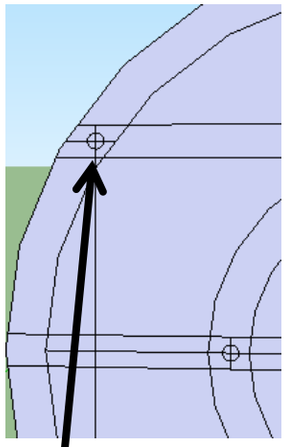
or

A 'slotted brass plate' which screws onto the back of the shelving unit and then a wall screw slots onto slot in the back.

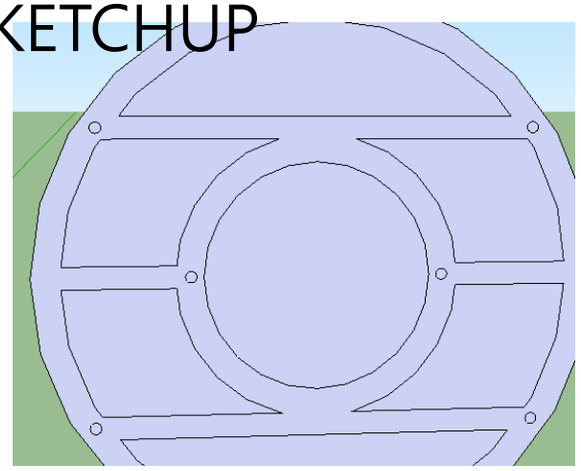
£1.75 10 pack - screwfix.com

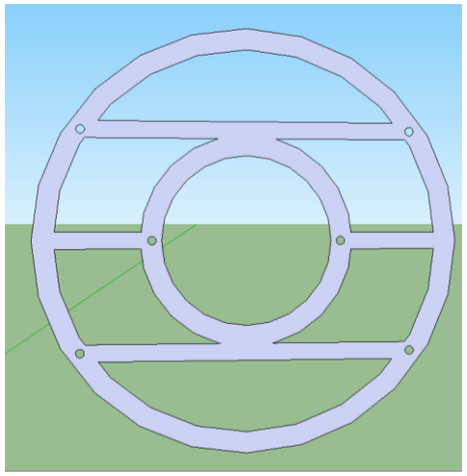
DEVELOPMENT #5 SCALE SKETCHUP

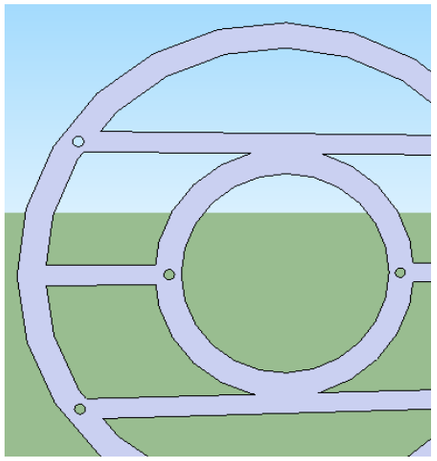


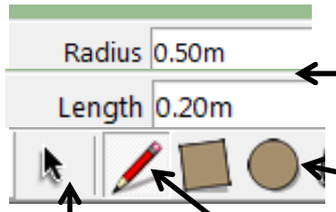


Dowel rods will go in these places.
Considerations: Putting in more for structural security.
No need to over do it make sure suitable amount is made.







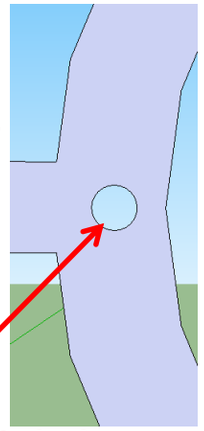


I used this box in the bottom right hand corner to accurately measure out different attributes of my design like the **radius** of circles and **length** of lines.

I use the **circle** tool to draw circles. It locks onto the centre of the first circle meaning its easy to draw circles 11

This is the **line** tool , I use it to draw lines.

The **select** tool I use to select different parts of the design. Mainly for deletion.



Dowel rods go through this hole to allow front and back to connect.

Measurements

radius total = 500mm
radius inner rim = 450 mm
radius inner circle 250mm
radius inner rim = 200mm

Centre shelves = 200mm
Top shelve = 700mm
Bottem shelves = 310mm

Shelfs = 6mm mdf

depth MDF or = 12mm for front and back

Size

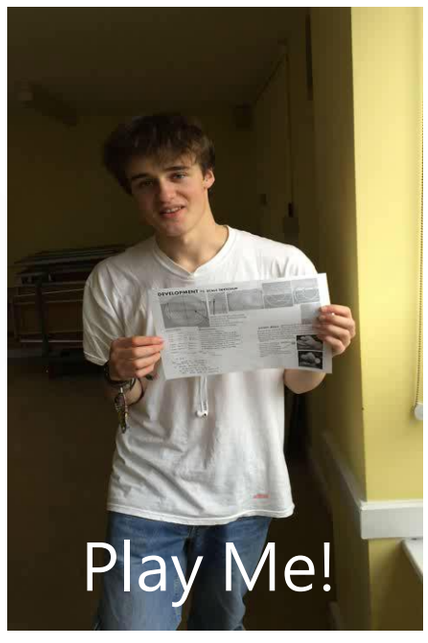
do i need to consider making it smaller?
If made smaller the dimensions will have to change but still support the same sort of objects.

Measurements

I've decided to keep my measurements simple. They're all to multiples of 10 which means that it's easy to cut. However I can extrapolate my measurement data downwards and make the shelving unit smaller but it's size is better large as this way larger items can fit on the shelves and it would be more useful to people

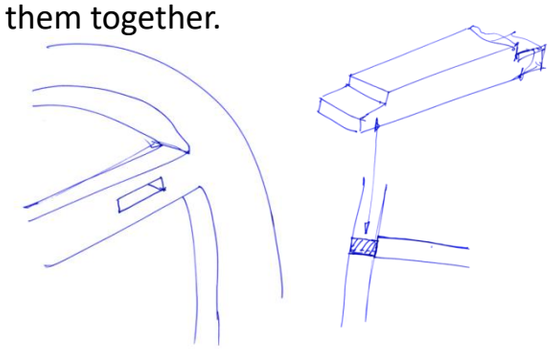
DOWEL RODS

Dowel Rods come in a range of sizes. The sizes that would best suit my shelving unit would be 15mm or 25mm (radius). For the most structural security 15mm dowel rods are the best option.



NEW IDEA!

Another Idea is that I could laser cut out some rectangular blocks from the same wood that I cut out the faces from. With rectangular holes in the front it could be easy to stick both of them together.

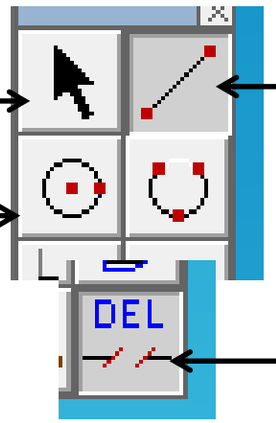


This would be easier to construct for the average person. It would minimize material waste. It would fit into a pack.

from **screwfix.com**

DEVELOPMENT #6 2D DESIGN

I made a layout canvas 1500mm x 1500mm so I could fit my design onto it, I started mapping it out. I can adjust this further in time to fit the 2440mm x 1220mm



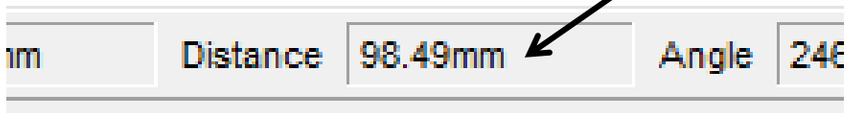
This is the tool I use to select what I want. (**Select tool**)

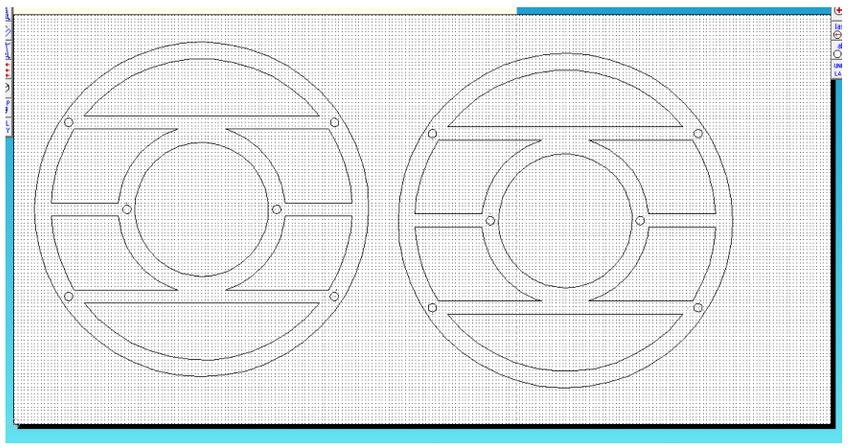
This is the tool I use to draw straight lines. (**Line Tool**)

This is the tool I use to draw circles. (**Circle Tool**)

This is the tool I use to delete unwanted sections. (**Delete Tool**)

The distance meter at the bottom of the screen made it easy for my to put in my measurements





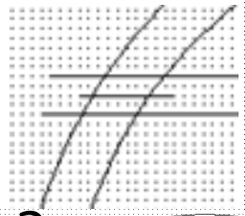
I could also easily attach the front and back of the design together by screwing shelves onto the faces

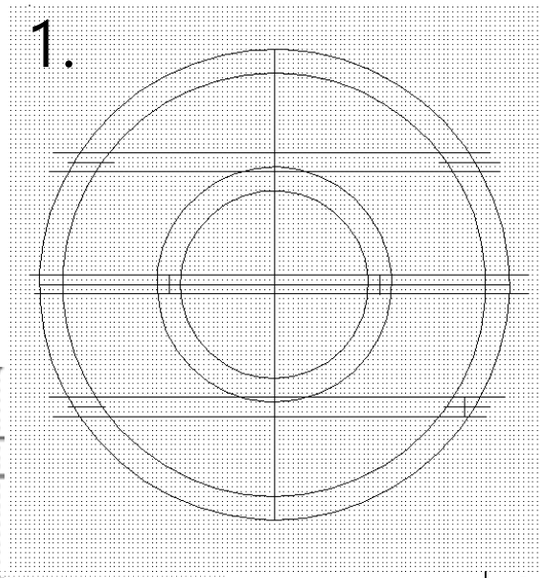
I need to find out a way to add the lip onto one side of the design.

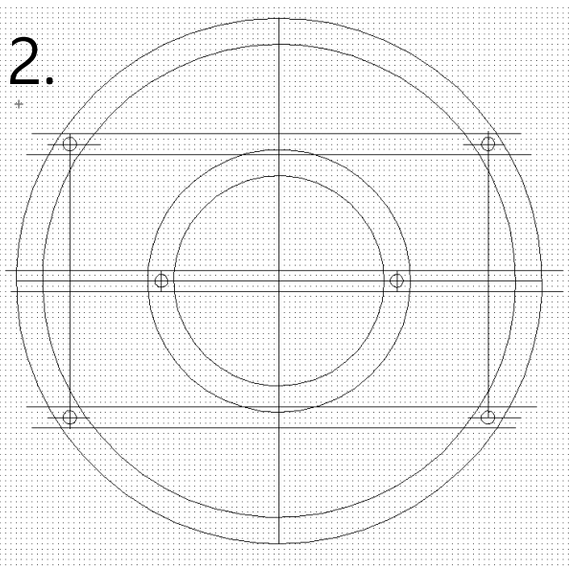
Perhaps there is a way I can get the company to route out a lip. Possibly they have apparatus which would allow for that.

Using bolts and washers would be a simple way of attaching the screws shelf and frame together. It may not look aesthetically pleasing from some angles though.

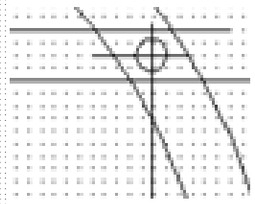
1. I lined out the level of where the dowel rod hole would need to go.

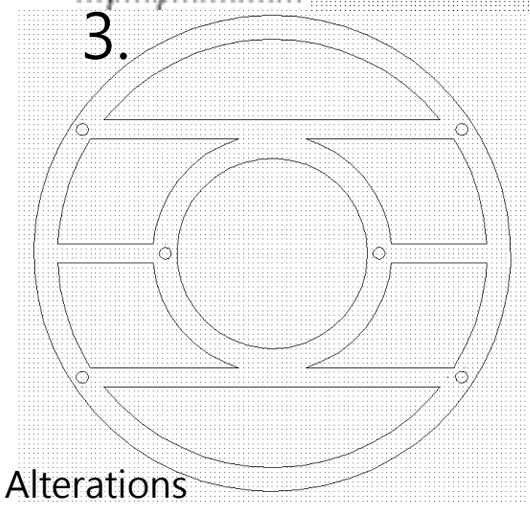






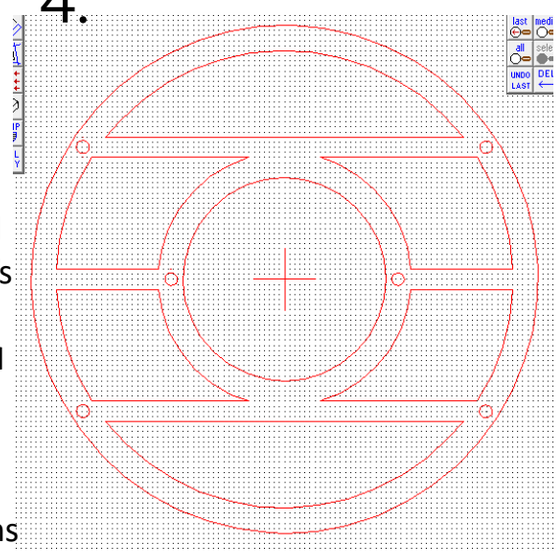
2. I used the line tool to draw where the centre of the dowel rod would go.





3. I used the delete tool to delete the guide lines I set out

4. Grouped my design together. Then coloured it red. This indicates it should be cut out.



This is not entirely accurate as the dowel rod holes are slightly different shapes. It's very difficult to draw the exact same shape circles on this program. How ever I have now discovered by using the select tool you can select parts of your design, copy and then paste them. Using these copies on other parts of the design means that each dowel rod hole will be exactly the same.

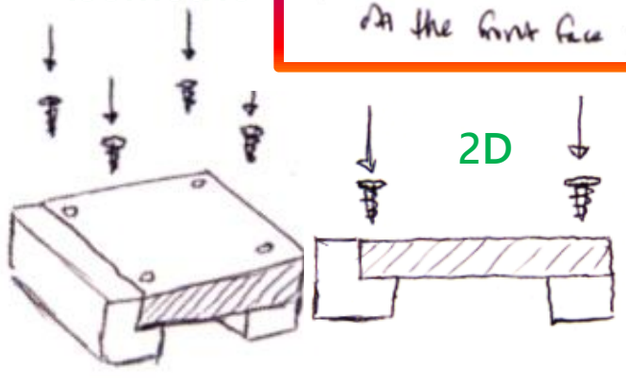
Alterations

I changed the canvas size to 2440mm x 1220mm. Here you can see I can easily fit both sides of the design onto this sheet of MDF.

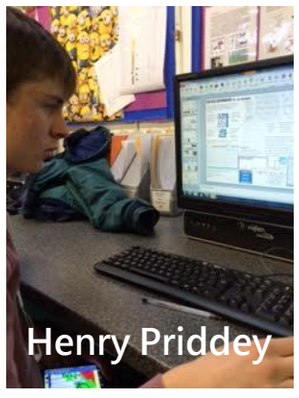
Client Feedback:

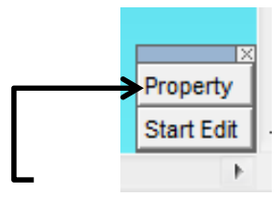
Its good to have this full scale map for your shelving unit however this doesn't account to the lip on the front face of the design.

Isometric

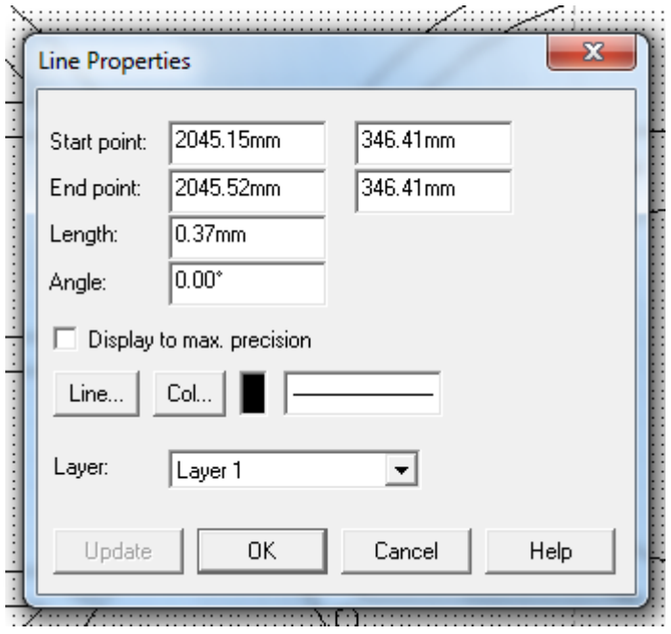


Use of washers and bolts to keep these two parts securely together. **Flat-headed screws**!

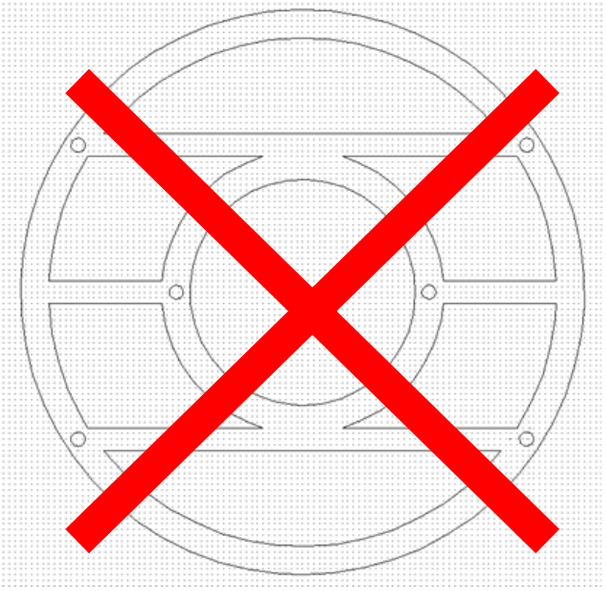




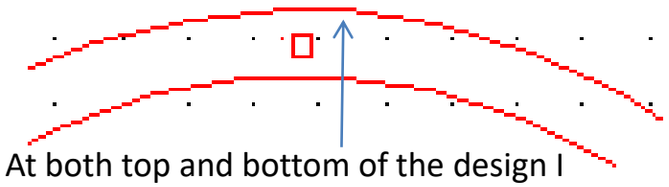
When selecting a line an option in the corner pops up for properties. Clicking on this brings up a window which allows you to accurately alter the properties so you can make it the exact size that you want.



FINAL DESIGN



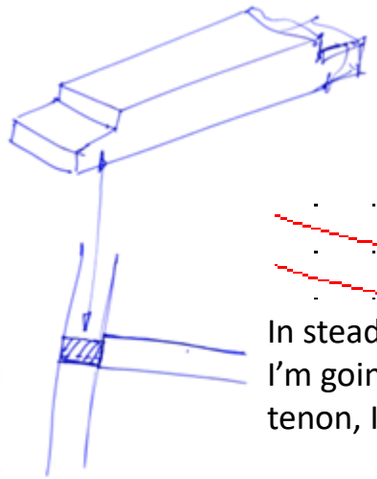
Fitting this in on 8 places in the design will act as support and keep the design a uniform distance apart



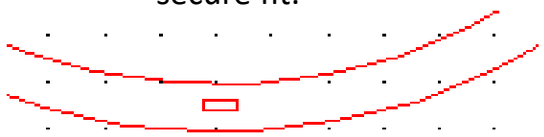
At both top and bottom of the design I added fittings for extra support as these would be particularly weak places

I've decided to change the input of dowel rods on my design as it has become apparent to be unnecessary.

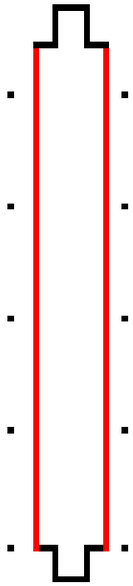
I made the decision that if I use the excess MDF as a mortis and tenon like structure it would save money and produce less waste



To allow this idea to work on 2DDesign I had to make it double sided as it would make a more secure fit.



In stead of the blue drawing to the right I'm going to do a double sided mortis & tenon, It'll strengthen the structure.

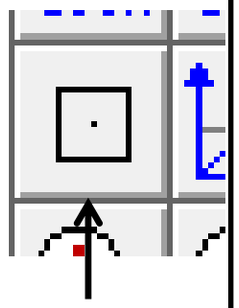


I had to adjust previous designs so the fit would be more tightly.

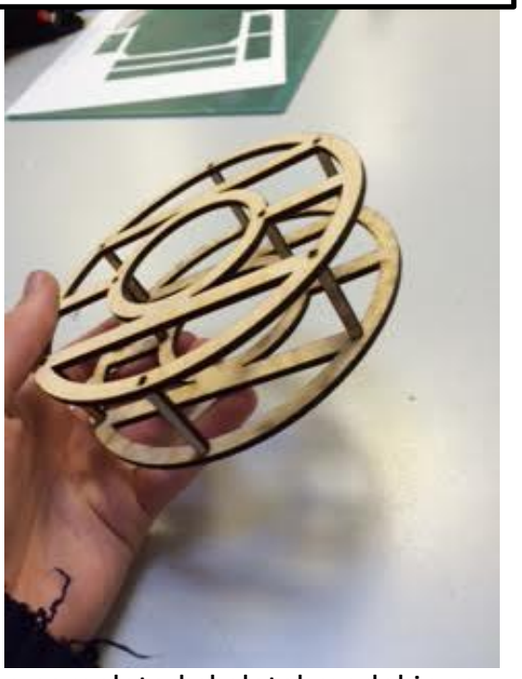
As you can see the joints are slightly thicker and also longer. Between these two joiners.

EXTRA!

I discovered this useful tool called the 'Attach' which allows you to attach lines directly to each other. Extremely useful to have found earlier on but is a big help with drawing out what is needed.



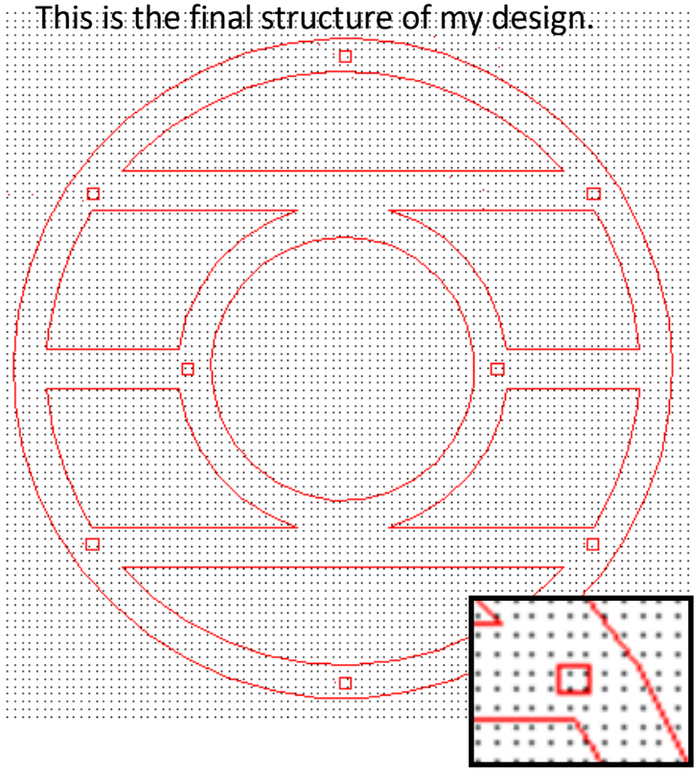
Using scrap 3mm plywood was a good way of continuously coming up with the correct sizing for the joints



Here is the completed skeletal model in my hand. However it still needs shelving.

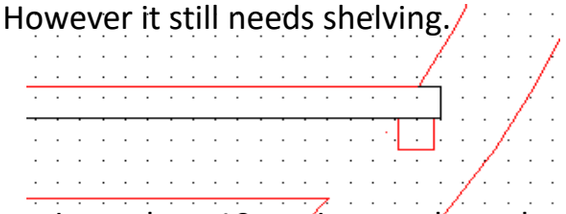
The left of these mortis and tenons fits perfectly in my design, however the right does not. A matter of millimetres changed the outcome

This is the final structure of my design.



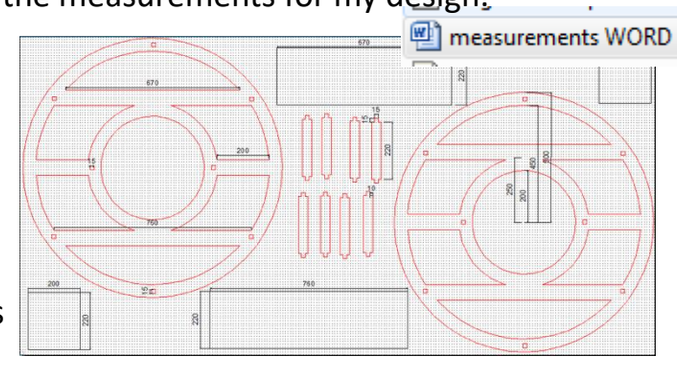
I scaled down this design so it wold fit onto 3mm plywood. This is why I constantly had to modify the mortis and tenons until they were the correct size.

In this image you can easily see how the front and back face fit. With the mortis and tenon joints



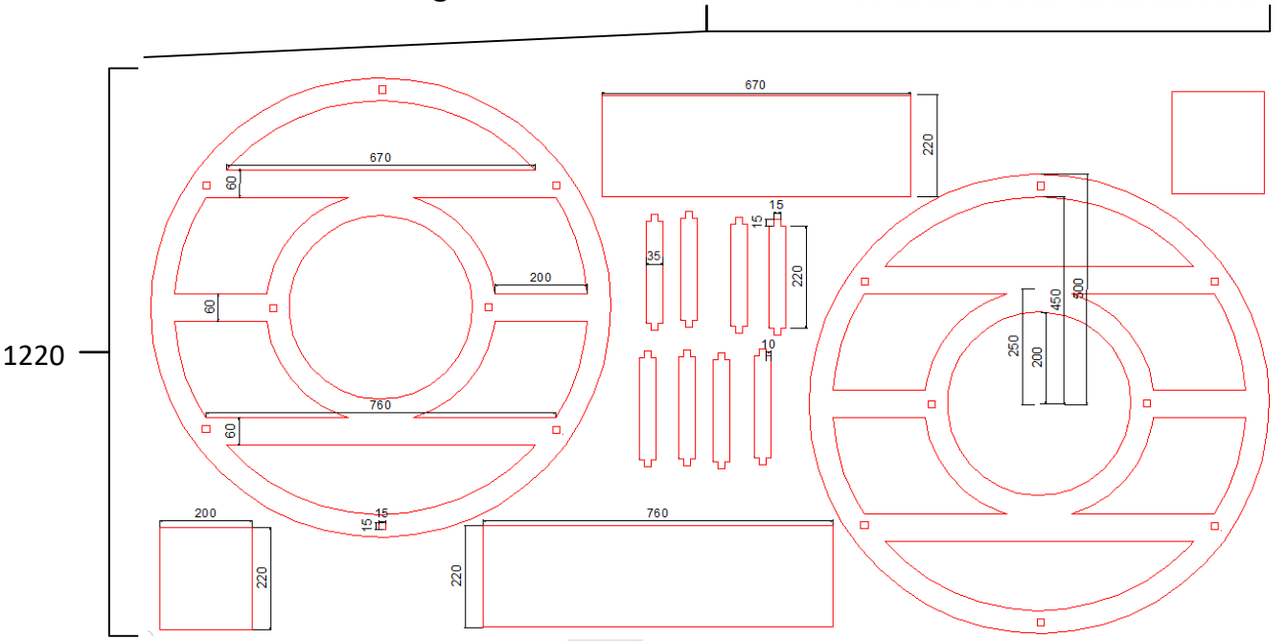
There is going to be a 10mm insert where the self fits

I made a word document so I could print off the measurements for my design.



MEASUREMENTS & CONTRAX

The unit for all of these numbers is millimetres (mm). The size of the rectangle represents the size of the 15mm MDF sheet I'll be using.



I'm going to send the printed off measurements to the company Contrax Furniture in Charlgrove. They don't have the same software (2DDesign) so I need to write up all the measurements and send them this picture so they can re-draw it with their software and then they can print it off on the machine The Stratos Sup Series.

01865 891 595

I called up Contrax Furniture on my mobile phone with the number above, they put me through to a designer called Sam. I had a talk with him about what I was doing. In conclusion I e-mailed him the schematics that are to the left of this paragraph along with some other necessary information such as the thickness of MDF that I want to use. Below you see my first e-mail to Sam and Sam's first e-mail back:

Robin Bowen Bowker <robinbowenbowker@gmail.com>
to sam

Hello Sam,

Sorry I was unable to make a .pdf to send you, so I screen shot a image of the measurements in .jpeg, if this format doesn't work on your computer tell me & I'll send you it in another file format.

If you need any other information on the design tell me and I'll update you.

The thickness of MDF I wish to use is 15mm

Thank you very much!

Sam Connolly via contraxfurniture.onmi Feb 29 (1 day ago)
to me

Hi Robin,

The image is fine. When I get some free time, I'll draw your components up as I would for any client and send you some PDF'S and notes explaining what I have done (perhaps these will be useful for you log books or work you have to submit). When do you need it by and how does your school propose to pay for the CNC work?

Best wishes,

Sam

Sam Connolly via contraxfurnitu 11:45 AM (3 hours ago)
to me

Hi Robin,

Did you get my email yesterday? I've drawn up your components with a couple of things to note:

- As the CNC cutter is round, it can't cut a clean square corner; therefore I've had to put 6mm radii on corners (such as the square holes and the shoulders of your tennons) which you can see on the drawing. These would need to be squared out with a sharp chisel. How does this affect what you are trying to achieve? I can CNC out shapes for you to use as templates to mark out and cut tight corners.

- Note that all the components on the sheet of MDF are spaced out 23mm or more apart. This is to allow that a 20mm roughing cutter to pass through without any damage to components.

- I've also spaced all the components in 5mm from the edge of the sheet of MDF. Quite often you can find the corners of a sheet of MDF can get damaged in transit or handling so leaving this 5mm margin all round saves you from ending up with components with damaged edges.

- Could you give me some dimensions for the correct spacing of the square holes? At the moment I've drawn them on a 475mm radius and 225mm radius respectively.

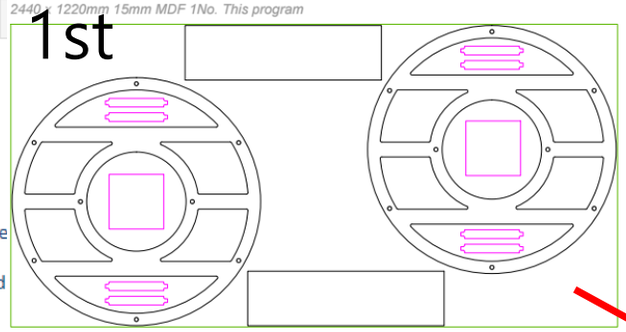
Apologies if any of the above sounds confusing, if you want to give me a call to discuss then please do.

Best wishes,

Sam

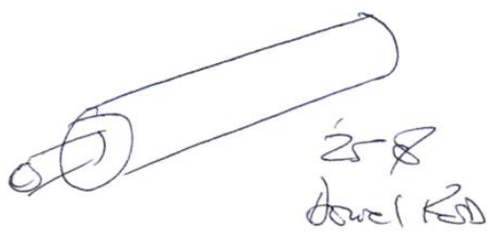
1st

2440 x 1220mm 15mm MDF 1No. This program



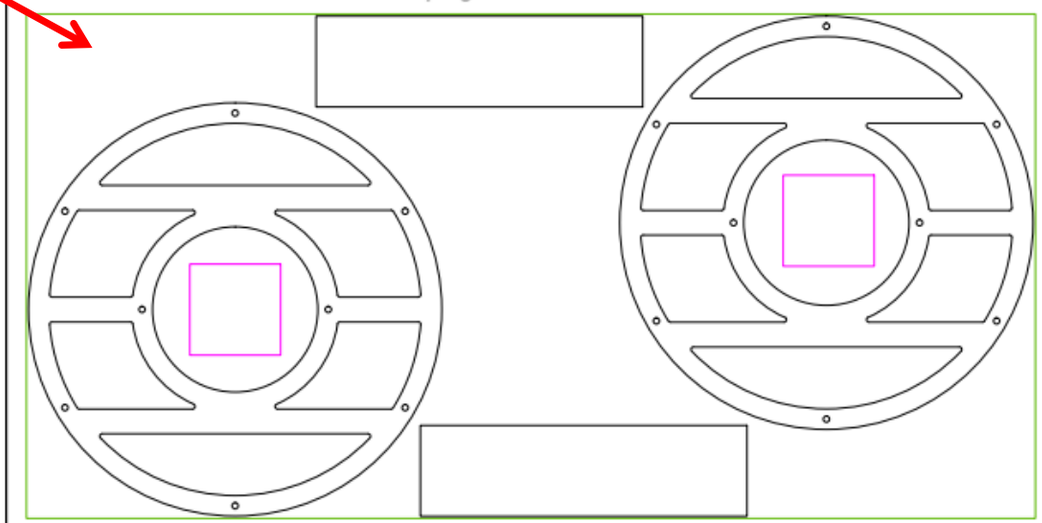
Problem:
To the left is the second e-mail Sam sent me. Here Sam explains that their CNC cutter cannot cut clean squares so my tennons wont work.

Solution:
I discussed with my teacher and we decided we could use a 25mm diameter dowel rod and use a lathe to make it the correct diameter to fit in the hole. This would mean there is no need for the eight tennons.



2nd

2440 x 1220mm 15mm MDF 1No. This program



CONTRAX FURNITURE
Unit 34a Monument Ind Park
Chalgrove, Oxfordshire
OX44 7RW
Tel: 01865 891 595
Fax: 01865 891 188
Email: contracts@contraxfurniture.com
Web: contraxfurniture.com

DRAWING STATUS
PRELIMINARY
FOR APPROVAL
FOR INFORMATION
FOR CONSTRUCTION
FOR SITE FIXING
FOR PRODUCTION

CLIENT: Wallingford School

PROJECT: Robin Bowen Bowker

DRAWING TITLE: Components

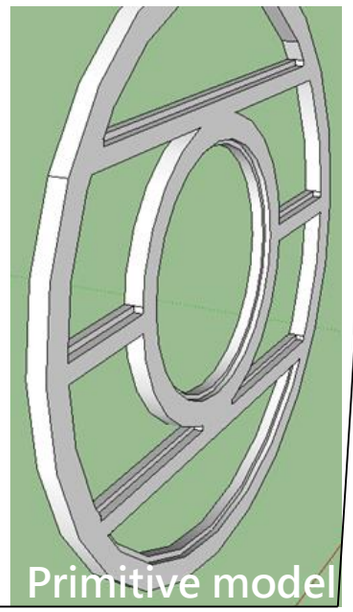
Job No. - Date 01/03/2016
Dwg. No. 001 Scales Do not scale
Dwg. By SJC Check. By -
Notes -

Here you see my design as reconstructed by Sam. He uses more advanced software which is integrated with the CNC cutter Contrax Furniture has, meaning you can visually see where the curve of the router will cut around corners

CONTRAX CONTINUED

FOLLOW THE RED ARROWS

Once the design had been started I remembered that I needed to have some 'lips' routed into the design's front and back for the shelves to fit in. Like in the image shown bellow. So I sent Sam this e-mail.



Robin Bowen Bowker <robinbowe Mar 2 (13 days ago)
to Sam

Hello Sam,

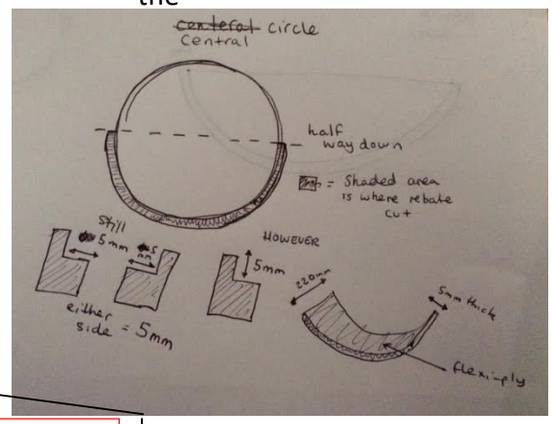
I was just wondering whether you could do another thing on my design for me.

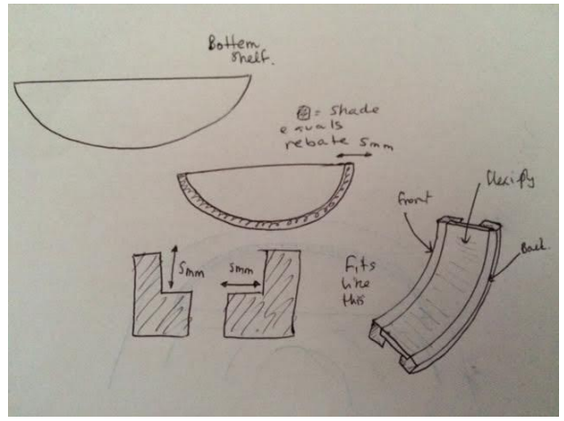
Bassically, it possible for your CNC router to cut in a sort of lip into both front and back of the shelving unit for each shelf to sit in?

I've drawn out some diagrams with measurements so you have a better idea of what I'm trying to get across.

Thank you,

These were the photographs attached:

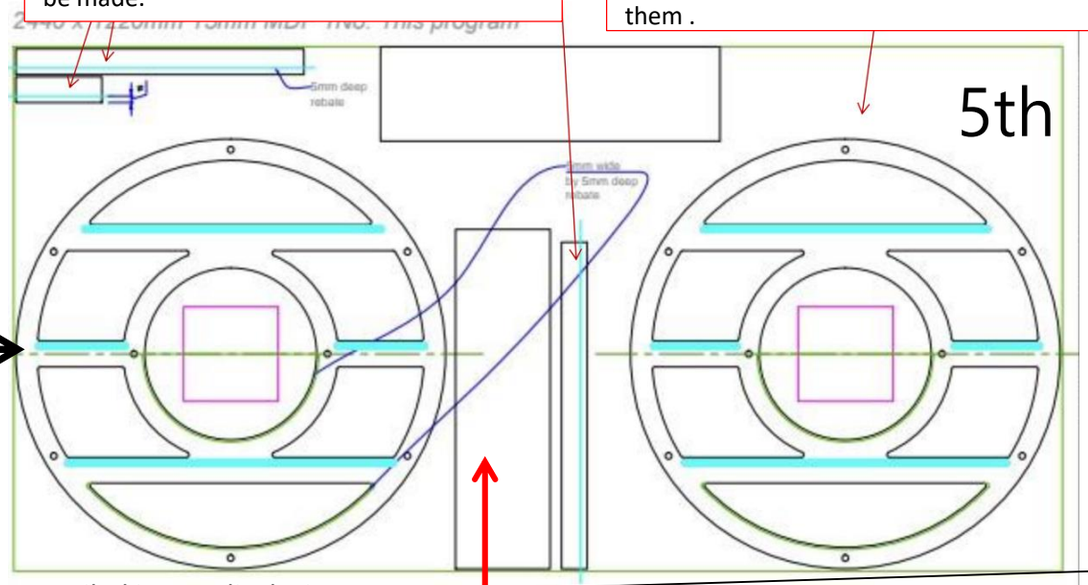




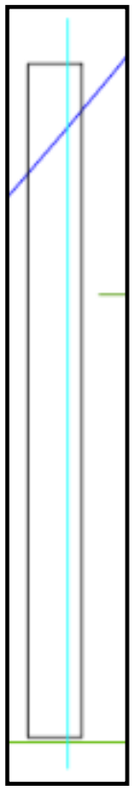
During mock week I had no access to school facilities so I drew some images and took two photographs on my mobile to send to Sam to explain where I wanted the

I don't really understand what these are. I meant for the rebates to be on front and back of the design. I've highlighted these areas in light blue underneath each shelf where 15mm vertical and 5mm depth rebate should be made.

Since the rebate is only has a depth of 5mm on the opposite side of both front and back it will have no crenulations in them .



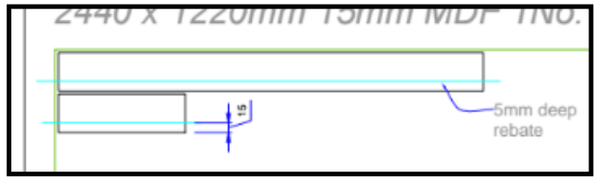
In the red boxes you and see the concerns that I made as well as the additions to the image to convey the problems I had



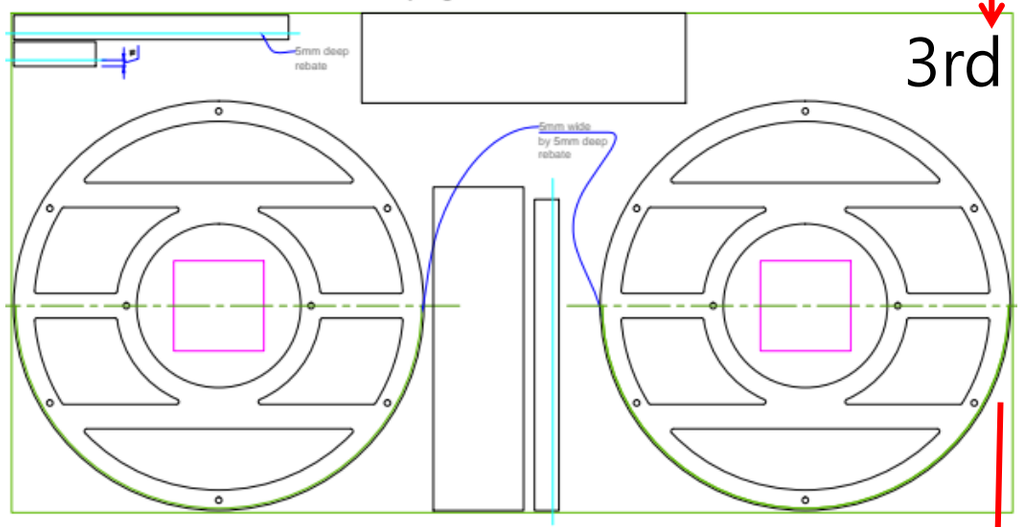
e-mailed image displaying concerns:

Where he put the 5mm wide by 15mm deep rebates seemed to be on a separately cut out piece of the 2440 x 1220 MDF sheet. I must have come across wrong somewhere in the intentions of my design. So I decided that I'd e-mail him an image displaying my concerns.

All three of these shapes are the same length in millimetres as the shelves that I needed to be implemented, so perhaps Sam did understand but was trying to signify what I wanted in a way I couldn't understand

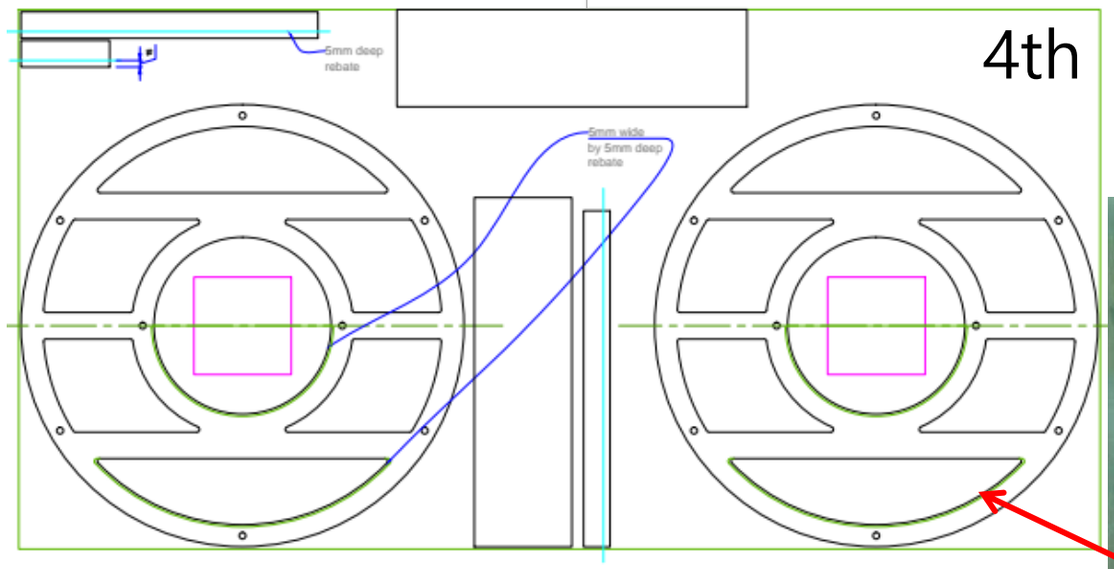


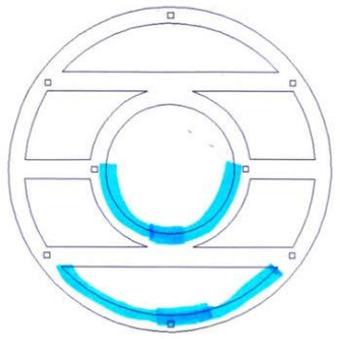
Sam came back to me with an e-mail with this file attached:
The photographs I e-mailed him obviously didn't sufficiently explain what I wanted to be done as he put the rebates at the rim of the design.



I e-mailed Sam back saying "sorry for the confusion" with this image attached:

It shows simply highlighted in blue where the curved rebates need to go. Accompanied by the 3D image of where the rebates should be.





At first I thought it was perfect and replied briskly. However I realised that there were some things which brought up confusion for me and my teacher

He replied back with this file attached:

PLAN OF MAKING

WEEK 1

Firstly, I called up Contrax Furniture on my mobile phone. Then spoke to a one of their design team members. (Sam)

We agreed to contact each other over e-mail so I could show him what needed to be done

Secondly, I e-mailed Sam a JPEG of the measurements for my design.

He came back within 24 hours with PDF of what their routing equipment would cut.

Thirdly, I decided to stick with my original idea of using dowel rods to connect front and back as the CNC router can only cut in circles meaning the tennons I had implemented were unnecessary and could be removed from the design.

WEEK 2

Once problems were sorted out we went to Contrax Furniture in Charlgrove to pick up all of my cut out components (also to film the machinery cut out work for my project)

We brought back all of our work in the school mini-bus

Once returned dowel rods need to be made by cutting the correct length and then being lathed to the correct diameter to fit through the 15mm holes in the front and back.

After this is done the shelving unit can be fitted together.

Before this a mechanism will be created so it can be wall hangable.

Safety:

During the manufacture of my shelving unit I am going to need to keep in mind safety precautions for instance in the work shop when dowel's, flexi-ply and other bits of MDF are being cut to the correct dimensions I will need :

- Protective Goggles
- A face mask
- Hearing protectors

These will prevent any wood chips potentially flinging in my eyes as well as preventing me breathing in any saw dust particulates. The circular saw is very loud and hearing protectors will prevent me from getting deafened after long term use.

In the process of painting I will need to have similar protection:

- Protective Goggles
- A face mask
- Hearing protectors

This is because particulates of primer and gloss paint are dangerous to your respiratory system especially when made volatile. The same goes for your eyes when the paint is being sprayed there's a change that paint can splash of the surface you're covering it in. The paint sprayer is also very loud and could cause hearing problems over time.

Work Shop – Circular Saw:

To the left you see an image of the work shop with the circular saw in it. This is a dangerous bit of apparatus and for the most part Mr Turner (the workshop supervisor) has to handle it.

Paint spraying

The paint sprayer I'm using is called the 'Erbauer'. It consists of a few components, the main body where air is channelled to come out of the spray gun which is the second component. Then there's a paint jug which you have to fill in the paint. There's also a tube where you connect the main body to the spray gun. You pull on the trigger of the gun and paint can spray in three ways:

- Horizontal
- Vertical
- In a round shape

MAKING

STEP 31 ON NEXT PAGE →

1. Here you see The ‘Stratos Super Series’ at Contrax Furniture. This is what cut out my design.

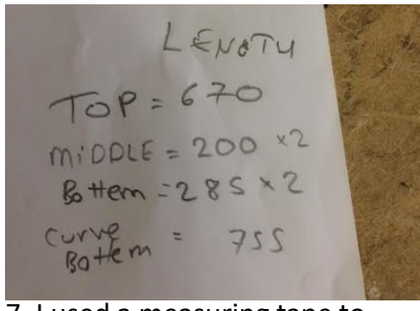
2. Under a pile of all the other routed work you can see the components of my shelving unit.

3. Here you can see the rebates. However Contrax didn’t do them to how I specified so my design had to be edited during the making.

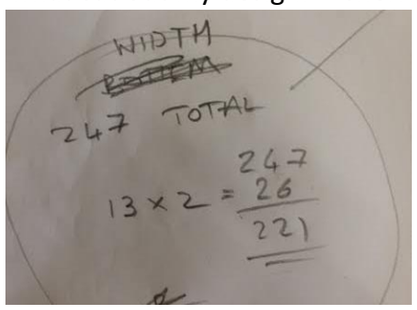
4. Here are the dowel rods I needed to hold both faces of my design apart. I had them cut on a circular saw.

5. I used the lathe to spin around the dowel and 100 grit sand paper to get it to the correct size.

6. I fitted it all together so I could roughly see how it looked and what needed to be done.



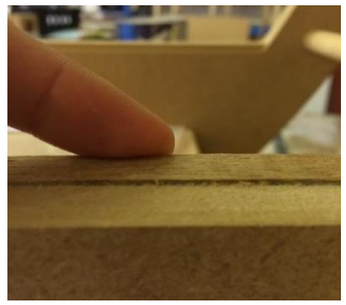
7. I used a measuring tape to measure how long all the shelves needed to be in millimetre.



8. I also used a tape measure to figure out how wide the shelves needed to be.

9. I cut out the flexi-ply shelf for the bottem of the design. The rebates were 5x5mm and the flexi-ply was 5mm thick so it fit perfectly.

10. I used this strip of wood to try and find a piece of MDF that would fit in the rebates.



11. This was 1mm too high at 6mm thick instead of 5mm thick.

12. I decided to ask Mr Turner cut out some shelves for me out of 12mm MDF and to cut out 7mm so there was a 5mm protrusion.

13. Whilst Mr Turner was cutting these out I sourced some PVA glue.

14. I glued up the inside of each hole for the dowels to stick in.

15. I methodically stuck in every dowel into one side.

16. Here is Mr Turner with all of my shelves cut out to the correct dimensions.

17. Here you can see the 5x5mm protrusion sticking out the shelf.

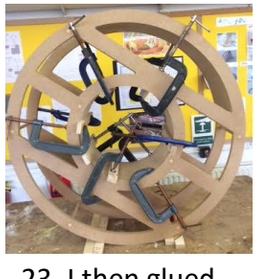
18. I had to square of off rebated sides so the shelves fit, to do this I marked it with a pencil .

19. I used a mallet and a small chisel.

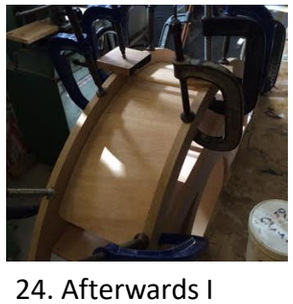
20. Here you can see a chiselled corner of the rebate.

21. All the shelves fit in perfectly

22. I cut out a centre bit of flexi-ply so the centre shelf could be complete.



23. I then glued and clamped in the central shelf.



24. Afterwards I clamped and glued the bottom shelf.

25. I glued in a little strip of flexi-ply where there was a gap in the central shelf.

26. I the used Caulk filler to filler any gaps to make for a more smooth finish when painted.

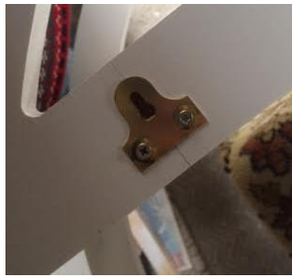
27. I used some 120 grit sand paper to sand off the corners.

28. I then decided to take it home to finish painting. I went to wickes and brought a paint sprayer.

29. I measured the viscosity of my primer and then began to spray.

30. Once the primer had dried I added another coat of white paint to finish it off.

COMPLETED PRODUCT



31. Drill in a small hole where a slotted brass plate can be screwed over for hanging .

I decided to make a quick compilation of pictures of my finished design so that It can be seen how it would look in the wall of a target market home.

Here is an Image of my shelving unit right after the slotted brass plates were fitted.

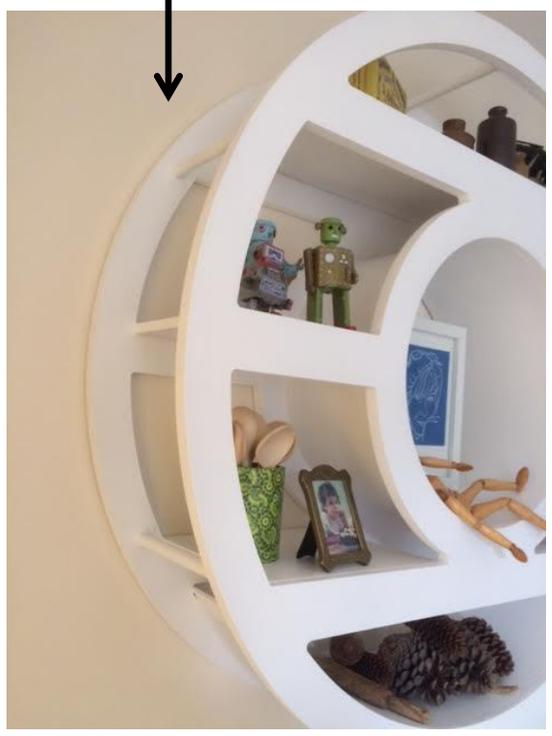
Above is an image of the shelving unit once it had been hung on a wall with, with nothing on it. Bellow is an image of the shelving unit once it had things put on it. In both images you can easily see how the lack of sides means that you can see things from more angles

Bellow and above are two side on images. One where the shelving unit is empty and another is an example of the types of things that might be put on it

What would I change about the making?

If I was to do one thing differently in the making of the product It would have been to paint most of the pieces first as it was extremely fiddly managing to paint every part.

Here you can see an image displaying the central flexi-ply ring and how it can be seen from many angles. It's still fully painted



TESTING

Now that the shelving unit is finished I must find out whether it fits well in a house and if it suits its function properly.

My clients thought that the unit suited its function very well and the fact that it had no edges meant that it didn't limit the size of the objects that could fit on the shelves. They thought that It would fit well in in the target markets home and would appeal to more than just the target market. They though it's easily accessible and simple to use. They thought it look very smart and clean. The white colour is a colour which can suit almost every home environment and make it look futuristic

Client Feedback: Henry Priddey commenting on how the lack of any sides allows for tall objects to be placed on it.

Client Feedback: Henry Priddey is a bit disappointed there is not a second function

Client Feedback: Henry Priddey saying how you can put objects in from the front and the side

My clients thought that it was quite disappointing that it didn't have a secondary function like was stated in the design brief. If it had another function it would help it stand out more in a room and would complement the objects placed on it as well as having another use which would make it a more useful conservation of space. This would also make it stay in the market for longer. Technology is advancing and the more advanced the unit is the more commercially valid it will be and for longer. Another problem is that objects that are placed on it are more likely to fall of due to the lack of sides on the unit..

STRENGTHS AND WEAKNESSES

Strengths:

- My shelving unit is unique and original. In the current market there aren't many products that match it. This means the opposition of my product is limited increasing its sales.
- It's a product that would suit and fit in a modern home with the white finish making it fit in most living spaces as it's neutral.
- The unit is futuristic and would stand out in a store display.
- The openness of the skeletal design doesn't have a great limitation on the size of the item you can put on it.

Weaknesses:

- My shelving unit wasn't as how I envisioned. I wanted it to be a flat pack 'build-it-yourself' shelving unit. However due to the error of Contrax furniture as well as time constraints my model had to be glued together meaning it cannot be dismantled at will.
- My design lacks to contain a second function where it should have had the addition of lighting.
- Due to the lack of any sides on any of the selves it makes objects more prone to falling off and getting damaged.
- Rounded shelves aren't very useful at storing flat bottomed objects on.

Acting on the Weaknesses:

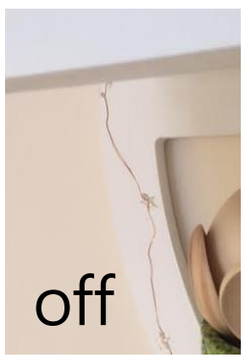
I have two options:

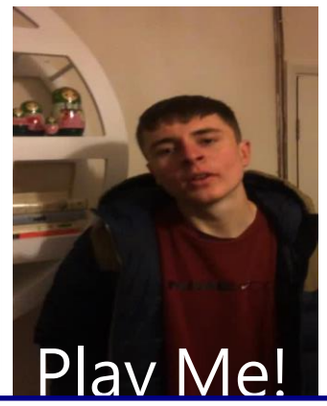
1) to get some remote controlled LED lighting.
2) To get some switch controlled LED lighting.

Even though remote controlled lighting would be more innovative and would integrate the two aspects of the design together it's two much of an expensive option.

Having battery operated switch controlled lighting is a lot less expensive and also more simple to use. Complexity like a remote isn't always best and a simple on-off switch is more easily usable by the target market and other potential costumers

Here's the battery pack for the lights →



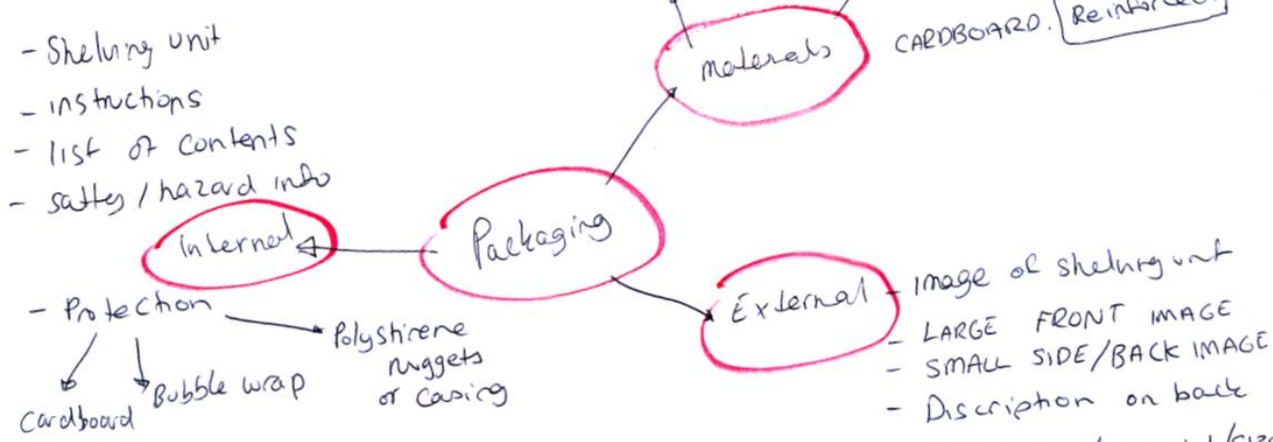


Here's an Image of the shelving unit with lights off to the left and on to the right. According to my clients it's a 'hit' and looks is a great multifunction.

Client Feedback: Henry Priddey is happy with the implementation of lights

MARKETING

I made some mind maps of initial ideas of how I could market and raise awareness for my shelving unit.

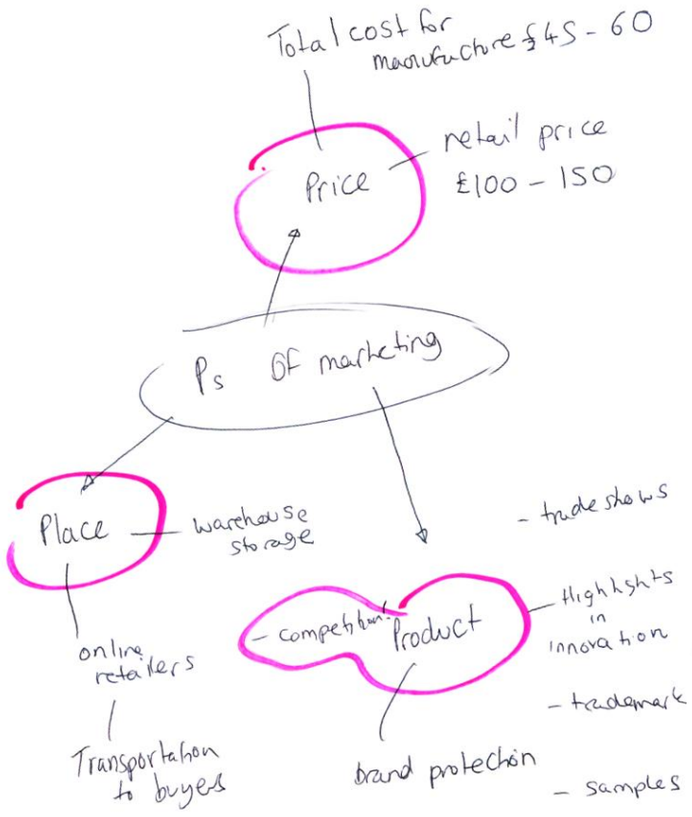


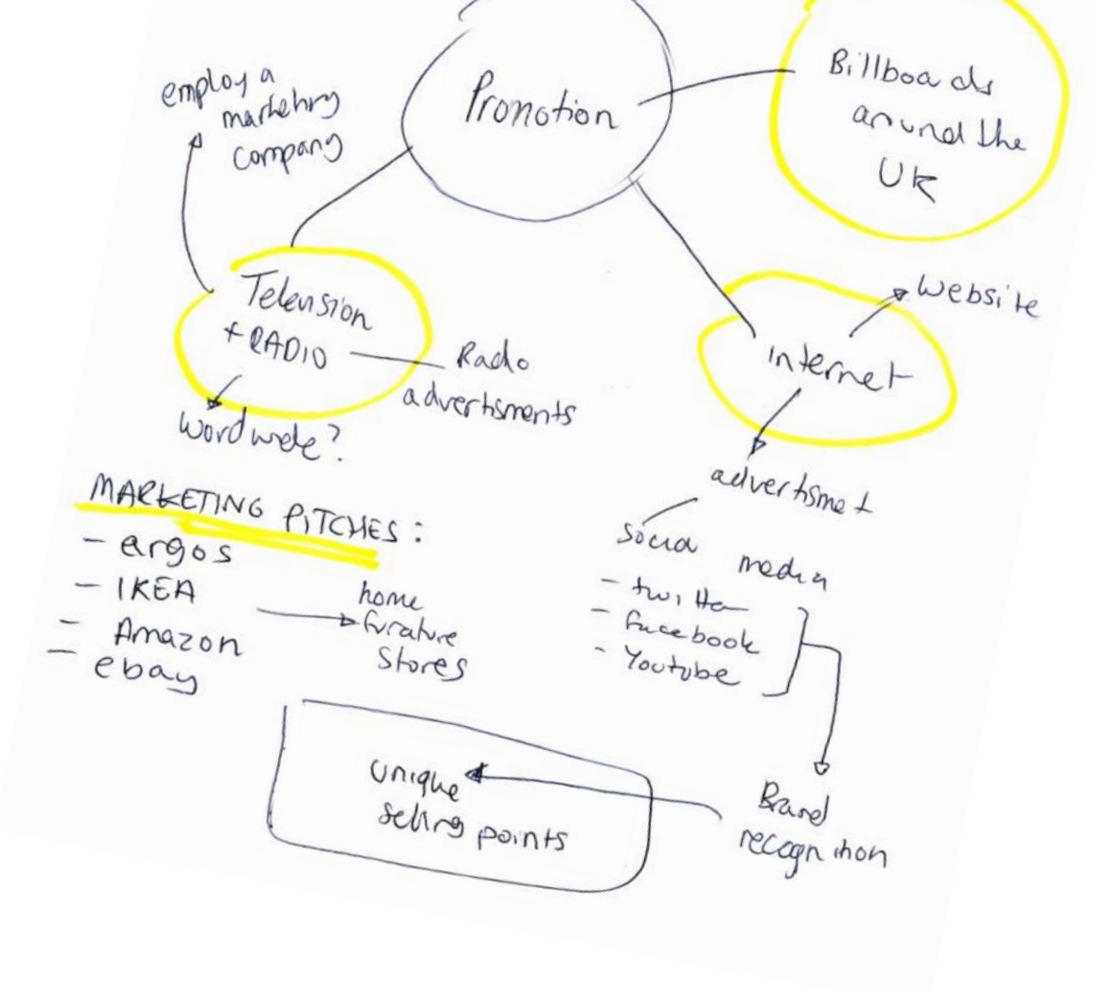
Marketing Strategy:
With each of the separate sections of my marketing strategy I made a mind map of how I would market my product.

I compiled all of the information I gathered here and used it to make my marketing and advertisement plan. Which will include:

- A Marketing presentation
- Internet Advertisement
- Magazine
- Name Chosen
- Web page

I thought that these were the best techniques that I had for my shelving unit and the target market it was aimed at.

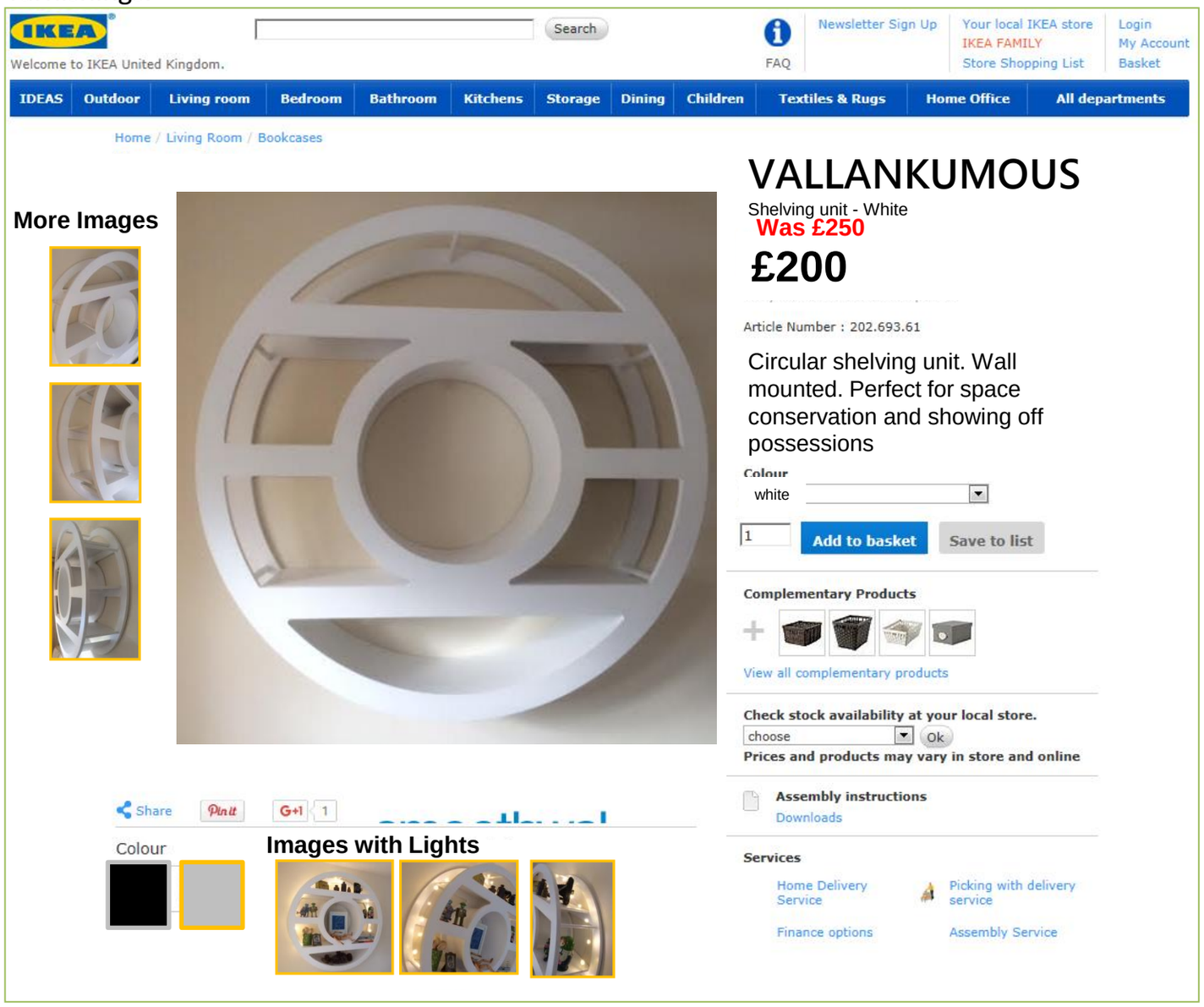




MARKETING & ADVERTISMENT

The Name: I've decided to name my product '**vallankumous**' this is the word for revolution in Finnish. I have chosen this because my shelving unit is circular, circular things revolve. The reason I chose it to be in Finnish is because this is a less obvious form of the word. It will sound more apealing and less cheesey to the target market.

Marketing: Bellow you can see a web page that I have created for selling my shelving unit. I have decided to choose 'IKEA' as this is a very well known home furnishings outlet. Also it suits my target market. Teenagers are likely to have parents who may be surfing the internet hence forth buying it for them. Young adults are also likely to use 'IKEA' over any other website to buy themselves furnishings.



Price: The price of £200-250 I thought is a reasonable price for my unit. This is as for the whole thing to be routed out will cost around £70 the painting about £10 and the dowels around £5. I say 'around' because this is what the price would be for one unit to be cut from 2440x1220. If this was being batch produced we could use larger sheets of MDF and order in bulk which would drastically reduce the price of the component parts. This leaves a large but reasonable profit margin.

Advertisement

I think a good way of advertising my shelving unit is by having it in various home furnishings catalogues. For one the IKEA catalogue would be a good way of advertising it.

Perhaps getting it printed into free home furnishing magazines which are posted into peoples letter boxes. Which is considered as junk mail but people will still probably read it.

Magazines like ideal home would be perfect for advertising 'vallankumous'. Waiting rooms all around the United Kingdom have Ideal Home magazines in them. People read when they have nothing else to do. This is a place where the young adult portion of the target market will find themselves in multiple times over the course of a couple of months.

Internet Advertisement

Having advertisements like the one bellow in pop up windows or in side bars of popular websites like 'Facebook' or 'Youtube' could be a successful way of advertising.

This is a advertisement that millions of people would see daily as Facebook, Youtube and others a like have millions of daily users across the Earth.

Weakness:

However a weakness of this is the fact that the target market is unlikely to be at all interested in what an advertisement has to offer. It will simply be ignored or the advertisement will be closed.

Strength:

With the sheer magnitude of users that use these websites the adds are bound to be examined by some. Quite possibly by the target market but more likely the more elderly users.

P.T.O for IKEA FEEDBACK →

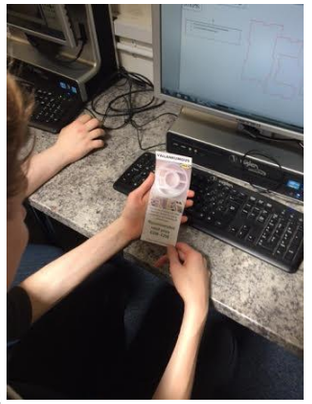
IKEA FEEDBACK

I messaged IKEA UK over Facebook explaining that I'm doing my A levels and If they could give me any feed back, along with some images of my unit.
They replied the above information saying it's very decorative and could be a feature point in Living room, dinning room or study.
However they didn't give me any criticism which is flattering.
Thanks IKEA.

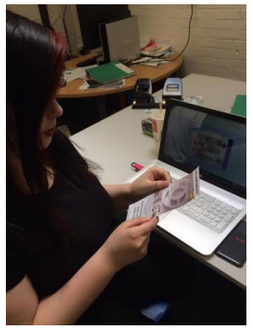
MARKETING PRESENTATION

This is an image of the front cover of my flyer.

For my marketing presentation I designed a flyer that I handed out to all of the people observing.



These images shows a viewers of my presentation reading my flyers



To the left is a image of one of my presentation views inspecting my finished product in person.

Above is a short clip from the presentation I gave. In it I give out the flyers that I made for the audience to inspect. Then I show them images with both the lights on and off.

FUTURE IMPROVEMENTS

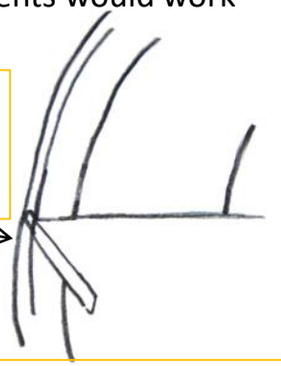
To improve my product the three main improvements that most people gave me was to have:

- Larger shelf space
- Better lighting
- sides to some of the shelves.

I decided that I would do some sketches to give an idea of how these implements would work out, and if they could be done without ruining the essence of the design.

For the lighting I could purchase LED strips like this and attach them around the front and back rim of the shelving unit. Where the arrows are pointing.

Shelves could slide in and go right to the very edge of the design. This way there wouldn't be a gap maximizing space



I could use flexi-ply and wrap it around the whole outside of the design like in the pictures to the left. This would add sides to the shelves.

REVIEW & REFLECTION

Aspects of the product

This section of my powerpoint is so I can look at my project as a whole and look at the progress of the design and how it's different now to how I originally envisioned it. I put a lot of time in consideration into my design sheets as well as models. One thing that works well with the shelving unit is the fact that there aren't solid sides to it meaning that you can place objects on it from more than just one direction.

Difficulties

One of the main difficulties of my product was the fact that Contrax furniture didn't correctly cut out the design that I had in mind. As their worker Sam had discontinued his work there before my design was finished. This meant that the shelving unit wasn't flat pack and had to be glued together. This added a lot more time into the manufacturing process. Another big difficulty was painting the unit. At first I tried painting on the primer with a brush. However due to the design having lots of hard-to-get places it made me give up very quickly. To combat this I brought the Erbauer paint sprayer so I could spray the coats of paint on my design. This minimised the time taken by a very large amount

Inspiration

The main inspiration of my product was other wall-hanging shelving units. I have seen many of these all over the place, I have them in my house and they're all around the school work space as well as office spaces. The vast majority of these are very uninteresting, square boxes which erect horizontally from the wall for objects to sit it. This may fill the utilitarian needs but it does nothing out of the ordinary, nothing to capture the imagination my shelving unit is more imaginative. I've taken inspiration from the art deco movement of the past and combined it with the minimalistic format that the future is bringing to make something simple but different, something that people wouldn't think about when the word shelf or shelving unit comes into their minds.

Moral and ethical implications

For my product moral and ethical implications were considered for instance I managed to design my product so one unit could be cut out of one 2440 x 1220 piece of MDF. This minimises the waste that is produced as off cuttings, which means that my design is taking into consideration of the environment. Also the fact that it was designed to be flat pack means that after all of the pieces are cut energy doesn't need to be spent on putting it together as it can be put together by the consumer. The idea was for it all to fit together without the need for any glue or screws, this would mean it could be built and taken apart as many times as needed by the consumer making it take up less space and meaning there's a valid storage option if it doesn't need to be used.

Economic implications

With my hanging lamp I noticed that all of the components for building are in abundance. They're also relatively cheap. A sheet of 2440 x 1220 MDF is around £17 pounds when brought singularly, however when brought in bulk from the supplier the price markedly drops until it only costs bellow £10 a sheet. Getting it cut out wasn't very expensive either at £10 a sheet. If it was batch produced and custom machinery was created to cut out each unit the price would greatly decrease. Painting each product would cost around £10 as well if the paint was bulk ordered. Considering the shelving unit looks more expensive than it is to make turning a profit would be extremely.

What worked well?

With the shelving unit one of the best parts the worked out for me was the fact that it could be hung up. This means that it really fits well into a living space without taking up too much room. It also seamlessly connects to the wall looking as if it's just floating,

Quality control

Quality control is a very important for me when this shelving unit is batch produced. The product will need to undergo vigorous testing the insure the amount of force that is needed to make it collapse, the maximum weight of objects that can be placed on the shelves. Each and every design will have to be identical to its predecessor, the paint job will have to be perfect, with no runs and with a uniform thickness. This is absolutely needed. Companies (for instance IKEA) have to make sure that all of their products co-inside with a set of standards. I will have to ensure this as well.

EVALUATION

These are my personal views on my product.

STRENGTHS

- My shelving unit is flat pack and simple to put together.
- It has a modern and minimalistic design which would well suit many homes.
- It doesn't have any sides so objects can be placed on from many angles.
- It hangs on the wall and does so without looking unnatural.
- The lights give it a second function which is useful and complements items on it.
- My shelving unit it at a perfect height for a home.

WEAKNESSES

- Screws need to be drilled into a wall for it to be hung.
- The lights are battery powered so they would need to be replaced lots.
- Most of the shelf space isn't that big limiting the items placed on it.
- The fact it has no sides mean that items placed on it could easily fall off.
- The white colour could cause it to get dirty very easily.
- In the end it was glued, meaning it cant be taken apart.

Question	Client Response	My response to clients comments.
What is your biggest strength?	• "I would say it meets all the specifications its been designed for and at the same time it looks pleasing."	Thank you very much, I agree with this comment .
What is your biggest weakness?	• "The fact that It doesn't have any sides means objects like books have to be stacked."	I should have looked into this whilst designing it however it would change the it's flat pack nature.
What would you change?	• "I'd probably integrate the lighting into the design better and use LEDs instead of fairy lights."	My original plan was to obtain LEDs but they were to expensive and would increase the products final price
What is your Favourite things about the unit?	• "I like the round shape, it really stands out when it's hung on the wall compared to other shelving units"	The main thing that was in my mind when creating this was making something that's different.
What is your least favourite thing about the unit?	• "Some of the shelves aren't very long so not many things would be able to be placed on it"	Changing the lengths of shelves would change the way the design fits into a circular shape.