

Home Decoration



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Action Plan

Context Introduction

This action plan is a rough scaffolding that allows for me to visualis the required research that is needed to be conducted, when in the middle of my project I am able to quickly and easily look back and reference this plan, allowing me to understand the next steps that I am required to undertake and do

Order	Steps/Tasks	Time required	Equipment and uses	Quality Checks	H/S
1.	Context Exploration - To understand what genre the product should be - To also understand what the genres topics and general information	Around 3 Hours	- Pen and Paper - Laptop for Videos - Google for searching - Books	I had to check for different biases on different websites, not a large issue for me however I decided to look at multiple sources to understand a general idea	n/a
2.	Client Exploration To understand clients NEEDS, WANTS and Dislikes	2 Hours	Pen and paper for taking notes	Understand my clients background, aspects to her life that possible effect the use of the final product	n/a
3.	Clients Interview To better understand my client, understand the requirements they have and ideas they have for the initial product	1 Hour	Pen and paper for notes in the interview	I asked my client specific questions, that I need to understand, instead of waiting for my client to tell me	n/a
4.	Sight Analysis To understand where the product will stay, the constraints and limits I have, better understand how it should function	15 Minutes	Tape measure to understand the constraints the product must fit into	I understood aspects in the room that possible would effect the product	Avoiding tripping hazards
5.	Further Research More indepth research, for niche areas and areas of complication that arises that need addressing	1 Hour	Google/ laptop to conduct the research on	Understand aspects that need addressing, use multiple sources	n/a
6.	Initial Designs To brain storm and create initial designs, not accurate but to understand and get ideas from	1 Hour	- Sketch book - Pen - Pencil - Rendering pens - Rubber	Make sure not to remain design fixated, you need to create different and unique ideas	n/a
7.	Existing products Analyse existing products, understand ideas and aspects I can implement	1 hour	- Pen and Paper - Mode of transportation to location	To look and analyze multiple existing designs in hand	Avoiding tripping hazards
8.	Design Brief Bring all my ideas into one place, all the constraints and aspects needed for the product	30 Minutes	Laptop	List all the necessary points without any extra added fluff, eg needs and wants of client	n/a
9.	3D Modelling Scale modelling, for possible testing of the product	2 Hours	- Cam Machines - Cardboard - Pencil - Ruler	To create real models using a wide array of techniques eg using a laser cutter, 3d printer or simple card modelling	Use mandatory PPE

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Order	Steps/Tasks	Time required	Equipment and uses	Quality Checks	H/S
10.	Specification To bullet point important pieces of information, that can be referred back to in the design stage	1 Hour	- Laptop - Notes from Client Interview and research	I need to list important and crucial pieces of information from my research, that need to be fulfilled	n/a
11.	Iteration 1,2,3,4,5,6,7,8 To create an initial model, then to expand upon and improve upon until you come up with a final design ready for manufacturing	4 Hours	- Laptop - Cad machines for testing aspects of products	I need to improve upon the designs, not become comfortable with the first iterations, find flaws and room for improvement	Use mandatory PPE
12.	Manufacturing Specification To list out parts, and manufacturing methods, and dimension of components, all to help when in the manufacturing process	1 Hour	Laptop	I need to show, and create a sort of action plan on how I am going to carry out the production of the final product	Use mandatory PPE
13.	Manufacturing Diary To document and demonstrate the manufacturing process of the final product	3 Hours	- Cad Machines used - Vernier Calipers - QC JIGS	To clearly display and convey the crucial stages of the manufacturing of the product	Use mandatory PPE
14.	Evaluation To understand and critique the final product, understand the positives and negatives of it	1 Hour	Vernier Calipers	To critique and understand the final product, to understand the flaws that need to be improved upon	n/a
15.	Further Changes To understand, and display the additions that could be made to the product, that could enhance it and make it better suited for its function	2 Hours	- Laptop for conducting CAD - Cam Machines	To display the improvements using Cad or creating physical models of the improvements	Use mandatory PPE

Context

Context Introduction

With this initial section I aim to understand the possibly designs I am able to choose, in addition to fully understanding and learning important information around my topics genre so that I am able to produce my product to a higher quality, resulting in my future client being highly pleased with the item I am going to produce.

1

Home Decoration Styles



Memphis

Memphis' interior designing consists of a high use of vibrant colors, in addition to using a lot of simple geometry designs that give of a highly chaotic, yet calculated design within the room. Mainly neon/ primary colors are used in this design, in addition to white and black, giving off a very bright interior, which differs to the usual dull colors you see on a day to day basis within a room. The memphis interior design is described by Hommes Studio as having: Bright colors, geometric shapes, strong patterns, stripes, clashing hues, abstract designs and plastic lamination. This interior design gives of a childish aesthetic from the 80s, not a very sophisticated look as seen by the likes of Minimalism and Industrialism. The Memphis Group which are the creators of this design where created by an Italian Design and Architecture group founded by Ettore Sottsass and this interior design was introduced in the 1980s by them. Inspirations that relate to this type of interior design are Art deco in addition to Pop Arts styles, these interior designs aim to give a very alarming and "in your face" aesthetic with the use of the previously mentioned bold and bright contrasting colors, in addition to the geometry (Like the zigzags and other patterns)

The bauhaus style uses a lot of simplistic and minimalistic designs, with a specific emphasis on clean lines and decluttering spaces, famous pieces from this style include the wassily chair, that utilizes a bent tubular and fabric aesthetic. Bauhaus designs are known for having; straightforward designs, simplicity, functional shapes, use of authentic materials and a large focus on mass production. The interior of this design usually uses a lot of dull colors, greys, blacks and whites are a very prominent color within these styles of rooms. In addition this the bauhaus moto is "Form follows function" which is very understandable once a person is able to look at their designs, their chairs are designed for comfort, with their form following closely by. For their furniture, primarily the chair, they use a lot of tubular steel that is bent in order to give a sort of flowing and complete design to the chair and as a result the whole room. The bauhaus home aesthetic is also very known for using a lot of plants and using natural lighting within the house as well.

Bauhaus



Minimalism

Minimalism is a recent trending interior design that mainly focuses on decluttering the living space and sticking to simplicity. The minimalistic design consists of a lot of white, black and even grays where are their main color pallet. In addition the minimalistic design is often referred to as the Bare essentials to create a simple and decluttered space. Minimalism is often not just a interior design movement but a way of life for some people. The minimalist design uses clean and sleeks designs for items within the house, which aim not to pop out into your face like the Memphis design, yet work subtle, and work in parallel with the other items within the room to create a coordinated and subtle/ sleek design. Minimalism is often seen as not being attached to materialistic things, therefore when looking at the interior design aspect is often looks plain, and very free and open for the user to inhabit. Minimalism is very patternless, instead aiming to use solid colors which are often described as quite dull. Wood is a very largely used material within this design in addition to plants and solid white or black items, for example often having matte black lamps within the house that don't necessarily stand out but complement and work together with the other items that are within the household

Home Decoration Styles



Industrialism

Industrialism, often referred to as a quite dark aesthetic utilises a lot of natural lighting, usually having very large windows with black panels surrounding it, in addition to often having large ceiling lighting occasionally as well. The industrialistic design often is seen as using a lot of whites, blacks, greys and even a lot of browns as well. The items within the room are often grey and black, for example the sofas known for being grey as seen within the photo. In addition the industrialistic design is known for not having painted walls/ plastered walls instead showing the bricks that are behind giving quite a rough aesthetic within the room. The industrialistic design is heavily inspired by the noble look of warehouses, factories and overall industrial spaces (Where the name tends to come from). The industrialistic design uses a lot of metal and wood as well, giving a tough and well put together aesthetic within the room however while still giving a stripped down aesthetic with the striped walls showing the bare bricks. This specific design was very prominent within the late 2010s and early 2020s however slowly starting to phase out within the mid 2020s where people are more opting for a more cozy and relaxed home aesthetic within the household

The art deco design is a major 20th century aesthetic that is notorious for using a lot of geometric shapes, stylizing curve, atmospheric lighting, luxe materials that are things like marble, velvet, brass, chrome and finally bold colors with metallic finishes. Identifiable features of Art deco are things like, Smooth wall surfaces, sharp edges, using a lot of geometrical forms, low relief decorative panels, strips of windows with decorative spandrels. Very well known colors for art deco are things like warmed grays, greens and steel greys. In addition a lot of pastels are used which are very prominent in the image that is displayed in the image below. Art deco uses a lot of patterns that are very bright, flashy and in your face. In addition the art deco design also has a lot of sleek and streamlined lines, with symmetrical and geometric designs and patterns, in addition to using bold colors and metallic colors. The art deco design was a staple of the 20th century which is now tending to start to regain interest within the 21st century. Wallpapers for this design consist of a lot patterns, which have a lot of geometric and curved/ aesthetically pleasing shapes

Art Deco



Scandinavian

The Scandinavian Design is very well known for using a lot of Wood. Wood is the main material that is used in this interior design style. It is known for having a minimalistic design and aesthetic, in addition understated design that follows function, light neutral colors, muted/ dark hues that are reminiscent of nordic landscapes, airy spaces filled with light, a lot of wood furniture and wooden accents, decorative/ statement pendant lights and finally minimalist and flexible designs. The Scandinavian is an aesthetic that is heavily rooted in simplicity. It features subtle textures, with a soft color palette. Natural materials are known for being the driving force behind this design and it is very understandable and prominent. Wood is a very heavily used material and I feel that for a interior deco project this would be a very useful interior deco design to follow, this is because one of the main materials I am told to work with is wood. The scandinavian design is aesthetically very “cozy” and is often referred to as very ‘homely’ and comfortable. It dives of a very warm aesthetic, which is very understandable due to the place it originates from is a very cold environment. Therefore their aim would have been to create a sort of warm aesthetic for their home to live in

Context

Context Introduction

With this initial section I aim to understand the possibly designs I am able to choose, in addition to fully understanding and learning important information around my topics genre so that I am able to produce my product to a higher quality, resulting in my future client being highly pleased with the item I am going to produce.

3

Home Decor Items

Lighting

With lighting there are many forms of lighting, mood lighting, mood lighting, productive lighting and general lighting that is designed to be able to light up a whole room from that one light. There are lights mainly for decoration as well, lighting has a lot of forms, and there's a lot that is able to be done with a light, in terms of adapting and changing the shape of it. Lighting is one of the most important forms of decor within a room due to the need of a lighting source, lighting is a must and therefore is present in any room if it is a little lamp to a large chandelier on the roof of a room. If I was to make some variant of a lighting source I feel I have a lot of option and a lot that I am able to do with it, therefore I am looking quite favourable towards it, however I will choose something that my client needs. Lamp bulbs have a lot of variation as well in addition, they can be led or they can be the traditional bulb, warm or cold lighting or even RGB lighting

Timepieces

Unlike a Lighting source, a clock is not a must within a room, that is why it is not very common within a room, however a clock is very fashionable and available in many forms, from a traditional victorian standing chiming clock, to a new age digital clock on a person desk, there is a lot that is able to be done with a clock, however changing the design of the clock if very difficult, this is due to the clock being small and usually in the corner or on the wall of the room. Clock are able to be customized when looking at the theme of it, the sizing, if it sits on a desk or on a wall, when looking at the hands of the clock or when looking at the backdrop on the clock which could potentially have a special design on it.

Tables

Table are a staple within the living room of a house, they are very adaptable pieces of furniture/ decoration and have many different forms. A table is able to be changed into different shapes, and offer different types of functions, it can contain compartments for storage, create a table top for tea pots and other small food items to be placed on, or be a decorative sort of foot rest for the user, the vision for a table is endless. However they are only very common within a living room, in smaller living rooms and other rooms within the house they are very useless as they take up a lot of space within said room, therefore if a only a small amount of people would be wanting a table

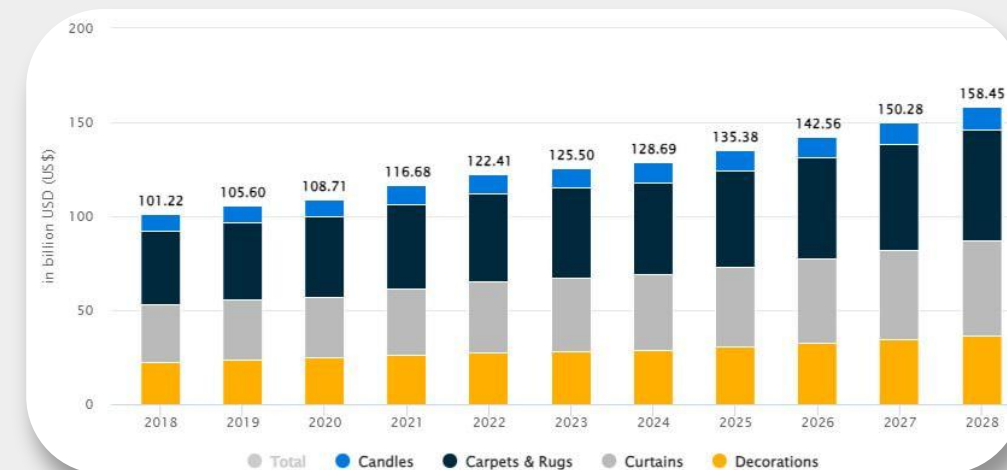
Source 1

When looking at this graph of data this is about the most popular home decoration items, This firstly shows that over the years the home decoration industry is linearly increasing year by year. In addition it shows that rugs are the largest and most popular home decoration item, as shown by having the largest market. This is not that surprising due to the fact that rugs are highly customizable. Rugs can display traditional patterns, or display pop culture references for the new generations in their room. With a rug however there is not a lot of room for adaptation and innovation, and with the current resources available it is an feasible option. Second is candles, which is also not a very big surprise due to candles being of very low cost, this results in people easily being able to purchase one without to much stress, in addition they have a need to be replaced or changed very quickly therefore making a customer a returning customer, resulting in more money being spent over a longer period of time.

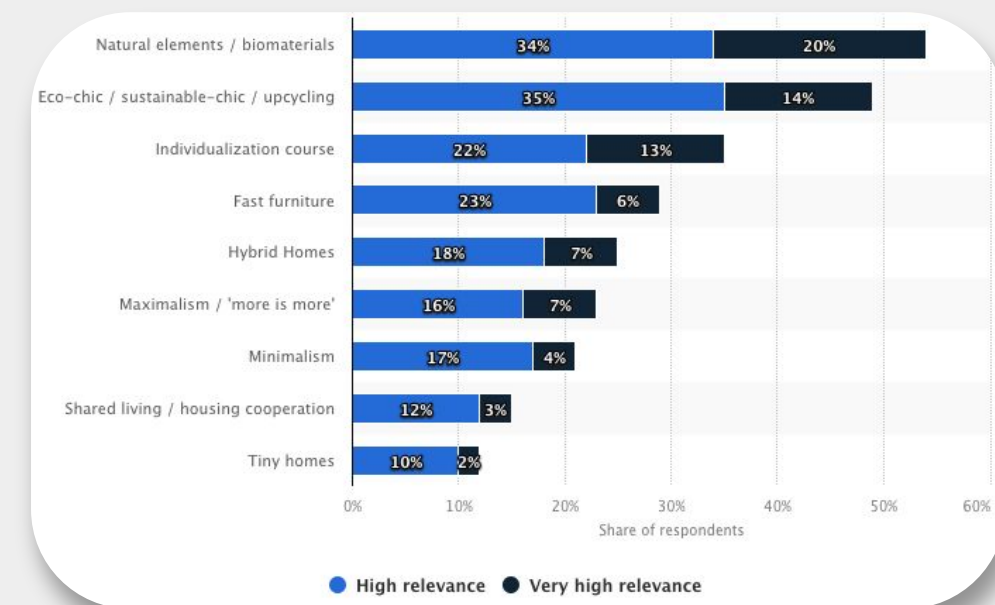
Source 2

With this graph of data this data displays information about different home decoration styles. The most popular style seen to tend in 1-2 years is natural elements, this is mainly consisting of woods and earthy elements like stone slab table tops. Surprisingly the recent trend of minimalism is thought to die out within 1-2 years, this graph will definitely influence my future decision when choosing what style to choose

Recent Trends In Home Decoration Styles



Source 1- [Statista](#)



Source 2- [Statista](#)

Context evaluation

Overall from my context I have gained a lot of information on possible things I am able to make and their genre/ style. With this information once I get a client I am able to ask them about possible genres they are interested in for me to make for them, and then develop a possible product that fits within the genre, if that be an industrial sort of product or a scandinavian sort of product, anything that is able to fit and work within their desired rooming space.

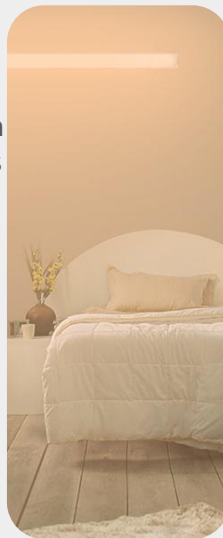
Mind Map

Mind Map Introduction:

Based of my previous context exploration I am now looking at possible making some sort of lighting source for a potential client, In this I look and understand different aspects of a lighting source from mood lighting to productive lighting and understanding their effect on the human using it

Mood Lighting

Mood lighting plays a big part when considering lighting within a room. Mood lighting is a vague 'blanket' term that refers to mainly creating an atmosphere depending on what purpose. It can be for relaxing in the living room, so going with a warm and cozy environment, usually with warm and plain colors, or if it is for a Gaming room which will have possible RGB intense atmospheric lighting



Spot lighting

Spot lighting is used for many different purposes, one of the main ones being is that it is designed to light up and put focus on paintings and other important pieces of artwork, if that means a vase to a sculpture it is designed to perfectly light up the object and attract the users eye naturally towards the object in question



Productive lighting

Productive lighting is very prominent on a students workspace. It is similar to spot lighting as it is designed to light up the desk of the user, this is so that when they are working they remain undistracted and are naturally focused on their desk, this type of lighting tends to be quite small, and is usually a lamp that is on the users desk when they are working, examples of these lamp for study desks are on the left

Lighting Types

Lighting

Chandelier

Chandeliers are very common in high end home and within halls, they are a lighting source that hangs of the roof that is designed to look aesthetically pleasing, they are often quite expensive to buy due to the complex nature of them, the complex craftsmanship to make them is very hard and therefore they cost as much as they do. The materials used usually to make them are things like glass and metal, mainly glass which is a very prominent material.



Larger indoor Lighting



Standing Lamp

Standing Lighting comes in a wide array of different forms, they unusually consist of a large lighting source that stands firm within one of the corners of the room which either is able to provide mood lighting or is able to provide focused lighting for people when they are intending to conduct activities like reading or focus tasks like painting. The most common material that is used for this form of lighting is timber or a form of bent tubular metal poles. With this form of lighting the most common source of the light is either LEDs or a variation of the light bulb, however the disadvantage with this form is that a lamp shade is very commonly required

Desk Lighting Mood

Desk lighting can commonly include mood lighting, this can come in the form of LED lighting with a RGB function to possible candle lighting. The aim of this form of lighting is to provide a sort of comforting atmosphere to the room, most commonly this form of lighting is found within Gaming rooms, as the intention is for comfort. This is most common on a gaming desk in the form of RGB lighting. In addition this is also common to be seen attached to a desk tidy sort of product, like a pen holder or something which is similar to that



Desk Lighting

Desk Lighting Focused

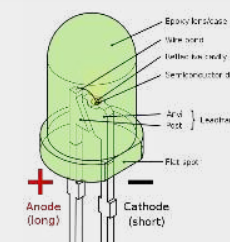
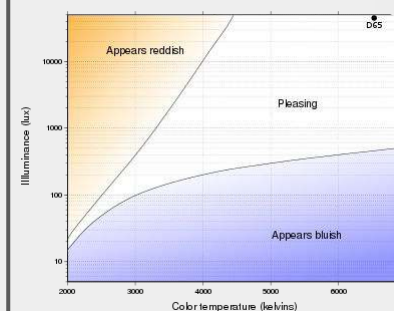
This form of lighting is very popular for a students desk. This form is very similar to the productivity lighting however this form also is very common to come with a sort of desk tidy as well. This can be in the form of a phone or pen holder to help free up space within the students desk while they are working. This for of lighting does not usually have RGB on it, instead consisting of hot or cold lighting that is able to light up a students desk, This lighting also usually comes on a sort of bendable neck so that the student is able to move it around to fit his desired angle



Mind Map evaluation

Of this mind map I gained a lot of valuable information that I am able to understand and adapt/ use for my product when I am making one for my intended client. In addition I feel like this is just the starting point for my research, and from this I need to understand all of the points more in depth and to use information from that to design a well tailored product for my client in the future when i am manufacturing

Types of Lighting Sources



Kruithof Curve

The Curve was created by a dutch physicist that wanted to understand where light was perceived by the human body as pleasing. When looking at the graph the pleasing range is deemed as the most natural source of lighting that is the most pleasing to the eye whereas the to warm or to cold regions are deemed as natural and manmade. Natural lighting fits within the pleasing range on the graph

Traditional Bulb vs LED

There are 2 main sources of lighting that I am wanting to analyse and understand, this is Traditional Bulbs VS the new and increasingly popular LED lighting strips. LED lighting is available in many forms including Strips and in Bulb Form. The advantages of the stripes is that a specialised socket is not required and only a USB slot of required to run the strip, In addition installation is much simpler as it simply requires a remove of the adhesive and sticking the strip onto the product in the intended area. In addition with the LED lighting they commonly are known for having RGB as a additional feature that only enhances the experience. In addition LEDS are much cheaper and cost effective when looking at the energy consumption. LedS are much more efficient using much less power to run

RGB Lighting

RGB is simply referring to the feature to be able to change the color of the lighting from other than white to colors like RED GREEN AND BLUE hence the name RGB lighting. A mix of these primary colors are able for the user to experience any color light that they desire

Client Exploration

Client Exploration Introduction:

In this slide I aimed to understand more of my client, and mainly I wanted to understand my client and her needs, wants and her dislikes and then I want to be able to fulfill all of my clients needs at the end

2



Client Name: Zakia Mehboob Khanum

Age: 53
Gender: Female
Profession: School Teacher
Nationality: Pakistan
Hobbies: Mainly Reading

Other Information

Residency: Dewsbury
Free time (for Reading: 5:00-9:00 (When dark)

Client Survey Analysis

My client survey and informal text messages have been really helpful, I have come to really understand my client, their needs and dislikes when it comes to start to design and make a product for my client. The informal text messages were really helpful and now I have a direct line of communication to my client in addition to asking questions whenever I need to do so

Client Information

My client is a mother to 4 children, and when not working take big pride in her houses presentation, she stated that her past time is decorating the house or is spent reading her many books in her favourite room in the house, which is the conservatory. The reason that this is her most favourite room within the house is because at night she is able to look out into the sky and see the moon and star, and during the day time is able to receive natural lighting when reading, feeling like she is outside yet still within the comfort of her house. At night however she says that she lacks mood lighting when reading her books, which is something that she said she would like me to change for her. In addition she said that she would preferably like a standing light next to her seat when she is reading, so that it may be able to light up her pages in addition to giving a warm and cozy atmosphere for her when she is reading her books. Finally she told me that storage was also a key thing for her. She said that she requires glasses when she is reading and therefore wants something to hold that for her

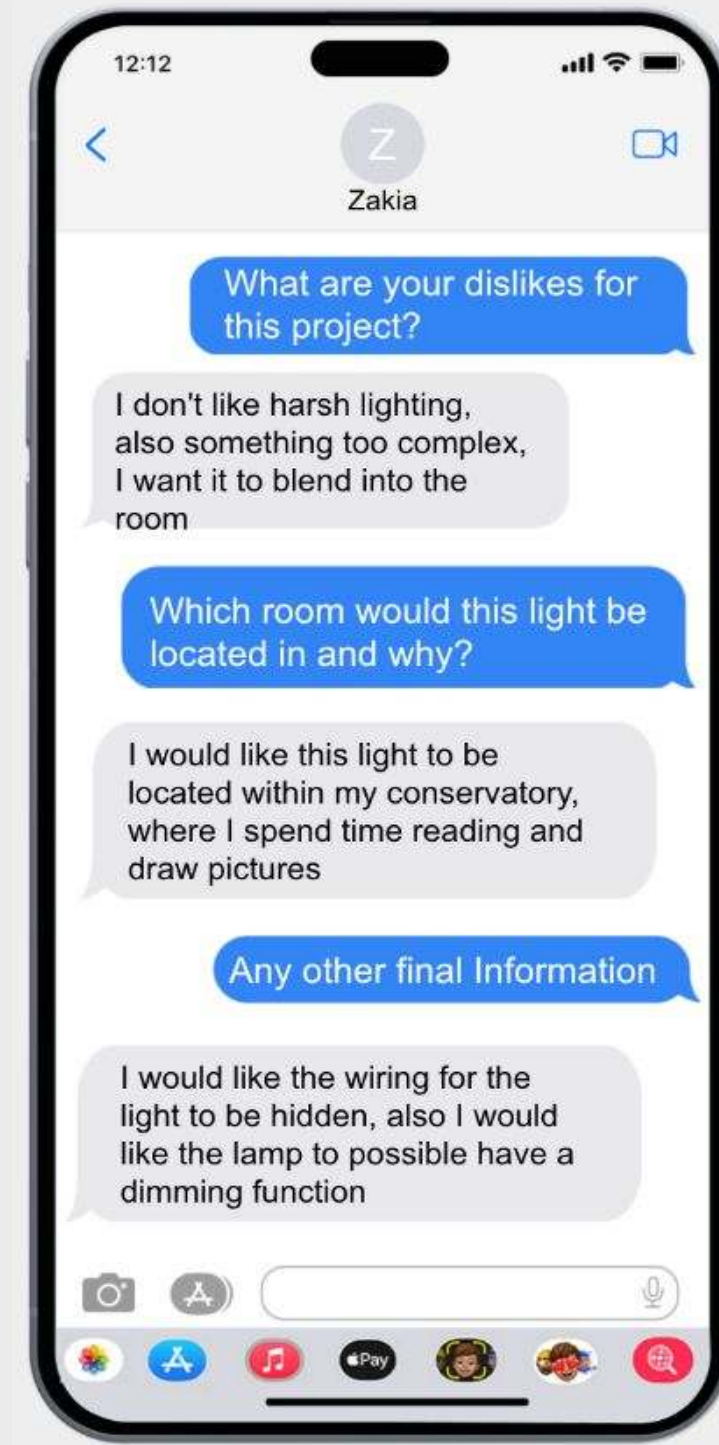
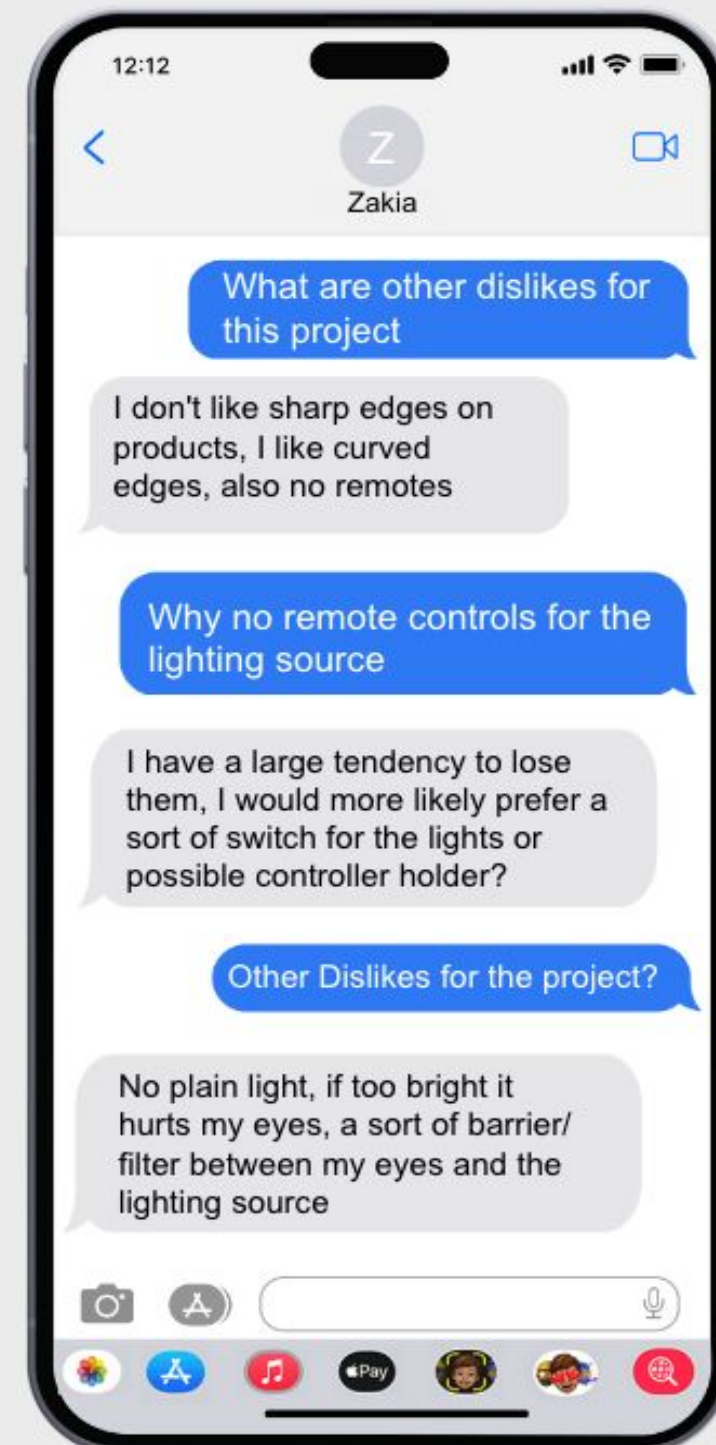
Client Needs (Look at next slides)

- My first client need is that she requires/ would prefer and standing light instead of one that sits on a table, this means that I am going to possibly not be making a lamp and instead a standing or hanging lighting source
- Secondly my client stated that her preferred lighting style is something comfortable and cozy, therefore not a harsh or a white and cold light but a warm and comfortable light. Mood lighting
- My client has also stated that she wanted the style of the light to be the Scandinavian style, and that is mainly made out of natural materials like wood for instance,
- My client has also stated that the product must have a Second Primary function of holding items within the conservatory of things that consist of things like glasses and other things like pens, books (Storage unit)
- In addition my client would possibly want RGB lighting within the light, this is possible so she can change the lighting for when she is reading, creating different atmosphere within the conservatory at different times

Dislikes

- When having an informal conversation with my client I understood that they do not like remote controls, instead they would like to have possible switches for the light on the product or have a holder for the remote control so she does not lose it.
- In addition I understood that my client doesn't like sharp edges on her product, indeed wanting more rounded and curved edges on the product.
- In addition my client does not like bright and harsh lights, indeed wanting a sort of dimming lights function or wanting a light filter like a frosted piece of glass that removes the harsh lighting from a lighting source, this is so her eyes do not feel uncomfortable when reading her books

Informal Text Messages



Client Survey

Client Exploration Introduction:

In this slide, I aimed to understand what my client wants, I wanted to understand their preferences and to understand what they are aiming for out of this product. I learnt a lot about my client from this slide and this has lined my up for a project that is tailored directly to my client

1

Preference

1 response



What Type of Interior decoration style would you prefer

1 response

Possibly the Scandinavian Style, I like the wood/ natural aesthetic

What Product where you looking for/ issues you have

1 response

A possible sort of lamp that is able to create warm and cozy lighting within my conservatory

Any secondary functions of the product

1 response

Storage for things like Books, Pens, sort of a storage unit

Primary Function Answer Analysis

Question 1.

When looking at question 1 I initially asked my client about their preference with the light, whether they would like it to be a standing lighting source or a sort of desk lamp that resides on a desk. When asking they replied that they would prefer a standing lighting source, therefore this removes any chance of creating a small lamp, this now requires me to make a large indoor lighting source that is completely able able to stand on its own. In addition this now means that the lighting source is most likely not going to be a productivity light, as those are usually known for being lamps that sit on the users desk. However standing lights heavy turn out to be either a mood light or a spot light which is designed to light up a curtain area in the room

Question 2

When asking my client about the style that they would prefer they replied that they would prefer the Scandinavian style, this means that my main material when making the product would be wood, a light wood and a sort of minimalism aesthetic. In addition they added that they would like a natural aesthetic, specifically naming wood, timbers like plywood I feel would be a large source of material for me when I am making this product. Natural aesthetic removes other ideas of largely using ABS or Acrylic that I can use when I am laser cutting, however I feel that the main source of material I am going to use in this product would be wood, and more specifically plywood

Question 3

In question 3 I asked my client an important question, what type of lighting source she would like, to this she replied that she would want a sort of lighting source that would create a “Mood light” and would light up the conservatory (The sight) with a sort of “warm and cozy” aesthetic. Therefore RGB lights might be quite helpful, in addition to a warm sort of lighting based of my research. This lighting must not be harsh as well, this is designed to light up the room however not be to harsh as then it would not give the cozy and comfortable aesthetic that my client is looking for from this project as a result. Possible initial ides I have are a sort of frosted glass to cover the light to give a non harsh and comfortable aesthetic

Question 4

I then asked my client another important question related to this project, that is what would my client like the Secondary Primary function of the project to be. On when asking this they replied storage for objects like Books. When looking at the sight analysis the lamp is aiming to go right next to where my client reads their books, therefore a small sort of drawer I feel would work really well in this project based of my clients feedback. This would go in the needs section of my clients needs wants and dislikes as this secondary function is bery important to them. This is what I am going to aim to incorporate into my design

Client Survey Analysis

Based of this client Survey I have learnt a Lot of important information. Firstly my client would like a standing lighting source that is able to light up the room with a warm and cozy mood lighting in addition to having the secondary function or having storage so that they are able to store important items like my clients glasses or my clients pens and books

Client Survey

Client Survey Introduction:

With this slide I want to understand my client, and to understand the final piece of information I need so that I am able to design a good product for them

2

Client Written Interview

Q. Intended Cost of Product?

A. For this Project, it is quite a large product, that is complex therefore I would place it at \$40

Q. Hobbies I can accommodate for?

A. I really like to read, draw, eat and generally spend time with family within that room

Q. Opinions on type of lighting

A. I want ambient lighting with a hint of productive lighting for when I am reading books or drawing

Information Based of the Interview

Firstly I sat down with my client and asked them 3 remaining questions I needed to know from them. These were what do you think the cost of the product should be, Hobbies they have and type of lighting they want. These are their answers

When looking at the cost the maximum cost they would place the product at is \$40, and I feel that this is a fair price, based of the material usage and the time designing \$40 would be a fair price

Based of Hobbies they said that they like to read, draw, eat and spend a lot of time in that room. This means that I need to be able to create atmospheric lighting in addition to creating focus lighting for when my client is drawing and reading

Client Survey Analysis

With this final information I am now able to start to undertake directed research that will then inevitably lead to me creating a product that will specifically be tailored for my client

Client Survey

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3

More depth regarding the secondary function of this product

1 response

Regarding the Secondary function, I would prefer some sort of storage unit, this most likely would take up a larger area on the product. This would be for storage of my essential items that I require on a day to day basis

Items that you use on a day to day bases that are needed to be stored

1 response

Glasses
Pens and pencils
Books
Possibly decorative pieces like a vase, to elevate the aesthetics of the product

Features you would like regarding the Secondary Function

1 response

Possibly a book case/ shelf compartment
Possible a countertop allowing for me to place items like a cup of coffee for when I am reading in the morning.

Any Extra Information Regarding the Secondary Function

1 response

Regarding mainly the secondary function, I want their to be a storage unit aspect to it. Possible draws or cubbies that allow for storage and decorative pieces to be added to it

Secondary Function Interview Answer Analysis

Question 1

For this question, I simply asked my client to specify their intended purpose for the secondary function of the product, they stated that want it to be a sort of storage unit for their day to day items. Specifically their essential items that they require by them. In addition they said it would possibly take up a large space of the product, Which has led me to some ideas of a sort of storage space with a lighting unit on top attached to it however I will expand upon this when it comes to designing.

Question 2

For question 2 I asked them to list out their essential items, I specifically did this so that I was able to design and possibly integrate spaces for these items when it comes to designing the final product, Some early ideas I had for this are possible Glasses and Pen holders, possible coasters or areas on a sort of counter top dedicated to these items, In addition they stated that they would like to display some sort of decorative pieces on the product

Question 3

For this question I asked my client features they would like for me to integrate into the final product, they stated some giving me a good idea on what my client would possible like, I am going to look back at this interview when it comes to making the final product, designing the final product in CAD

Question 4

Finally I allowed my client to give some final information and feedback and they gave me more idea which I am going to integrate when I am making the final product

Client Survey Analysis

Looking at this client feedback I am able to use it to tailor the initial designs that I am going to make more accurately. This key information and different things that my client wants me to include are perfect for me to integrate into the initial design as I try to fulfill them

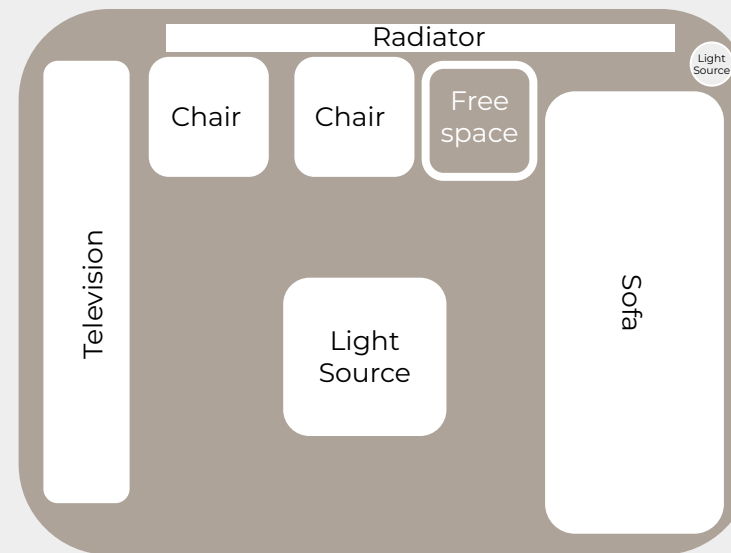
Site Analysis

Site Analysis

With the sight analysis I wanted to understand where my client spends most of their time and to understand where they wanted me to place the final product. I need to learn a lot about where the product is going to be and understand variables that might effect the final product

The Reading Corner

In the image on the left it displays my client in her described favourite place within her house, her reading corner. In this corner she spends a lot of her time, and in that time she unwinds by reading some of her favourite books. She stated she love to redecorate the room once or twice a year, and she take big pride in this room. She has a comfortable sofa and beautiful carpets however states that lighting is a big problem within the room. One issue is that lighting is too harsh for her and therefore she struggles to fully feel comfortable in a harsh lit room, mood lighting is a large issue for her in this room. In addition she stated that storage within the room is a big issue for her. As you can see their is only a small ledge that is able to hold her drink when she is reading, however in close proximity to her seat she doesn't have any possible area to store her book and reading glasses/ pens. She states that as she gets older she finds it more and more difficult to stand up and venture into different rooms to get her essential items, and would instead love to have some sort of storage compartment near her/ within her proximity while she is reading so that she does not need to stand up and instead and reach over and quickly/ efficiently get her desired item when she is reading. She finally stated that she would like a bookshelf as she stated that a bookshelf is also another item that she desperately needs within tis room



Dedicated Area

My client gave me a dedicated area that she would like me to place the item within and the sizing of this area is

950mm/2000mm/500mm

She stated that the high constraint is not that big of an issue as the height is so large that we are most likely not going to breach it. These sizing constraints are very important however as if we where to breach these then we would not be able to fit our product into the desired area within the room. In addition this dedicated area for the product is right in front of my clients usual sitting area and therefore we are able to place the possible storage compartment on the product and then therefore my client is able to easily and quickly pick up and place items that she requires as pleased. In addition the dedicated area for the product is shown in the image in the top right corner, issues with this area are that the radiator is placed right behind it, therefore we would not want to use very flammable materials however my client stated that she does not use it and therefore feels that this is not an issue. In addition the item is being placed in front of a window, which posible impairs the vision through the window however my client also stated that this is not a big issue and feels that the light would best be placed in this area



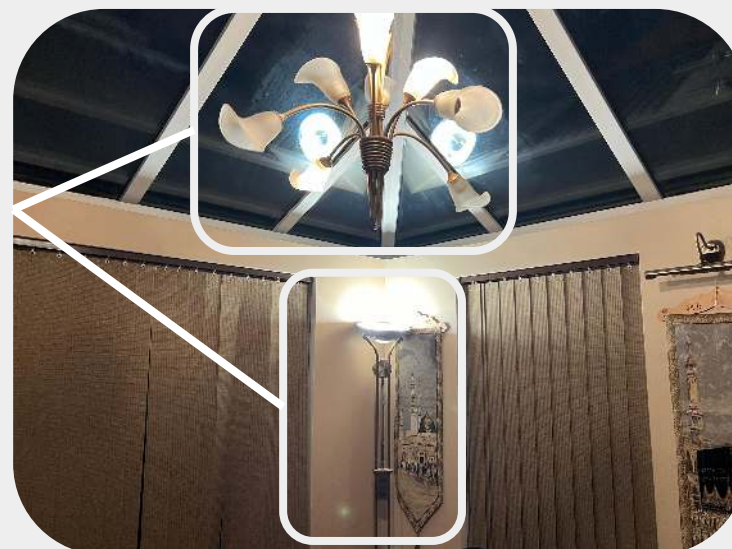
Evaluation

Overall I gained a lot of useful information from my client for my product, and now I understand my clients sizing constraints for the product, i analysed possible issues with the placement however they are very easy to work around and in addition are not a real problem.



The 2 lighting sources that are available

1. Lighting source one is a sort small chandelier that hangs of from the ceiling, problems with this light source is that it is too harsh for the client. She feels it ruins the mood lighting aesthetic she is chasing within the room. This is very notorious as being a problem with larger lights inside a room, which is the reason recent trends in lighting sways to more lamps and smaller lights instead of using the larger light in a room
2. Lighting a source 2 is a lamp within my clients room, she mainly uses this as spot lighting for her books however recently she has been having problems with this light, saying its too harsh and starting to fall apart after extended usage, in addition my client does not like the aesthetic of the light saying its outdated and not stylish enough for her liking



Light Sources

Lighting Sources Introduction

With this slide I want to understand the ideal lighting sources. I with the help of my client want to understand which is the best option for my client, and then with this information I am able to make designs that incorporate the desired type of lighting source, and after this I am then able to research the best product from the desired group

2

LED

How It works- Firstly The circuit board help to take power from the LED power supply and distributes it through the strip. There are multiple color channels inside an LED, and depending on the desired color light up, An LED consists of RGB lights, Red, Green and Blue, and a combination of these colors are able to create a set color. This is the main method for how an LED light works and operates. These lights come in a sort of STRIP with adhesive which then has adhesive on the back, With this the strip is stuck onto a surface. This can be used in many ways to my advantage. This is the most ideal form of lighting to create a sort of Mood lighting within the room

Advantages- There are many advantages for the LED. Primarily is that it is able to change into different colors, the advantage for my client is that they are able to change the light into aesthetic or other color which gives of a very large Mood lighting effect, which is what my client is wanting. In addition this is able to have either frosted glass or a sheet that is able to reduce the harshness of the light and instead give of a foggy and comfortable, hazy aesthetic. This is a very good option for my client, in addition this source requires low power when in use, which saves my client a lot of money. Finally this form of lighting is very cheap, a large strip of lighting only costing 11 Pounds for a large roll, which can be used multiple times. Replacing the light is very simple and easy to conduct

Disadvantages- there are some disadvantages with this source of lighting. Firstly this lighting it known to be very harsh, this isn't what my client wants however this can be combated with the sleeve as shown. In addition LED lights change color slightly depending on temperature, and with the quickly changing conditions within my clients room, as it is a conservatory, it might not be beneficial

How It works- The metal strip and LEDs are covered, typically with glass or another transparent material, and then coated with a phosphor to turn the light emitted from the LEDs from blue into usually, a warmer yellow tone, similar to incandescent filament bulbs.

Advantages- Lifespan, these LED bulbs are very efficient and long lasting, this is because they are in addition also energy efficient. In addition they have a Superior Color rendering index which simply means it is closer to natural lighting than artificial lighting, this I really like as it means that the lighting is much softer and therefore it isn't as harsh as other lighting sources.

Disadvantages- However there are disadvantages to this source of lighting. Firstly they require a specific socket for it to connect and start to work, Unlike the normal LED strip that uses a USB port however this requires a specific lighting port which makes it much more difficult to work with when manufacturing. In addition



LED Filament

Energy saving bulb

How It works- In a CFL, an electric current is driven through a tube containing argon and a small amount of mercury vapor. This generates invisible ultraviolet light that excites a fluorescent coating (called phosphor) on the inside of the tube, which then emits visible light. The light is created through excitation and deexcitation of the electrons in the shells of the atoms

Advantages- The main advantage of this lighting source is that it is very cost effective. In addition it has in increased life span due to the little needs for energy/ electricity. In addition its more environmentally friendly, this is because due to the prolonged life span of the item, less waste is created and therefore less ends up in landfills around the world resulting in this being more environmentally friendly

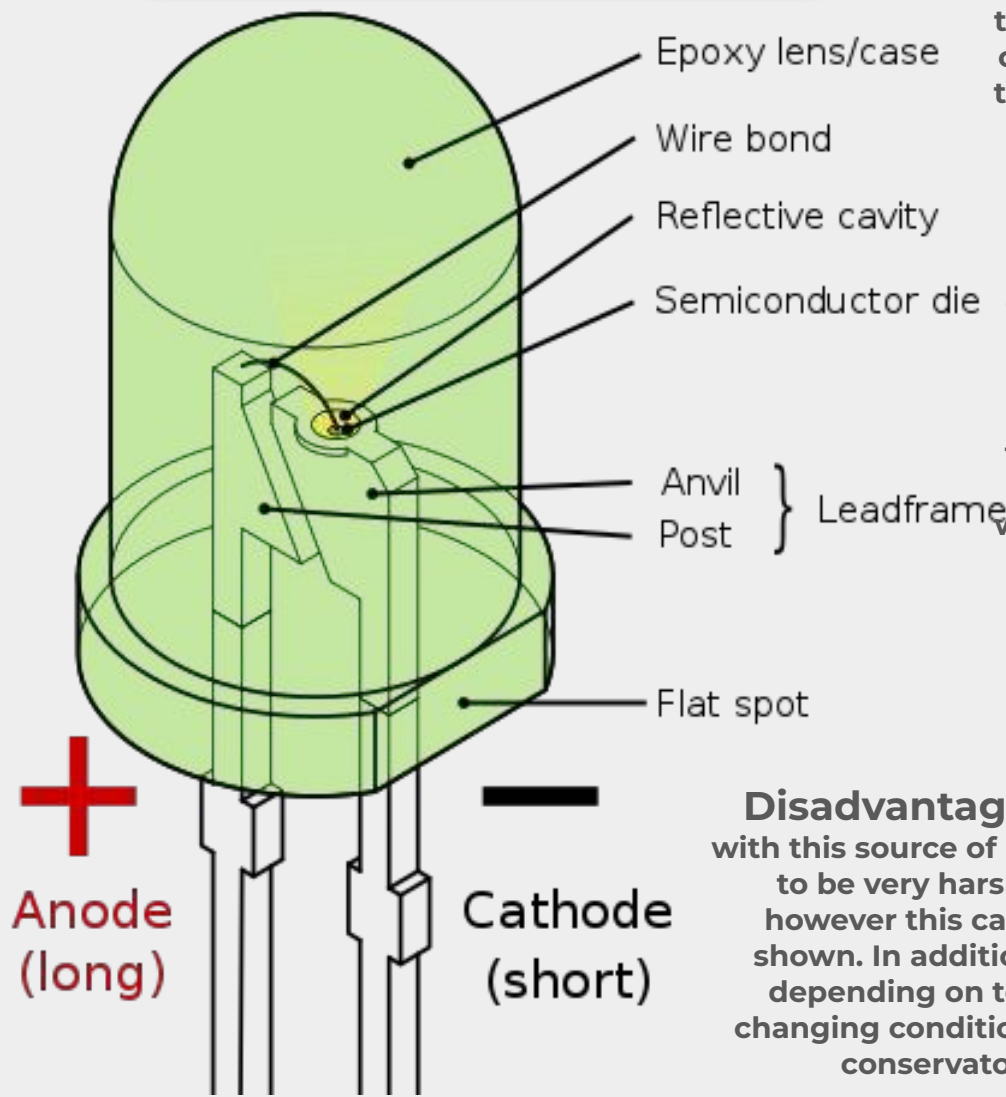
Disadvantages- The downside is that they contain mercury. It's only present in tiny amounts but it can be environmentally damaging if the light bulbs are carelessly disposed of for example if they end up a landfill.

Client Feedback

" Overall I am happy with the research that was conducted, I feel the best option for me however is a form of LED lighting. I feel for me they provide the best option and work the best with my preferences "

Evaluation

Overall I have now come to understand the types of lighting sources that are available for me. I think that my best option, based of research and the client feedback, is the LED light, personally I feel it is by far the easiest to work with and would provide the best resulting performance



Scandi Lighting Style

Scandi Style Introduction

In this slide of research I aim to understand the niche of Scandinavian lighting and aspects that I am able to take from it and use for my actual produce in the future

Style 1

The first style of lighting when looking at the Scandinavian Style is the rounded spherical lamp. This rounded spherical lamp usually has a matte finish to it that doesn't give off a harsh lighting however disperses the light evenly giving a more sort of mood and relaxed look towards the room. In addition however main materials used for this sort of Style of matte plastics and not timbers as heavily featured on the other styles, Incorporating this sort of style is quite difficult to incorporate into a design due to the nature of it however I am aiming to do 1 slide that mainly incorporates the rounded squerical aesthetic of this style. This style usually is a sort of hanging. In addition this design usually is very sort of Wavy and in a way almost flows, this idea is very evident by the far right image which is multiple lights hanging of the ceiling, and this flowing aesthetic I really like and would love to incorporate into my future designs. However with this style it is quite difficult to incorporate it into a standing lamp which is what my client prefers. However I will come up with many designs and not limit myself



Evaluation

Overall I am happy with the research that I have conducted. With this information I am now aiming to make designs and sketches based of these different styles. I want to add that with this information I am able to now make my product more tailored towards my client because they want the Scandi style and now I fully understand the style, I am able to make designs based of them.

Style 2

This is arguably my favourite sort of Scandinavian Lighting style their is, This style heavy focuses on the use of laminating timber in order to give it a flowing and wavy for of aesthetic. This style I really like as it embodies the sort of standing lamp my client wants me to. It heavy relied as previously mentioned laminating wood, and I find this very pleasing. The curved and simple aesthetic it gives to the lamp I feel would work very well within my clients room as it gives of an aesthetic that matches her room. In addition this style is primarily a standing lamp instead of a handing sort of lighting like the other 2 styles therefore I naturally have come to preferring this style over the other styles available. With this design the lighting source is usually a bulb however it is covered by a lamp shade that can easily be replaced with different styles of lamp shades. Lamp shades are one thing that I need to look into, this is because they are a simple way to change the lighting source, it can make a light less harsh in addition to changing the color of the light that lights up the room. One problem with it tho is that it requires textiles and doesn't this does not match the aesthetic of the toom that my client is in



Client Response

"My Favourite style from these has to be either 1 or 2, 3 I don't like too much as I feel it doesn't give off the mood lighting aesthetic. I am however really happy with the research that was conducted and I feel the project, if taking inspiration from one of the designs, show turn out really pleasing"

Style 3

With this final style of scandinavian lighting, This sort of style is primarily a lighting source that tends to hang of the ceiling. With this lighting style it has a lot of simplicity in addition to having a lot of curved and simple edges, They are usually bowl like shapes. In addition the main material for this sort of mainly HIPS plastic that is vacuum formed. In addition other material that is used is wood, however this is come to be a common material that is present throughout the whole of the scandinavian style. My evaluation of this style is not positive due to the fact that it is primarily a hanging light. Both me and my client do not this form of lighting, instead wanting a standing light.



Existing Lighting Examples

Secondary Example Intro
For this slide, I conducted secondary research, looking at existing examples in a book regarding furniture., and their designs

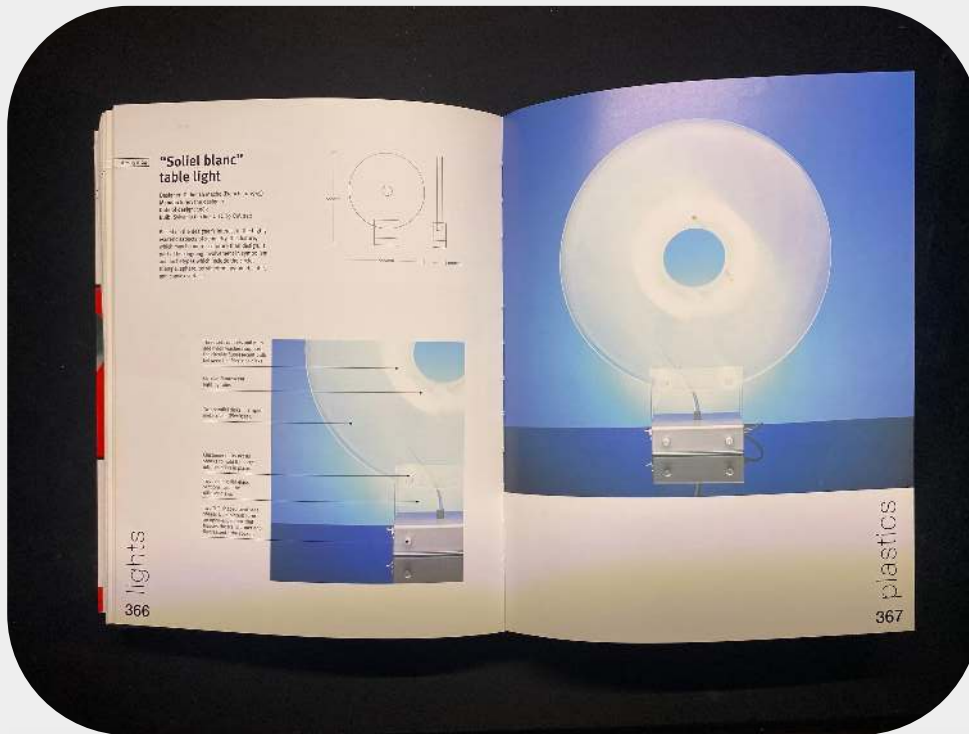
The book 'the best tables, chairs and lights

For this slide, I decided to carry on my research on the different and existing examples of lighting products. Form the school library I picked up the book The best chairs, tables and lights '. I mainly am aiming to look at the lighting section, I want to look at not specific examples, but different features from different product that I could possibly integrate into the design for the future product. Reading the biography it highlights that this book is mainly for furniture pieces and are made from contemporary design, and details the specific technologies, methods and techniques used in making these lights and chairs come to life. The products in this book mainly priorities form over function.

I now wanted to look at the Soliel Blanc Lamp. The designer when making this lamp was very interested into esoteric aspects of geometry. This fixture onto this aspect lead to this design, which is also a continuation of the designers involvement in symbolism and archetypes which include the circle, triangle, sphere and convex shapes.

This product is very bare, and is designed to look very geometric. I do like the actual lighting source itself, it is LED lights warped around the centre, facing outward to allow for the light itself to disperse all around. His simple use of screws, circular fluorescent lighting tube and plexiglass all work together perfectly to display this simple yet effective design.

The main materials used in making this product is plexiglass, plastics and steel, which gives a very core sort of feel to the product, where their is no unneeded excess to the product



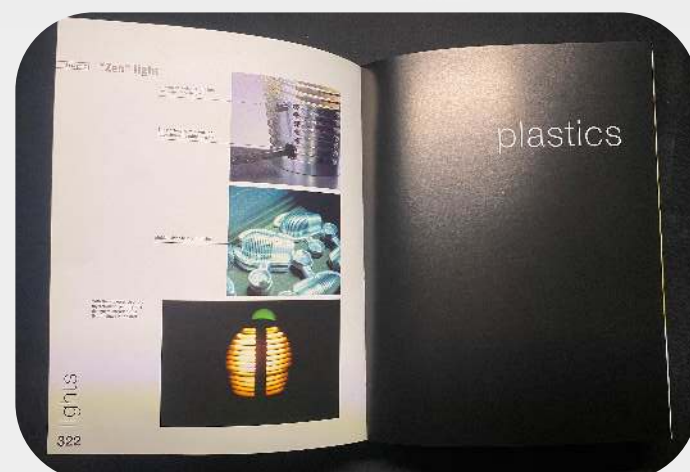
Soleil Blanc Lamp

I wanted to start of this research by looking at the zen Light. Specifically I wanted to look at this example because it is able to show me a possible design for the lighting system itself. It highlights a sort of aesthetic and misty lighting, not a harsh but a sort of ambient lighting, that is said to perfectly fit into the background and fit into place. This product is able to achieve this sort of frosted and mystic lighting by utilizing frosted acrylic. They use frosted acrylic to cover the light. This ensures that the original harsh lighting from the source, is able to be dispersed, and provide that ambient lighting. They sort of attach it in 2 pieces, wrapping around the main lighting source, and then attach them together using simple screws. The main massive advantage of this design is that it is very sustainable. If the light bulb breaks or malfunctions, then you can simply unscrew and then replace the light in it

'Zen' light

For this section, I looked at the 'Drop 1' sconces. This is sort of a wall attached lighting source that can be replaced and fixed when required. The part I particularly like of this product is that the diffuser of the light is made out of a soft silicone/ rubber material, that can simple be removed and placed back on. This means that the lighting unit itself is able to be reached easily. The actual lighting base itself uses 2 Fluorescent lights, that can be placed on and off. This is very important to me as I need to come closer and closer to understand how to actually assembly the lighting system itself. I need to choice which lighting source to use, and I do like the idea of either using a Fluorescent lighting source or a LED light. The LED comes ready to use however this fluorescent one comes disassembled, and as shown in the diagram on the right, needs to be assembled together. The battery back, with the circuit board and attaching the lighting mount to it will require me to use my soldering skills, to assemble everything together. The perk of the base being made out of a plastic, is that it can be pigmented into different colors, for example this one is pigmented green but it stated that it is available to be pigmented into different colors such as red or blue

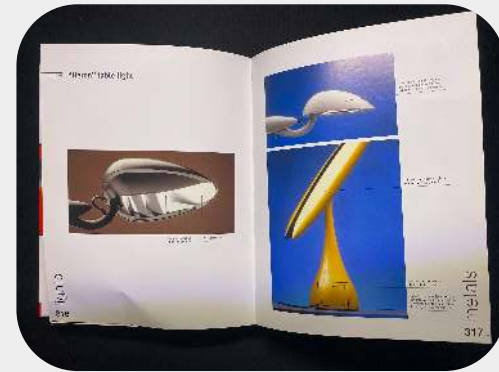
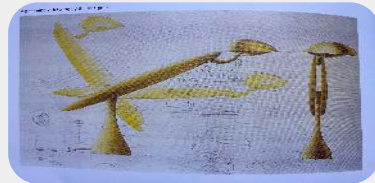
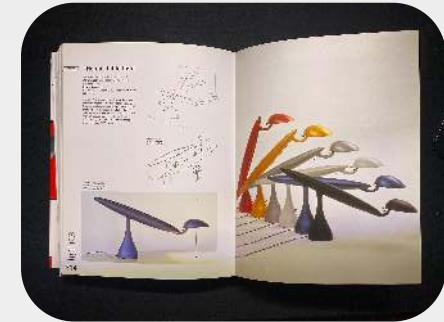
Light dispersion example



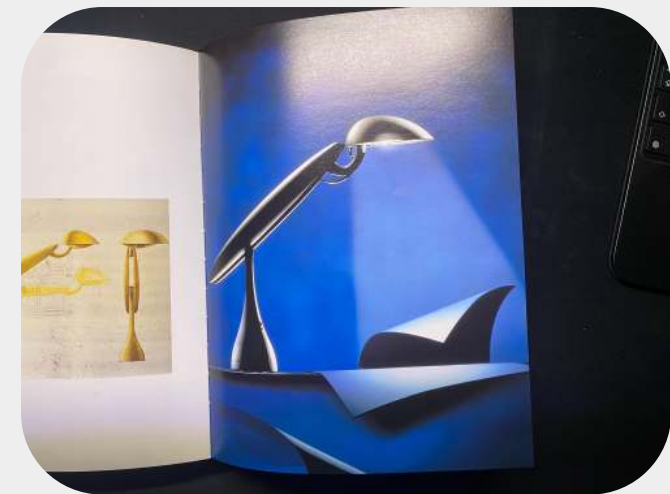
Existing Lighting Examples

Secondary Example Intro
For this slide, I conducted secondary research, looking at existing examples in a book regarding furniture., and their designs

Heron Table Light



For this product, i decided to look at the HERON table light. This product was by far the most detailed in the book, with multiple pages dedicated to it. The design is one that is very complex, yet very effective; The main lighting system has a diffuser in front of it and a protective pyrex glass in front of it. One thing that really intrigued me was the product energy efficiency. The use of mirrors are very effective, as it allows for a very directed light towards the item that it is in the direction of. Furthermore the functionality of the product is very interesting. The product features small wheels on the base of it, primarily for moving the product around the desk of the user, which means that someone working in low lighting can have the focus light they need on the areas that they require it



George floor light



I decided to combine these 2 examples together, this is because I wanted to primarily focus on their materials that they use. Both of these product primarily utilize timber. The table light uses veneered timber for the bass, and has a fabric cover on it. The george floor lighting uses solid lathe-turned pack, which gives it a very rich and tight grain to the legs of the product. In my project I can only use mainly Plywood, this is due to my resources, and what I have available to me within the DT department, however I can use other materials as well, such as the HIPS plastic for vacuum forming or MDF, for smaller uses.

Table Light



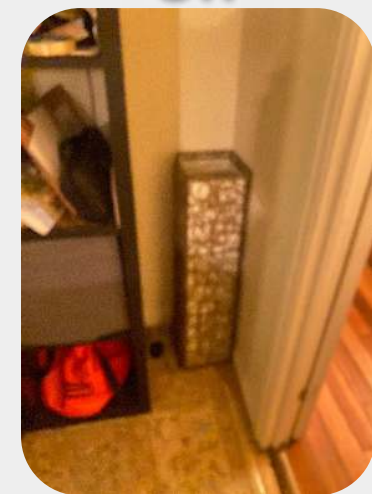
Disassembly of Lighting Unit

Listed Component 4

Analysis of the product / Functionality of the product

This product is mainly situated in my clients other room, the main purpose of this product is to provide mood lighting to the room, I broke down the product into its different components and then labeled and analysed them to see their functionality. This product has maily 4 pieces to it that I analysed below. I also labelled them and zoomed in on one of the parts as shown on the left

Off



On
(without Diffuser)



On
(with Diffuser)



Parts list

- **Main Lighting unit (1)**- this main lighting unit includes the light bulb and all of the electronics associated with that, this is what mainly powers the product
- **The diffuser (2)**- this main purpose of this is to diffuse the light coming off the Light bulb so that it provides ambient lighting to the user, that is not too harsh
- **The decorative Piece (3)**- this is mainly for aesthetics, it is a thin shell that covers the outside of the piece, which is mainly made out of straw, this part does not provide any support in any way but instead is just their to make the product look more aesthetic
- **The plug and on and off switch (4)**- if you look at the image on the left, it shows the on and off switch that is used to control the light. It is a sort of push mechanism that is very interesting to look at



Designs

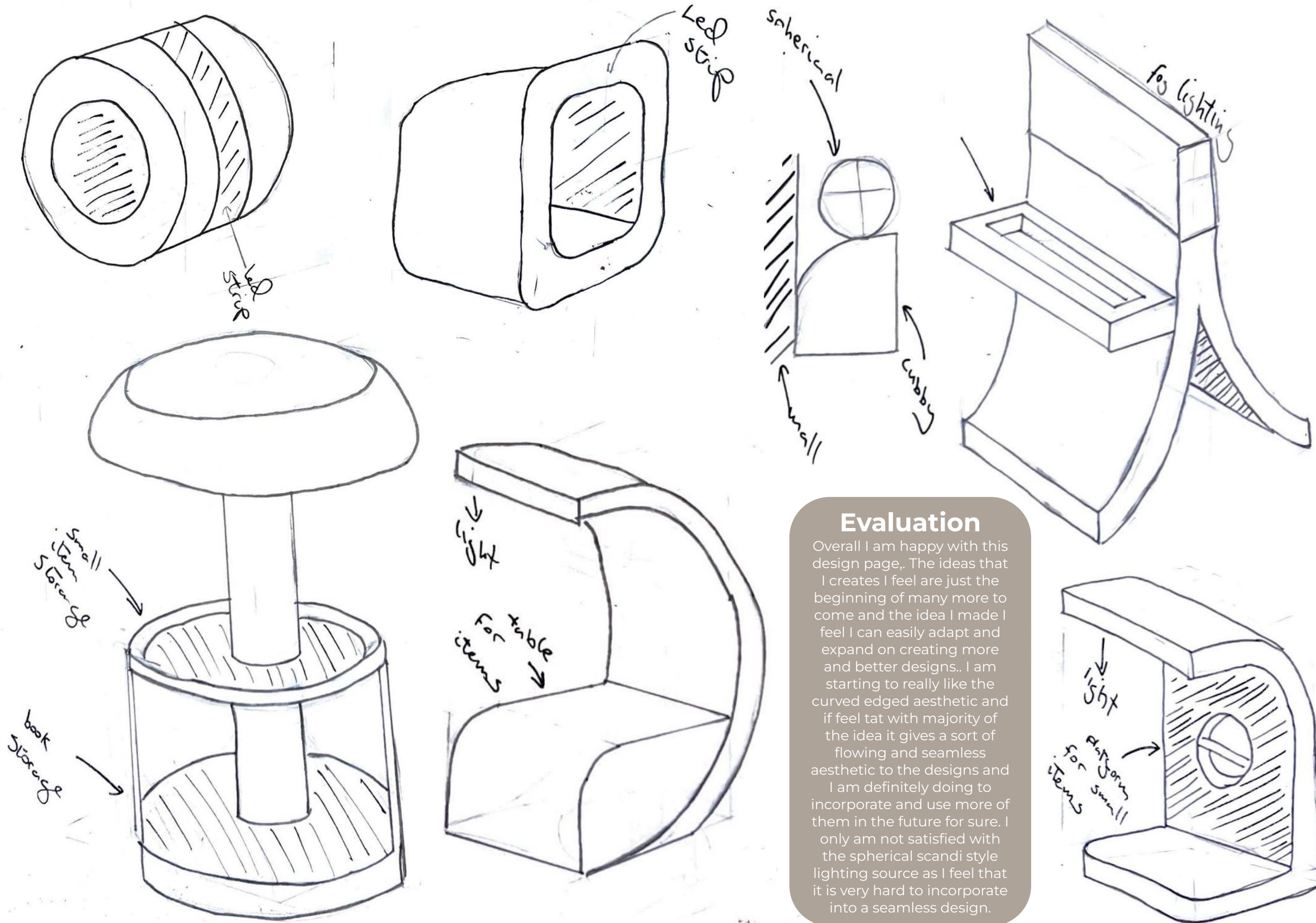
Designing Introduction:

With designing my main aim is to brainstorm and to understand different designs that I am possible able to use and adapt for my actual project production. I over the slides aim to create more and more designs and at the end make a product that takes up aspects from different sketches that I made initially during these slides

1

Takeaways; Sheet 1

In this sheet I initially aimed to fulfill my main client needs and wants. I aimed for making majority of the designs include, round edges, in addition to having and fulfilling the desired secondary function of storage, and with these the secondary function either had a small storage area for small items like glasses or had that and another storage area for the book that my client is reading at that time, i tried fulfilling the secondary function of a sort of storage unit that my client suggested. I also tried to incorporate styles like the scandinavian spherical foggy lighting that is very popular within that interior decoration space. This however I found difficult to incorporate into the design as it is large and it being spherical is hard to integrate into designs however as I make more and more sheets I aim to integrate it more and more until I end up on a design that I like. In the next 2 design slides I aim to make more ideas and with the remaining design slides I want to make designs for storage and lighting sources



Evaluation

Overall I am happy with this design page. The ideas that I creates I feel are just the beginning of many more to come and the idea I made I feel I can easily adapt and expand on creating more and better designs. I am starting to really like the curved edged aesthetic and if feel tat with majority of the idea it gives a sort of flowing and seamless aesthetic to the designs and I am definitely doing to incorporate and use more of them in the future for sure. I only am not satisfied with the spherical scandi style lighting source as I feel that it is very hard to incorporate into a seamless design.

Designs

Designing Introduction:

With designing my main aim is to brainstorm and to understand different designs that I am possible able to use and adapt for my actual project production. I over the slides aim to create more and more designs and at the end make a product that takes up aspects from different sketches that I made initially during these slides

2

Evaluation

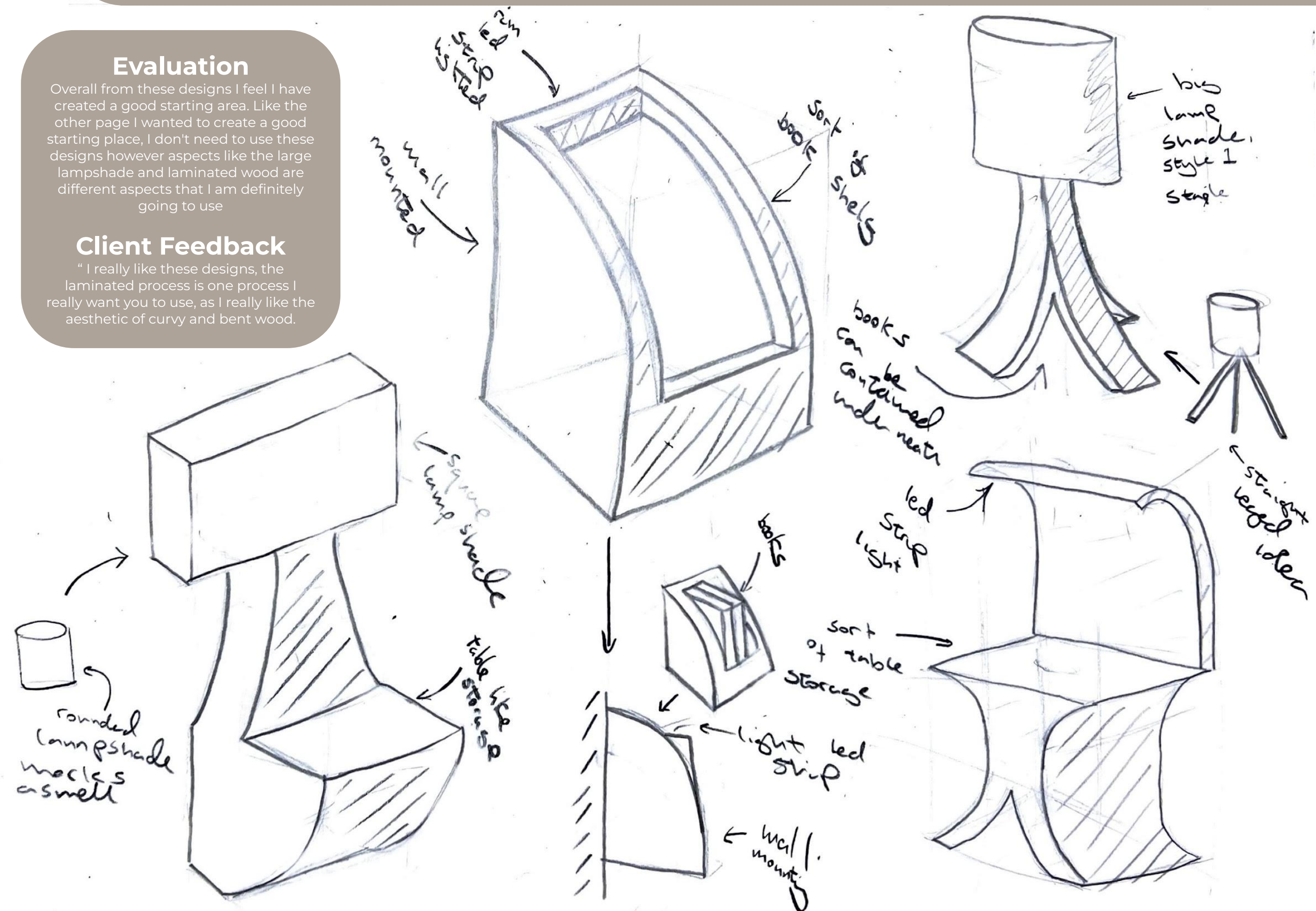
Overall from these designs I feel I have created a good starting area. Like the other page I wanted to create a good starting place, I don't need to use these designs however aspects like the large lampshade and laminated wood are different aspects that I am definitely going to use

Client Feedback

"I really like these designs, the laminated process is one process I really want you to use, as I really like the aesthetic of curvy and bent wood."

Takeaways; Sheet 1

With this sheet I wanted to make radical designs and not remain design fixated, These designs I feel work well and with my project. I wanted to based of my recent research make curvy and flowy aesthetics like the Style 2 from my research. I created one large wall mounted Idea that I do really like and I feel could work. In addition the main form of lighting I designed around was LED lighting, I did create a few lighting designs with a light bulb however the main form of lighting I used was LED lighting, With this sheet I tried to adventure into different styles, and avoid design fixation. I tried to incorporate lamp shades. The curvy aesthetic was me trying to incorporate the sort of laminated timber aesthetic, as from my research I understand that that is one manufacturing process that can achieve the curvy aesthetic of these designs



Designs

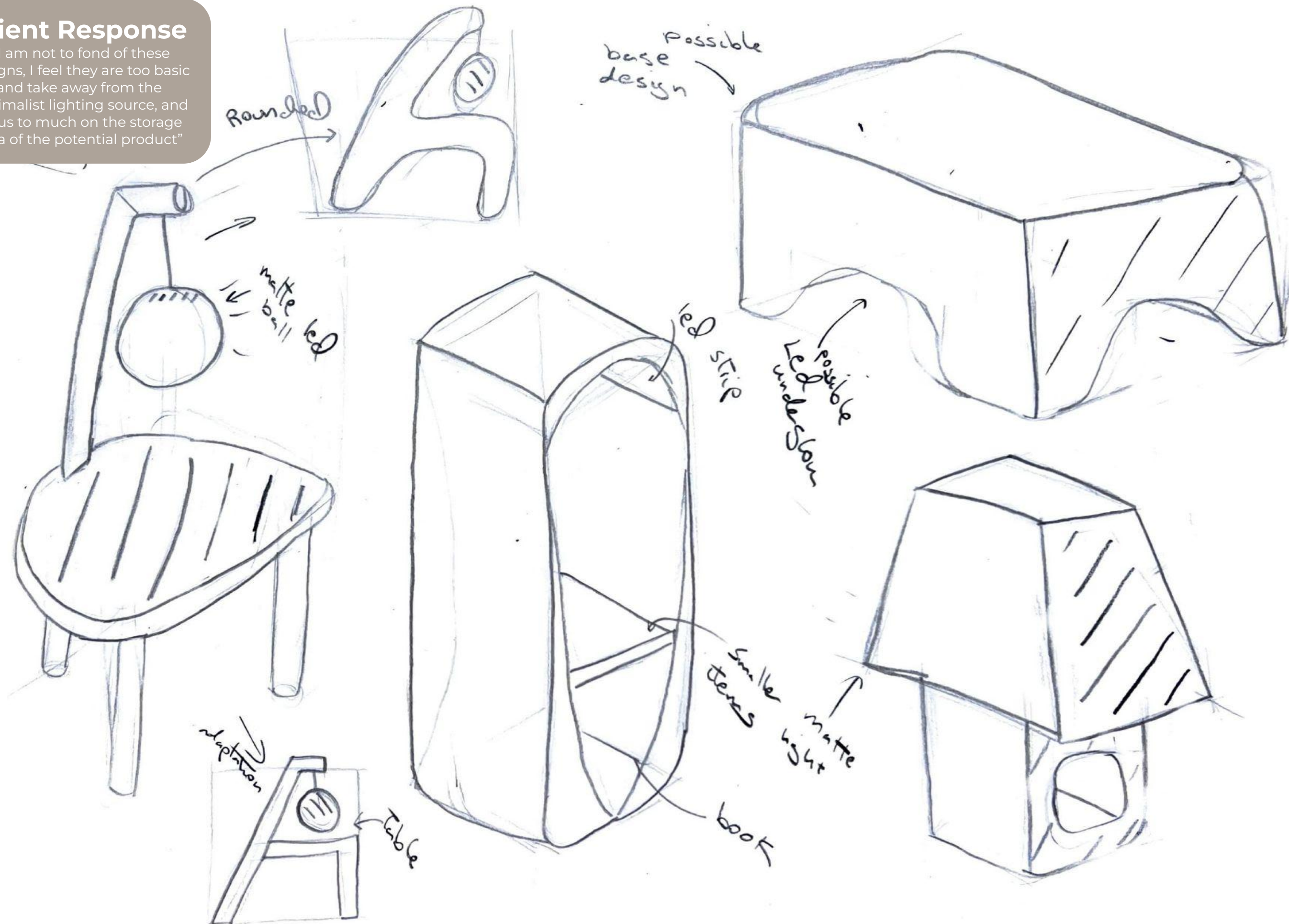
Designing Introduction:

With designing my main aim is to brainstorm and to understand different designs that I am possible able to use and adapt for my actual project production. I over the slides aim to create more and more designs and at the end make a product that takes up aspects from different sketches that I made initially during these slides

3

Client Response

"I am not to fond of these designs, I feel they are too basic and take away from the minimalist lighting source, and focus to much on the storage area of the potential product"



Takeaways; Sheet 6

Takeaways from this sheet are the basic designs, This is the 3rd sheet, and my aim for these was to make basic designs that I can adapt and use ideas from. Now after this sheet the remaining sheets are going to be more indepth with specific ideas, as I try to edge closer and closer to the final products design. However I am still quite far away from that just yet. I tried to move away from the primarily lamp shade design and introduce sort of storage units with an LED strip on the inside, however I do not think that sort of design would work well, and instead I would prefer a more lighting based product. I want to avoid focusing on the storage aspect from now as that is only a secondary function and could take away from the primary function of the lighting source. Which I feel is much more important

Other Lighting Designs

Other Lighting Designs Intro
For this slide, I travelled to IKEA, in aimes to analysis existing products in hand and analyse them for their validity



Disadvantages

The main disadvantages that surrounded this light where, The primary source of the power from through a Cord, This gave a overall messy and uncalculated look to the lamp hindering the aesthetic of the lamp and in addition taking away from the wooden and organic look to the Scandi Interior design style. In addition the price according to my client is way to high, and they would not consider paying 60 Pounds for this lamp. It does not contain any sort of storage in addition it does not have RGB or any sort of dimming light effect to it



Advantages

The main advantages with this light is, firstly it perfectly matches the scandinavian lighting aesthetic. The large lampshade and primary material of plywood timber has allowed me to understand potentially how my final projet might aesthetically appear. In addition the clever mechanism to adjust the hight of the lamp is one part that I really like and would in some way want to incorporate within my own project when designing more

Description

One of the first and best lighting designs I encountered on my trip was this standing lamp. This standing lamp was mainly made out of timber and made use of the typical scandinavian lighting style by utilizing the large Lamp shades that are typically found on a Scandi Light. In addition the price of this lamp was 60 Pounds and used a electrical plug unlike how I intend to use batteries instead for the energy source



Client Response

"Overall I feel that the first product that you analysed fit a lot of my criteria, aspects from that for example the timber, big lampshade and soft hue of light would fit perfectly within my own room that I intend to have the light in. IN addition the second light did not fit my criteria at all, however aspects like the hinge and other would work well on the final light Their where no sort of storage areas on these product which I require, I require a sort of storage unit aspect to the product, however the lighting aspects of these products fit perfectly



Disadvantage S

Firstly one of the main disadvantages of this light is that it does not provide mood lighting. This as a result means that it would not fulfill the needs and desires of my client and therefore would not be suitable to copy aspects from. In addition the light is also 50 pound which similar to the previous project was labeled to expensive by my client. In addition the lighting provided no storage. Also the bulb itself, the hue of the bulb was way too cold and harsh, meaning that it would not fit well into my client room and provide mood and comfortable lighting for them, result in my client being dissatisfied



Advantages

Firstly, even though this light used a cord method for powering the light, the cord was not very noticeable and did not take away from the aesthetic of the light itself, this is due to the slim nature of the cord and the fact that it matched the same hue of the lamp itself. This lamp also came in a wide array of colors from white to black and even a brownish gray. In addition One of the main features of the lamp that I have really come to like is the hinge mechanism that allows to user to be able to direct their lighting onto the curtain areas that they intend to direct it on. The Focus lighting aspect of this light I feel worker really well and the light is easily as demonstrated, able to be moved and altered so that the user is able to change where the light is being used instead of the user needing to move and alter to fit the light itself. In addition the flat and large base ensured that the light did not topple over or have any issues of the sort, Instead staying still and firm even when it was slightly knocked



Description

Although this light does not portray the Scandinavian style, their was still a lot to be learnt from this light. The advantages and disadvantages of this light where massive. Prominent features of this light where the hinge mechanism that I feel was useful to understand



Other Lighting Designs

Other Lighting Designs Intro
For this slide, I travelled to IKEA, in aimes to analysis existing products in hand and analyse them for their validity

Advantages

One of the main advantages of this light is that it is unique, the large lampshade idea is inspired from the scandi style, however it uses a very loose woven design to give this warm and comforting aesthetic, In addition this paired with the soft lighting really emphasises the warm and comfortable aesthetic that this lighting is trying to go for, This would work really well within my clients room as it fills a lot of her criteria, excluding the ones mentioned in the disadvantages box

Disadvantages

One of the main disadvantages of this light is that the light is quite harsh, although soft it provides quite harsh lighting that can hurt the human eyes after a short period of time. In addition there is no storage compartments and or area that my client is able to store their smaller items within, this is a large disadvantage as it means it does not fit their needs

Description

On my trip, I intended to analyse and understand an existing example of a hanging Chandelier for of light, see how well it would fit within my clients room and then take useful aspects as required for my own to improve and then possible implement into the final product



Description

This section is not necessarily analysing a product but an aspect/ area that is useful towards my final product, and that is a matted lamp. Their were quite a few examples of this that I found during my trip, and their where some large disadvantages and advantages to them



Advantages

Their are a couple of advantages i picked up on when I was analysing these product. Firstly the matte aesthetic reduced the harshness of the light massively resulting in the lighting possessing more mood elements and giving a large matte aesthetic, which is sort of cozy and much more comfortable compared to previous. In addition these lights usually require less power than normal harsher lights, therefore meaning that it is much more power effective and efficient

Disadvantages

One of the main disadvantages that I found was that the matte part comes from the covering around the light itself, And these covers usually had a very round shape that I feel would be very difficult to obtain within my DT department. Therefore I need to try to find a way around this problem when I am manufacturing, however I might be able to externally source a sort of shade that could massible benefit



Client Response

Overall I also now feel that there were very key and important lessons to be learnt from these designs. Firstly the straw light I feel looks very aesthetically pleasing however would not work well within my room. In addition however I feel the matte light aspect would work really well and I would strongly advise for you to incorporate that in some form or another. However as previous the lighting aspects where perfect, however their was not storage aspect to these products which I de nrequire

Lighting Sources

Lighting sources introduction

With this slide I aim to understand the various lighting sources I could use. This mainly is a test as a existing lighting source readily available to me then to analyse and understand the suitability of it for my own project

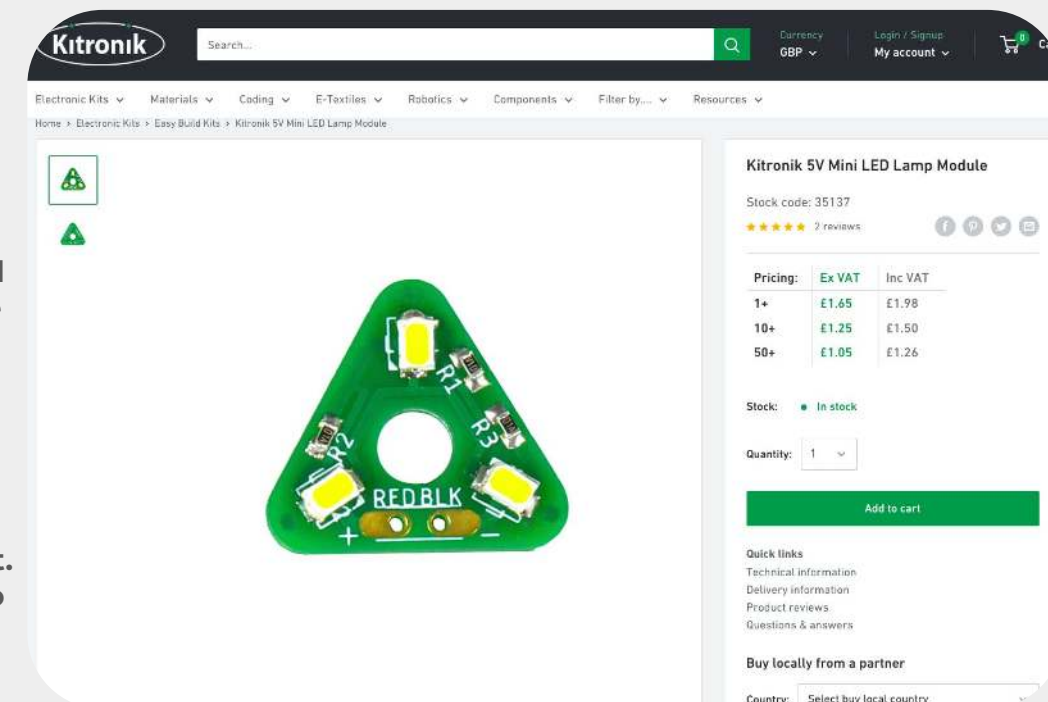
Suitability

I Personally feel that this lighting source is very suitable for my project. On further research on the kitronik website this particular light was for one module 5V. This means if I wanted to stack multiple onto one cord (On a normal 120V socket) to be safe we could stack around 20 which is feel is more than enough. In addition the cost of 1 is very cheap coming in at 1.65 Pounds for one, and if bought in a pack of 10, 1.25 each. For my project this is well within my budget that I am able to access. In addition due to the small size integrating this would not pose a big challenge and would be fairly simple. Finally the small but bright nature I feel makes this a very suitable lighting source for this project

Initial Impression

When initially looking at the LED light my initial positives where: The Led is small yet letting of a bright light, compact, uses a USB cord which is simple to work around and it is able to be attached in rows to one cord. However disadvantages of the bat where; it is a very harsh lighting, does not contain RGB Lighting. the lighting on the Kruithof Curve is to blue giving a unnatural effect to it, and finally that it does not have a on or off switch, instead requiring the light to be unplugged. This LED also does not come in a strip form meaning it canbe used with adhesive to stick onto the product. Instead it means that it requires a place to slot into

After this I decided to conduct some tests to understand possible solution to the problems at hand



Client Response

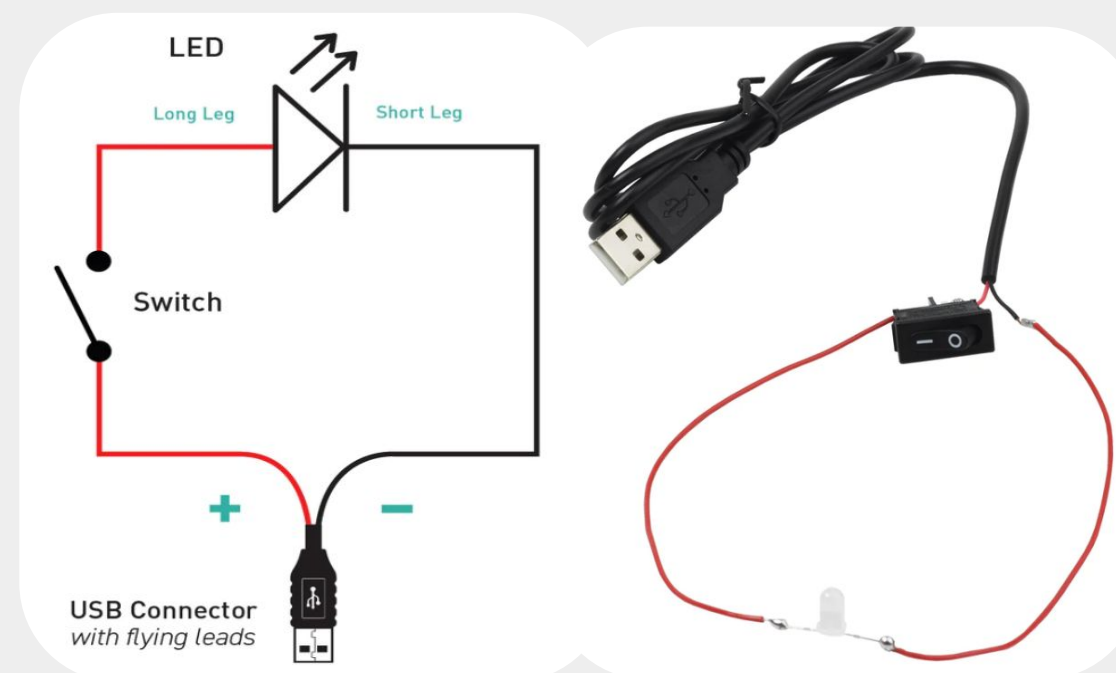
" I really do like this product, however I do feel that their are a lot of problems with it that I feel would need solution to fix, however they are fairly simple solutions like the frosted glass"

Evaluation

I feel liek this works well. And solutions are readily available just I need to be able to work with the cards that I am dealt, however if I(can't come up with foliations I am able to just purchase a better/ suitable lighting source

Solutions

When Testing I wanted to come up with quick and simple solutions. Firstly regarding the main problem being the lighting was too harsh I placed frosted plastic in between my eyes and the glass, it resulted in the light dispersing and giving a matte and comfortable aesthetic. This was a much better light that without the frosted plastic, in addition the use of different colored plastic means that the color is able to be easily changed of the light which also solves another issue. Regarding the switch to turn the light on and off, on kitronics their are switches that are able to be soldered on meaning this problem is able to be resolved very easily



Other Products

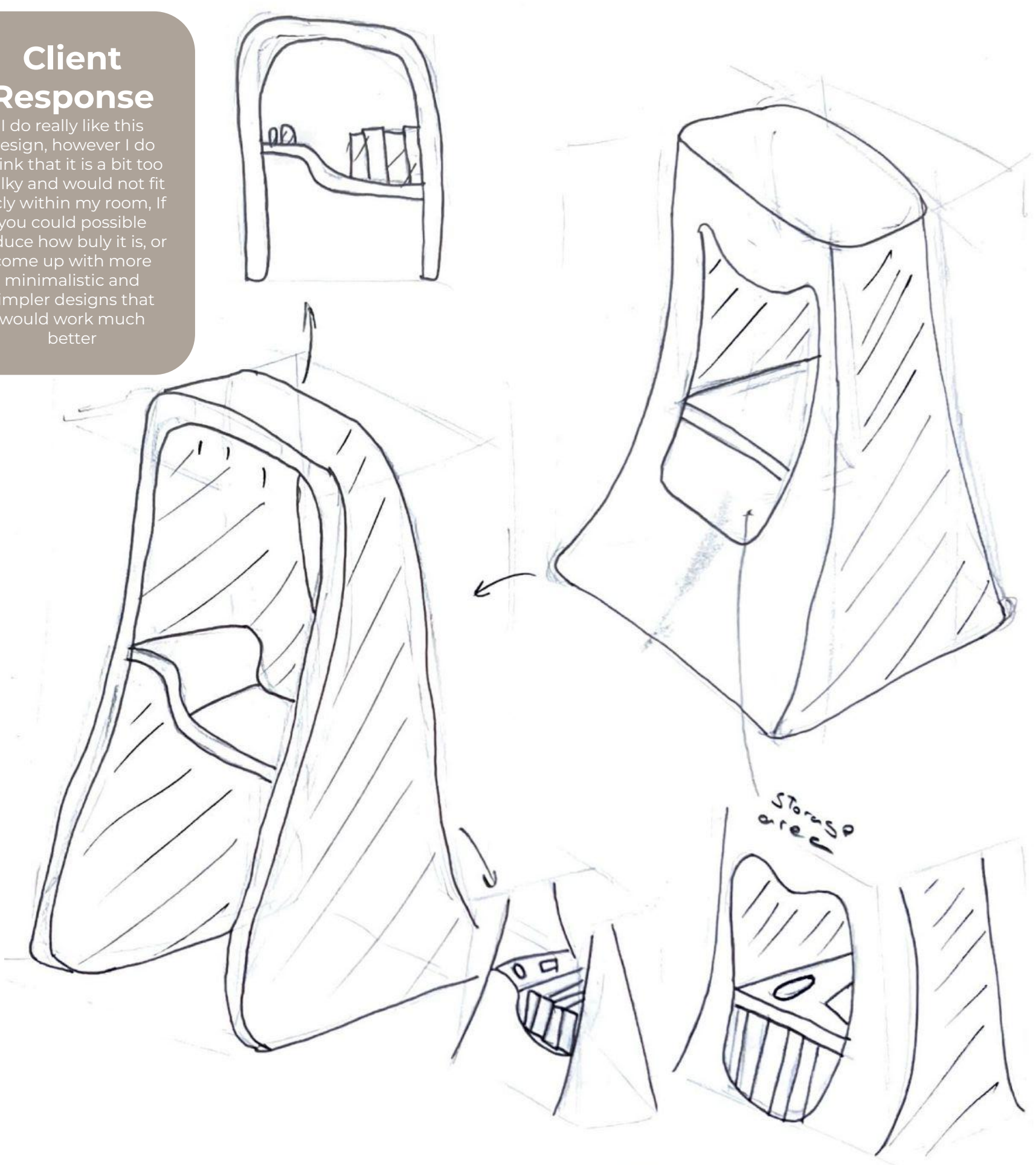
This is another viable product that I found on kitronik. It is the same price as the other, however it is RGB lighting in addition to having a cord with it and a light switch onto it. This is very similar to this product however it contains solutions to problems that I faced with the other Product like the no RGB lighting. The price of this is 60 pounds for a kit of 50 so around 1.2 Pounds per kit which is very cheap and viable for this project

Designs/ Stock Form

Stock Form Introduction:
This research is so that I am able to visualise the available resources to me in the DT Department

Client Response

I do really like this design, however I do think that it is a bit too bulky and would not fit nicely within my room, If you could possible reduce how bulky it is, or come up with more minimalistic and simpler designs that would work much better



Material	Stock Form	Length	Width	Thickness	Notes
Plywood (Timber)	Sheet	600	300	3	With this informations I am able to understand the lengths that are available to me when I am designing. This allows me to be able to create designs around these sizes. For example the thicknesses being 6 or 12 means I can design clips or other items to be able to fit around the 6 or 12mm thickness
	Sheet	600	300	6	
	Sheet	2400	1200	6	
	Sheet	2400	1200	12	
MDF (Timber)	Sheet	600	300	3	MDF is a very important Material. This however can not be used to laminate curved items like plywood. That is the main disadvantage of MDF
	Sheet	600	300	6	
	Sheet	2400	1200	6	
	Sheet	2400	1200	12	
Mild Steel (Metal)	Rod-Circle				With the Mild Steel Robs I am able to use them to display artistic memos and others of that sort
	Rod - Square				
	Rod - Flat Bar				

Evaluation

Now that I understand the stock forms that are available to me I am doing to model designs around this so that manufacturing is much simpler

Design/ Design Brief

Design brief Introduction:

The design brief is here to condense all the important pieces of information, for example mainly the NEEDS, WANTS and DISLIKES of my client

Design Brief

For my project I am designing and making a Scandinavian Inspired Standing Lamp/ Lighting source. This project is intended initially for my client Zakia Mehboob, however if mass produced its target market is aimed at people aged 20-50, this is for people that have their own living space/ home who have the Interior Design that is similar to the Scandinavian Style, in addition more specifically this product is intended for my client Zakia Mehboob khanums conservatory/ living room. My project is intended to reside in any sort of living/ general room that would require mood lighting, eg a reading room or a gaming room. The project is aimed to help solve the main problem of creating mood lighting within a room, this is in addition to looking aesthetically pleasing and matching the style of the residents room at the same time. The products intended time usage is post sunset, when the client might want to light up their house/ room. Sizing constraints for the project are 950mm/2000mm/500mm, this is based of the Sight Analysis slide from my clients intended room of usage, The constraints ensure the project is not to big to have difficulties being places in smaller rooms, however it ensure at the same time it is still large enough to light up my clients full room. Cost limitations of this project are Maximum 40 British Pounds. This is because based of my client research I have concluded that this is the correct and the most reasonable price for a product of this nature. In addition the weight limitations of this project is 15kg, this is because if any heavier I might start to find it difficult to manufacture and move the project.

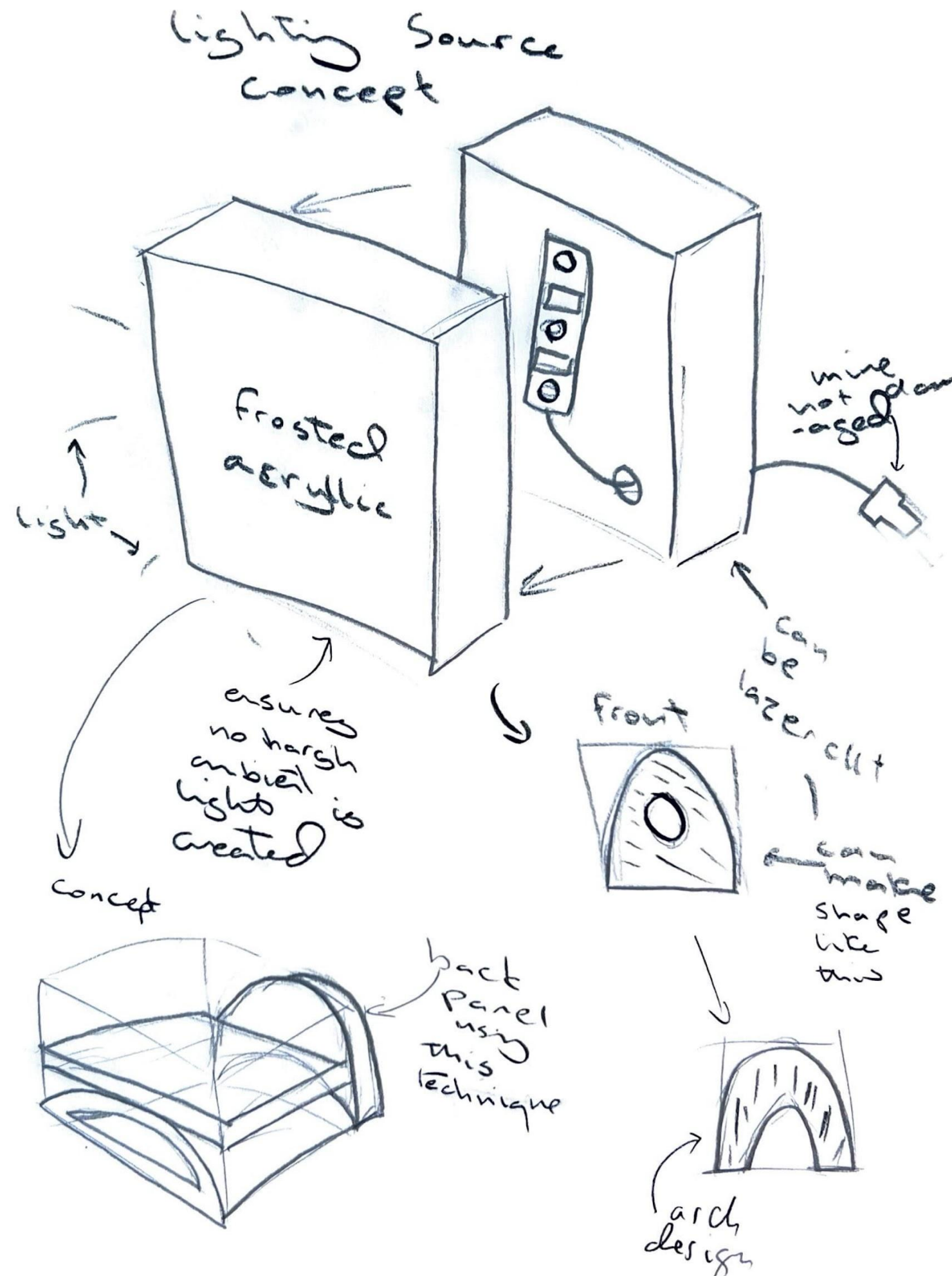
In addition the Secondary Function of the project is going to be a sort of storage function, this is so that my client is able to store any items that she feels that she needs to do. She specified a sort of storage unit on the product for all her items, eg books, glasses, pencils and possible decorative pieces

Based of the previous client research slides I have now come to understand my target markets/ clients needs, wants and dislikes. Needs for my client is that she wants a standing sort of 'lamp' instead of one that resides on a desk, in addition she wants the lighting source to be comfortable and give of a warm and cozy aesthetic.

She also wants the secondary function to be that the project has a storage compartment or dedicated area for storage. In addition a final need for my client is that the project must take inspiration from the scandinavian style, this is to match the aesthetic of my clients room. Things that I am able to do to fulfill this need is by using materials such are Ply Timber that are very common in that style.

A want of my client is that the lighting for the project could provide RGB lighting. This is so that it could possibly provide a sort of mood lighting that can change different colors, meaning my client has an endless combination of lighting colors and doesn't get tired of the same one.

Dislikes from my client (The constraints I have with the project) are things like, not wanting to have to use a remote control because my client finds it difficult to use in addition to preventing them from losing them. In addition my client stated that instead they would like a button. Furthermore my client has stated that they don't like sharp edges, as they feel that they can get cut very easily on it very easily therefore a potential solution to this problem is just sanding or rounding out the edges. In addition my client has stated she doesnt want harsh our blue lighting, as it hurts her eyes and she feels that it does not create an mood and comfortable aesthetic. Solutions to this is possible using a warmer lighting source and in addition possibly using frosted glass to cover the lighting giving a matte aesthetic/ finish



Modelling

Modelling Introduction:

With this stage of my project. I wanted to create scale models that I would be able to visualise and adapt. The benefit of modelling is that I am able to visualise and to an extent test the models, and then from that information expand and and adapt the designs from their. The initial designs would be quite basic, that I could adapt from, if I have the basic designs down I am able to expand and adapt from their

Introduction

1

With this lighting design their are a few key aspects to it. Firstly their is the base that contains the storage areas, and then their is the lighting arm that is able to move up and down to meet the needs of the client. The base contains a countertop that is able to hold small items like my clients glasses and other things like cups and others as she specifiied. With the insert cubby my client is able to store things like 2 to 3 books sideways in addition to other larger items that they plan to keep their for a long period of time, not small items that are continuously being taken on and off like glasses or the others. In addition the arm does not contain a hinge, instead simple curving up and down to direct the lighting. On the model the simple masking tape represents a LED stip that is also in addition going to contain RGB Lighting. In addition the Base of the model contains a very aesthetically pleasing curve in addition to having a wide solid base. The intended materials used for this design would have been timber mainly



Changes 2

With this model I made a few changes. Firstly I heavily adapted the base, giving it a more curved and flowy aesthetic. The storage compartment if much larger than before and does not fully go through the bawse however partially goes thorough. In addition another big change that I made was to the arm of the design, the masking tape in the middle of the arm is their to represent a sort of hinge mechanism that is able to hinge up and down which then allows my client to direct the light of the LED to different places as much as they desire to. In addition the countertop of still their however it is much smaller than before in the previous design. The arm is also less wide, much narrower which matches the new narrowness of the counter top



Disadvantages 1

One of the main disadvantages is the proportions, The base is too large and the lighting section is not proportional. This would not look aesthetically pleasing as the proportions are off. In addition the arm has no hinge, instead simple folding and unfolding which would be quite complicating to copy

Disadvantages

One of the main disadvantages of this design is that it looks bulky, it may take up unnecessary space within my clients room that I feel could be wasted, or used for a better purpose. In addition the arm I feel still needs to be adapted to work better. The countertop is also not as large as before, and I feel like this is a disadvantage because I feel like not my client is not able to store as many items on it as before which is a major disadvantage and I feel I will need to resolve

Advantages

There are many advantages to this model. One of the main advantages of this model is that it contains a lot of storage for my clients smaller items. For example their glasses and pens/ pencils. In addition the lighting arm is able to pivot, moving up and down which means my client is able to direct their mood lighting to things like their books when they are reading. In addition the design is quite aesthetically pleasing, displaying a artistic design while still not compromising on functionality which is evident with the large amount of storage and the pivoting lighting arm. In addition the use of the LED stop means that the product would come with the advantages of using an LEd, for example RGB and the cost effectiveness. In addition this design is quite basic, this is an advantage because this means that I am able to quickly and easily expand and create different addition to it that are able to benefit the product

Advantages

Advantages of the new design is firstly there is much more storage. The storage cubby is much larger allowing for larger items to be stored for example more books that my client is reading. In addition the hinge mechanism is a new idea that I have which I do feel could work quite well. In addition the new design has improved proportionally. Unlike the previous design the new one looks much more proportional and aesthetically pleasing paired with the new base design.

Evaluation

Based of these designs I like where I have started off. These designs re definitely able to be adapted and changed quickly and easily until I feel I have got a competent and well working solution that my client is content with and is able to use. This is a good starting point and the next few designs I Am able to adapt and evolve from

Client Response

" I do like this design and I feel that it is a good starting point for you. I really like the new hinge mechanism you made however I feel it still would need to be4 adapted and changed to be made better and better"

Disadvantages 2

2

Another disadvantage with this design is that it has a lot of sharp edges, as my client has stated they do not like sharp edges, instead wanting their to be more curved and more a flowing aesthetic to the product therefore that is one point that I am doing to need to improve and expand apon

Hinge Mechanism

The hinging mechanism is a new addition I made to this design. The advantages of this I feel are that it is easier and much more simple for my client to understand. In addition to being easier to replicate when manufacturing unlike the curving design I had previously. However disadvantages of this new design is that the a simple hinge might not be able to uphold the load required from the arm and might easily break unless it is reinforced



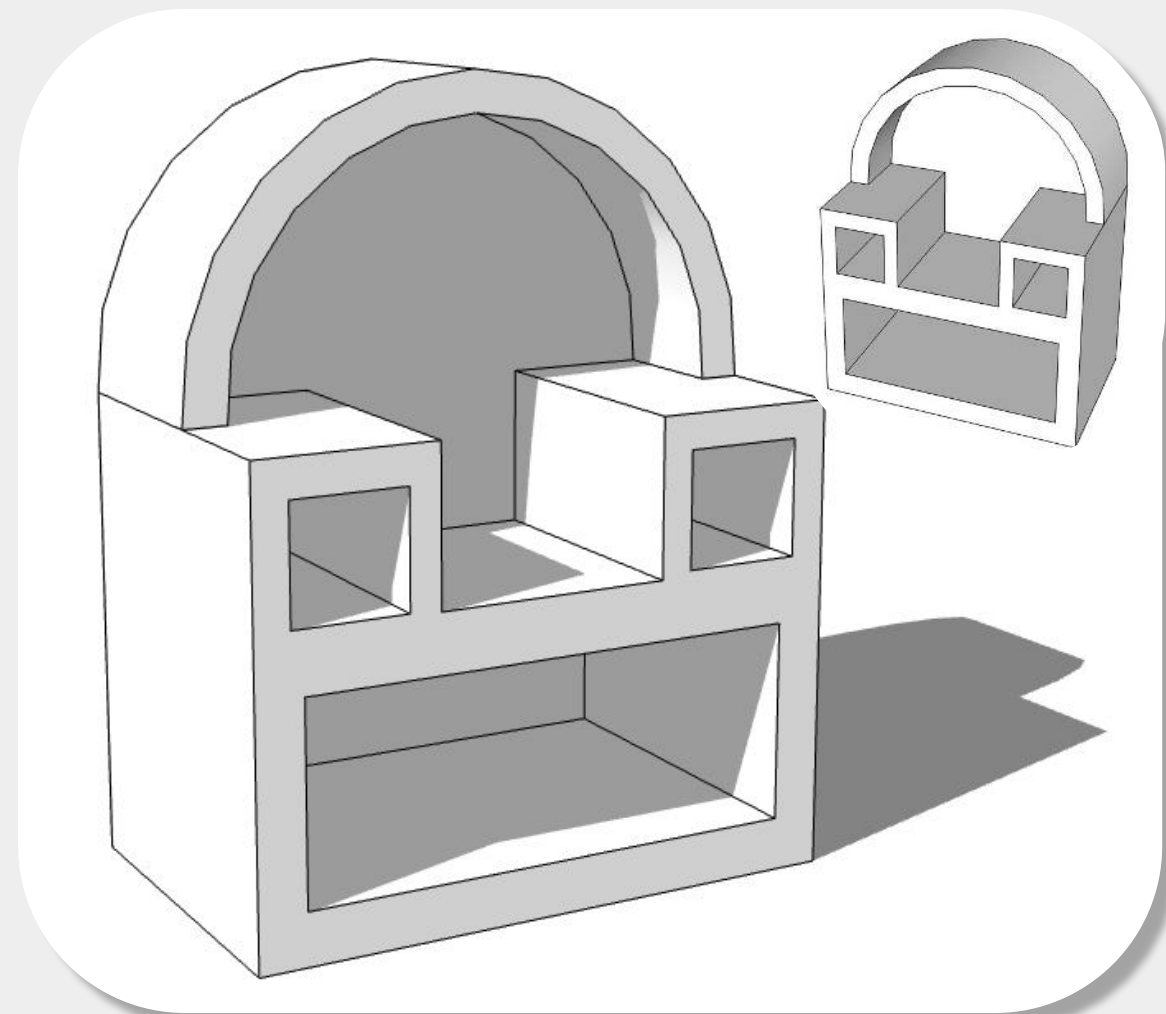
Modelling

Modelling Introduction:

With this stage of my project. I wanted to create scale models that I would be able to visualise and adapt. The benefit of modelling is that I am able to visualise and to an extent test the models, and then from that information expand and and adapt the designs from their. The initial designs would be quite basic, that I could adapt from, if I have the basic designs down I am able to expand and adapt from their

Intro

For this model, I decided to change to use a CAD software. Changes that I made where, firstly I reduced the height of the arch, In addition I changed mainly the base, by saving material I can make indentations in it to give more room for items. In addition I created a dedicated area for books in the middle step, which is specifically free for that specific function



Disadvantages

One main disadvantage is that it is bulky, the addition of the black piece can give quite a bulky aesthetic. In addition there are a couple of design modifications that I can make. One of them being the the base. I could possible make indentation on it so that small items can be placed in addition to decorative pieces

Advantages

The main advantages of this model is the mood lighting. The LED strip provides a mood lighting when turned on which would provide relaxing lighting and a relaxing environment for my client. In addition the base is is new and improved. In sort of step design allows fo different functionalities, like for example on the lower step books are able to be placed, and on the top step smaller and more miscellaneous items are able to be placed on.

Advantages

One of the main advantages of this design is that their is more room for storage. The indentations allow for more room to store things like pens, glasses, in addition to possible being used to store decorative items as well in it. In addition the change to the shape of the base now means that there is a dedicated area for the books my client would read

Evaluation

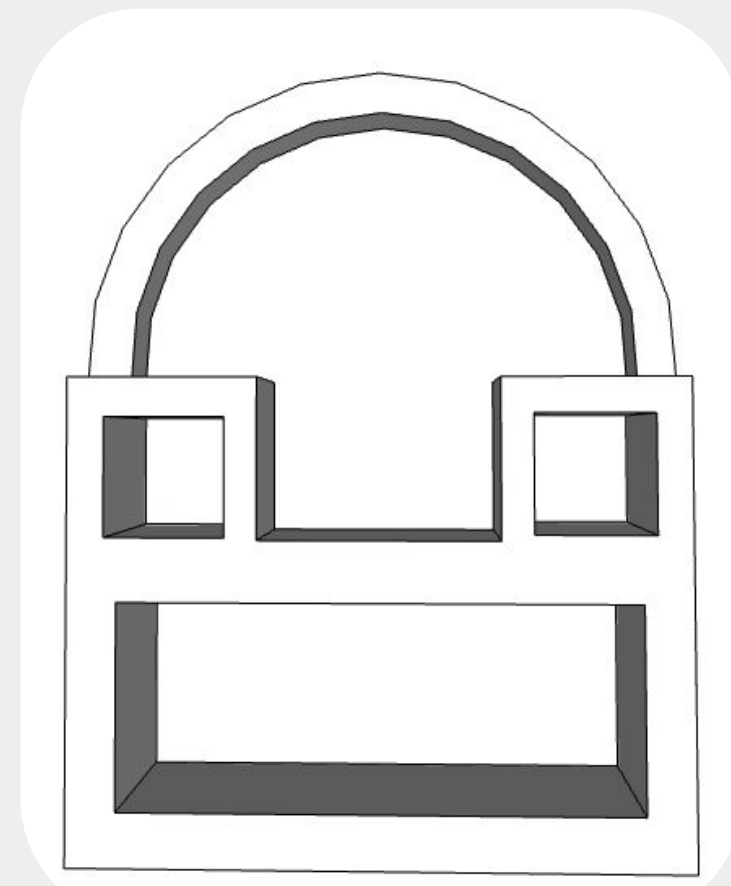
Overall, I do like the final CAD Model that I made, and I definitely think that I am able to expand upon this design when starting to create my iterations

Client Response

I do like these designs, However they are still bulky, this needs to be reduced for it to be simplistic and minimalist

Disadvant ages

The main disadvantage is that it is still bulky, that is one change that I need to make



Intro 3

With this model I had a massive change/ adaptation compared to the previous. I completely changed the base and completely changed the lighting source placement, however I still maintained aspects from the previous models and idea



Specification Introduction:			
Specification Point		Justification	Test
			Priority
1.0 Primary Function - The product MUST be able to provide mood lighting to my client - The Product COULD provide LED lighting		Regarding the first point, the product must provide mood lighting,, this is because based of client interview and surveys they stated they would prefer a lighting source that provided mood lighting to give a “ Warm and cozy “ aesthetic for my client. This is an essential for my client hence the MUST . Regarding the second point the lighting source could provide LED lighting for my client. This is because based of client interviews my client stated that this was not a need for them however they would not mind having the RGB function.	To test for the mood lighting, I am able to carry out surveys, asking clients their opinions on it, and in addition test for myself by using my eyes to see if the lighting is harsh.
2.0 Second Primary Function - The product MUST provide storage for my clients essential items - Can Possible constain a bookcase		For my secondary function I asked my client what they would like, they stated that they would like for the secondary function to be a storage unit, so that the product is able to contain essential items like my clients glasses, pens and books, for this I can possible create storage spaces on the product. Some sort of storage unit that my clients is easily and effectively utilize in their day to day like when they are reading or just relaxing	To test this, I can simply get my clients essential items, and try to fit then or place them on dedicated areas of the product, if everything is not stored then I have failed this specification point
3.0 User Interaction - The product COULD have an instruction manual to aid the client - The product SHOULD be simple for any clients 7+		For a simple user interaction I could give the addition of a instruction manual that comes with the product. This is so that when a new client opens the product they are able to quickly understand how to use the many features of the product most optimally, for example how to operate the lighting system in addition to understanding how to use the storage compartments most effectively. The product Should be simple enough for clients over 7 Years of age, this is because the product is intended for family usage, evident as my client is a mother of 4, so I intend for children to be able to use and interact with the product so that an elder or a parent is not require to help and turn on the light	I can carry out focus groups, and asses people using the manual with the product, and after test them to see if they understand how the product works, carry this out then with the data understand if the manual works well or not. In addition carry out surveys to see of 7+ are able to use the product
4.0 Size/ Weight - The product MUST fit into a space of 950mm/2000mm/500mm - The product MUST not be heavier than 18KG		The product MUST fit within the space of 950mm/2000mm and 500mm, this is because this was the space that was sectioned off for my product within my clients room, and therefore if it does not fit within this space then my product would not be used. In addition based of client work the product should not be heavier that 18KG. This is because this is the maximum load my client said they are able to lift and move with ease, and they said they may need to move the product, in case they are intending to reorganize their room	For this test, I simple can measure the dimensions of the product, and if it fits within the given constraints when the product passes. In addition I can test the weight of it on a weighing scale to see if it fits in the 18KG constraint
5.0 Aesthetics - The product MUST take inspiration from the Scandinavian interior design style (Must be simplistic) - The product MUST fit into my clients room flawlessly - The product MUST display attractive grain - The product COULD portray a seamless design		The product MUST take inspiration from the Scandi Innterior design style. Thjis is because that style is what fits my clients room the most optimally in addition to being the style that my client favours the most meaning its the one they would most prefer in their intended room. In addition the product must fit seamlessly, this is partially related to the previous point but my client stated tha the product must fit and blend in into their room and they do not intend for the produict to stand out within their room. In addition the product must display the attractive grain of the intended manufactuuer board, this is because that is the aesthetic my client likes the most and it is the aesthetic that fits their room the best. And finally the product could display a seamless design. This means that the product could portray a curvy or aesthetic design with no sharp edges that would be the most artistic and aesthetically pleasing	To test for if it fits the Scandinavian Style, I can consult experts in interior design, and ask them to express if it fits the interior style or not. For the second point I can place it in my clients dedicated space, and ask my client and other potential clients if it fits well or not within the space.
6.0 Cost - The product MUST cost less or up to 40 British Pounds		Based of client surveys they said that the product MUST not go over the maximum price of 40 pounds. This is because this is what the customer deams the fairest price and one that matches the closest value to the product	To test for this I am able to simply carry out a survey, asking what clients would place the price of the product at
7.0 Safety - The product COULD have rounded edges - The product COULD not contain any loose wires or potential electrical/ tripping hazards		The product Could have rounded edges. This is because rounded edges mean that the product would reduce the chance of cutting or harming my client as it is softer on the skin and less harmful. In addition the product COULD not contain any loose wires or tripping hazards this is because if the product had loose wires they pose as a tripping hazard and could trip my client inguring them in addition to possible electrocution my client as well is water or any sort of liquid of poured onto them	To test for rounded edges, I can use my eyes and hands, to see for rounded edges, and run my hand along the edge to see if it is rounded or still too shrap so that someone could hurt or cut themselves on it. In addition I cause simply look to see if the product had any tripping hazards or not
8.0 Materials - The product MUST use materials available within the QEGS DT Department - The product COULD use Manufacturer timber or HiPS/ acrylic plastic		Regarding the first point the available material must be readily available within the QEGS Dt department. This is because that is where I am going to carry out the majority of my manufacturing and am going to be obtaining my resources from when in production. Regarding the 2nd point the product COULD use manufactured timber, HIPS or Acrillic plastic. This is because these are the main materials that I am able to work with within the DT Deparement so I must create a product around these materials	N/A

Specification

Specification Introduction:

This specification is designed to bullet point the main objectives of this project, it is so I am able to refer back to it when designing further on and in addition prevent me from losing the objective of this project, in addition to easily providing a place to refer to when wanting to understand my clients needs and wants

Specification Point	Justification	Test	Priority
9.0 Sustainability - The product MUST use sustainable sources materials - The product SHOULD maintain low levels of waste product when in production	The product MUST use sustainable sourced material, the reason for this is so that the product is made fully out of sustainably sourced materials, that does not harm or damage the environment. In addition regarding the second point the product SHOULD maintain low levels of waste when in production. This is because if the product where to use high levels of waste when in production then these wasted materials would end up in landfills that would negatively impact the environment	To test for sustainability, I can simple look at the suppliers of the timber within the DT Department, and see and analyse if they source the timber sustainable or not, like if they replant the trees, carbon offset, or not.	
10.0 Ergonomics - The product MUST fit Anthropometric Data - The product MUST be inclusive	The product MUST fit anthropometric Data, this is for items that would fit onto the product like switches and handles, I need to use anthropometric data in order to ensure that the product fits the client. In addition the product must be inclusive. This is because the product must	For this, I can use focus groups, allow them to use the product, and then ask them if it was difficult or uncomfortable to use any functions for the product and if it fit them or not	
11.0 Manufacturing - The product MUST use processes available within the QEGS DT Department - The product COULD be manufactured on the scale of mass production	The first point is very important, this is because any manufacturing process that I use must be available within the DT Department, as this is the main area and the workshop that I am going to be working in. In addition this product is a one off prototype for my client, however this product could be made in a way that allows for it to be produced on a scale of mass production	N/A	
12.0 Durability - The product MUST withstand Coffee or water stains - The product MUST last have a product life for longer than 5 Years	The product must withstand coffee or water stains, this is because the potential ledge the product would have would have to accommodate for holding beverages, when my client is sat next to it. I can possible use different finishes like varnishes that could prevent it from damaging to the spill	I can carry out tests on different pieces of timber with different varnishes, to see how they respond to beverage spillages, and see how well they respond.	
13.0Ethics - The product MUST not display or offend any groups or minorities	The product MUST not display any offensive messages, this is because this is designed to be an inclusive product, and not a politically motivated one, so it should fit all people no matter what background or religion, therefore it must not offend them	Carry out surveys, asking a diverse group of people and see if anything on the product is offensive to them or their race, color, creed or gender	

Iteration 1

Iteration Introduction:

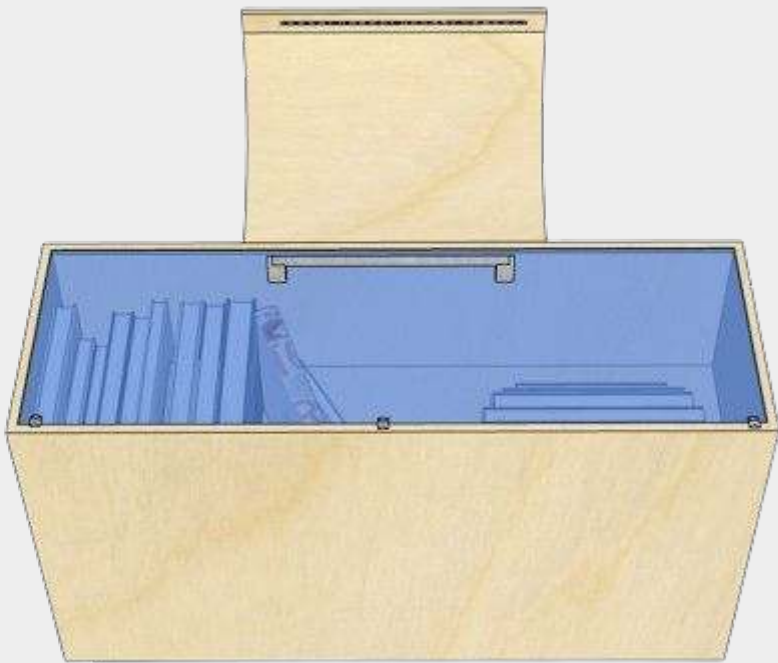
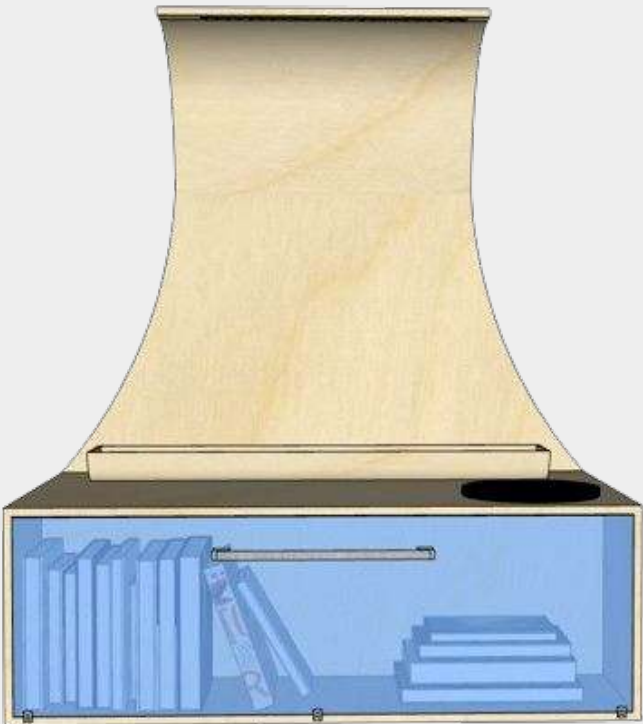
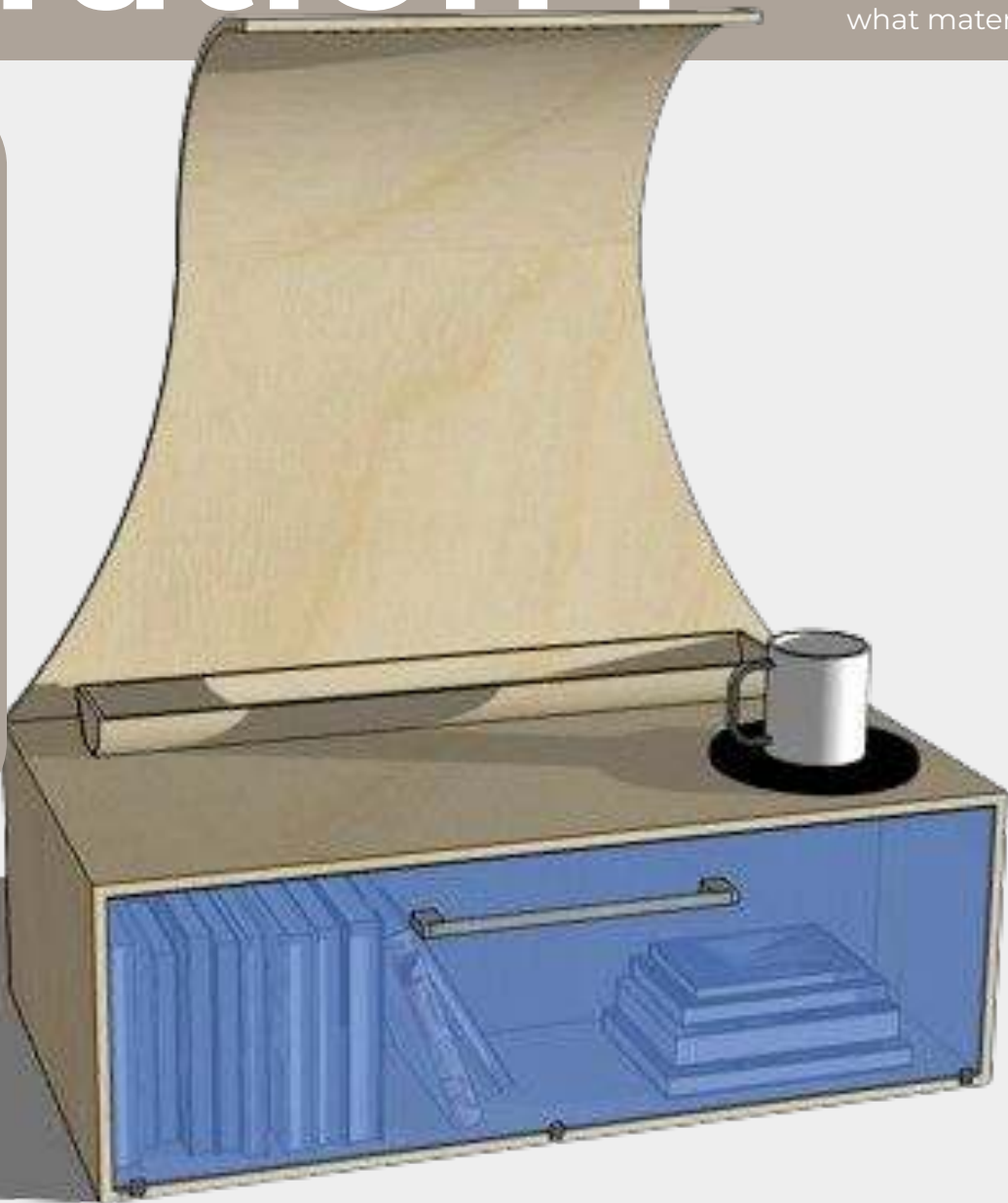
With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

Evaluation

Overall I am happy with this initial design that I made. It is a good starting point with aspects that I really like, however the sizing isnt perfect and it looks more like a table than a light, something to change

Client Response

I like the starting point, but as you said it looks more like a table right now than alighting unit, which does need changing



Advantages

The first advantage of this iteration is the acrylic door, this helps to protect the books stored within in addition to allowing my client to be able to view the books inside easily and seamlessly. In the laminated arched back piece is very aesthetically pleasing and really brings out the interior design aspect of the product. In addition the wide array of storage available on the product, there is a book shelf, mug holder and a cupped holder for smaller more miscellaneous items. When modelling I am going to 3d Print the coaster and understand if it works well or not, and then can be improved and iterated after. In addition the integration of the LED means that we are able to use its capabilities of RGB and also for providing moodlighting to the clients room

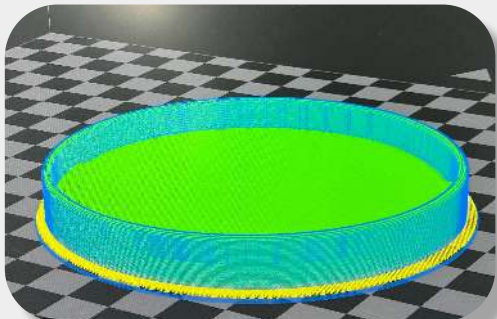
Disadvantages

There are many disadvantages to this product. Firstly the design is very boxy, it does not fully fulfill the specification point of needing to have curved edges, instead having sharp edges to it. In addition the LED light would not provide mood lighting as there is no frosted acrylic in front of it dispersing the light and reducing the harshness of the product. In addition the base of the product is too wide, and does not fit within the constraints of the specification. The width of the base will need to be reduced and in addition the laminated curved back piece may not be able to hand on itself, the counter oi mass of the curved back piece will result in the piece struggling to sand on its own without and support, this will need to be changed asap. In addition I may completely change the back piece in the future iterations so that it is frosted acrylic, which would then provide adequate moodlighting to my client and their room. In addition the layout of the countertop could be changed. This is so that it can store more items/ be more efficient

General Description

Regarding this initial design I tried to create a solid base to expand upon. I integrated a lot of aspects that My client wanted, for example the curved/ laminated lighting source, that also uses an LED strip. In addition this is a lot of storage on the product and a place to store books. I created this with the intention of then expanding upon this in the later iterations. There are many problems with this product and therefore it does not fully fit the specification however over the remaining 4 iterations I am able to make drastic changes to it until I reach a final and complete project design that is ready for manufacturing

Coaster Modelling



Spec check

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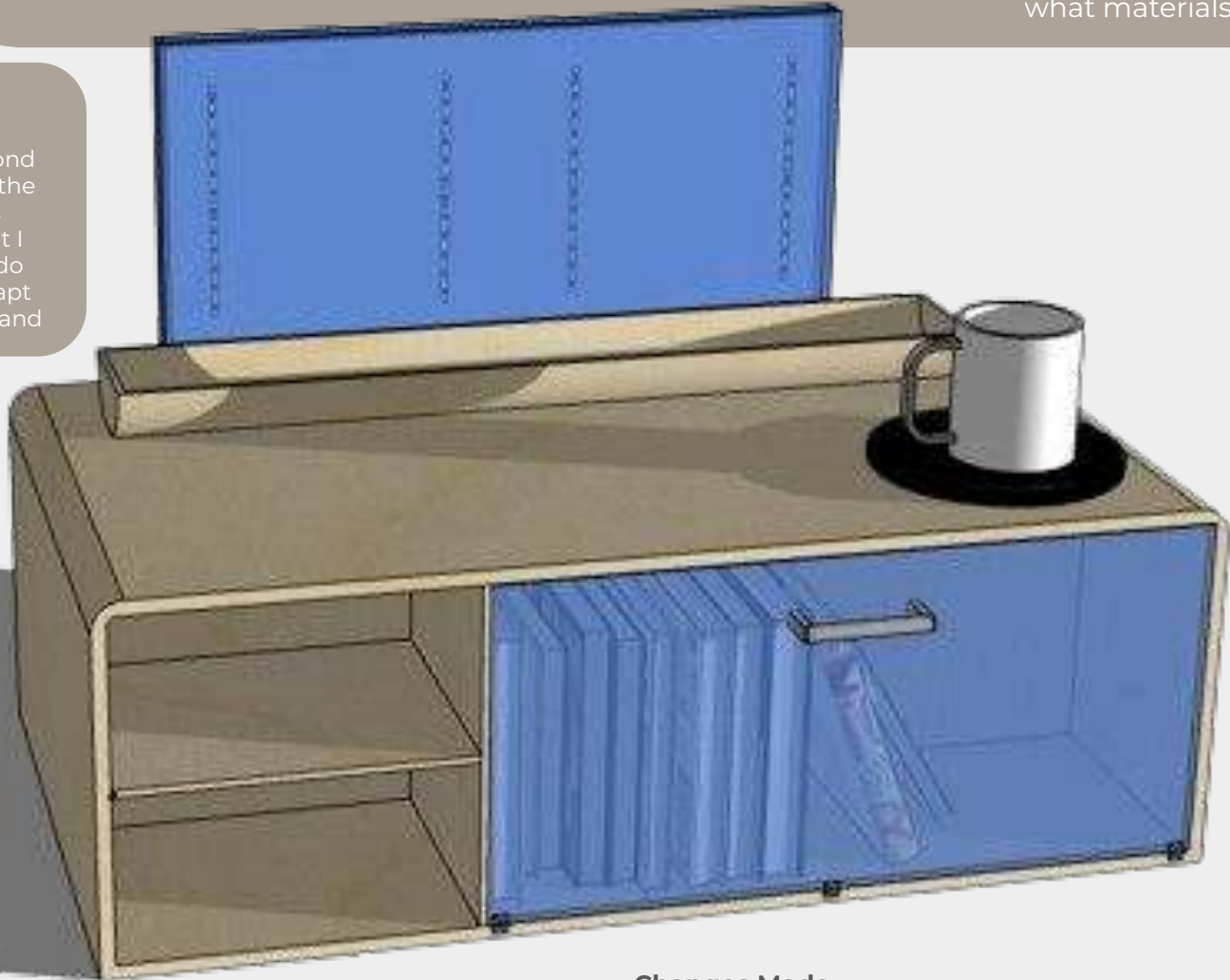
Iteration 2

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

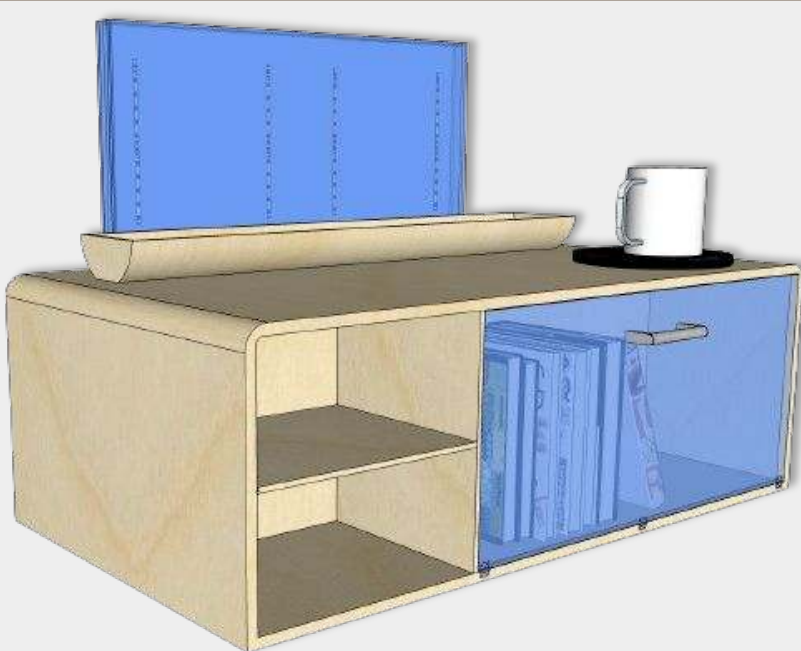
Client Response

Overall this second design is good, the back piece is something that I really like and do want you to adapt apon, changing and innovating



Changes Made

For this iteration. I made a few but needed changes. Firstly for safety I rounded the sharp edges that were left behind. In addition I also changed the layout of the storage on the base by shortening the length of the book storage compartment and then adding 2 extra cubby holes for things like decorative items. And the biggest change that I made was the back piece, for this iteration I scrapped the laminated back piece and instead I decided to change it with a frosted acrylic back that would provide mood lighting. And also that the LED Lights are actually inside of the piece. In addition A minor change that I also made was the handle, making it shorter so that it is more proportional compared to the rest of the product



Advantages

There are many advantages to this piece. Firstly there is extra storage space 4 for smaller items, for example things like glasses pens and also pencils, this is also the sort of design she wanted, a sort of storage unit design. In addition the rounded edges on the base enhances the safety of the product meaning that now the safety of the product is at a higher quality. The backpiece is also very aesthetically pleasing, and the new design ensures that mood lighting is provided, Before possible harsh lighting could be viewed at certain angles however now this is no longer the case with this product. In addition the manufacturing of this back piece will be simpler as well, The laminated back piece would have been difficult to conduct on a large scale so instead this frosted pieces simple can use processes like laser cutting to achieve it

Disadvantages

Firstly one of the main disadvantages with this product are that it still does not look much like a lighting source. The base is too wide, and as a result gives the impression of it mainly being a storage unit or compartment. Improvements that are required are I need to reduce the length of the base, and In addition I need to reconsider the layout on top of the base. This has remained the same over the iterations and so therefore in the next iterations I look to change and improve this aspect of the product. Finally I need to reconsider the back piece. The BOX aesthetic I feel does not work well and needs to be changed

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Opinions on this design

1 response

I do like this design, aspects I like from it are the storage spaces on it, like the book compartment, and the cubbies for storing items. In addition the rounded edges I also like and means the safety aspect of the specification is fulfilled. Finally I also really like the back piece idea for the lighting, however I don't like the aesthetic of the design, and how it is a long sort of "Table" design

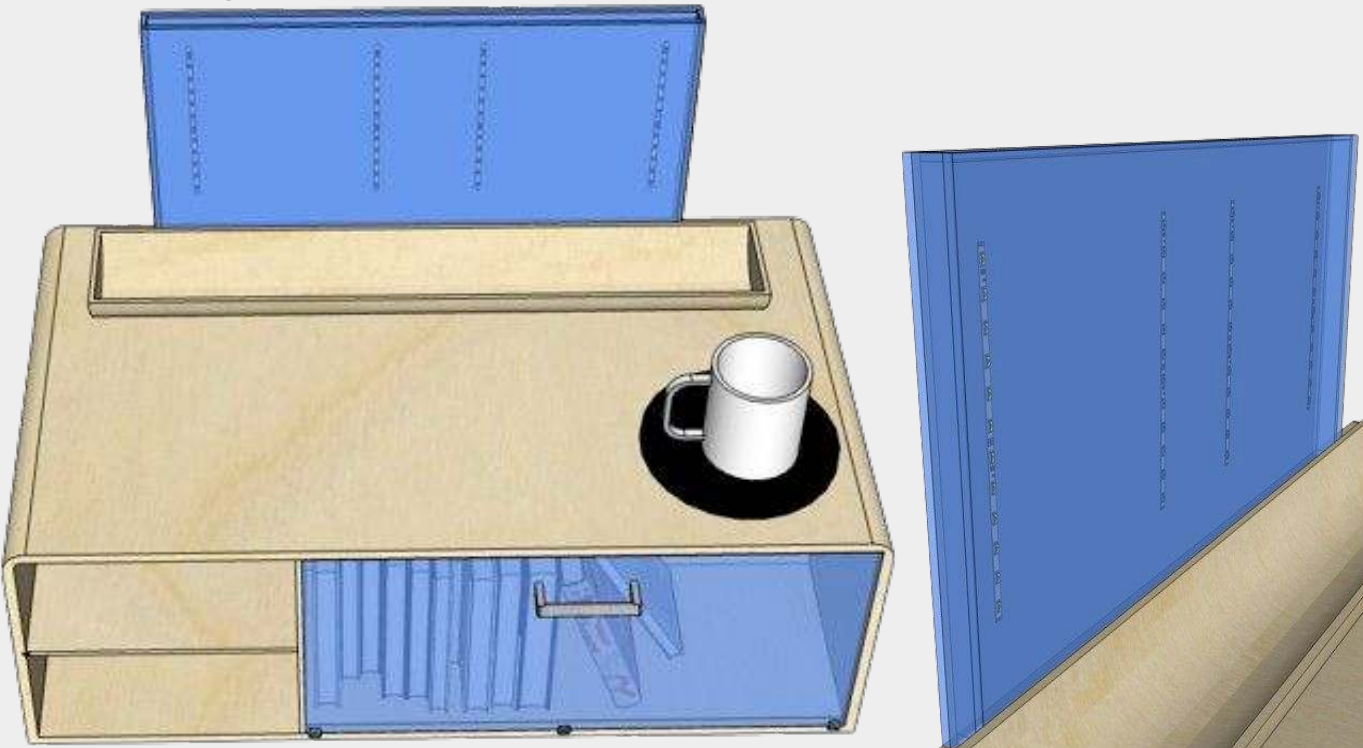
Changes that you would make to this iteration

1 response

I would firstly, decrease the length of the product and increase the hight, this would ensure it fits within the specifications area and also it ensure it doesn't look like a table but more like a storage unit and light, more aesthetically pleasing that way. In addition I would Improve upon the door of the book case as it might get in the way when I need something from that compartment, and finally I would improve the back piece idea, making it thinner and more compact

Client Interview

For this slide I conducted a client interview. I asked her what she liked about the product, and what she also disliked about the product, She like the storage and lighting aspects of the product, but heavily criticised the look and shape of the design saying it looked a lot like a table instead of like a light/ storage unit.. She heavily suggested that I decrease the length of the product and instead brought up the height of the product ensuring it has a lot of storage space and also fit within the required space. In addition she suggested that I improve the design of the door as it might get in the way for my client and also improve upon the back piece design, making it less thick and more compact



Iteration 2 Modelling

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT Workshop

General Description and process

For this slide, I intended to understand and carry out a manufacturing process. And this process is Lamination.

For this my main aim was to model and show the curved edges of my product, and the best process to achieve this curved design is Lamination. I had to create a model, initially I had to create a model. I intended to use Styrofoam, instead I switched to using a MDF made mould as this would result in a more structurally stable mould when conducting the lamination process. Initially when I did use a styrofoam mould or Jig it broke under the stress from the Flexi Ply pushing back during lamination, so I had to reconsider and then I switched to using a MDF Mould. To create the mould I had to create a block of multiple pieces of MDF attached together, once dry I marked out the curve I intended to make the product and then cut it out using the table saw. This resulted in 2 pieces.

The bottom piece I had to trim down to create space for the 8mm product to sit in. Next I gathered 3 Pieces of Flexi Ply that where similar lengths and widths. With these I used PVA glue to attach them together and then I placed in the mould to let curate and dry. After this I cut the excess of the end and used the belt sander to smoothen the 2 sides and remove any other sort of blemishes



Evaluation

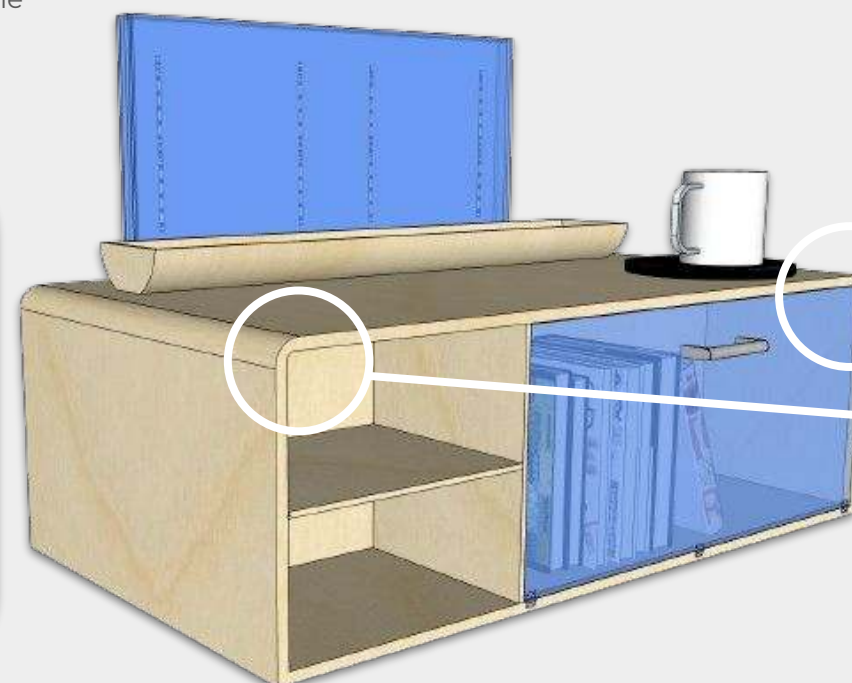
This is a key process I am looking to implement within my project, however it does have its setbacks, firstly my product is on a much larger scale, and possibly doing this will not be beneficial in the long run for a prototype, and it will require a lot of material to on the actual product. I can possibly think of using other process on the prototype such as living hinges instead. This would allow for me to now waste as much material. Therefore my next step in designing is to consider living hinges on the product which might work quite well

Advantages

There are main advantages to this process. Firstly it is highly repeatable once the mould/ jig is created. In addition this process does create then intende curve shape as desired while not compromising on the strength of the timber. From testing this piece was able to withstand high levels of stress without bending, dish forming or breaking which as a result means that It would not break under pressure on the full scale model. In addition with this process it does not require a large amount of labor. As majority of this process is spent curating and drying which is easy to be scheduled to be done overnight so that when I am able to return to the workshop I am easily able to take it out the mold and use

Disadvantages

The main disadvantage of this process is that I does not always work out perfectly. In this case during curation / drying the right side was at the perfect angle coming out at 90 degrees however the other side did not , resulting in an uneven piece that does not look aesthetically pleasing to the eye, this is one of the biggest disadvantage of this process that I feel really needs to be taken into consideration. In addition it is quite difficult to actually place the pieces of flexi ply into the mould as it easily slips apart so during drying not all of the pieces sit perfectly together, as a result meaning after the product has dried a lot of time is needed to perfect the product, things like sanding and cutting the edges



These are the areas in the product that are intended to be manufactur ed using the lamination process



Iteration 3

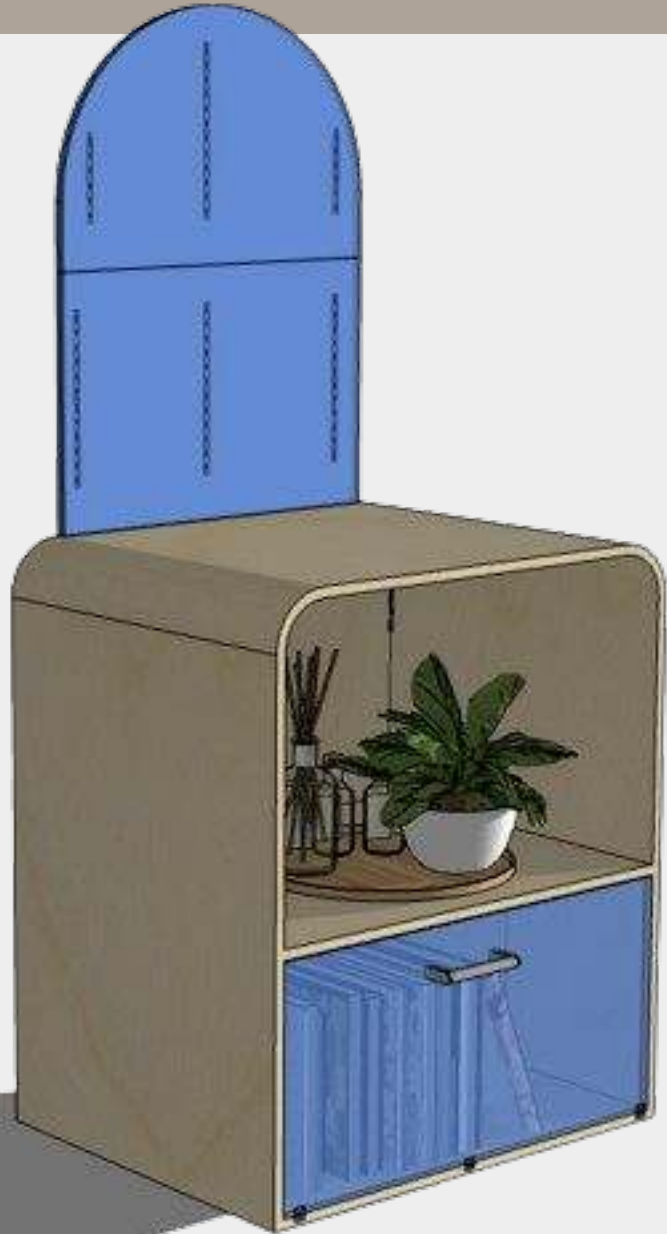
Iteration Introduction:
With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT Workshop

Evaluation

Now I do really like this iteration, the changes made are perfect and I feel confident that I am coming closer and closer to a final product that I can start manufacturing

Client Response

I do really like this prototype. The back piece is also a design that I do really like and think that you could adapt and change to the final prototype. My only concern is how will the back piece stay up and not fall over?



Advantages

The main disadvantages with this iteration are a few things. Firstly the structural stability of the back piece, this back piece stands high and tall without any support as a result posing the threat of falling over at any moment. In addition the actual back piece on further testing did not provide the sort of mood lighting that I aimed to achieve and the result is shown below, this as a result means that I need to change and improve upon it in the coming iterations as I near closer and closer to the final product design

Changes

This iteration was a drastic change from the previous design, I changed many aspects of the design in this iteration. Firstly I reduced the length of the base, in addition I removed the 2 Cubbies on the previous design and I instead extended the height of the base so that there is another section for more storage. In addition I completely changed the design of the back piece once again so that now it consists of 3 pieces of acrylic that are attached together with a dedicated space in the middle for the LED strip to pass through. In addition for moodlighting within the actual base of the product I decided to attach a strip of LED so that moodlighting will also be present within the actual base. For visual purposes I decided to attach a decorative piece my client suggested into the cad design so that we are better able to visualise what the actual product would look like in use.

Advantages

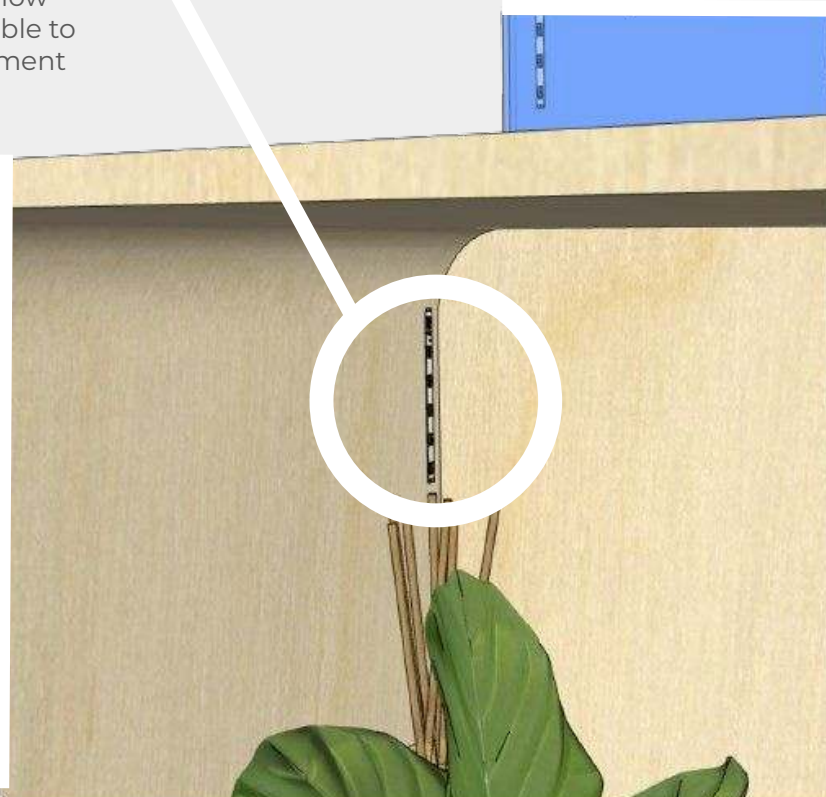
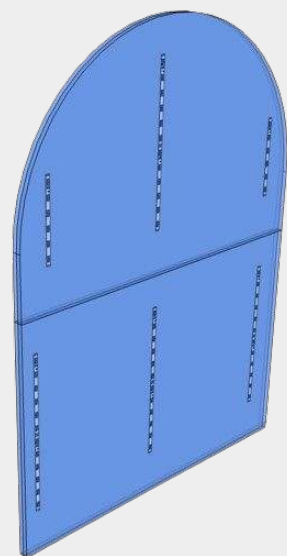
There are many advantages to this new design. Firstly with this design the product looks much more aesthetically pleasing to my client, In addition this products back piece has had a massive improvement which I talk about in the case study underneath as well but the back piece now is less bulky, and much more slim and clean, with the arch as well displays the sort of curvy aesthetic I aim to achieve and acquire. In addition with the smaller changes the LED strip within the base I feel simply elevated to product. In low lighting conditions It ensures my client is able to easily and quickly see within the compartment and see what is inside



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Drawing showing the back piece and how it works



Iteration 3 Scale Modelling

Introduction

For this slide and iteration, I decided to test the ergonomics and anthropometric data of the base on this iteration. Main things that I intended to test out where, the base and if it would fit in the designated area, the size of the book compartment and to see if the size would be optimal for book, the size of the second compartment, and finally the size of the whole product and if my client was able to reach easily and comfortably to the top of the product with ease. I built a cardboard rough cut out of the base and then took it to my sight for the intended product and then proceeded to test it with my client and gain valuable feedback from her



Advantages

When testing with my client, from the verbal feedback I got from her she stated " the height of the product is perfect, and I feel that it is the perfect height for me to be able place my coffee and other beverages on top ", in addition regarding the other dimensions, the length of the product was perfect, and comfortable fit within the constraints of the sight, in addition the width also fit perfect, and did not protrude unnecessarily from the wall, looking out of place or too wide, in addition not blocking the left side of the sofa, their is still enough space for the people to be able to easily and comfortable sit.

Disadvantages

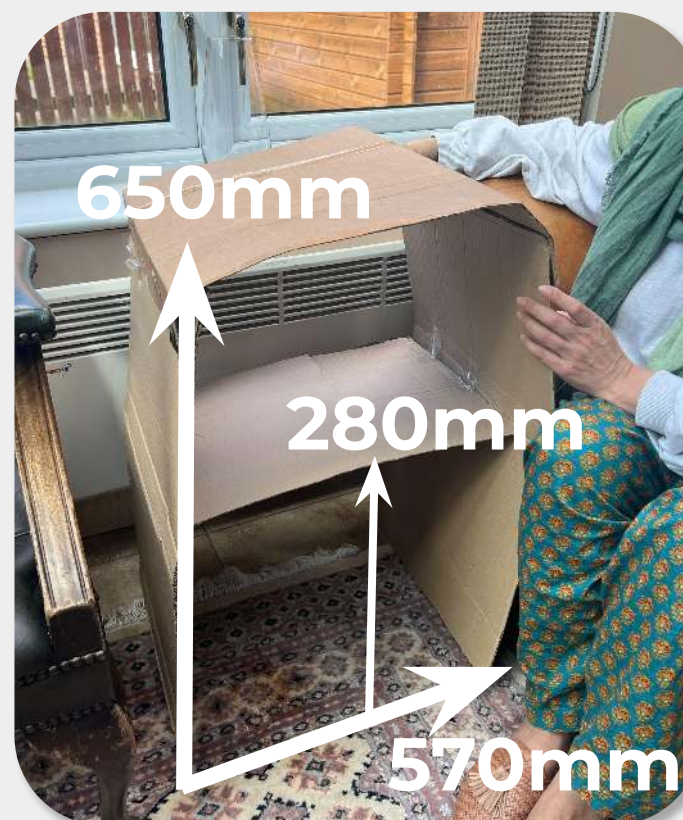
The main disadvantage of the sizing of the product is the height of the top compartment. Firstly my client said it is too large and they would prefer for it to be more condensed, and have more segments/ dividers to help with organisation, and organising items. However my client said this is not a major concern and their it can be fixed in the other iterations. Also the top table needs to have some compartments on it, and dividers that are able to easily organise smaller items

Evaluation

Overall the sizing of the base I feel is perfect, the sizing of the top compartment needs work in addition to the table top

Client Response

"I do really like the base, the sizing is perfect for me personally and the high especially, fits perfect and is easy to reach to and place/ grab items "

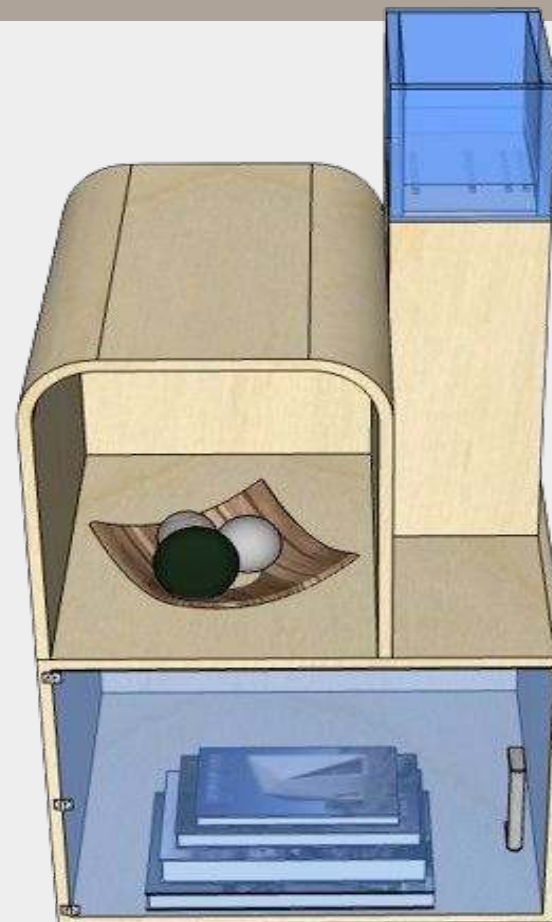
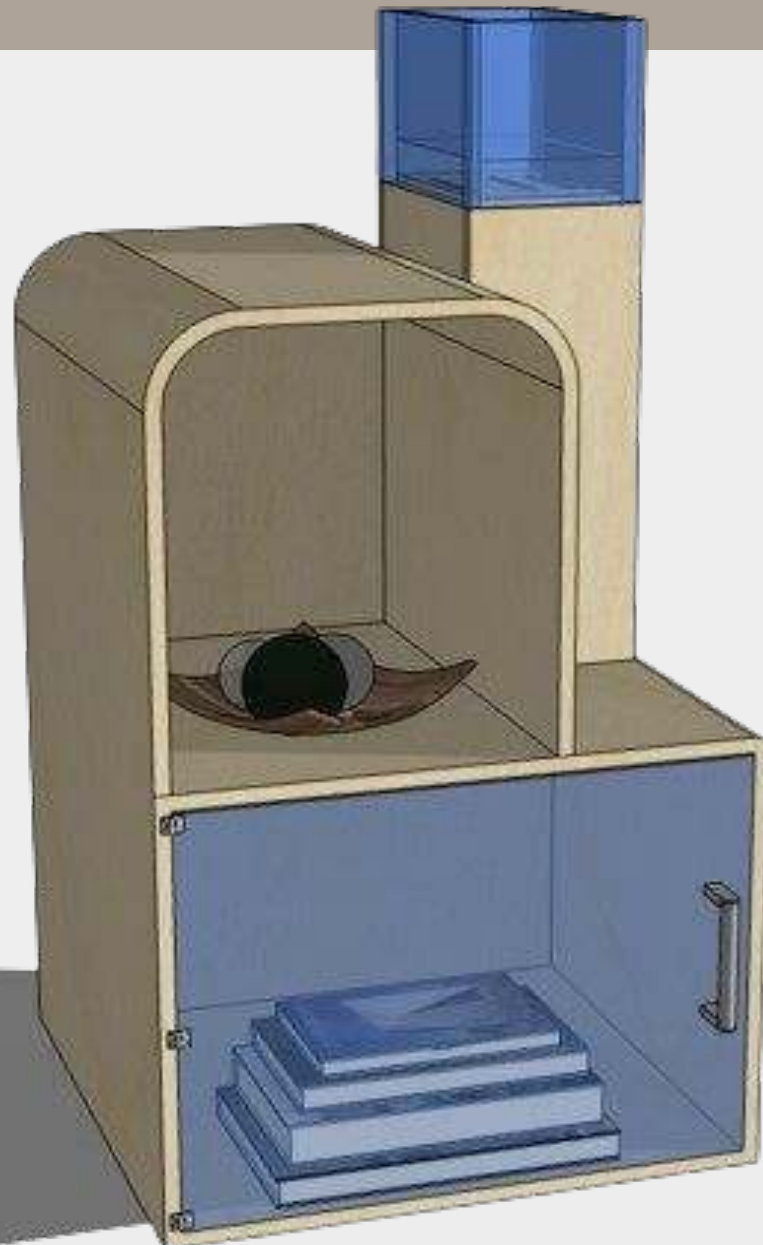


**1:1
Scale
Modelling
(Base)**

Iteration 4

Evaluation

Overall this is a design that I drastically change, this is not what my client like and nor do I, I wanted to change up the design and experiment with it however the result is not how I intended for it to turn out, this is something that I am going to change and use the information given to improve upon



Advantages
The main advantages of this iteration, is the main change to the top compartment, by reducing the size it ensures that there is more room for me to use. In addition altering the design of the lighting unit itself, to this design can be argued to look more aesthetically pleasing for my clients.

Disadvantages
There are many flaws with this design. Firstly the design does not look aesthetically pleasing, and this was made very clear in the client interview. In addition there is reduced room for items inside the top compartment, this means there is less room for my client to be able to store items. In addition with this product the hinges on the side means that the door might get in the way for some people, and it is in a very awkward configuration for my client which they also stated that they do not necessarily like

General Description

For this iteration, I took my client's feedback, mainly regarding the top compartment. I reduced the size of it and then with the remaining space I decided to alter the design of the lighting unit itself. In addition I changed the way the hinges are oriented on the door. Finally I curved the top edges on the top compartment, like the previous iteration, for aesthetic purposes

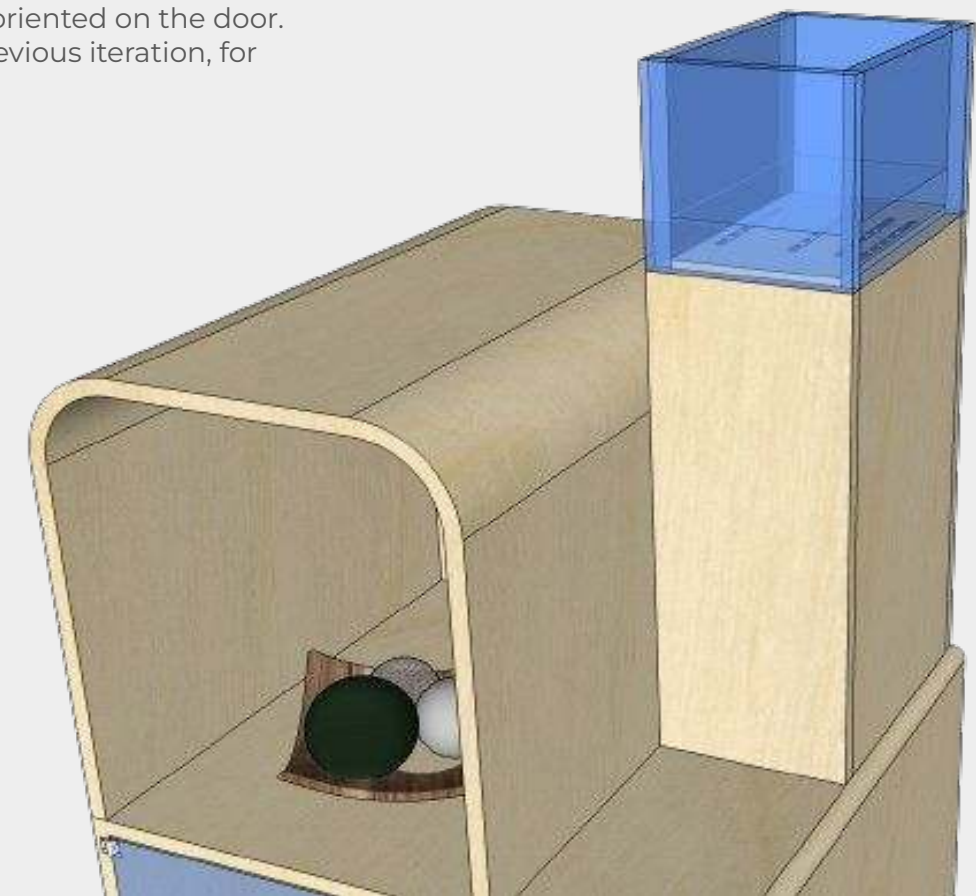
Client Interview Regarding Iteration 4

Opinions on the new design

1 response

Overall, I am massively displeased with this design, the aesthetic of it does not fit my room and the storage space has been reduced from the previous iteration. I feel that you should remove this design and then improve upon the old design and I much prefer the functionality and aesthetic of it compared to this one. Mainly I am dissatisfied with the new design of the lighting source and want you to revert to the older design instead, as they looked and worked much better, functionality and the aesthetic was better compared to this design

For this iteration, I conducted a virtual client interview, overall opinions on this design were very negative, firstly my client stated that they don't like the aesthetic or design of this iteration, and much preferred the previous, therefore my client said she would prefer for me to retake the old iteration and advance from that instead, and leaving this design, she doesn't like the new design of the lighting source and instead much preferred the older one, so therefore I am going to do that for my 5th iteration



Iteration Introduction:

With these iterations, I come close to the end of my design journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT Workshop

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Iteration 4 Modelling

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

General Information

For this slide of modelling, I tried out electroluminescent wire. I modelling a piece of the top compartment, and with this I placed electroluminescent wire inside, I did this in 2 configurations, firstly I placed the wire at the top, and on the back piece, to see how it would look in both places. In addition I tested out other colors of the electroluminescent wires, to see and understand how well each worked. I also tested the wire out to better understand how well it worked in low light level conditions, and to see if it successfully lighted up the contents inside the compartment well or not

Advantages

When testing, there were many advantages and disadvantages with this feature. The main advantages of this feature is that it is able to light up the contents inside the compartment. And at night this would work very well as demonstrated in the top right hand corner picture. In addition another advantage of this wire is that it is readily available in many different colors, in the DT department it was available in the BLUE, PINK and ORANGE color to name a few, if a color is not available that I would want to use, then I am able to order it online. In addition the wire comes stock in long strands so I am able to use one wire for the whole top, instead of needing to use many at once. Finally it is able to be turned on and off with a remote control, which is a feature my client said that they would like



Disadvantages

The main disadvantage of this design is that it is not very bright, so during the day and around sunset it is not very visible to my client, and is only really usable in low lighting conditions. In addition it may be difficult to integrate into the current design, and changes may need to be made to accommodate for this feature to be used.



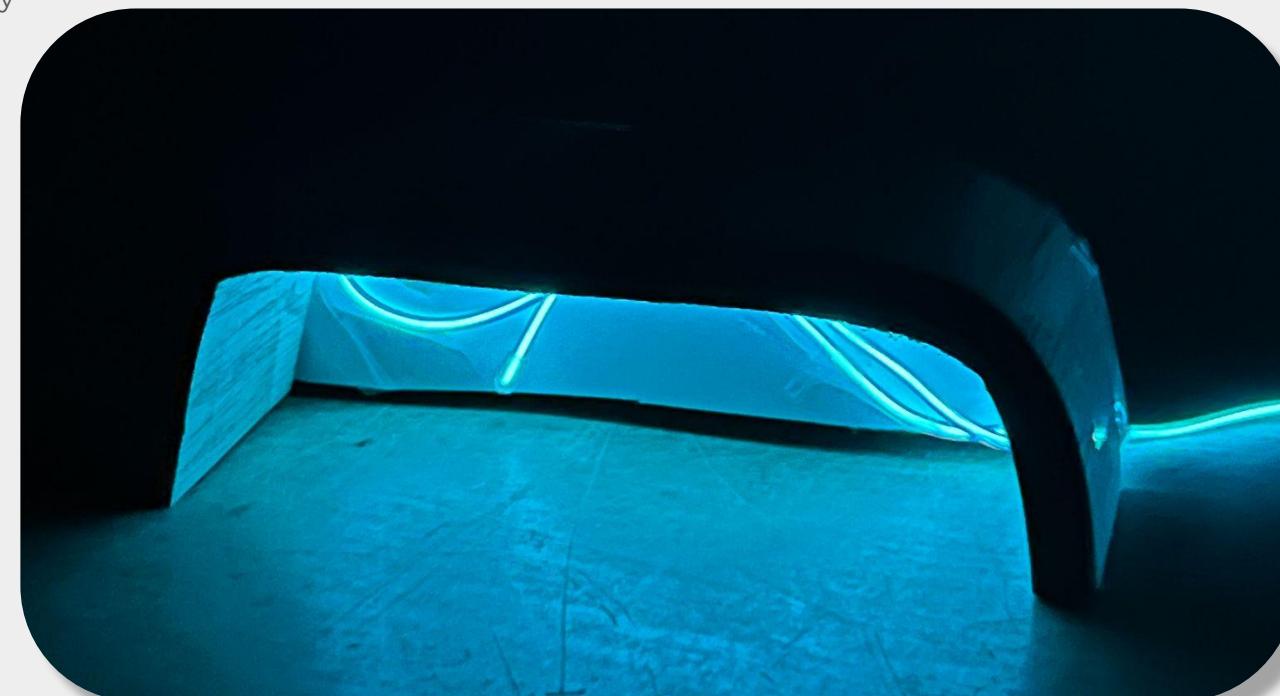
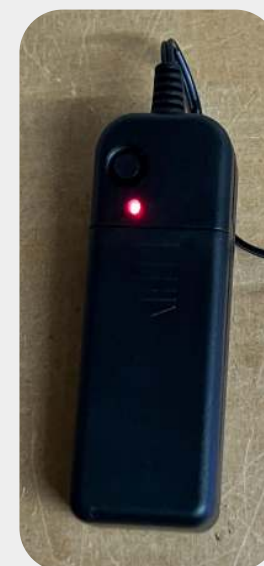
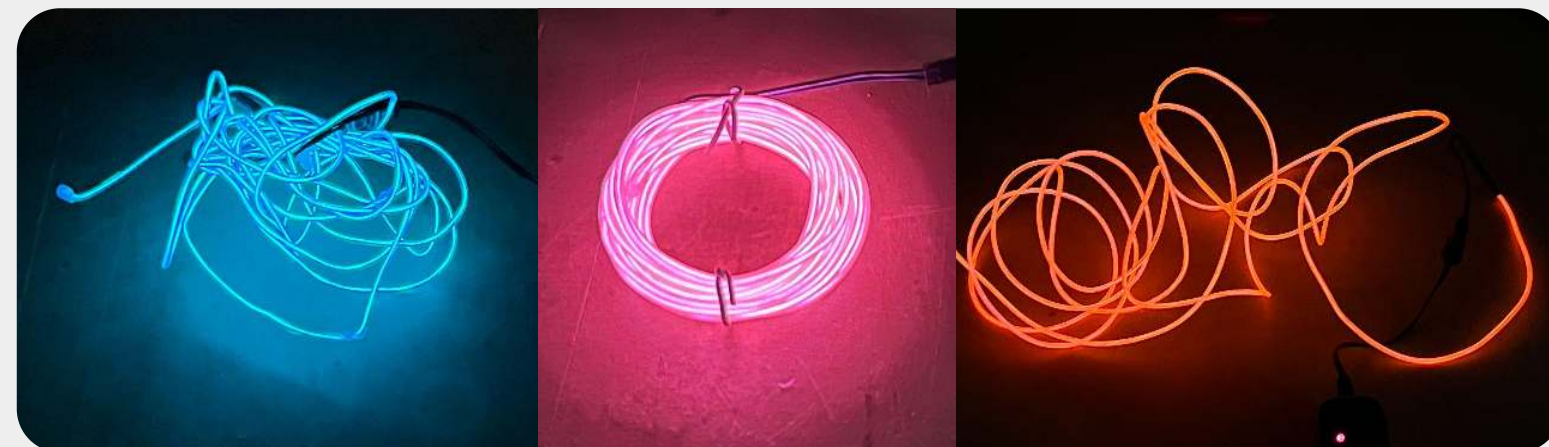
Evaluation

Overall I do like this feature, and I would want to integrate it into the product, as it can help with visibility in low lighting conditions.

Client Response

"I do like this feature, as it elevates the aesthetic of the product, and provides a higher degree of mood lighting with I am reading or just relaxing on the sofa next to it"

Electroluminescent Wire



Iteration 5

Iteration Introduction:

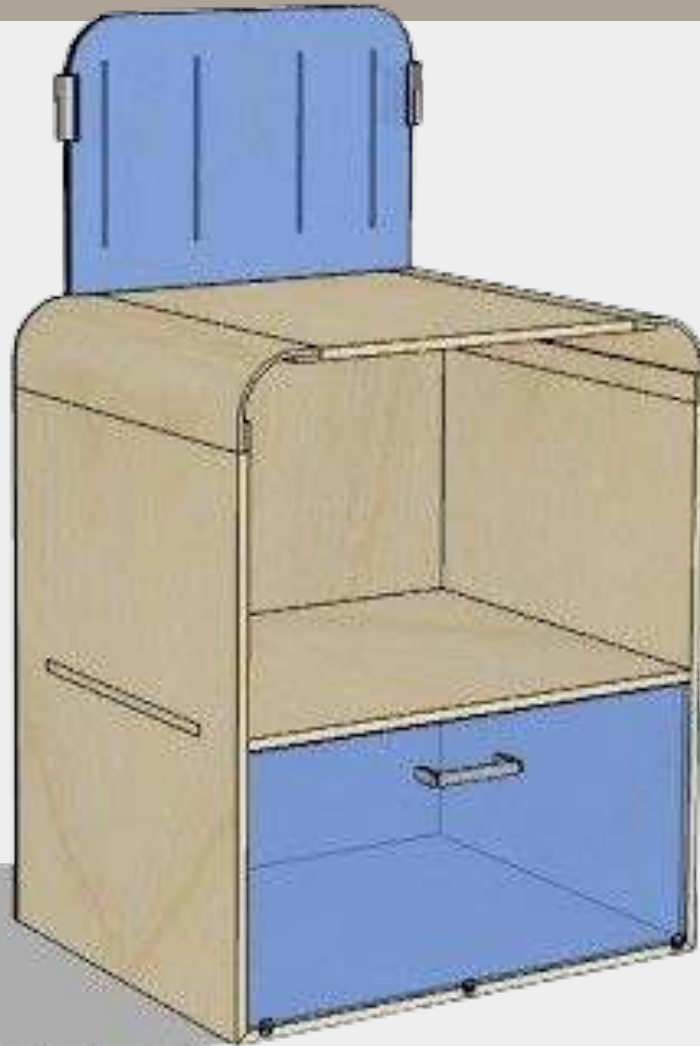
With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT Workshop

Evaluation

Compared to the previous design this is a massive change that was needed. This is perfect and I feel that I can really quickly expand upon this to the final product

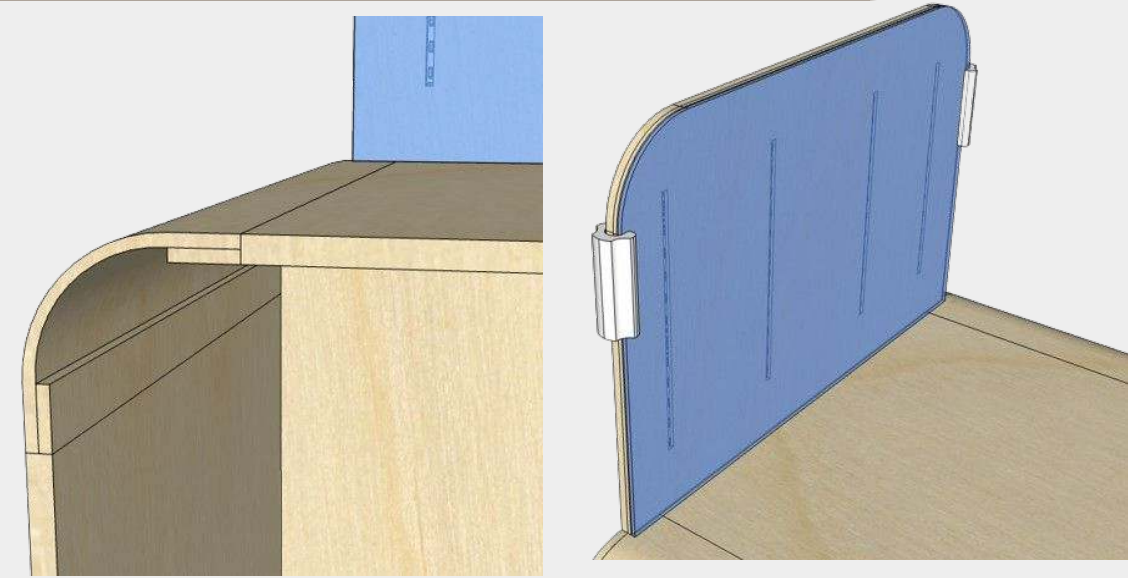
Client Response

This is much much better, and I do really like the living hinge design, this is phenomenal and I feel a really good product coming up



Changes Made

Firstly, I changed the design and then expanded upon that design. Changes I made from that where firstly the back piece has a 3d printed clamp holding the new 3 piece design together. In addition I changed the way that the rounded edges are rounded. In addition I added how the middle piece was going to attach to the side pieces and that is through a simple joint. In addition I changed the orientation of the hinges on the door so they are back to normal as before the previous design. In addition I changed the way that the bottom piece is attached to the side pieces and what I did was make it a miter joint



Advantages of this design

Firstly, the main advantage of this design is that it is much more aesthetically pleasing according to my client. In addition the top compartment had more room for different items for my client to store. In addition I made a drastic change to the back piece, firstly I made it a 3 piece design. One with the main backpiece which also includes the back of the whole product, a middle piece to hold the LED Lighting, and a front acrylic piece for the light to disperse from. The advantage of this design is that the light not only shines from the front instead of dispersing in all directions, sort of direction the light from the LEDs more. In addition the middle piece is now attached to the side pieces through a mortise and tenon joint, this is a simple yet very effective design that I feel would work very well with this design. In addition I changed the design of the floor, and now that is attached to the side pieces through a miter joint. With this design I took Assembly into consideration, as I am coming closer to an end product I want to integrate into the design how I am going to manufacture and assemble the products pieces together

General Description

This is a new method for the curve that I wanted to try out. This uses a type of technique called Living Hinge. With the help of a 3d printer I laser cut a pattern into the plywood, which allows it to have bendable properties.

Advantages

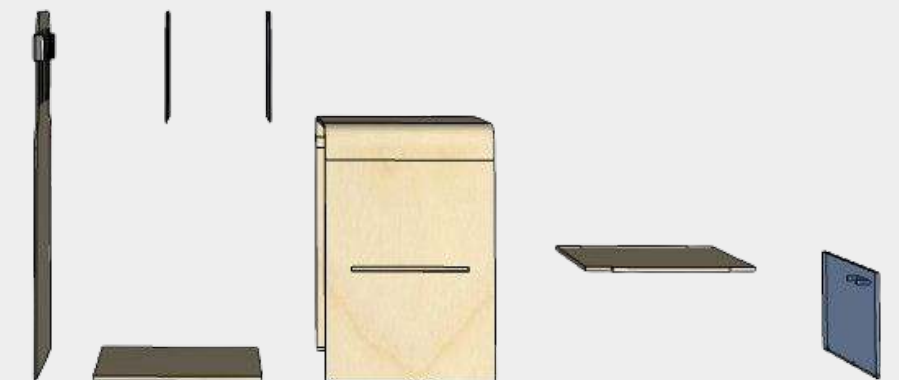
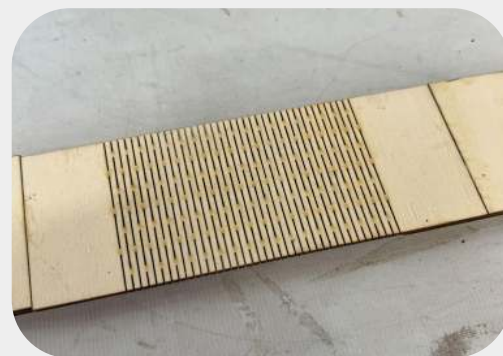
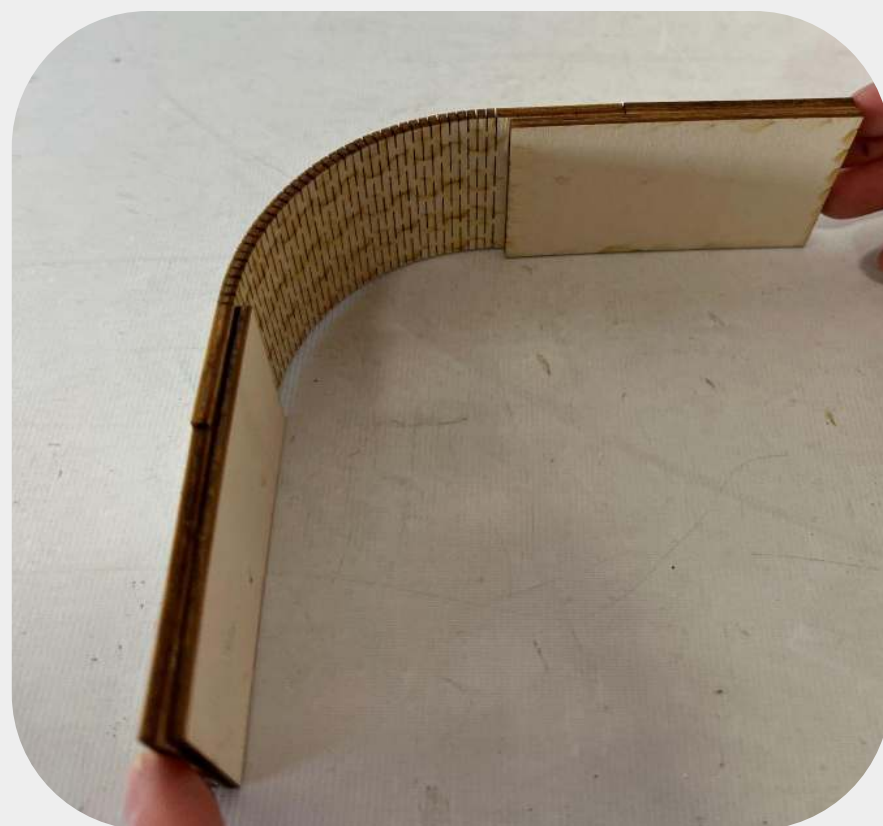
The advantages of this design is that it does not require a lot of material, with the lamination in the previous design I would be required to have a large jig which is not viable on such a large scale, however with this design it is easier and simpler

Disadvantages

It is not aesthetically pleasing. However I am able to adapt this in the next iteration, in addition after enough load it has the risk of snapping in half breaking the hinge

Disadvantages

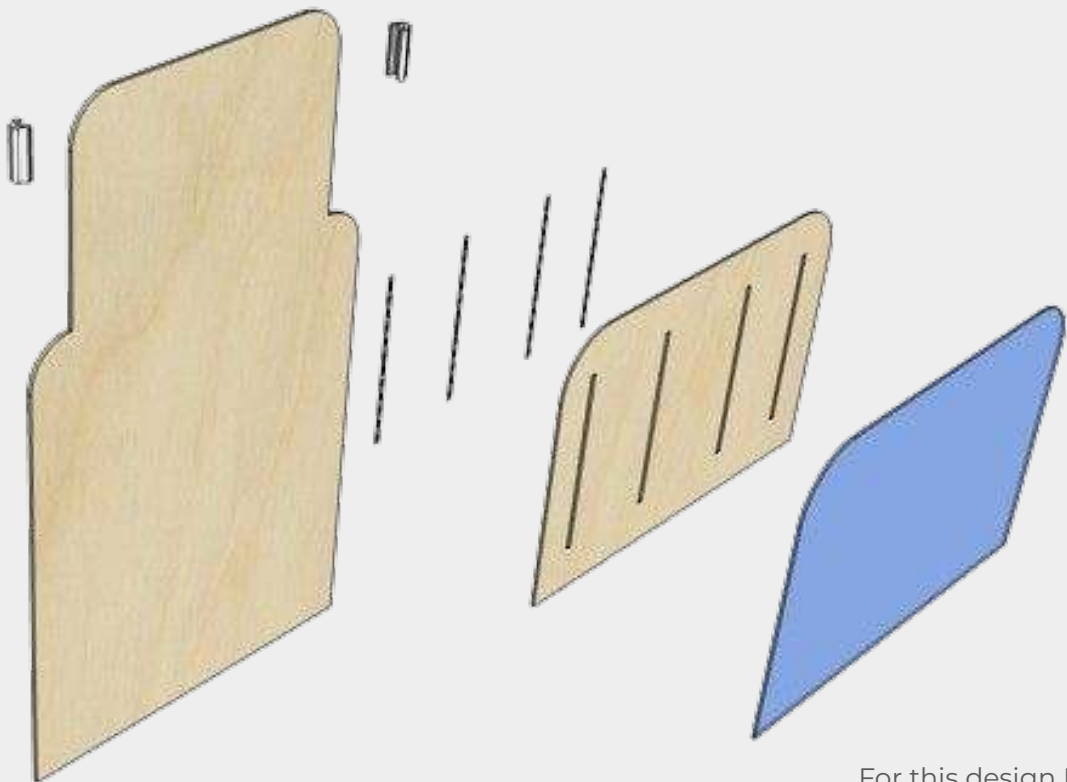
The main disadvantage of this design is that my client still feels like its too boxy, and wants it to have more personality. In addition they feel that the door does need improvement and that it is too basic and doesn't work as well as it could. This is something that I am going to improve upon in the next iteration



Iteration 5

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT Workshop



Back Piece Modelling

Explanation of design

For this design I did not massively change the design from the previous design, however with this design I massively improved it. There are 3 main pieces, the back piece which holds up the pieces as it is the back piece of the whole product. In addition I have another piece which is where the LED is held in, and giving the LED space ensuring that everything attaches together seamlessly, and the front piece which is where the light come out from. These are all held together by 3d printed clips which ensures the front piece does not fall off

On Sight Testing and Compatibility

Once I had made this prototype model of the lighting system, I took it to my clients sight, where the product will eventually be used. I firstly saw how well the LEDS worked, and the provided a very bright light, possibly too bright, not providing mood lighting, I need to take this into consideration when I am purchasing the LED I will use for the final product

In addition another thing that I tested was the power supply, Right next to the intended sight their is a plug socket, and this is perfect as it ensures that their is enough space for me to plug the LED light in.

Advantages / Customisation

There are many advantages with this design, Firstly the front piece is switchable, simply you can take the clips off, replace the front piece with a different color and then attach the clips back on. In addition this design is simple and effective, which my client likes. In addition this feature also allows for maintenance, the LED is able to easily be taken out and replaced in case of a failure or it breaks, meaning my client is able to use this for a long time, ensures that the product is sustainable, and won't stop working.

Disadvantages

The main disadvantage of this design is that the clips do no look aesthetically pleasing. I can possible change this in the next design, possible by replacing it with magnets, so it is simpler and can attach on and off easily. Also the clips need to be improved, theirs not enough tension and they are able to easily fall off from the product

Client Response

I do really like this design, the simplicity of it and how it comes together is perfect, and I feel this is something you need to stick to

Pieces Required For Scale Model

- 2x Plywood
- 2x Clips (3d Printed)
- 1x Acrylic
- 1x Led Strinp



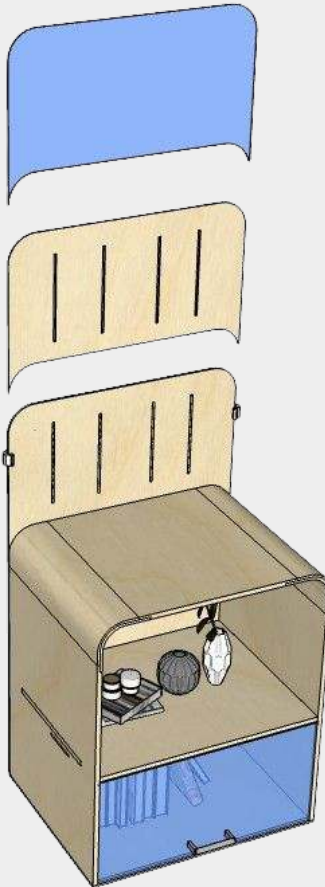
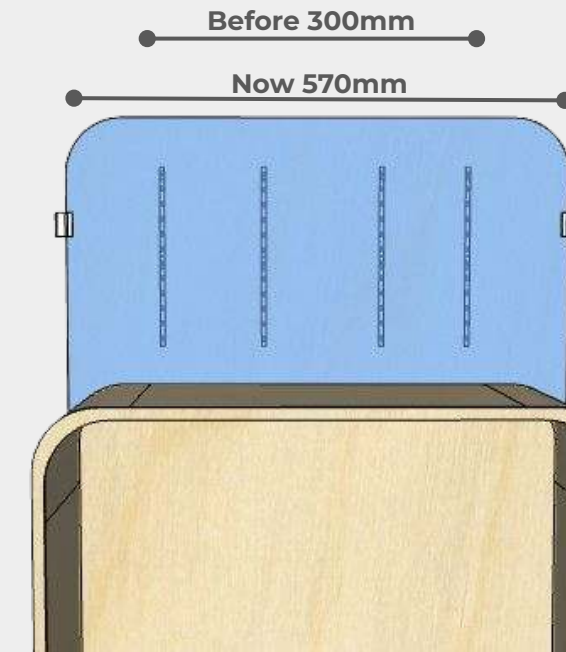
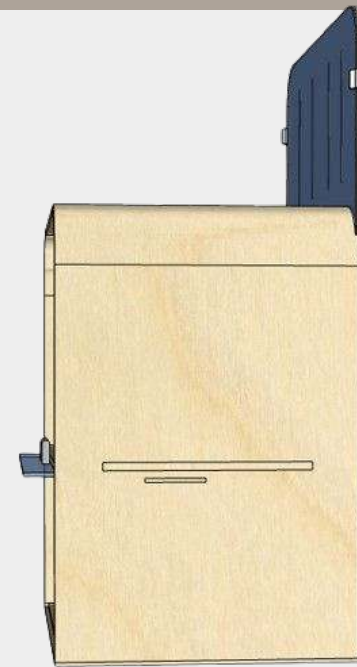
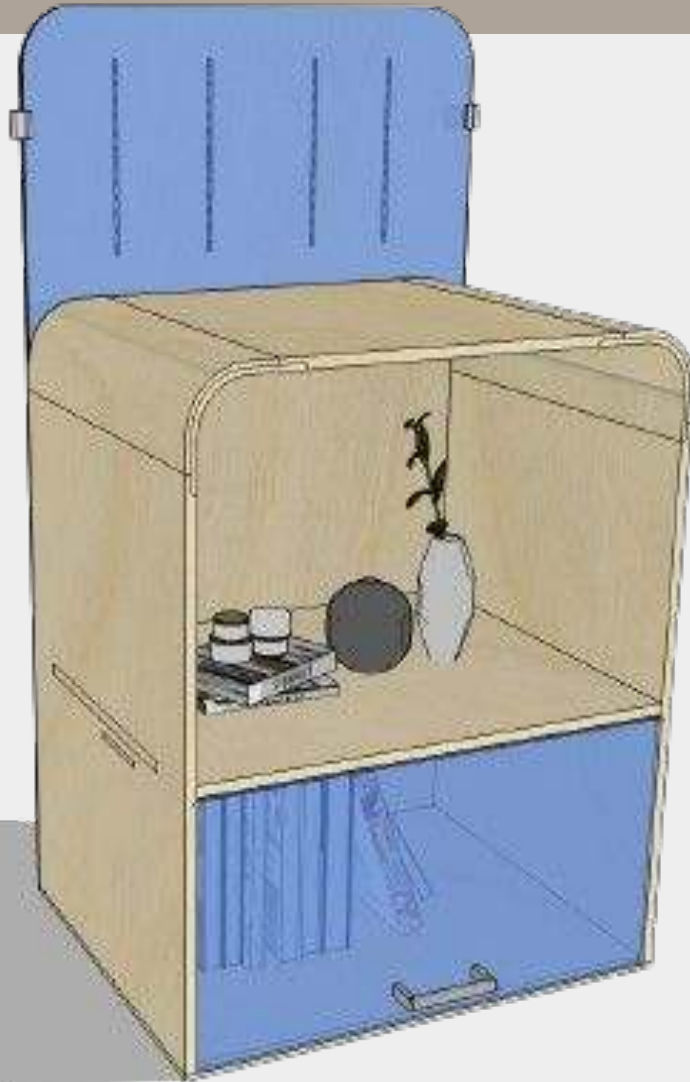
Iteration 6

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

Client Response

Now this is a prototype design that I do really like. The only improvements I would suggest making are to the bottom 2 corners, could you possibly add the living hinges to these corners aswell to increase the aesthetic and form of the overall product???? Something to think about and possibly change



Changes

The first change, and the biggest is the new door mechanism. I go into depth on it with a new model in the next slide. In addition I changed the design of the back piece/lighting pieces. I increased the length so that it is the same length as the main body itself. In addition I made other minor changes for example i changed the design of the corners, by adding another living hinge piece of ply to even and equal out the product, and now it looks much more aesthetically pleasing

Advantages

There are many advantages to this new design, firstly the door works much better, when opened the door retracts not getting in the way of my client, and the mechanism works well without visually impairing the products aesthetics. In addition the new joint and the extension of the lighting system, enhances the aesthetics of the product, which is what I mainly tried to do with this design, improve upon the aesthetics of the product and design

Disadvantages

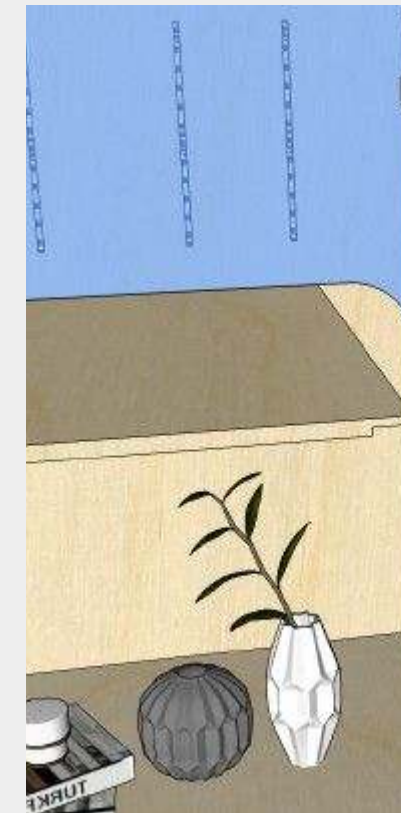
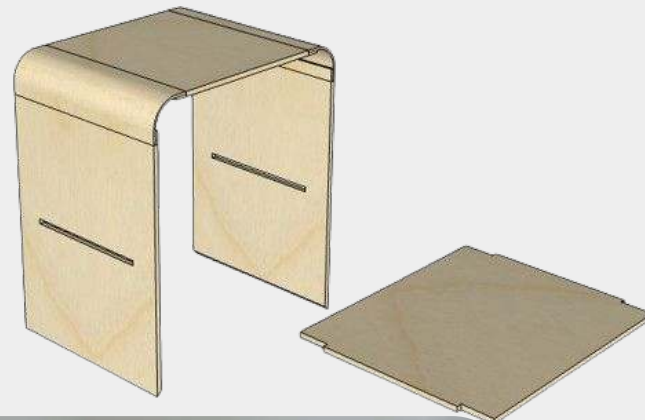
The top compartment is still to large and needs to be broken up or reduced. In addition I need to round out the bottom edges. Their to sharp as a result on the next iteration I am going to round them out like the top edges

Description

For this iteration i decided to model the Mortise and Tenon Joint in the design. I used the laser cutter to create this model

Advantages

The main advantages of this is that it is simple yet effective, assembly is simple, all that is required is for me to slot it in and allow the glue or adhesive to dry. In addition it is easy and simple to manufacture, quick and effective, as this model did not take me a long time to manufacture. In addition I can make this joint even stronger by using adhesives, that will ensure that the joint will fall apart but will instead remain in contact

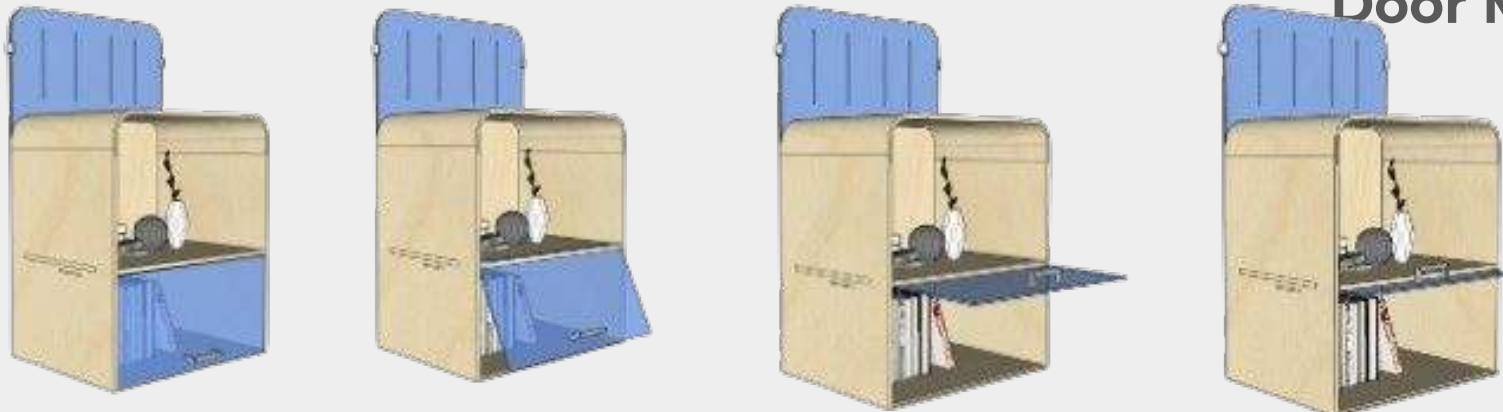


Iteration 6

Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

Door Mechanism/ Scale Model



General Description

For this iteration, I introduced a new design for the door, this design allows the door to open and then fold in allowing my client it access the contents easier. The way that this design works is that their are sort of indents into the side pieces, their are extensions on the door that fit into these slots, and with that the door is able to slide up and down them as shown in the photos on the top right. There is another sort of platform that the door is able to rest on, and it prevents the door from falling out again, in addition to the physical model

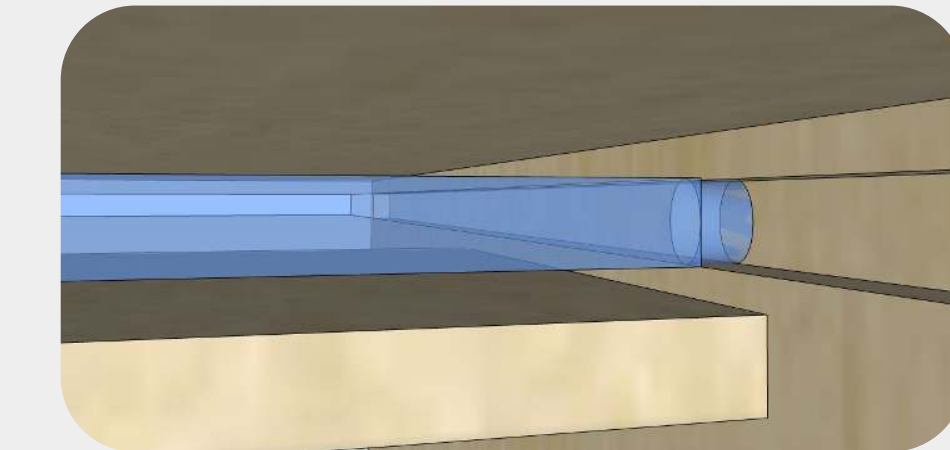
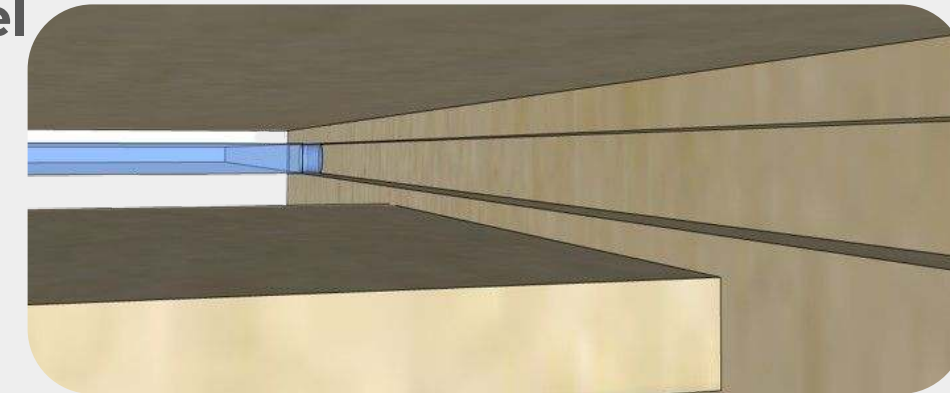
I ran into a problem, which was the door had a tendency to fold inwards, I only wanted it to fold outwards so I placed stoppers on the side preventing the door from moving inwards. With this design there are many advantages and disadvantages that I highlight. Their are also many improvements and changes that I need to make, for example I could possible introduce bearings that allow the door to move along the grove easier and smoother than with this current design

Advantages

Firstly the advantages, the main advantage of this design is that It allows my client to easily fold the door up, and allows them to grab items that they need without the hassle of needing to have the door in the way. As my client is elderly (53) they said they tend to find it uncomfortable to bend down very low when the door can tend to get into the way, so with this this allows my client to easily and simple move the door out of the way and then reach for the item from all angles. When the door would fold up or down, I can mean my client has to stitch to actually reach the books or other items within that designated compartment.

Disadvantages

One of the main disadvantages of this design is that it does not move smoothly, the door has the tendency to catch onto the side, and take a significant effort to move, for my further iteration I could possibly change the design, so that I could add ball bearing allowing the door to move easier and quicker without the risk of catching onto the side. In addition the platform doesn't look very aesthetically pleasing, and uses an excess of wood, i could possibly change this be reducing the length or the width of it, therefore reducing the material usage



Client Feedback

This is a very interesting design, that I think could work quite well, only things to consider with this model is the strength of the doors hinges, at a larger distance and a larger force applied do you think that I could still hold up or might it end up breaking in the end, something that you need to consider

Evaluation

Looking at my clients feedback, that is a very important point that I did not consider, I am going to possibly do some more research when i am manufacturing to ensure that the door would not break, and worst case scenario I can possibly change the door design



Iteration 7

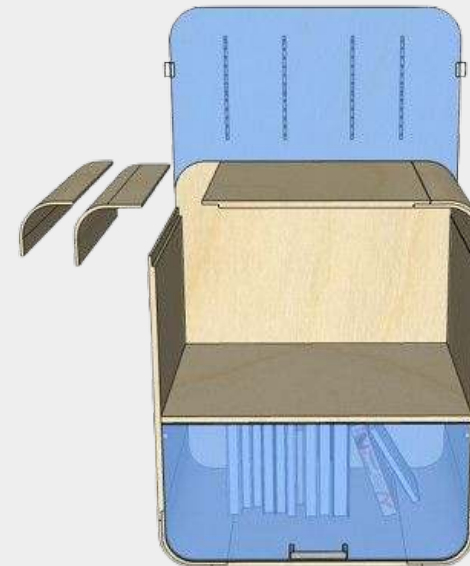
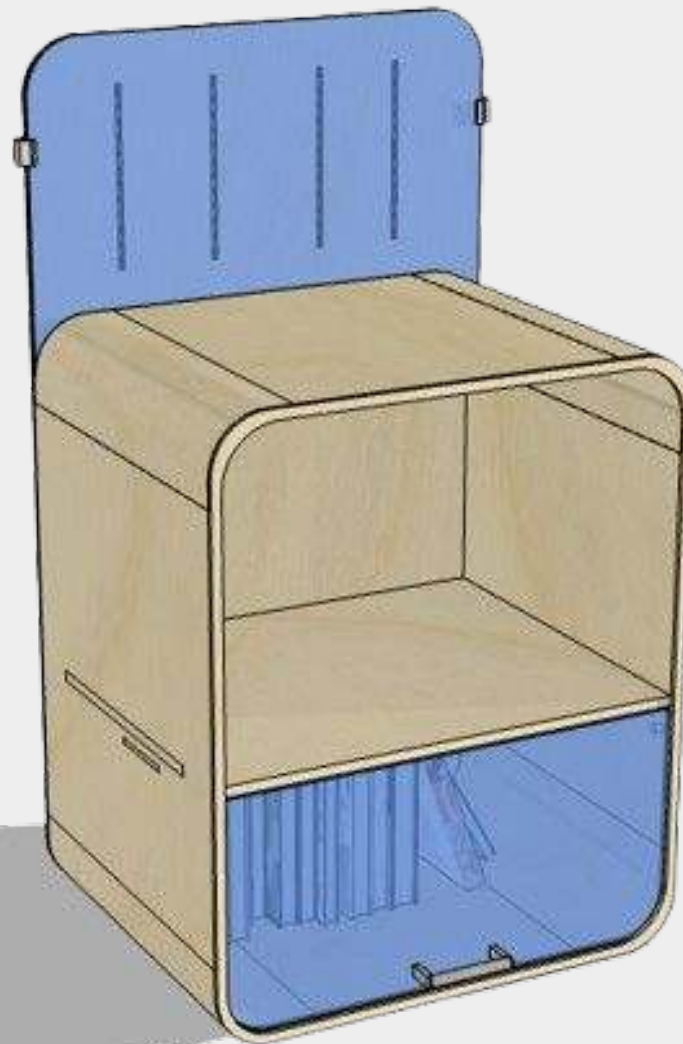
Iteration Introduction:

With these iterations, I come close to the end of designing journey, as I start to tend more towards using CAD I create 5 iterations, of consistently improving designs that when at the end will be my final project. In this stage I need to look more in depth, consider the manufacturing process that may be used in addition to what materials are required to make it and feasibility of actually making it within my given DT WorkShop

Changes

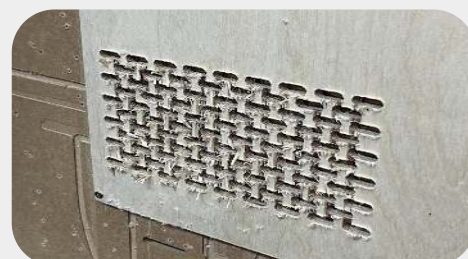
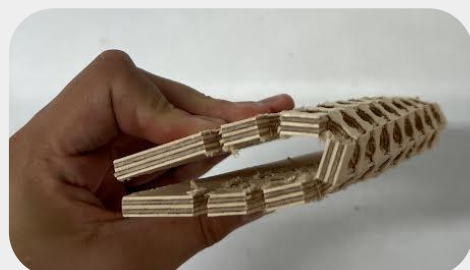
The main changes that I made to this design where that I rounded out the bottom 2 corners, I now incorporated living hinges onto the bottom 2 corners and changed the new design of the lighting hinges, where I now have 2 which are able to produce more support to the top bottom and side pieces. For increase structural stability and also to enhance the aesthetics I added a front pieve provisionally. This is able to possibly be CNC routed or lazer cut in 2 pieces but this part will be very important in supporting the weight on the bottom 2 living hinges and preventing them from breaking.

Furthermore I carried out a test for the living hindges as shown below, where I attempted to see possible ways for me to manufacturer the living hinges



Overall Evaluation And Client Response

'Overall I do really like this final design prototype and I do feel that you can manufacture this perfectly. I think changes and adaptations will need to be made during the manufacturing of the product but overall this is a very aesthetic and nice final design



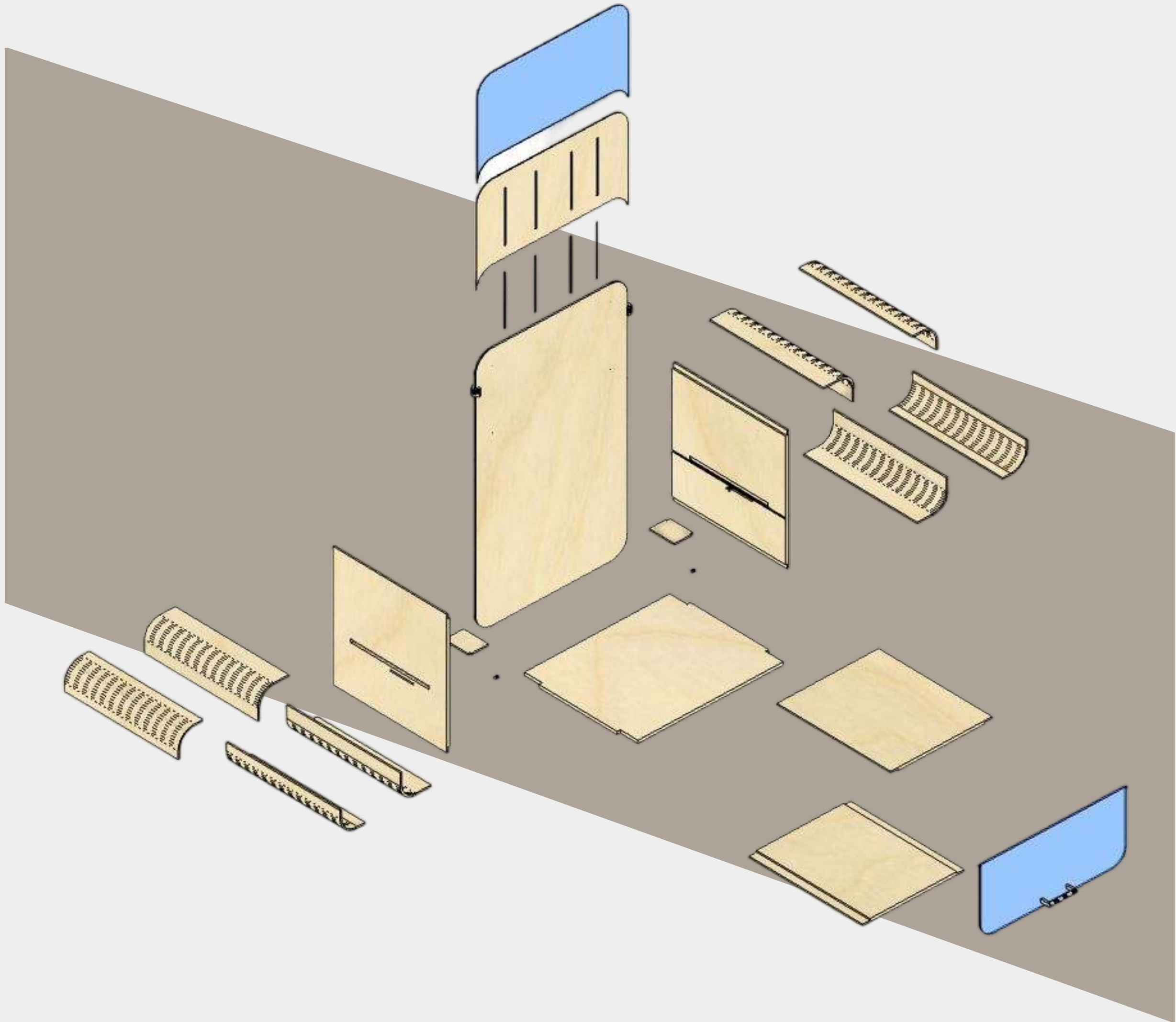
Model (Living Hinge on the CNC Router)

For this model, I tried to model how the corner piece will be manufactured. I decided to test a living hinge design that I had created. I used the VR milling CAD software when making this, and used a premade template. I set the dimensions up to my liking and then I proceeded to use the CNC router to cut the piece out.

Positives of this piece are that I now know that I am able to create living hinges using 6mm pieces of plywood, and that they work fine and are very structurally strong

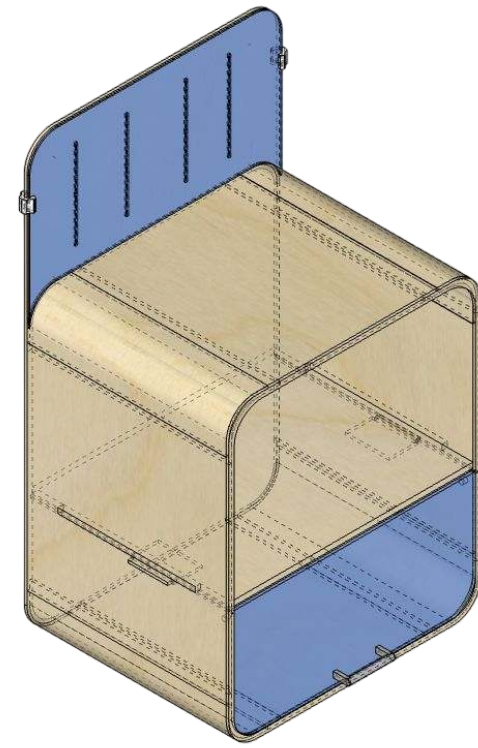
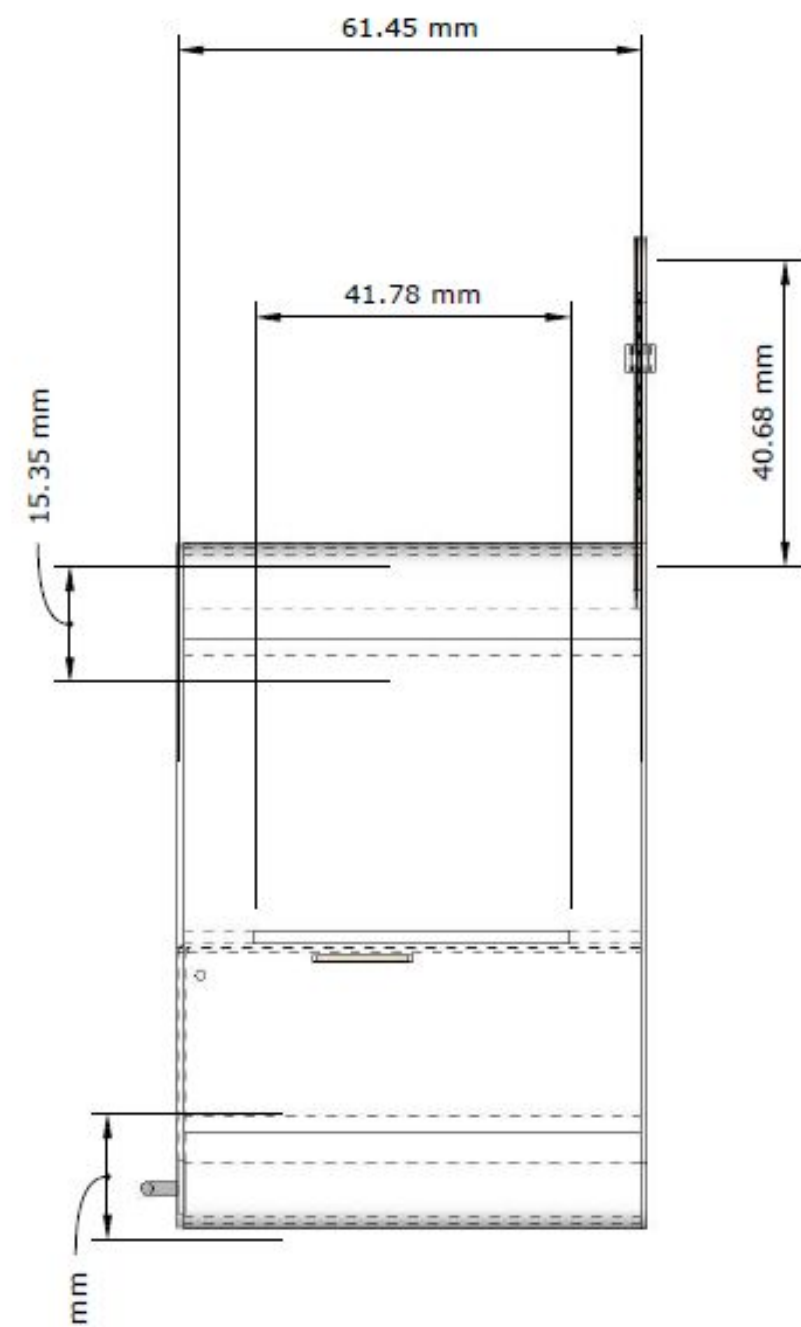
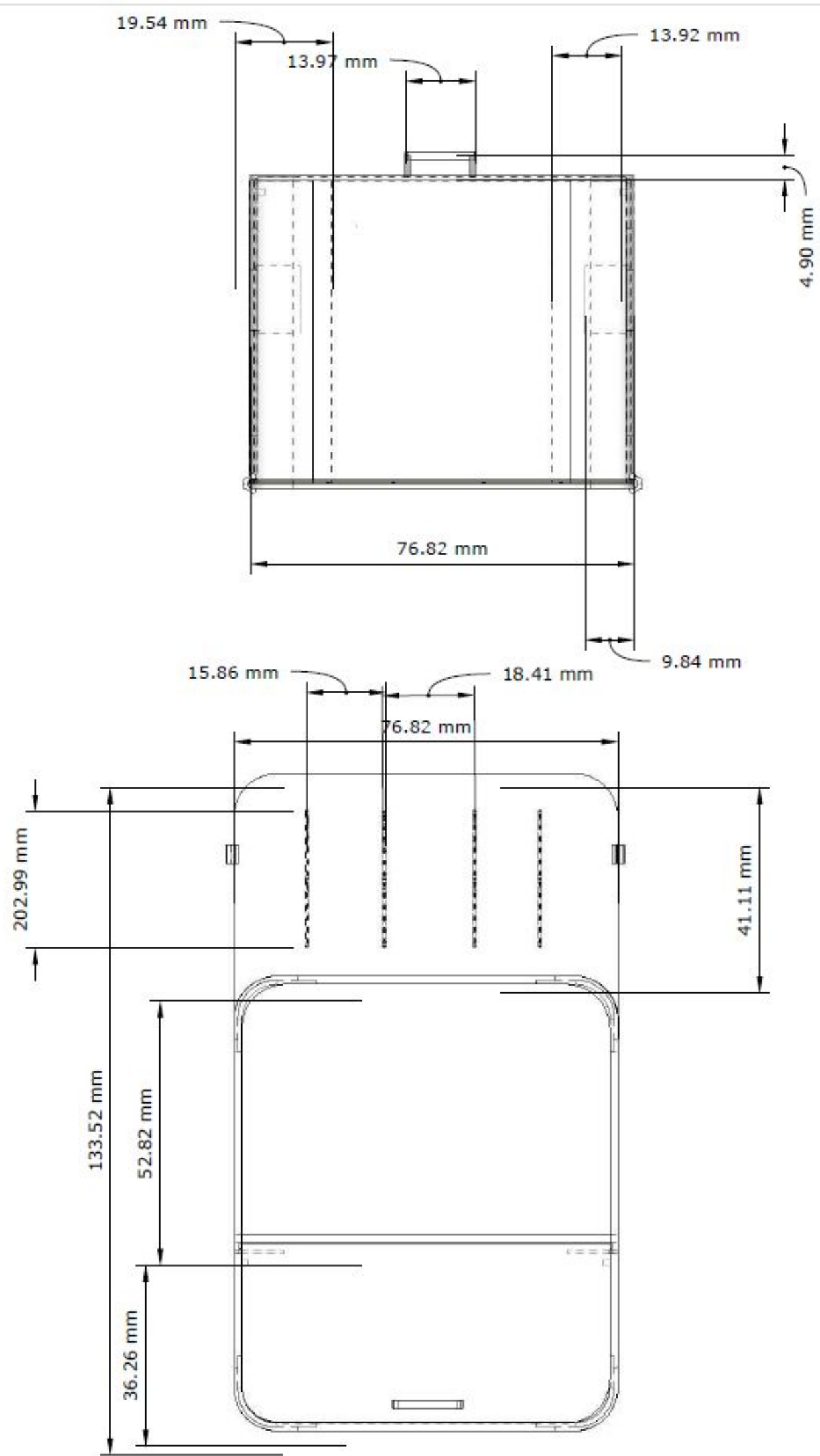
Disadvantages of it however is that it removes a lot of the timber material on the piece and makes it look unaesthetically pleasing. I also was unable to remove all of the splinters and fur within the gaps, which made it unsafe and not very appealing to look at, this is something that I do need to consider changing. I could possibly look at Laser cutting a different model when manufacturing and using that but this is a very solid start to this design process





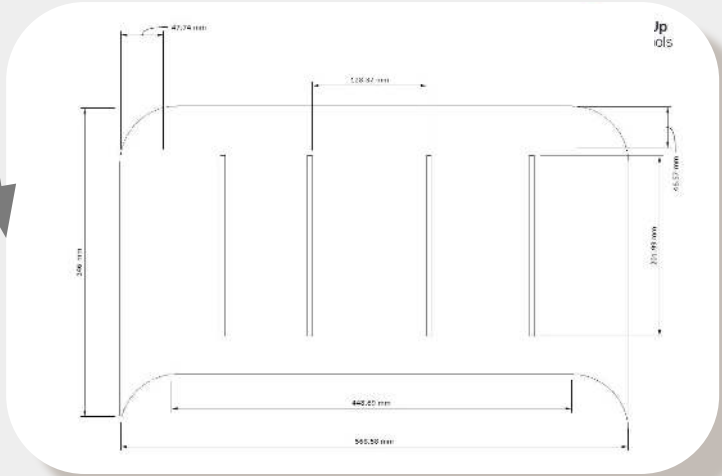
D E S I G N I S O M E T R I C

DESIGN ORTHOGRAPHIC



Component A, Lighting Source

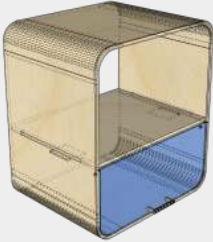
			Dimensions (mm)				Manufacturing		
#	Part Name	Material	L	W	T	Qty	Methods	Notes	Costings
Component A						1			
1	Diffuser	Acrylic	570	300	6	1	Laser cam 2d file sent to the Laser cutter which manufactures the piece	Must be sanded post Laser cut, to remove burn marks	Source: Acrylic sheet costing per meter squared Cost/m²: £26.55
2	Spacer Mount	PlyWood	570	300	6	1	Laser cam 2d file sent to the Laser cutter which manufactures the piece	Must be sanded post Laser cut, to remove burn marks	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
3	LEDs	Gallium Arsenide	200	12	4	4	Purchased		Purchased from Amazon for \$26.50
4	Clip Attachments	Abs Filament	N/a	N/a	N/a	2	Up box studio file sent to 3D printer for printing/ manufacturing	Did not end up making, used the magnet substitute instead	Source: UP 500g Spool of Black ABS (Pack of 2 x 500g) Cost/gram: £0.03 Cost/part: £0.37
5	Back Piece	PlyWood	974	570	12	1	Vr milling file sent to the CNC router for routing out of sheet	You must use the table router to remove the piece from the sheet once Vr milled	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
6	Magnets	Iron	10mm diameter		2	4	Purchased	Was made and designed during the manufacturing	



This Highlight is for pieces Bought, NOT manufactured in house

This Highlight is for future modification pieces, not originally designed

Section 1



Component B, Storage Unit

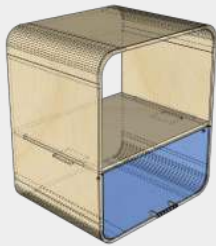
			Dimensions (mm)			Manufacturing		Costings
#	Part Name	Material	L	W	T	Qty	Methods	

Component A1									
1	Side/ Wall Pieces	Plywood	462	450	6	2	For all of these pieces they will be Vr milled and then using the table router will be removes from the sheet they come on	They all will need to be sanded post table routing to remove the excess fluff on the edges of the parts	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
2	Top Piece	Plywood	450	326	6	1			Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
3	Divider Piece	Plywood	450	546	12	1			Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
4	Bottom Piece	Plywood	450	326	6	1			Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75
5	Door Stopper	Plywood	5	5	5	2	Ould be made from cutting a part of a dowel		Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75

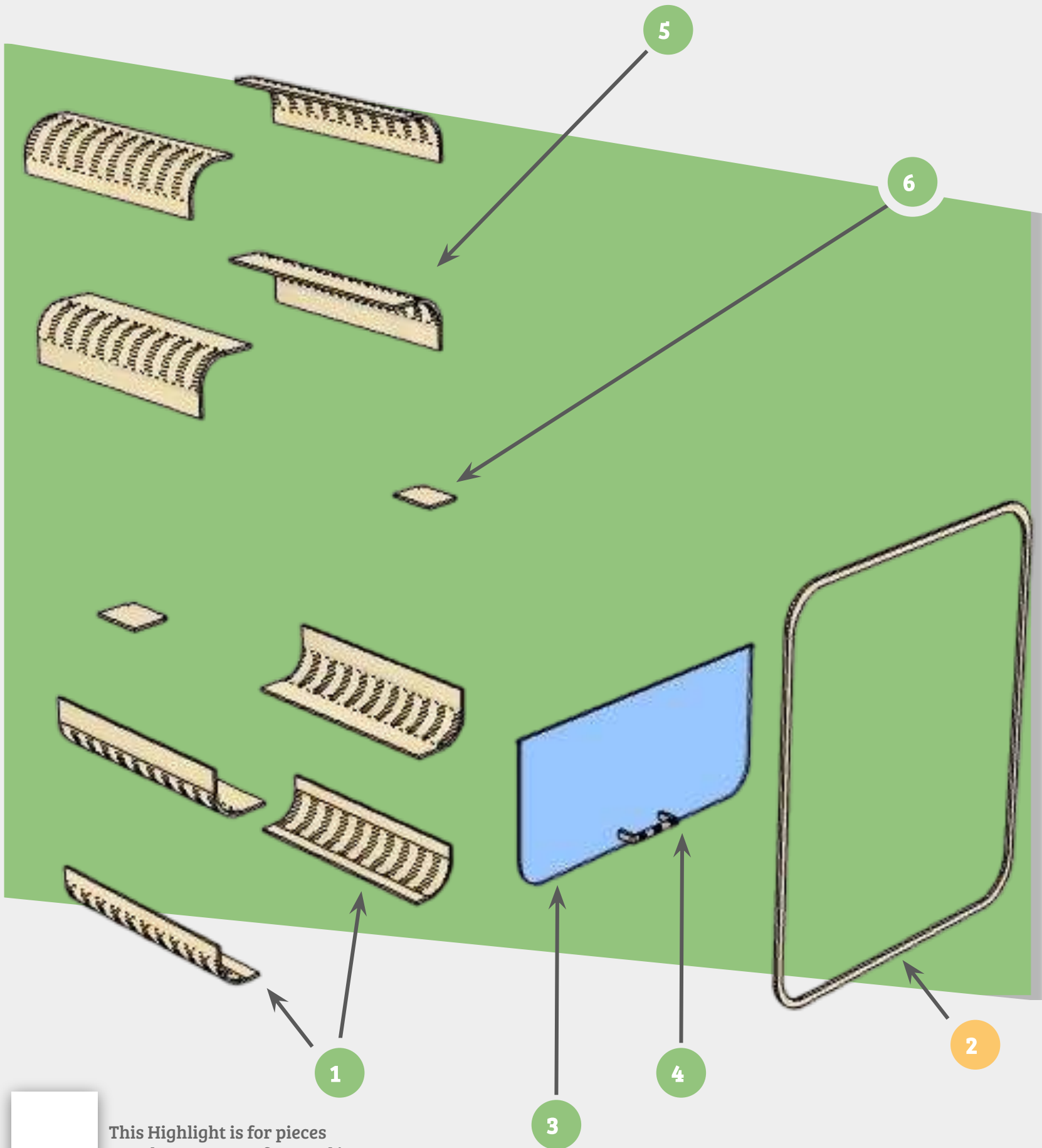
This Highlight is for pieces Bought, NOT manufactured in house

This Highlight is for future modification pieces, not originally designed

Section 2



Component B, Storage Unit



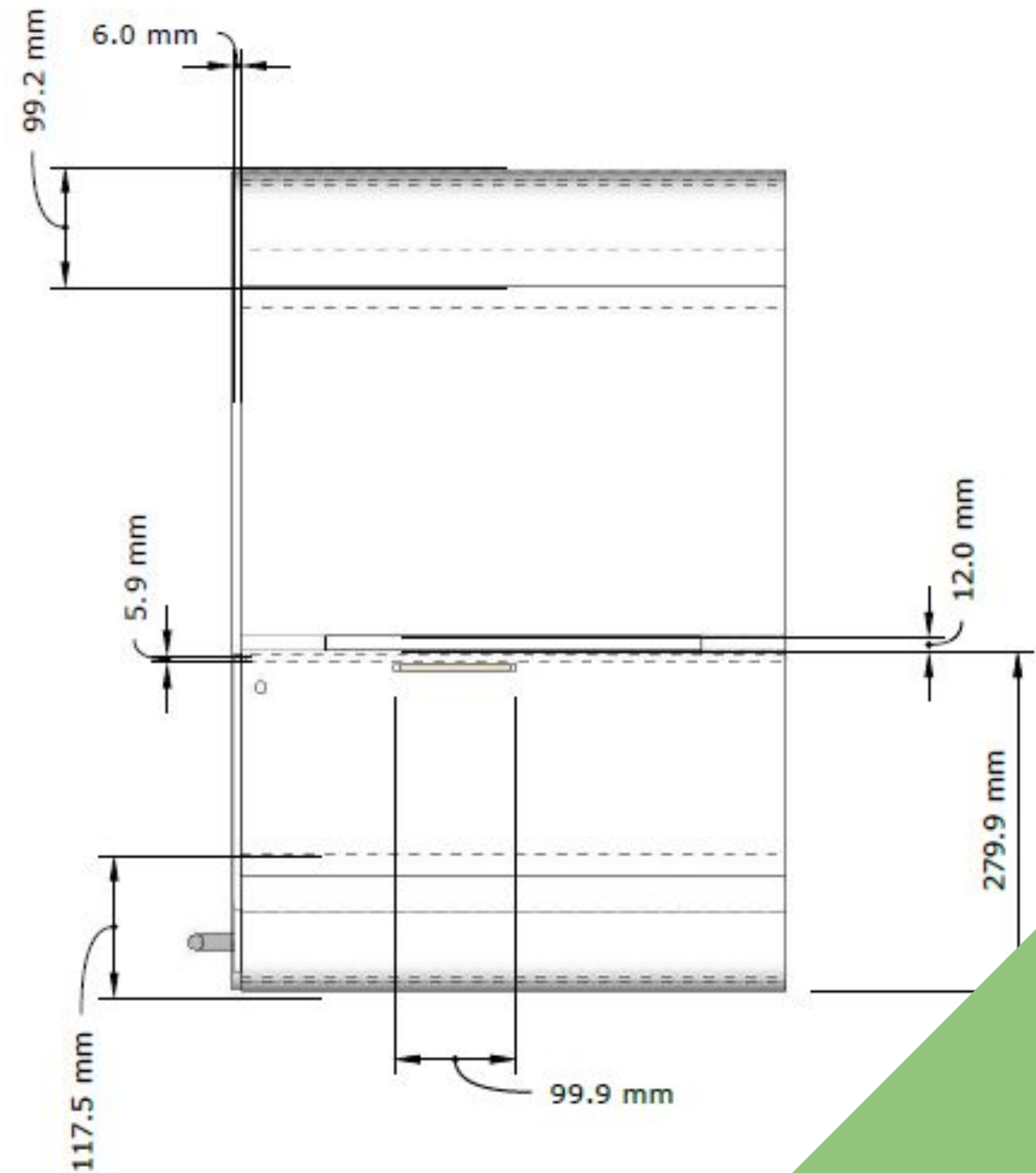
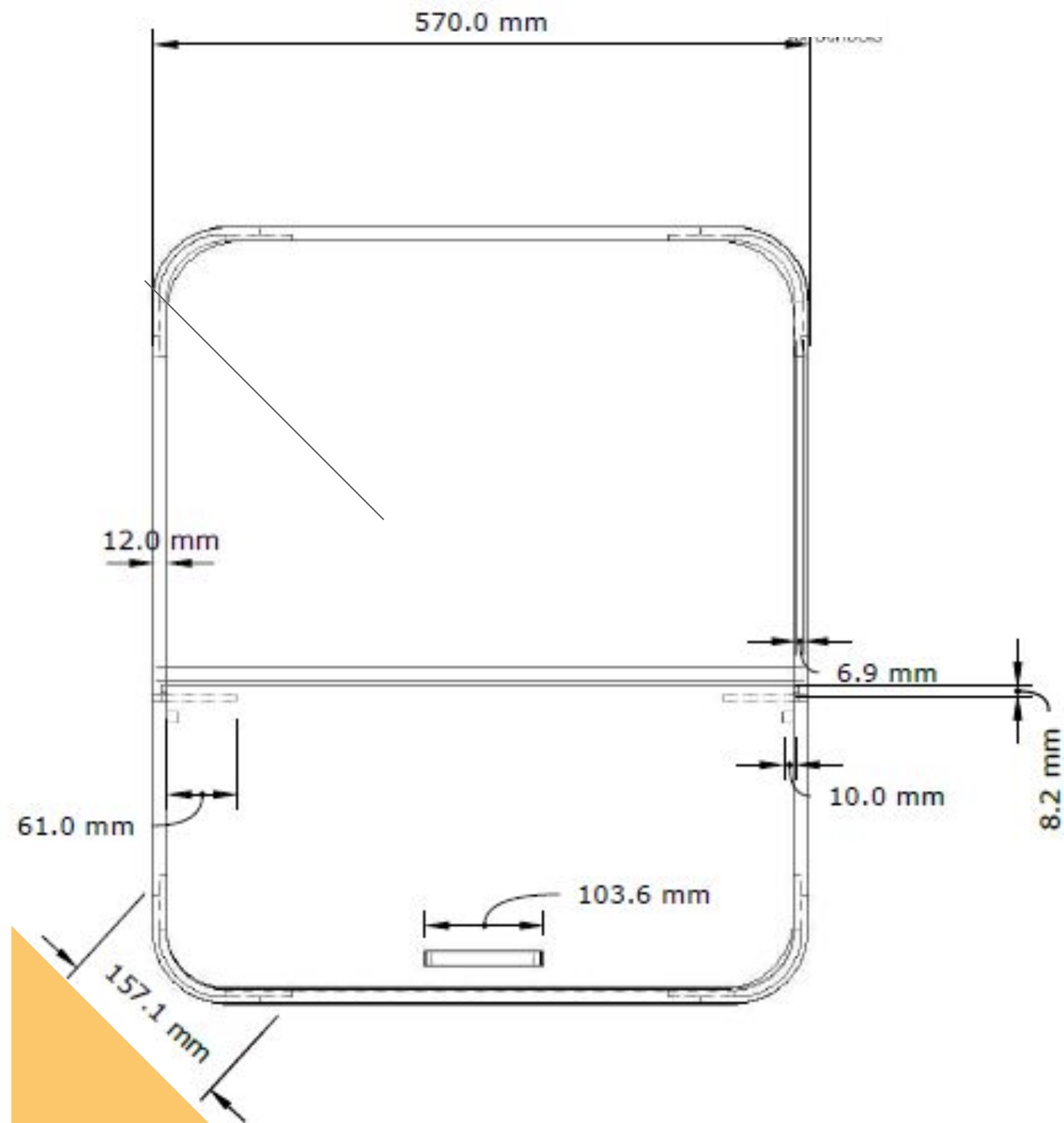
#	Part Name	Material	Dimensions (mm)			Qty	Manufacturing		
			L	W	T		Methods	Notes	Costings

Component A										1
1	Outer Living Hinges	Plywood	Radius of 64mm		6	4	Vr milling file sent to the CNC router for routing out of sheet	You must use the table router to remove the piece from the sheet once Vr milled	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75	
2	Front Support Piece	Plywood	674	570	12	1	Vr milling file sent to the CNC router for routing out of sheet	You must use the table router to remove the piece from the sheet once Vr milled	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75	
3	Door	Acrylic	268	546	6	1	Laser cam 2d file sent to the Laser cutter which manufactures the piece	Must be sanded post Laser cut, to remove burn marks	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75	
	Handle	ABS	149	13	13	1	Originally was going to be made using 3D printing but I instead used an existing and stronger handle			
	Inner Living Hinge	Plywood	N/a	N/a	N/a	4	Vr milling file sent to the CNC router for routing out of sheet	Did not end up manufacturing due to it not being possible to	Source: Hardwood Plywood Handy Panel FSC 1220 x 610 x 12mm Cost/m²: £24.75	

This Highlight is for pieces Bought, NOT manufactured in house

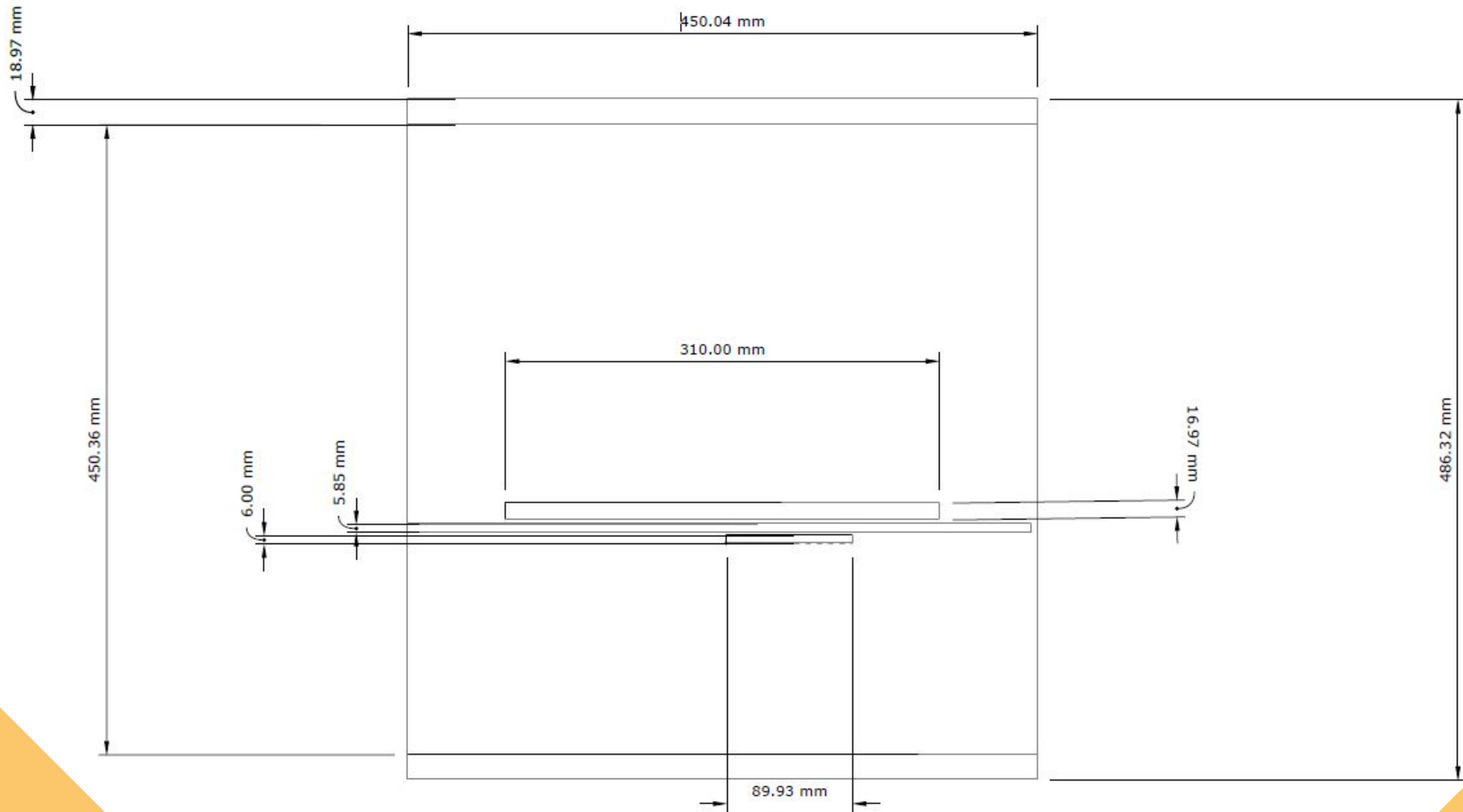
This Highlight is for future modification pieces, not originally designed

Component A1 and A2 Orthographic



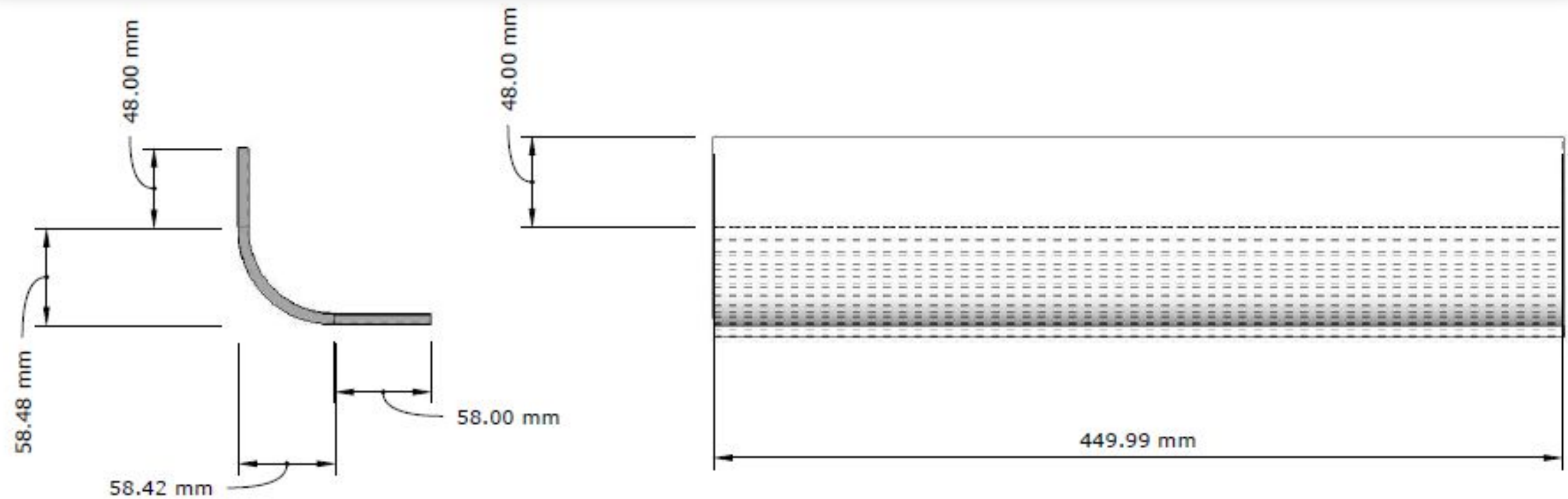
Side Piece

Component B (1)



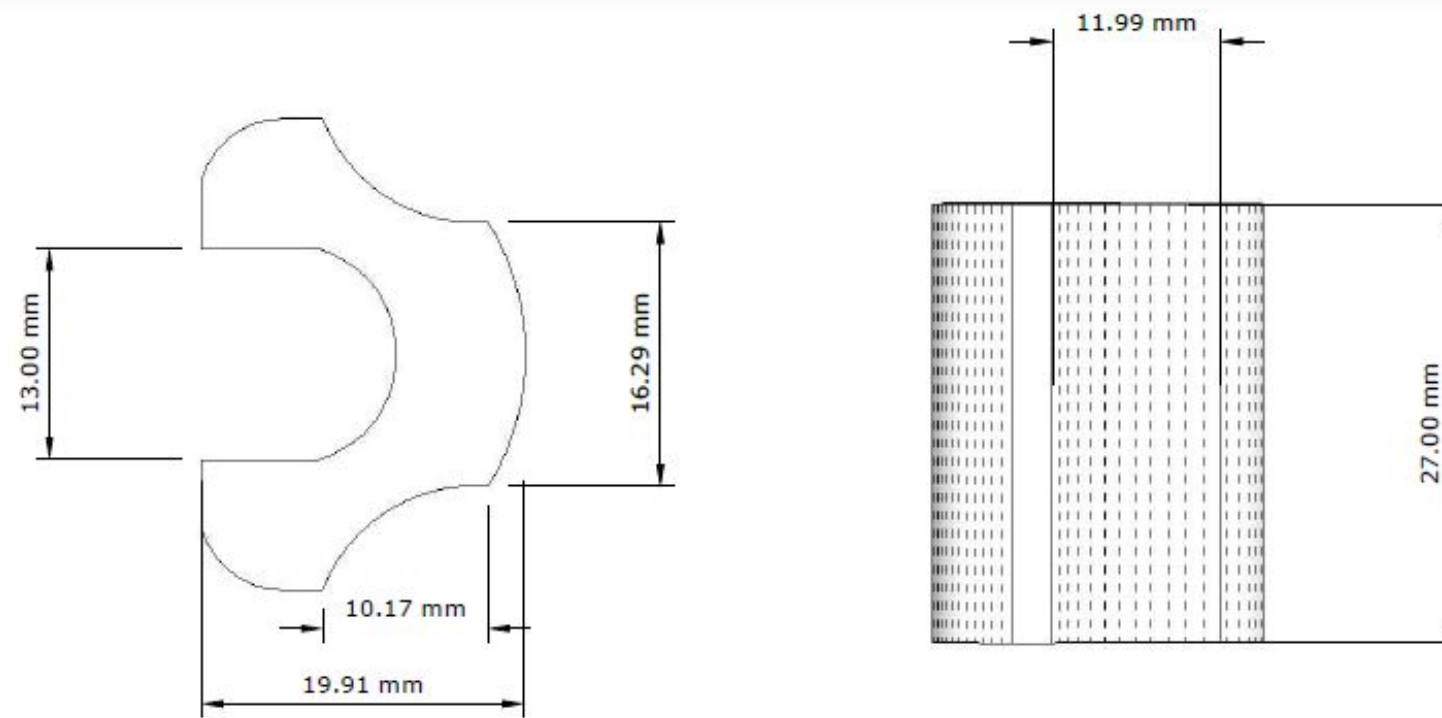
Corner Living Joint Piece

Component B (2)

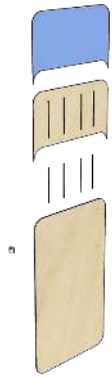


Clip Piece

Component A



Component A



Stage 1

± 2mm

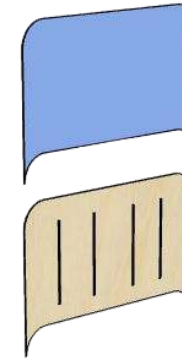


Manufacturing Process:
For this first step, I need to CNC Router a sheet of thick of 12 MM. After this I am needing to sand down the edges to prove a smooth surface. Varnishing Is not required now, it will be done once all assembled

For this piece, measure the dimensions to ensure that it fits within the required tolerance.

Stage 2

± 1mm



Manufacturing Process:
For the second step. I need to produce 2 different parts, they both have similar profiles. The acrylic will be Laser cut, 6mm, and the timber piece will be CNC routed, 6MM. Only the Timber piece will require sanding after

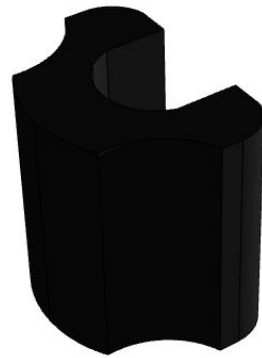
Stage 3



Manufacturing Process:
This piece will not be manufactured, It will have to purchased and then soldered together to the wire. I need to purchase 4 strips and solder it to 1 wire, potential link a control to these LEDs for remote use

For this piece, I need to check the brightness of the LEDS. The color changing capabilities and need to tests how well a possible remote would work with it

Stage 5



Manufacturing Process:
For this step, I am 3d Printing the clips, used for holding the lighting system together. This will have a quantity of 2, one to hold from each side. There is no finishing method for this product, once printed is instantly ready for usage

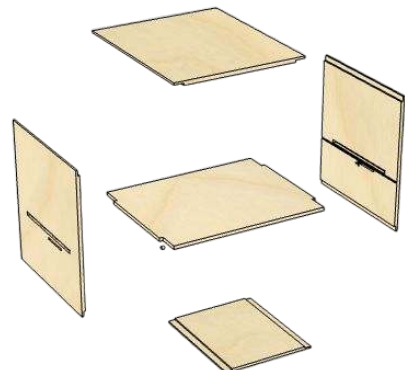
Stage 5



Final Assembly Test
For this final step. I need to test our the assembly of the different parts. I will assess how well the clips work, if any pieces slip, and the lighting, to see if it provide mood lighting which my client requires. After this I move onto component 2

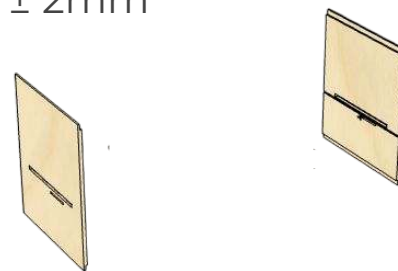
Flow Chart (Component Manufacturing)

Component B (1)



Stage 1

± 2mm



Manufacturing Process:
For this step, I am CNC Routing this piece, with a 2x quantity. Then I need to use the table saw possibly to create the rebate joint, which is required for assembly of the whole product. When CNC Routing I need to cut slots into the piece for the door guide

For this piece, I need to test out the mortise and tenon joint, if their to small then I must sand it until it perfectly fits in, in addition need to test the rails sizing.

Stage 2

± 2mm



Manufacturing Process:
For this step, I am CNC Routing this piece, with a 2x quantity. I possibly for these pieces, evolve them so that the door stopper is incorporated into it, so that the 2 stopper pieces are not required providing a more aesthetic form, compared to the current design

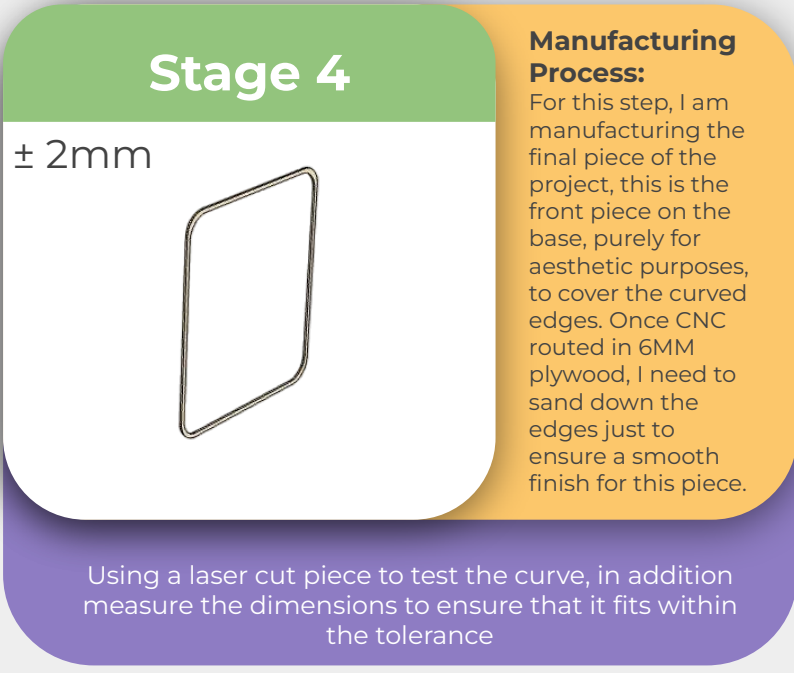
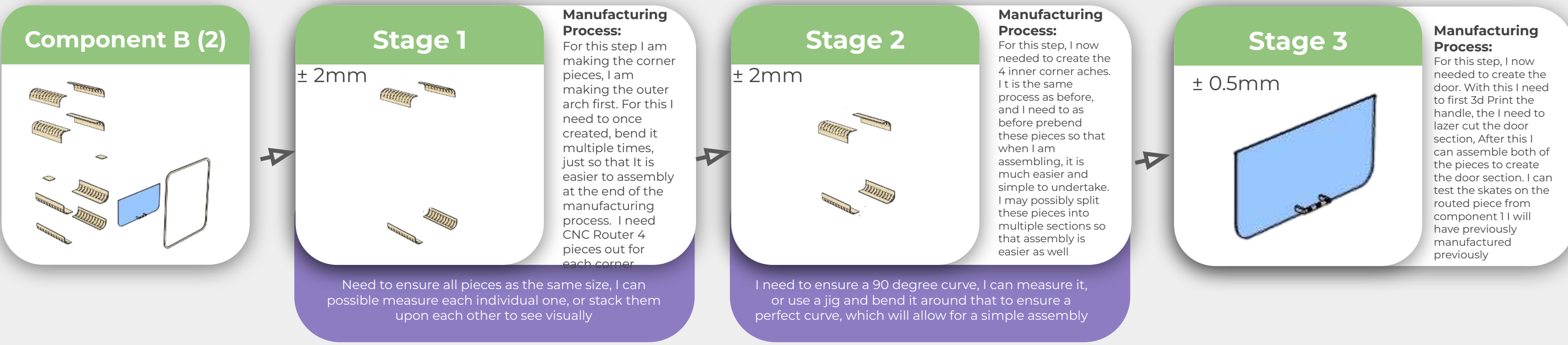
Stage 3

± 2mm



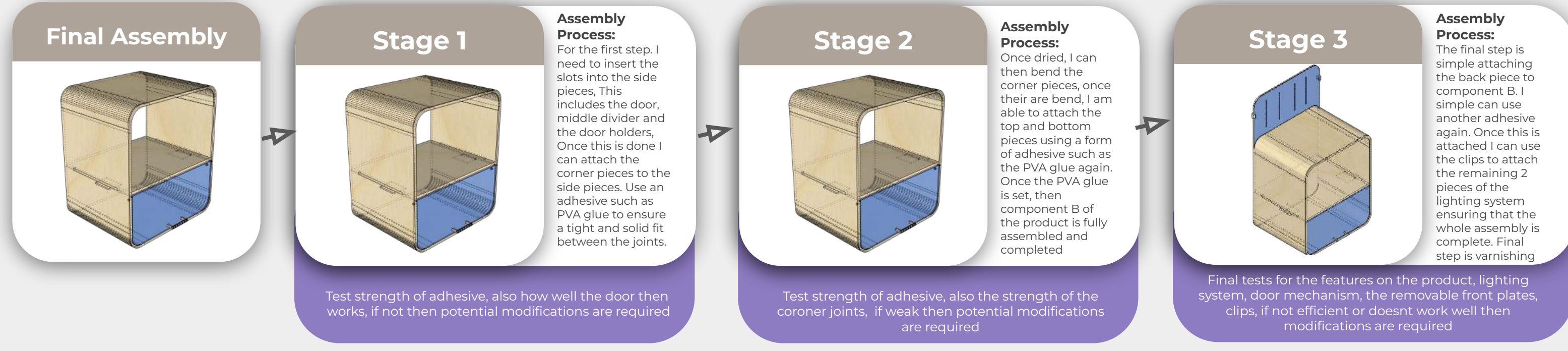
Manufacturing Process:
For this step, once again it is a simple CNC Route, 6mm. I can possibly create 1 or 2 sheets of CNC routing so that I can be more efficient and create multiple pieces at once when required

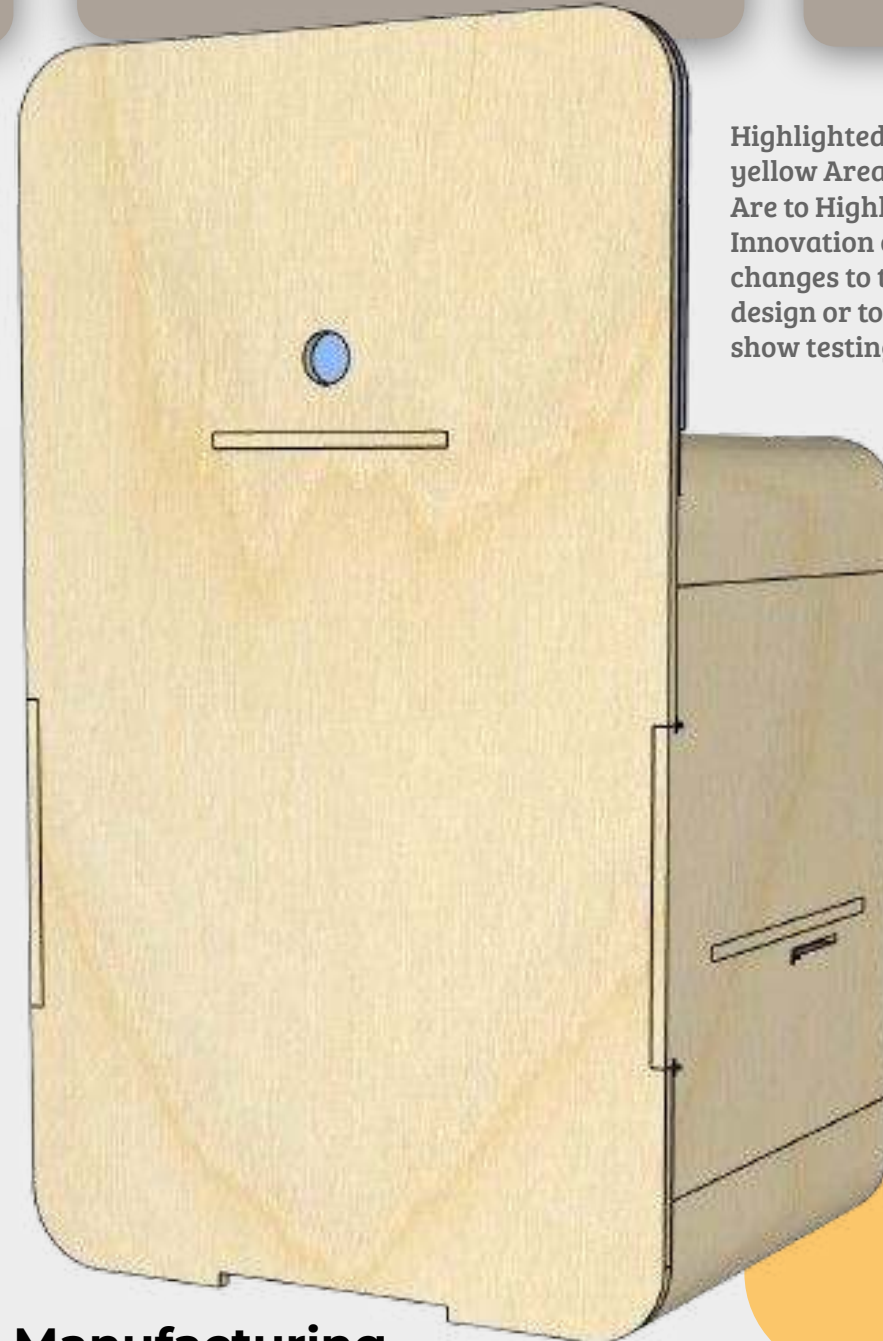
Test the mortise and tenon joint, see how well it fits into the slot, if to large then possible sanding down the edges to ensure a snug fit



Flow Chart

(Remaining Component Manufacturing and Assembly)





Highlighted yellow Areas Are to Highlight Innovation or changes to the design or to show testing



Initial Modifications

I initially gained feedback from my teachers, and they advised me to make changes once I had considered how I would assemble the product. With this information I proceeded to add slots, for the external timber pieces to use to attach to the back piece. This would allow for the timber pieces to have a larger surface area to attach to, ensuring more adhesive could be used, and the joint would be more secure. In addition the benefit of this would ensure that the storage compartments would be attached to the back piece in the correct location. As they would simply slot into the right place

Component A Manufacturing

I initially started the manufacturing process by cutting out the back piece, This is the most crucial part of the project, as it connects all of the pieces of the project together. I started off by importing the file for this piece into the VR milling application. After this I created a plan on how this piece would be produced. Then I proceeded to cut the piece out using the **CNC router**. After this I used the **table router** to cut it out of the sheet of ply before then finishing by using a piece of **glass paper** to remove any rough edges to the product.

Health And Safety

- For the **CNC router**, I ensured that I had sufficiently closed the door, proceeded to turn on the extractor to remove all of the extra pieces of flying timber, then kept an eye on it throughout the whole process to ensure that everything ran smoothly. I also used ear protection to ensure my ears were kept safe
- With the **table router**, I ensured I had eye protection, ear guards and a workshop coat to ensure that I was safe. Then used the help of my teacher to make sure the ply wood piece would not fall when in operation

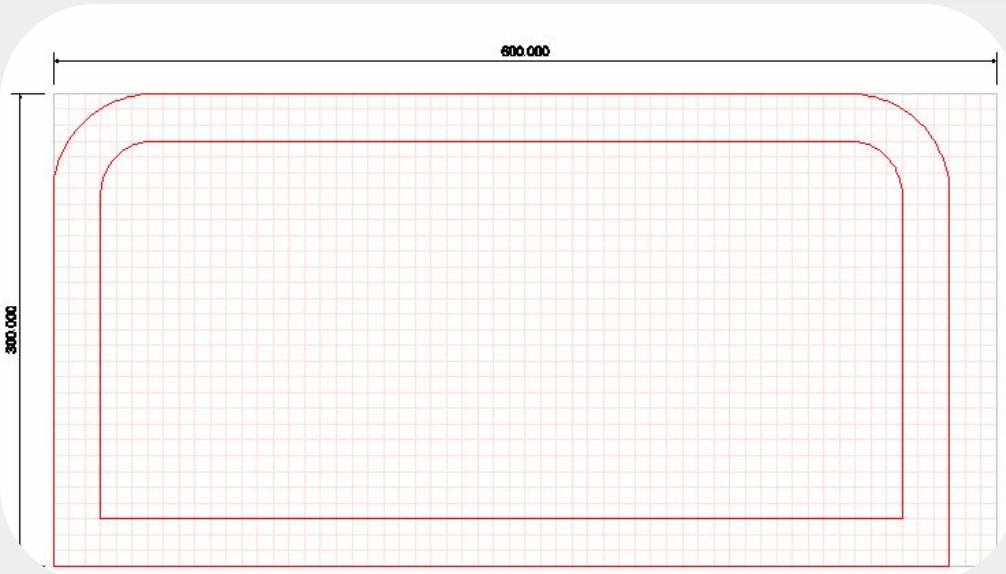


Component

A

Manufacture Diary

Week 1 (4/11)



Quality assurance

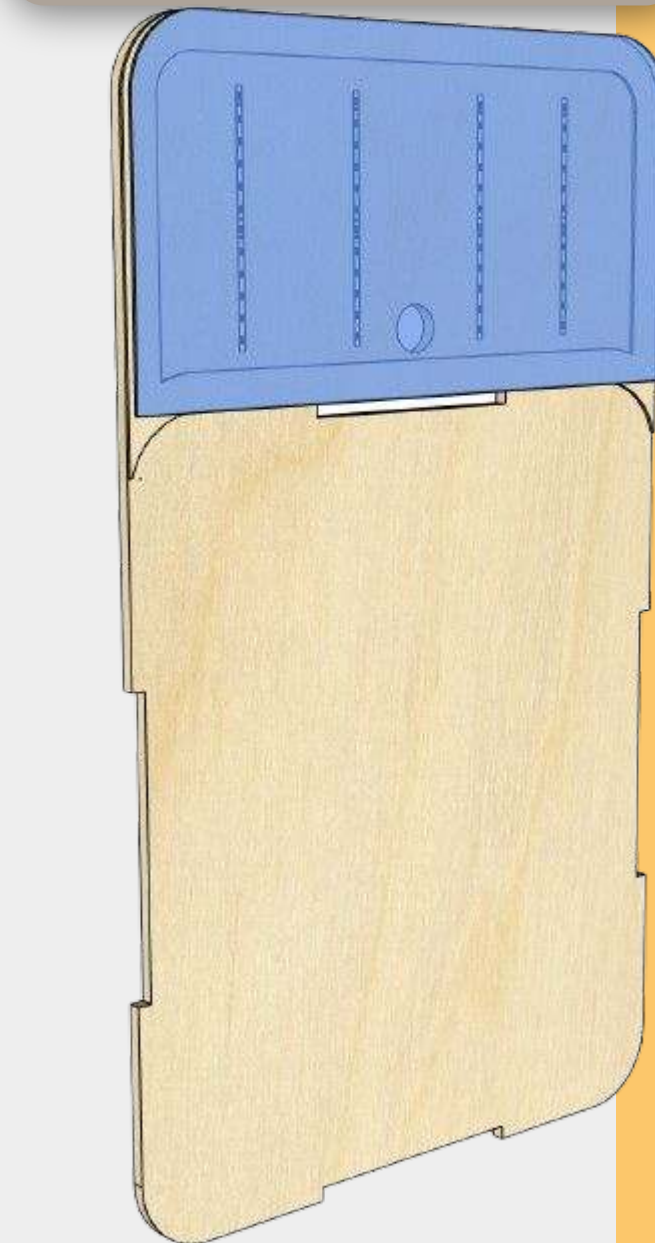
Before printing out the piece, I firstly measured the width of the back piece, and the length of the Cad file to ensure they matched. Then measured the width of the piece to ensure it would fit in between the whole of the wires and the slot

Component A Manufacturing

After I had manufactured the back piece, I decided to work on the lighting system. I imported the cad file into lasercam 2d, where I would be able to use the **laser cutter** to cut out the spacer, which would create space for the LEDs to rest. Once printed out, I then lightly sanded off visible burns on the timber, and then proceeded to use **PVA glue as an adhesive** to attach the piece to the back piece. And with the use of clamps I was able to let it rest for 24 hours, allowing the adhesive to solidify

Health and safety

Health and safety measures when using the laser cutter are, firstly ensure that the extractor is on, this would remove any harmful gasses from the printing bay. Then I needed to ensure that the lid had properly been closed before starting the machine. And as an extra precaution I ensured that I was watching it the whole time so that I would catch instantly if anything went wrong



Major Innovation/ Change to design

When looking at the resources in the DT department, I found 10mm wide magnets, the change I made to the design was that I removed the previous clips idea and changed it with a new magnetic design. The front panel would come on and off magnetically. This meant the back piece was sustainable as the LEDs could be changed as you could take the front frosted piece off, but it would remove the bulky and unpleasant clips, giving a more aesthetically pleasing look

Quality Assurance / Check

I printed the same piece again, but instead left whole for the magnets to be placed in. As shown in the image above. I firstly measured the magnets, and found out that it was 10mm wide, and if 3 magnets were together, it was 6mm thick, the same as one sheet, ensuring that it would sit flush in the joint

Once printed I used **Vernier callipers** to check all the dimensions and it checked out. Meaning it came out perfectly

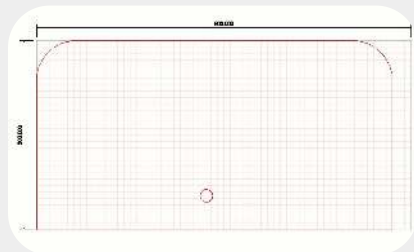


Component

A

Manufacture Diary

Week 2 (11/11)

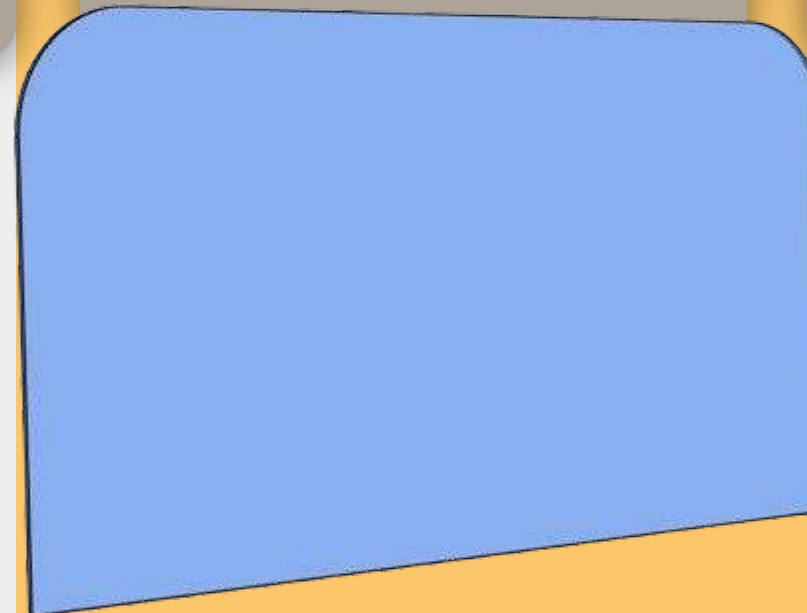


Component A Manufacturing

After I created the back pieces spacings, I then moved onto making the front piece frosted acrylic, due to the change in the design, moving from the clip design to the new magnet design I had to change and improvise with the front piece frosted acrylic,

Changes to the front piece acrylics design are that there is a new finger hole, to allow the user to take the piece off from the front, and that I would print another piece for behind the frosted acrylic for where the magnets are able to sit in

To start off making the design I decided to print the frosted acrylic out using the **Lazer cutter**. I then proceeded to print the second piece out. Once both pieces were printed I used adhesive to attach both of the pieces together



Fitting test

Once I had finished making the acrylic piece, I then proceeded to test the alignment of the front piece and the back piece and also do a visual check. The holes aligned perfectly together and the general shape of the pieces fitted together, however I ran into one big problem. The finger hole was not center. Looking at the bottom right image it shows how the alignment was off, this was very visible especially when fitted on as it was off center, but the back hole for the wires was not, so this has to be resolved

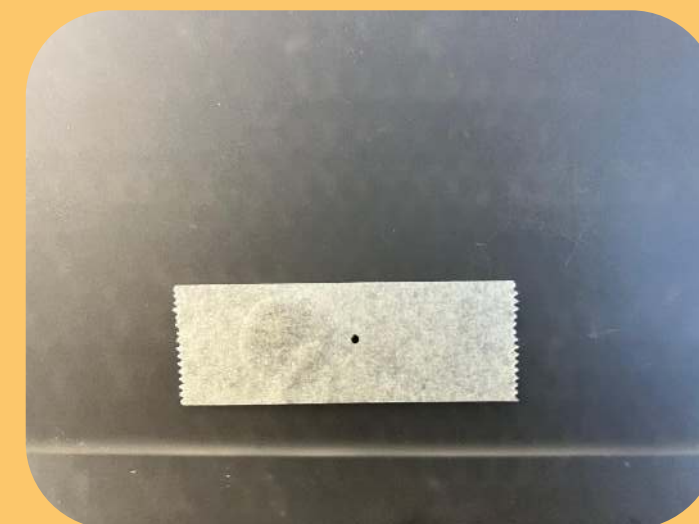
Resolving Issue

Resolving the issue was simple, I used the laser cutter to cut out an ellipses shape, which was center. The benefits of this new ellipses was that it is a larger hole. Allowing for different people, with different finger sizes are able to use the product, indirectly making it more **inclusive**

Alignment



Image shows centre, and how the finger whole is off center



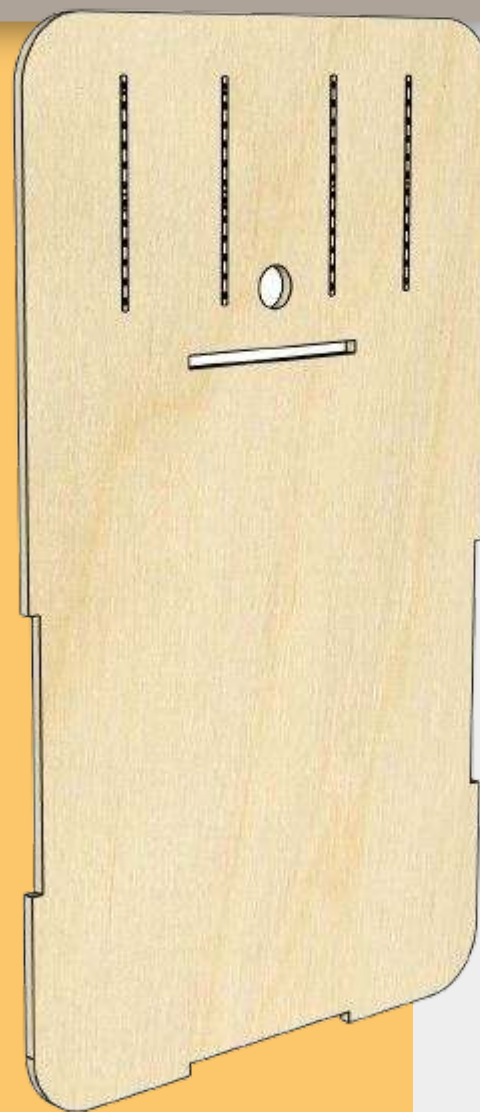


Innovation/ Design Change

Firstly, this products main functionality was to be very aesthetically pleasing, therefore I decided to purchase premium LEDS, ones that would prove a continuous strip of light, instead of multiple LED lights added together, which is much more aesthetically pleasing. In addition This LED has a plug which my client wanted, and a major feature which is a **remote control**, this is a feature that my client wanted and that I was able to provide, the majore change was to the way the LED was fitted, **instead of in strips as shown in the image to the right, I would instead mount the LEDS in one strip along the edge**, providing a more aesthetic finish

Sizing Test

This LED however, came In a very long strip. So I initially used tape and put it onto the edges, the way I wanted it fitted as shown below, then proceeded to cut the desired length before putting it on



Component A Manufacturing

This was the final step for the lighting system to be completed, I would need to finally attach the LEDS onto the frame I had created. To do this I simply removed the tape and the adhesive already on the LEDS where used to attach them onto the frame, and this part was complete



Quality control Check

Once all of the lighting system had been assembled, i proceeded to carry out a **visual check** on all of the pieces.

When carrying out this process I noticed a burnt finish on the edges of the lazer cutted pieces of timber. This was very noticeable and unpleasant to look at, was it was very contrasting from the color of the back pieces plywood timber, which was a light and aesthetically pleasing brown color.

I gained opinions from my piers and teachers and they all reiterated the same message, therefore I had to improvise and remove these black burn marks from the edges



Resolving the Issue

To resolve the Issue, I decided to use a **hand sander**. This simply required a drill, and a drill bit which was used for sanding, after I had assembled the sander, i proceeded to sand for some time before all of the back burn marks on the edges had disappeared.

Health and Safety

With the **hand sander** are a few health and safety measures you need to consider. Firstly I had to wear **correct PPE**, this was a workshop jacket, and also goggles to ensure any loose pieces of timber did not get into my eyes

Final Result and Feedback

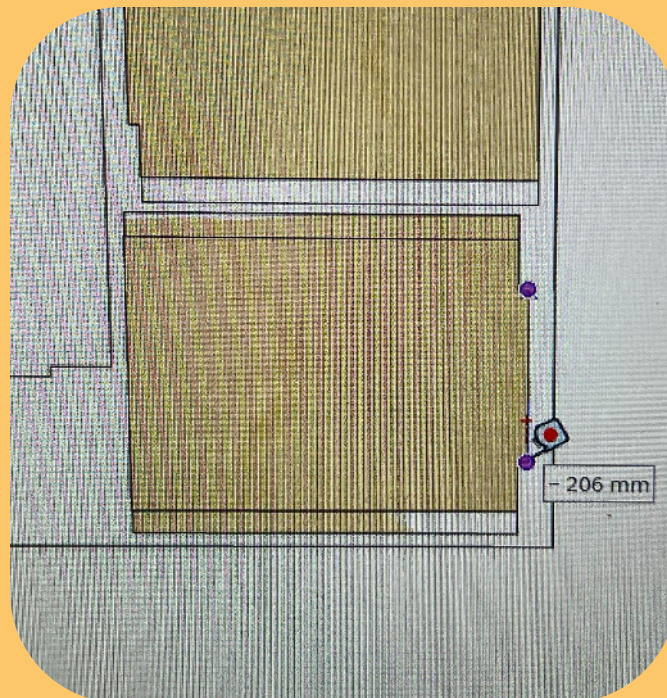
Once I had completed this, the black burn marks had completely gone, and I was left with the natural color of the timber, which perfectly matched the back piece plywood timbers color. This now made it look more like one coerced piece, instead of pieces stuck together



Quality Assurance

Once I had completed component A, I moved on to making parts for component B. Before I started printing them out, I decided to do a **Tolerance Check**. This was to check that the sizing of the slots on the back piece matched up with the cad files on the top piece, and bottom piece.

This check passed out, and the slot on the back piece was **within the 1mm tolerance** of the sizings for the slot on the cad file, therefore meaning that I would not need to make any changes to the cad files. This meant I was able to print the part out without worrying about sizing, and not possibility wasting timber.

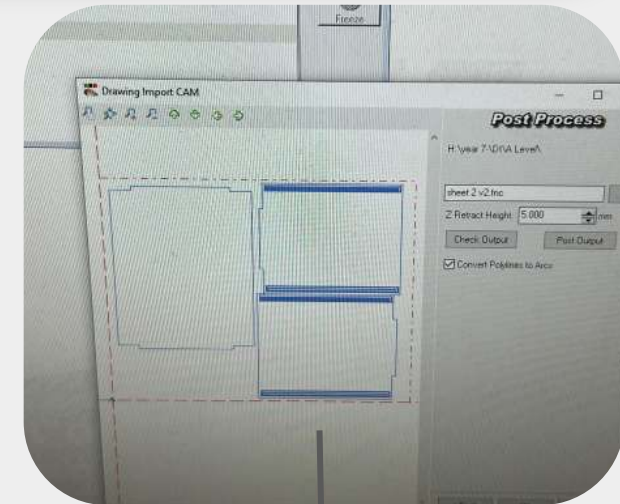


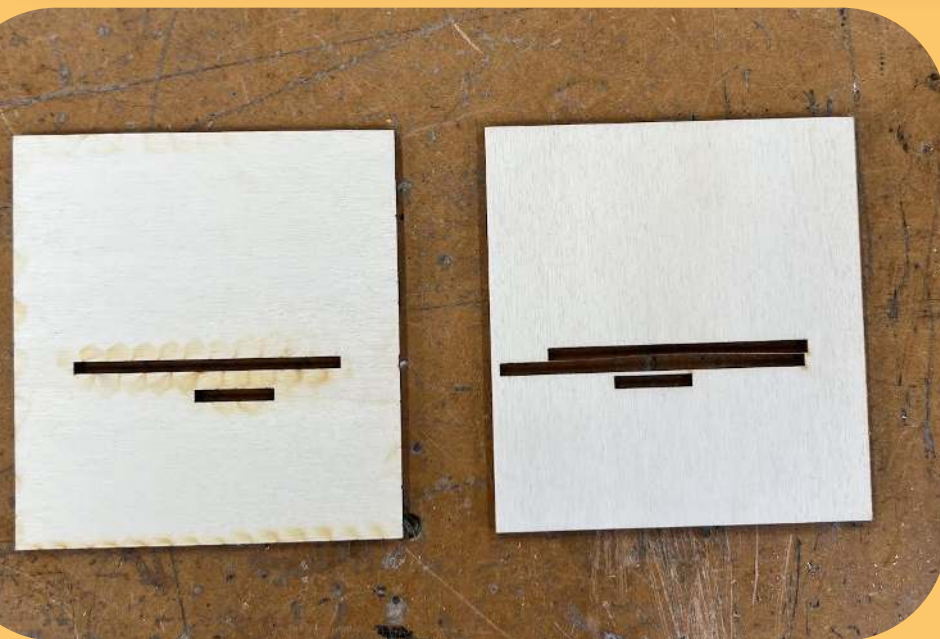
Top and bottom

Component B Manufacturing

Once I had completed the quality assurance test, I had to go to start the manufacturing of these parts. I first created a 'sheet' of this design on **sketchup**. I then imported it into **VR milling**, where I used the **CNC laser cutter** to cut out these pieces. After this I simply used the **table router** to cut these pieces out of the sheet, then to finish off I used **glass paper** to remove all of the extra furry, sharp pieces of the edges of these pieces, after this I was able to test its fitting into the back piece.

For the bottom and top piece, I was able to create a **rebate joint** on it using the **CNC router**. You can see it on the edges, and these edges are where I planned and designed the living hinges to attach to the outer pieces. However cutting out these **rebate joints** took a very long time, and required a lot of sanding once it was done, however they turned out perfectly and ensure the living hinges will sit flush.

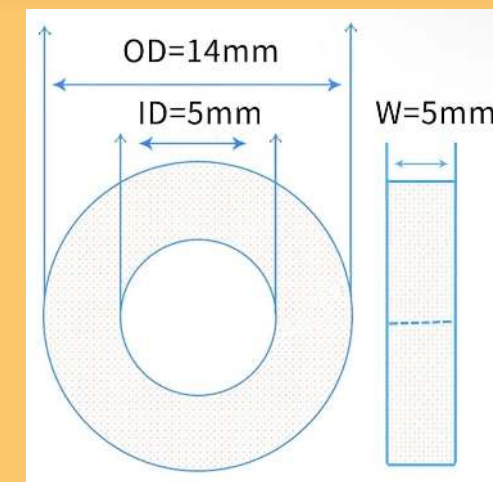
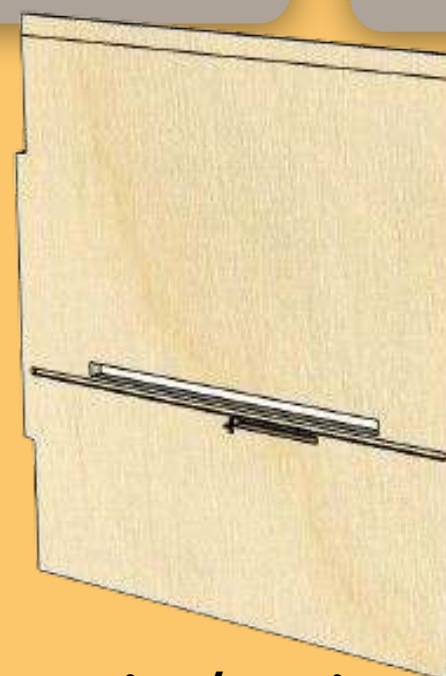
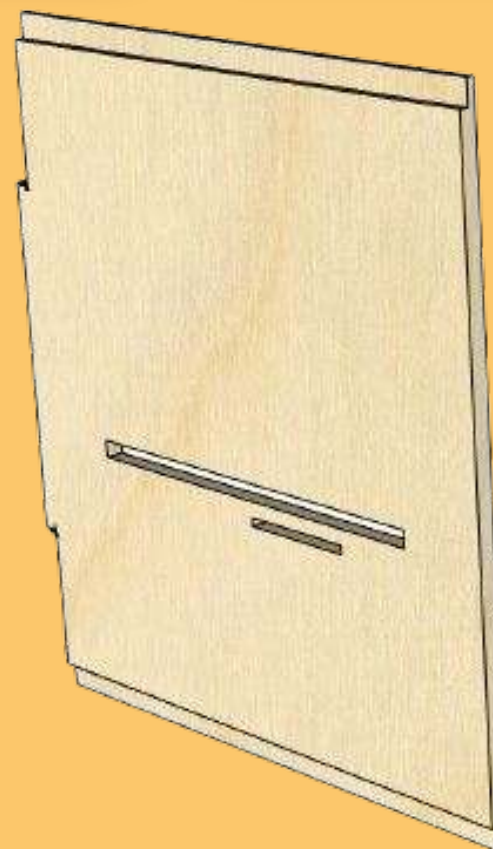




Side wall, manufacturing scale model assembly TESTING

I now had to manufacture the side wall pieces, however I ran into an issue. I had to create a rebate joint on the edges, like the previous pieces, for where the living hinges were going to sit. However on the other side I had to have a slot, for where the door was going to sit and run along, as shown in the cad render above. This was not able to be done using the CNC Router, so I had to test other possibilities

I created a **scale model of the door**, but cut it in 2 parts, One had a slot for the door to run along, and the other was taller, to provide area for the living hinge to sit onto. Therefore I was able to attach both of these pieces together and **create the intended design I was looking for**. Therefore I was forced to create 4 pieces of 6mm, for the sides, where I would stick them together in pairs, and would be able to achieve my intended design



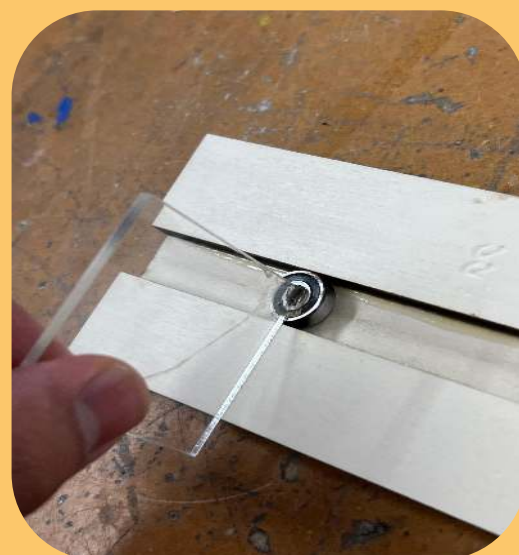
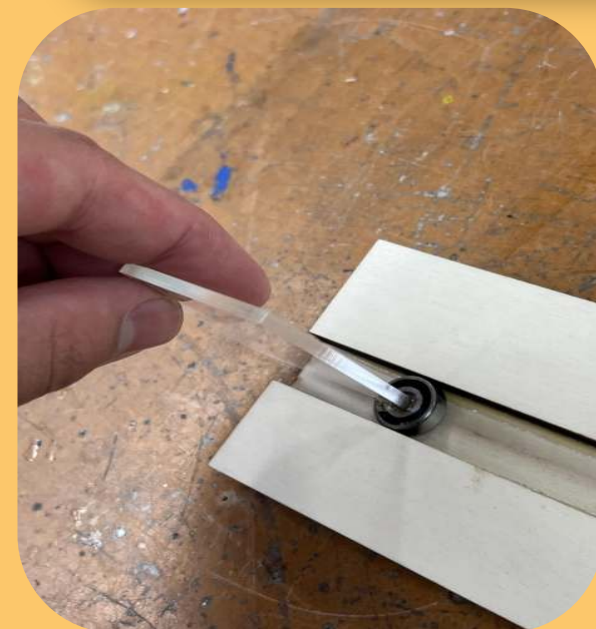
Innovation/ Design Change (Door)

When considering the design of the door, I decided to introduce **Ball bearings**. These would allow the door to smoothly glide across the ridged slots on the walls sides, as the ball bearing would rotate it would ensure that the door would slide comfortably

Testing the Design Change (Modelling)

Once I had my hands on the ball bearings, I used a vernia calliper to measure the inner diameter, for there the door would sit in, and also I would measure the outer diameter, and make sure it would fit within the spacings of the slots. I then created a small cutout to represent the door and tested the doors fit into the inner diameter, and with some adhesive it fit perfectly





Slot/ Door mechanism Scale Testing

After I had assembled a scale door with the ball bearing attached, I had to resize and retest the side pieces, and specifically the slots in them, for where the ball bearing will run across. To create the model I lasercut 2 pieces of timber in the required sizes, and one of the pieces had a slot of the ball bearing to run through.

When testing I had left a >1mm tolerance between the ball bearing and the slot for it to run through, and when testing I found that this worked perfectly, and would work perfectly on the project.

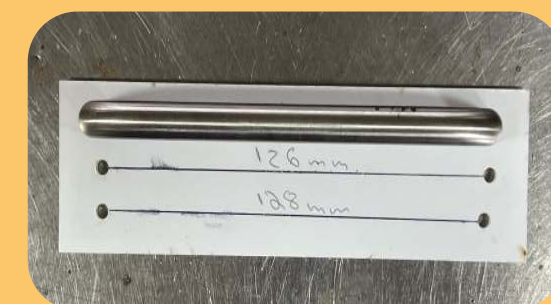
With this information I adapted the CAD files I had, so that they would fit within the required sizes. These tests ensure that once I cut out the side pieces they would work perfectly with the door mechanism

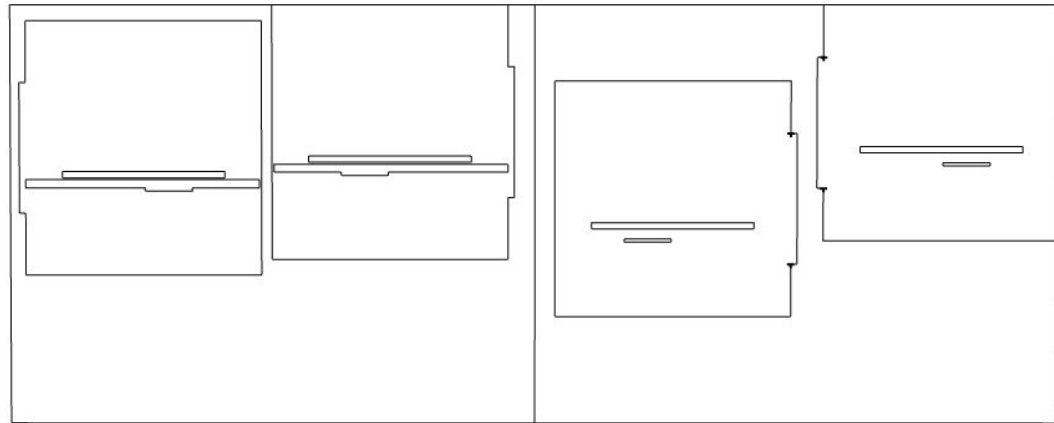
Handle Ergonomics Testing

To increase the strength of the handle, I had decided to move from the originally decided laser cut handle, and instead moved to a premade metal alloy handle. This handle was more aesthetically pleasing than a laser cut handle, and furthermore is much more secure than a laser cut edition. **I simple test the fit of it in my hand** and found it works very well. I further got a client with larger hands which also stated it worked perfectly. Its smooth finish ensure its comfortable to hold, and just wide enough to ensure it fit perfectly

Handle Distance Testing

I then **tested the distance between the 2 screw threadings on on the handle**. I created a small sheet with holes of different distances and deduced that on the cad file I would need to create the **distance between the 2 holes as 124mm** wide. This ensure that it fits perfectly once I print the door out





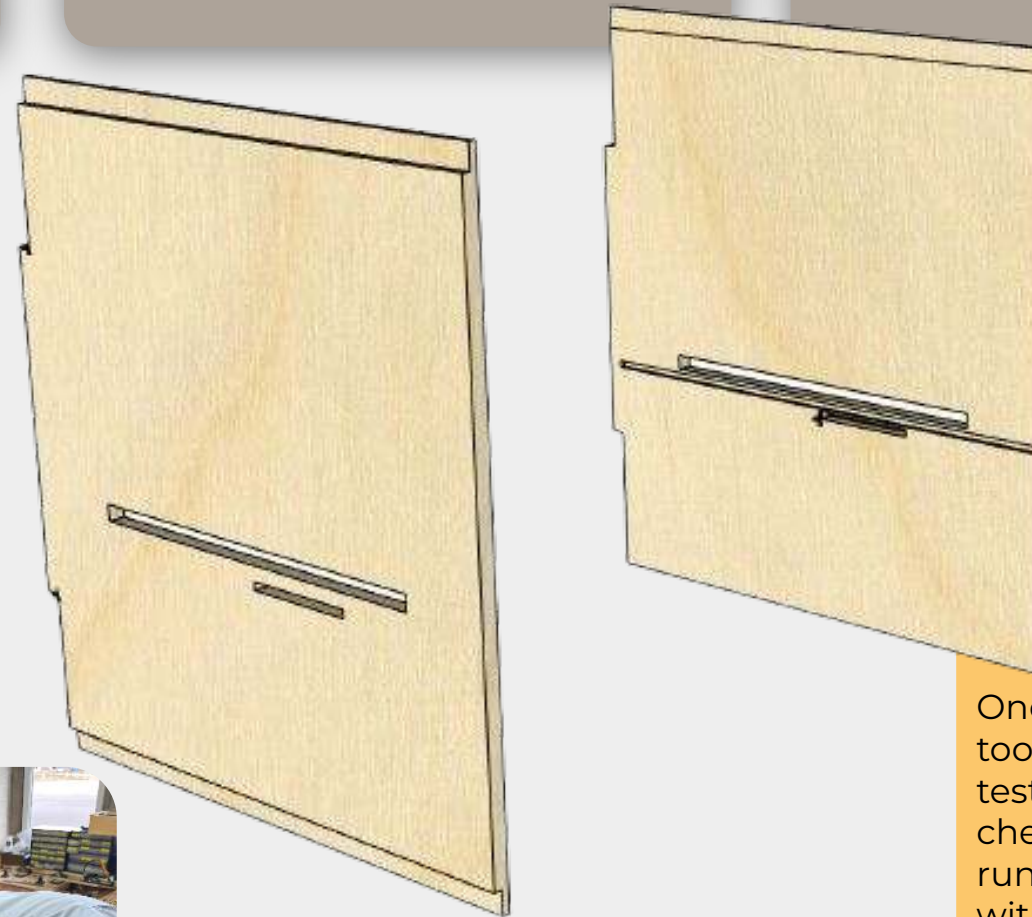
Component B Designing

On sketchup, I had to change the design, so that it was in 2 parts, that are able to be stuck together. As shown in the top right corner I created 2 sheets, of the 4 pieces

Component B Manufacturing

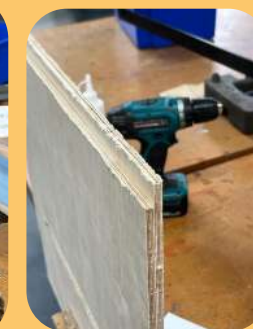
For the Walls of the storage compartment. I had a better understanding for how I was going to manufacturer it, this is because of all of the testing I had carried out. And I was very curtain on how I was going to create and design this component

I first created a 'sheet' of this design on **sketchup**. I then imported it into **VR milling**, where I used the **CNC lazer cutter** to cut out these pieces. After this I simply used the **table router** to cut these pieces out of the sheet, the then to finish off I used **glass paper** to remove all of the extra furry, sharp pieces of the edges of these pieces, after this I was able to test its fitting into the back piece Then I pair each piece with the corresponding piece, then I proceeded to use **PVA** glue to attach the pieces together. I let it rest for 25 hours before carrying out the quality control tests to ensure that it is up to standard



Quality Control Check (Tolerance)

Once I had let the pieces glue together for 24 hours. I took it out the clamps and then proceeded to conduct tests on it. First I conducted a tolerance check on it, I checked the slot for the middle piece and the slot for the running of the door, and they passed. I then tested it with the model of the door and it passed. It simply need some sanding to further smooth it out

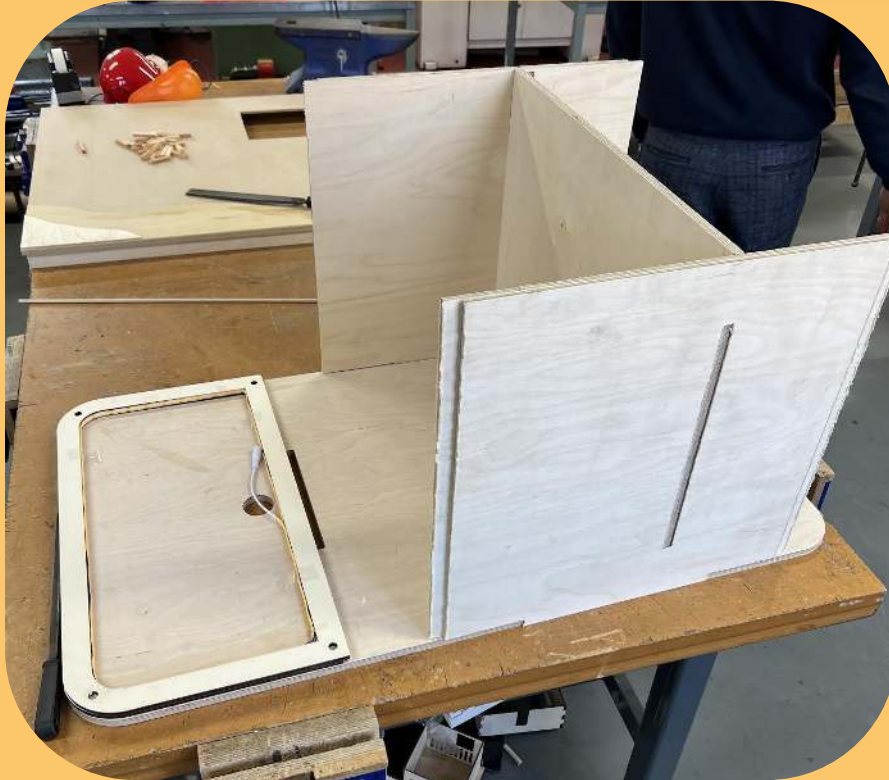


Quality Control Check (Visual)

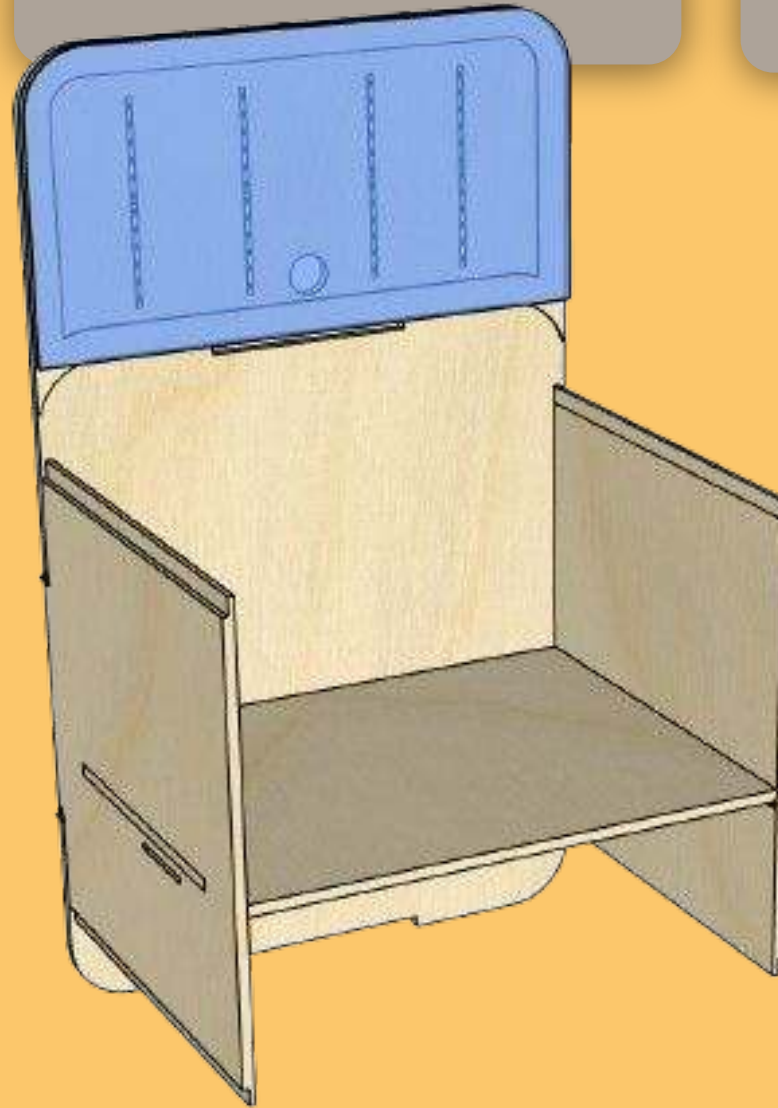
I then proceeded to conduct visual testing on the pieces. These are very important pieces and need to be to the very best standard. I ran into an issue when doing the visual testing, and it showed that the edges, had gaps in them (in between the 2 pieces). I highlighted an example area. To resolve this issue I decided to appley more adhesive, only to the edges. And clamp it ensure it remains attached, and it worked



Parts assembly testing



Manufacture Diary



Week 5 (2/12)



Quality control test (Parts Assembly Testing)

I now with majority of the parts decided to conduct a parts fitting test. I assembled all of the parts and **decided to test their assembly, the fit of them all together and furthermore the look of them**

I first assembled the side walls with the middle piece. These Fit very well, it was a very tight fit, which is a positive as it ensures that it is a very very strong joint. I also inserted the piece, which is used to hold the door up when it is contracted and that fit perfectly. I looked at the runnings, which are for the doors, and they were in the perfect place, they ensured there was enough room at the top for the door to stay in when contracted.

I then proceeded to test these pieces with the back piece attached to it. **This was also successful, they slot into the perfect places**, and with just enough room, so once the adhesive is attached then it will be a very strong and rough joint. They also fit into the right place, no complications with where they fit.

I Decided to **slightly sand the edges of everything the ensure that their is a little more room** for the adhesive to sit

Quality control check (Tolerance)

I then proceeded to conduct a tolerance check on the pieces, when they were assembled. **They all fit within the 2mm tolerance comfortable.**

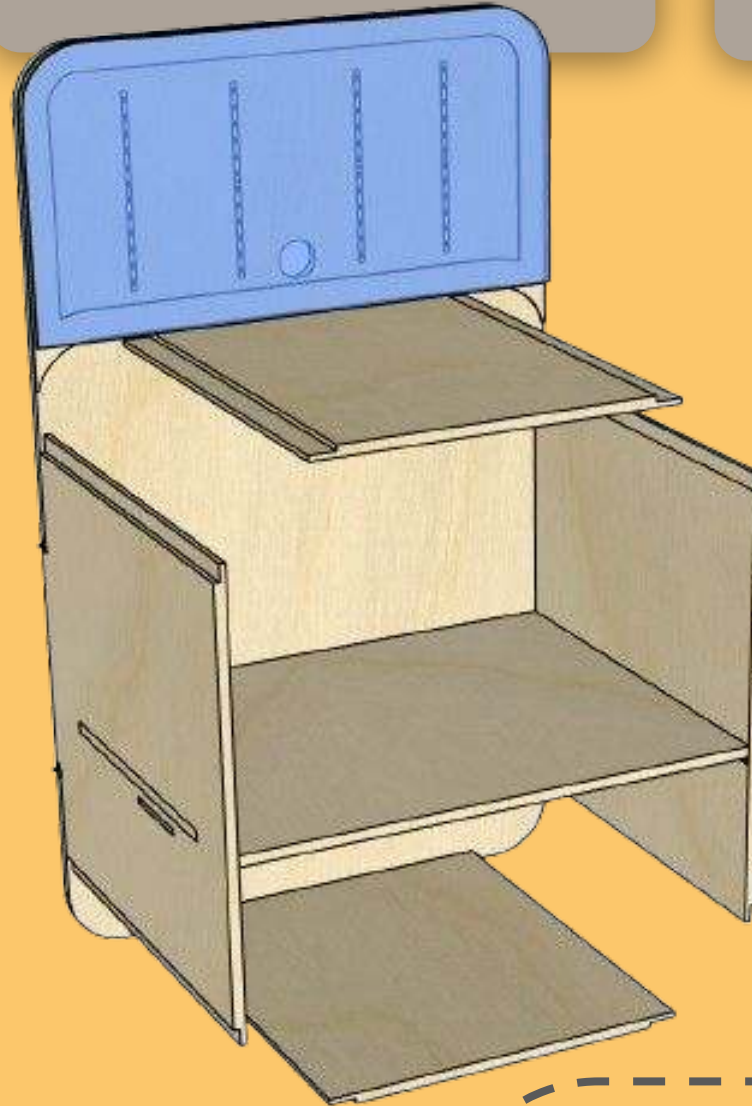
These were designed very precisely, and with the precision of the CAM machines it ensures that they will be to a very close tolerance. I further **used these measurements to compare** to the Cad Files I have and to the **CAD files of the living hinges and they matched**



Parts assembly testing



Manufacture Diary



Week 5 (2/12)



Parts Assembly Testing (Top and bottom Pieces)

After the previous test. I then inserted the top and bottom pieces, and proceeded to test the fits of the top piece and bottom piece. These furthermore fit perfectly within their slots, the top piece fit very tight, which was a massive win. However the bottom piece doesn't have any external support so I required someone to hold that up in place. This can be a problem when properly assembling the pieces together. I could possibly use sash clamps and other devices to hold it in place while it is drying.

I then looked at the spacing in between, for the living hinges, and decided to complete more testing as shown on the side.

Living Hinges testing

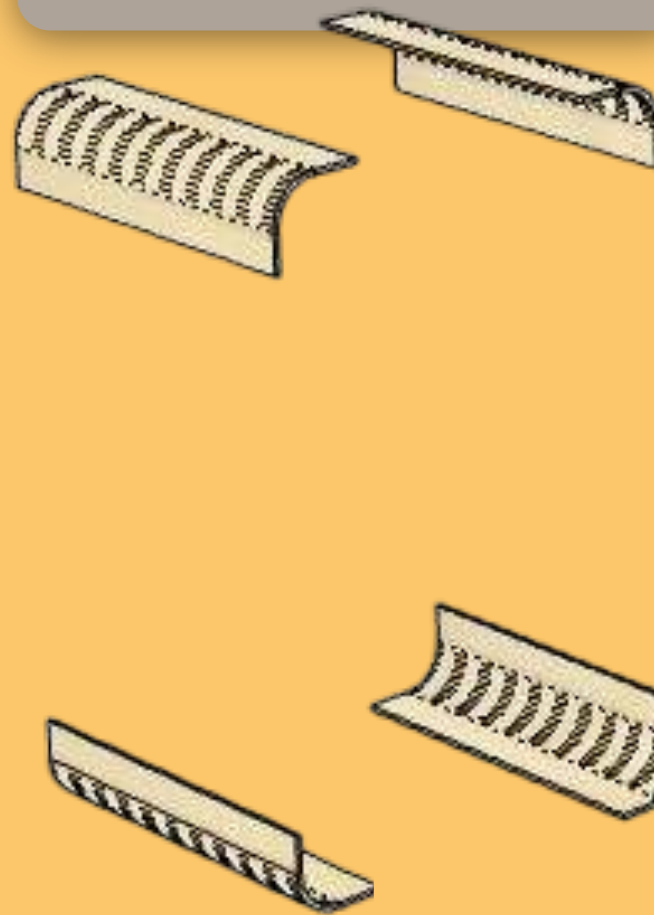
I then proceeded to test the spacing in between the side pieces and the top/bottom piece. I used my already existing living hinge model to place in between them and test the spacings. They fit near perfectly, however they were a bit too wide, which I can easily change for the real things.

I further found out it was really hard to hold in place, and that I would need to think of possible external ideas for how I would hold them in place while they are drying. Possibly using sash clamps would be the best idea.



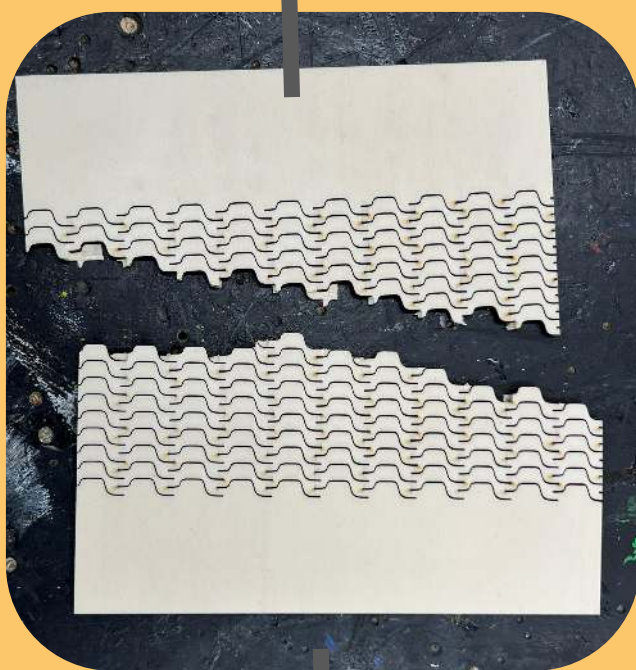
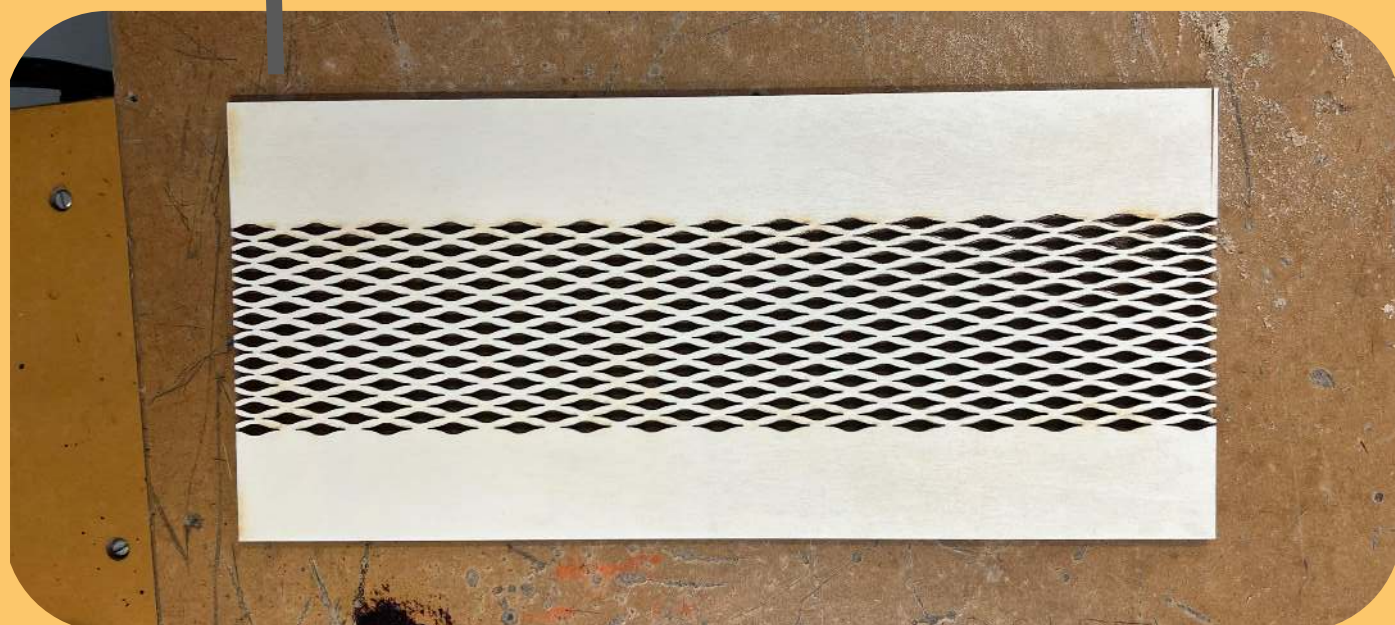
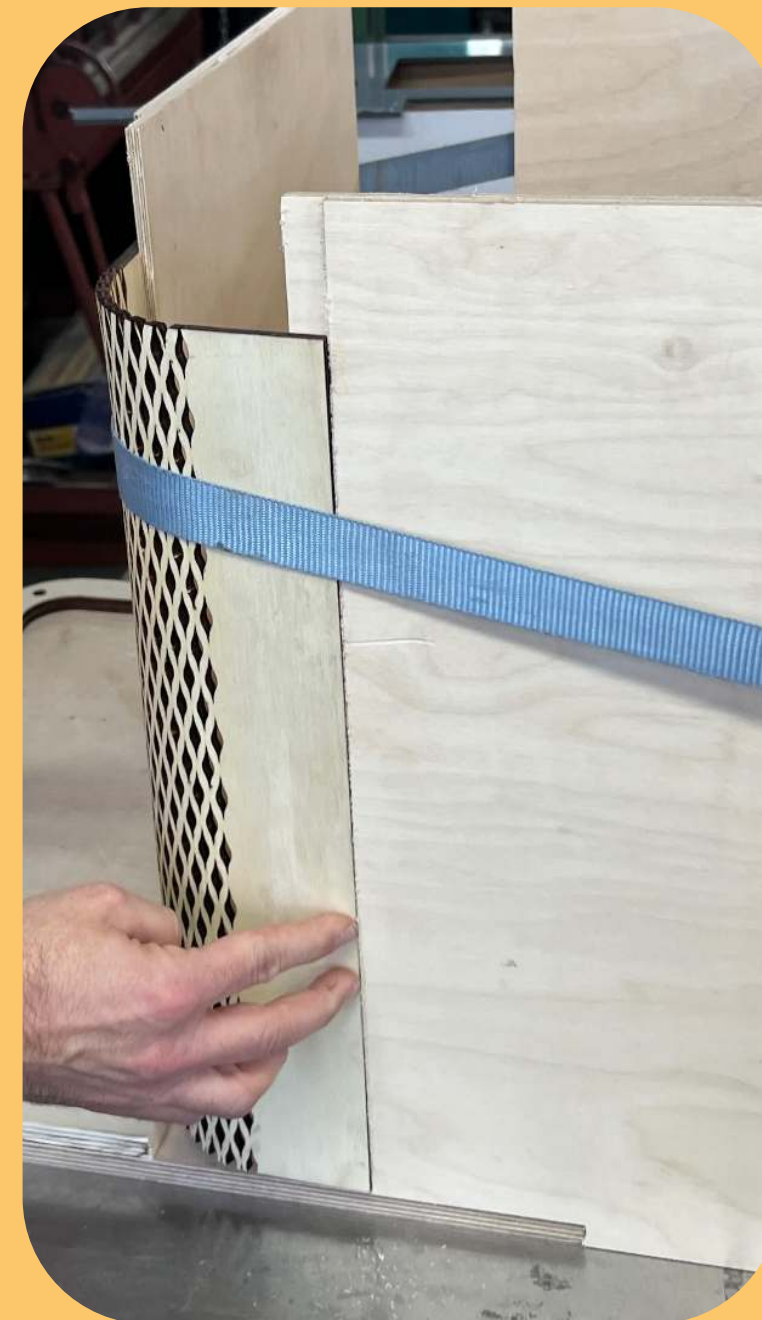
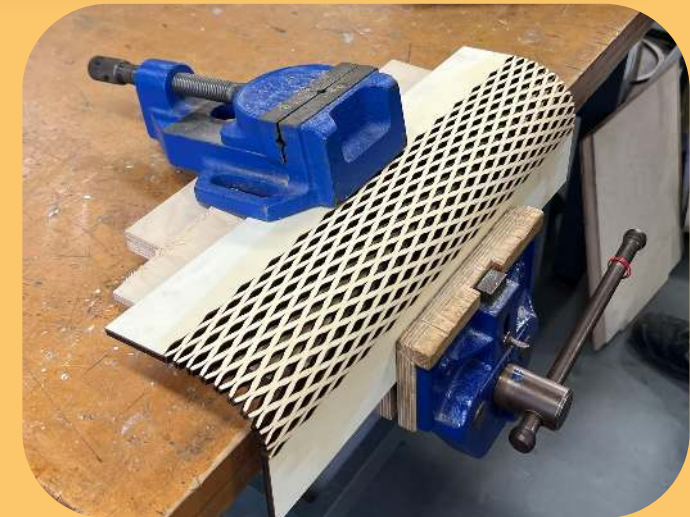
Living Hinge Design Testing

Originally, I had started off with the **CNC routed** living hinge design, but this had many problems, the holes on the cut out were too large and it looked more like a net instead of a piece of timber, and it was very **very stiff**, and hard to bend. It was also hard to sand, and I was unable to remove all the **splinters** and fluff of it. I then tried to test making one on the **Laser cutter**. This would ensure that no splinters or fluff would remain on the piece. I **tested many different layouts for the new design** as shown on the side but then I ended up sticking with the bottom one as it didn't break, and looked much **more aesthetically pleasing**



Living Hinge Fitting Testing

I temporarily **assembled** all of the parts I had together, and with my **test living hinge placed in its dedicated place**, the width of the piece was perfect and fit perfectly as shown but it **was 50mm short**, which was a simple change in **Lasercam 2d**. Once I did this it was time for me to state producing **4 pieces and assembling all of them together**. The living hinges only **required some sanding and wetting** to ensure the glue could become loose and allow the plywood to bend into place

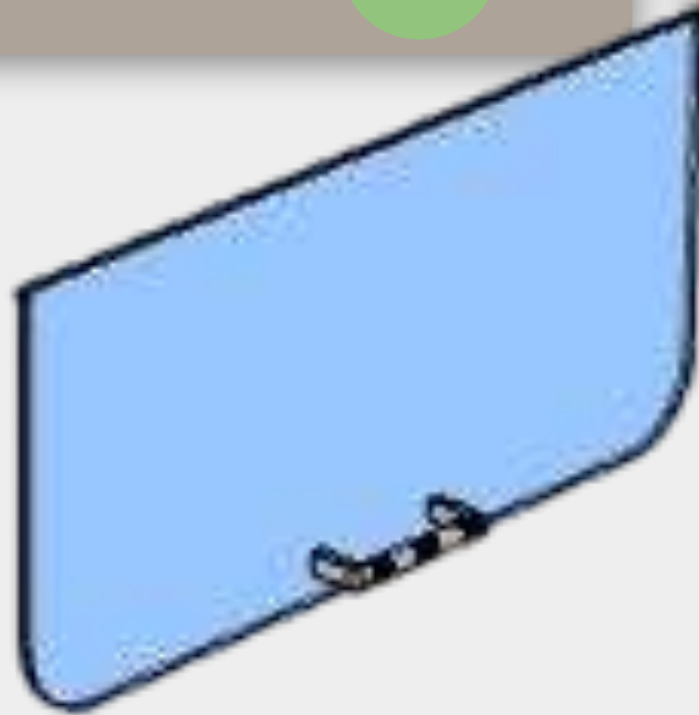


Component

C

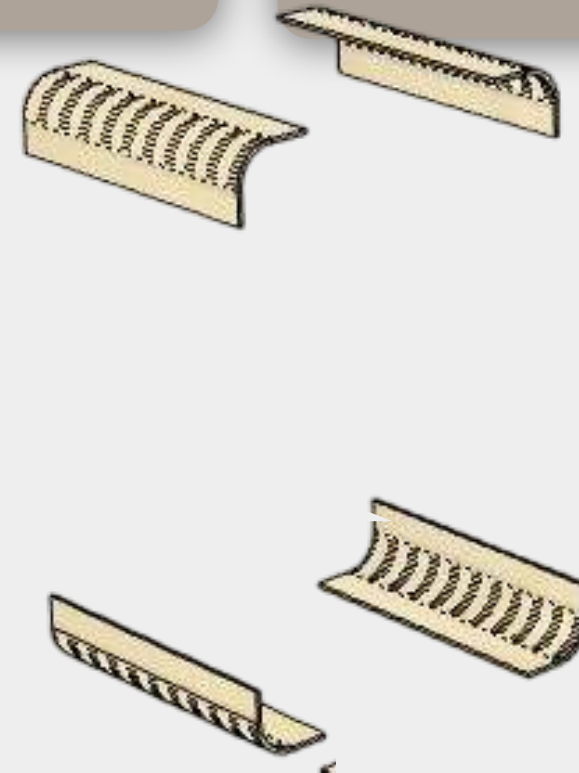
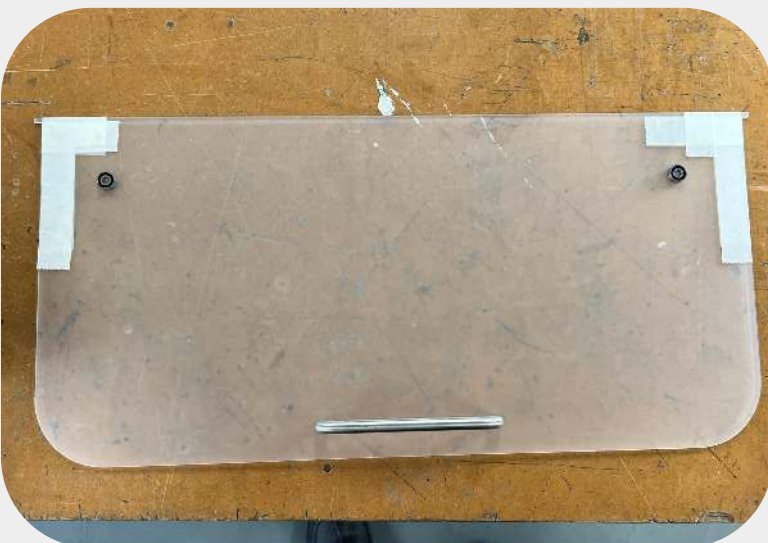
Manufacture Diary

Week 6 (9/12)



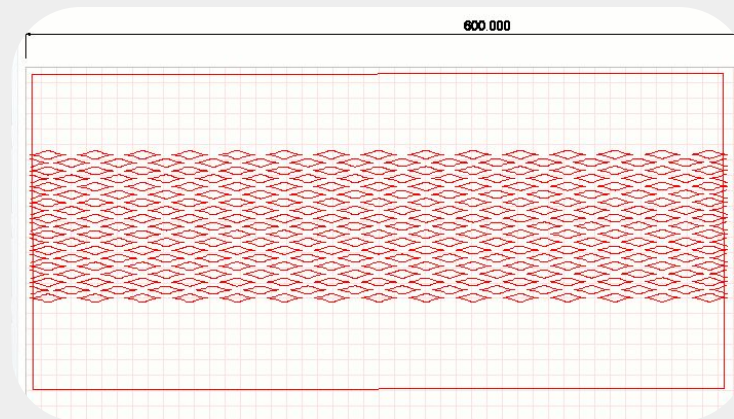
Manufacturing Component C

I then restarted my production, after large amounts of testing. I sent my door cad file into **Sketchup**, and tweaked it slightly before importing it into **laserCam 2d**. Then I started to print it out on the **laser cutter**, making sure to watch it the whole time. Once it was printed I **attached the handle** with the 2 4mm screws and started the process of attaching the ball bearings. I stated of my taping of areas that I didn't want the **epoxy resin** to touch. I then started to **sand down** the insides of the ball bearings so that the **epoxy** has something to hold onto. Once I did that I then started to apply the epoxy onto the sight to which the ball bearing will go on and put a little on the ball bearing. I let the ball bearings rest on it and let it **dry** for 2 hours before testing

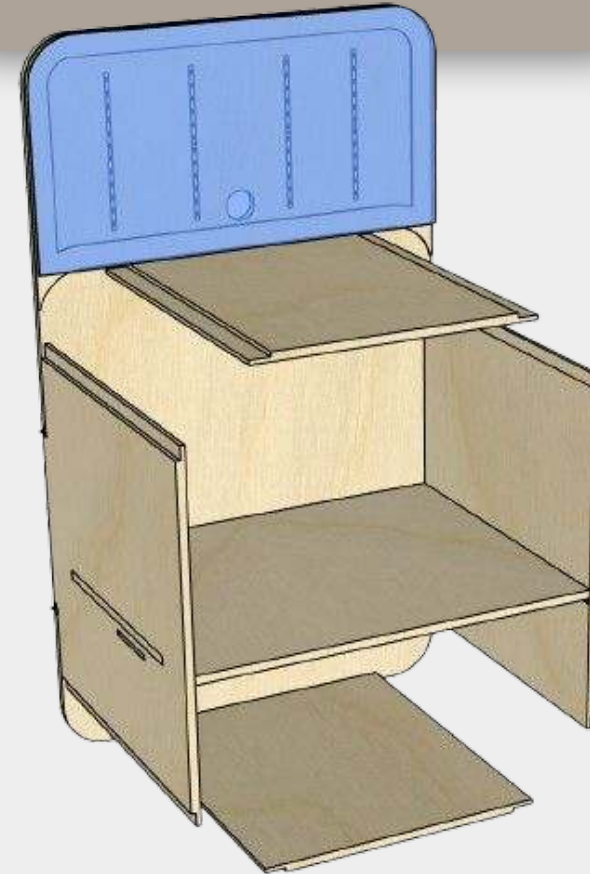


Manufacturing Component C

I then started manufacturing the living hinges. I first **printed** out 4 living hinges using the **laser cutter**. These took a very long time due to the complex and detailed design of the living hinge. After this I took them, **sanded off** the remaining **burn marks** from the **laser cutting process** and started to bend the pieces. To ensure they would **bend** I **used water to wet it**, this would temporarily soften the glue in between the plywood layers so I would be able to **bend** it and place them pieces in **clamps**. I had to let it dry for **5 hours** before taking it out of the clamps. Once they had been bent it was time to start **assembling** as I had all the required pieces



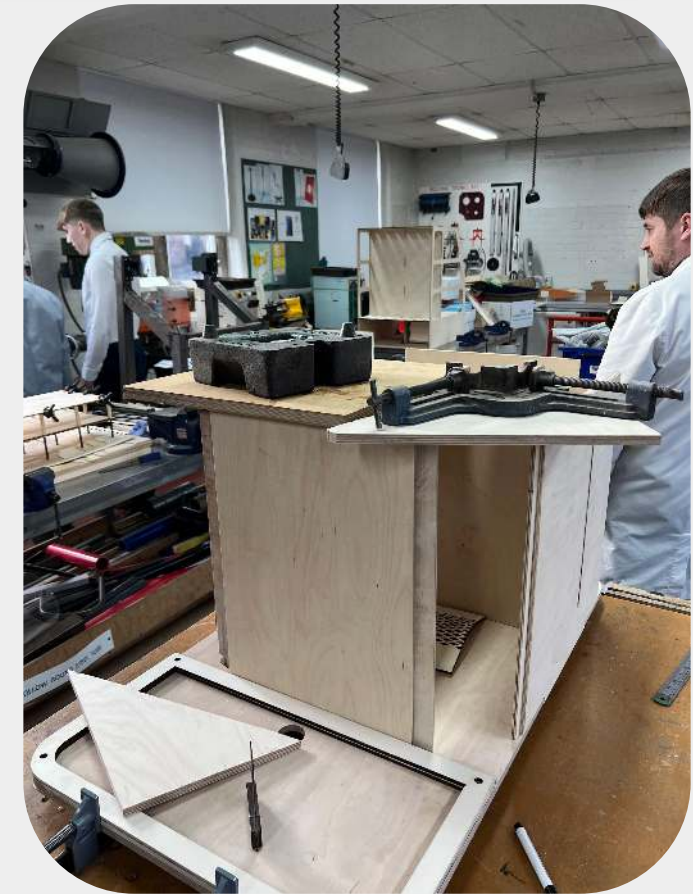
Step 1



Step 2

Assembly (Step 2)

For step 2, once everything else had glued into place, I decided to start and attach the **top and bottom pieces** in. In simple used **PVA Glue** for both of them and once in place I used **weights** as shown on the right, to hold them in place. For the bottom piece however I was required to take an extra step and use a **sash clamp** to hold it in place ensuring that it does not fall out of place



Assembly (Step 1)

For step 1. I attached the **side pieces, middle piece and the back piece all together**. To do this first I assembled the side pieces together with the middle piece using **PVA glue**, one crucial thing I had to do was make sure the door was placed in the middle before doing this, and I did this by using making tape to hold the door in place and ensuring that it does not move. The door cant just slot in and out. Then I proceeded to attached all of these together to the **back piece**. I used **sash clamps** and **larger clamps** to hold them all together and hold them **very tightly**. The reason I used to much force when attaching them together was because I wanted to ensure their was very little space between them, and that it was a **very very tight fit**

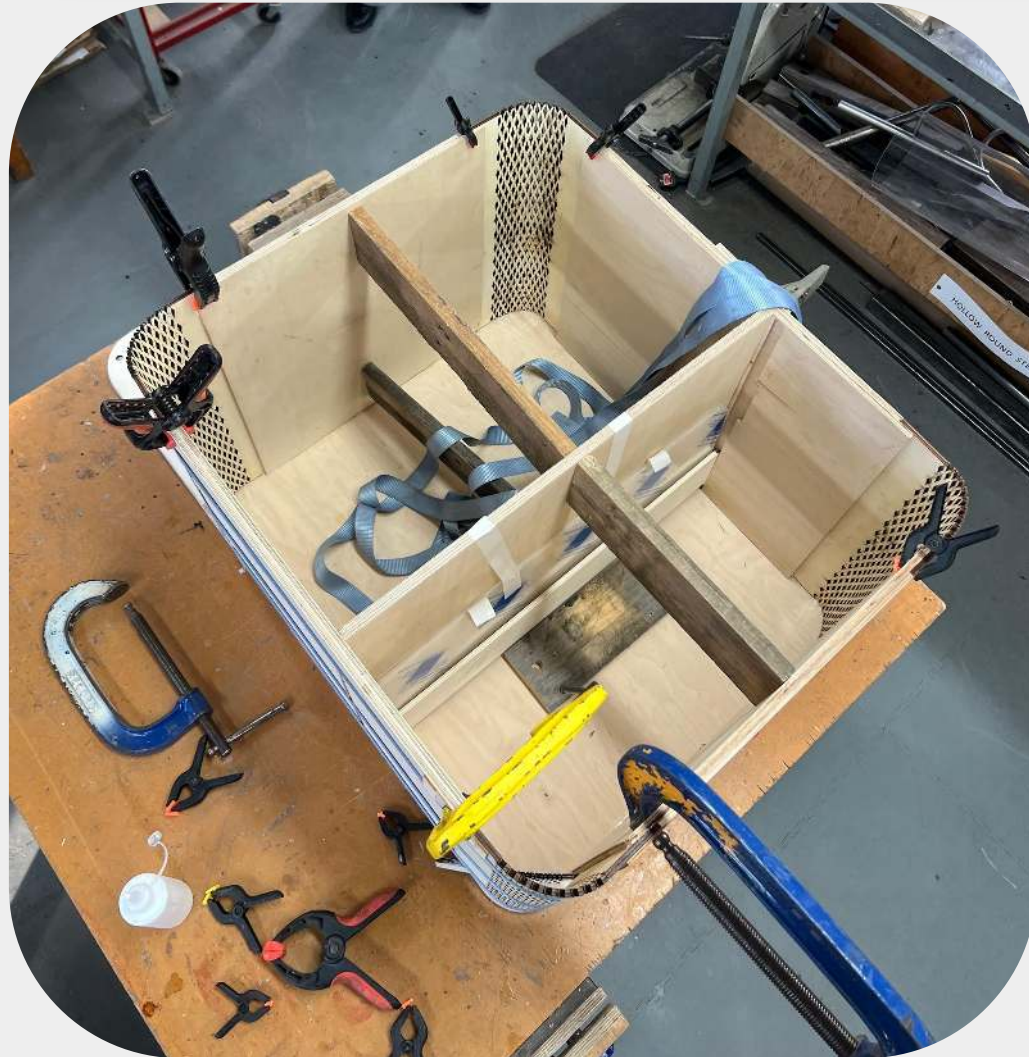


Quality Control Test

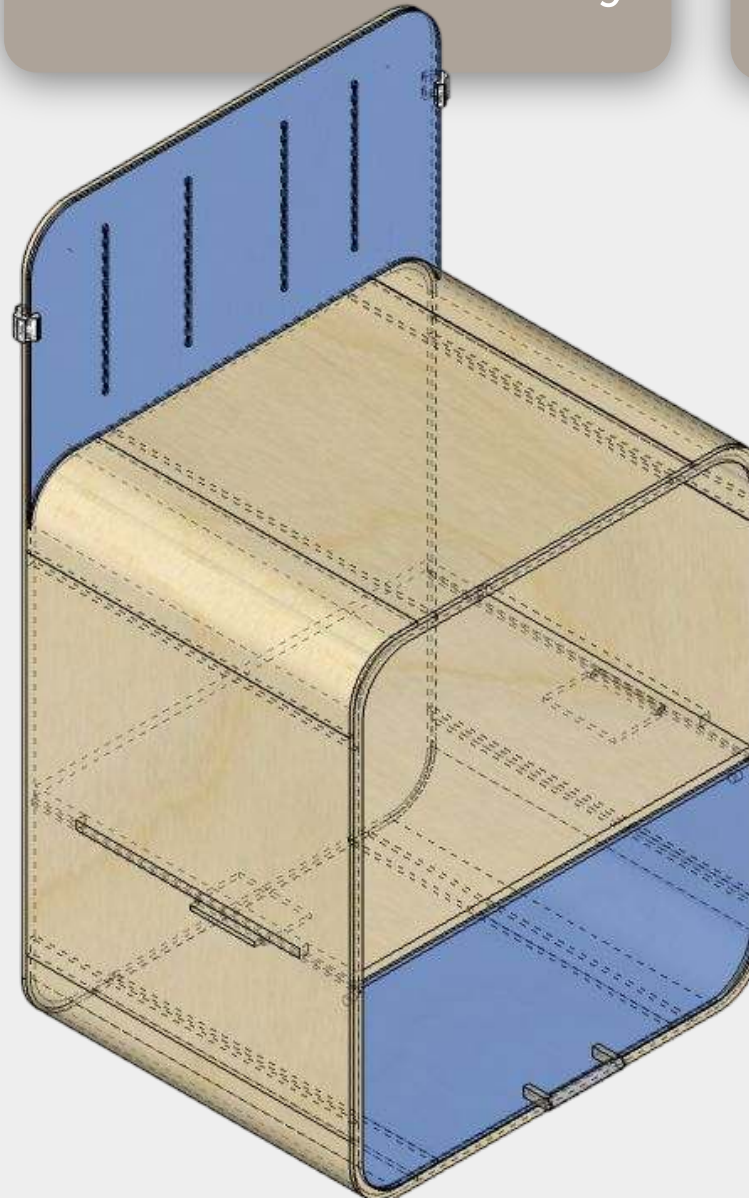
Once everything had had 24 hours to dry, I wanted to mainly test the bottom and top pieces, to see if they sat at 90 degrees, and they infact did, something i used to test if they where at 90 degrees was a combination square. This showed me they they both sat at a perfect 90 degree angle



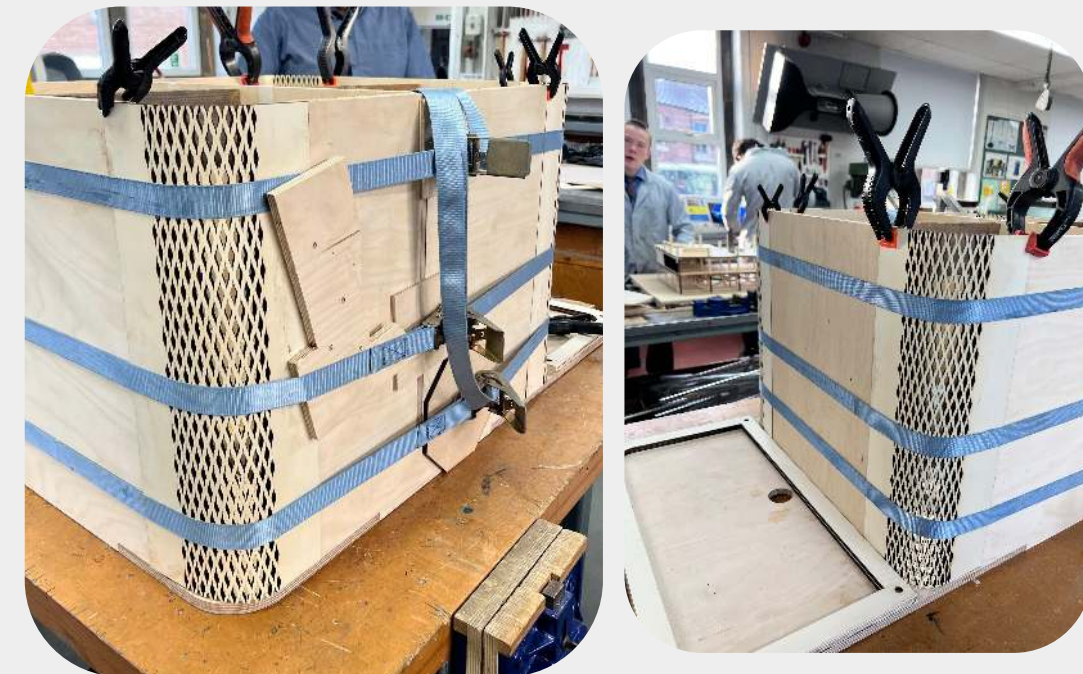
Assembly



Manufacture Diary



Week 7 (16/12)



Assembly (Step 3)

For this step, I had to attach the hardest part which were the **4 living hinges**. This was the hardest step by far. I firstly assigned one living hinge to each side. Once I had done this I used **PVA Glue**, and applied it to the edges of the living hinges and the area it will contact with. With the help of teachers I was able to get them to hold it in place while I attach the sash clamps. I used 3, **one for the top, one for the middle and one for the bottom**. This would ensure that all areas of the living hinges would make contact with the contact areas. I also had to ensure that each one was bent perfectly before I was able to continue. Once the 3 sash clamps were around I proceeded to **tighten each one**, making sure no living hinges would pop out, and doing it **very tight** allowed for the more sleek and compact finish, This was **very successful** but doing them so tight meant I needed to take action.

I produced **braced** for the **bottom and top pieces**, this ensures that the tension from the Sash clamps **would not break** them as they had very minimal support, but once the living hinges were glued on they would be more protected.



Door Test Fail

Once I had glued everything into place, I ran into a major issue. I was conducting a normal test when the door suddenly broke. When I applied a little force on it the areas the ball bearings were attached to both broke. This meant that I would not be able to make or use the sliding door mechanism.



Inspecting the issue I realised that the issue was the strength of the acrylic, increasing the perpendicular distance to the pivot (Moments) was something I hadn't accounted for and meant any little force on the handle would be amplified enough to break it. A tougher material would have been able to withstand the test.

Assembly

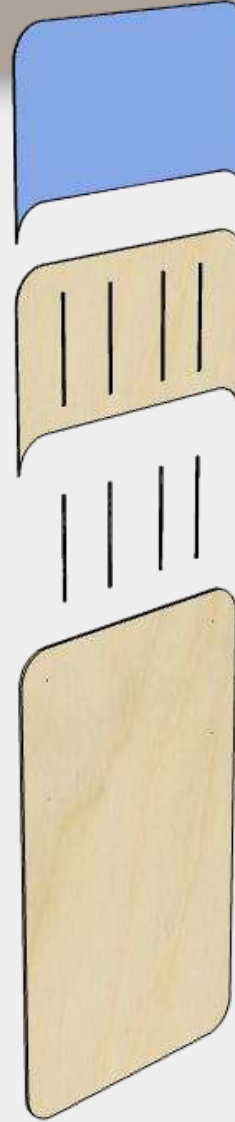
Manufacture Diary

Week 8 (23/12)



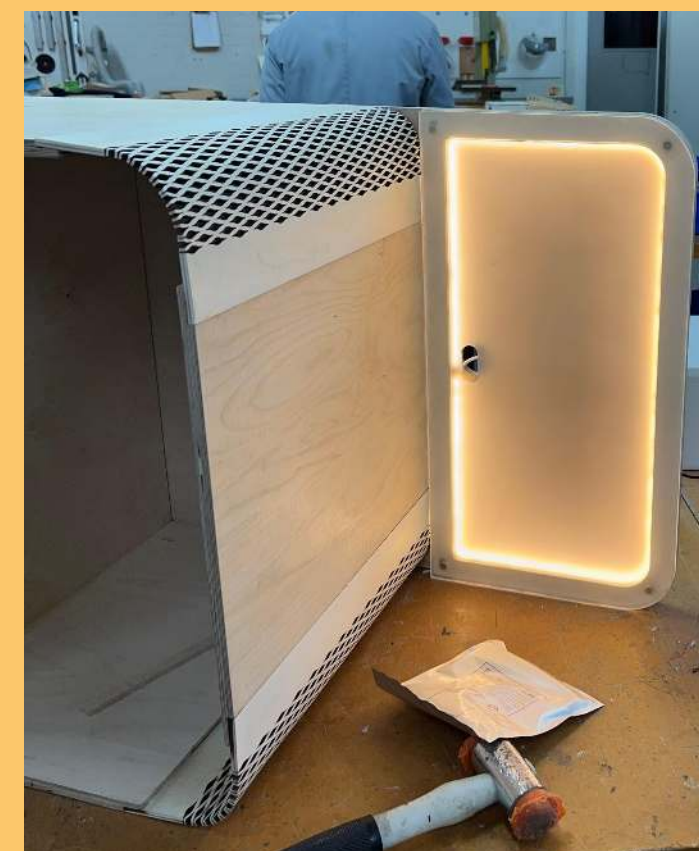
Assembly (Magnets)

Once everything had been done. I proceeded to then finish the small miscellaneous jobs. The first one was to **attach the magnets** onto the dedicated areas. For the timber areas I simply used **Epoxy resin** to attach the magnets. For the Acrylic areas I used **masking tape** to tape areas preventing **stains** from the **epoxy resin**. I had to crucially ensure that the **polarisation was set perfectly** so i matched the magnets with its **counterparts** before setting them in place. The Magnets fit in **Flush and look perfect**



Assembly (LEDs, but again using Glue Gun)

Before, I had simply used the **LEDs** built in **adhesive tape** to attach it to the LEDs, but I was forced to remove it when assembling, and sanding, to avoid dust build up, once I had taken it off, the adhesive had gone weak, and mean I needed to find other ways to. **I decided to use a hot glue gun**, this worked **perfectly** and very **quickly**, the LEDs don't need a very strong adhesive and it is lightweight and wont move., and the weak hot glue gun ensures it can be ripped off and replaced if needed. **The final result for the lighting system is shown on the right**





Major Design Change (Door) 1

Once the door failed its test and broke. I was forced to massively change the design. I then decided to improve and create a sort of **magnetic door**. Similar to the **magnetic** top in front of the LEDS. I firstly reprinted the **original design** of the door, without the species of the Ball bearings to attach too, and instead of the handle being so low, setting it **higher**, as now the **door needs to be taken on and off, not pivoted**. I did this and attached the handle

Testing

I then proceeded to test the handle placement for the new function and it worked **perfectly** as shown in the side

Major Design Change (Door) 3

I now had to improvise with the original slots for the door to slid across. I decided to fill them up with timber but then also use these pieces as shown on the right for the magnets to attach to, which are both made out of **3D printed ABS filament**. The **magnets** on the back of the door would attach to these pieces and hold the door in place. To achieve this I did trial and error getting closer and closer to a piece of timber with the shape that would perfectly fit into the slot, once I was able to achieve it I then used **PVA glue** to attach it in and then slotted the **3D printed Pieces** in. Once both sides were done I attached a **strip** between them to purely improve the aesthetics hiding the slots behind



Major Design Change (Door) 2

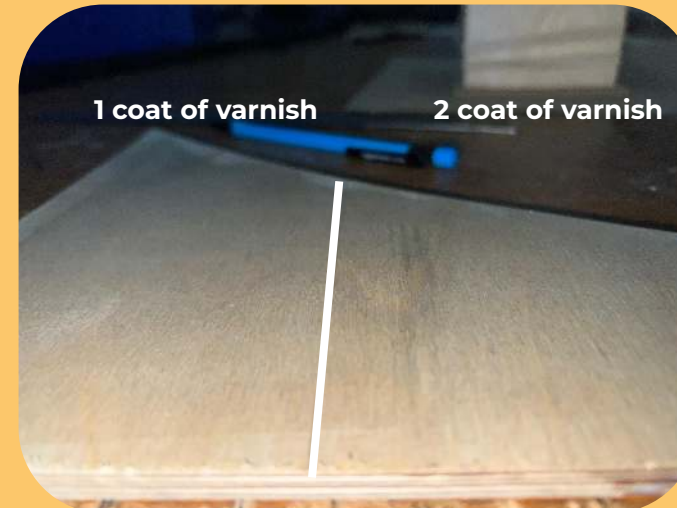
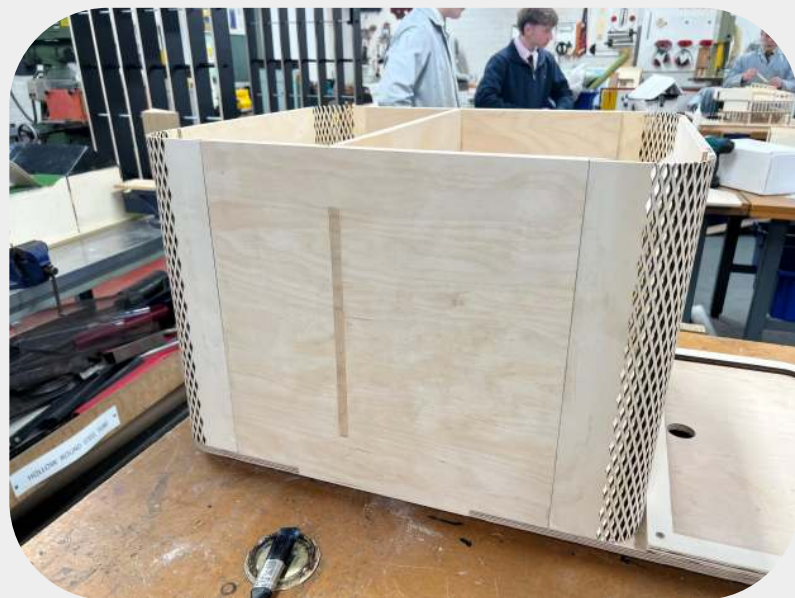
After I reprinted the door. I decided to use the addition of these **timber pieces**, these pieces provide an **aesthetic flair**, and also serve as a place for the magnets on the back of the door to stay. Looking at the bottom right image on the other side of the door is **magnets**, attached to the door.





Sanding Process

Once I had assembled all of the parts together proceeded to carry out the final steps of the manufacturing process. I started of my **sanding the sides, inside, top and back of the product**, ensuring that it is smooth and that there were no harsh areas of bumps, I used a **hand sander** as it worked **quickly, efficiently and removed any percent blemishes** in the process. I then at the end removed any smaller blemishes with some glass paper. Furthermore the **hand sander** was able to partially **round out some edges**, ensuring that the product meets the **specification point for safety**



Varnishing Coating Test

Before I started the **varnishing process**, I had to choose a varnish to use, I ended up using a **clear satin varnish**. This was able to provide an aesthetically pleasing satin/ matte finish to the product and allow for a **waterproof coating**. But I on a scrap piece of paper did **one layer** on one side and **2 layers** of varnish on the other. **The side with 1 was much more matte and aesthetic compared to the other which had a more sort of glossy finish**



Varnishing

I then completed the final process of the manufacturing process. I **varnished** the product. I used the **Satin clear varnish** and used a **thick brush**, making sure to brush along the grain ensuring no brush marks were visible after the process was complete. I did **one coat**, and let it **rest for 24 hours** before moving it. I also placed a **block underneath to ensure no varnish would stick to the end** and instead dripped off, after this and it dried I **flipped it and did the other side**

Against Specification

Context Introduction

For this slide, I have now finished the making and wanted to compare the final product to the specification points, to see what I had met

Specification Point	Priority	Evaluation	Success?
1.0 Primary Function - The product MUST be able to provide mood lighting to my client - The Product COULD provide LED lighting		Overall, for the primary function the product meets all of the points. The product has a frosted piece of acrylic that covers over the LED lights, which ensure that the harsh light is able to be dissipated. This allows for the lighting system to provide mood lighting for my client. The LEDs also have a function that allows for my client to dim the lights intensity. This ensures that the light is not overbearing and is instead subtly contributing to the light of the room. For the second point, I did use LED lighting. Some key features that were included with this LED kit was, it has a remote that allows for my client to easily and externally control the intensity of the light, or simply turning it on and off. Furthermore it has a plug socket, ensuring batteries are not needed, and there for my client does not need to worry about replacing the batteries	
2.0 Second Primary Function - The product MUST provide storage for my clients essential items - Can Possible constain a bookcase		For the secondary function of the product it meets all of the specification points. The product does provide a lot of storage for my client. Firstly I has the top ledge, for small items such as glasses or coffee mugs to rest on. Then it has a very large compartment underneath, for items such as plant pots, this area is mainly for aesthetic or decorative items, as my client wanted. And finally at the bottom, their is a protected compartment for my client to store key or important items, such as books, or other things such as my clients notepads for when she is not drawing. They product also meets the final specification point, as at the bottom of the product, it has a protected and dedicated storage area for my clients books and other items	
3.0 User Interaction - The product COULD have an instruction manual to aid the client - The product SHOULD be simple for any clients 7+		I did not meet all of the specification points for User Interaction. The first point of that it COULD have an instruction manual I did not meet, this is because I did not feel that the product is complex enough to indicate that a user manual was required. The product I do feel is simple enough for 7+ year old to operate. The only parts that the user may need to understand when interacting with the product is the frosted acrylic cover on the lighting system, which does not need to usually be used unless the LED are being replaced. The second part is the door part on the product, which simply just magnetically comes on and off of the product, which is not conceptually hard for the user to understand how to operate	
4.0 Size/ Weight - The product MUST fit into a space of 950mm/2000mm/500mm - The product MUST not be heavier than 18KG		Regarding the first point. The product does very comfortably fit within these set constraints. The dimensions of the final prototype is xxxmm/xxxxmm/xxxmm which is comfortable within the range. This ensures that the product comfortable fits within the dedicated sight that my client intended it to sit in The product weighs xx KG, which is not over the weight limit, however due to its size and the way it is shaped makes it stall hard to maneuver. However my product is intended to sit in once place and not move, so its being heavy is not a large problem	
5.0 Aesthetics - The product MUST take inspiration from the Scandinavian interior design style (Must be simplistic) - The product MUST fit into my clients room flawlessly - The product MUST display attractive grain - The product COULD portray a seamless design		For the first point. The product does heavily take inspiration from the scandinavian interior design style. The way that I was able to integrate this style was from my heavy use to timber. Timber is a staple material in the Scandinavian Interior design style, and to replicate it the most commonly used material on this project is timber. Furthermore the style uses RAW materials, such as my used of a metal for the handle of the door cover. Furthermore I tried to integrate minimalism into the product, so my simple design meets this. I tried removing all unnecessary components and focused on its form. The product does fit into my clients space, aesthetically and within the constraints of my clients room. The natural aesthetic of the product fits perfectly into my clients dedicated room The product PRIMARILY uses timber, and therefore I ensured that the product would display its aesthetic grain. I further used finishes, such as varnish, to further protect but highlight the grain, and enhance it The product furthermore does portray a seamless design. Thes rounded edges and simple forms means that the product does portray a seamless design (In my clients opinion)	
6.0 Cost - The product MUST cost less or up to 40 British Pounds		Unfortunately, I do not meet the constraints of this specification point. The LEDS alone cost me 25 pounds, which is half of the total constraint. The time taken for making and assembly, including the cost of the materials meet around 60-90 great british points according to my client, therefore meaning that I don't meet this specification point	
7.0 Safety - The product COULD have rounded edges - The product COULD not contain any loose wires or potential electrical/ tripping hazards		Regarding the safety of this product, I meet all of the points. Firstly my use of living hinges ensures that the product has rounded edges throughout. In addition when sanding before varnishing I used the hand sander to round out all of the edges, further ensuring that the product meets this specification point. There are no sharp edges of the product and all of them are rounded The product also has all of its wires covered up. The LEDS came with their wires covered up all the way, including all the way up to the plug socket. The thick rubber coating on the wires ensures and water spills and possible abrasive wear, will not expose the wires underneath and risk the safety of my client	
8.0 Materials - The product MUST use materials available within the QEGS DT Department - The product COULD use Manufacturer timber or HiPS/ acrylic plastic		For the products materials used, I primarily used timber, this was more than 80 percent of the total materials used. Furthermore other materials that I used where acrylic and a metal alloy. Only for parts of the door and the cover for the lighting system did I use these other materials But for the living hinges, the brackets, the backpiece and the side, top and bottom parts I used Timber All of these parts where available to my in the DT department for me Furthermore I did not use any HIPS as I did not need to vacuum form any pieces on this product, however it says HIPS/ Acrylic and I did use a bit of acrillicy as stated on the frosted cover and the door	

Against Specification

Context Introduction

For this slide, I have now finished the making and wanted to compare the final product to the specification points, to see what I had met

Specification Point	Priority	Evaluation	Success?
9.0 Sustainability - The product MUST use sustainable sources materials - The product SHOULD maintain low levels of waste product when in production		I had designed the product to be sustainable, that is why I decided to create the frosted acrylic cover to be magnetic, I did this so that the products LED could be replaced if broken, simply by popping off the cover taking the LEDS of and replacing them with new ones I did mainly use sustainable materials, I used timber which is a very sustainable material Regarding waste. I tried to keep that to a minimum, when creating the sheets of the different parts, I tried to fit as many parts into as little sheets as possible, the reason that I did this was so that no extra unneeded material would be wasted, but I unfortunately did waste material, from the broken door, to the multiple tests I had to carry out on the different parts a lot of material had to be used	
10.0 Ergonomics - The product MUST fit Anthropometric Data - The product MUST be inclusive		Overall, this product is very inclusive according to my client. They stated that this product is not too tall, so that younger individuals would not be able to use the product. This product does not however use any anthropometric data, and instead just used simple dimention measurements for different items such as books, so that they fit inside of the book area.	
11.0 Manufacturing - The product MUST use processes available within the QEGS DT Department - The product COULD be manufactured on the scale of mass production		This product used majority of the available processes in the DT department. Firstly it used primarily, the CNC router, which I used to cut out the larger items on the product. In addition another process I majorly used was the Lazer cutter, this was for smaller but more intricate items such as the frosted cover, as it was able to precisely cut the holes for the magnets, to a very small tolarance. However this product did not use any other process, such as the vacuum former, this was simply due to me not requiring the use of it. But then I used other processes, such as the table router. But I didn't use all of the process available to me. This product I feel is currently not suitable for mass production, I address this in the following slides	
12.0 Durability - The product MUST withstand Coffee or water stains - The product MUST last have a product life for longer than 5 Years		Regarding the first point, the product if able to withstand Coffee and water stains, to achieve this I used a protective coation to cover the timber. I used a matte varnish, that prevents the timber from damaging or staining from accidental pours on it The product I feel, and according to my client, does have a product life longer than 5 year, however rigorous use of it, could damage the delicate joints and possibly risk a breakage	
13.0Ethics - The product MUST not display or offend any groups or minorities		This product does not display any image, that may be offensive to any group. It does not display anything that may be offensive and therefore clears this specification point	

Modifications Made through the Manufacturing Process

01.

Joints-

a. My first modification to the design was to add the key joints, this where mainly the finger joints to the side pieces and the back piece in anticipation for when I needed to join them together
02.

Magnets-

a. I then changed the design for how the diffuser would attach to the back piece, I decide to scrap the idea of using the clips and instead used 10mm magnets, which would allow the diffuser to attach magnetically to the back piece, I also used spacers to allow for the LEDS to have more space
03.

Diffuser-

a. A minor change I made was adding a finger hole to the diffuser, so that you could easily take it of the back piece
04.

Fitting of the LEDS-

a. I then changed the was the LEDS would fit onto the back piece, instead of facing forward I would place the LEDS facing inward, so on the outside, so that the light would not be direct onto the client, so as a result not being as harsh
05.

Side Piece Assembly-

a. Due to not being able to produce the runner on the side piece and the rebate area on the side piece, I had to change the design to make the wall into 2 pieces , that would attach to each other and then be fitted onto the final product
06.

Door runner-

a. I then changed the runner on the door itself, so that it would have a ball bearing on the end, this would allow the door to smoothly run across the runner without catching on anything and stopping
07.

Handle Manufacturing-

a. I instead of using the 3d Printer, instead used a premade handle that is much stronger, and fit the anthropometric data provided
08.

Living Hinge Design-

a. I completed testing on the living hinges, and wanted to test possibly ways I would be able to manufacture it, as I was not satisfied with the current design using the CNC router, I landed on a much cleaner and slick design that featured sort of diamond shapes on it. I then tested this design and once I completed that Used this design on the final product
09.

Door Design Changes-

a. When testing the product, the door broke, on the ball bearing area, so I then had to drastically change the design, I created another door, with inserts for magnets that would magnetically attach to a 3d printed piece attached railings.
10.

Varnish-

a. Instead of using 2 coats of varnish as originally intended, I used 1



Final pre manufacture render



Final Product

Testing

Context Introduction

After all of that, I proceeded to conduct rigorous testing of the product. This consists of on sight testing of the product, testing of the different components and parts, a test of its assembly and many others. There are crucial tests to ensure that I can understand all of the products weaknesses, and so that I am able to correct them in the post manufacturing modifications slide, after all of this is done. I also did a product timeline, so that I was able to visualise the progression of this product from the start to the finish

Functionality Test A

For this test, I wanted to test the door, and its functionality. Firstly taking it off the prototype, **the handle was very ergonomic**. I have large hands and this fit perfectly so I feel like it can fit all types of peoples hands. I then placed different items inside to **test its sizing**. I put a weight in (substitution for a general item) and then placed multiple books from the DT department. I did this to ensure that the compartment was able to **hold all sizes of books and other items**. I noticed that the strip did sometimes get in the way, and this is due to its unplanned nature, and that fact that I did not think that I would implement it, so I took it off and it removed this issue. I then tested putting the door back onto the prototype, and this was smooth as well, however another problem I noticed was that when **weight was on the top of the product, the bottom hinges tended to flex** as well as the top hinges, this meant that the **side of the door did not perfectly met the shape of the compartment**, this can be something to think about changing. This is a possibly future modification



Load Bearing / Stability testing

Load Bearing

I then based of the previous test results, decided to do a **load bearing test to showcase the flexion on the hinges**, I placed a weight onto the top of the product and I noticed that the hinges started to flex, however It did not break or snap which was a very large **positive**. I used a **15 kilo weight, which is much larger than my client requires**. Meaning that it passed this test. However I do feel that I could address the flexion problem as it tends to change the shape of the door section, which I do not want to happen, this is **possibly something that I can change and adapt**

Stability testing

I then conducted a **simple stability test on the product**. I simple used my hands to apply forces to the sides of the product to **assess the stability and whether it would be able to stay upright** and not fall. This wide base ensured that it would not fall, even with the rounded living hinges, **this was not a problem**



Non loaded



Loaded



Testing

Context Introduction

After all of that, I proceeded to conduct rigorous testing of the product. This consists of on sight testing of the product, testing of the different components and parts, a test of its assembly and many others. There are crucial tests to ensure that I can understand all of the products weaknesses, and so that I am able to correct them in the post manufacturing modifications slide, after all of this is done. I also did a product timeline, so that I was able to visualise the progression of this product from the start to the finish

Functionality Test B

This simple test was to showcase the functionality of the **LED lights**, and the **frosted acrylic front cover** on the product. I firstly utilized the remote control to increase, decrease and turn of the lighting unit. The **control was very simple to use and simple**. However one problem I have is that there is no place to simply place the remote control. I want the product to have a dedicated place for the remote control to sit, however I do still need the product to remain simple, and prioritise the aesthetic and form of the product over the functionality. The frosted acrylic cover fitted on **very well, and simple snapped on, with no issues**



Turning On



Dimming



Turning Off



Peak Brightness



Sizing Checks

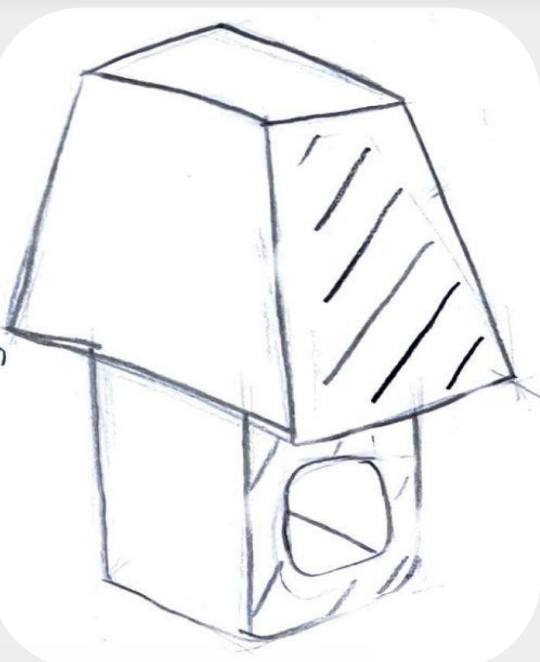
For this product, I then decided to check the sizing of the product, to confirm whether it does or does not fit within the designated tolerance. The sizing of the product is **575mm Wide, 980mm tall and 470mm depth**. This is well within the tolerance of **950mm/2000mm/500mm**. Working with the product I do really like the sizing of it as it perfectly fits next to chairs. Even as shown in the image the product fits perfectly **fits next to a chair. In the image the height of the top of the product considered perfectly with the chairs arm height**



Product Timeline



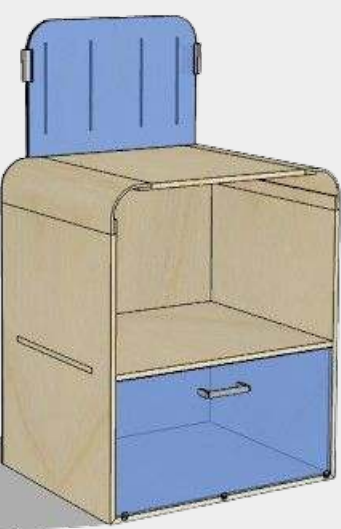
Stage 1; Initial Sketching



Stage 2; Initial Modelling



Stage 3; CAD Modelling



Stage 4; Final Prototype



Client Testing (Spec)

Context Introduction

After my client had time to spend with the product, I decided to ask them/ interview them on relevant spec points. Not all of them but only once that I feel are very relevant to my client and their testing of the product

Question	Answer	Evaluation
1.0 Primary Function How well do you feel that this product is able to carry out its main / primary function. This being it being able to provide mood lighting in addition to the LEDs and their function	This prototype perfectly fills out its primary function. The LEDS are perfect, however heavily impact upon the product price. The continuous strip of light, instead of the individual small LEDS really elevate the lighting system, in addition the frosted cover is perfect for dispersing the light, so that it is less harsh and more ambient. I do like how it is magnetic, allowing for other possible covers to be put on the front, however could you possibly instead use LEDS that change colors, meaning that the covers don't need to be changed all the time	My client likes the choice of LEDS, they were pricey but with it. They also stated that they would possibly like LEDS with an RGB feature instead of needing to change covers
2.0 Second Primary Function How well do you feel that the product is able to meet its secondary function. This includes the storage compartments on the product and the overall storage of the product	This product I feel perfectly fills out its Secondary function. The book compartment is my favourite feature, it allows for me to store many things, not just exclusive to books. In addition the middle compartments is perfect for decorative purposes, such as my plants or other more artistic pieces I do like that section. And the top is perfect for my glasses and sort of other smaller items when I dont need them, however I would like something to change on the top, sort of dividers or something else I feel could really elevate this point altogether	My client stated that they really likes the book segment, with the cover to protect the books, however want a change to the ledge, possible dividers?
3.0 User Interaction For this question, I want to ask about the User interaction/ ergonomics of the product. How easy is the product to interact with, and how inclusive is this prototype. Do you feel that 7 plus year olds are able to use and interact well enough with the product or do you feel its to complex	Regarding if I feel 7 year olds are able to interact with this product, I am a mother of 4 and at that age I do feel that they would be able to interact with the product to an extent. Controlling the LEDS I feel they would not be able to, however using the middle compartment and top ledge, I feel they definitely are able to interact with. Regarding the covered compartment I don't know about that. I feel they would be able to take off the door, however using it and putting it back on they would struggle with, and instead would just leave the door cover placed somewhere on the floor, this is something that I feel you could change if you wanted 7 year olds to be able to interact with the product. Regarding inclusivity I feel it fits this criteria as well, it's not a very tall product just coming up to my hips, but this is designed to sit next to the sofa, so all heights are able to interact with it	My client stated that they feel some of the features on the product would be accessible for a 7 year old to use, however the door cover is a suggestion that they made to ensure that the full product is accessible for them
6.0 Cost of the Product What do you feel the cost of the product is, and why do you feel it should be placed at that price	I feel like a very fair pricing for this product would be around 70-90 pounds. Furnitures price range can be quite large but I know that this product takes heavy inspiration from IKEA which has similar items to this at that price range. The LEDS however raise the price, due to the cost of them being so high at around 30 Pounds, if this was cheaper then I would have placed the price at around 60-70 pounds instead	They stated the cost at around 70 - 90 pounds which is quite high, however once you consider the price of the LEDS it makes sense , as they are quite pricey at around \$30
5.0 Aesthetics This is one of the main points of the product, the form and aesthetic of it. How well do you feel I incorporated the scandinavian interior design style? How simple and aesthetic is the form of the product? Do you like the natural timber finish on the product?	This product is very aesthetically pleasing to me. It fits very well within my rooms aesthetic which I feel was the most impartenat thing to me, if it did not fit within my room I would not have liked it. I feel you incorporated the Scandinavian style very much when designing and making this product, your extensive use of timber I feel is what gives it that Scandinavian style, as that style is heavily influenced by timber usage. Furthermore your use of simplicity when making this project is perfect. The simple form of the product definitely elevates that overall aesthetic of the product. Finally the natural timber finish is very aesthetically pleasing. This is elevated further by your use of the varnish to make it pop out even more which I really like.	They stated that they really liked the aesthetic of the product. The timber provides a ‘Natural’ aesthetic to the product, which is further enhanced by the varnish that I applied to it, and they really liked the simplicity of the product,and the simple form of it all together
7.0 Safety Do you feel like this product is safe for children to use and if not what are suggestions that you would make in increasing its safety	Overall the current safety precautions that you took in making this product are sufficient enough for me, this includes your covering of the wires and rounding off of the edges, these 2 where the main threats and by your covering up and wires and rounding the edges prevents possible electrocution and furthermore prevents a kid from cutting himself on it. How about possible cutioning on the edges to further prevent a kid from bumping themselves and possibly bruising on them	They stated that the safety of it was really good, the wires are covered and the edges rounded. However they suggested that I add cushioning to the edges
8.0 Materials Finally, how do you feel about the material selection of the product, do these materials used look aesthetically pleasing	I really like your use of extensive timber, this really brings out a natural aesthetic to the project, in addition the use of metal instead of using abs for the handle is perfect, and makes sure the product is still taking inspiration from the scandinavian interior design style is and much more aesthetically pleasing	They said that the natural aesthetic on the product is really aesthetically pleasing, and likes how I didnt 3d print the handle, instead using a metal pre made one

Testing

Context Introduction

After all of that, I proceeded to conduct rigorous testing of the product. This consists of on sight testing of the product, testing of the different components and parts, a test of its assembly and many others. There are crucial tests to ensure that I can understand all of the products weaknesses, and so that I am able to correct them in the post manufacturing modifications slide, after all of this is done. I also did a product timeline, so that I was able to visualise the progression of this product from the start to the finish

Safety Testing

I then proceeded to conduct a test on the safety of the product. I looked at a couple of main areas of the product to see whether it fit and completed the specification point. I **looked at the wiring first, to see if it was all covered up or if their were exposed areas, this prototypes passed this test**, as all of the wiring was cover and protected until the port. I then looked at the edges on the product. Mainly things like if the edges are sanded enough to ensure that the product would not cut, hurt or put any splinters into my clients fingers or skin, **this also passed this test as well, therefore the prototype passes all of the safety checks**



Cleaning Testing

I finally looked at the cleaning aspect of the product. **This prototypes is after all a piece of furniture, and as a result will be used and have to regularly be cleaned.** In addition the product will also have different liquids spill onto it. I therefore decided to test how well the product cleans. I firstly splits some water on it, cleaned it off with a paper towel, and it all came off leaving no watermark, damage or stain. **This was perfectly and partially down to the hydrophobic coating, that prevents the product from damaging**

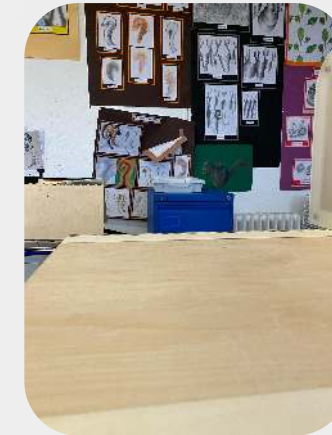
Spill



Cleaning



Results



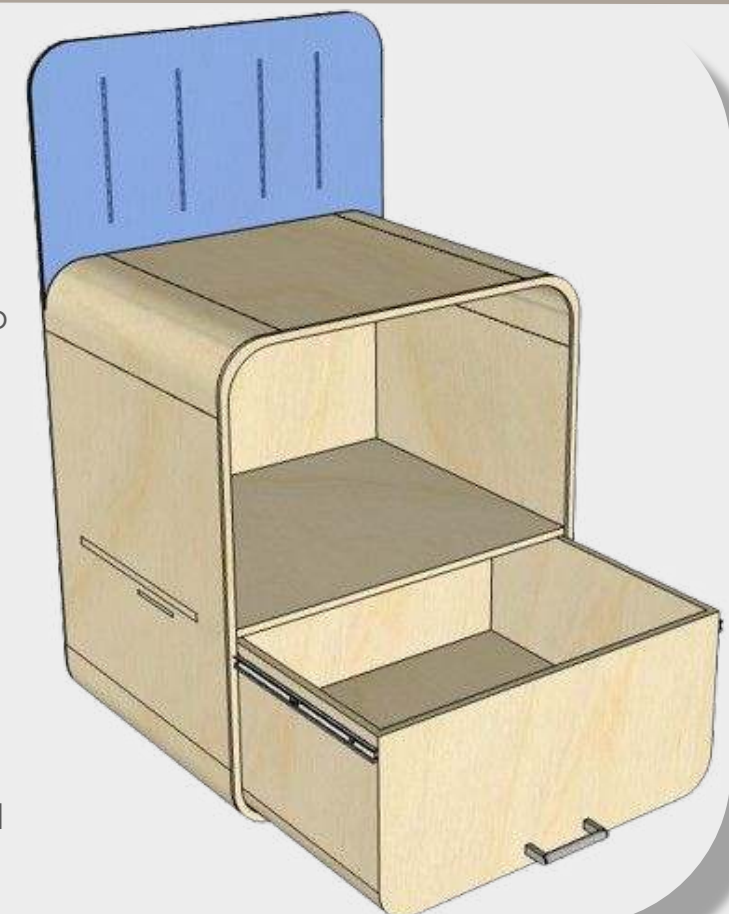
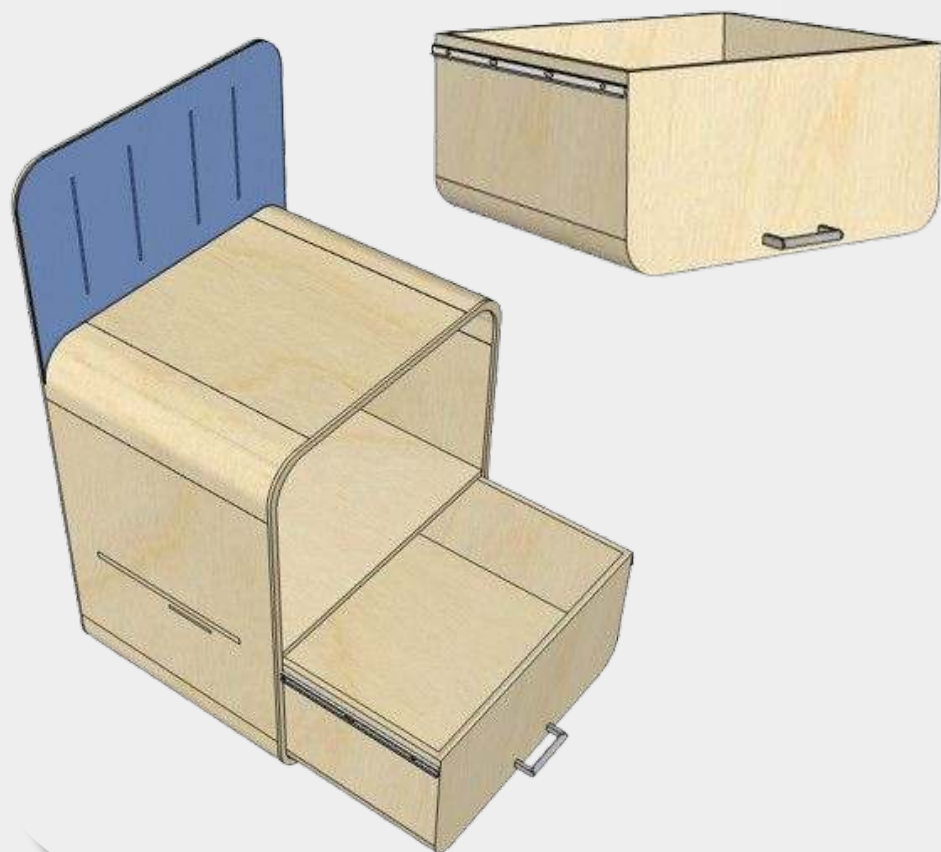
FM 1 (Storage Change)

The change to the design

For this first future modification to the design I decided to change one of the storage compartments. Due to the difficulties with this section when manufacturing, and the changes that I had to think of last minute I decided to go back to the drawing board and redesign a change that I could possibly make to the design, with more time to think and when I am not constrained to the DT departments resources. The main change is that I added a drawer that can be pushed in and out, this had many advantages compared to the previous design

Advantages

The main advantages to this are the it is much more aesthetically pleasing, in addition to being more ergonomic and convenient towards my client. Instead of my client needing to bend over and look under the middle piece to reach the books and other items that have, instead they can simply wheel out the drawer and take out the books and other items that they have stored instead . My client said they they really liked this design change and feel that it is very beneficial and convenient compared to the previous design to this section



Future Modifications

Context Introduction

For this slide, i decided to product a cad file of future modifications I intend to do if I wanted to take this product onto the mass market

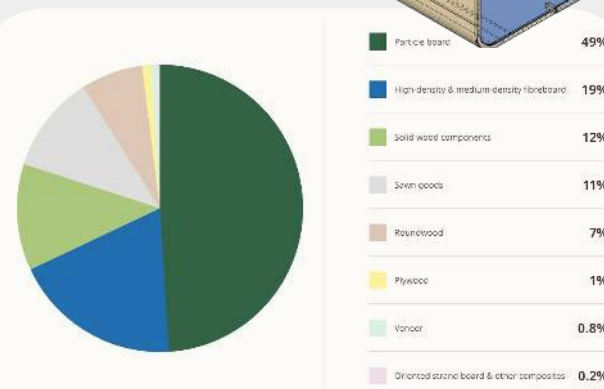
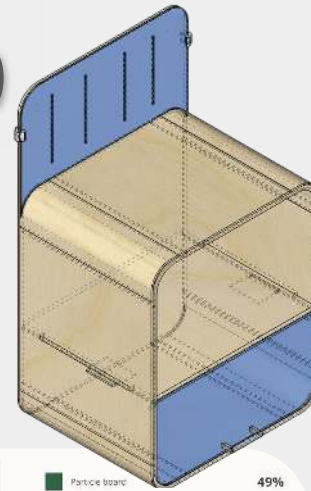
FM 2 (Adaptations for Mass Production)

Positives

The product is already suited for mass production in many ways, firstly the product uses many mass production processes such as the laser cutter or the CNC router. It also uses Cad files aswell for manufacturing ensure the high level of the product in addition to the high level of precision of the product. The product is assembled using many storck forms aswell, such as the timber sheets used to make the product. And the product is manufactured and finished, ensuring its viable for the mass audience

Negatives

The living hinges I feel would not be suitable for mass production due to their weakness, possibly using made jigs I am able to create laminated pieces that create the same shape. In addition with these large laminators I would not need to cut out holes for the living hinges into the product and instead it would be a solid piece os timber laminated to that shape



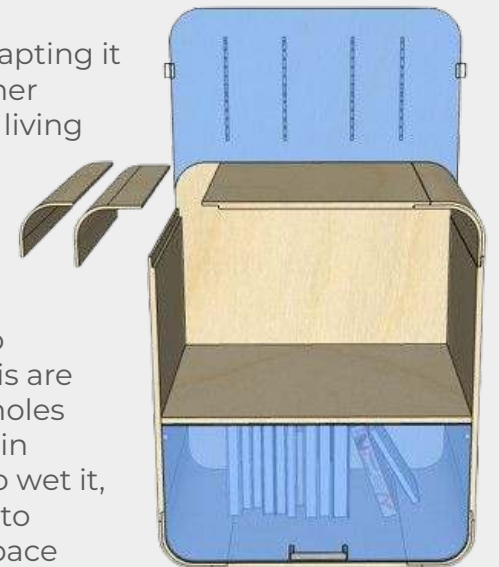
FM 4 (Aesthetics Change)

The change

For this further modification to the product I decided to reintroduce a previous design that I had made, due to the restraints of the living hinges I was unable to actually implement this living hinge design however if I am adapting it to industry I could possibility instead laminate the corner pieces instead of using the current version of laser cut living hinges on the product

The Advantages

Because I am adapting parts of the product for mass production, I am going to change the living hinges to laminated pieces of solid timber, the advantage of this are mainly aesthetic, Firstly I do not need to cut out the holes into the pieces of timber and instead I can keep it plain enhancing the aesthetics. In addition I do not need to wet it, bend it and clamp it into place, instead only needing to attach it on without that. Furthermore the missing space that can look quite unaesthetic can be filled in with another living hinge making the product look more aesthetic than before

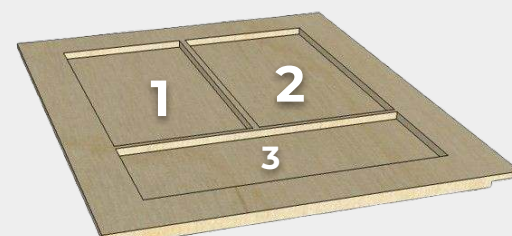


FM 3 (Top Ledge Design Change)

Changes

For this future modification, I made a big change to the top of the product, originally intended just holding coffee and mugs I decided to change / switch it up. My client stated that this section is missing something, and that they said that they wanted the section to possibly have sections, so that they were able to organise their different things, such as pens, pencils and wallets. This as something that my client heavily suggested changes, and so I did change it. I made it so that It has 3 sections, 2 bigs ones for holding items and the front smaller section for temporary items such as phones and coffee which will be moved often, I placed that right at the front as that is things my client will be

Grabbing often, This would be made using the remove section tool on the CNC router, and then sanded and finished, possibly using other processes such as sanding to round the edges and smoothen it out



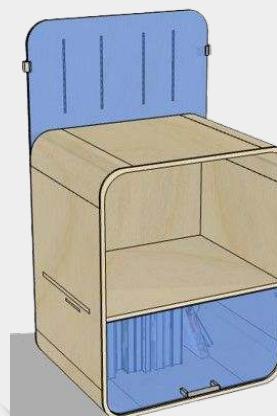
FM 5 (Structural integrity improvement)

The change

For the last future modification to the product, I decided to add a frontal piece to the project. This is a outline shape that would be attached to the front of the product, (On the side of the living hinges, top piece, bottom piece and both 'wall' pieces) This would be manufactured using a simple cad file imported into the CNC router, cut out and then sanded before being attached to the final product. This would be attached simply using some adhesive or other forms

The Advantages of these Changes

There are many advantages to this change that I feel would improve the stability of the product, firstly it would prevent the bending and flexion on the living hinges on the product.. This would prevent that and in the process increase the prevention on the product breaking. In addition it would prevent the edges on living hinges from breaking or snapping, as this can close to happening multiple times when I was manufacturing the product. In addition it would cover up the sharp edges on the side of the living hinges ensuring that my client would not be cut up accidentally when walking past the product



Action Plan Evaluation

Context Introduction

For this slide, I looked at my action plan that I had made at the beginning of the project. I decided to evaluate my time management, and to see how on schedule my project was

Order	Steps/Tasks	Time required	Evaluation
1.	Context Exploration - To understand what genre the product should be - To also understand what the genres topics and general information	Around 3 Hours	This was the initial stage of the project. This took me longer than expected, which was around 4 hours. This was because I had to conduct a lot of research into different interior design schools, then select a few that I would be able to talk about before writing up the slides, however this time allowed for me to truly understand the perfect design school for me and my client, eventually ending on the Scandinavian Interior Design style
2.	Client Exploration To understand clients NEEDS, WANTS and Dislikes	2 Hours	This part took me less time then expected, taking around 1.5 hours. I simply wrote about my client, their background, job and needs/ wants that they initially stated to me on the phone text messages. We only however scratched the surface with things that my client wanted. The main information I needed came after this section
3.	Clients Interview To better understand my client, understand the requirements they have and ideas they have for the initial product	1 Hour	This section took me the longest. Taking around 3 hours. I conducted multiple types of interviews with my client. I conducted: a phone text message thread, a physical in person interview showing the transcript and an online interview/ survey that they filled out for me. Majority of the time was taking considering the types of questions I had to ask my client, I asked very specific question, and asked as much as I could, to ensure that not problems surfaced during the designing process , that I could not solve
4.	Sight Analysis To understand where the product will stay, the constraints and limits I have, better understand how it should function	15 Minutes	The sight analysis took longer then expected, it took 2 hours. I had to measure out the area that my client had dedicated for my product to sit in, then I mapped out key areas of the room, and noted down other sources of lighting that my client had available to me. Once I had done this I had asked my client to show me how she interacted with the room, where she sat and areas she would want items to be, such as her books, so I could adapt my product to them
5.	Further Research More indepth research, for niche areas and areas of complication that arises that need addressing	1 Hour	After this I conducted much more in depth reasearch, I looked at key/ crucial things that contributed to my product before starting my designs. I looked at different lighting styles that could contribute to my prototype, and then looked at the scandinavian interior design style in more depth. This was crutrial as I had only previously skimmed the surface, and now reaserched things such as the typical materials, product forms and manufacuting processes used
6.	Initial Designs To brain storm and create initial designs, not accurate but to understand and get ideas from	1 Hour	I now looked at creating initial designs, this was primarily done using sketches, the aim of this section was to not create a final design, but brainstorm multiple different onse, so that when it came to making the iterations for the final design, I was able to simply take and adapt different aspects from the designs of this stage to make a final and complete design that I could start manufacturing
7.	Existing products Analyse existing products, understand ideas and aspects I can implement	1 hour	For this section, it took 4 hours, this was because I decided to take a trip to Ikea. this was because at IKEA they have a lot of existing product that I would simply be able to interact with and dissect, in person, which is much better than doing it online behind a screen. This trip was crucial in understand the existing product and adapting aspects to my own product
8.	Design Brief Bring all my ideas into one place, all the constraints and aspects needed for the product	30 Minutes	This section took the prescribed amount of time, which was 30 mins. For this section I simply gathered all of my clients needs and wants, and dislikes, into 1 paragraph that I could easily go back and refer to when I needed. this was crucial in my product development as I could easily look at this to see my clients needs and wants
9.	3D Modelling Scale modelling, for possible testing of the product	2 Hours	I now start to create more complete designs, I create scale models of possible designs that I would create, these models would allow for me to visualise mistake and places that I could make changes to

Order	Steps/Tasks	Time required	Evaluation
10.	Specification To bullet point important pieces of information, that can be referred back to in the design stage	1 Hour	This section took 1 hour, the same as prescribed. This section was very similar to the design brief, however, I created multiple bullet points of critical pieces of information, stemming from material usage to ethics of the product. This section allowed for me to visualise all the criteria my client had set for me and allowed for me to better understand how the product should, look function and operate. I tried my best to stick to these criteria however I still did not meet all of them
11.	Iteration 1,2,3,4,5,6,7 To create an initial model, then to expand upon and improve upon until you come up with a final design ready for manufacturing	4 Hours	For this section, I started to create very specific designs, the time however took around 8 hours altogether, this was due to the time taken to create the cad files, think of ideas to improve upon it, ask my client for feedback, create models and test different and specific aspects of the different and ranging designs, and then document them all onto one sheet, which altogether to a very long time
12.	Manufacturing Specification To list out parts, and manufacturing methods, and dimension of components, all to help when in the manufacturing process	1 Hour	Once I had a final design I had to create a plan on how to make it which took 3 hours, I created multiple GA drawings of the different designs, then I had to split the product design into 3 sections, and then label each part talking about the cost of it, the dimensions of it and the manufacturing processes I would have to use when I am making that specific component. This took a very long time
13.	Manufacturing Diary To document and demonstrate the manufacturing process of the final product	3 Hours	I then documented the whole manufacturing process, which took around 5 hours. Making the product took a lot of time to do, making sure it was perfect, however a lot more time was taken writing up the documentation relating to the manufacturing, and sorting out the images to best showcase the production of the product.
14.	Evaluation To understand and critique the final product, understand the positives and negatives of it	1 Hour	The evaluation took around 3 hours to complete, the reason this took more time then expected is because I had to critically dissect the final product, testing it on all things possible, and then had to receive as much information from my client as possible. They then gave me ideas on how to adapt the product to make it even better which I did in the further changes section
15.	Further Changes To understand, and display the additions that could be made to the product, that could enhance it and make it better suited for its function	2 Hours	For this section, I used all of the information my client had given me and made the relevant changes, this section took around 3 hours to complete, from designing the changes, manufacturing the changes and integrating it onto the final product, ensuring it was a perfect fit onto the prototype, once this had been done I further interviewed my client asking them about the changes and were satisfied that they where content with them

Overall Time management Evaluation

Overall, the project took much longer then expected,. This is because I had not accounted for all of the additional parts and processes that would need to be carried out through the project, from the initially unexpected IKEA trip, to the extra client research I had to do and the extensive manufacturing diary that took more testing and pages up then I had expected altogether. However I am very content which how I spaced my time, ensuring I had enough time to carry out each task, and breaking larger sections like designing into smaller sections like initial, 3d modelling and iteration. This allowed for my to manage my time better and achieve the high level prototype that I did