CAL SUMMERS

3D DESIGN & CRAFT 2017

TABLE

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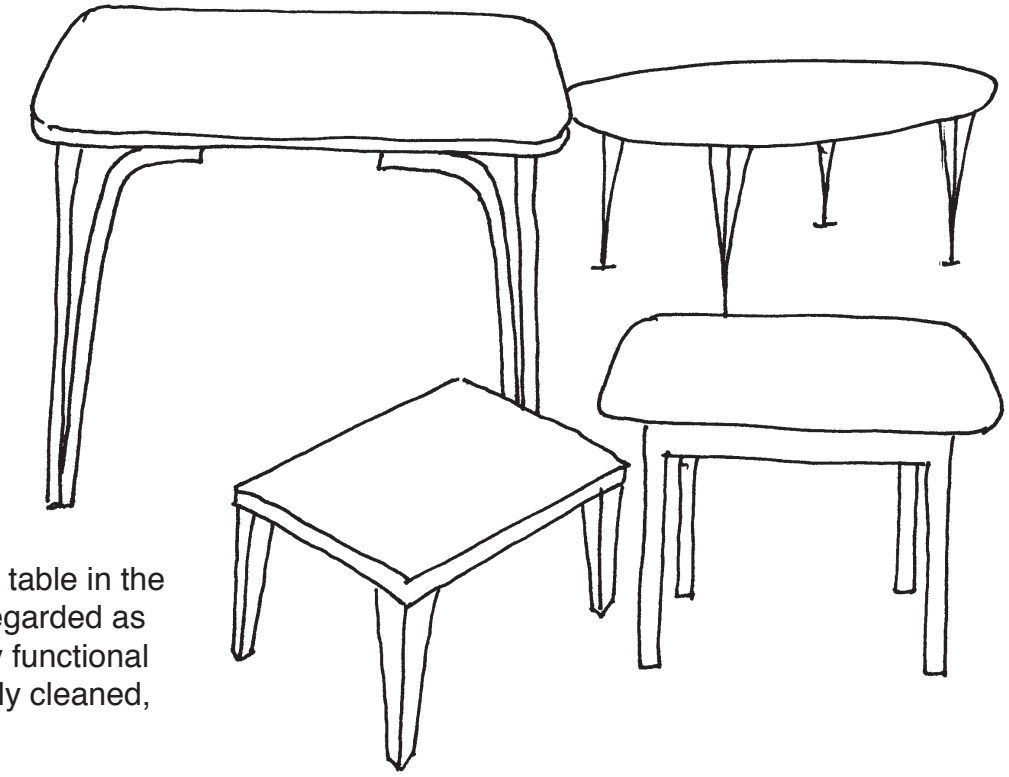

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Every household had a formica table in the 50’s and 60’s. They were not regarded as chic or stylish, they were purely functional and practical as they were easily cleaned, lightweight and small.

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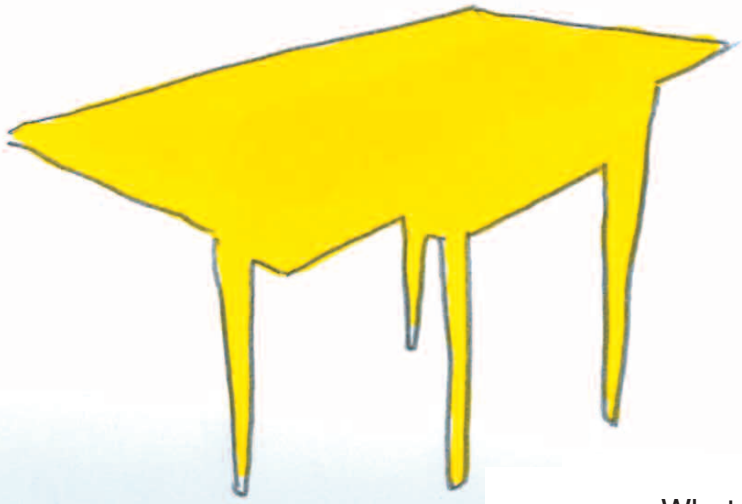
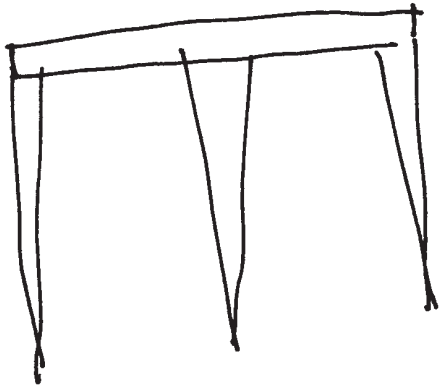
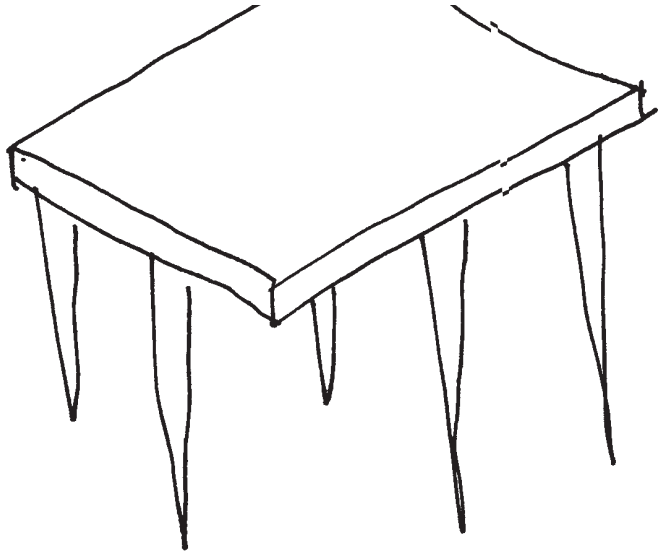
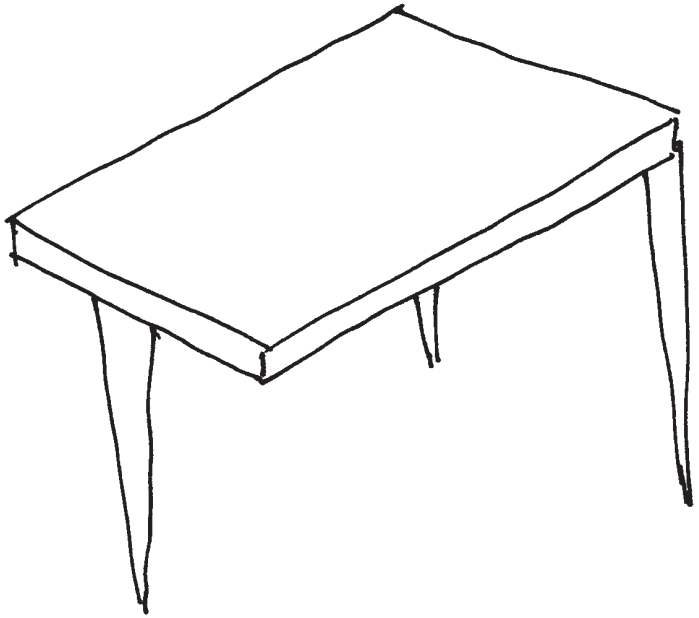


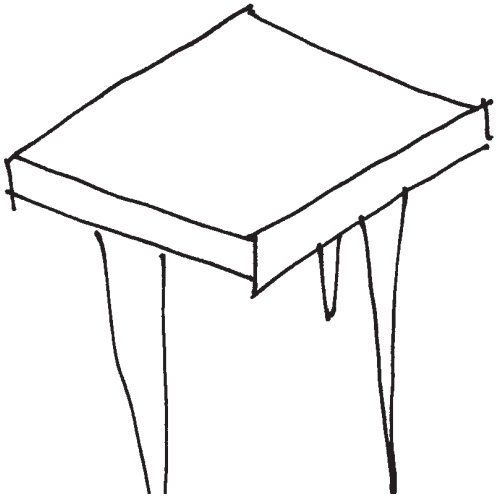
What stood out to me were the bold colours, the scale and the proportions.

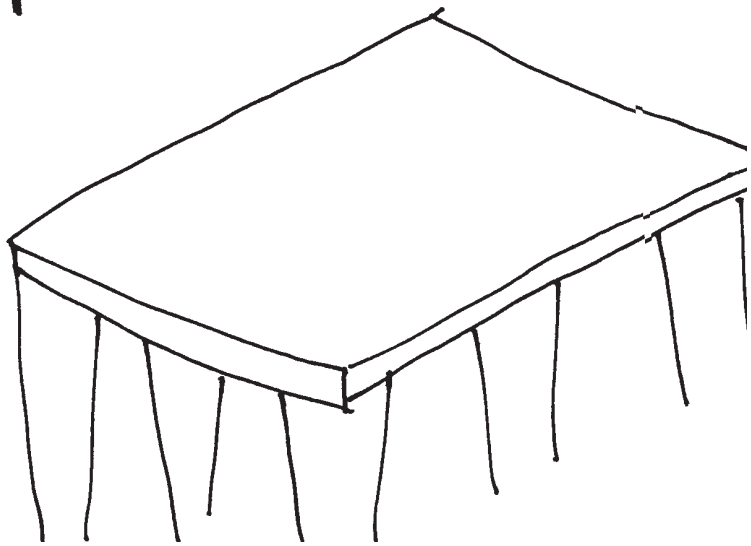


Tracing them made me look at tables in a different way. Why do they have to have 4 legs?



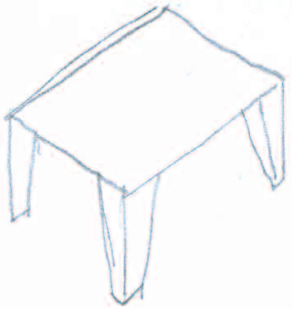






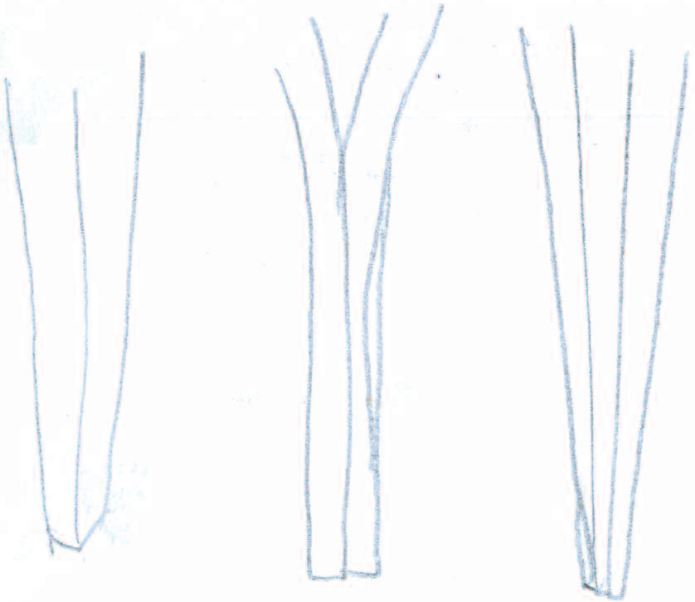




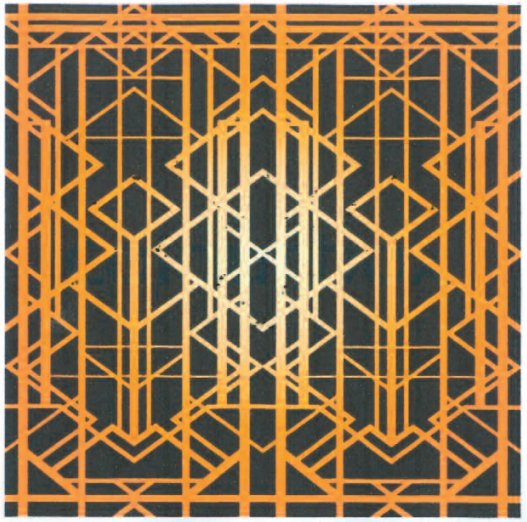



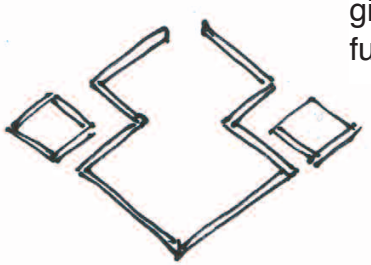
Where did 1950's designers get their inspiration from?

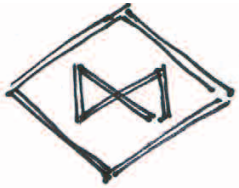
Bold colours, hard lines and tapered shapes, was it from Art Deco?

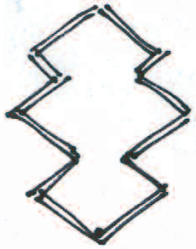


I came across 1920's Art Deco whilst researching modernism.I was interested in the geometric and bold tapered shapes. They give the pieces a very contemporary and futurist style, even to this day.

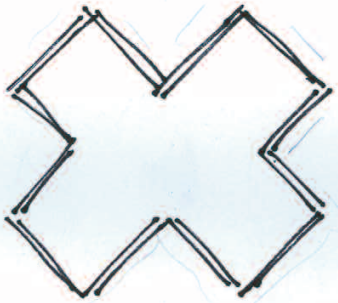


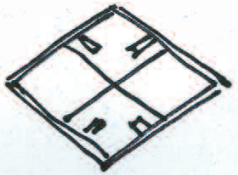






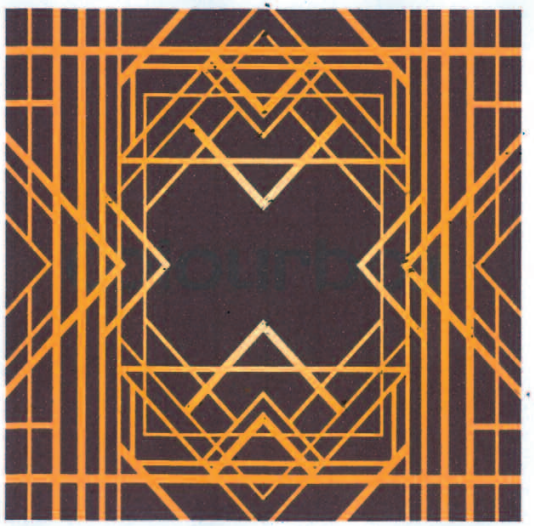
The black and yellow compliment each other very well, making the stricking shapes very prominent.



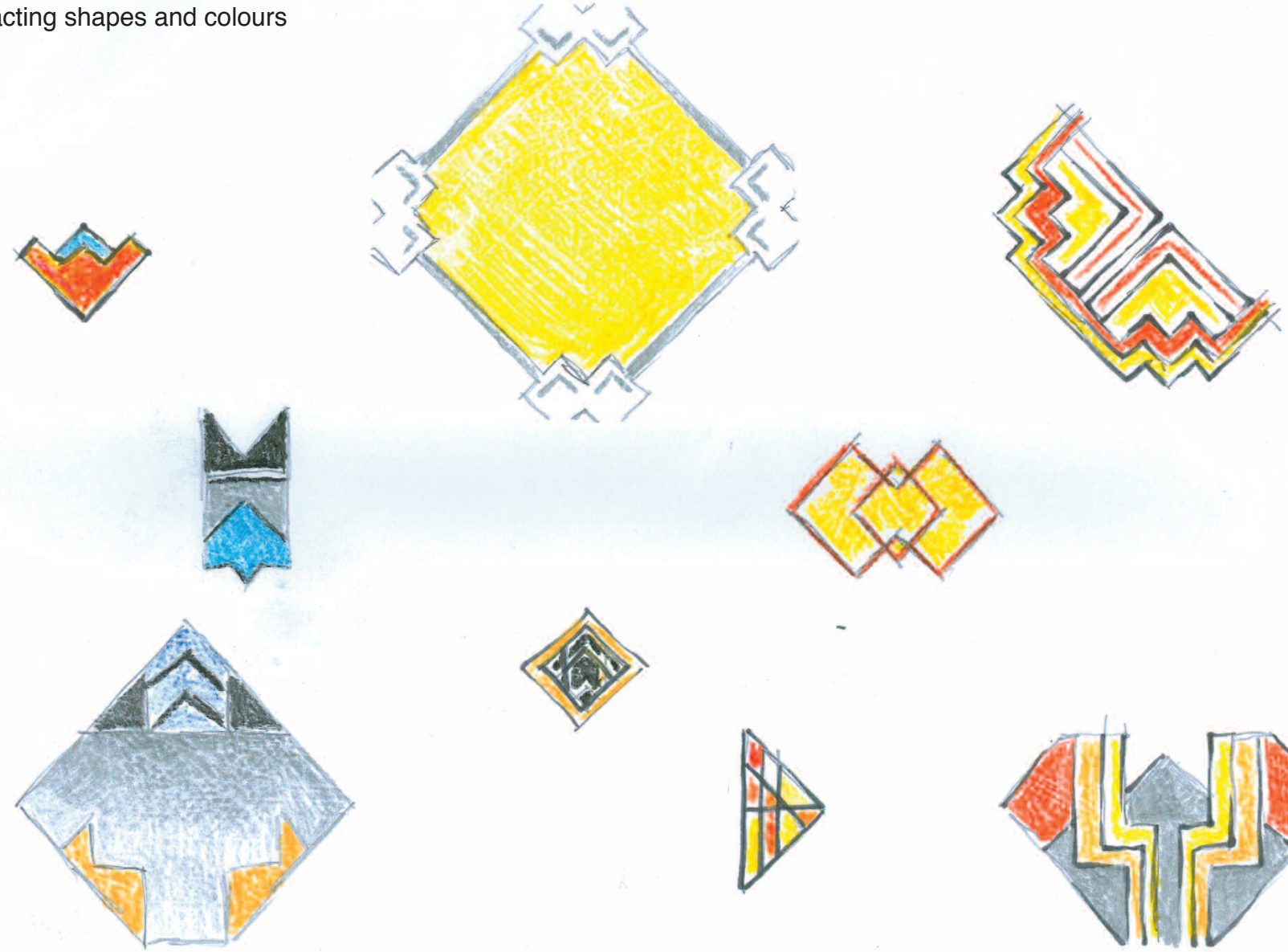


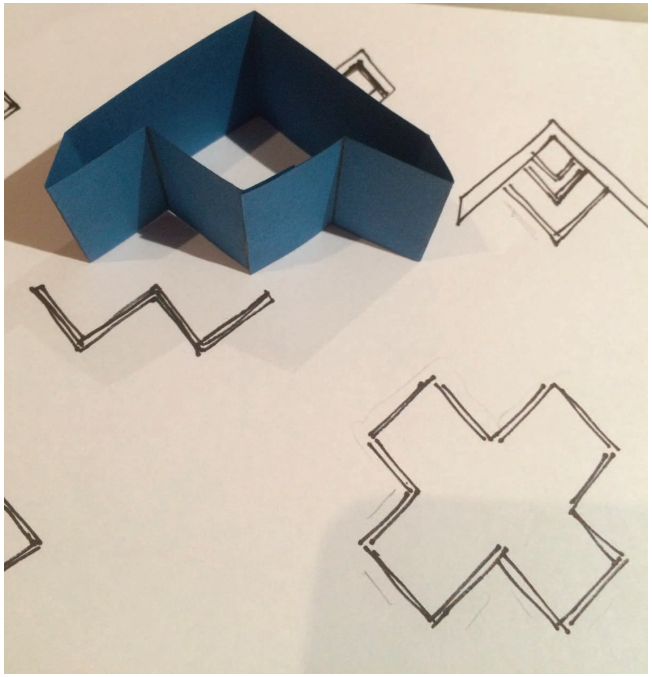
Extracting shapes

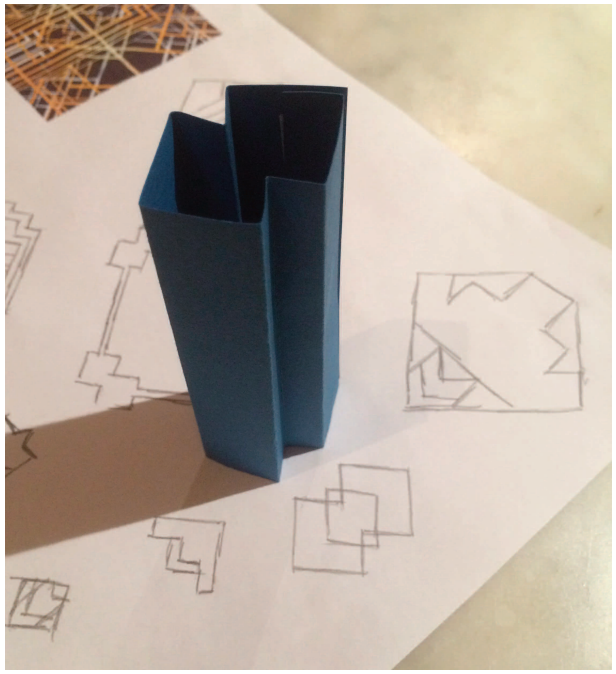
Zig zap shape?

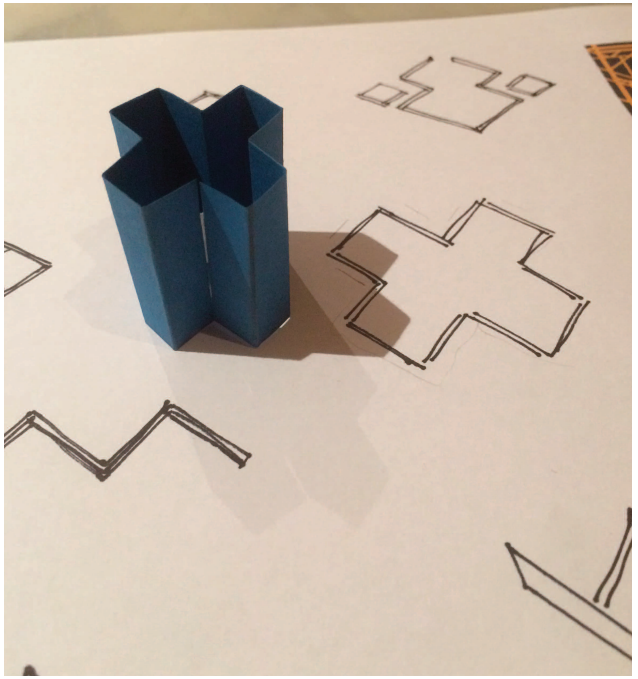


Extracting shapes and colours

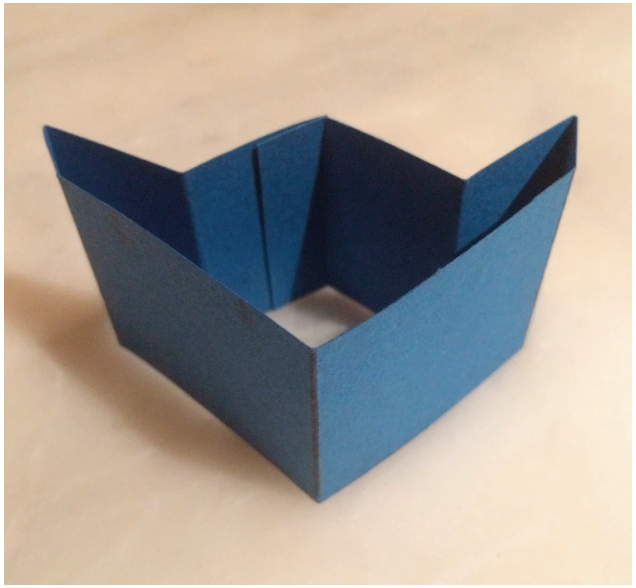


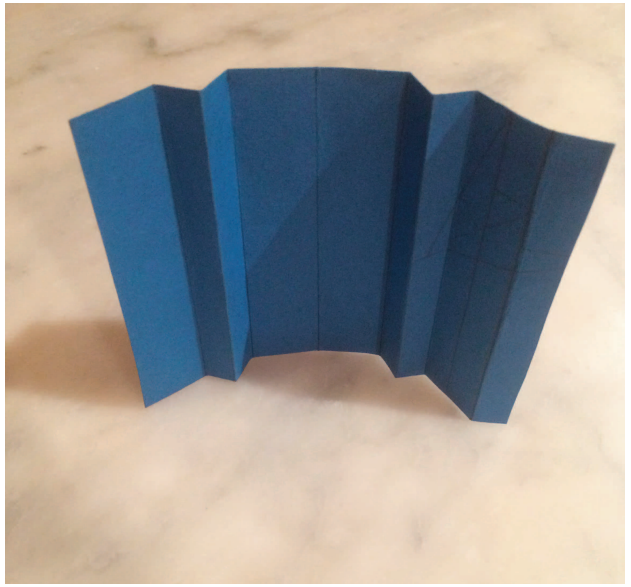






Turning 2D drawings into 3D shapes.
The folds offer support and add strength.

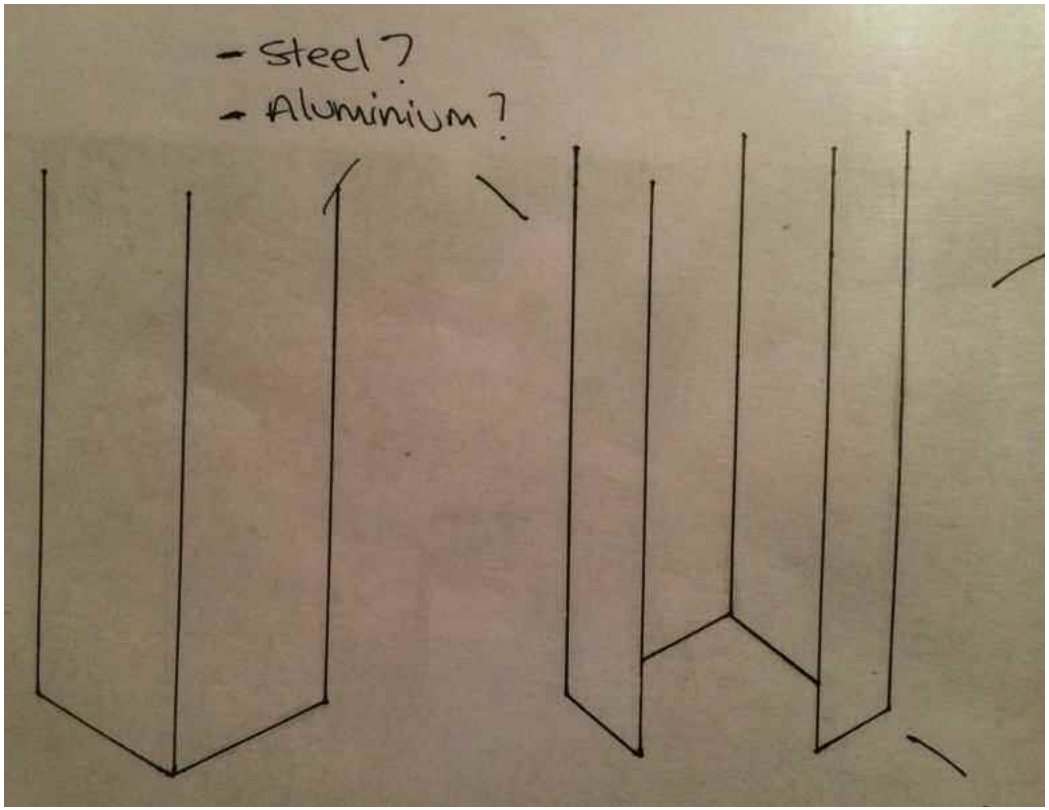




Hollow leg made from sheet steel would reduce weight.

This design would reduce weight even more and wouldn't require any join or weld.

Edges are folded in here to give an illusion of being more solid and weighty. This design looks more considered as well as being more sturdy



I wanted to use steel because of its stylistic qualities and durability. I was aware that it can be heavy for something as large as a table leg, especially solid steel, so I wanted to come up with a way of making the shape as lightweight as possible. I decided that sheet steel would be the best option in terms of reducing weight and also being cheaper to manufacture. Through drawings and models, I came up with a design, which used only folding, where no joining or welds were needed. These folds allow more structure and stability, as well as giving it the illusion of looking solid.

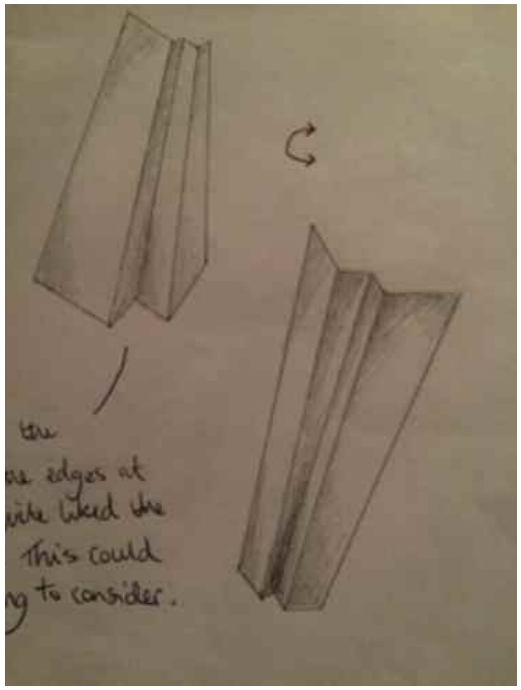
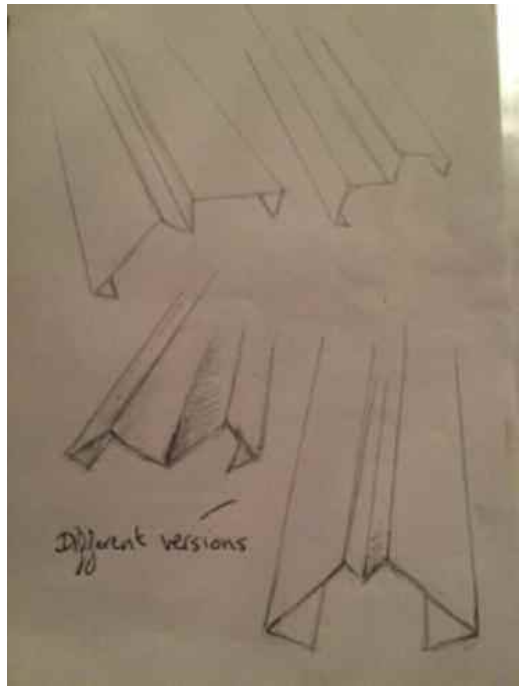
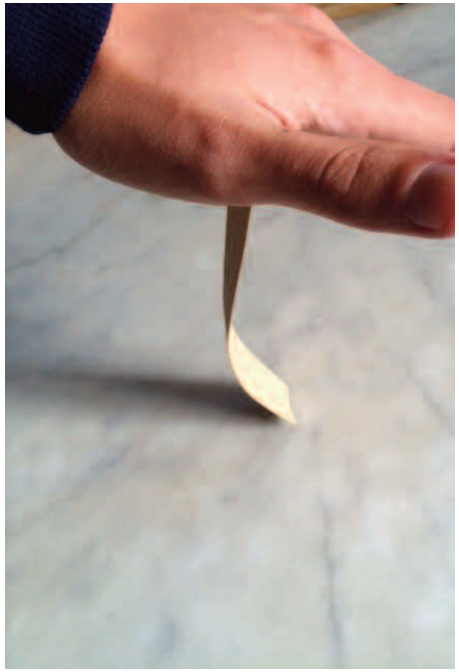


Table leg maquettes.

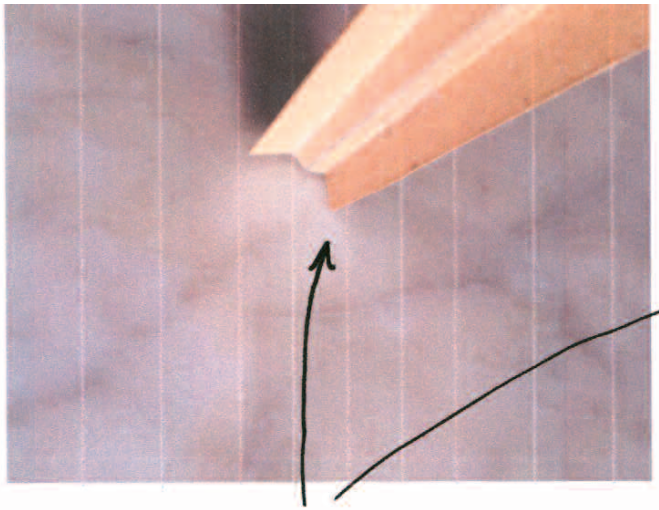
Initially I scored the cardboard to bend the edges at right angles, I then discovered the groove itself was quite appealing, and so thought I would make a feature of it. Here are a few table leg designs I came up with from that. I liked the ridged edge and so I wanted to push forward the design on the far right. This fold also adds stability

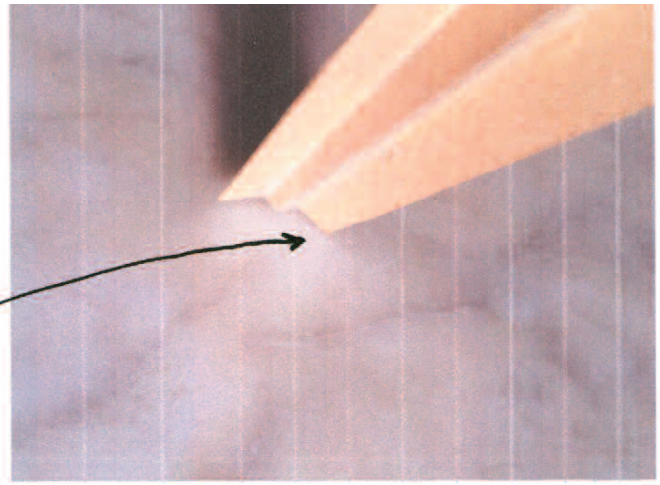


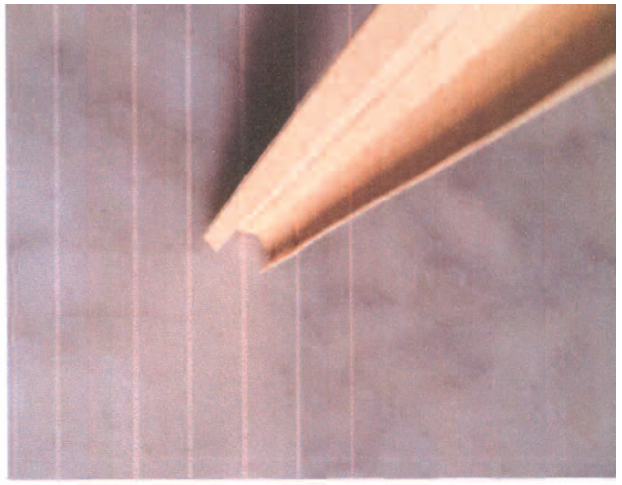
Score

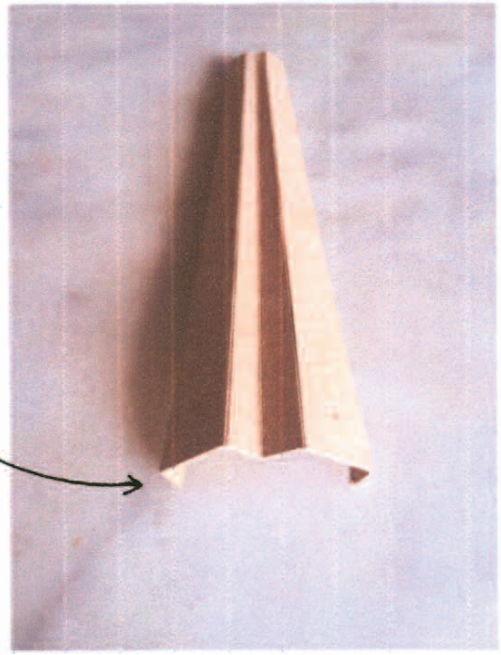
Proving strength tests.

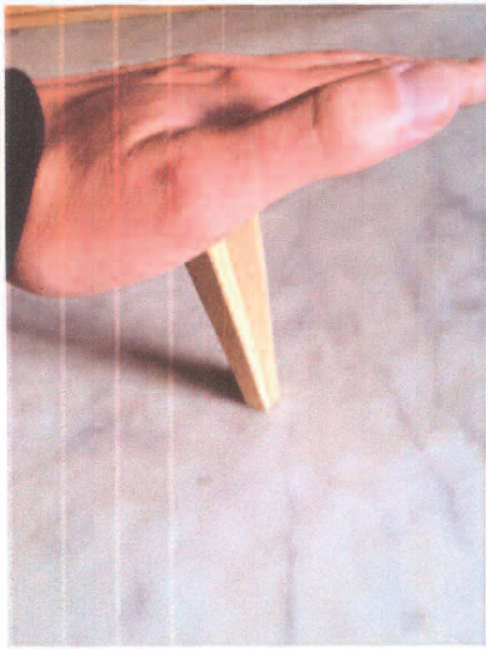






I found that the weakest part of the leg was the corners. When weight was applied here they would bend. I folded the edges in to prevent this. This piece will now be very strong when made in steel.







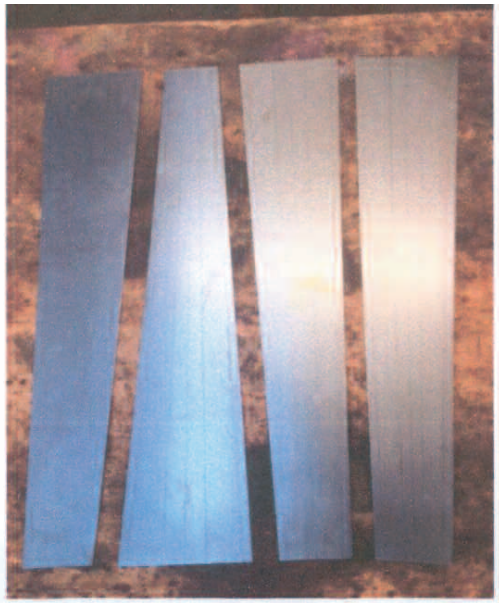
Here is a model I made from grey card. I took photos from various angles to show the different ways the shapes of the legs respond to light.



I would like the table to primarily fit into a domestic environment. Because of it's size and versitility it will have the ability to adapt to other situations, from kitchen/dining table to desktops, it could even be used outside.
I produced these images using photoshop.



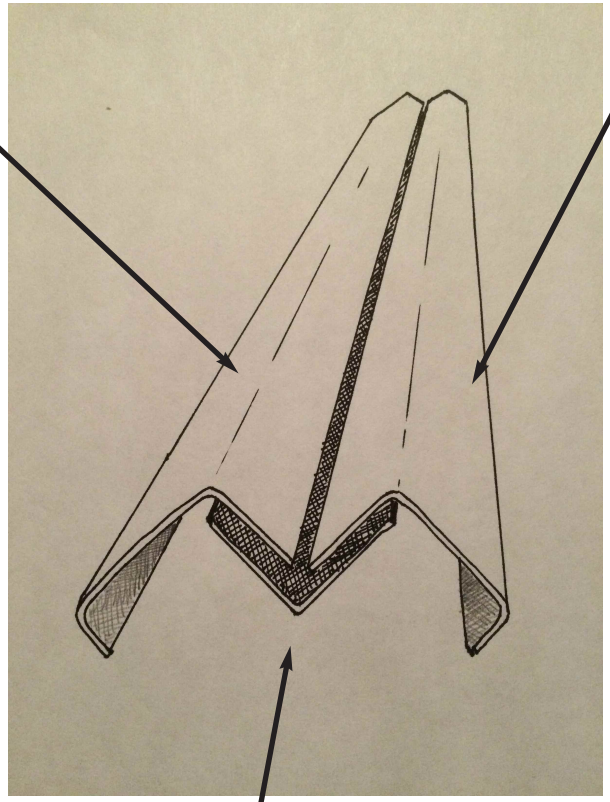

I carried out some tests using stainless steel. When trying to make the leg I found that I was unable to make the shape I wanted due to restrictions of the magna bender. I could only bend the shape one way and wasn't able to bend back on myself so I needed to come up with a different method.



I found this the most successful way of constructing the leg. Its made from three parts, which have been bent and spot-welded. Other than some slight discolouration in the steel, spot welding is an effective way of joining, however it isn't robust enough for a table leg. I will be looking into other ways of joining the steel in a more proficient manor.

Piece 1

Piece 2



Piece 3

Spot weld

Welding tests. I tried TIG and MIG welding to join the steel but I would like my edge to look straight and crisp, whereas these processes provide you with an imperfect finish.

Spot welding is easier and gives a cleaner edge than other welding techniques but isn't robust enough.

Steel leg prototype. I feel the leg looks too ultra modern in raw steel so I will be considering powder coating or chemical blackening fo a more subtle and grounded look.

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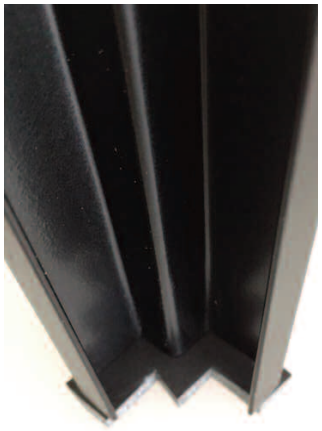
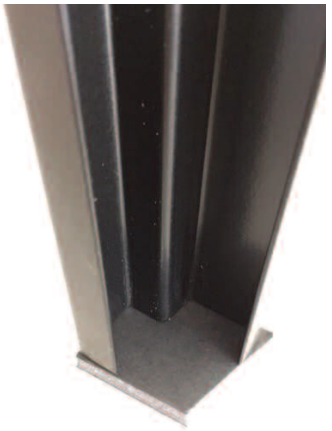
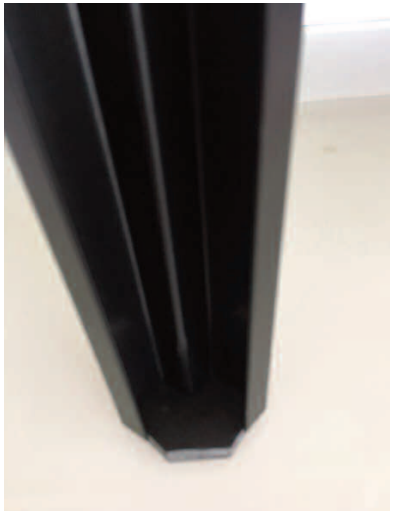
Powder coated steel legs fabricated by Precision Metal products. I was really pleased with the finish, the clean welds and the sharp folds.

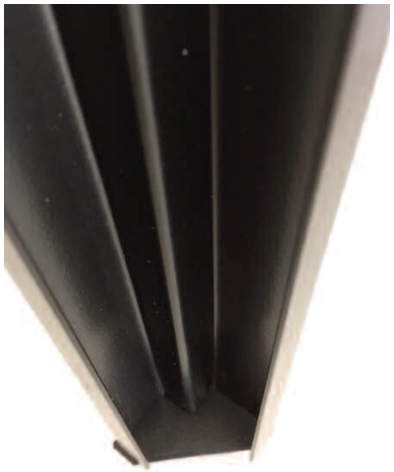
I designed a plate for the top of the leg with 3 screw holes so it could be easily detached and utilised for other table tops or pieces of furniture.

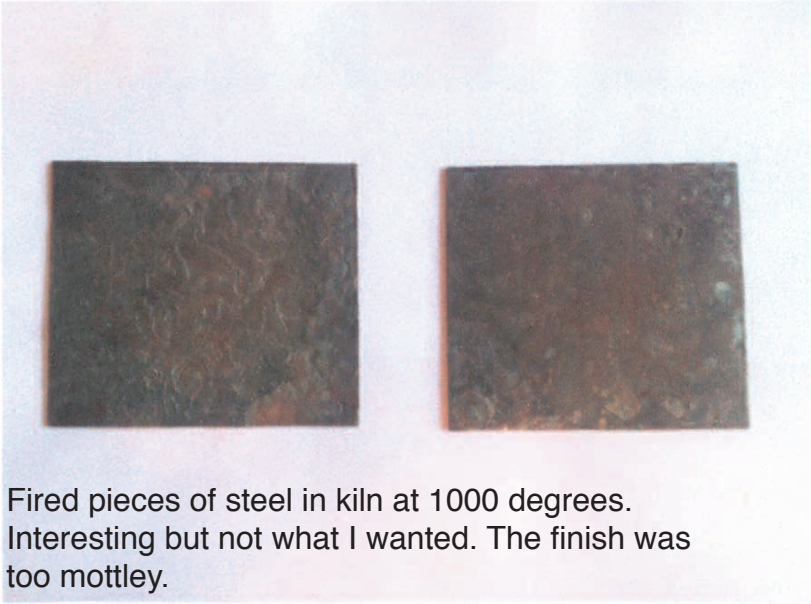
Foot plate tests



When strength testing the original open ended leg, the sharp edges would scratch the floor. I worked on capping the end with a steel plate which also strengthend the whole leg.
The leg was very strong, one leg took my whole bodyweight (80kg)

Black steel lock.



Fired pieces of steel in kiln at 1000 degrees. Interesting but not what I wanted. The finish was too mottley.

I wanted each set of legs to be a different finish. I like the industrial look of black steel which is seen on this old door lock and this piece of steel flat bar. Chemical blackening of steel is an expensive process so I tried and tested various other inexpensive ways to achieve this finish.

These included:

Firing in the kiln.

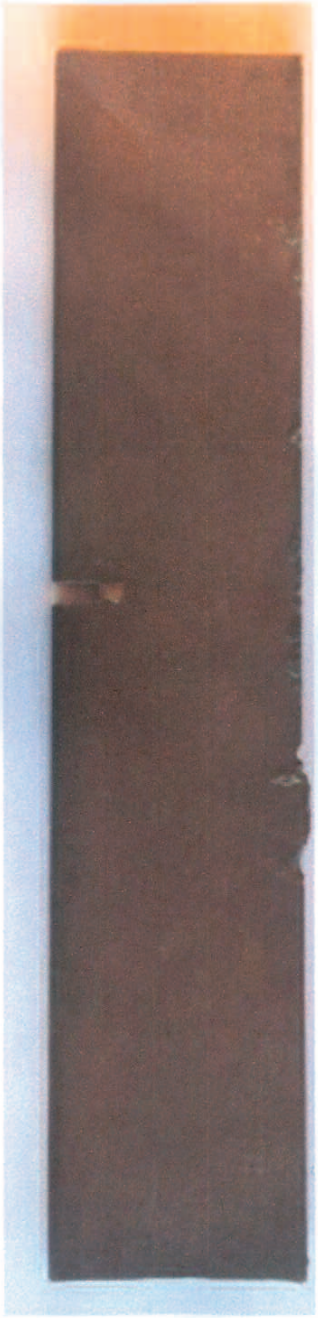
Torching and then quenching in oil.

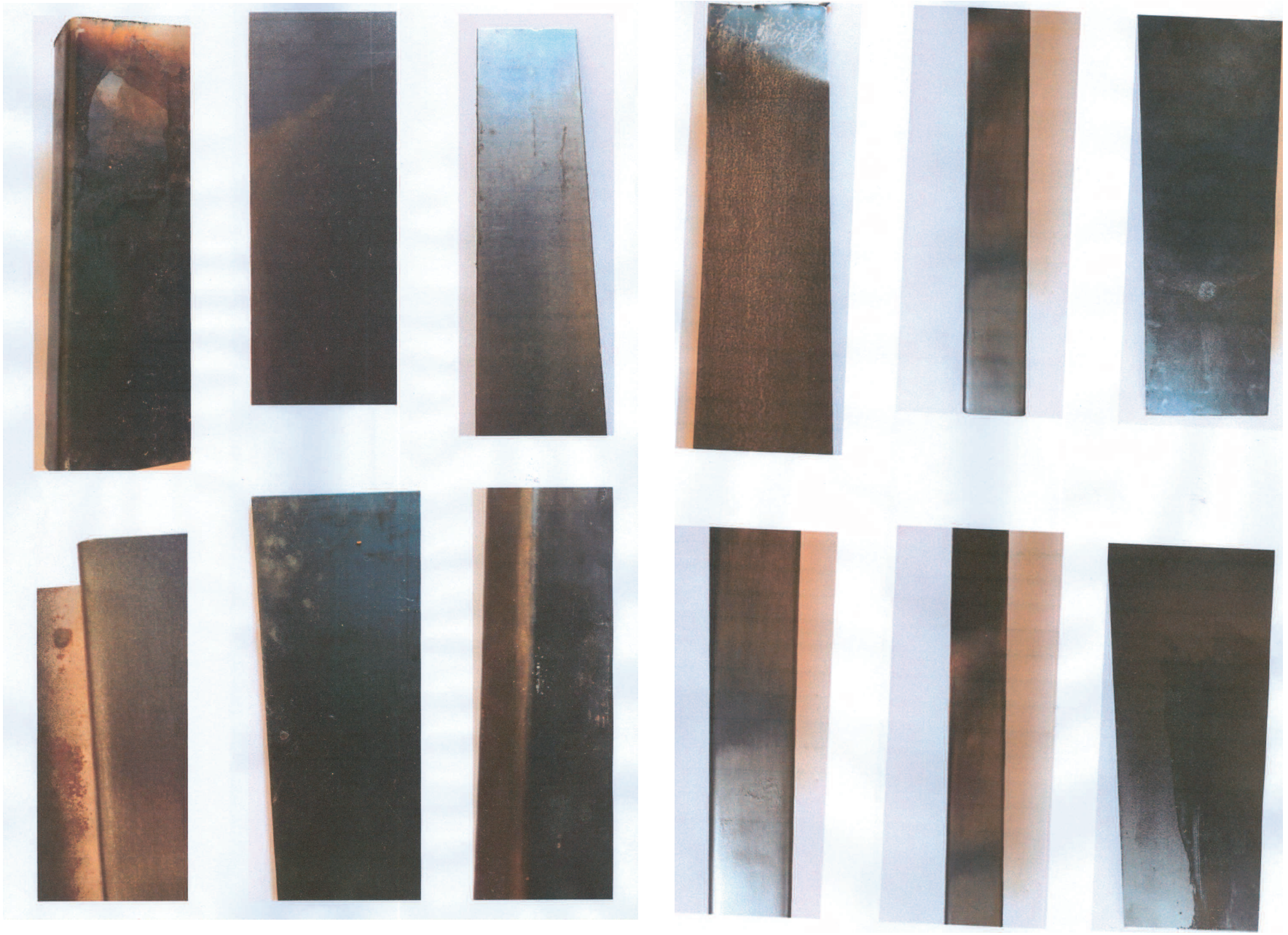
Peroxide, salt and vinegar solution to rust steel and then boiled in water.

Matt black primer and polish with zebo(graphite based grate polish).

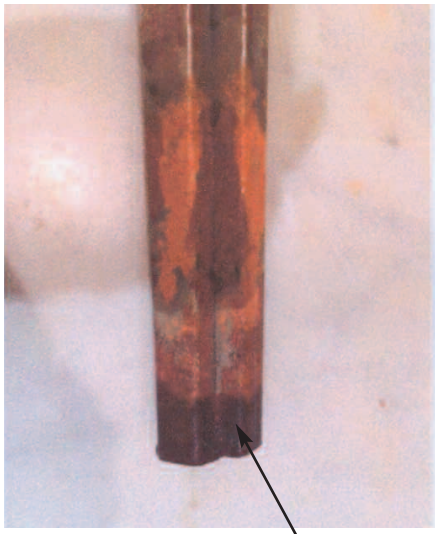
Heating in Woodoven and then quenching in oil.

Mixing graphite powder into satin varnish over black primer.





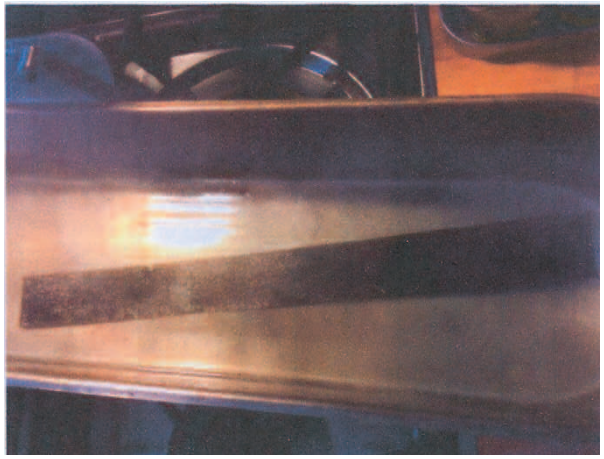
Steel blackening tests.



Peroxide salt and vinegar solution rusts the steel in 15 mins. The solution reduced hugely due to the reaction that took place. The bottom section was the only part that rusted properly.

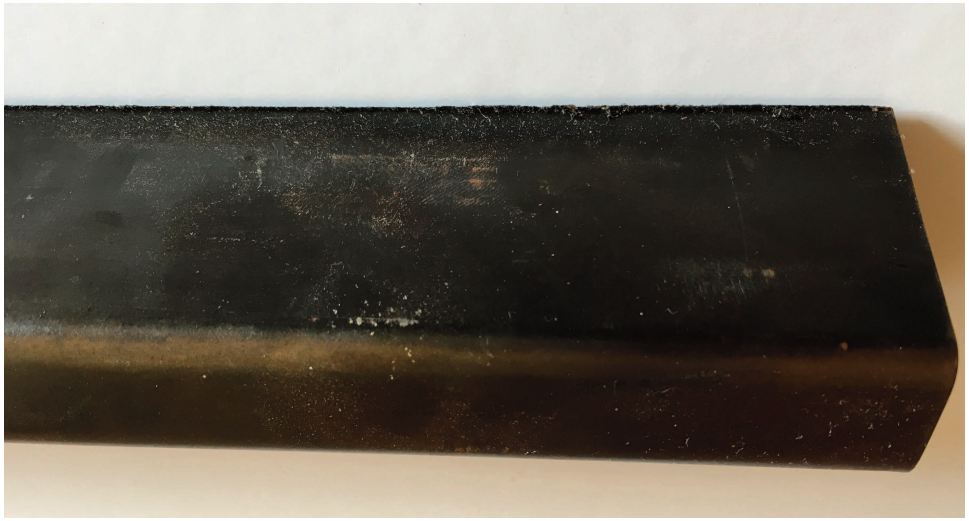
The steel is then boiled in water for another 10 mins which causes the steel to turn dark grey/black and provides a protective coating from rust. I liked this finish but I would need a lot of solution to carry out this process on the legs.



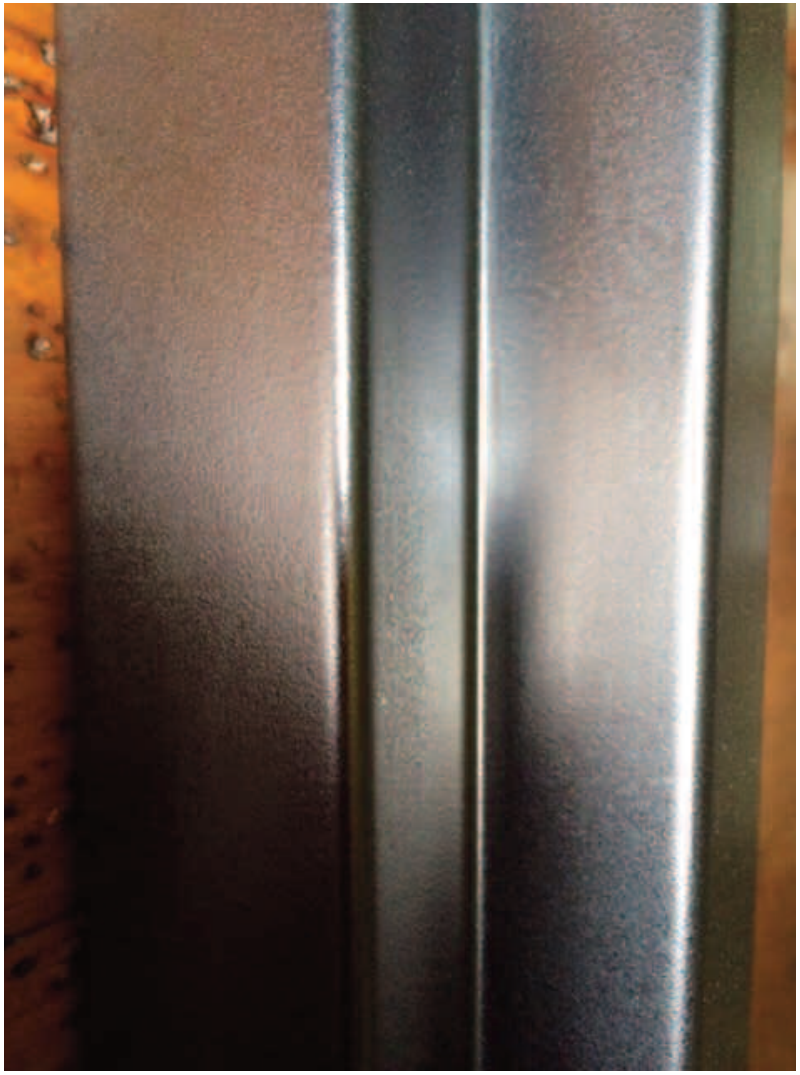


I did the same experiment with the peroxide salt and vinegar solution but this time spraying it rather than dipping it. This just produced surface rust which came off when boiling in water and so gave an uneven finish.

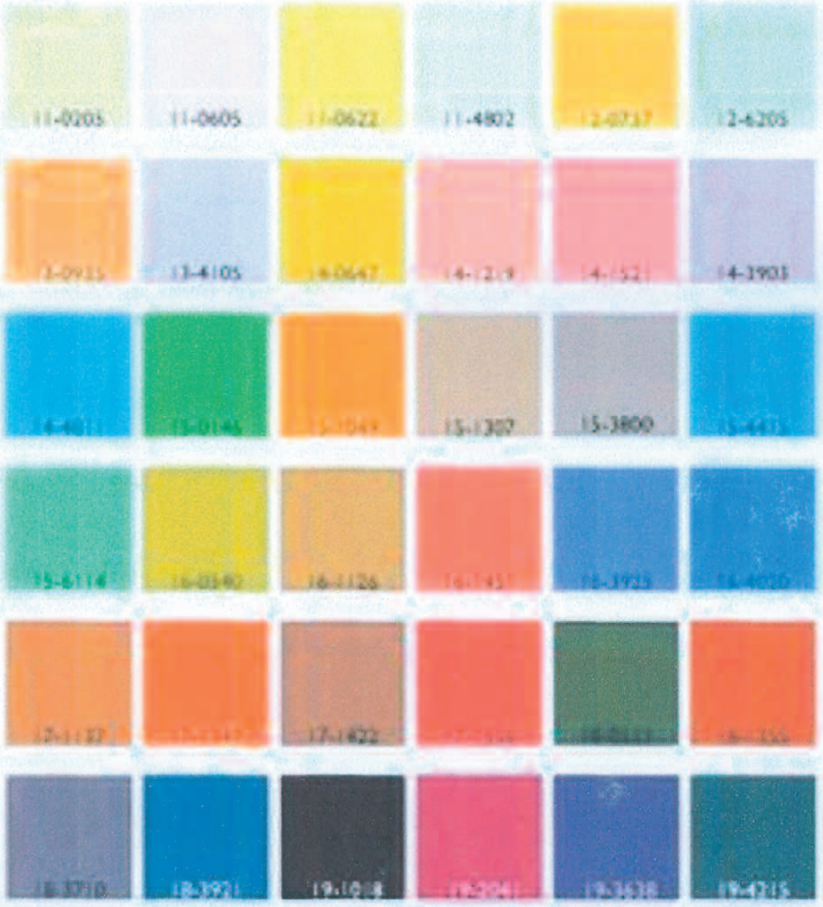
I tested a piece of steel in a wood oven with the temperature over 700 degrees. I heated the steel and quenched it in vegatable oil but unfortunately couldn't get the steel to an even cherry red as the oven was not hot enough. The outcome was that the steel heated up unevenly therefore it was mottled in colour and wasn't the finish I was after.



I used a Graphite based grate polish called Zebo which gave a very metallic even finish. I applied it over a matt black primer which gave me the look I wanted to achieve. This is the second set of finished legs.



1950’s colour pallette



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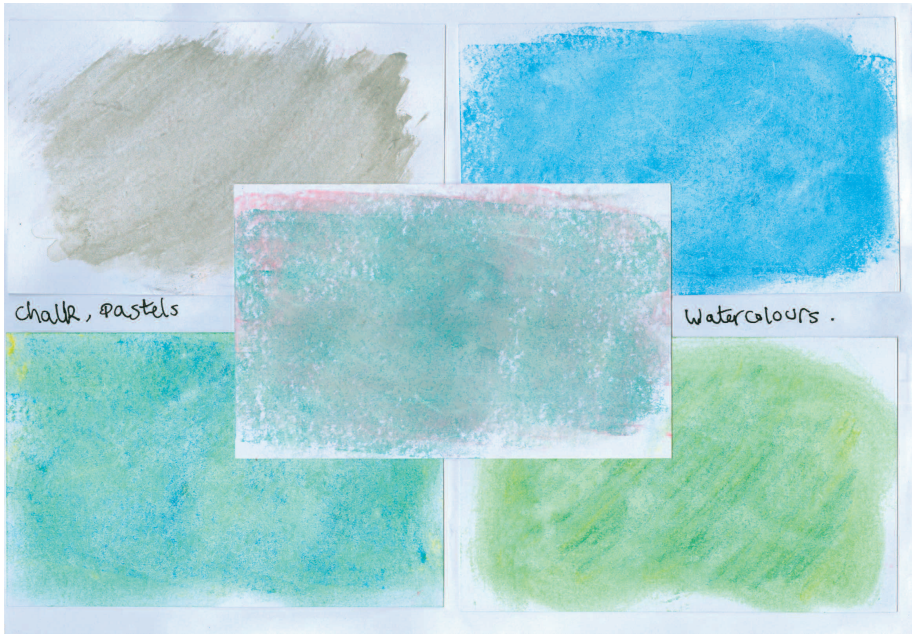
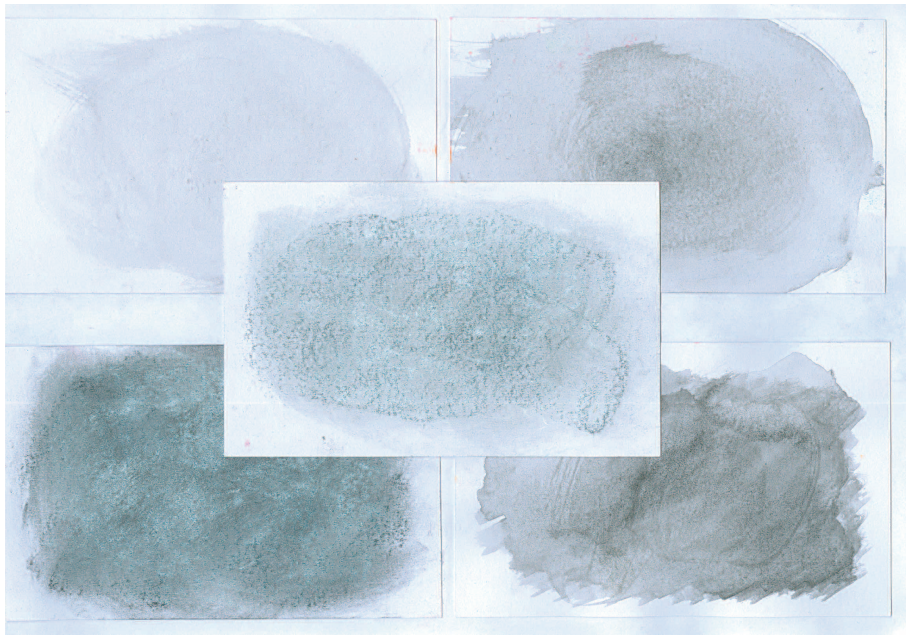
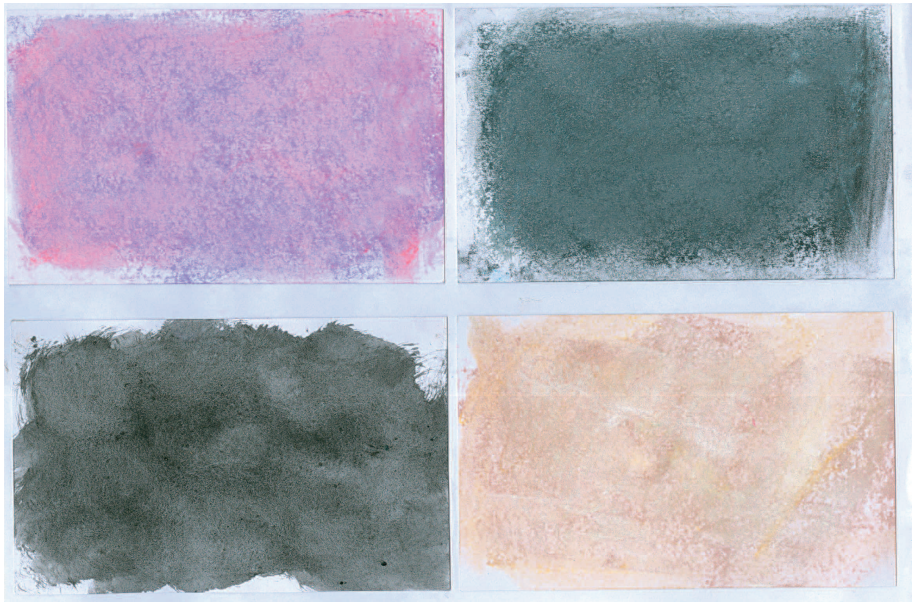
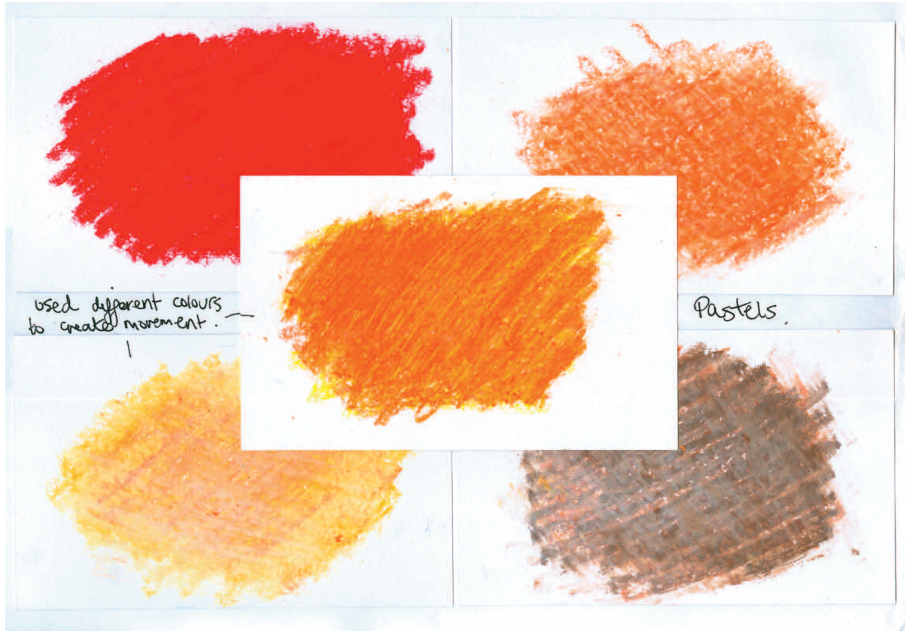
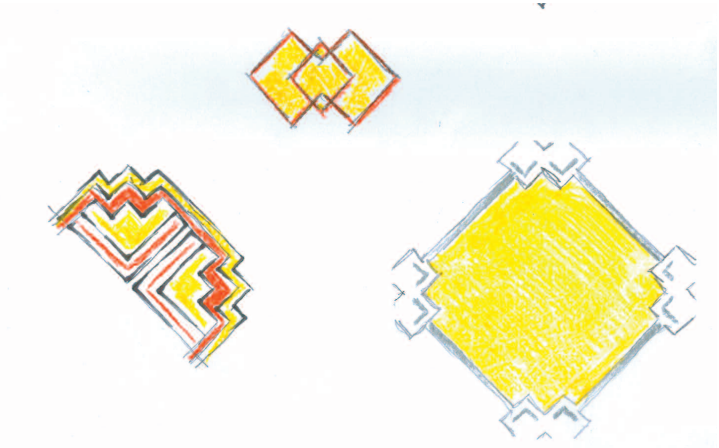
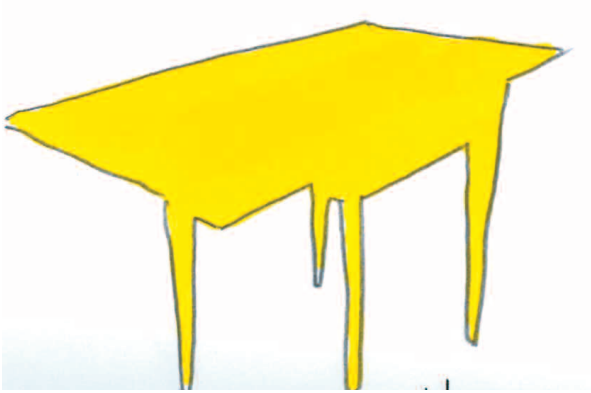

chalk, pastels
Watercolours.

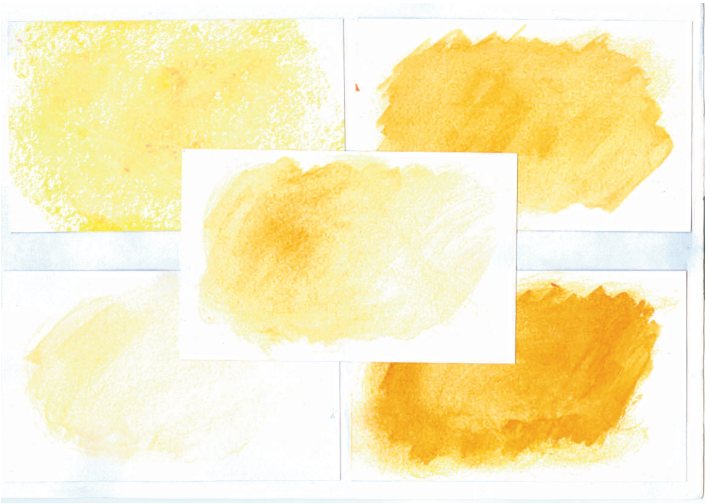




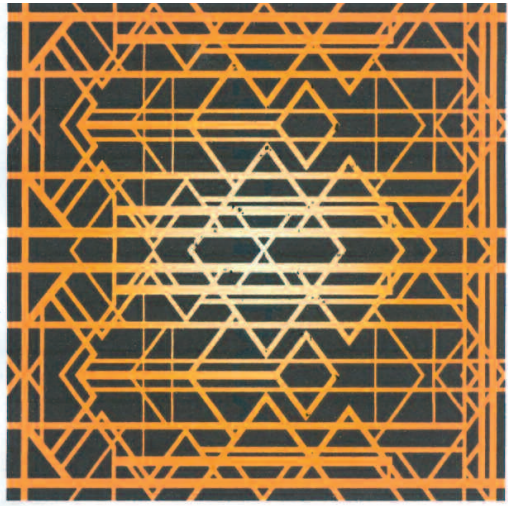

used different colours to create movement.
Pastels.







1



Yellow was a colour that ran throughout my project. I didn't like the flat shiny plasticy colour of the formica, I wanted something a bit more organic and less kitsch.

1

2

3

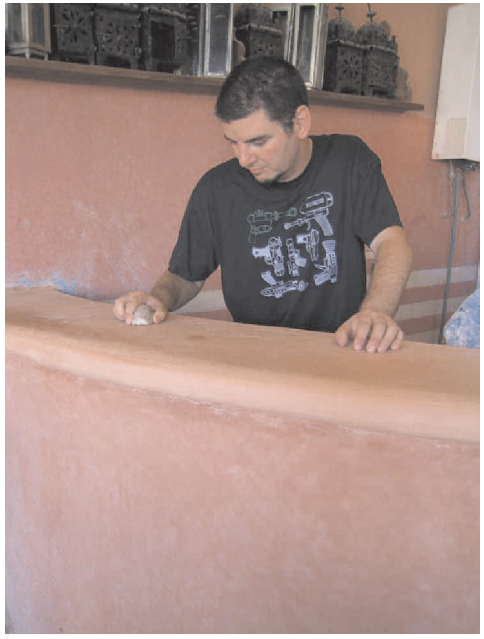
4

I decided to go with a compete opposite of this finish which made me look at Mediterranean buildings which are made from yellow ochre plaster. What I like about this plaster is the soft marbled effect and movement of colour in the walls. It evokes feelings of warmth and of the summer.

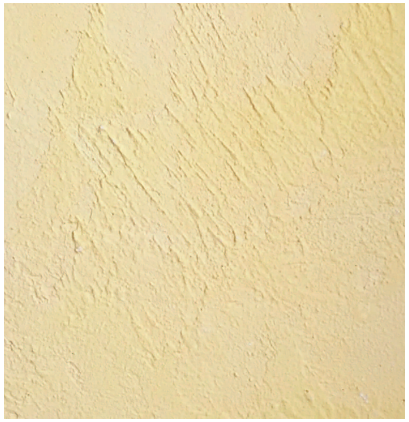
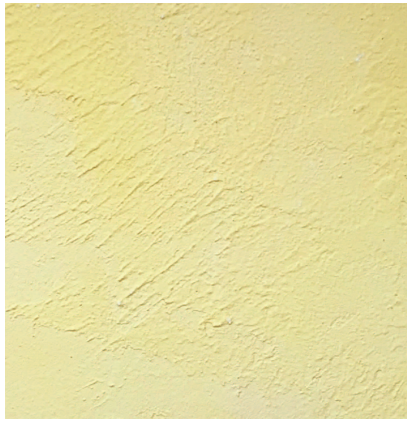
1

2

3

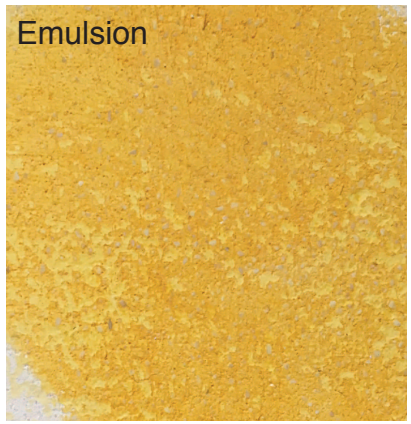


Tadelakt Plaster. I came across a Moroccan plaster called Tadelakt. It's a traditional decorative and waterproof plaster indigenous to the Marrakech region of morocco. Tadelakt has a honed smooth based surface reminiscent of marble with a very pleasing satin sheen. This natural lime stone plaster has been used for centuries in morocco and provides a 100% waterproof barrier, which is resistant to mould and mildew. I found that it comes in a range of beautiful earthy colours. Its durability has been proven by its use on floors, stairs and bathrooms, which would make it a perfect material for my tabletop.

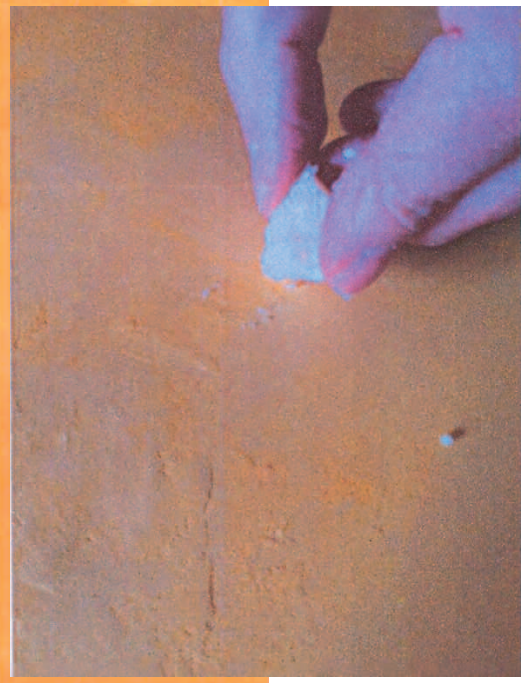



Tadelakt tests, textures and finishes with ochre pigment.



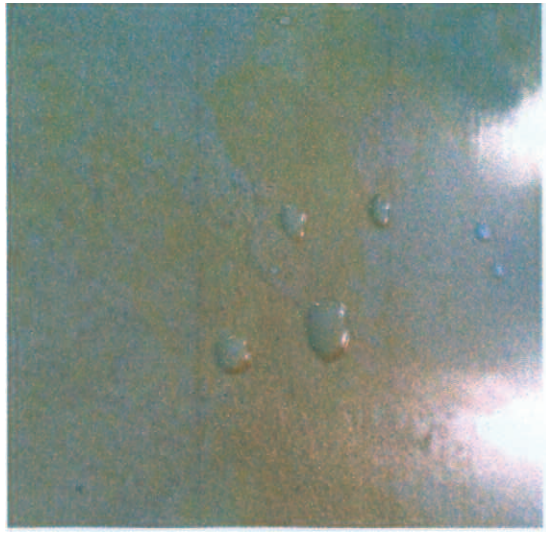
Plastered tabletop with sanding sealer finish. Rubbed wax onto surface to fill small holes and soften edges and imperfections

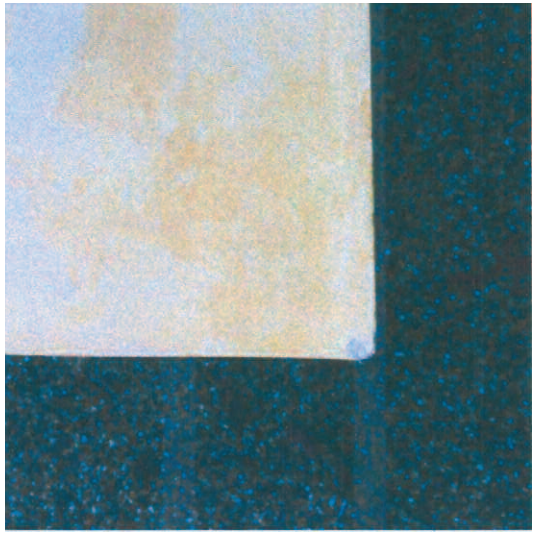


It was very difficult to achieve a smooth flat edge with a trowel. It seems this is the case with all plaster. A way to improve the sides is to have an edging to plaster up to.

I found that after a few days, when the plaster dried, it began to shrink. This caused the wood to bow. To avoid this I would need to plaster both sides. I could also seal the plywood with sanding sealer .

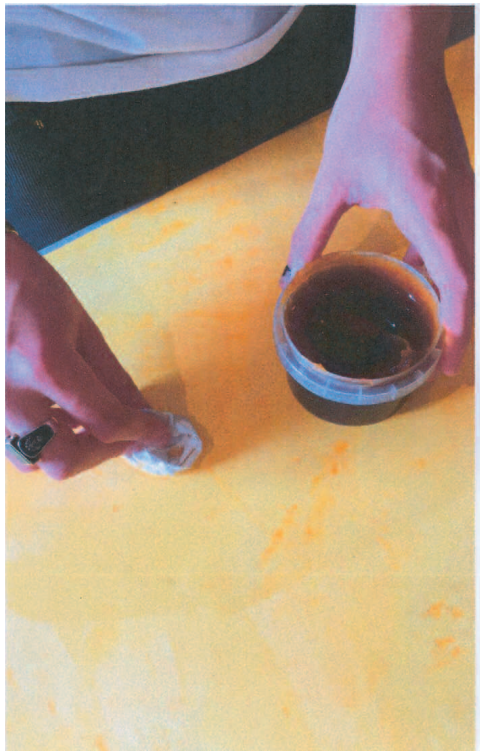
I was pleased to find out the plaster was water resistant. I used Liberon Sanding sealer to make it even more so. This also improved the depth of colour.





I plastered the edges last to get a crisp edge. This meant I couldn't compress the plaster and therefore it crumbled easily when knocked or handled. I looked into ways of improving this.

I masking taped the edges so I wouldn't scratch the steel with the trowel.

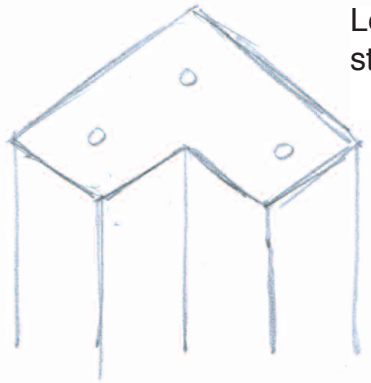


On my second attempt I used thicker Plywood and sealed both sides with Sanding Sealer before applying a bonding primer. This prevented it from bowing.
I introduced steel edges that I was able to plaster up to. This gave me a crisp edge.

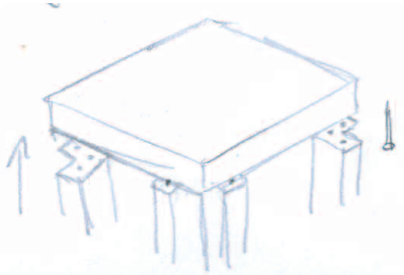
I was more familiar with using the plaster this time round and even though I got a good finish with the trowel, I used a river stone to finally polish the plaster which compressed it making it harder, stronger and waterproof.

Then I finally sealed the surface with black olive soap which is traditionally used. It reacts with the calcium ions in the plaster forming lime soap. The sodium ions in the olive oil soap are replaced with the calcium ions. The result is a water repellant surface. It is also a much nicer marbled finish than the sanding sealer I used previously.

STOOL

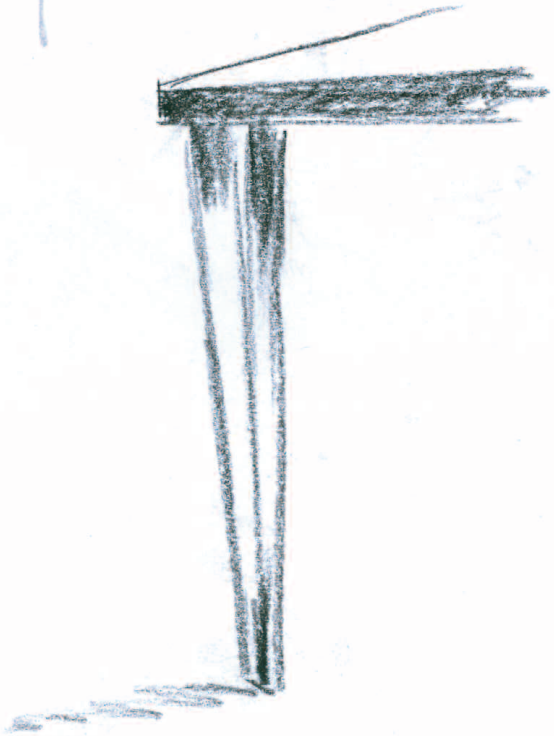


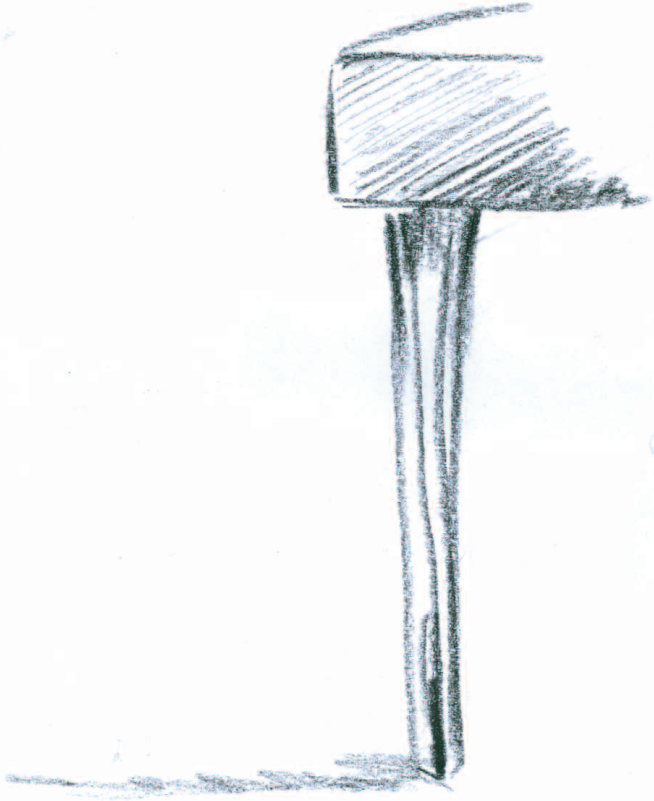
Leg with top plate on. Will design stool top around this shape.

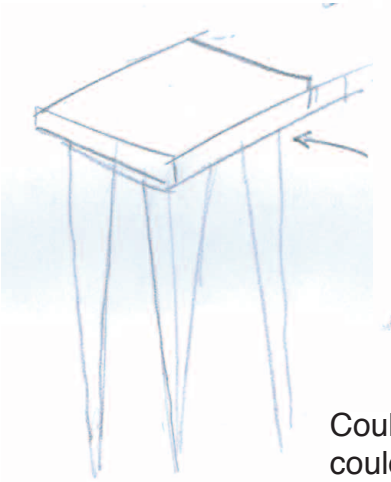


Screws..
Top would have to be thick so screws don't pull out when under strain.

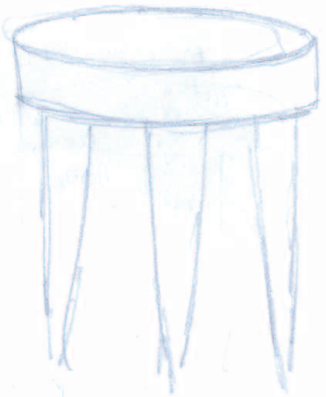
Birds eye view





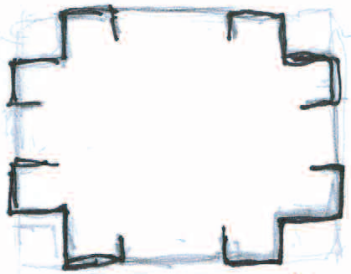


Could allow for overhang but this could make it more unstable.

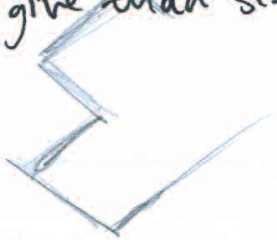


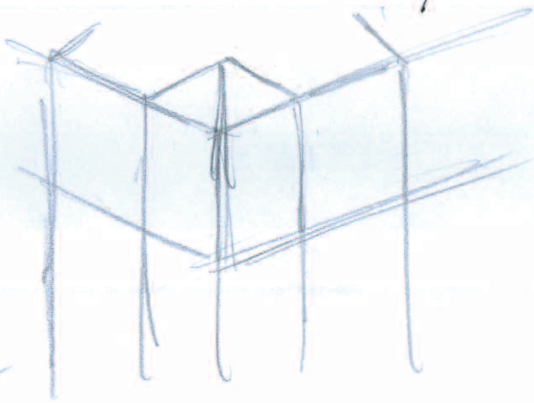
Round top.
Would the legs suit this?

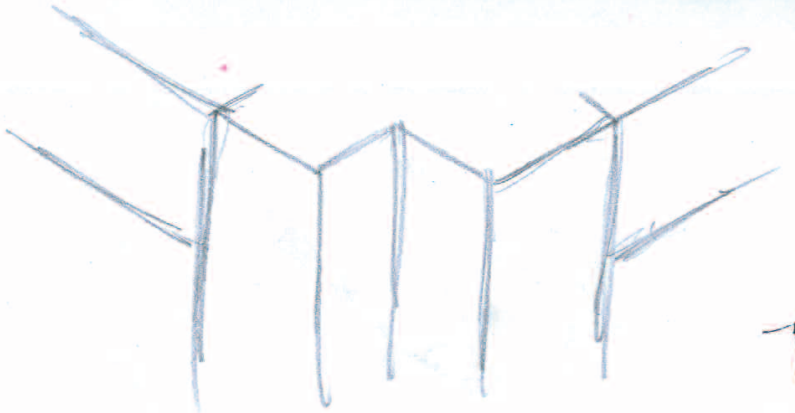
Polystyrene
+
card.
Worked well, but difficult to judge as card has more give than steel.



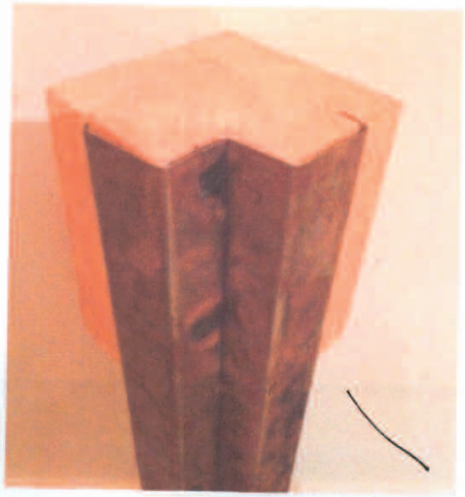
top of leg slots into wooden block.



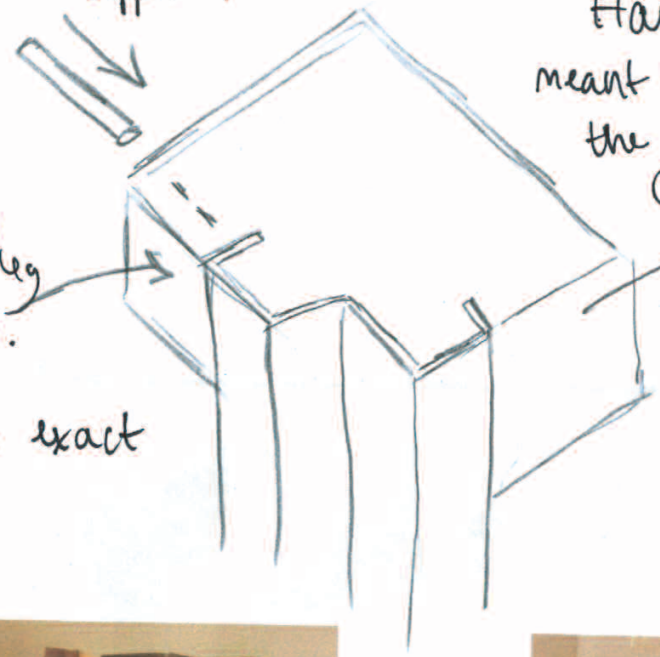




This would make the stool lower, as seat would be level with legs (720mm)



Dowel through here for extra support.



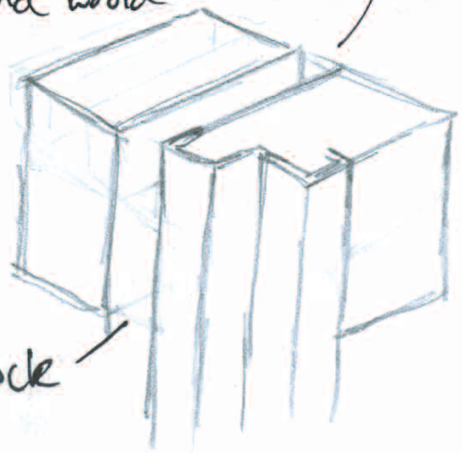
Having seperate blocks, meant that I could cut the slots in each block (8 slots overall) seperately without having to redo whole seat.

Cut slots in wood for leg to slot into.

couldnt get exact fit.

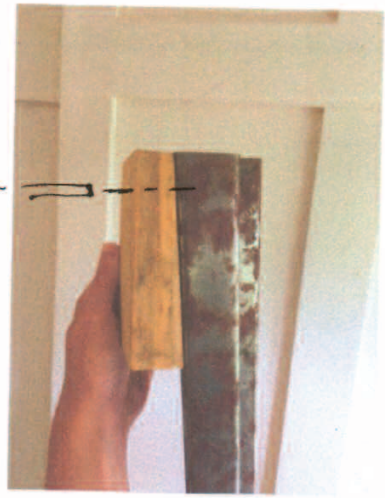
want to avoid seeing this cut.

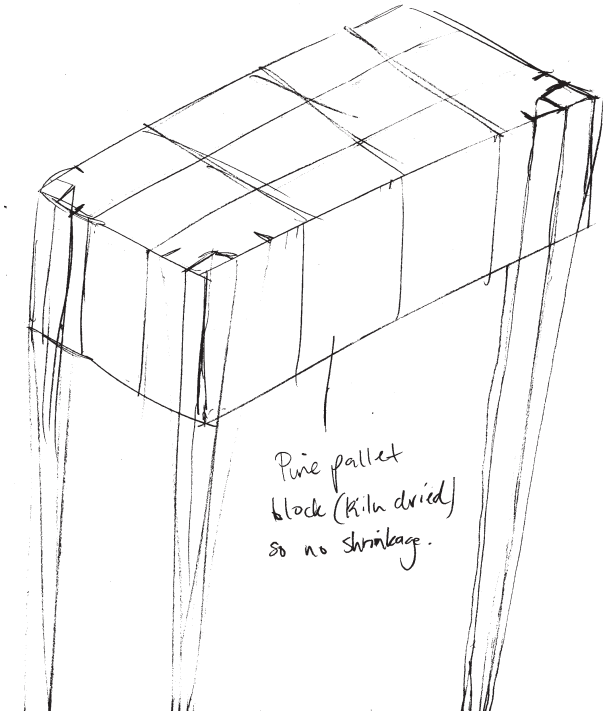
Easier and would fit better.

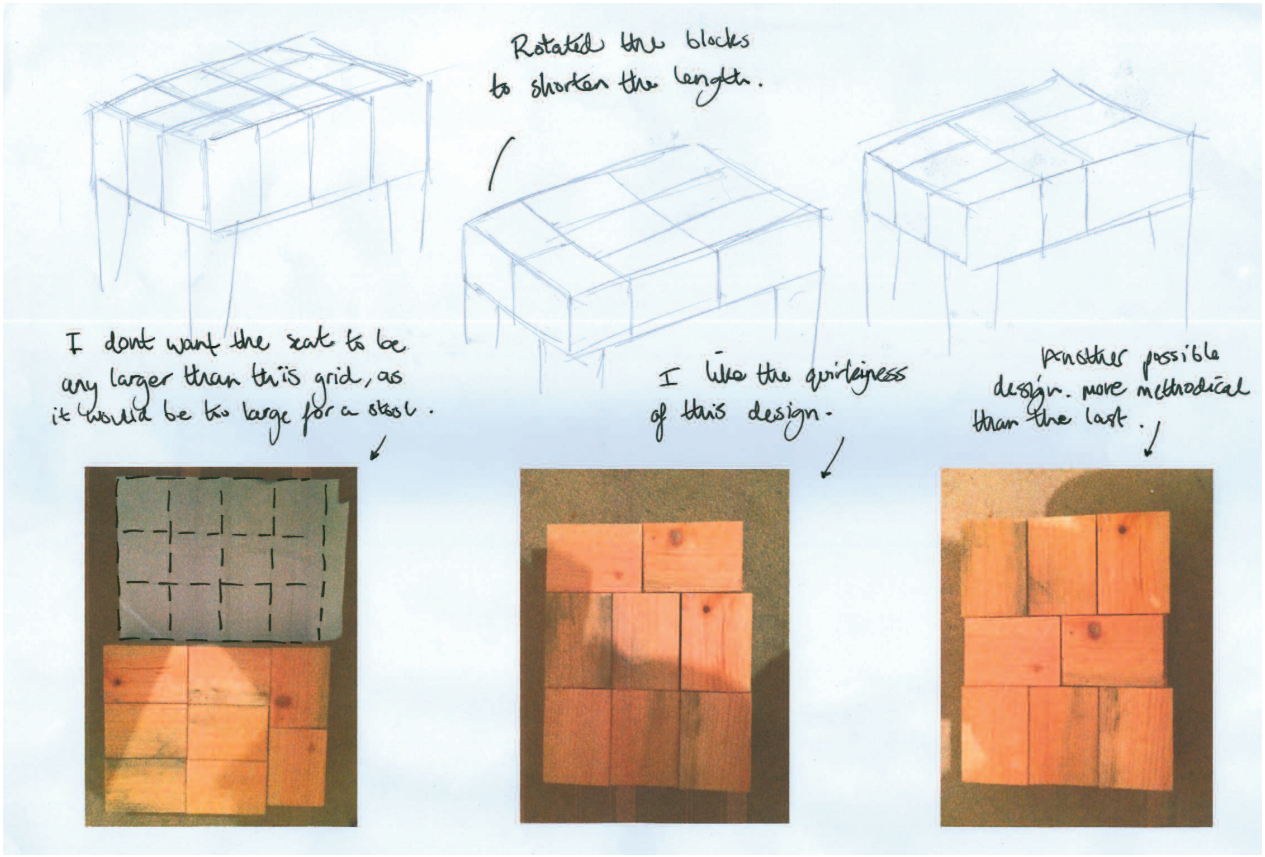


Cut block

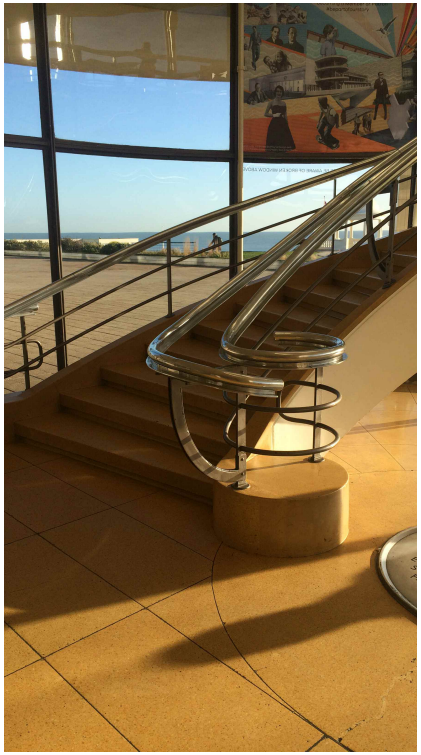
Dowel



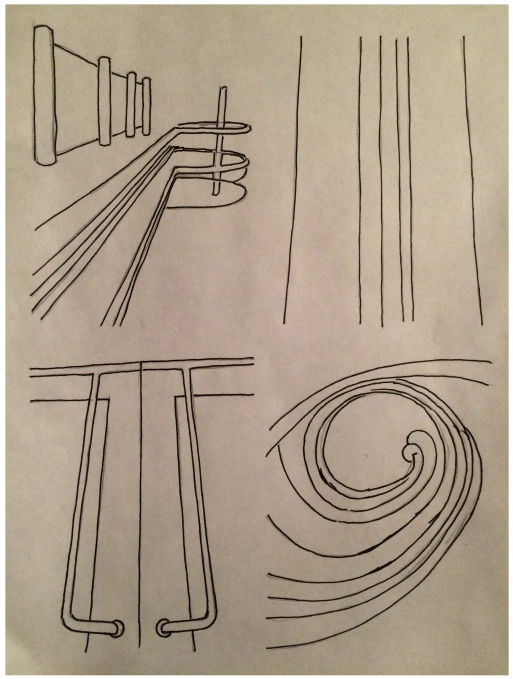
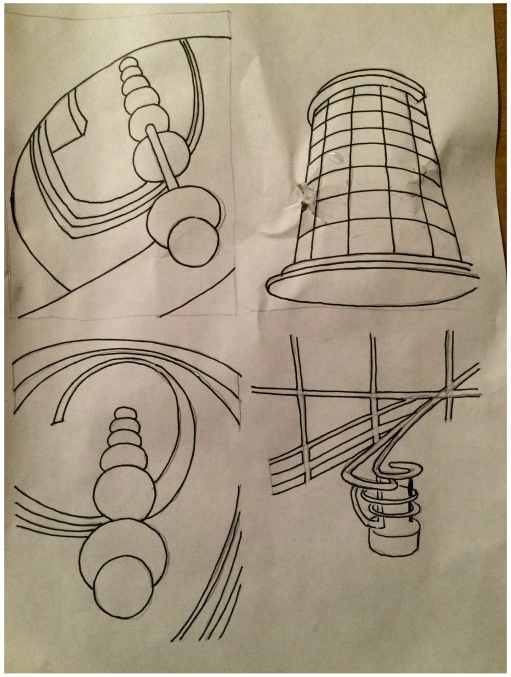
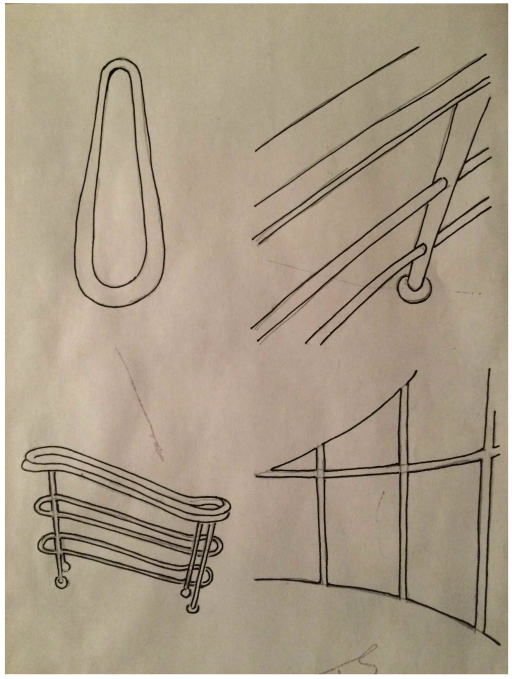
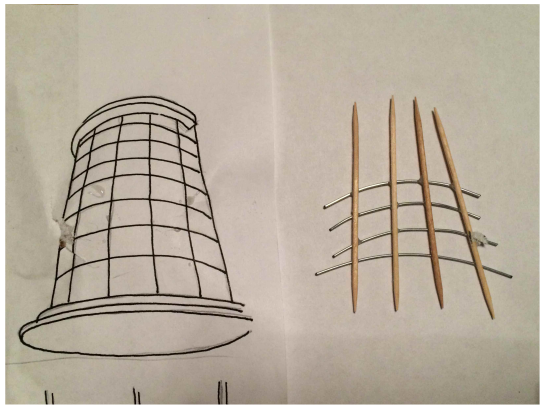
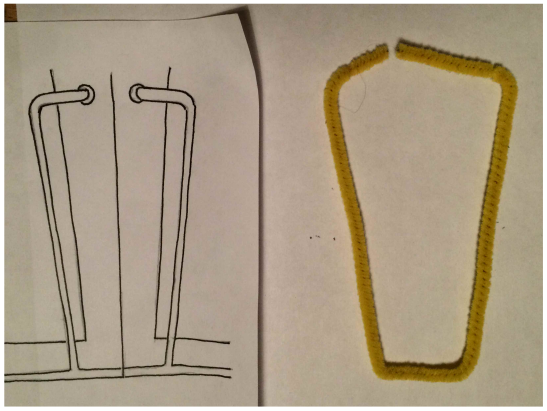
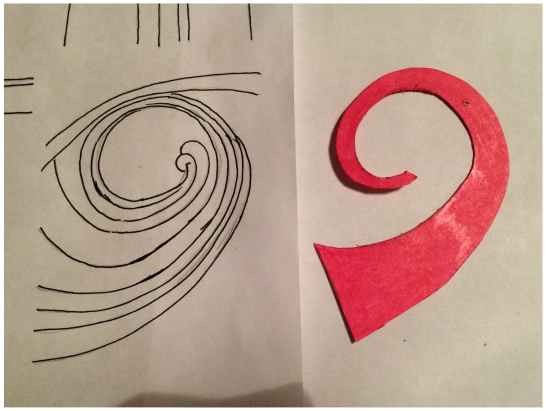




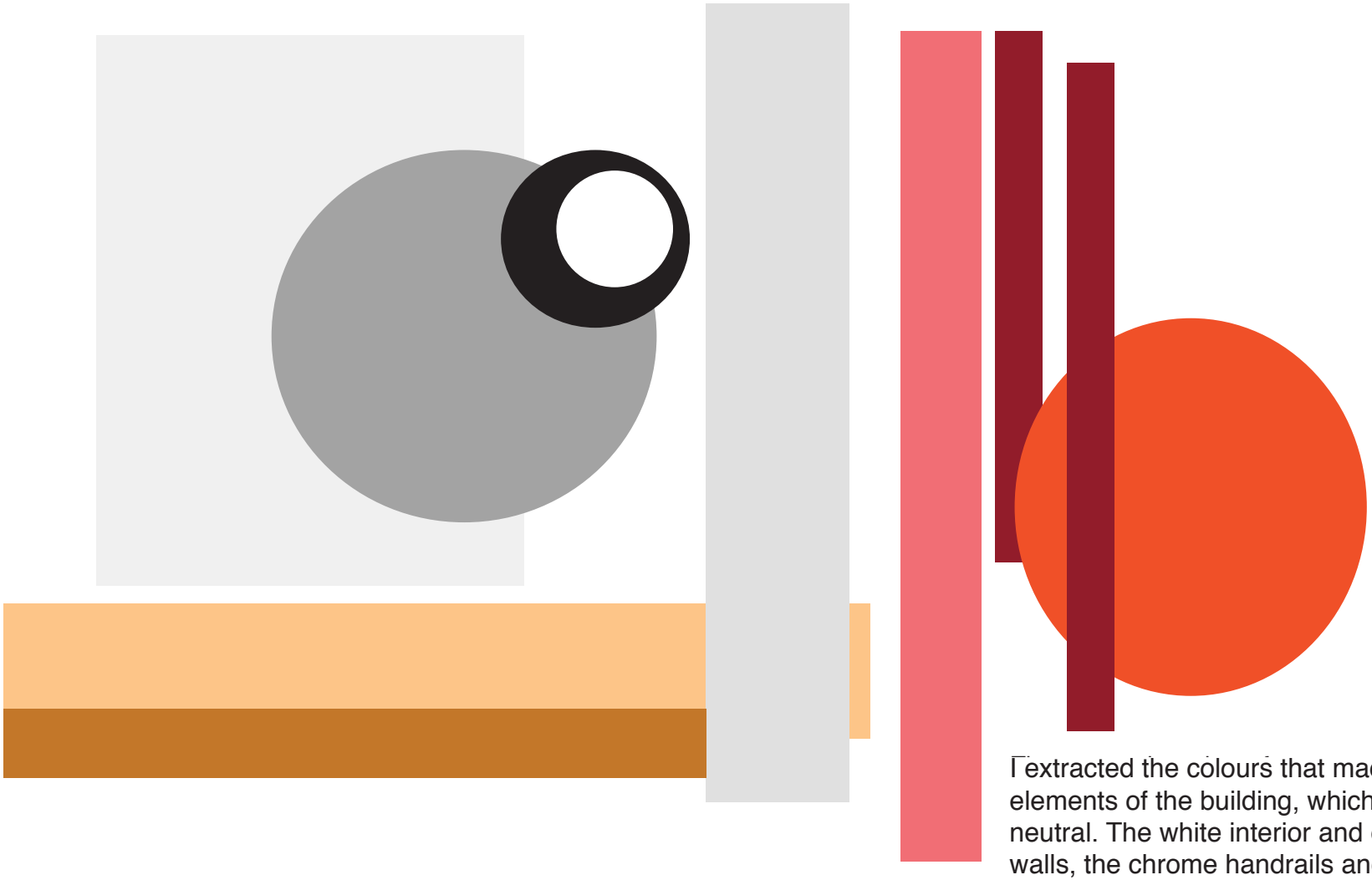
Althougn I liked this design, it was very difficult to get the exact angles for each slot right due to the angle of the leg and restrictions of the bandsaw. By making the seat from separate wooden blocks, it meant that I could cut the slots in each block (8 overall) seperately without a risk of error in the whole seat. I realised that this was very difficult to achieve perfectly and I felt that I could come up with a better design.



Many Formica table legs were made from tubular steel, which was an iconic component of Modernism. As I have been researching Modernism, as well as Art Deco, I went to visit the De La Warr pavilion in Bexhill as the building was widely acclaimed as the first modernist building in Britain, constructed in 1935.

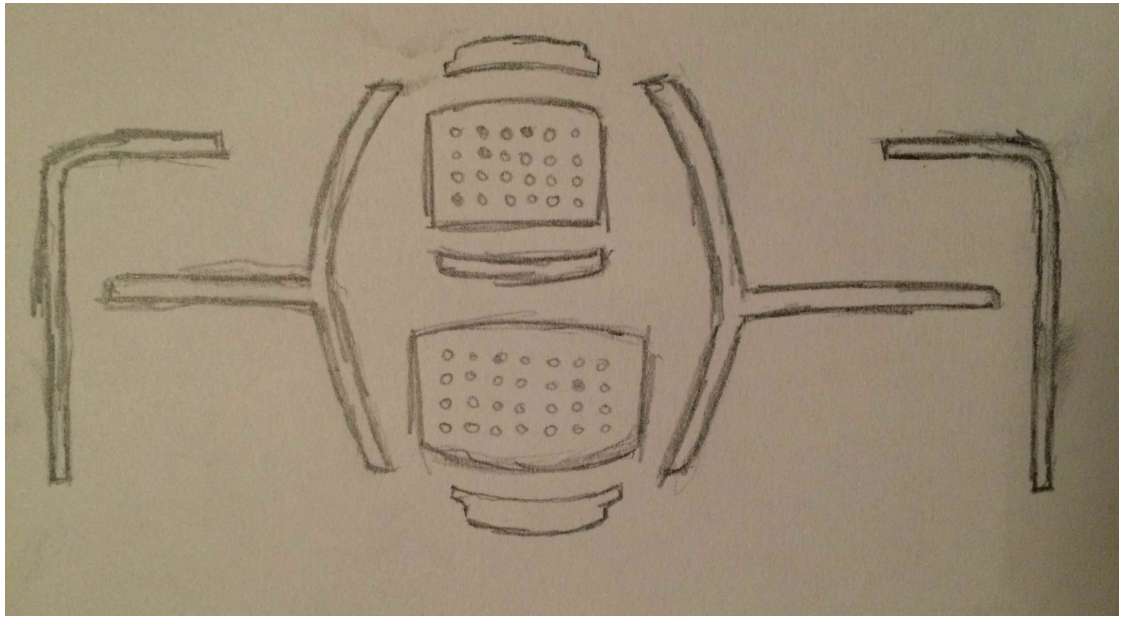







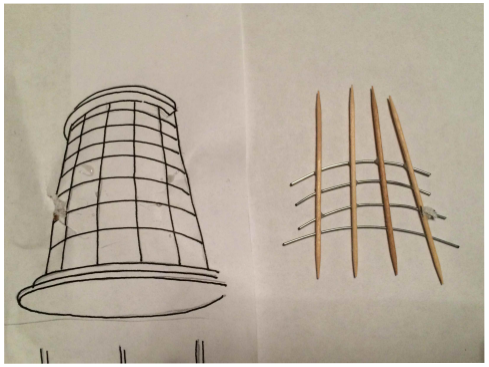
I was interested in the architecture, which was made up of bold, curved shapes and hard lines. I took photographs around the building from various angles to capture these shapes, from which I noticed a recurring pattern of parallel lines and circular forms. I sketched parts of the building and the shapes I was interested in.
I then distilled those shapes into maquettes using basic materials such as tooth picks, pipe cleaners, wire and card.

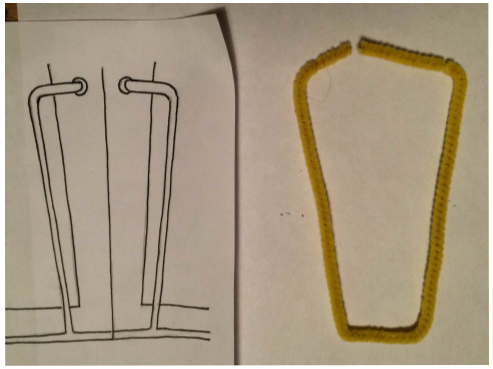


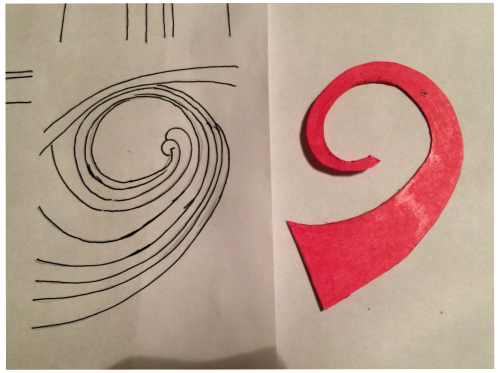
I extracted the colours that made up elements of the building, which were very neutral. The white interior and exterior walls, the chrome handrails and the ochre coloured floor, are in stark contrast to the bright red coloured furniture.

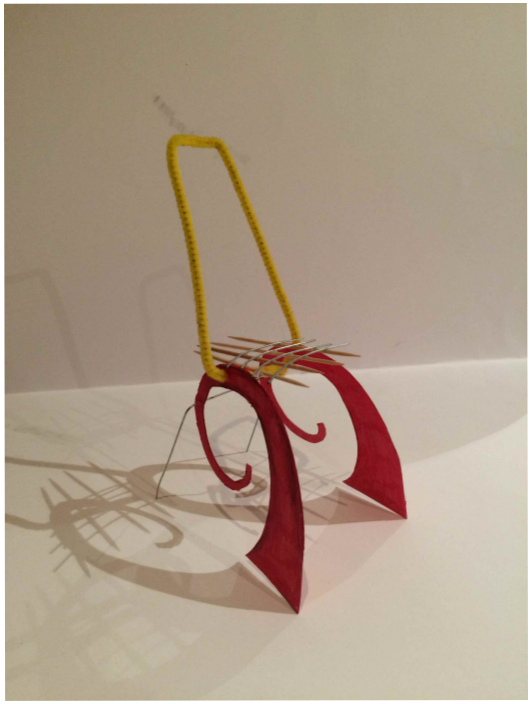
I came across a chair designed by Edward Barber and Jay Osgerby. They were commissioned in 2004 to design furniture for the newly restored building. The chair draws reference from the building and its many architectural features, including the steel window frames, door handles, handrails, ceiling panels and the exterior balustrades. The chair was painted an orange red, in reference to the original colour of Alvar Altos wooden chairs. I was interested in how the archicture influenced the furniture and I wondered If I was to design the chair for the Pavilion, from my observations, what it might look like.







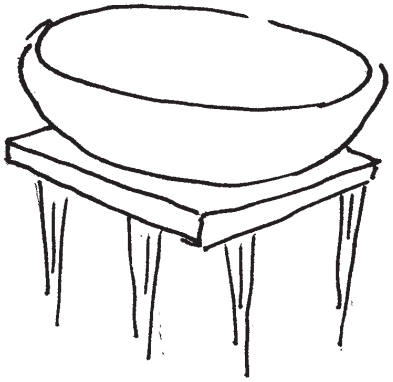


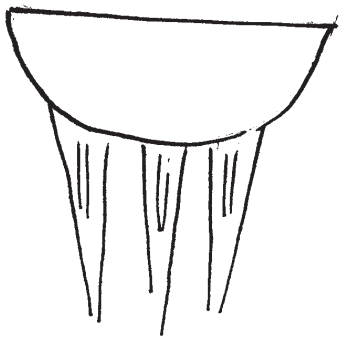


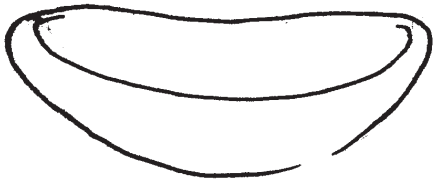
I put together the shapes that I obtained from my drawings and photographs to create this chair. The colours are taken from the buildings architectural features, and in reference to Alvar Alto's and Barber and Osgerby's orange/red theme. The spiral legs are reminiscent of the curves within the banisters. The back of the chair is inspired by the bold lines of the door handles, the seat is in response to the steel framed exterior window panes. As I am producing a series of furniture for this project, this approach has made me consider whether my designs will be influenced by their environment.

I was unsure before about whether a round seat would suit my legs due to the sharp lines and edges of my legs. After visiting the De La Warr Pavillion which main features were made up of bold parrallel lines and curved circular forms, it inspired me to look at using a rounded seat for my stool top. I used a round chopping board to test it out which I thought worked well.

Can’t have seat too thick as legs are already long so would be hard for people to sit on.

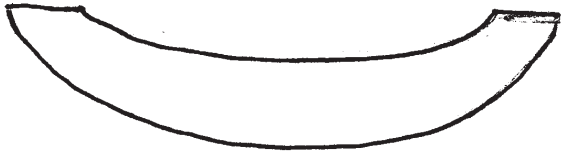


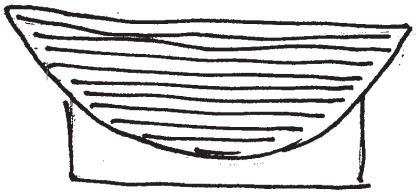




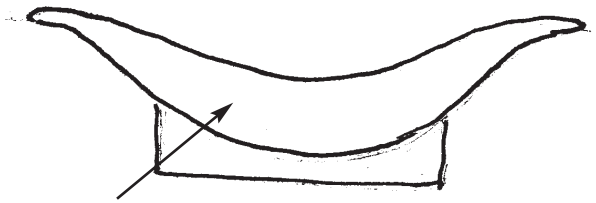
Bowl seat

Ply? Black stain?

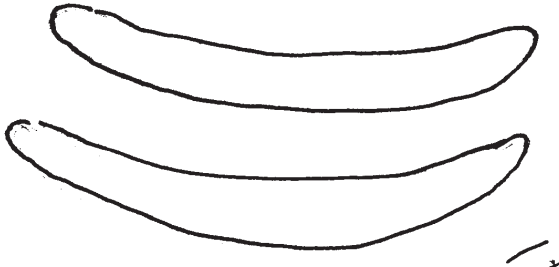


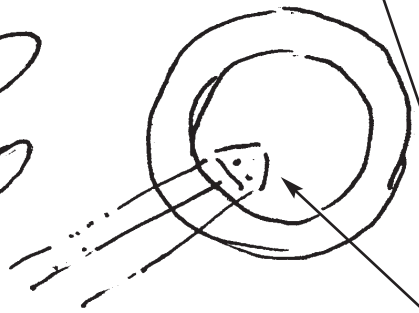


Is ply strong enough?



Would have to be hardwood for this thickness.





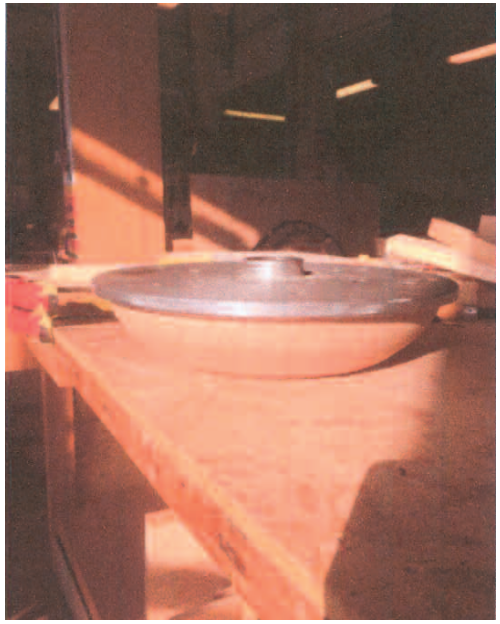
Oak will allow seat to be thin as it’s strong

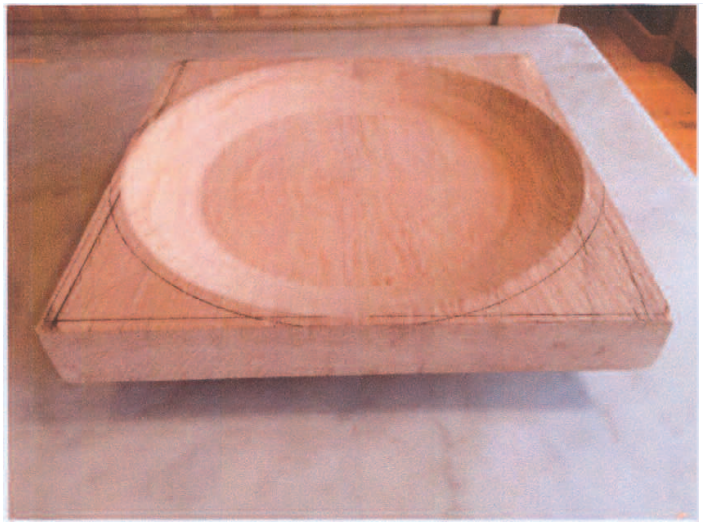
Cut base flat to fix on legs

would lathe both peices

The idea was a bowl shape which sits in a square base so the legs can be attached to each corner. As the legs are a fairly design, I wanted to keep the stool top simple as well so to not overpower eachother. The top of the stool will have a slight dip for comfort and to highlight that its a stool and not a small side table. This will also improve the aesthetics.

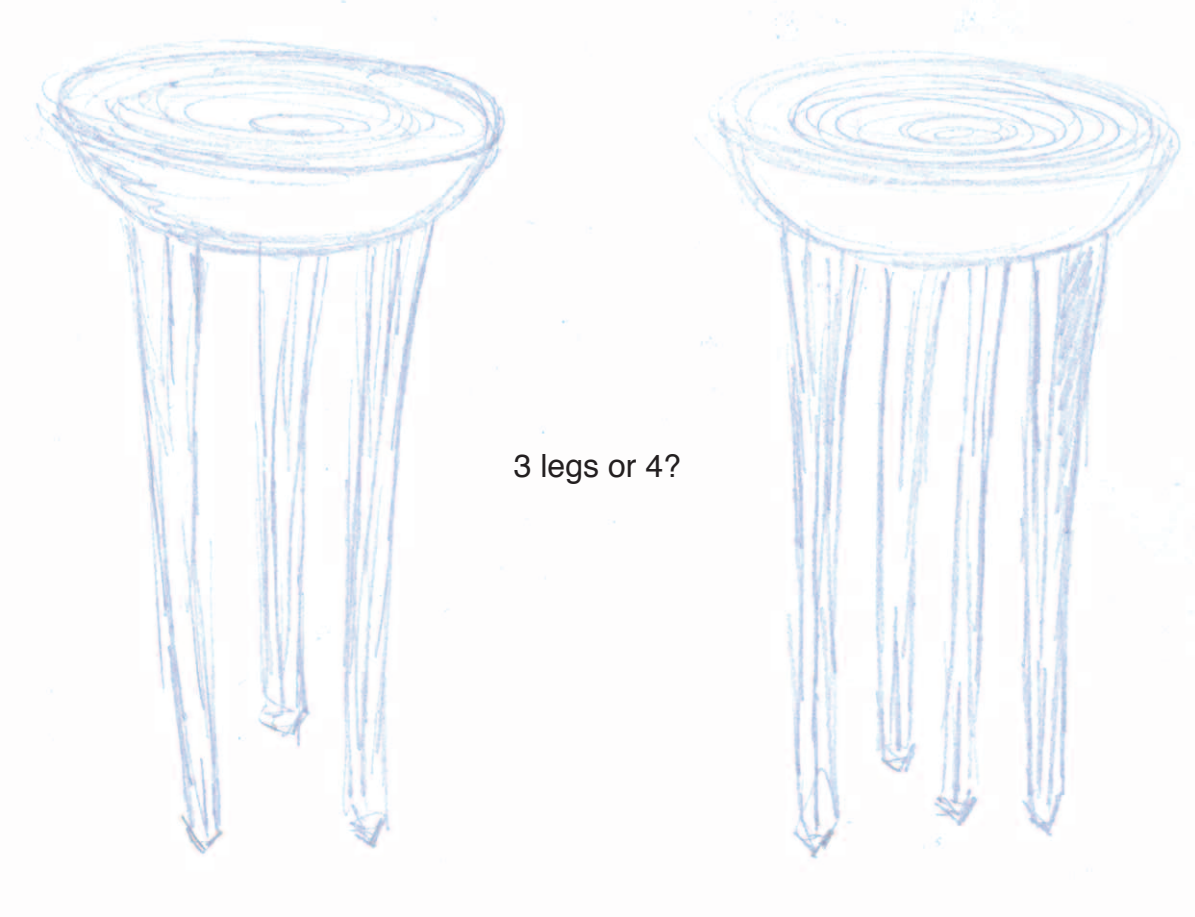
Making process. Lathing seat





I designed a flat base for the legs to screw into but when I put the pieces together I felt the base looked too chunky and I didnt like how much it pertruded, something I was unable to gauge from my drawings.

I tried the leg with just the top part and it worked well.



3 legs or 4?

The stool top looked unfinished in its natural colour against the black legs so I looked into ebonising the oak to match the legs.

Ebonising

Soaked steel wool in cider vinigar for 1 week.

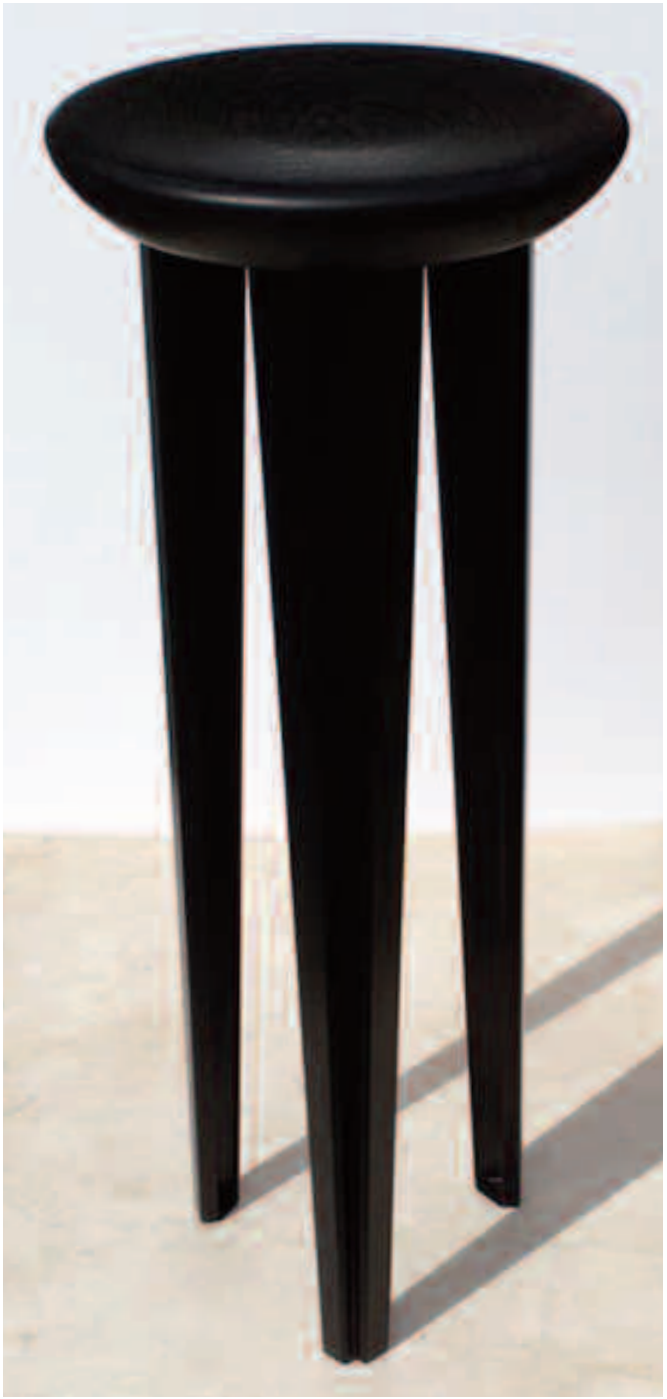
Strained through a cotton cloth to filter out small particles

filtered solution.

Tests on Oak

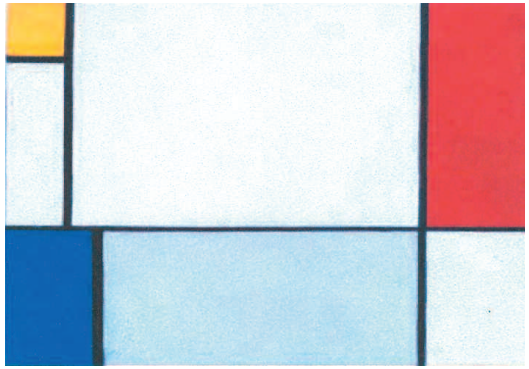
Used strong tea to bring out tannins in wood for a darker black.

Finish was very successful. Oak turned very black

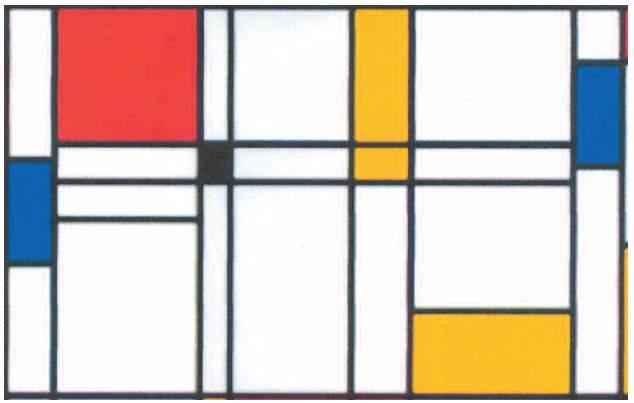


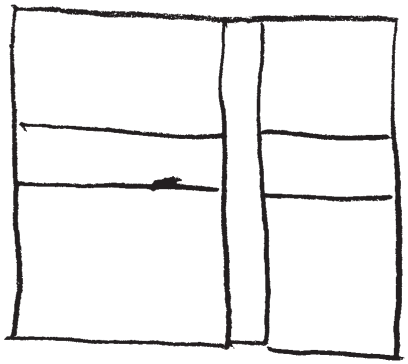
I used Danish Oil to preserve the wood, seal the finish and to give it a slight sheen, to match the legs.

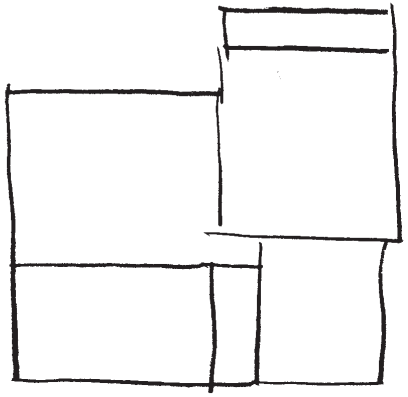
CABINET

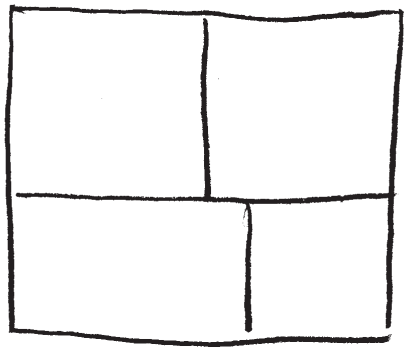


As both my pieces had a quality finish and aesthetic, I wanted this to be my main focus of the cabinet, along with the legs. The form of both pieces were quite simple so I wanted to keep the shape of the cabinet quite minimal.

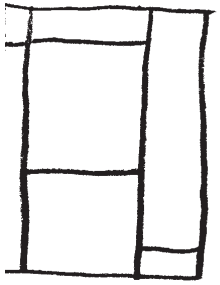


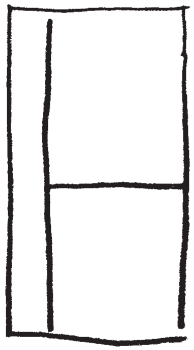


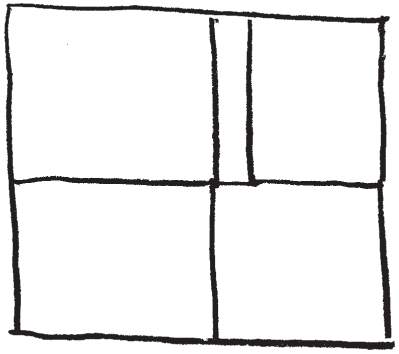


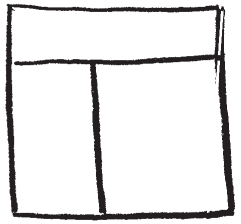


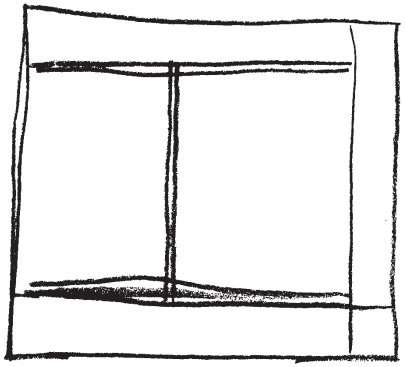
One artist who does simple well is Mondrian. These are my interpretations.

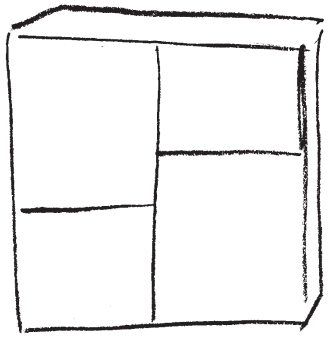




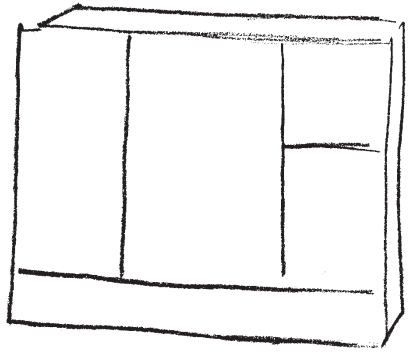


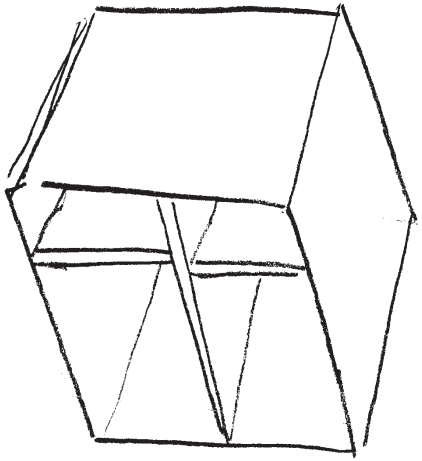


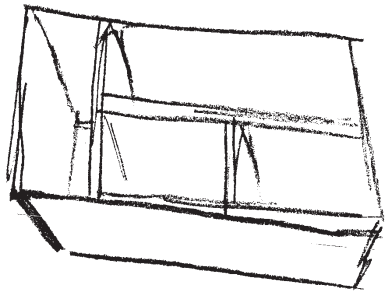


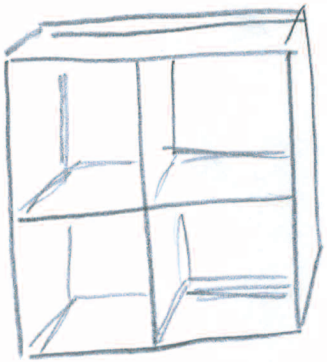


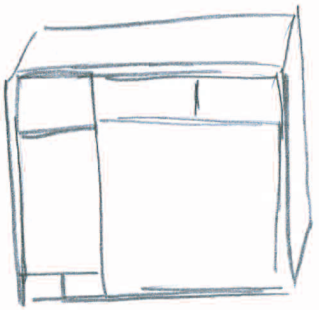
I was inspired by Scadinavion cabinets for their simplicity as well as their versitilty. I would like my cabinet to have different sized spaces to allow the piece to be multifunctional for storage and display.

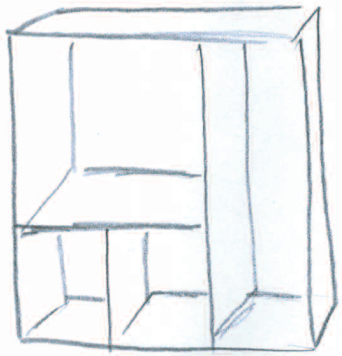


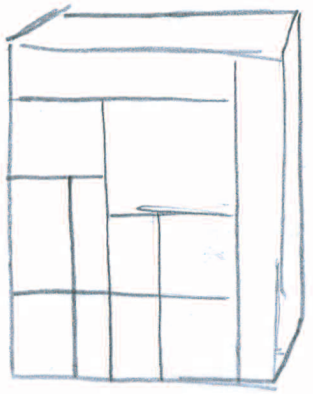


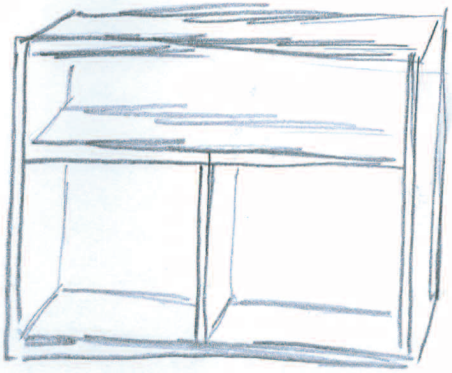


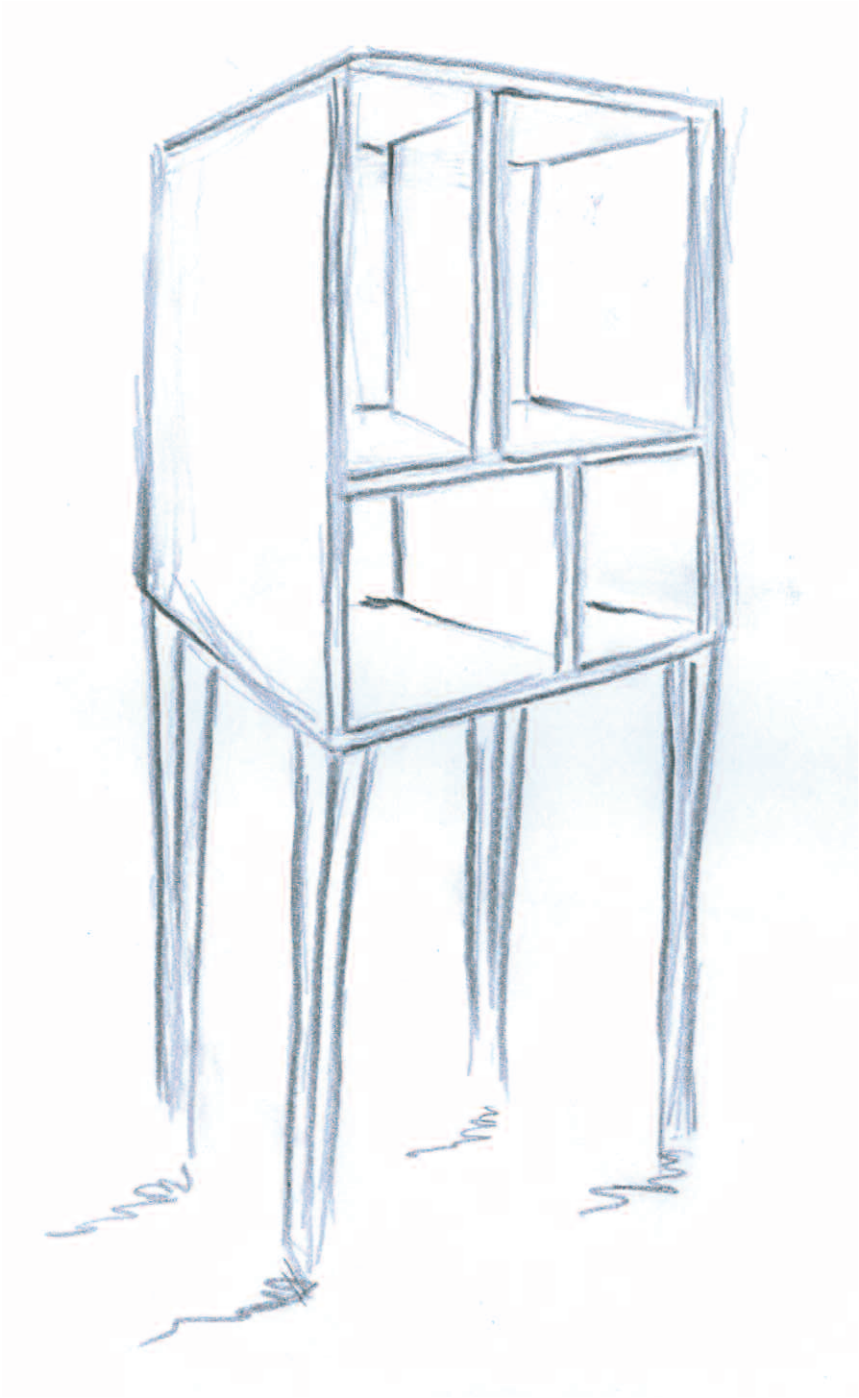


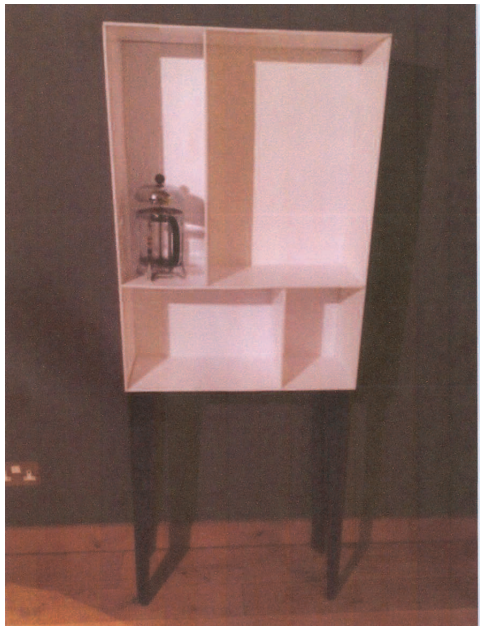


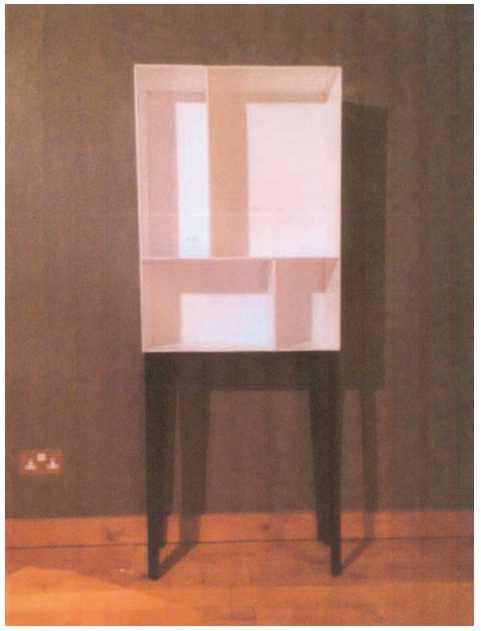


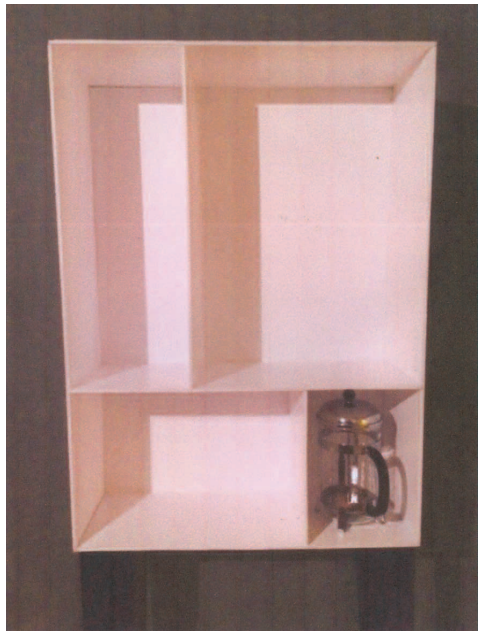












This is a prototype I made from foam board. I used common popular household products to gauge the depth and the height of each section. I will make this from MDF.

1

2

3

I intended to paint the cabinet. I thought about which colour would go well with the yellow ochre. When researching mediterranean yellow plaster, I found that many of the window shutters were painted arsenic green and blue. The blue and green both compliment the yellow. I also like the distressed paint which had the look of patina .

4

5

6

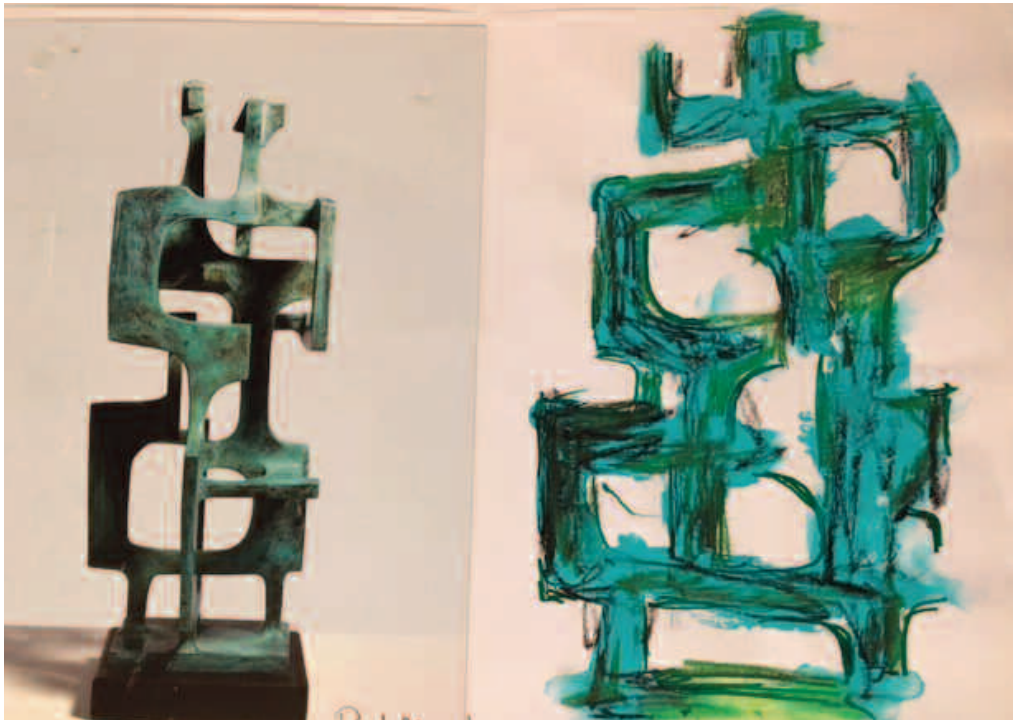
1

2

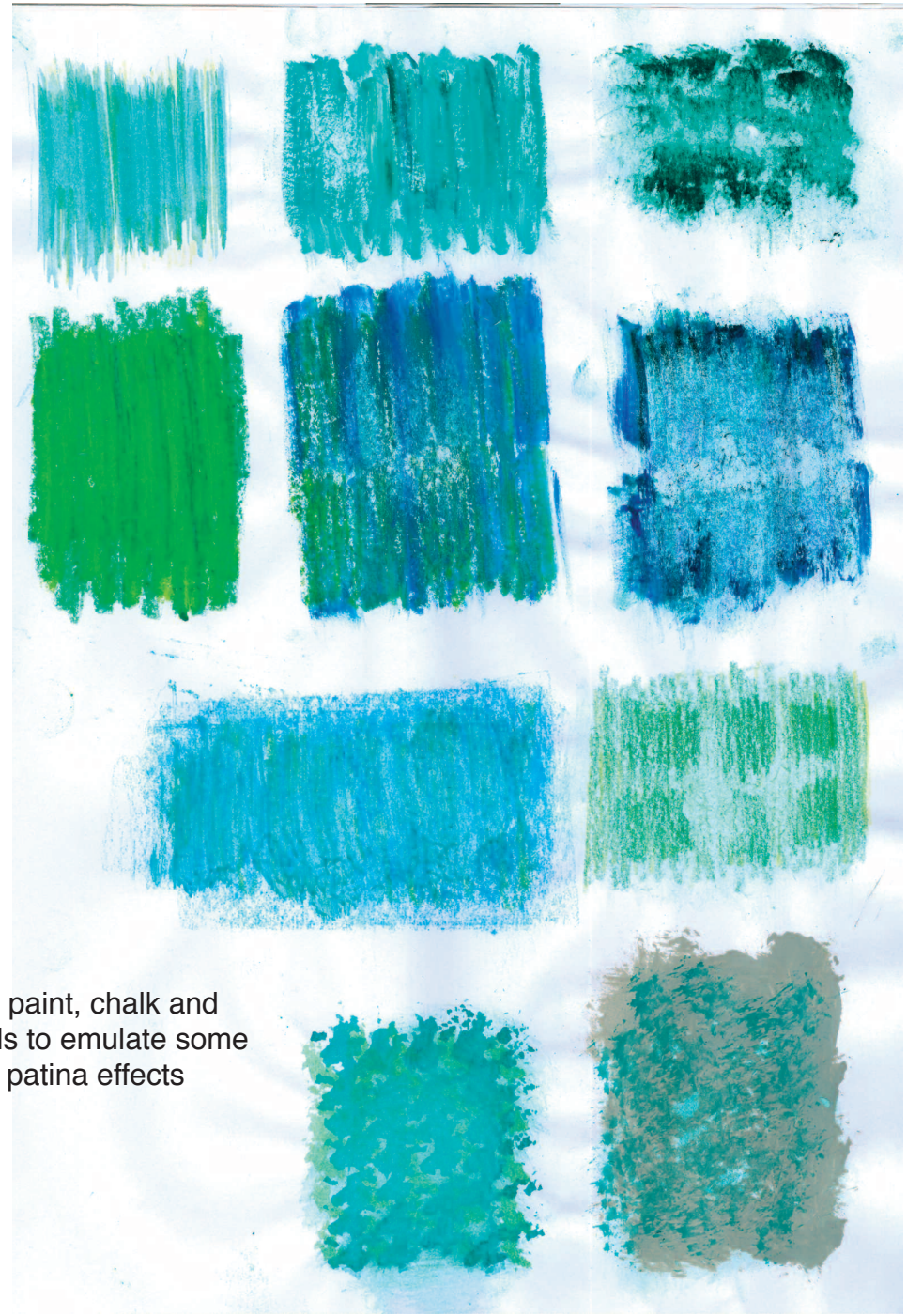
3

4

I looked at pieces with similar colours and was interested by the metal patinas of the sculptures by Henry Moore and Paul Mount.

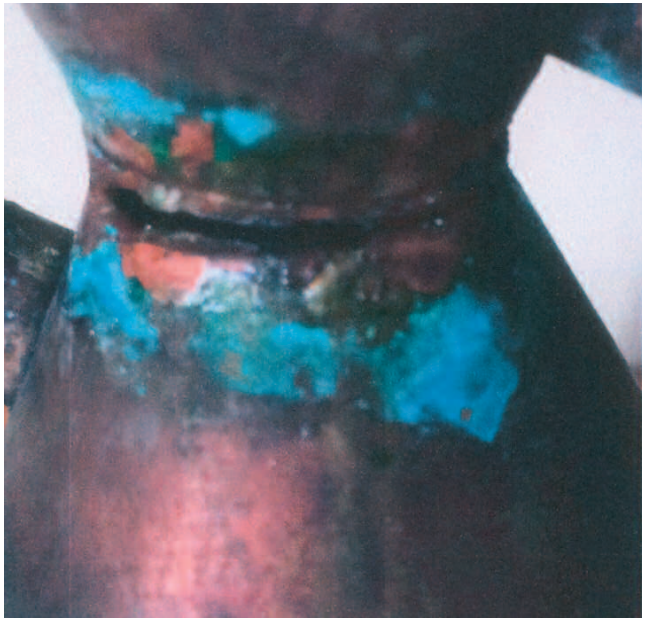


Paul Mount, patina responses.



Using paint, chalk and pastels to emulate some of the patina effects

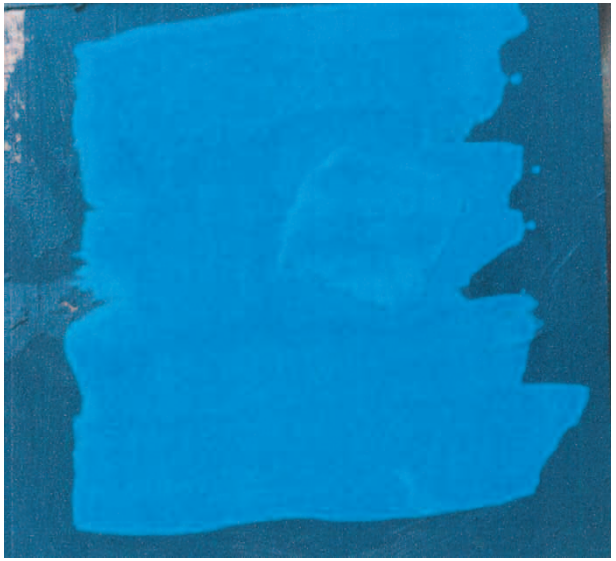
Blue patinas I came across



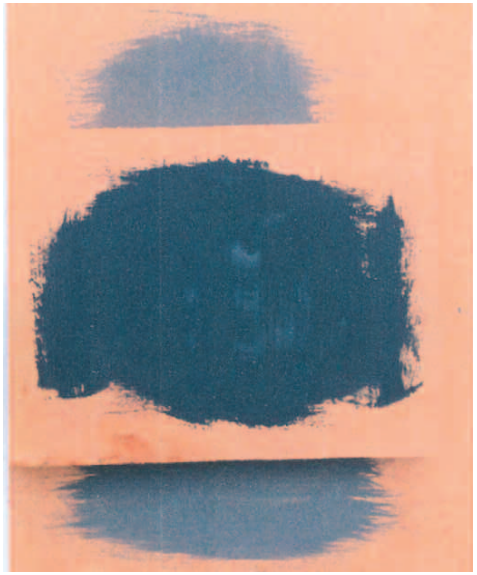
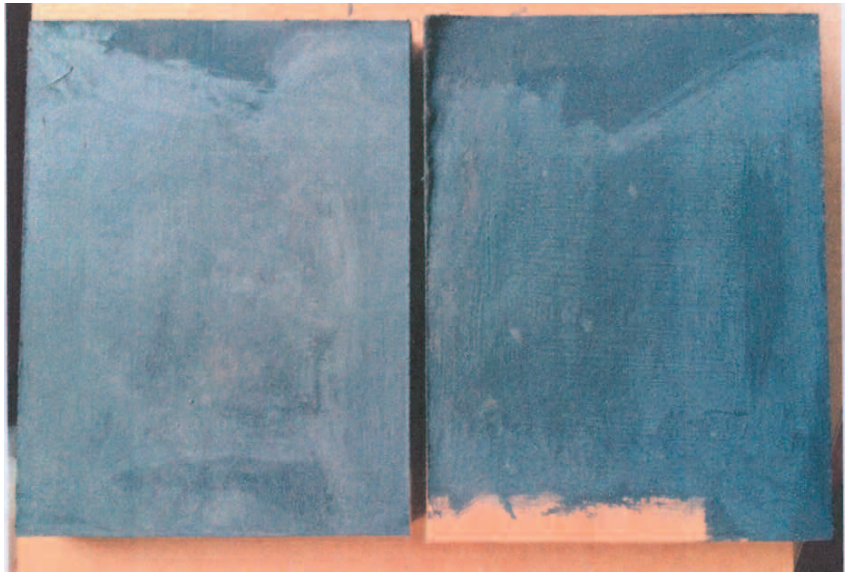
Copper Patina

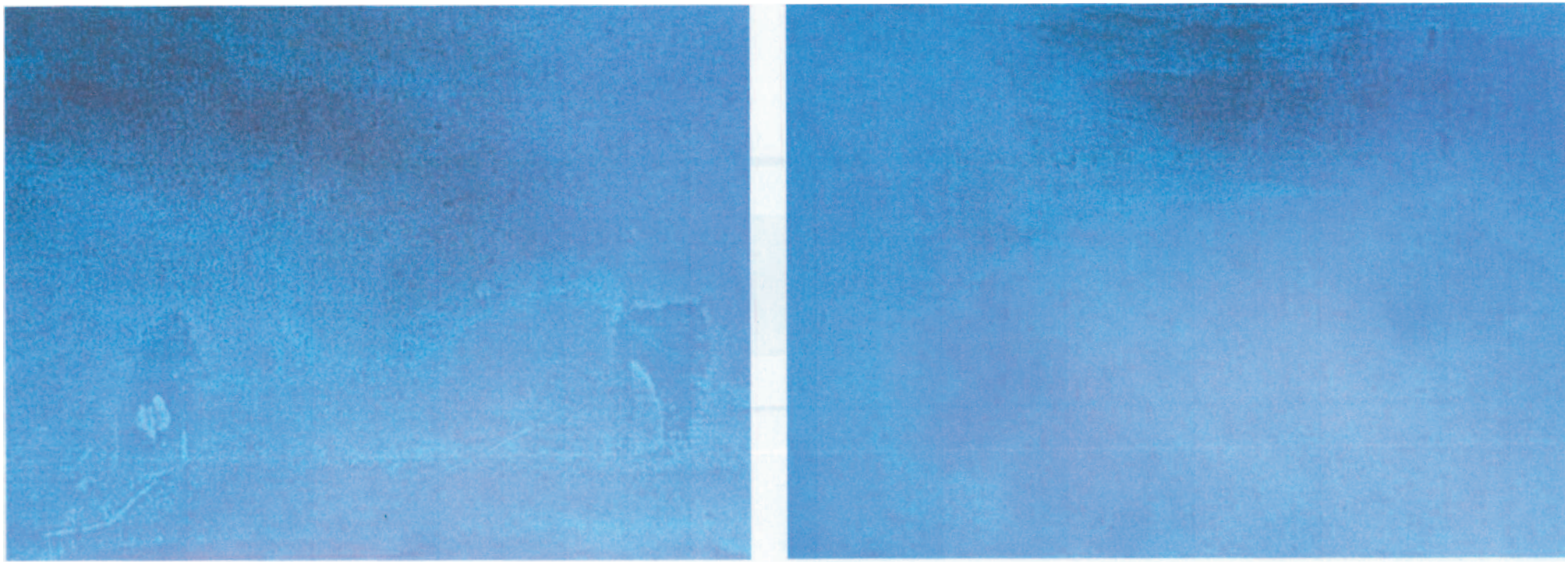
Zinc Patina

Lead Patina

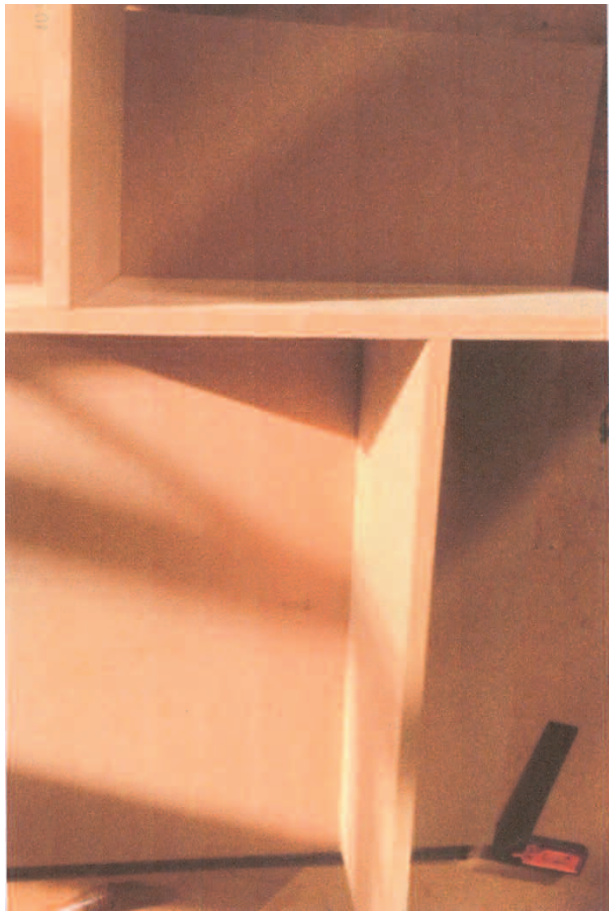


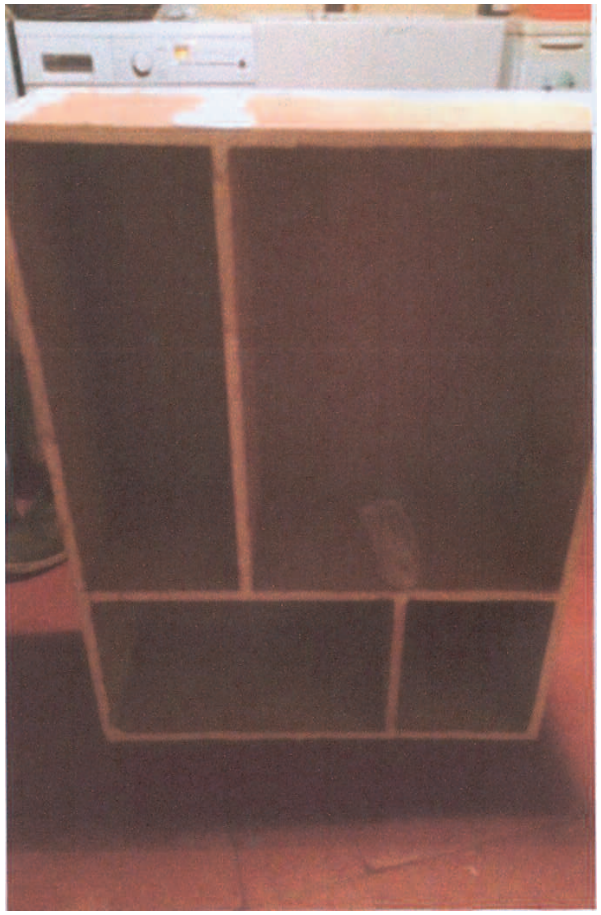
I used a grey emulsion paint which I covered with a blue. I then used steel wool to rub back the blue. This colour was a bit intense so I watered the blue down to get a more subtle effect as seen on zinc. I found that the steel wool would easily rub through the paint to the MDF so I used a dark grey car primer which was oil based and harder wearing. I used watered down grey emulsion on top with a final coat of blue, which I rubbed back.

The finished zinc effect





I used wood filler to cover up any joins and end grain of the MDF as I didnt want the piece to look like wood but wanted to create the illusion of it having a zinc/lead look.



Painting process

References

Page 3.
1. https://picclick.com/VINTAGE-FORMICA-KITCHEN-TABLE-W-LEAF-MID-CENTURY-232278966811.html
2. https://www.1stdibs.com/furniture/tables/dining-room-tables/super-ellipse-dining-table-piet-hein-bruno-mathsson-fritz-hansen/id-f_6229453/
3. http://foter.com/explore/formica-top-kitchen-table

Page 4.
1. http://www.ebay.co.uk/bhp/formica-table
2. https://tr.pinterest.com/pin/352969689518440058/
3. https://www.mustardvintage.com/products/vintage-1950s-red-formica-vintage-

Page 34.
1. Red table. http://table.procssorapp.com/vintage-formica-table-for-kitchen-and-dining-room/
2. Green table http://cdiannezweig.blogspot.co.uk/2010/11/1950s-formica-and-chrome-tables-gaining.html
3. Yellow table http://seeur.com/yellow-formica-table-on-vintage-design/
4. White table http://www.ebay.co.uk/itm/Vintage-50s-60s-formica-Drop-Leaf-Table-/272675666212
5. Blue table http://www.ebay.co.uk/itm/retro-60s-formica-top-table-chunky-table-top-/272663218412
6. Pink table http://www.ebay.co.uk/itm/Red-Formica-Top-Table-Retro-Vintage-Rectangular-Kitchen-Dining/252928521616

Page 36.
1. https://tr.pinterest.com/pin/60165344996594512/

Page 37.
1. http://jeffreygardens.blogspot.co.uk/2011/02/colors-of-morocco.html
2. https://tr.pinterest.com/pin/31243791134360507/
3. https://tr.pinterest.com/alibell22/study/?lp=true
4. https://sminteriors.co.uk

Page 38.
1. http://www.stuccoitalianoinc.com/tadelakt/
2. http://tadelakt.co.uk
3. http://tadelakt.co.uk/portfolio_item/tadelakt-training-marrakech-morocco/

Page 67.
1. http://www.alamy.com/stock-photo-curvy-road-around-a-building-with-green-window-shutters-on-an-overcast-89466824.html
2. http://www.alamy.com/stock-photo-mediterranean-shutters-310341984.html
3. https://www.dreamstime.com/stock-photo-mediterranean-weathered-shutters-rustic-south-europe-image56482410
4. https://pixabay.com/en/blue-doors-blue-shutters-weathered-1039967/
5. https://www.shutterstock.com/image-photo/detail-view-some-shutters-on-mediterranean-23980981
6. https://www.shutterstock.com/image-photo/old-green-wooden-window-shutters-rustic-574286566?src=6bnzzshgb-Qy8FOJsi9z4w-1-34

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1.Sculpture by Henry Moore
2. Sculpture by Paul Mount.
3. Sculpture by Paul Mount
4. Sculpture by Henry Moore