






# PLANNING

Tasks	Resources	Materials	By when	Completed
Identify the client	Search for possible client	Pen and Paper	8th June	
Identify the need	Client and me	Pen and Paper	8th June	
Explore different possibilities to solve the need	Client , internet, library and myself	Books and internet	10th June	
Design process	Myself	Template	8th June	
Web diagram	Myself	Pen and paper	8th June	

## Planning summary

First two weeks of the project, the first week is a very important week as I have to find my clients otherwise the rest of my project would be delayed. But the first week went by very smoothly and I completed everything which was need.

# Design processes

## *RESEARCH*

### **MATERIALS**

what type of material? Is it of a high quality? Is it available?

### **COSTS**

Printing the paper work, the materials, tools

### **RESOURCES**

Where do I get it from? Is it available? Health and safety issues, costs

### **TARGET MARKET**

Questions, situations, likes and dislikes, interviews, stake holders

### **PRODUCT ANALYSIS**

Disassembly of different variations of similar existing products while looking at its function and aesthetics

### **INTERNET, MAGAZINES, BOOKS, CD'S**

Presentation, layout, styles, architects designers and artists. Analyse their products

### **AESTHETICS**

What does the product look like?, does it appeal to the viewer? Color, harmony, rhythm, pattern and proportion etc.

### **FUNCTION**

How does the product work? Ergonomics, anthropometrics, user friendliness etc.

### **EVALUATION**

Take out the most important and relevant information from the information collected to be used in the project. Make judgements on what materials, colors, assembly, sizes, weights textures and fittings I see that are most suitable for the project. Taking in mind the likes and dislikes of the target market. I must also keep notes on the specifications of the project and why I made the decisions that I made for the project.

### **SPECIFICATIONS**

what does the project have to have? This tells me what the target market wants the projects to have, the sizes, the theme, color and can provide more details on what is to be done than the brief

# Design processes

## **Drafts**

A collection of 2d and 3D sketches, computer graphics and models

## **Evaluation**

Evaluate these ideas against the project specifications. This also develops the ideas further. Justify the reasons of any decisions and alterations of the original ideas

## **Changes**

## **Developments**

Further alterations of ideas. These help to create more alternative ideas and improve the quality of the ideas and the presentation of the project

## **Evaluation**

Continually evaluate changes against the project specifications using annotation

## **Build and test/final solution**

## **Models/mock up**

To test out the product at a scale size in the environments and situations that it will be used in. this will help in developing the product even more

## **Evaluation**

Continually evaluate the product through this process, explaining the reasons of why certain changes have been made

## **Project evaluation**

## **Planning**

Did I keep to the time frames that I gave myself? What changes did I make to the times that I gave myself?

## **Materials**

Was the materials used for the project suitable for its use? Why?

## **Design brief**

does the project answer the design brief

# Design processes

## **Aesthetics and function**

Does the final product meet the required standards?

## **Manufacture**

Can the product be used to manufacture?

## **Client testimonial**

The clients thoughts throughout the project. Continually criticising the project in both positive and negative ways to develop the product. This helps to make sure that the product can fulfil the brief

## **Changes**

What changes and developments were made?

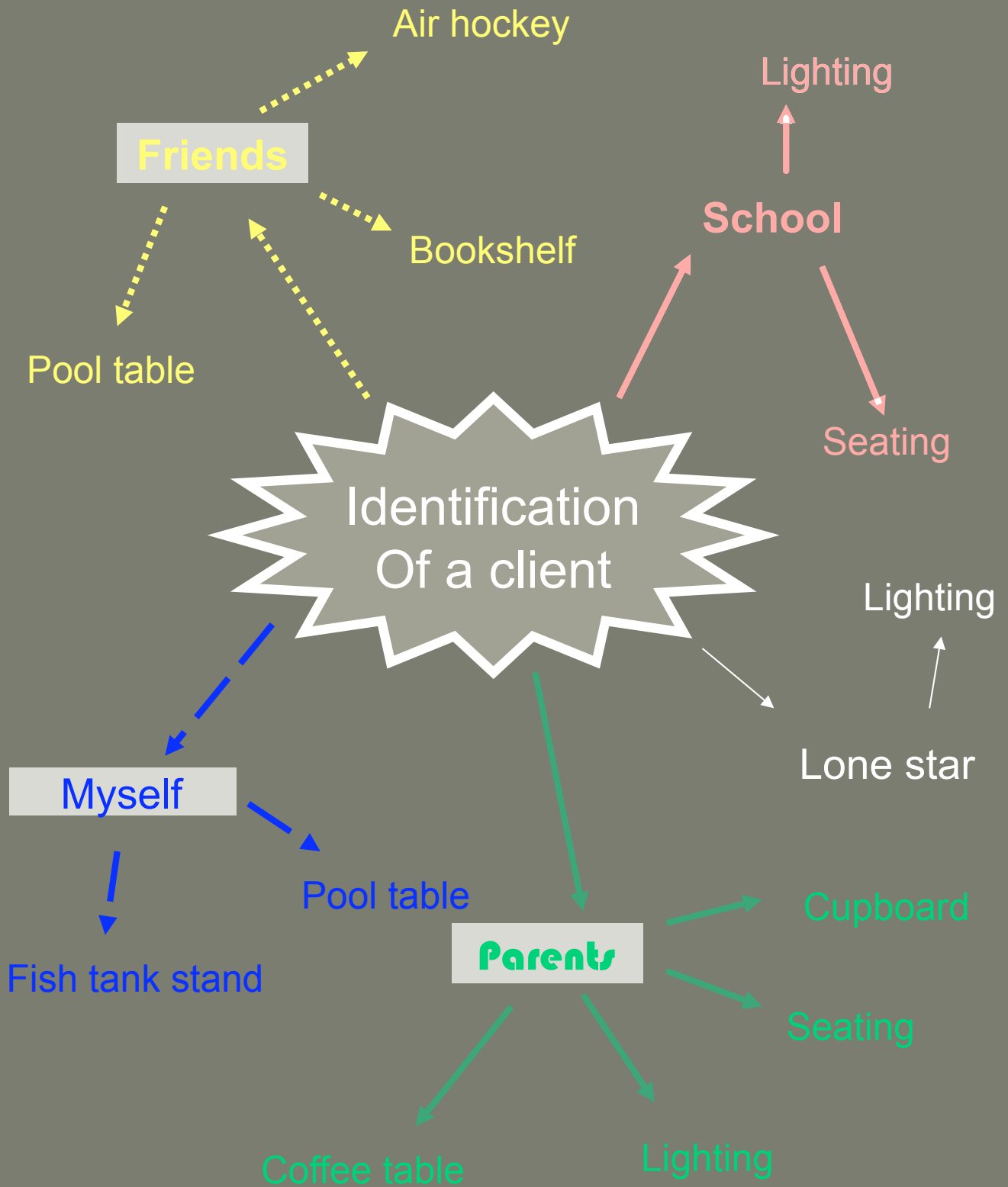
## **Personal qualities**

What was easy and hard to do? What training and experience will need to be done for a future project?

# Problem to solution stages



I have highlighted in gray some clients that I have interests in.



# Situation & client

## Situation

One of the assessment for design technology this year is internal 2.2. This internal is worth 6 level 2 credits. For this project I have to find a client and identify a need, so I may design something that will solve the need/problem.

## Client

I think it is important to find a client close, so I can show the progress that I have made on the project and ask for my client's comments on my work, so I can improve.

I have asked a lot of people to be my client, so I can get a range of needs so I can pick the one that I am interested in.

- Friends
- Parents
- School
- Lone star
- Myself

In my final decision I have chosen my (mum) to be my client.

## Need identification

- Coffee table
- Book self
- Storage
- Out door seating

# RESEARCH

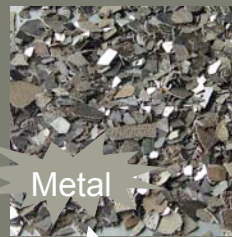
*Identifying need and client*

With drawers

Function

Client: May  
Problem: coffee table

Under table storage



Metal



Plastic



Triangular

Square

Materials

Wood

Shape

Glass

Round



Rectangular





# Research

*Identifying need and client*

Materials

Plastic



Metal



Glass



Wood



Client: Jack  
Problem :Bookshelf

With drawers

Triangular

Square

Function

Shape

On wall



Round

Rectangular

Free stand



# Client, primary stakeholder & secondary stakeholder

The client that I have chosen for this year are my parents; May (Mum) and Ed (Dad) and Gao (Aunty).

Gao: secondary stakeholder

Hobbies:

- Shopping
- Drinking Gong Fu Tea



Ed: primary stakeholder

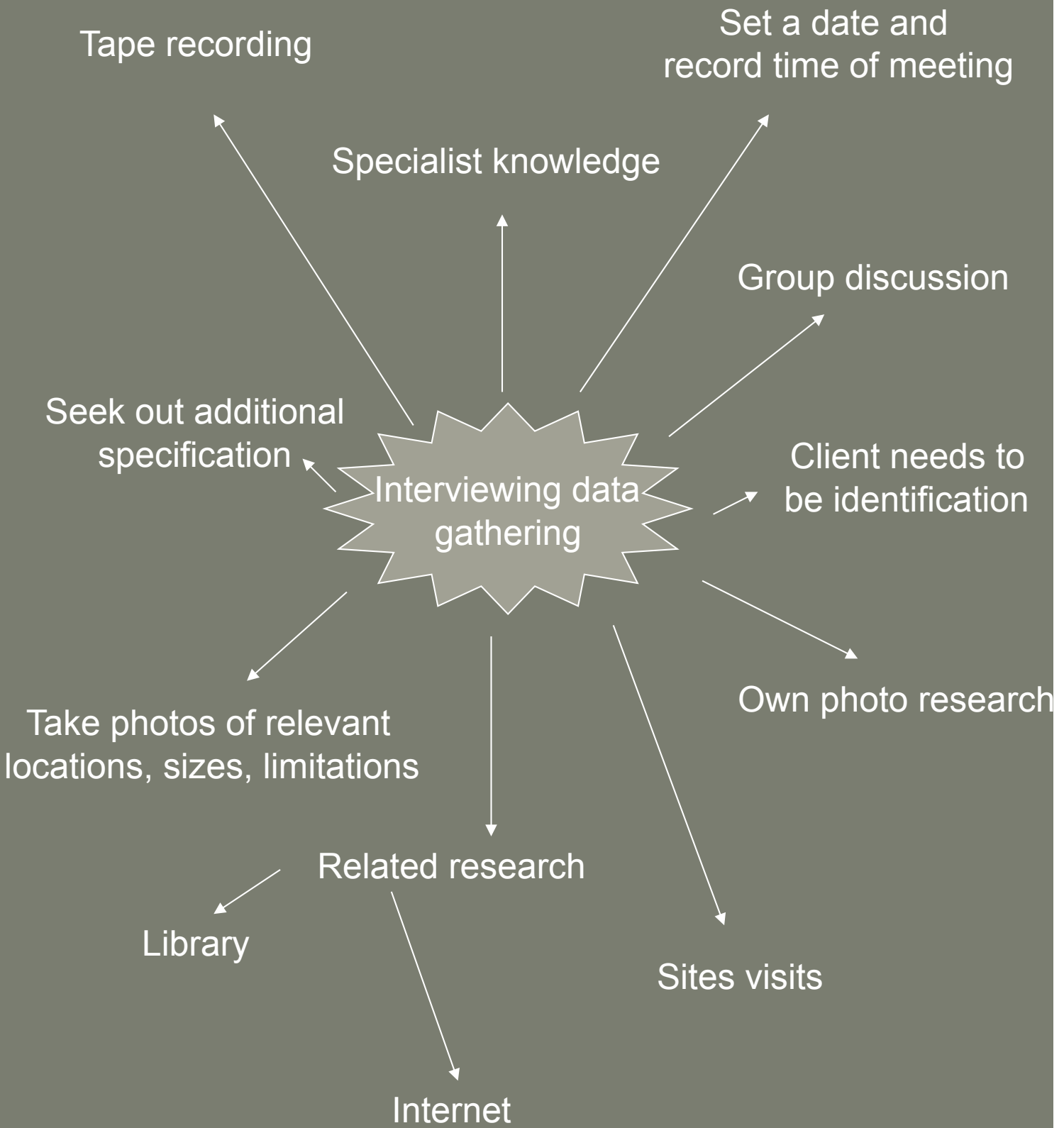
Hobbies :

- Enjoy a cup of cappuccino
- Watching TV

May: client

Hobbies :

- Shopping
- Having afternoon tea with friends



# Questionnaire for the client

1. One of the assessment for design technology this year is internal 2.2. This internal is worth 6 level 2 credits. For this project I have to find a client and identify a need, so I may design something that will solve the need/problem. Would you like to be my client ?

**Yes, I would love to be your client for this project.**

2. What are some things that you have had problems with and would like me to come up with a solution to fix it?

**Well, there has been two things around the house that I am not liking.**

- **coffee table: the design is very boring, time for a upgrade**
  - **Book shelf: there has always been too much books around the house and the book shelf is too small**
- But I would like a new coffee table more**

3. What kind of designs are you wanting ?

**Modern, fresh, things that are new**

4. Are there any kinds of materials that you would like me to used in the project ?

**Yes, I always wanted some acrylic or glass in my furniture and there must be some wood. Other materials are fine too.**

5. What kind of finish are you looking for ?

**Varnish, stained, painted, polished. Anything which looks nice**

6. Is there a budget/limit that you would like to me to stick to ?

**\$150, if it is not enough, we can work something out.**

7. what kind of size are you wanting?

**Not too big, just a normal sized coffee table, that will fit about 6 adults**

8. Where is this item going to be situated? What kind of theme, colour is the room?

**The theme of the room is quite modern and the colours of the room are very warm.**

9. Do you have any safety concern ?

**No, I don't have any very young children but there still shouldn't be any very sharp/pointy edges dangerous for the eyes etc**

# Draft Brief

## Situation

This year for technology internal 2.2.I have chosen May to be my client. She has asked me to design and build her a new coffee table.





## Problem

May has told me what she wants. She would like me to design a modern designed coffee table, which is fresh. The coffee table should fit about 6 adults with room to move around. The materials that must be in this coffee table are glass or acrylic and wood, any other materials are fine too. The finish on this product can be Varnish, stained, painted, polished, anything which looks nice. The coffee table must be safe, which means there should be no sharp/pointy edges.

## Key factors:

- Budget/cost: Sticking to the budget provided by my client
- Time:
  - My time- from planning to the making process there is a lot of research that needs to be done before I can come up with a excellent solution to fulfil the need of my client. Which means, to keep up to my planning I have to used time wisely
  - Client's time - my client is a very busy person, so I have to plan and use my interview times wisely
- Size: the size is also another important key factor. The coffee table can not be too small as it must fit about 6 adults. It can be too big either, otherwise it will not fit in my clients lounge. So it must be the perfect size
- Aesthetics: the colour of the product should fit in with the environment and it should be stand out in where it is put
- Shape: I think the shape should be a long rectangular shaped object so it will fit more people
- Ergonomics: this is also important. Because everyone is different in size, weight, height so I have to design something that everyone could use.
- Durability: this should be a strong and long lasting product. so
- Function: the product should do what it is designed to, and if it does not, then I have failed

# PLANNING

Tasks	Resources	Materials	By when	Completed
Research different materials that could be used	Internet, teacher, client	Pen and Paper	21th June	
Research other similar products	Internet	Pen and Paper	21th June	
Identify the cost of the materials that could be used	Internet	Books and internet	21th June	
Identify the specification from client	Client	Pen and Paper	21th June	

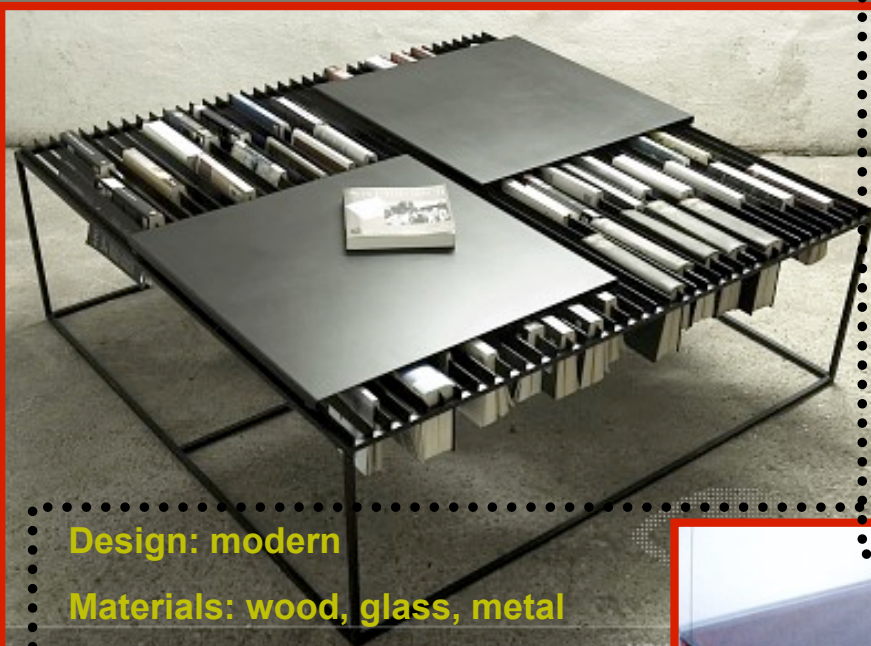
## Planning summary

These two week went by very fast. I was able to use time wisely and completing all the work I have planed to.



# Research of other similar products

● The designs coloured in red are some of the design that my client likes/interested in.



**Design: modern**

**Materials: wood, glass, metal**

**Positives: this is an excellent design. This coffee table lets you enjoy you favorite music and drinks at the some time.**

**Negatives: it is kind of dangerous. Both the glass and electricity can result in serious injuries**

**Suitable for project: yes**

**Design: modern**

**Materials: metal**

**Positives: this is a very cool design, which is also huge: lots of books can be stored.**

**Negatives: if coffee spills or any liquid the books would get wet.**

**Suitable for project: yes**



**Design: classic**

**Materials: wood**

**Positives: this is a simple design, it is very solid, so not easy broken.**

**Negatives: it is not what my client was looking for**

**Suitable for project: no**





Design: modern

Materials: wood, acrylic

Positives: this is an fresh design. This coffee table very big, which creates lots of room for people around it. The use of materials are very eye catching.

Negatives: it is too big, there is not enough space in my clients lounge.

Suitable for project: yes



Design: modern

Materials: wood, glass, metal

Positives: this is an simple but effective design, it has storage room underneath the table top which is very useful.

Negatives: it is kind of dangerous. Both the glass and sharp edges can result in serious injuries

Suitable for project: yes

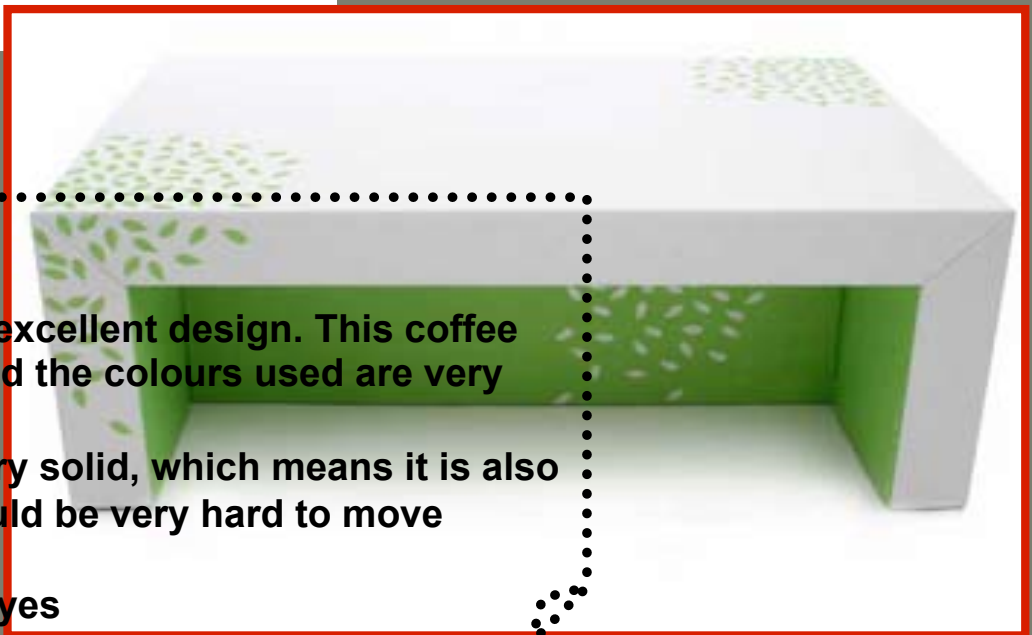
Design: modern

Materials: wood

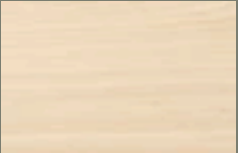
Positives: this is an excellent design. This coffee table is very solid and the colours used are very eye catching.

Negatives: this is very solid, which means it is also very heave. This would be very hard to move around if it is need.

Suitable for project: yes

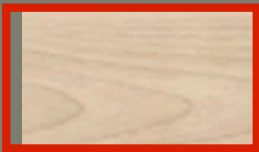


# Materials research- wood



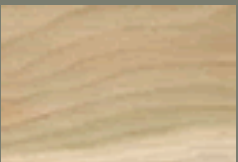
## Alder

Alder is characterized by its straight grain and even texture. Its reddish brown colour often looks similar to Cherry. It has been called the "cheap man's Cherry". Unfortunately it dents relatively easily, but offers a stable surface.



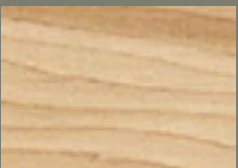
## Red Birch

The heartwood of Yellow Birch is red in colour and softer than Oak but has a tighter grain, which finishes well. It is similar to Cherry wood, smooth and resistant to abrasion.



## Cherry

Moderately heavy, hard, and strong. Machines and sands to glass-like smoothness. The heartwood in cherry is red in colour and the sapwood is light pink. Material generally consists of approximately 25% sap wood, 75% heartwood.



## Soft Maple

This is considered a **paint grade** because of minor mineral streaking. Medium density, hardness and strength. Machining and finishing properties are good; stability is good. Fine texture, close grained; wood does not require filling.



## Hard Maple

This wood considered **stain grade** because it is more consistent in colour than its cousin "Soft Maple". It is dense and light in colour. Fine grain does not require filling.



## Red Oak

Very hard, heavy, and strong. Fairly easy to work, density considered. Turns, carves, and bends well. Sanding, finishing, and stability are excellent.



## Pine

Lightweight with straight grain and fine, even texture. Dimensionally stable and durable. Knots are prevalent in this material giving it a rustic look.

● The materials in red are the materials that my client likes.

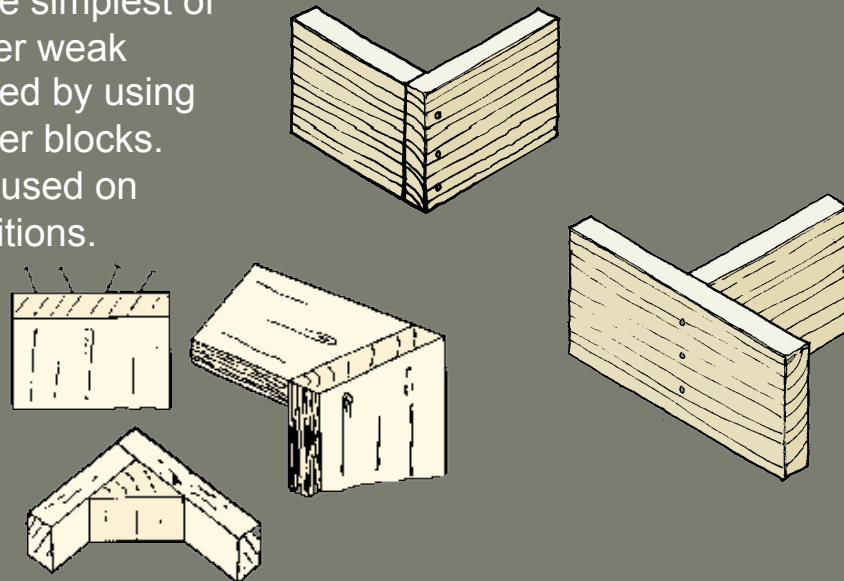
# Materials research- acrylic

- Acrylic is a useful, clear plastic that resembles GLASS, but has properties that make it superior to glass in many ways. Common brands of high-grade acrylic include Polycast, Lucite and Plexiglass.
- There are two basic types of acrylic: extruded and cell cast. Extruded or "continuous cast" acrylic is made by a less expensive process, is softer, can scratch easier and may contain impurities. Cell cast acrylic is a higher quality acrylic and U.S. domestic cell cast is a good choice for applications that require the best. Imported cell cast acrylic is often manufactured to lesser standards.
- Acrylic is used to make various products, such as shower doors, bath enclosures, windows and skylights. It is chosen over glass for many reasons. It is many times stronger than glass, making it much more impact resistant and therefore safer. Acrylic also insulates better than glass, potentially saving on heating bills.
- Another great advantage of acrylic is that it is only half as heavy as glass. This makes working with acrylic much easier. It can also be sawed, whereas glass must be scored.
- Adding to this favorable array of properties, a transparency rate of 93% makes acrylic the clearest material known. Very thick glass will have a green tint, while acrylic remains clear.
- A unique property of plastic is its ability to be shaped. Bow-front aquariums are beautiful examples of acrylic's wonderful properties. There are also no seams in acrylic structures, as chemical welding at the molecular level actually "melts" seams into one piece of solid material. Seams that are welded and polished are invisible.
- There are some misconceptions about acrylic, namely that it yellows, turns brittle and cracks over time. Though this might be true of very cheap forms of plastic, it is not so with acrylic. For example, airplane windows are also acrylic. If taken care of, acrylic remains new looking regardless of age or exposure to sun. Some people worry that acrylic scratches too easily, but unlike glass, scratches can be easily buffed out of acrylic.
- For all of its advantages, there are two disadvantages of acrylic: it is more expensive than glass, and if exposed to a direct flame it will melt and eventually burn.

# Wood joints

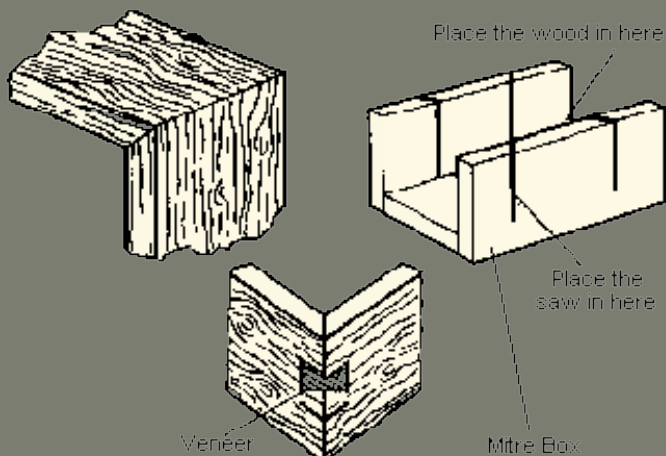
## Butt Joint

The butt joint is the simplest of all joints. It is rather weak unless strengthened by using glue, nails or corner blocks. Butt joints can be used on corners or as partitions.



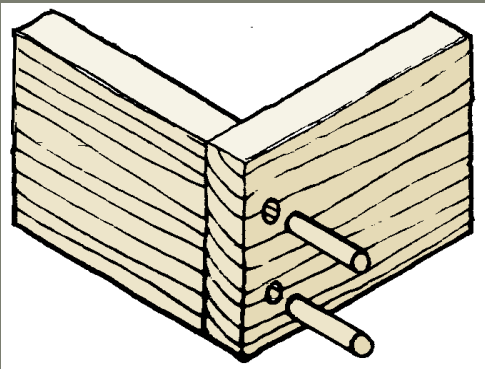
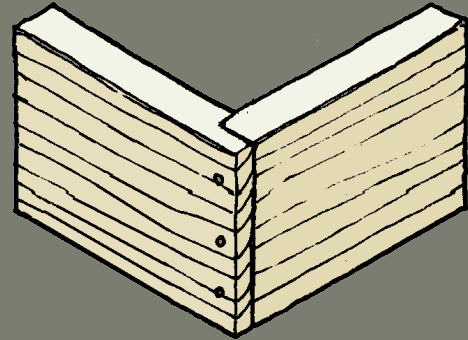
## Mitre Joint

This joint is used on corners. It is useful because it hides the end grain and also provides a larger gluing area. Like the butt joint it is weak unless the joint is strengthened. This is often done by cutting slots and gluing veneers in between. Mitres must be cut at 45° we use a mitre box for this purpose.



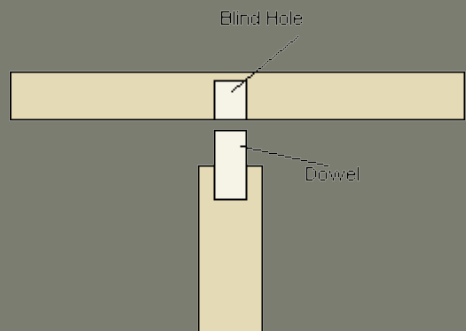
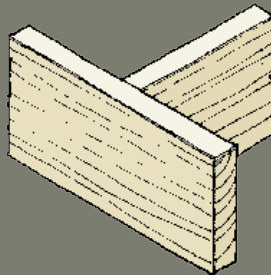
## Rebate Joint

This corner joint is stronger and more rigid than a butt joint, but some end grain shows. You will need a saw, chisel and mallet to cut this joint by hand.



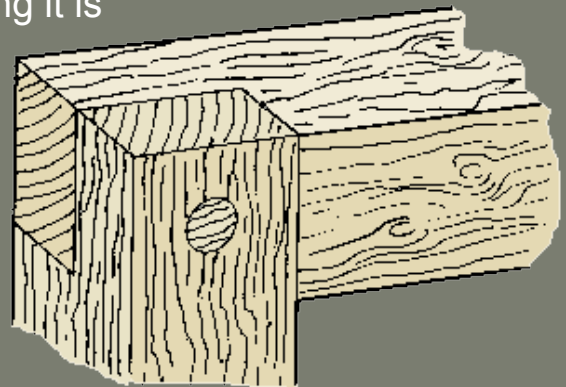
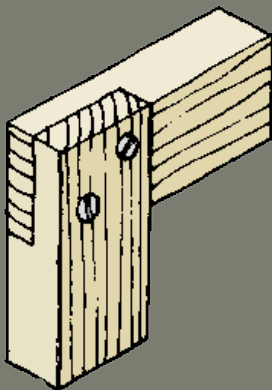
## Dowel Joint

This corner joint is essentially a butt joint which is strengthened by wooden pegs called dowels which are pushed into both pieces of wood as they are glued. Dowel joints can also be used to make partitions. If the dowel holes are 'blind' (they do not go all the way through) the dowels are completely hidden



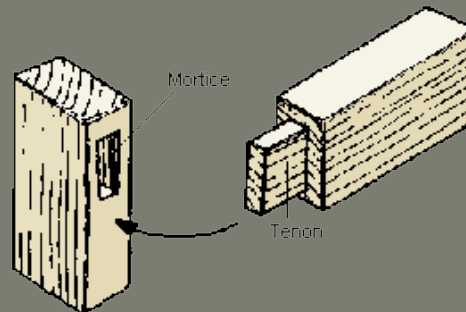
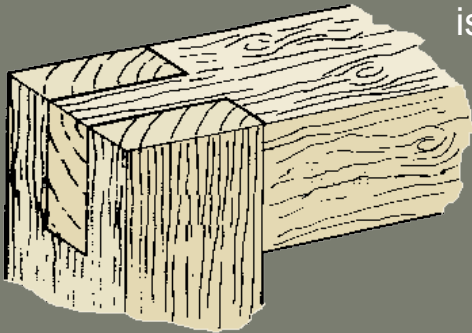
## Corner Halving Joint

This is a simple corner frame joint that can be made with just four saw cuts. End grain shows on both sides of the joint and although quite strong it is often dowelled or screwed.



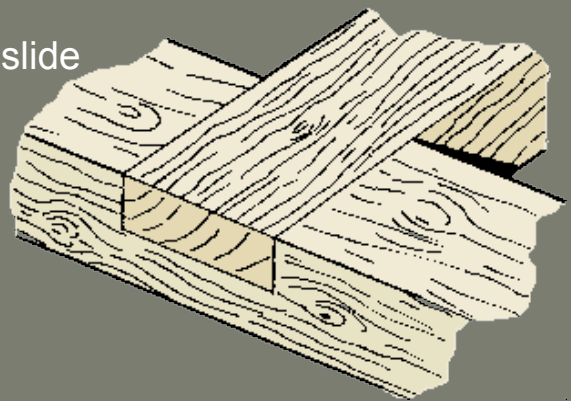
### Corner Bridle Joint

This is a strong joint. It is sometimes called a corner mortice and tenon. The mortice is often cut blind and it is then known as a stopped mortice and tenon.



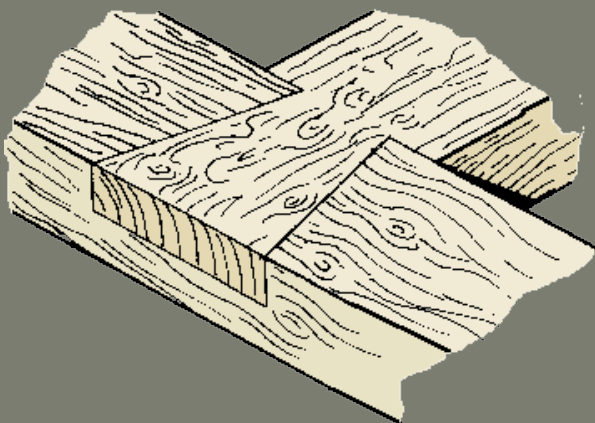
### Tee-Halving Joint

This is similar to the cross halving joint, but this joint is used to make Tee's or separators in frameworks. It is quite strong but the tee can slide apart if pulled.



### Dovetail Halving Joint

This joint is much stronger than the Tee Halving as it can withstand pulling of the cross member. It is a difficult joint to cut accurately.





# Finishes of acrylic

There are many ways of finishing acrylic. Here are two ways that I have tested.

## 1. Using the torch

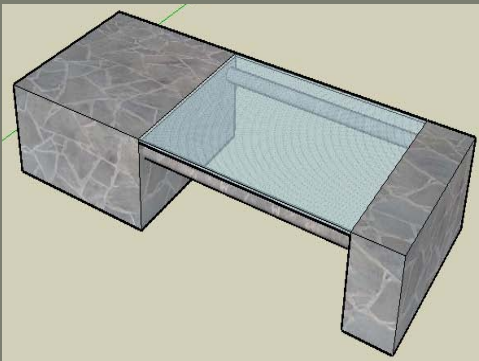
Here you can see the differences between the two images. The piece of acrylic is first sanded with fine sand paper then using the flames of the torch melting the acrylic giving it a shiny finish. black burnt marks are left behind on the acrylic but it is easily cleaned off with some mineral turpentine.

## 2. Polishing

Polishing are the ideal way of finishing of acrylic. Instead of using the torch, polishing can be done with a buffing wheel. The acrylic is first sanded to a very smooth stage then as the buffing wheel rotates at a high speed the acrylic polish is applied on to the acrylic. This gives both the acrylic and wood a protection layer, this will prevent the them form scratching or getting wet. Because I am making a coffee table and there for Polishing the acrylic is the best option, as it protects the materials.



# concepts



Materials: stone and glass

Style: modern

Like or dislike: like (very)

This is a very nice design, but it will be very heavy, which can not be moved around easily.

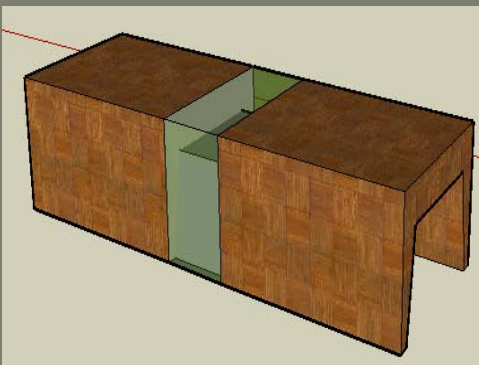


Materials: glass and wood

Style: old/ classic

Like or dislike: dislike

This is a very boring design, not eye catching.



Materials: acrylic and wood

Style: modern

Like or dislike: like (very)

This is a my favorite design. I think it is what my client is looking for.



Materials: wood and acrylic

Style: old/ classic

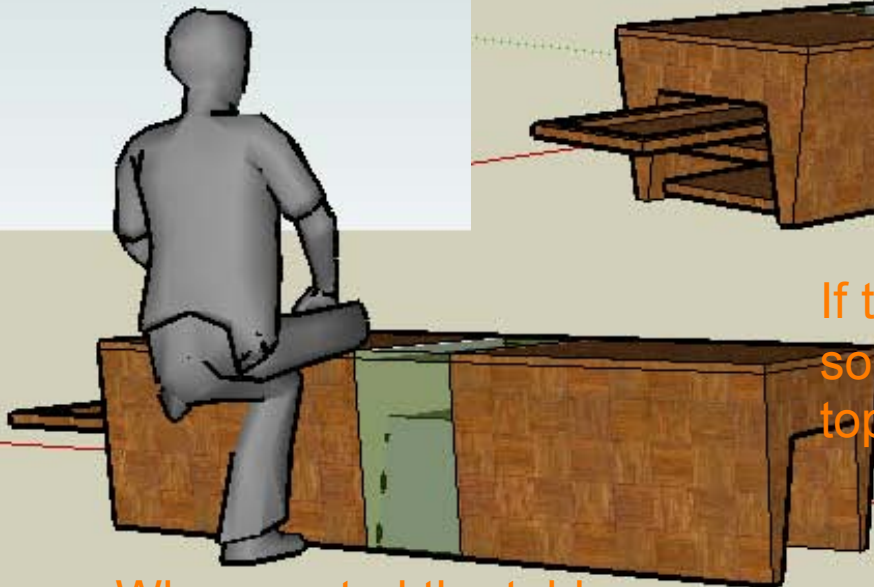
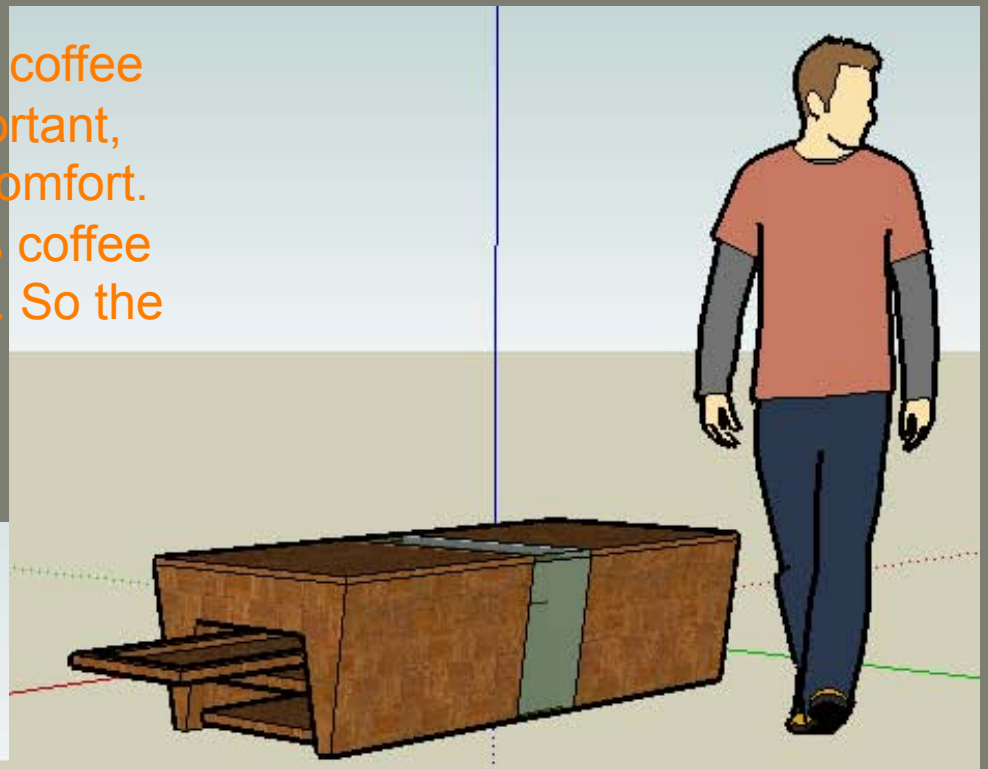
Like or dislike: dislike

This design is too simple, it will not look good in the environment that I am designing for.

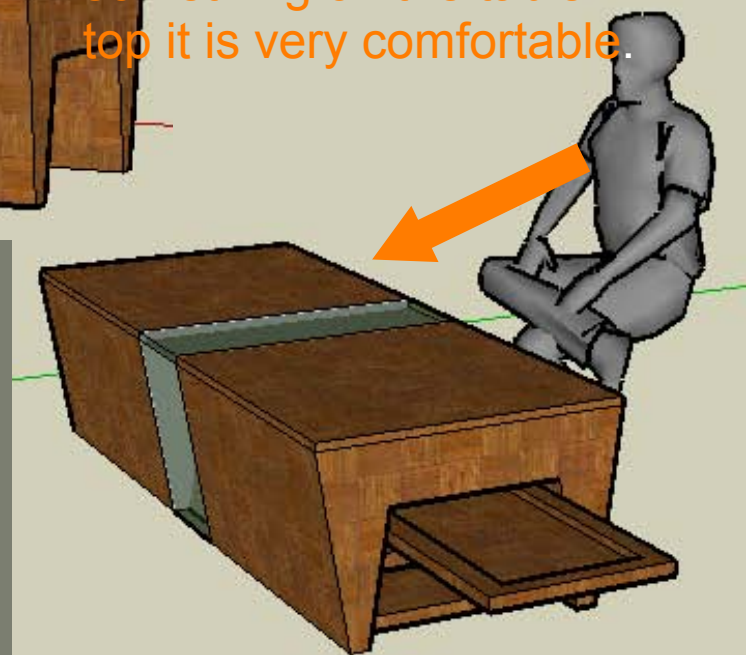


# Ergonomics

The height of the coffee table is very important, as it effects the comfort. The height of this coffee table is 420(mm). So the height is perfect.

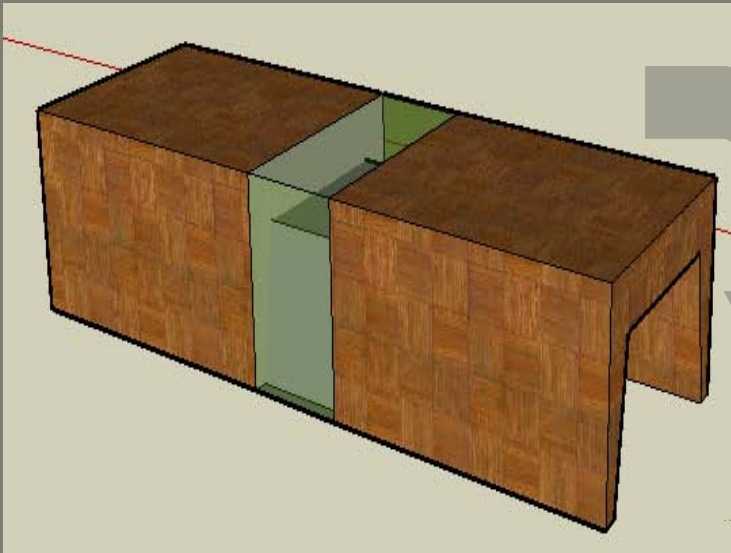


If the arm is reaching for something on the table top it is very comfortable.



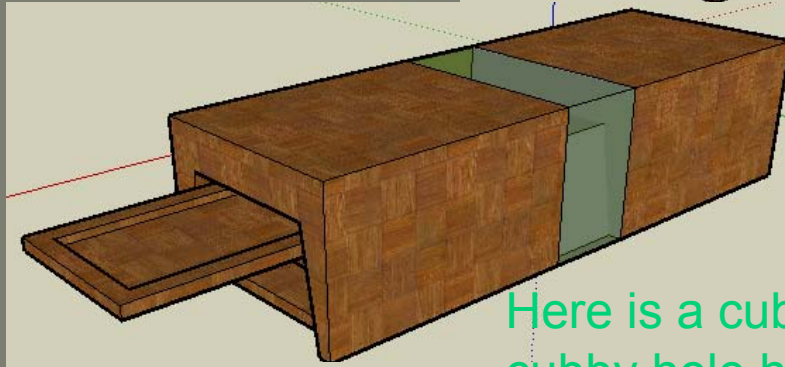
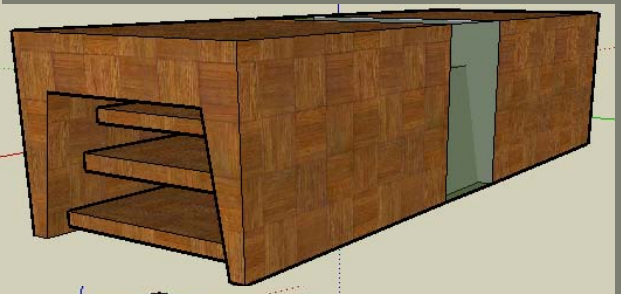
When seated the table should be very comfortable because the height of the table is to the knee, so it gives easy access to the table top.

# Design development

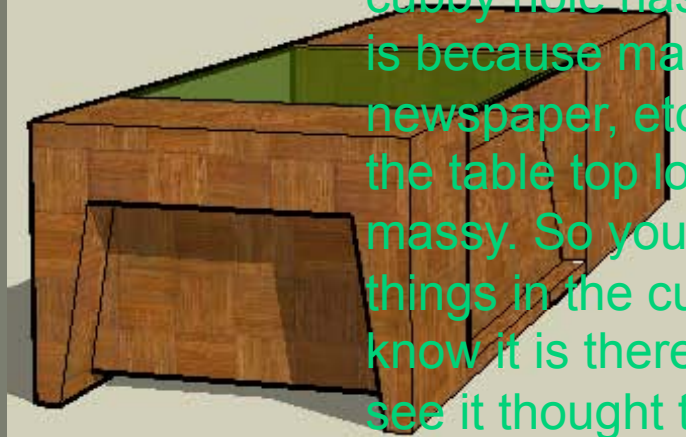


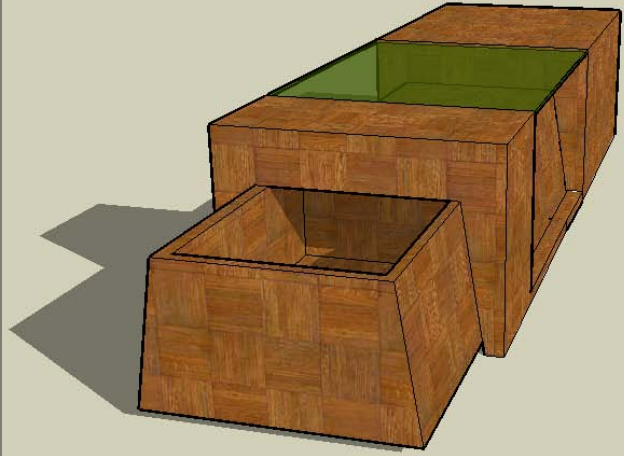
From the concepts I took this design because I think this would be the most suitable design for my client lounge.

I add to the design some sliding trays. This would be useful to store coffee, tea, cups...

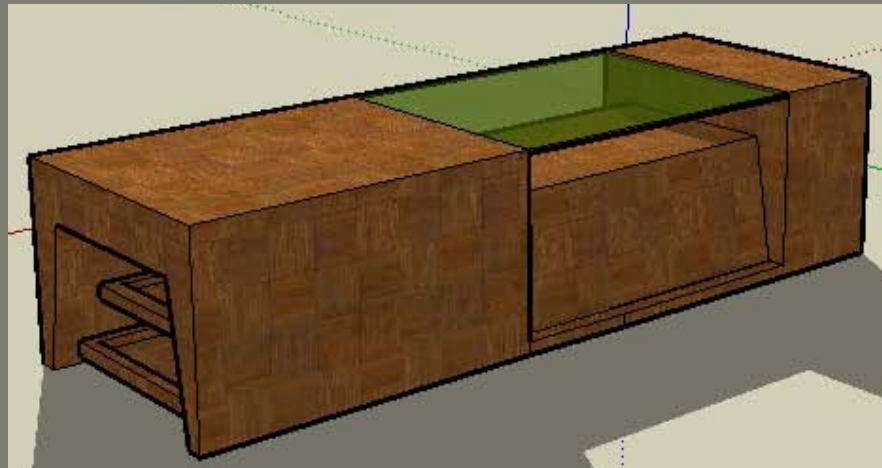


Here is a cubby hole. This cubby hole has been added is because magazines, newspaper, etc placed on the table top looks too massy. So you can place things in the cubby and know it is there, as you can see it thought the acrylic top.





To this design I also add a sliding storage drawer. This is very helpful because my client can store thing that she dose not want to put on the top.



Acrylic

Wood

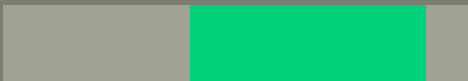
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2



3



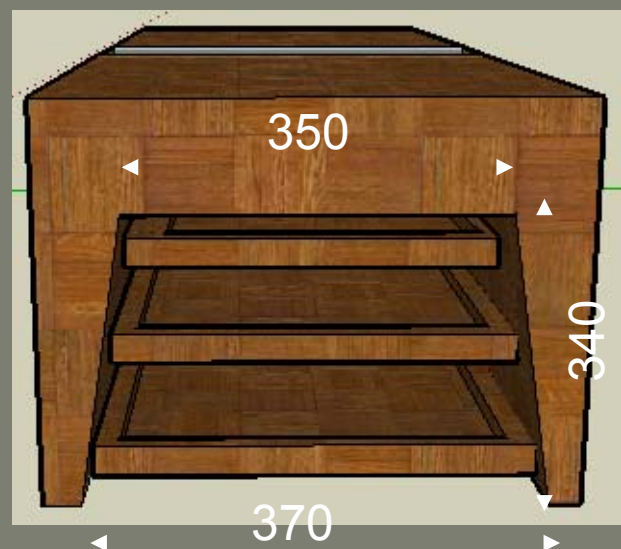
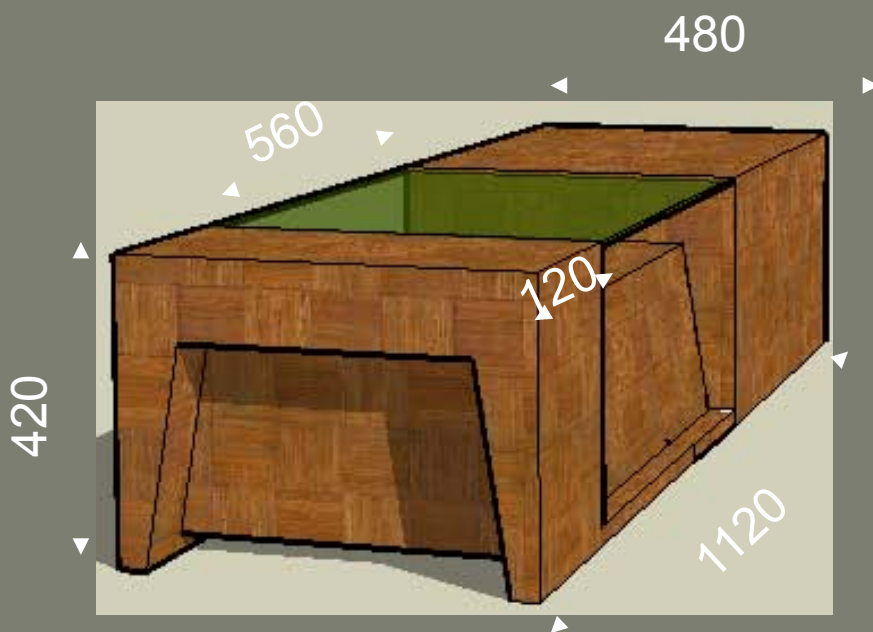
I wanted to change the sheet of acrylic to a bigger piece, which means taking of some of the wood tabletop.

Here are some of the ideas that I had.

I took my ideas to my client and discussed it with her, in the end we both agreed on number 3. number 3 was the best one for the table.

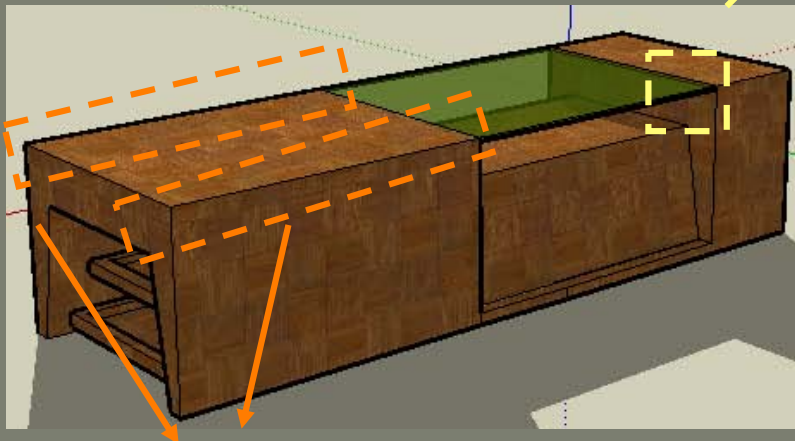
# Design development

The measurements of the coffee table are:





# Design development

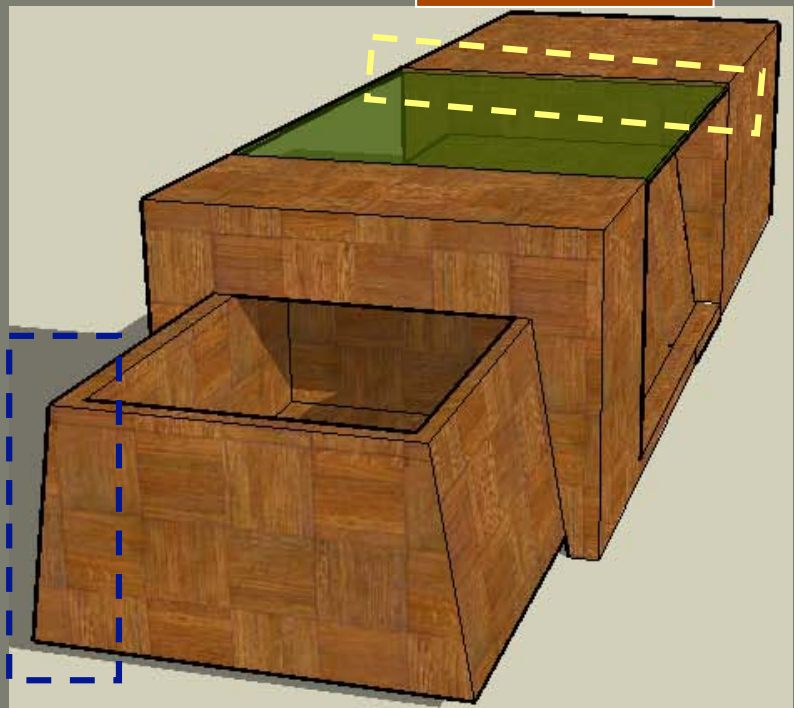


For all of the box joints I will use mitre joint.

This is where the acrylic joins to the coffee table. This is a very important joint as it must be able to hold weight, otherwise the sheet of acrylic will not be stable. So for this part I will use the rebate joint.



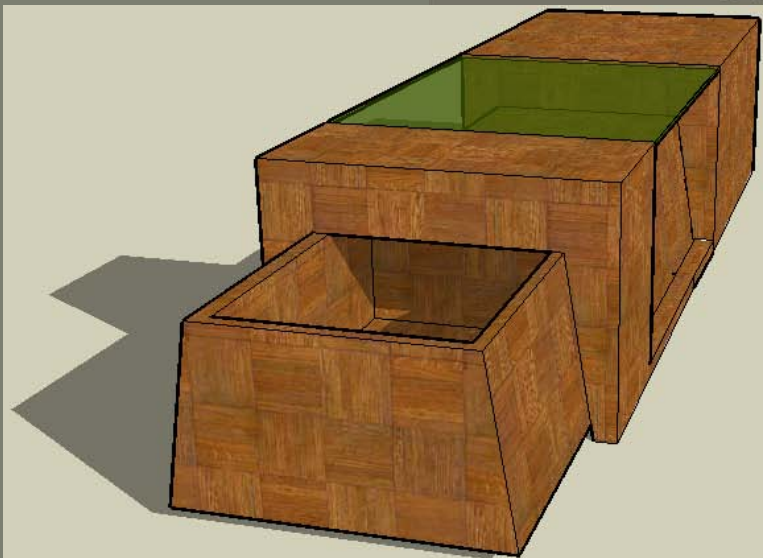
For this part of my design I will use the rebate joint to make slide out storage unit.



# Final design



I think that my client will like this design. The design of this coffee table is modern. I have used acrylic, wood as my materials and even added some storage to the design.



# CUTTING LIST-real

PART	WIDTH	THICKNES S	NUMBER	MATERIALS	LENGTH
Table top 1	430	10	1	parquet timber	440
Table top 2	430	10	1	parquet timber	120
Table top 3	430	8	1	acrylic	560
Front 1	120	10	2	parquet timber	420
Front 2	440	10	2	parquet timber	420
sides	480	10	2	parquet timber	420
Draws 1	370	10	3	parquet timber	440
Draws 2	650	10	4	parquet timber	340





# Client comments

This is just what I needed. I love the design, this should fit in my lounge nicely. I think having some storage in the coffee table is a great idea. I use to just put the magazines on the top of my coffee, it looked very messy. The size of the table is perfect as it is not too big and 6 people can easy fit around it. I like the patterns on the parquet timber, it adds flavour to the table.

Good luck with making the real thing.



# PLANNING

Tasks	Resources	Materials	By when	Completed
Make model to test for joints	Workshop	MDF, glue....	20 July	
Complete model which tested for joints	Workshop	MDF, glue....	30 July	
Record the process	Workshop, computer room	Pen and paper	3 August	
Ask for client comment	Client	Pen and Paper	6 August	

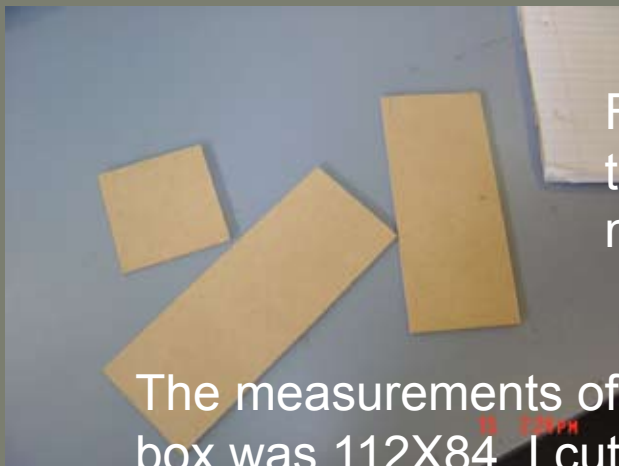
## Planning summary

The plan worked out perfectly. All of the tasks that I had set for my self I have completed on time and at a high standard.

# CUTTING LIST- model

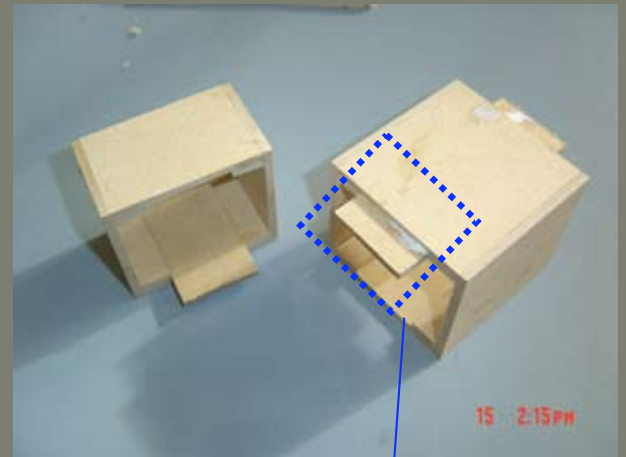
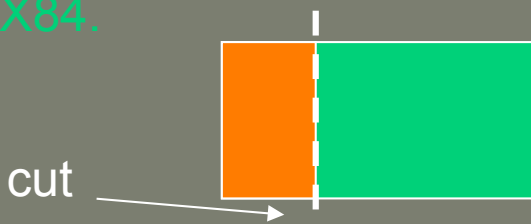
PART	WIDTH	THICKNESS	NUMBER	MATERIALS	LENGTH
Table top 1	86	2	1	parquet timber	88
Table top 2	86	2	1	parquet timber	24
Table top 3	86	1.6	1	acrylic	112
Front 1	24	2	2	parquet timber	84
Front 2	88	2	2	parquet timber	84
sides	96	2	2	parquet timber	84
Draws 1	74	2	3	parquet timber	88
Draws 2	130	2	4	parquet timber	68

# Process of THE 1ST model making

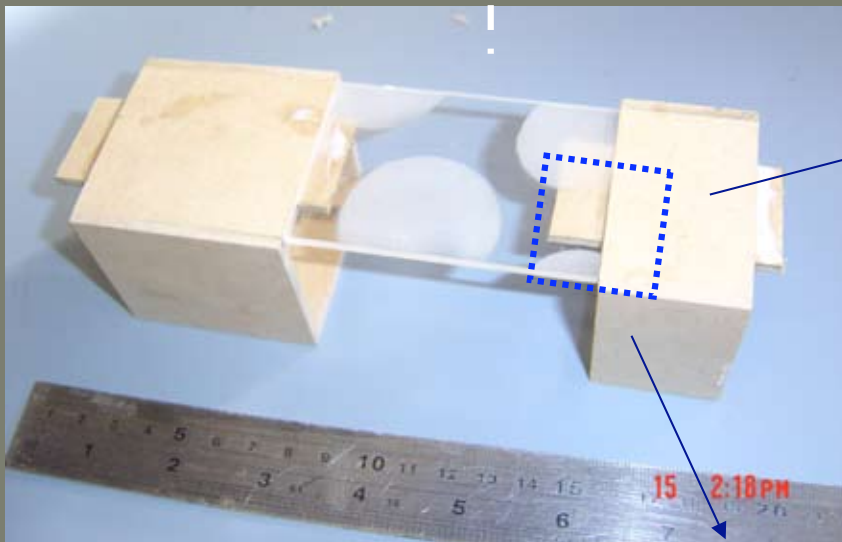


First I cut all the pieces that I needed. Then I made a box.

The measurements of the box was 112X84. I cut the top of the box into 24X84 and 88X84.



Rebate joint



Then I made a rebate joint on each of the boxes, so the piece of acrylic can sit in.

I made this model to test out the joints that I was going to use. I found out that rebate joint was the most suitable joint for joining the wood and the acrylic together.

# Hand tools used in model making



Set square- used this to get the angles right,90 degrees.

Pencil- used this tool to mark out the measurements.



Hand saw- this was used to cut the materials that was needed to size.

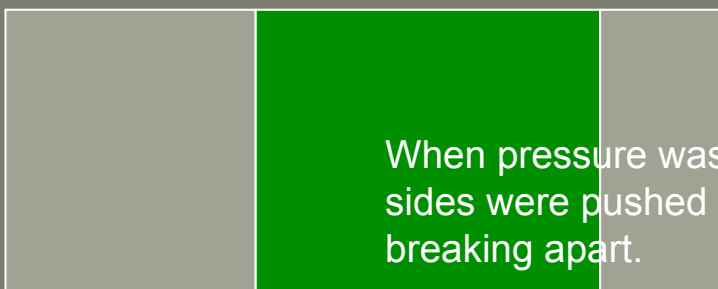
Ruler- I used this hand tool to measure the materials to the right measurements/size.



PVA glue- this was used to glue the materials together.

# Problems in model making

Sliding off the table



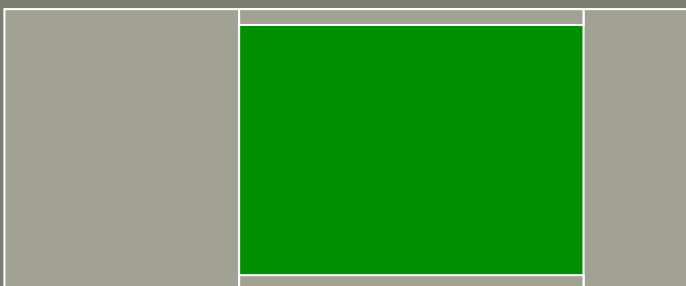
When pressure was on the acrylic table top the two sides were pushed inwards, which resulted in the table breaking apart.



Sliding off the table



To fix this problem, I came up with a solution simply by adding two sides to where the acrylic is joined to the table top.



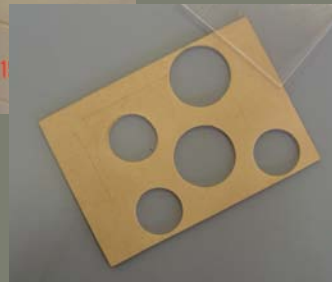
From this diagram you can see that the acrylic is stable and the two new sides are keeping the whole table together.

# Machines used in model making

Sand blasting machine was used to make this pattern on the acrylic.







The drill was used to make the design so the pattern could be sand blasted.



Almost every piece of wood was cut this saw.

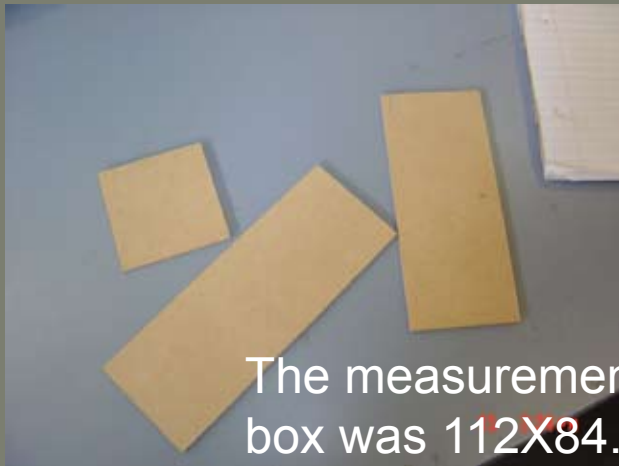
# PLANNING

Tasks	Resources	Materials	By when	Completed
Make second model to test for style	Workshop	MDF, glue....	7 August	
Complete second model which tested for style	Workshop	MDF, glue....	11 August	
Record the process	Workshop, computer room	Pen and paper	12 August	
Ask for client comment	Client	Pen and Paper	16 August	

## Planning summary

These task was all completed.

# Process of THE 2ND model making

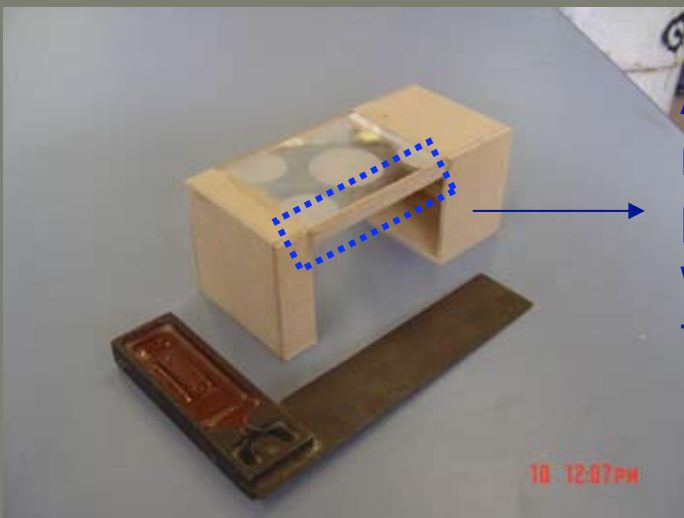


First I cut all the pieces that I needed. Then I made a box.

The measurements of the box was 112X84. I cut the top of the box into 24X84 and 88X84.



cut







After the model coffee table was made I finished it off with some paint. I also added two side to where the rebate joint was so that the acrylic is satiable.

Client comment: I like what you have done to the acrylic. It is very stylish.





# PLANNING

Tasks	Resources	Materials	By when	Completed
Draw some new design for the coffee table	Me	Pencil and paper	2 September	
Ask for client comment	Client	Pen and Paper	5 September	
Research gluing	Internet	computer	8 September	
Start making final product	Workshop	Tools...	10 September	

## Planning summary

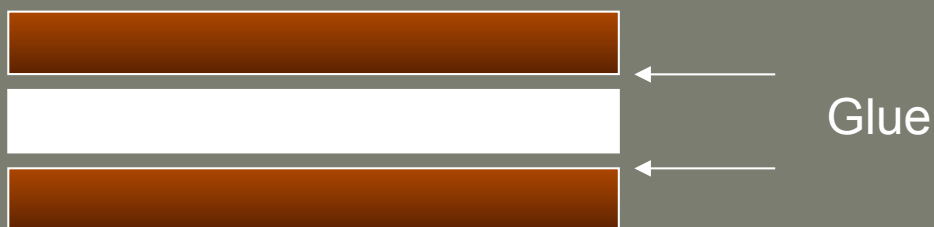
I was able to use time well, so I was not behind.

# MATERIALS

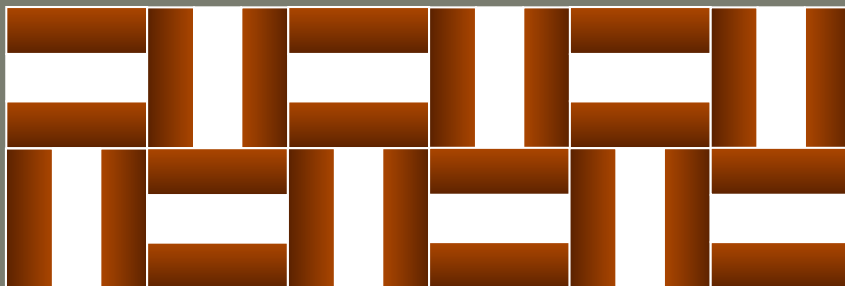
Originally I wanted to use a material called parquet. This type of timber is normally used for flooring, so it would have been expensive also hard to cut. So I came up with a solution for this problem.

I would like to make my own type of parquet timber.

I aim to use two pieces of treated/injected pine and a piece of acrylic glued together.



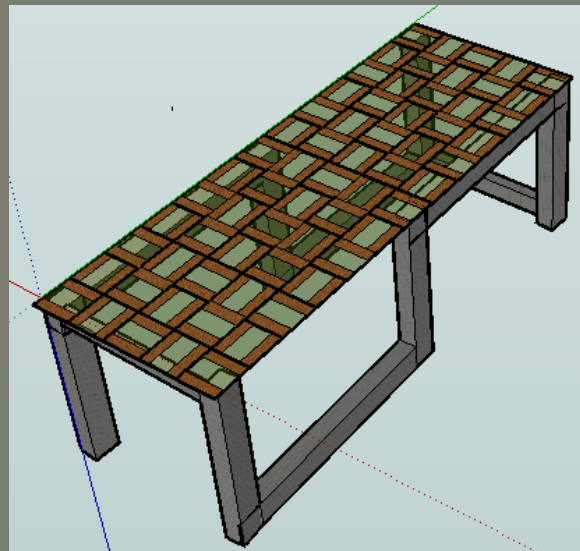
After it is dry I will cut them into little cubes and glue them altogether, which will give me my table top, with the patterns that I wanted.



# Change of final product

After coming up with the idea of making the pattern for my table top, I had to change my final design to express the idea. If I put this pattern on the design that I had decided to make then it would be “over kill” in other words there would be too much happening, which would take the focus from the main feature of this table, the table top.

I took my design of the table top and the two new designs of the table top to my client and discussed with her about the idea of changing from the original design. I explained to her why I wanted to change it and assured her of a good result.



Client comment:

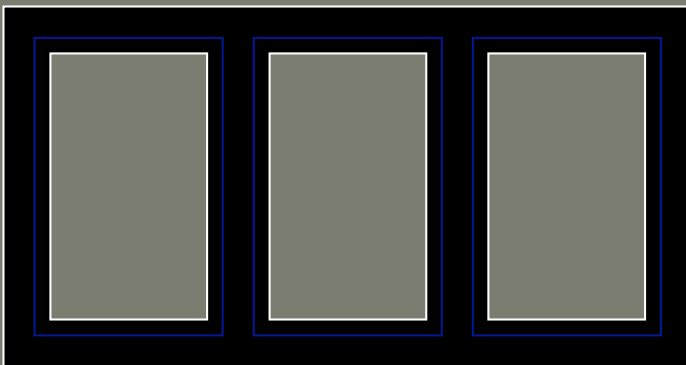
Good idea! I think this will turn out great, I have faith in you. I like the idea of mixing the new with the old.

In the end we agreed on the 2nd design.

# Help from the experts- Victoria university students

## Plan 1

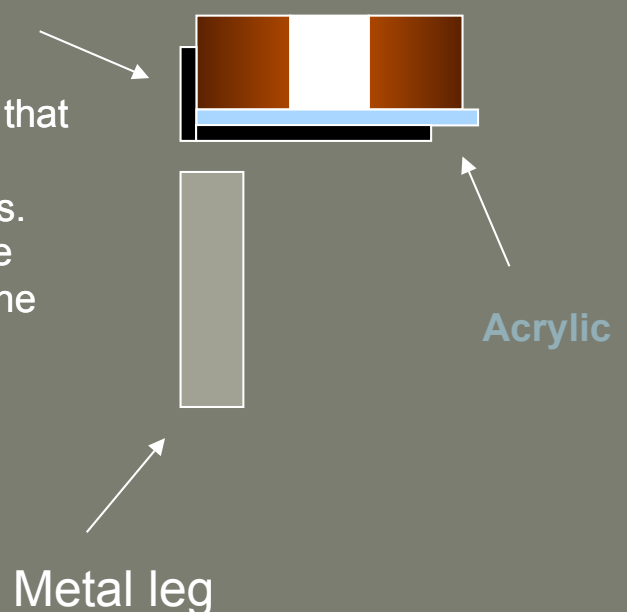
Joining the table top with the bottom was a hard process. It needed to be careful planed so nothing will go wrong. I had some help from the Victoria university students. They came up with two ways of attaching the table top with the bottom.



Here is a top view of what the bottom will look like and how is it connected with the table top. The blue rectangles indicates where the sheets of acrylic goes. The acrylic supports the weight of the table top.

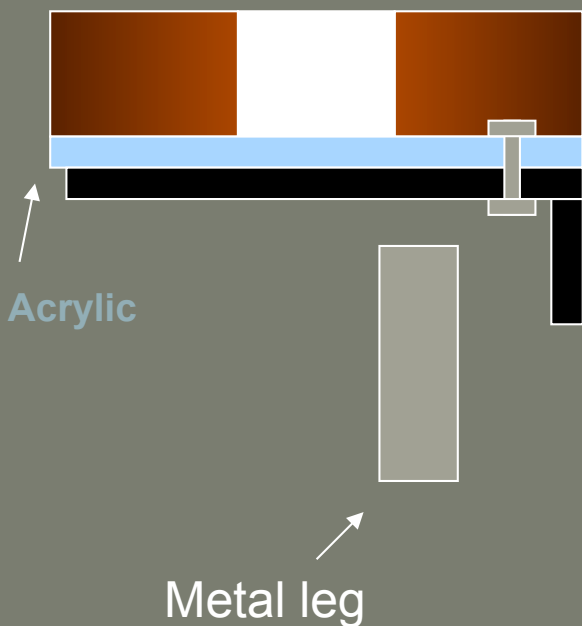
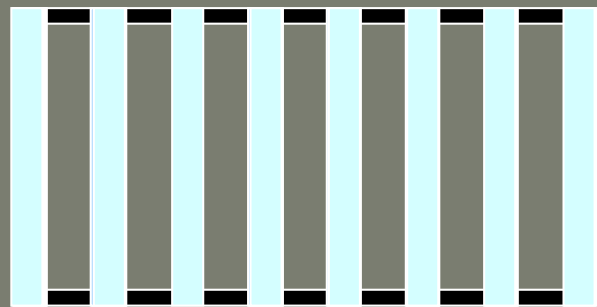
### 'L' shaped steel section

This is a side view of the table. You can see that the table is top is boxed in with a frame. The frame is made up of 'L' shaped steel sections. The reason for have this frame is to keep the table stable and not using nut and bolts on the table top.

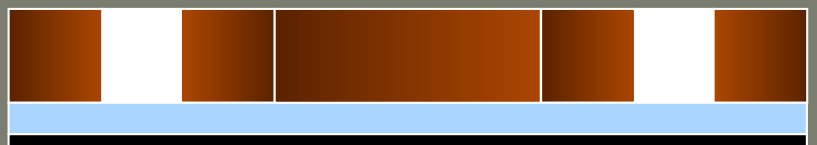


## Plan 2

Strips of acrylic are evenly placed over the metal frame. The acrylic is to support the weight of the table so that the table top does not break.



This frame still uses the 'L' shaped steel section, but it is up side down. The frame supports the table top and to keep the table top in place/stable nuts and bolts are used.

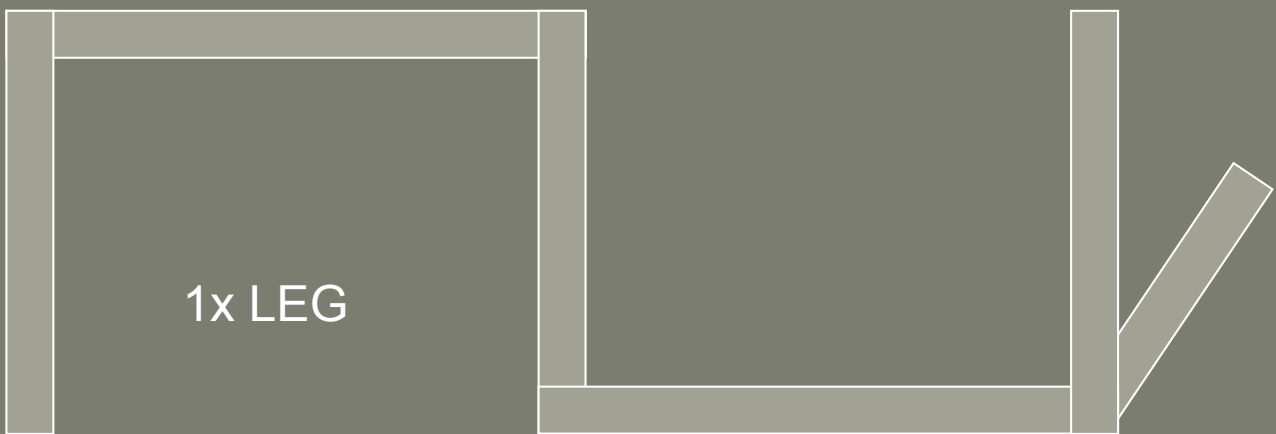


I think this is a better option because it does not block out any of the sides on the table top. Plan 1 using the 'L' shaped steel section, blocks out the sides of the table which is not something that I want. There for plan 2 is a idea that suits this project.

# Cutting list



1x BLOCK



PART	WIDTH	THICKNESS	NUMBER	MATERIALS	LENGTH
Leg 1	37	20	6	Metal	440
leg2	37	20	4	Metal	535
leg3	37	20	2	Metal	500
1 X Block	70	25	180	Metal	70



# Finishes for the table top acrylics

The two ways of finishing of the acrylic on the table top.



As you can see from the picture the two different finishes that can be done to the acrylic. On the left the acrylic is polished with the buffing wheel, as a result it is clear and see through. It is not good because you can see the ugly yellow glue. On the right it is something totally different. The acrylic is not polished with a buffing wheel, which is indistinct. This unclear surface avoids you from seeing the yellow glue (F2), which is not something that is attractive so I wanted to hide it.

It has come to my attention that the best option is to keep the acrylic no-clear so that it stops my client or anyone from seeing the ugly glue.

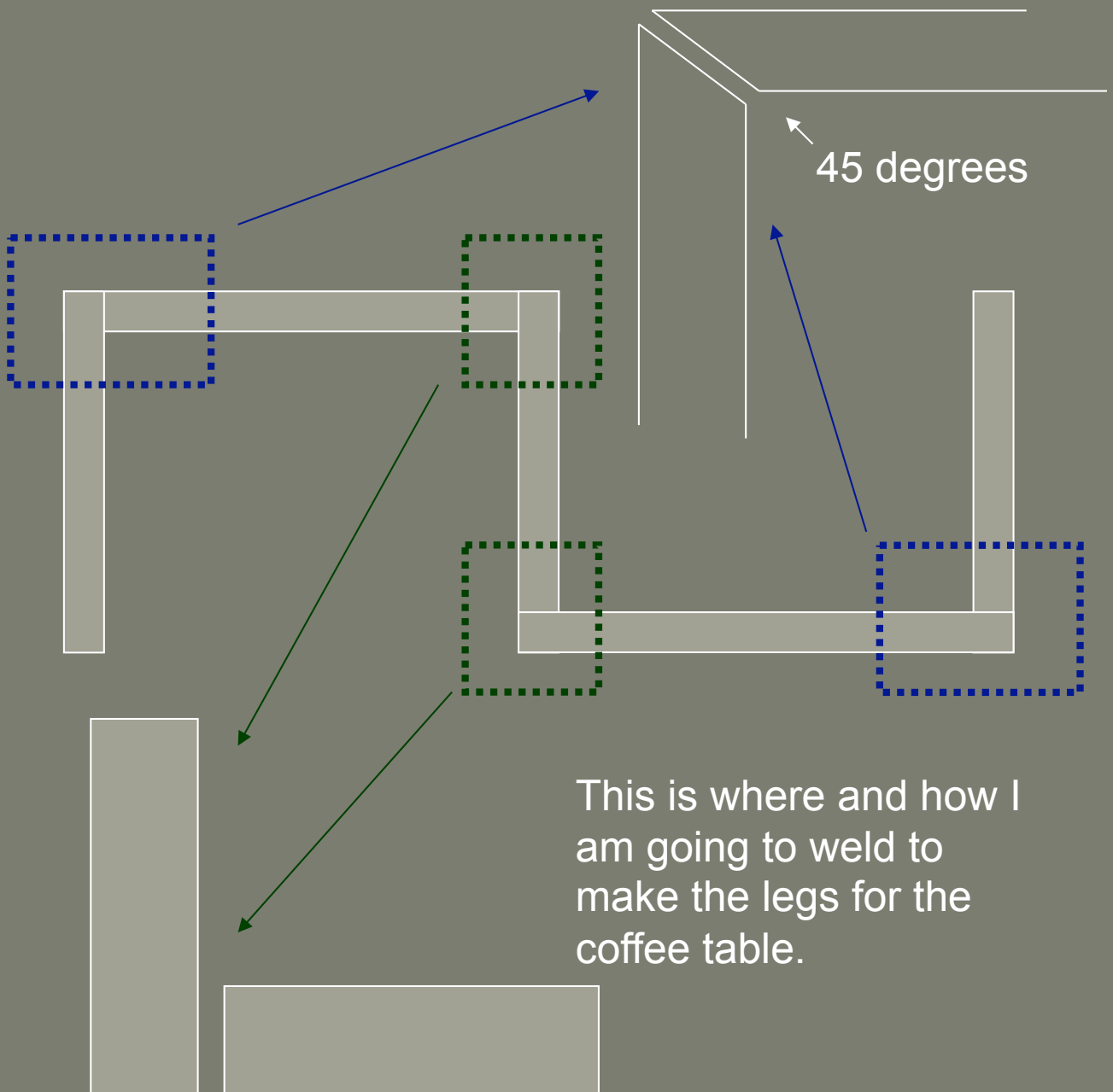
I asked many people about their options. 8/10 like the unclear one better than the clear one.

## Client comments:

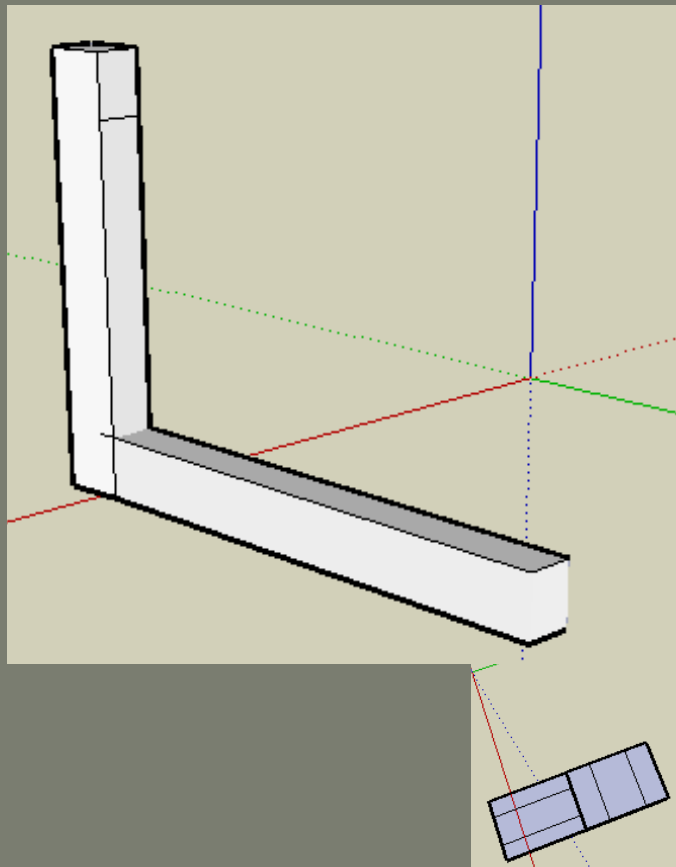
I like the unclear one better, its easy on the eye and it flows well with timber/wood.

# Welding

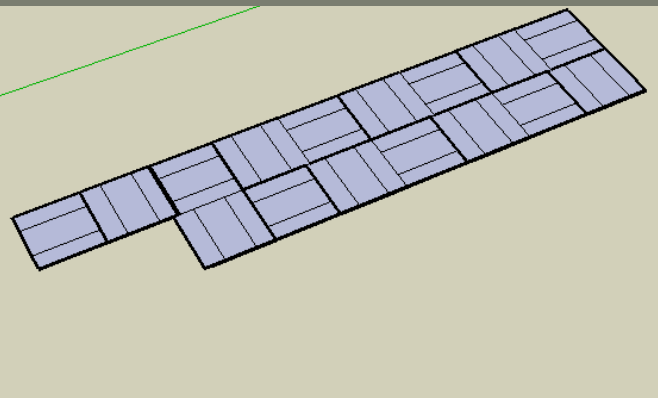
Welding is how you join two pieces of metal together.



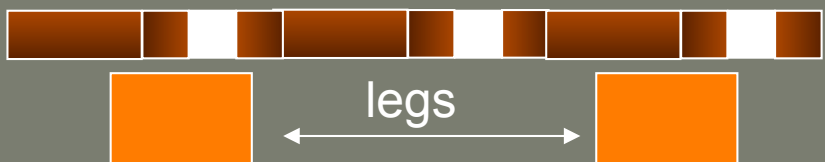
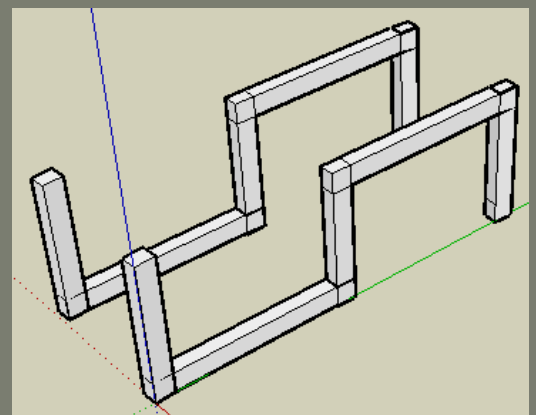
# Design process in 'Google sketch up'

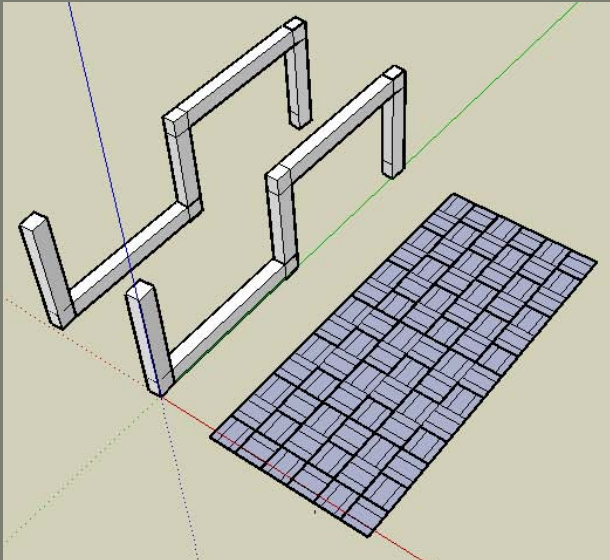


I started making the legs on sketch up first. Then I began to make the patterns for the table top.

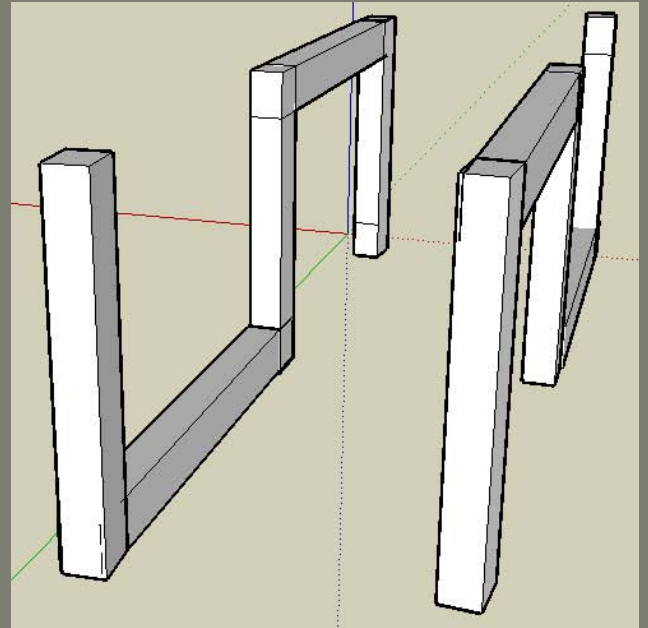


Here are the legs of the coffee table. It is important that the two sides are the same so I made one side then copied it to get the other. If the legs were not even, the table top would not be flat.

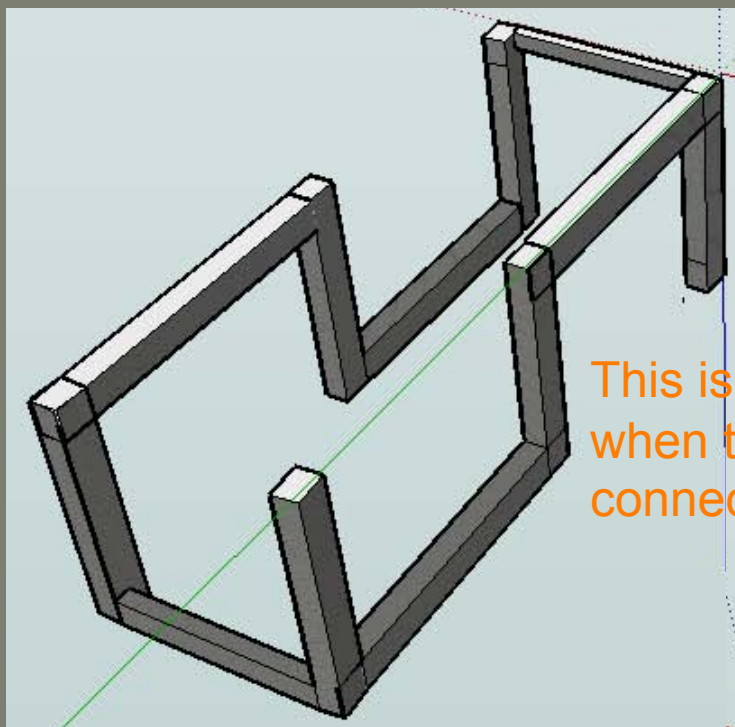




Here I had to turn one of the legs upside down so I could get this.

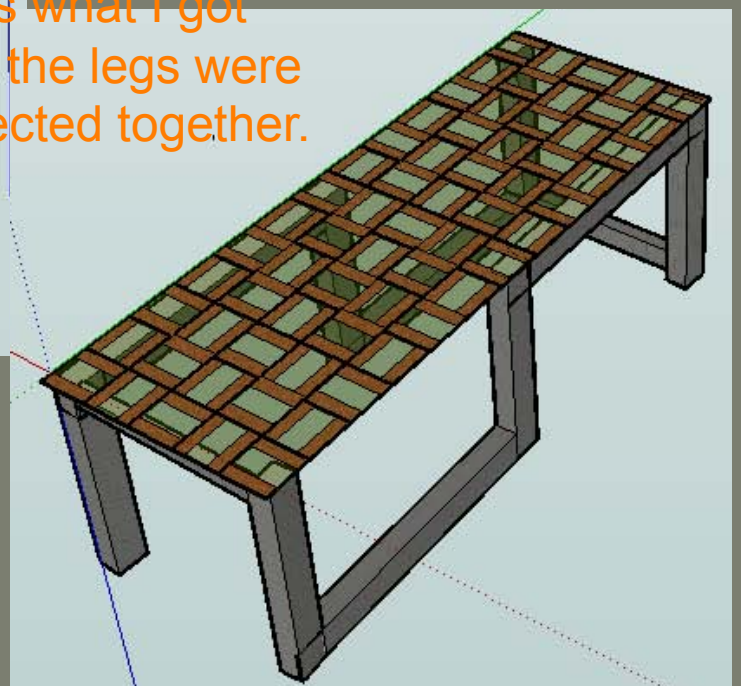


Here I added the metals rods so that the legs could be connected together.






This is what I got when the legs were connected together.

This is my final product. I coloured the coffee table showing the finishes which I wanted.



# PLANNING

Tasks	Resources	Materials	By when	Completed
Start recording the process of making	Me	Pencil and paper	10 September	
Research welding	Internet	computer	15 September	
Finish final product	Workshop	Tools...	19 October	

## Planning summary

Everything but the final product was finished. The final product took a long time as it was difficult to make.

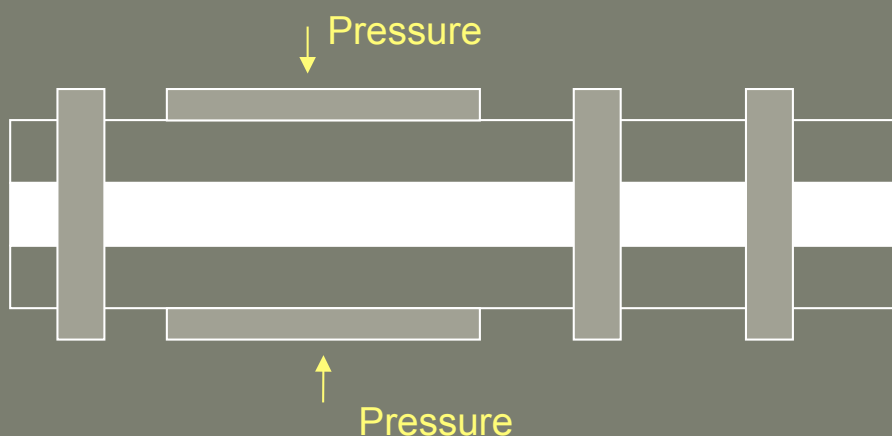
# Practical diary

## Day 1 - 5

The first day of practical. I showed my design to Mr. Lane and asked him for materials. He then used the circular saw to cut my wood and acrylics. After I received my materials I went to glue them together. This was important to use the right type of glue otherwise the materials would not stick together.

The glue that I used to glue the acrylic and wood was F2. This is a very strong glue.

I used the vice and 3 G clamps to hold the materials together.

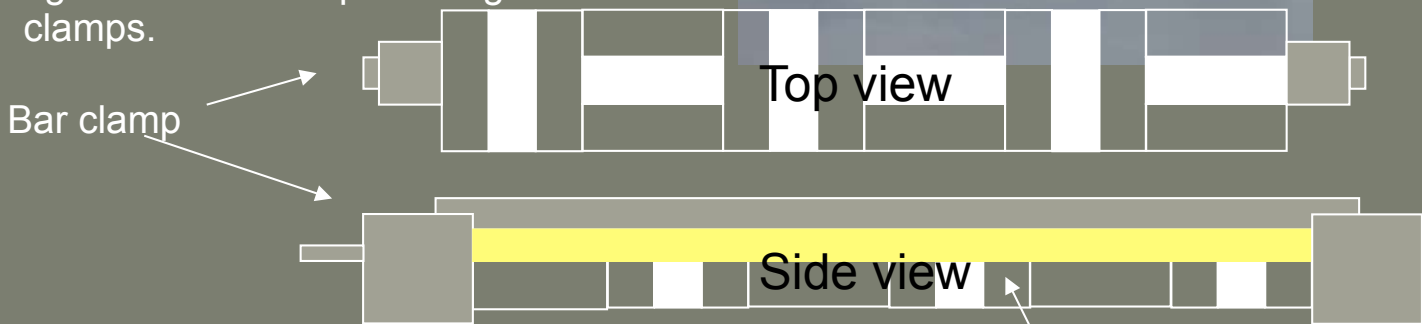


## Day 6 - 10

The glue took all weekend to dry. On Monday the glue was still not quite dried, but there was one that was dried so I asked Mr. Lane to cut that piece into cubes. Using the circular saw, Mr. Lane cut the piece into 30(mm)strips. Then he cut them into cubes. Then I placed all the blocks in a box. The same process went on though the week. By the end of the week I had a box full of blocks.



When all of the glued materials were cut into cubes, I started to glue them. I glued them in stripes using bar clamps.



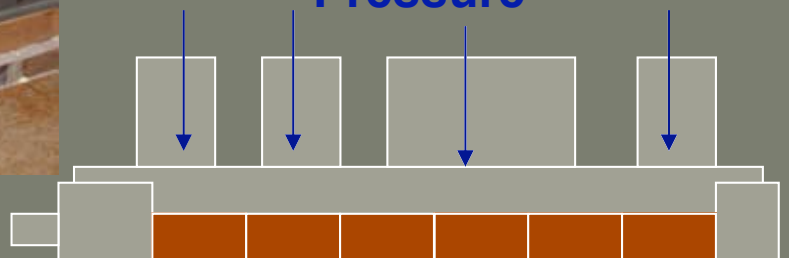
The week ended when I glued all of the cubes into strips. I was pleased with my progress.

Piece of wood, to help keep the cubes glue straight



Heave weights was placed on top of the bar clamps so that pressure are on the strips, to help glue them together flat.

**Pressure**



**No pressure**





# Problems which occurred

1



Some of the glued cubes broke. I think the glue was not spread to all of the surface, so some of the cubes broke.



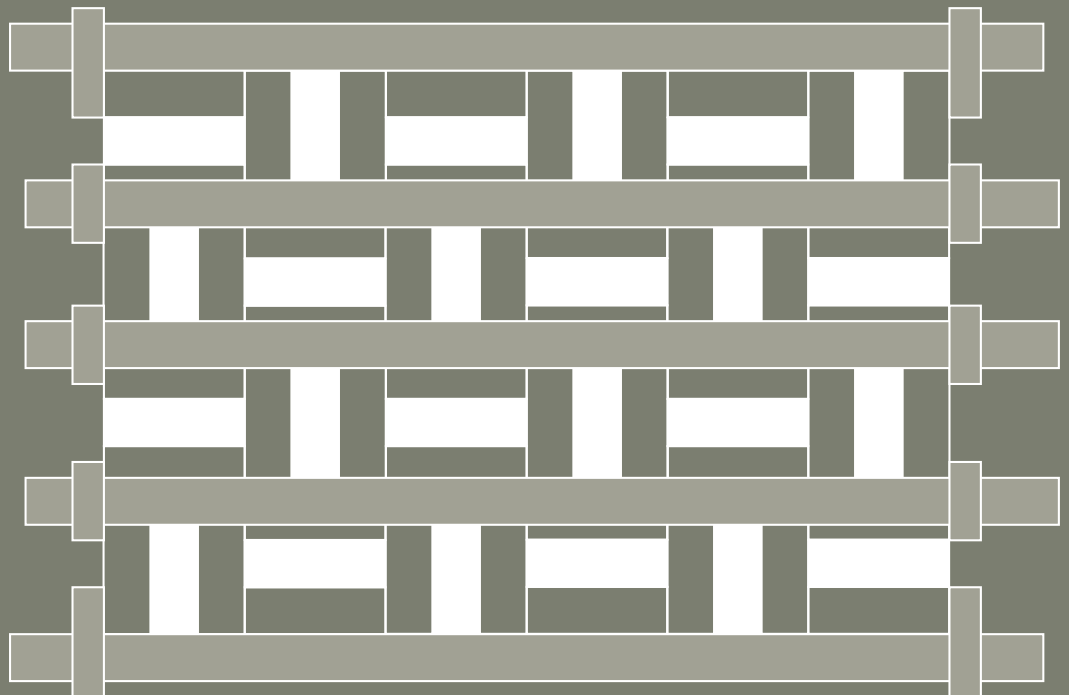
To fix the broken cubes I used some araldite glue, to glue them back together.

## Day 11

Today was the first day of the holidays. Mr. Lane organized it so we could come in to work on our project. I began by lining up all my stripes of cubes that was glued together. This was to find the gaps, so I can trim it off. Then I took the ones that need to be trimmed using the circular saw to Mr. Lane. Not much was taken off 1-2(mm).

After it was all trimmed I lined them up again, this time there was still gaps but it was fewer then last time.

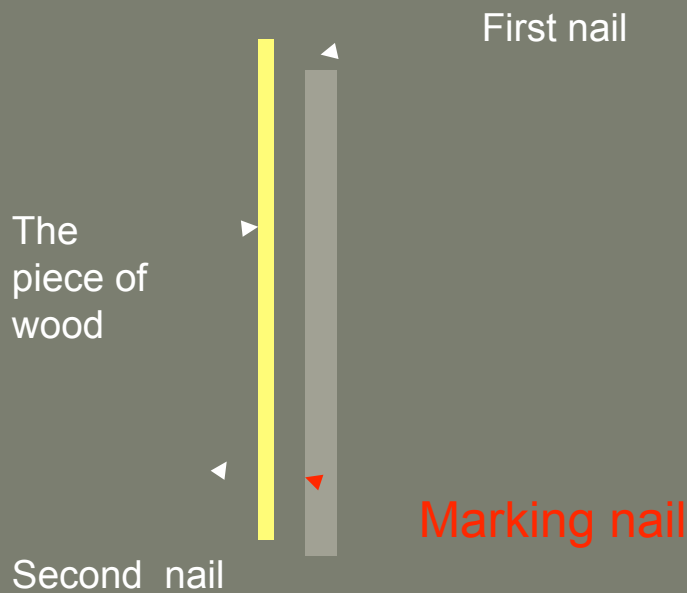
When there was not more gaps I glued them all together. Using 5 bar clamps.



Once it was all put together I want to cut my metals legs. I got my metal rods and started to cut it with the electric hacksaw.



To mark out the metal I came up with something that would help. I got a long strip of wood and hammered 1 nail into it, then from the point of the nail I measured the length that I wanted and hammered another nail into that point. Using this method I marked out on the metal the length that I needed.



## Day 12-17

I took all the clamps off. The surface was filled with news paper, because I used news paper to prevent it from gluing to the top of the desk. After I peeled off the majority of the news paper I could see that the surface was not even, it is bumpy. Then I started to sand it, using a sanding machine. Not much difference was made, soon I realized that it was not going to be done by using the hand held sanding machine. So I asked Mr. Lane if I could ask one of the factories for a favor. Mr. called TOUCH WOOD and they agreed to help, I was so happy. The table top was dropped off at touchwood that very next day.

## Day 18-23

While the table top was being sanded at TOUCHWOOD, I started to weld my legs. First I began by cutting them into the right lengths and angles. Once they were cut by hand I ground the cuts using a grinder.

Once they were all ready I set them up in 90 degrees so it can be welded. When welding you must wear the safety equipment. They are gloves, welding mask and coat. If these safety equipment you can get seriously hurt.



After the joints were welded, I cooled them down with cold water. For these legs I wanted a clean finish so I had to ground the welding down until I can't see it.





## Day 23 - 28



Once the legs have been grinded, the two legs are welded together with a metal rod on each of the sides. To make a frame. It was important that the angles was 90 degrees, if it was not right which could result in the coffee table wobbling.

Metal rod



Metal rod

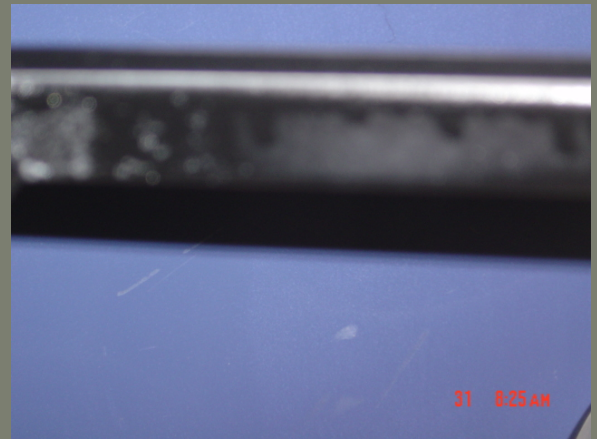
Once that cooled down, it was time for more grinding. After it was grinded the frame was spray painted gloss black. There will be three coats. One coat of the primary and two coats of the gloss black. There was some problems which occurred, which resulted in delaying the time of finishing to project.



# Problem with spray painting

## Problem

The problem which occurred during the spray painting of the legs was, I sprayed the paint too close to the legs, which resulted in the paint running. This was a big mistake because I had to sand off all of the running places with wet and dry sand paper. The sanding process took a very long time. The sanding was a success but the primary coat was gone so it had to be sprayed again.

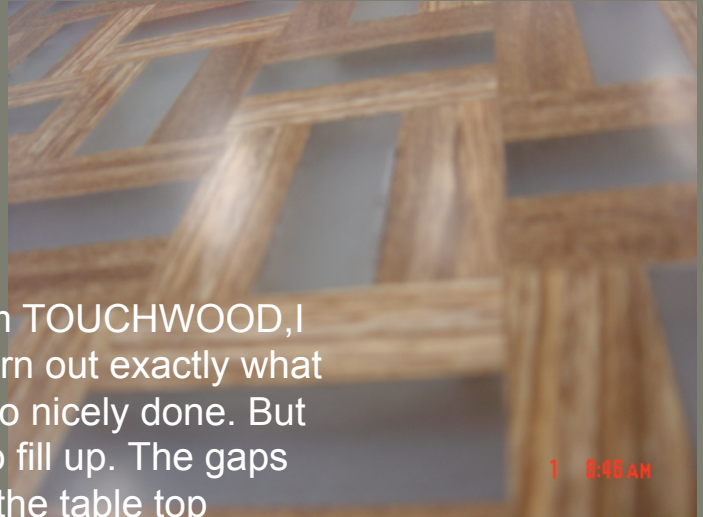


## Solution

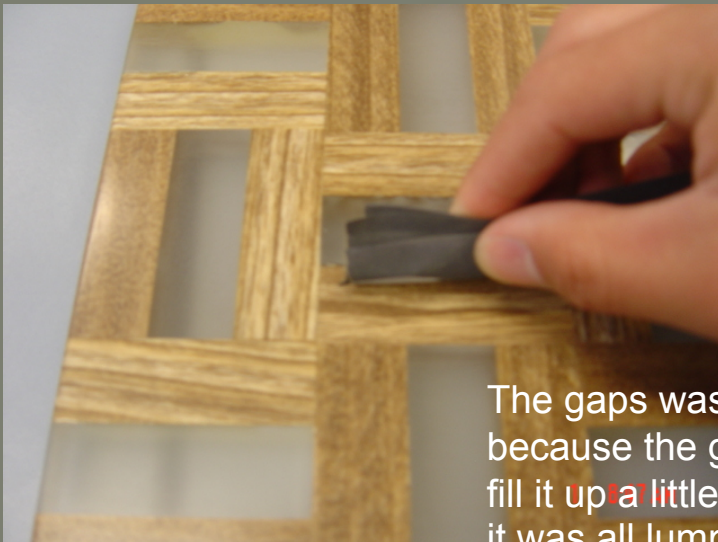
To prevent the running of the paint again, the legs were turned to face upwards so only the top surface would be spray painted, therefore the paint would not run. After the top surface was dry, it was turned again so that other surfaces could be spray painted. The same process was used until all of the surfaces were spray painted.



# Problem with the table top



When the table top came back from TOUCHWOOD, I was so happy. The table top had turned out exactly what I have wanted. The table top was so nicely done. But there were some gaps that I needed to fill up. The gaps had to be filled as it could result in the table top breaking apart and it will look nicer if it was filled.



The gaps were filled with araldite. This was a hard job because the gaps were very thin, therefore I had to fill it up a little bit at a time. After the araldite had dried it was all lumped around the gaps due to the glue. As a result of that I had to sand it off. This took time and concentration because I did not want to sand off the polish. When it was all sanded I applied a tiny bit of polish to the place that I sanded, just to make the whole table look the same, shiny.



Once the frame was dry the top was attached to the bottom frame. This is attached by using nuts and bolts.

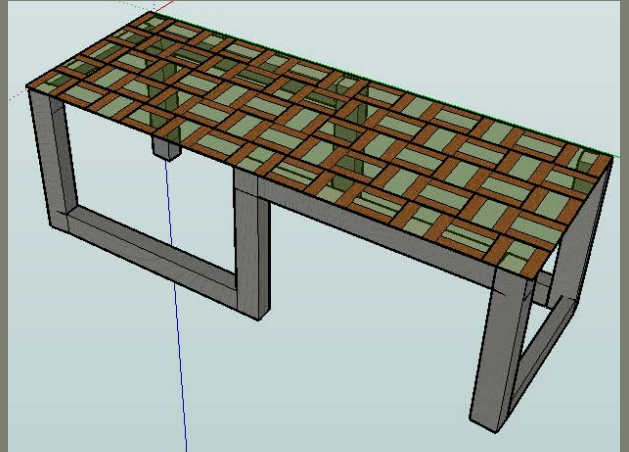


Here is the finished product.

# EVELUATION OF FINAL PRODUCT

## **Designer:**

This coffee table has been designed for May, my client. I have designed and built this coffee table from scratch. The coffee table has turned out exactly what I thought it would be like. As the designer of this coffee table I think this coffee table provides the solution to my client's problem.



## **Changes that I have made to the coffee table:**

During the design process I changed the design a little. I made the decision of changing the design because I think it would fulfill my clients needs even more, which provided a better solution. I did not change the design without my client's agreement, so I explained it to her and she agreed with it.

## **Improvements:**

I think there are not many improvements that I have to make to this coffee table, because I think it is at a pretty high standard. But the improvement that I would like to make is to use a different type of glue to glue the materials all together that is because the F2 glue I used was not very strong for gluing slippery surfaces. To fix this problem, I changed the glue to araldite glue.

### Key factors:

- The design that my client was looking for was a modern design, which is fresh. I have addressed this by designing the coffee table in a fresh, new way. Which is very modern.
- The coffee table should provide space for 6 adults with room to move around. I have completed this key factor by making the coffee table to a reasonable size, 6-8 can be seated around the coffee table.
- Materials were another important key factor. My client, May, asked me to use the following materials: glass or acrylic and wood, any other materials are fine too. I have done what she has asked for. In the coffee table the materials that were used are acrylic, wood and metal. These three are the most commonly used materials, they are also a great combination.
- A particular finish was not in the key factors. My client did not mind what kind of finish the coffee table had; anything which looked nice was all she said. on this coffee table I have dip coated the metal legs and polished the table top. To my point of view it looks great.
- The coffee table must be safe. My client did not want any very sharp edges. I have not designed the coffee table with any sharp edges, so it is very safe.



# Client comment

Woo. This is beautiful. I love this new look, it is something that I have wanted. I see you have used the materials that I asked you to used, which is great, I love the combination. The size I think is perfect for my lounge, it provides enough space to be seated around it and by the looks of things, I think 8 adults can fit around the coffee table easy. Overall I think this coffee table is great and it will be a highlight in my lounge. Lots of money was spent towards materials, but it was not too much. Well I guess real projects cost money.

Lots of time as spent discussing the project. I was pleased with this.

I am glade to be your client and you did not let me down. I will be happy to be your client next time.









# 2.3 and 2.5

## Situation

This year for technology external 2.5 and 2.3. I have to continue my project and mass produce it.

## Problem

I must plan how to mass produce at a factory.

## Key factors:

- Budget/cost: working out the cost of the materials
- Time:
  - My time- plan each stage of the factory.
- Size: the size is also another important key factor. The coffee table can not be too small as it must fit about 6 adults. It can be too big either, otherwise it will not fit in my clients lounge. So it must be the perfect size
- Aesthetics: the colour of the product should fit in with the environment and it should stand out in where it is put
- Shape: I think the shape should be a long rectangular shaped object so it will fit more people
- Ergonomics: this is also important. Because everyone is different in size, weight, height so I have to design something that everyone could use.
- Durability: this should be a strong and long lasting product. so
- Function: the product should do what it is designed to, and if it does not, then I have failed



# Materials list

Materials	Cost	Needed reduces	Making number	Cost of bulk (20% off)	Cost of one
acrylic	95-115	100	500	40000	80
Injected pine	50-80	50	500	25000	50
Rectangular Metal tube 37x20	30-45	45	500	22500	45

Materials are cheaper when it is bought bulks. You get a 20% off when it is bought in bulks

# How did they checked: Quality\_Control and Precision

## Touchwood

During term two our DST class went on a visit to Touchwood: a factory specialising in furniture making. As there quality control they tested for strength, durability, finishes and quality of the whole product. Before assembly a pre-assembly measurement check sheet is used. All the important measurements are checked, this is to prevent it from going wrong. Not all of products are checked before assembly, only 1 in every 50 or 1 of each model manufactured.



As their trademark, quality is the first thing that comes to your mind when you hear about or see their products.

## Myself

This effects me because I am making a coffee table which is a home furniture. The coffee must be to a excellent quality as it must be strong and long lasting. I have made my own check list before assembling. The check list will help me from avoiding:

- miss cuts
- Getting the wrong materials
- assembling it right

Using this method I am sure that my products will be a high standard.

## What I did to check Quality Control and Precision.

I made my own check list. This was a hard process, lots of measurements was taken. It was important that all the measurement was right so I will not result in assembly errors.

## Material selections

### Touchwood

Factories like touchwood order their materials for their products. For example, touchwood purchase their wood from 'pro wood components. One of the key factors that effected their choice in material was the cost. Touchwood as you can tell from the name, that main materials that they use is wood. Before Touchwood used to use Rimu, but, with the increase in price, they had to change towards a different material, Pine. The other factor that came along with the cost of the material was it's durability and how long it lasted under the use of it's client. So, one of the major things to make sure they were giving their clients quality work with quality material. They had to make sure that there were no bad problems with the wood they bought/ ordered.



### Myself

This effects me because my coffee table top are made out of very expensive materials. One of the materials is acrylic, this is very expensive due to the increase of petrol prices. there is no cheaper options for this. The other materials that I am using are injected pine and metal tubes. These two materials are not valued at a high price. Therefore it is affordable.

Before the material was used the prices did not come to my mind. Because I made this at school materials did not need to be purchased first, therefore I did not know about the prices. When the project was completed the invoice was given to me from Mr Lane. It cost a lot.

## Safety

Safety is the most important key factor when working in a factory. During the visit to Touchwood I saw safety signs around the workshop. This was to help staff remember that safety is first. Different areas in the workshop have different safety gears. For example: at the spray booth you must wear a mask and goggles.



This affected me because at school safety was also important. When using the machines, safety gear must be worn. Otherwise, you may not use the machines. Sometimes when you work, you kind of forget about the safety gear, which can result in dangerous hazards.



## Staff and working crew

### Touchwood

At touchwood factory there wasn't just any random people working at the factory floor. For example, the fork lift. Only staff that were trained to use it were allowed to do so. As we went further on through the factory we saw that there were also trained and qualified/trained people in certain areas like, the spraying booths, machines where the joints were made, and most importantly, the safety and hazard check area(s). But one of the areas that I found in the factory that weren't in the need of qualified staff was assembly. In saying this, even though there is a need to have qualifications and training to work in certain areas at touchwood, qualifications and training are still offered while working at touchwood.



### Myself

One of the things that I would look for when finding staff to work at my factory are qualifications and the training/experience that they have. In doing so I can assure that both my customers and I can get the best result for our money. In having qualified and trained staff I will be able to see that there will be little or hopefully no problem in the assembly line, booths or the checking of the product.

### **Areas of qualification that I would look for are...**

Forklifts for bringing in heavy and uncut materials and other heavy machinery  
Retail businessman  
Mechanical engineers to check safety, and the planning and designs of the product

### **Training on the premises will be provided for areas like...**

Assembly  
Spraying booths  
Packaging the product  
Using certain pieces of machinery



# Flow diagram of mass production

First the materials arrives at the factory, then the materials are checked if it's up to standard and if isn't it will be rejected.



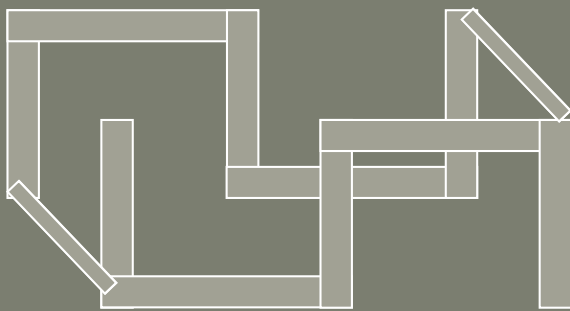
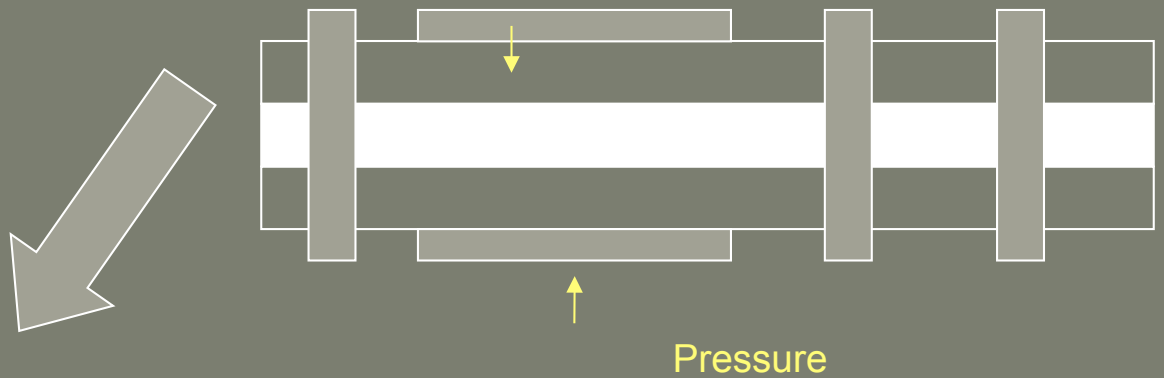
Before any work can be started, these must be followed and worn.

The materials are cut into size using different saws. These saw are very dangerous so you have to be very careful.



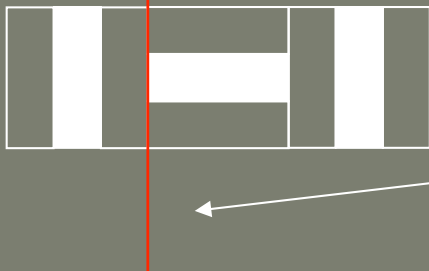
Once the materials have been cut then it is placed into a tray and on top of it there is a small piece of timber with the description of what is on this tray and the size also how many.

Now it is time to glue the acrylic and the wood together so blocks of cubes can be made.

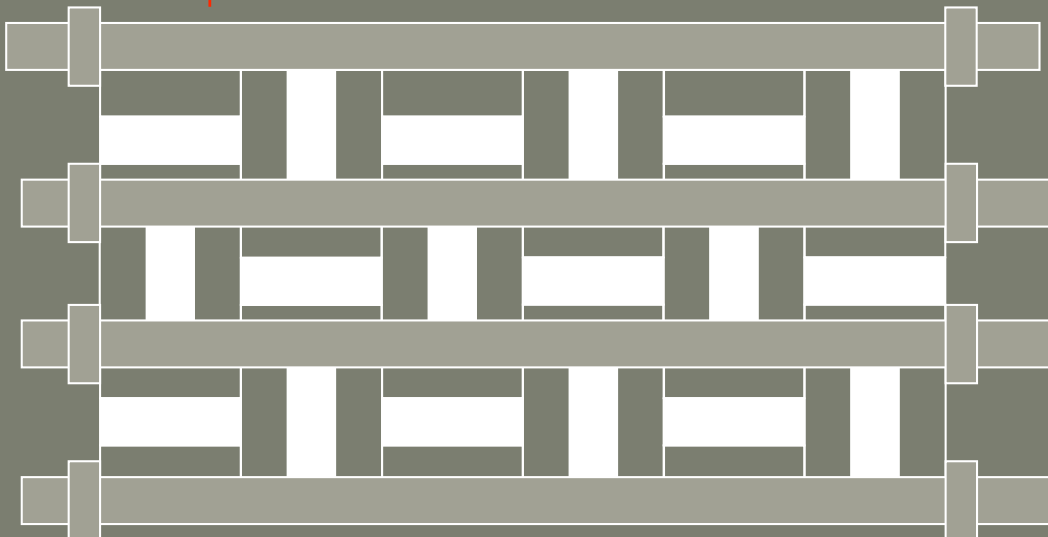


At the same time the metal rectangular tubes are cut and welded to make the bottom legs of the coffee table.

When the glue has dried the pieces of materials will be cut into cubes. This is a important process as it could result in the cubes in different sizes. So this must be cut with a laser cutter. The laser cutter will provide accuracy with has a 99% chance not going wrong.



Then all the blocks are glued and when it is dry it will be taken to sanding machines, to give it a smoother finish.





When it is all sanded it is then sent to the spray booth. This is when the table top gets its shiny polish finish. At the same time the metal legs are sent to spray paint. There should be two coats for the spray paint, the first coat is the primary and the second is the gloss black.

When all the coats are done and it is dry it will be sent to the assembling room. In this area it is checked with a check list. Then if nothing is wrong. The table top will be attached to the bottom legs. This will be done with nut and bolts.



Then it is packaged for sale. To prevent it from scratching bubble wrap is placed around the item, then placed in a box.

