

AQA Design and Technology – Resistant Materials Technology 45602



Jodie



Jewellery Cabinet



Introduction To The Situation

I have decided to make my GSCE Final Project based on this design task:

Design Task 8

'Design and make a small storage unit influenced by any design era of the last 100 years.'

The Situation

I have a lot of jewellery and as I have no place to store all of it, I put it all onto my shelf.

My shelf is therefore a mess and I find that all my necklaces and bracelets get tangled up and I constantly am losing the little pieces of jewellery like my earrings.

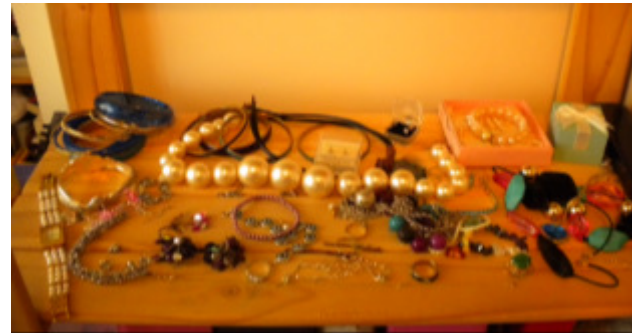
The pictures to the right show my shelf and all of my jewellery tangled up in a mess.

I have decided to use this task as I need a place to store all of my jewellery and I intent to try and market this as a product at the end of the project.

The Brief

I intend to design and make a small jewellery cabinet storage unit which will be small to medium in size. I want to make the cabinet out of wood as it is a sustainable material and wood can be aesthetically pleasing. I want to base the main design on a similar jewellery cabinet that my Mum has. I want the cabinet to be sturdy and hold all of my jewellery.

My Jewellery Shelf
(600mmx280mmx370mm)



Primary Research

Interviews

I decided that for my primary research I would interview three of my classmates and also my Grandpa who is a builder.

Megan, 15

What material should the jewellery cabinet be made out of?

"I think wood would look nicest for the jewellery cabinet and metal and plastic look a bit tacky. Wood would be better as it is more aesthetically pleasing for a piece of furniture."

What shade/colour?

"I like lighter wood because it is more neutral."

What design era would suite this best?

"Art Deco. It is elegant."



Shannon, 15

What material should the jewellery cabinet be made out of?

"I think wood is best. I would want something that looked expensive but isn't expensive to buy."

What shade/colour?

"I like wood that is light brown because it looks warm and I also like oak."

What design era would suite this best?

"Art nouveau. It is romantic and beautiful."

Rebecca, 15

What material should the jewellery cabinet be made out of?

"I think that wood would be better for this. It looks more professional."

What shade/colour?

"Dark wood, rich in colour like mahogany although I wouldn't want it to be too expensive, so using a venir could be good."

What design era would suite this best?

"Art Deco. It looks professional and modern."



Secondary Research

Good Points
Bad Points

I typed 'jewellery cabinet' into Google. The amount of search results gives me an idea of how popular jewellery cabinet's are and will give me an idea of what the target market I want. →

Results 1 - 10 of about 2,040,000 for jewellery cabinet. (0.22 seconds)

Existing Products

I thought I should look at existing products and look at the key features that are common in most jewellery cabinets.

I want to use these key features in my jewellery cabinet as they have been successful in other designs.

The glass is not as a sustainable material as wood and breaks more easily.



The layout of the drawers is good as there are not too many of them and they are simple

The handles are small and aesthetically pleasing

The base is sturdy and the type of wood is aesthetically pleasing and looks more professional

<http://whateveruwant.com.au/LImage.aspx?i=799&t=1>

I would imagine this is about standard size 500mm tall and 180mm wide.

The drawers if they do not have a stop, due to the canter lever affect on the drawer, can break/damage the end of the drawer if it comes right out. They can also fully come out and can be dropped.

Fold out side drawers can become difficult to open and the hinge can become weak.



The colour of the wood is simple and as it is neutral can appeal to all.

I would imagine this is about 300mm tall and 200mm wide.

<http://www.sandsandson.co.uk/images/gifts/mele-wood-jewellery-t.jpg>

Analysis

I will try to avoid the bad points of these designs and apply the good points. Most of the designs I looked at were made of wood and I will use this to make the main body. I also like the idea of having a drawer and will use this in my design.

Design Eras

Art Deco

The definition of art deco on Wikipedia is “Art Deco was a popular international art design movement from 1925 until the 1940s, affecting the decorative arts such as architecture, interior design and industrial design, as well as the visual arts such as fashion, painting, the graphic arts and film. At the time, this style was seen as elegant, glamorous, functional and modern.”

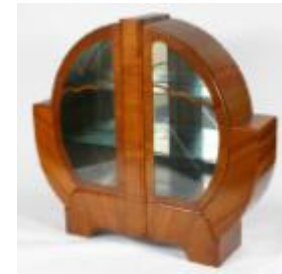
http://en.wikipedia.org/wiki/Art_Deco

Art Nouveau

The definition on Wikipedia is “Art Nouveau is an international movement and style of art, architecture and applied art—especially the decorative arts—that peaked in popularity at the turn of the 20th century (1890–1905). The name 'Art Nouveau' is French for 'new art'. A reaction to academic art of the 19th century, it is characterized by organic, especially floral and other plant-inspired motifs, as well as highly stylized, flowing curvilinear forms. Art Nouveau is an approach to design according to which artists should work on everything from architecture to furniture, making art part of everyday life.”

http://en.wikipedia.org/wiki/Art_Nouveau

Examples



http://www.jlfurniture.com/Art_Deco/Deco_Cabinet/deco.jpg

<http://www.antiquehelper.com/auctionimages/36228t.jpg>



<http://www.antique-marks.com/image-files/majorelle-cabinet.jpg>

<http://www.gallantantiques.co.uk/RICHARD/S95.jpg>

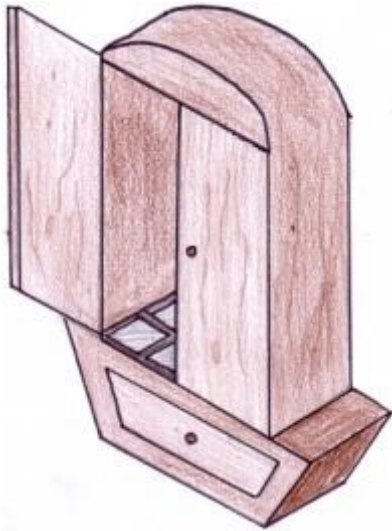
My jewellery cabinet design must include:

Specification

Specification	Reason
1. Must be made out of a robust material; wood	So that the product is sustainable and eco friendly
2. Hold jewellery: necklaces, earrings, rings, broaches, bracelets, watches etc.	So that the jewellery does not get damaged and so that it will be able to hold everyday type jewellery.
3. Have one drawer	To hold chunky/bigger jewellery
4. Easy to use	It must be practical and easy for the customer to use, for ease
5. Size: No larger than 500mmx200mmx350mm	So that it can fit onto my shelf and still have room
6. Cost to make should not exceed £30	So that is cheap to make and can make a profit when it is sold to customers.
7. Must be aesthetically pleasing	So that it is appealing to the customers and looks expensive in the hope that it will sell more.
8. Must weigh around 2 kilograms	So that it is not too heavy for the customer to handle if it needs to be moved and also so that the product is sturdy.
9. Be based on the design era: Art Deco	This is so the product can be aesthetically pleasing and to fit the design task.
10. Preferably a dark wood colour	It will look more expensive
11. High quality wood	Brazilian Mahogany wood is of high quality and it is not too expensive.
12. Be easily maintained	So that the customer can easily mend the jewellery cabinet if it gets broken, by using 'off the shelf' components.

Initial Ideas

Design 1



Advantages: I like this design because it is an interesting shape and has a curved top. It is in the form of art deco with the modern style base and also with the top of the cabinet being curved.

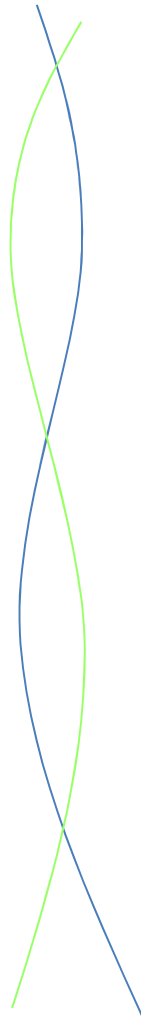
Disadvantages: The reason for having a tall body is so that necklaces can hang from the top. It is not practical for the shape of my shelf and I think it would be better for me to hold the necklaces in the soft storage holders or the drawer. I would therefore not need to have a tall body.

Design 2



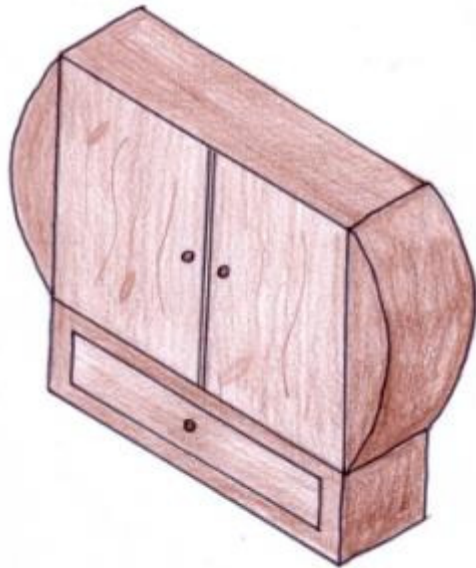
Advantages: I like this design because it is practical for the shape of my shelf (wider than it is tall). The curved top shows that it is based on art deco and also is a more interesting design than a flat topped cabinet. There is still room for a drawer at the bottom which is key in my design.

Disadvantages: The curvilinear top will be hard to make as with the base.



Initial Ideas

Design 3



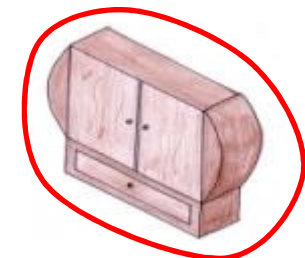
Advantages: This design is in the style of art deco, which fits into my specification. It would fit on my shelf better than a taller jewellery cabinet and I think that the design is unusual. There is room for a drawer in the bottom which would fit any chunky jewellery and necklaces.

Disadvantages: The curvilinear sides would be hard to do and would be time consuming.

Analysis

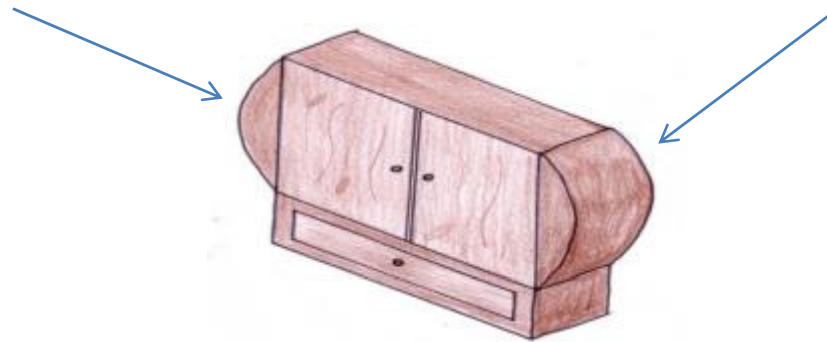
I have decided that I would like to carry on with design 3. This is because it fits the art deco era and is also practical for the shape of my shelf. If I have time, I will try and incorporate the base of design 1 into my jewellery cabinet instead of the current design so that it will represent art deco more. I will try and use a dark wood as it looks more expensive as I have stated in my specification. The wood I have available to me at my school is Brazilian Mahogany and so I will probably use this. I may use lamination to make the curved sides. The environmental issue here is if I am using recyclable materials and if the material is sustainable. To meet this issue, I shall be using recycled wood from my school. It is sustainable and environmentally friendly; this is also in my specification. The shape of the jewellery cabinet is aesthetically pleasing as my specification states and is different from a regular, taller jewellery cabinet. Also if I have time, I will try and put glass in the doors to make it more aesthetically pleasing. If I have time the interior will be either similar or the same as design 1 and 2. Also I plan to make the drawer a contrasting colour to the rest of the body of the jewellery cabinet. This design meets all specification points.

This is the design idea I will be developing



Development Of The Design

Laminating: To make the sides of my jewellery cabinet I may decide to use a method of laminating so that I can curve the sides so that it is curvilinear. This will also allow the jewellery cabinet to have a more art deco look and to fit the design task.



Former



How It Works



A piece of solid timber is cut up into thin strips (only about 5 mm in width) and built up on with layers. It is glued together and put into a former which the timber will set into the shape of. When it has set it will stay in shape.

Development Of The Design

The Drawer:

For the drawer, I have thought about how big it will be. To make it look smaller, I have thought about the front of the drawer being split into two drawer fronts, but still only having one drawer. Having two drawers will make the design very time consuming so instead this will let me get maximum drawer space, but give the illusion of having two drawers.

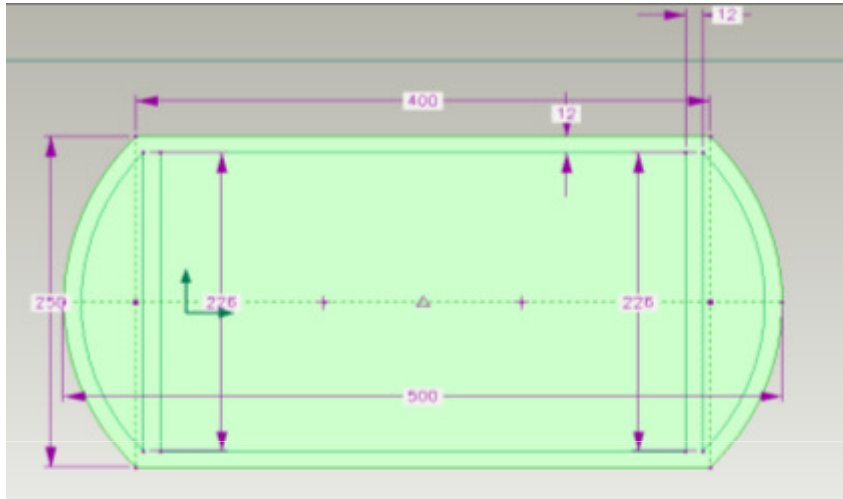
Doors:

For the doors, I am planning to make them a different colour from the main body of the jewellery cabinet. There will also need to be a depression in the wood of the main body so that the doors can open and close. I will also be using hinges to allow my door to open and close.

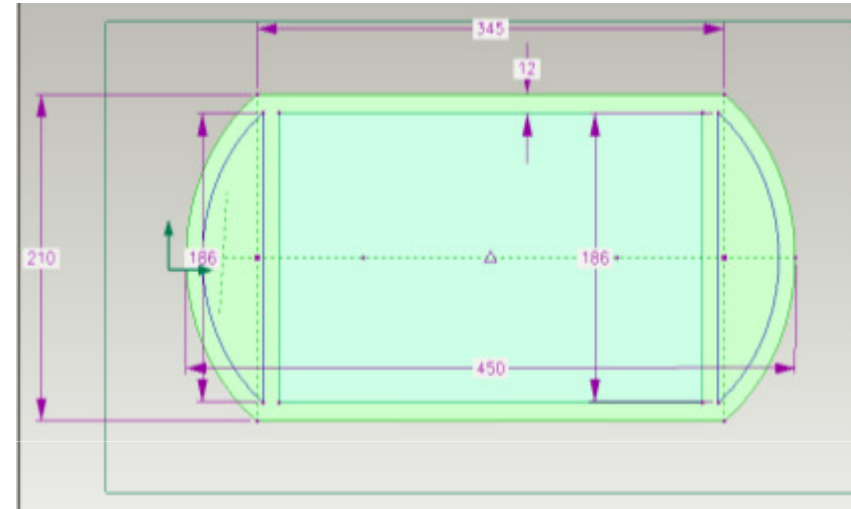
Environmental Issues:

The main environmental issue here is if I am using recyclable materials and if the material is sustainable. To meet this issue, I shall be using recycled wood (Brazilian Mahogany and with a contrast of Ash) which I will get from my school. I will also be using MDF (Medium Density Fibreboard) which is made out of compressed pieces of excess wood fibre. It is good to use this as it is recycling pieces of wood and using it instead of wasting it. It is sustainable as it comes from trees and is a renewable source and also environmentally friendly which is part of my specification. I will also look into using recycled 'off the shelf components' but if they are of a bad quality, I shall buy them instead. Any of my waste wood shall be recycled at my school and reused for other students if it can be. At the end of the jewellery cabinet's lifecycle, it will still be sustainable, and can be reused to make more products (or more of my jewellery cabinets). It can also be reused by the customer for personal use. If not, it can easily be recycled, and it is environmentally friendly so it will not harm the environment. The 'off the shelf components' can be reused if they are still in good quality and if I decide to put in a mirror, that can also be reused or recycled.

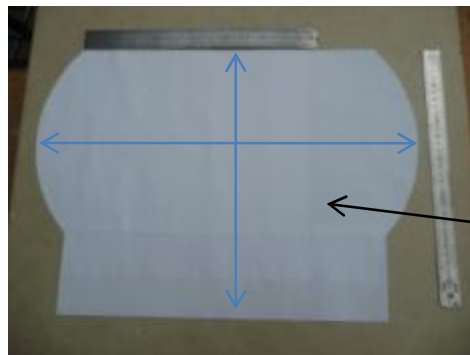
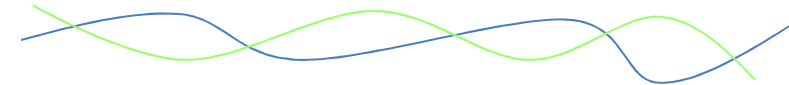
Pro Desktop Drawings



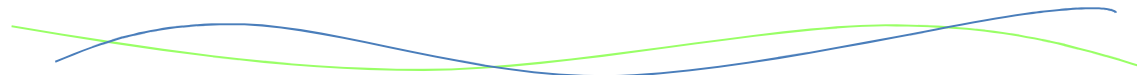
This is the original measurements and the drawing that I had of the top part of my jewellery cabinet design.



I decided that after drawing a 2D model of this that it was too big and that I should make the measurements smaller. I shortened the sides by 50mm overall (25mm on each side). I also shortened the main rectangular body shorter by 55mm from 400mm to 345mm. I then reduced the height by 40mm from 226mm to 186mm. I thought that this was a better size for my jewellery cabinet. These are the new dimensions and measurements for my jewellery cabinet:

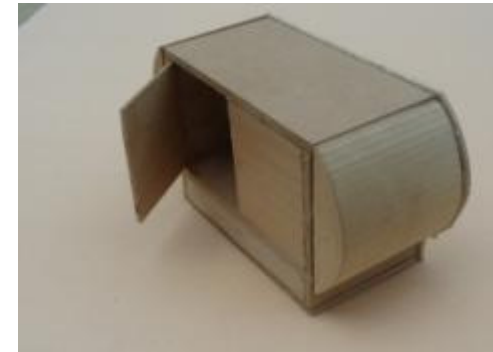


This is a picture of my 2D model that I made with the measurements 500x350 which the arrows represent. This would have been full size scale. The two rulers either side of my 2D model are 300mm long, not including the very ends which are 26mm long.



My Model

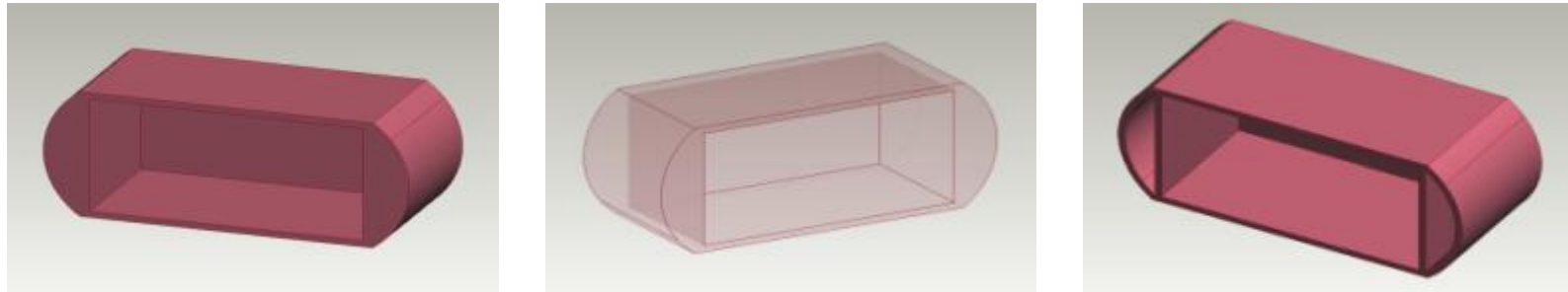
I decided to make a model to see if my design would be work. These are some pictures of the model. The wooden model is half scale size . I had changed the original measurements from my 2D model which was full size as I thought that the measurements were too big and that my jewellery cabinet would turn out to be too large. These pictures show different angles of my model.



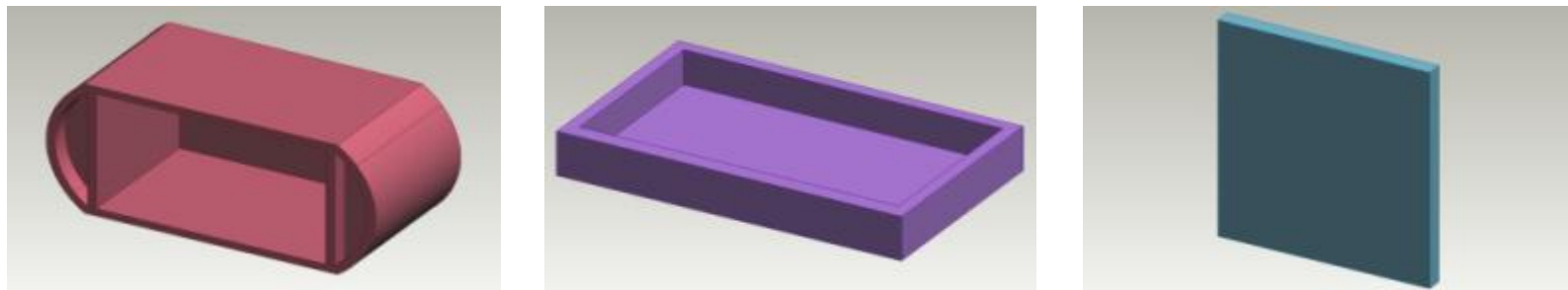
I think that my model has shown me that I have the right measurements for my jewellery cabinet and that it is the right size for what I am trying to make.

Pro Desktop Drawings

These are some pro desktop pictures of my final design. The first row shows the main body of the jewellery cabinet. The first two images on that row are the top of the jewellery cabinet with two different views. You can see the curvilinear shape of the sides and also how deep the cabinet is on the inside. It also shows how big the sides are in relation to the whole width of the top of the jewellery cabinet. The third image shows the decompressions in the curvilinear sides which will store rings on dowels. It is the image before the correct depth had been established. I decided that the sides should not be hollow, and they did not need to be cut out very deeply as they only need to store dowels to hold rings.

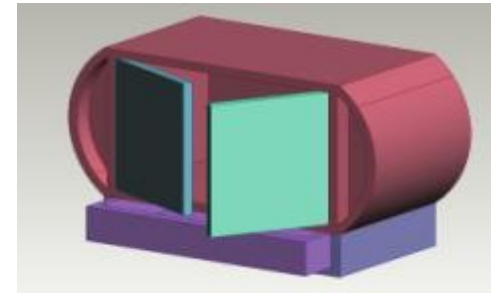
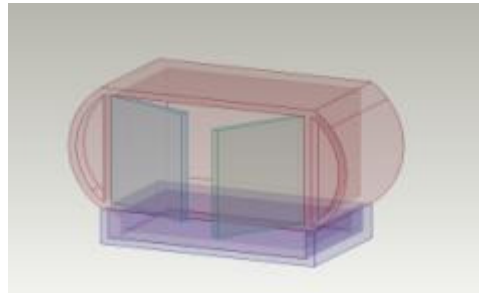
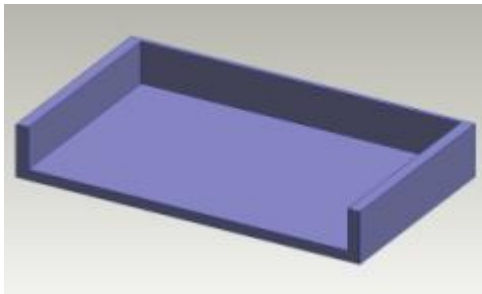


The first image here shows the decompressions in the curvilinear sides which will store rings on dowels. It shows how deep the storage in the sides will be in comparison to the depth of the inside of the cabinet. The second image on this row shows the drawer, its depth and relative size. The third image shows one of the doors, which consequently is the same size and shape for the second door also.



Pro Desktop Drawings

The first image on this row is of the bottom of the jewellery cabinet. It is a 'U' shape to allow the drawer to fit in and also not to be doubling up on the size of the wood between the bottom of the top half of the cabinet and the top of the drawer. It is cutting down on weight and the jewellery cabinet will look more aesthetically pleasing without any extra, unnecessary wood. The second image is a transparent view of the assembly of the jewellery cabinet all pieced together along with the third image which is a different view of the cabinet.



Added Extras

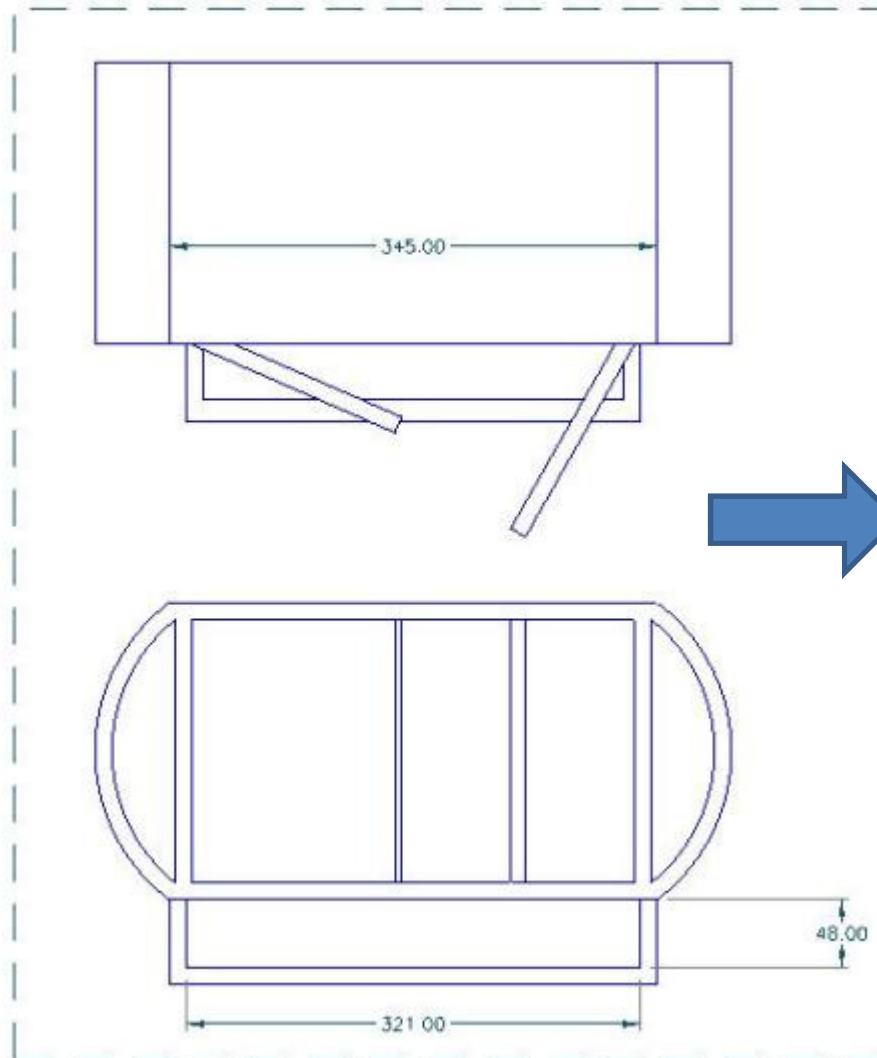
If I have time, I will also make a jewellery tray to fit into my main cabinet. I think I have too much to do at the moment and so I do not think I have enough time to do it all. It will have about 12 small sections which will slot into the main body at the bottom. This is where the jewellery will be kept in sections. For this I may also have to put in a turn button to secure the jewellery tray, but also allows it to be removable.

Also if I have time, I will put a mirror on the inside of either one or both of the doors. This is so the jewellery cabinet is more useful.

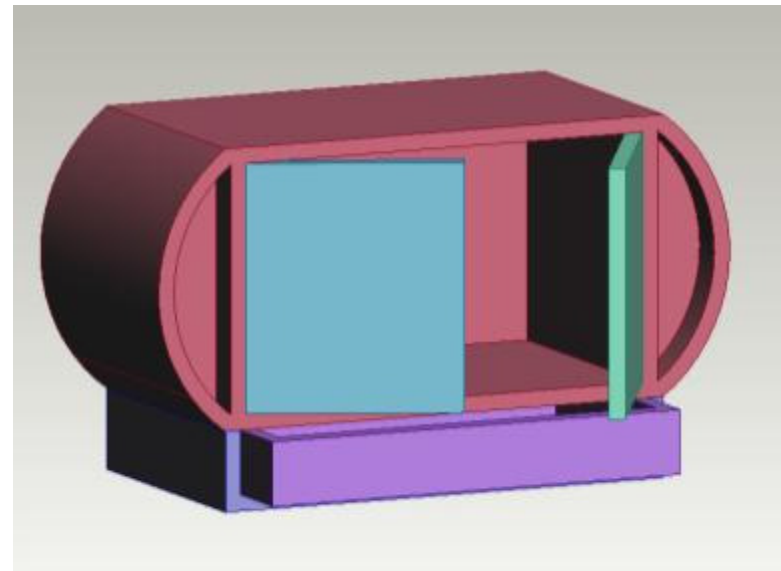
I will make either a 2D Design Image or Pro Desktop Image for these if I do them.

I shall also be making lids for the curvilinear sides which will slot into the depressions. This is so the jewellery does not fall out. I will make a 2D Design Image for this.

Engineering Drawings

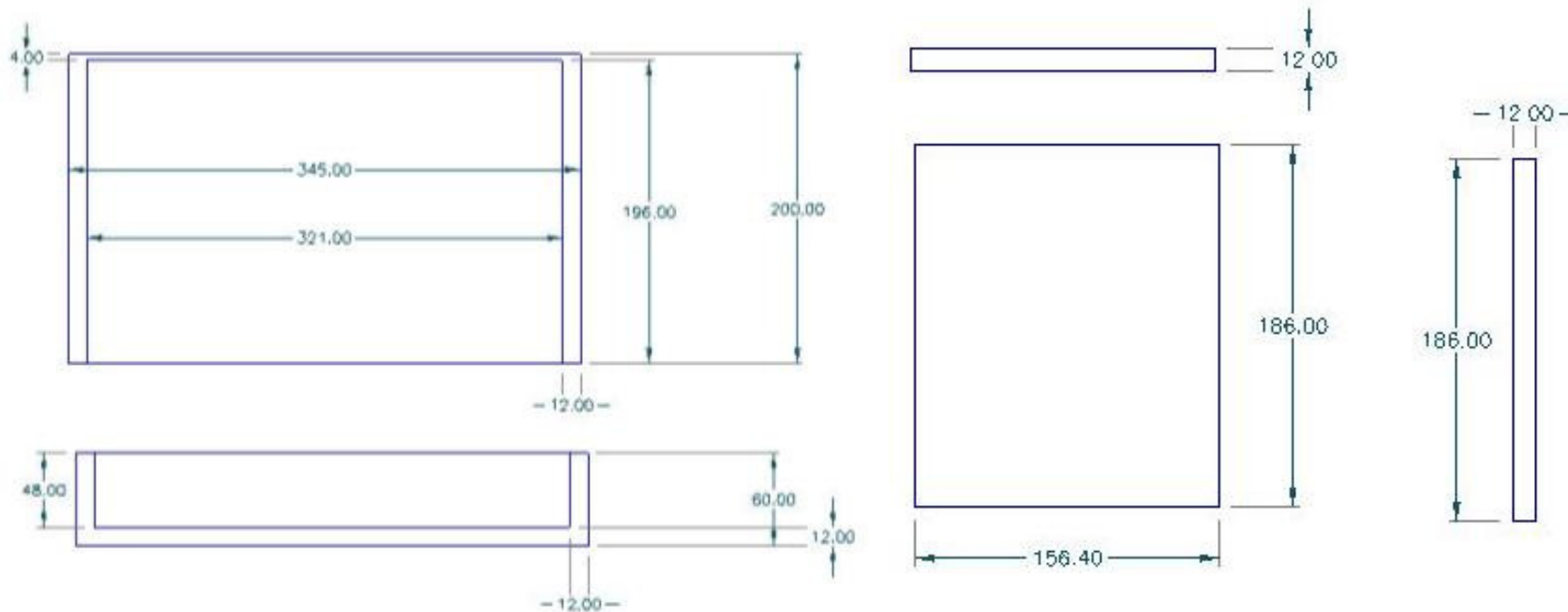


This is the first of the engineering drawings that I produced using Pro Desktop. The Pro Desktop drawing that is below shows the jewellery cabinet assembled. This helped me to understand what my jewellery cabinet would look like and the proportions of each section.



It was very helpful to use Pro Desktop to create each piece of my cabinet and then being able to put all of the images together and make it into a 3D jewellery cabinet. It has given me generated measurements and engineering drawings from the images. It has also allowed me to look at my jewellery cabinet with different measurements and decide which is the best for what I am trying to achieve.

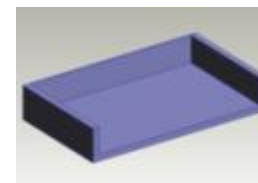
Engineering Drawings



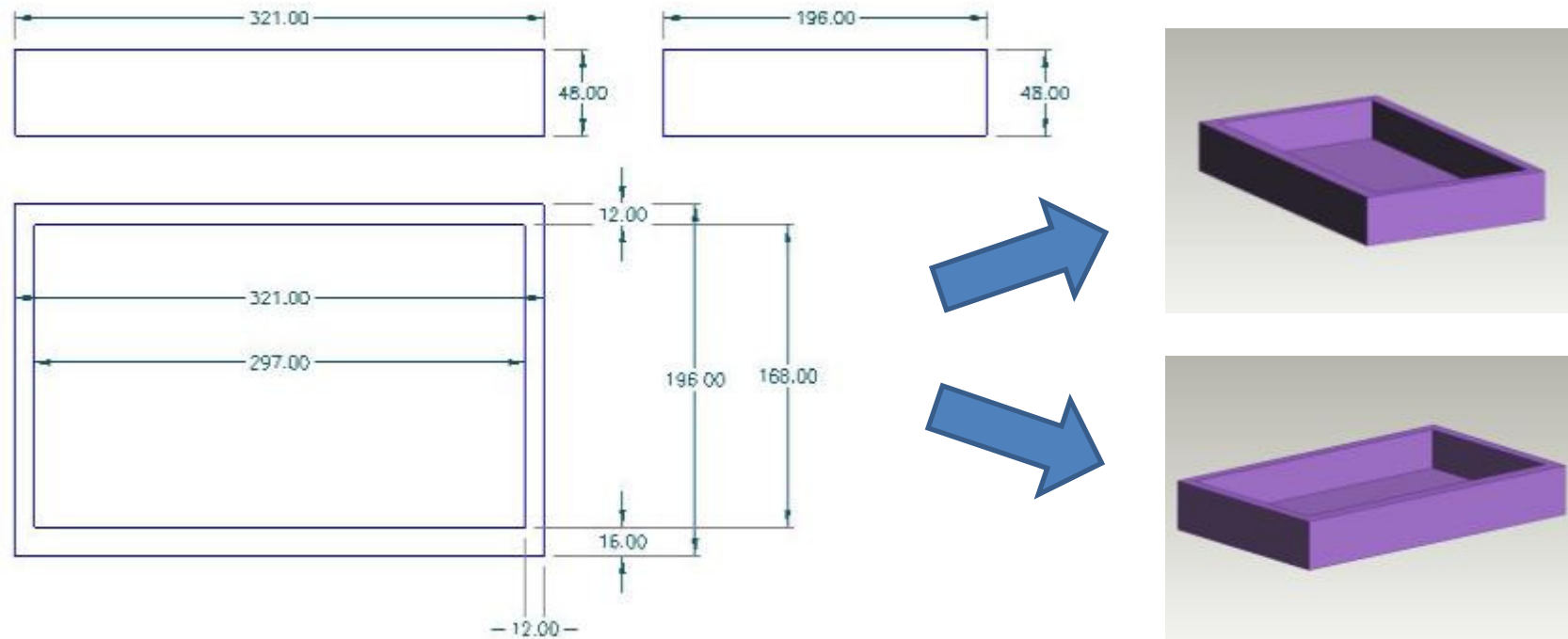
This is the engineering drawing of the bottom half of the jewellery cabinet using ProDesktop. It shows the measurements of whole of the bottom half of the jewellery cabinet. As you can see, the full length is 345mm in width, 60mm tall and 200mm deep. The bottom half is in a 'U' shape so that it is cutting down on weight and the jewellery cabinet will look more aesthetically pleasing without any extra, unnecessary wood. If the top was enclosed, there would be an extra 12mm of wood which is not needed.



This is the engineering drawing of one of the doors which is consequently the same for the second door. The dimensions of the door is 186mm tall, 156.40mm wide and a wood depth of 12mm. The doors will be connected with hinges to the main jewellery cabinet and if I have time I may put a mirror on the inside of the doors.



Engineering Drawing



This is the engineering drawing I produced using Pro Desktop of the drawer that will fit into my jewellery cabinet. The main measurements are 321mm wide, 48mm tall and a depth 196mm. The front thickness of the wood is 16mm and the back is 12mm. To the right is a Pro Desktop picture of the drawer.

What I may do (if I have enough time) with my drawer front is split it into two drawer fronts to given the illusion of two drawers. This may make the cabinet look more aesthetically pleasing but be less time consuming as I would be only making one drawer.

Parts List

PART NUMBER	PART NAME	NUMBER OFF	CROSS SECTION (mm)	LENGTH IN METRES (mm)	MATERIAL	COST/METRE	TOTAL COST
1	Horizontal Panels	3	200x12	0.3	Brazilian Mahogany	3400p	£7.04
2	Vertical Panels	2	200x12	0.2	Brazilian Mahogany	3400p	£2.86
3	Curvilinear Sides	4	52.5x25	0.2	Brazilian Mahogany	3400p	£1.50
4	Curvilinear Sides	12	52.5x25	0.2	MDF	1172p	£1.55
5	Back Of Main Cabinet	1	198x4	0.3	Plywood	1510p	£0.44
6	Front Of Drawer	1	48x16	0.3	North American Ash	3360p	£0.56
7	Side Of Drawer	2	48x12	0.2	North American Ash	2780p	£0.52
8	Back Of Drawer	1	48x12	0.3	North American Ash	2780p	£0.46
9	Base Of Drawer	1	196x4	0.3	Plywood	1510p	£0.44
10	Door	2	156.40x12	0.2	North American Ash	2780p	£1.70
11	Base Of Bottom Of Cabinet	1	200x12	0.3	Brazilian Mahogany	3400p	£2.35
12	Side Of Bottom Of Cabinet	2	60x12	0.2	Brazilian Mahogany	3400p	£0.82
13	Back Of Bottom Of Cabinet	1	60x4	0.3	Plywood	1510p	£0.13
						Total	£20.37

Off-The-Shelf Components

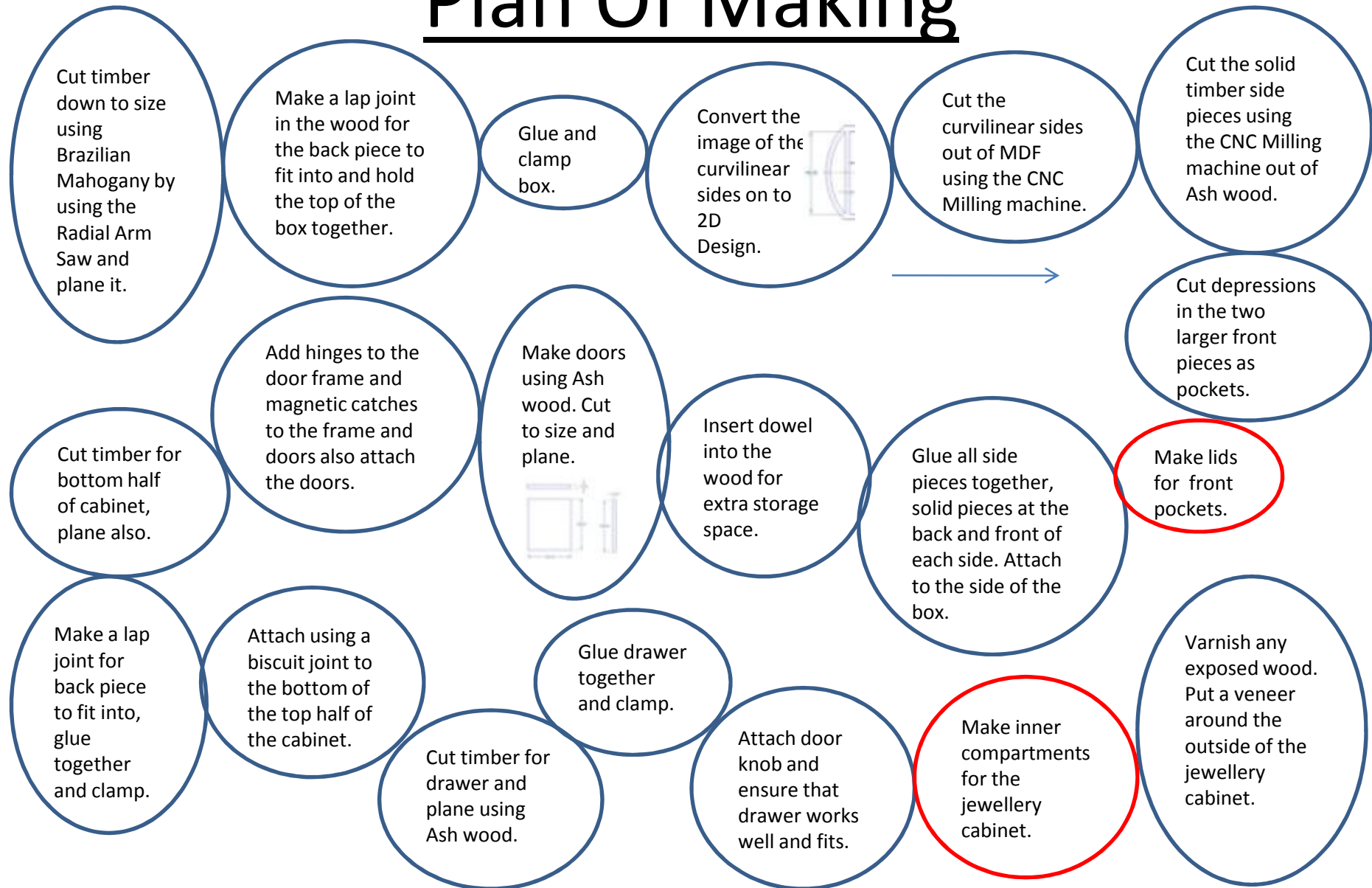
Door Knobs: 30mm - 10 with screws = £7.18,
 Chrome coloured door knob = £2.68

Hinges: 38mm - 2 = £1.16
 (No notch) 50mm – 2 = £2.68
 28mm – 2 = £1.16
 13mm – 2 = £1.06

Drawer Catch: 1 = £1.93
 Screws: 25 = £1.96

Plan Of Making

_____ = may be done if I have time.



The Making

The first part of the making of my jewellery box I had to do was to cut the pieces for the main body. Below you can see a picture of my pieces of Brazilian Mahogany wood before they were cut down to size, and afterwards at the size I needed. They are now 14mm thick as I thought that they would be a little too thin at 12mm. Mr. Smith advised me on this. Mr. Smith had to cut them for me so that they were cut precisely using the radial arm saw. This was to ensure it was cut at 90 degrees so that they would be cut accurately. I cannot use the radial arm saw so Mr. Smith had to cut my pieces for me.



Before



After

I then had to cut a lap joint in the pieces of wood so that I could fit them on each other to form the main box shape. I marked out where it had to be cut, but it needed to be precisely cut using the radial arm saw again so Mr. Smith had to cut it out. I had to score down the length of the wood, exactly half way across and then I shaded in the piece that needed to be cut out. I then placed the wood together to check that it fitted.



The Making

I had to cut a groove for the back piece of wood for my jewellery cabinet. Mr. Smith did this for me as it was too dangerous. This also allowed for the box to be much more sturdy and could fit together more easily. This was cut using the router which is shown below.

For my back piece, I used some plywood. I decided that the colour of the plywood was not what I wanted and it did not have a nice finish so I decided to put a veneer onto it to make it look more aesthetically pleasing and to fit in more with the design. I used Thixofix which is a contact adhesive to glue my veneer to the plywood. I then had to sand the veneer and plane the sides to make sure the veneer and plywood were both flush.



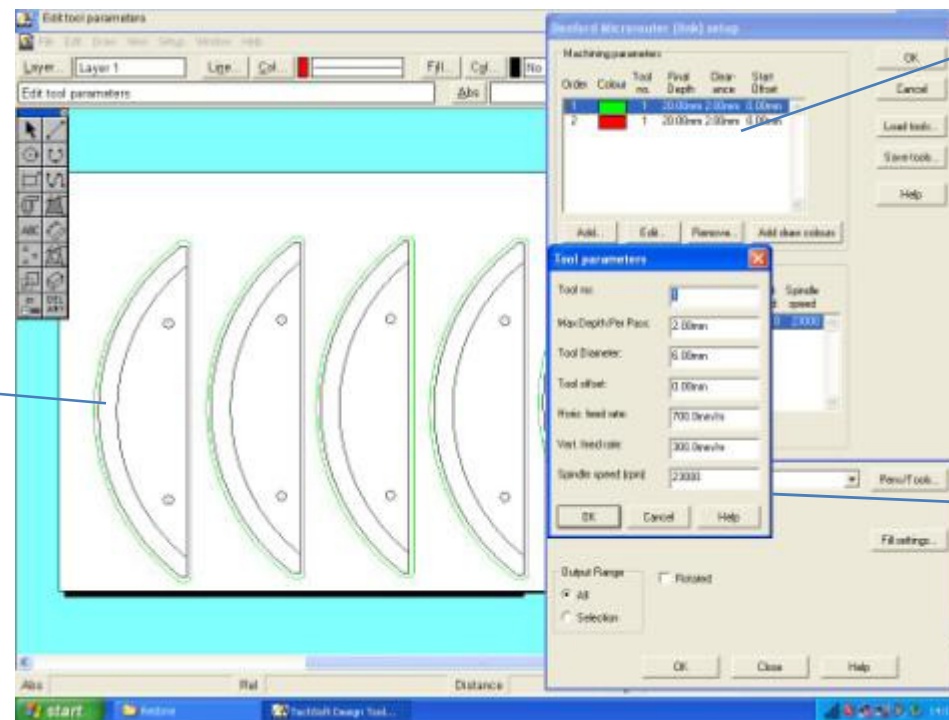
I then assembled my box and using sacrificial wood, I clamped up my box to see if it fitted together properly. I did this once first before I glued the pieces together and clamped the box to check that everything was at right angles and all fitted together as a quality control check. Once I was happy that everything fitted together in place, I glued the pieces of wood together, wiping away any excess, and clamped the box together. After the glue had dried, I planed the edges of the box so that they were all flush.



The Making

I next had to make my curvilinear side pieces to fit onto my jewellery cabinet. I decided that the easiest way to do this was to use the CNC Milling Machine. I first used the engineering from my ProDesktop image of my curvilinear sides and copied it onto a 2D-Design file. I then modified the drawing so that the CNC Milling Machine would recognise what I wanted to do. I first put a contour of 3mm around the edge of my drawing (using a different colour that the computer recognises) to allow for the radius of the drill bit in the machine. I also made holes in my drawing so that all of my pieces could be aligned when I assembled them. I then copied the image an extra 5 times so that the CNC Milling Machine would cut out 6 pieces at a time. I had to convert the 2D-Design file into a 'FANUC' file so that the virtual milling machine software could recognise it.

The drawing that was to be cut out.



Contour lines to cut out.

Programming the drill.

The Making

I then used the CNC Milling Machine to cut out the curvilinear sides out of MDF (Medium Density Fibreboard). I had to nail the piece of MDF that I wanted to be cut out onto a sacrificial piece of wood and then put it into the machine to be cut. I had to do this 3 times so that I had the correct amount of pieces for my sides. Each side piece was 18mm thick.

I then had to cut out 4 solid pieces of wood; two were 30mm thick and two were 26mm. To do this, I had to get the original drawing for the side pieces and then change the settings on the computer software so that it would cut my wood deeper than the previous pieces. For the 30mm pieces, I also had to make a contour so that the machine would cut a pocket into my work that was 25mm deep. This was for my front pockets for extra storage.

In each of the curvilinear side pieces there were two 6mm holes in , equally spaced apart so that I could more easily fit them all together , in a much straighter position so that they all lined up .



The Making

The next thing I did was to make the doors. For this, I had to cut out a piece of Ash wood which would contrast with the Brazilian Mahogany. This is so that I could have my desired Art Deco look. I cut out the pieces of wood, and then I also cut out four more smaller pieces of Ash wood; two for each piece. I cut the wood using a band saw. I then had to glue the doors together by putting on one of the smaller pieces of wood on the top and bottom of each door. This is so the wood would be less likely to warp as it has the extra pieces with their grains going in the opposite direction.

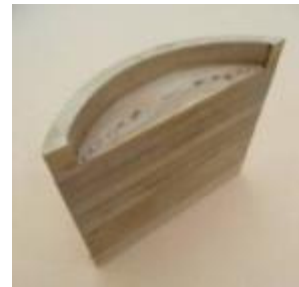


Using the router, I had to make groves into each piece of wood so that they would have a tighter, more secure fit. Mr Smith had to do this for me as it was too dangerous for me to do. Before I glued them I first clamped the pieces of wood together to see if they would fit correctly and that the wood was flat so that they would fit together. I then clamped and glued my pieces of wood together and left them to set.

After the doors had been glued, I had to plane the doors so that the end pieces were flush with the main piece of Ash. I did this with a small plane so I had more control.

The Making

I then went back to creating the curvilinear side pieces for my jewellery cabinet. I first assembled each side, with 8 MDF pieces on each side, one 30mm piece for the front, and one 26mm piece for the back of each completed side. I used 2 pieces of 6mm dowel and pushed them through the holes on each side. I discovered that it was a bit tight fitting and so I used the drill and a 6mm drill bit to ensure that each whole was 6mm wide. I then assembled each side to see if they all fitted together in line. After I did this, I glued the pieces together and used 3 clamps on each of the completed, assembled side pieces. I then left them to dry. Once they were dry, I sanded down the sides so that they were smoother and so that all the pieces were flush.



The Making

I then needed to fit the hinges for the doors. I did this by marking an equal distance from the edges of each door and then drawing around the shape of the hinge on the side edge of the doors. I then used a marking gage to mark the thickness of the hinge into the wood. I also used the marking gage to mark along the section of hinge that I had drawn out, just under half the length of the actual hinge. I then used a tri square to make sure my lines were straight and at right angles. I then scored across the edges of where I had drawn around the shape of the hinge to sever the fibres and to make the cut much easier and so as not to take up extra material. I then used the router to take out the material on each of the places where I had marked out the hinges to be. I then used a chisel to take out the excess material from the corners that the router had not managed to take off.

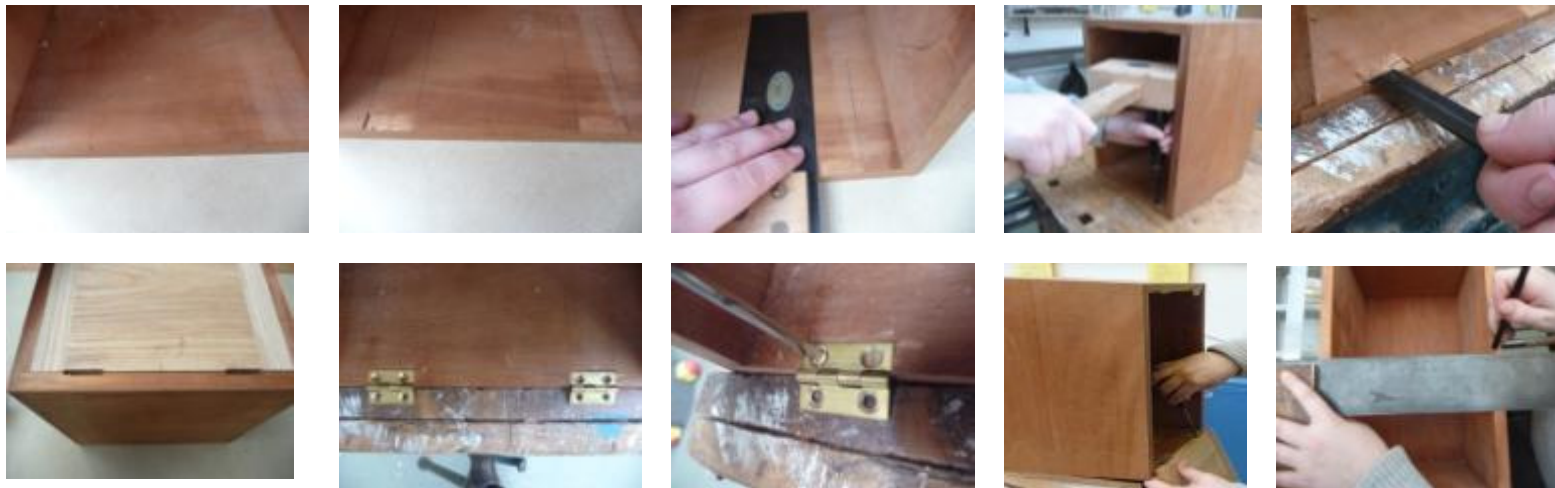


The Making

After creating a space for the hinges on the doors, I then had to repeat this process for the inside of my box. I had to transfer the lines I had drawn for the hinges on each door onto the inside of each side of the box. I then marked out the hinges in the wood with a marking gage, but instead of using the router, I used a chisel to slightly bring up the material so that it could be cut out more easily.

I then made whole for the screws to be put in. I did this by drilling a small hole where the screw would go, and using a slightly bigger screw, I screwed into the whole. I did this to all of the hinge cut-outs on the inside of my jewellery cabinet. I then screwed the hinges onto the box using some smaller brass screws.

I then measured across my jewellery cabinet and found the centre. I marked a line on each side as to where the centre was. This happened to be 158.5mm. I then used a tri square to make sure the lines were straight, and the putting one door at a time, flush, to the inside edge of the jewellery cabinet, I drew a line across that joined the two marks up.



The Making

I then cut away this excess material from my doors and planed the new sides down so that they were even. I then checked that both doors fitted at the same time by attaching both doors to the hinges. I then proceeded to sand the doors using an orbital sander. I then decided where to mark the holes for where my door knobs would be. I decided on 25mm in from the edge of the wood for each piece. I used a tri square to join the line and I made sure each line was exactly in the middle of each piece of wood. I then drilled the holes for where the screws would go using a 4mm drill bit which was the same as the diameter of the screws.



After I did this, I then varnished the doors. As it was the first coat, I used varnish with 10% white spirit, using thin coats so that it was not too thick and would be absorbed by the wood.

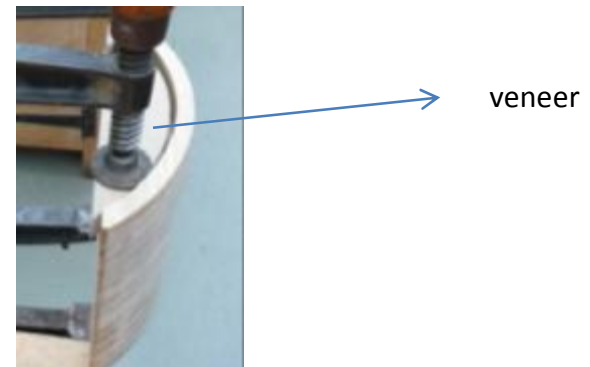


The Making

I then had to attach the curvilinear sides to my box. This was difficult as the sides are curved and so I had to cut out some pieces of wood to fit the shape of the sides that I could clamp onto. I glued the curvilinear sides to the box and then using the pieces of sacrificial wood, I clamped them so that they would have a stronger, closer fit. I then left the glue to set and dry.



The next part of my making was to put a small veneer on the inside of the pocket of my side pieces. I did this so that you could not see the dowel marks and it gave the curvilinear sides a more aesthetically pleasing look from the front view as it looked more professional. I did this by gluing the veneer on and then clamping it.



The Making



After attaching my curvilinear sides, I had to put a veneer around the outside of my box. Mr. Smith did this for me as it was very difficult and I did not have the time to do this myself. He did this by bending a piece of veneer around my box using some flexible pieces of plastic, G clamps and strap clamps. We decided to clamp it dry at first to see if it could fit around the box. He then glued it and we clamped it up again and left it to dry.



I then had to screw the door knobs onto my doors. The screws were slightly too long so I used a junior hacksaw to cut down the screws. I then attached the door knobs to my doors.



The Making

I then varnished the veneer around my box and I left it to dry.



Once it had dried I took it home to evaluate if my jewellery box met the specification.

Unfortunately my project was very time consuming and as a result I was unable to fully complete it and make it as I had intended in my design. I did not get a chance to make the lids for my pockets on the curvilinear sides, I did not get to attach the bottom of my box with a drawer and I did not have the chance to attach the dowels to create extra storage or make an inner compartment for the jewellery box. I did however mention that I might not have time to do some of these things as they were mainly extras too make the box look more complete.

My Final Product



My Final Product



Evaluation

I took my jewellery box home to evaluate. I checked to see if it fit inside my shelf and also if it help my jewellery. I also got some opinions from other people and compared it to my specification.

Did it meet all specification requirements?

I realised that it adheres to 10 out of my 12 specification points.

1. **My jewellery box does meet specification one.** It is made out of a robust material as it is made out of hardwood. I made the box out of Brazilian Mahogany and Ash wood, as well as using MDF for the curvilinear sides, as well as solid ash. I also used plywood for the back piece of my box. This has allowed my box to be sustainable and environmentally friendly. The box is made out of recycled wood as I am reusing wood that had previous been used at school but was still of a high quality.

2. **My jewellery box meet specification point two.** It is able to hold necklaces, earrings, rings, broaches, bracelets and watches. It holds all of these items in comfortably and my jewellery will not get damaged when it is in the jewellery box.

3. **It does not fit specification point 3.** I did not have time to make a drawer for my jewellery box however if I had the time I would have made this and it would have fit the specification point as I included this in the design. My jewellery box however can contain all of my jewellery including chunky items which the drawer was supposed to do.

4. **My jewellery box meets specification point four.** It is very easy to use and is very practical to use as the only thing you have to do is open the doors to get into the storage space. You can do this by pulling the doors by the knobs to open them. The door knobs are not too small and you can fit both hands around them to open them. They also do not come off as they are screwed onto the door tightly. This makes the jewellery box easy to use and practical for the customer.

5. **My jewellery box meets specification five.** It is 210mmx200mmx350mm. Unfortunately I did not get to put on the bottom bit of my jewellery box but it would have been only been another 60mm long, which still makes it under 500mmx200mmx350mm. As you can see in the pictures, it fits comfortably onto my shelf and this was the purpose of the specification point.

Evaluation

6. **My jewellery box fits specification point six.** It costs under £30 to make. Using the parts list to calculate how much it would cost it came out to £20.37. The extras that I used were hinges, doors knobs and screws. The hinges were recycled and so did not cost anything. The door knobs and screws were provided by the school and so would have cost no more that an extra £3. In total this means that my jewellery box would cost around £23.37 to make, meeting the specification point.
7. **My jewellery box meets specification point 7.** I believe it is aesthetically pleasing and I asked some other people if they thought it was and I got positive results from them. They said that my design looked attractive and they especially liked the curvilinear edges which was different to most jewellery boxes.
8. **My jewellery box does not fit design specification point eight.** This is because it weighs more than 2 kilograms. Unfortunately due to the fact that most of my jewellery box is made out of hardwood, it has made my box slightly heavier than expected. However, it is not too heavy and the customer will still be able to handle it and move it around.
9. **My jewellery box does meet design specification point nine.** This is because I have made the jewellery box based on the Art Deco design era. I have done this by using contrasting colours for my doors and main box by using Brazilian Mahogany and Ash wood. Also, the curvilinear sides have an Art Deco inspired look.
10. **My jewellery box meets specification ten.** This is because the main hardwood I have used is Brazilian Mahogany which is a dark wood. This has therefore made my box look more expensive.
11. **My jewellery box meet specification point 11.** This is because it is mainly made out of Brazilian Mahogany and Ash wood which is of a high quality, but at the same time, it is not too expensive.
12. **My jewellery box meet the final specification point 12.** This is because I have used 'off-the-shelf' components which can be easily bought by the customer if the jewellery box gets broken. It can be easily maintained as these items are cheap and easy for the customer to fix themselves.

Evaluation

Mass Production

The next aspect of my evaluation is how I would produce this on a much larger scale.

- I would try and use as much recycled/recyclable material as possible as to be environmentally friendly and to keep costs down.
- I would also make sure that as many parts as possible are sustainable.
- I would make sure that my intended design was manufactured including a draw and inner compartment section for extra storage.
- I would use batch production to produce my product as I think it would be the most appropriate as I think it is too complex to be made quickly through flow, but too time consuming to produce through job production. This would also allow me to have more quality control and I could put more measures for quality control checks in place.
- I would use jigs that are properly made out of metal so that they can be reused and are robust. This would make the production much easier and I could make many jigs so that production can happen more quickly.
- I would use some machines as jigs such as marking gages so that the jig could be fixed to mark the hinges, and would be more accurate and not susceptible to human error.
- I would use much bigger CNC Milling Machines that could produce the pieces for the jewellery cabinet much faster.
- I would also make sure there were lots of quality control check measures in place to make sure that every product was of a high quality.



Inclusivity

Fortunately, my product does not require too much modification for inclusivity. This is because the door knobs I have used are relatively large and so are easy to access for all ages i.e. People with arthritis will still be able to use the jewellery box as they will be able to hold onto the knobs to open the doors, as the knobs are relatively large. Also, anyone with a sight impediment will still be able to use my jewellery box as the box is smooth and not complex on the inside, which means they will still be able to feel for the door knobs, open the doors, and use the full space inside the jewellery box. The product is also not too heavy and so it can be moved if needed also.

Door knobs that are not too small ←



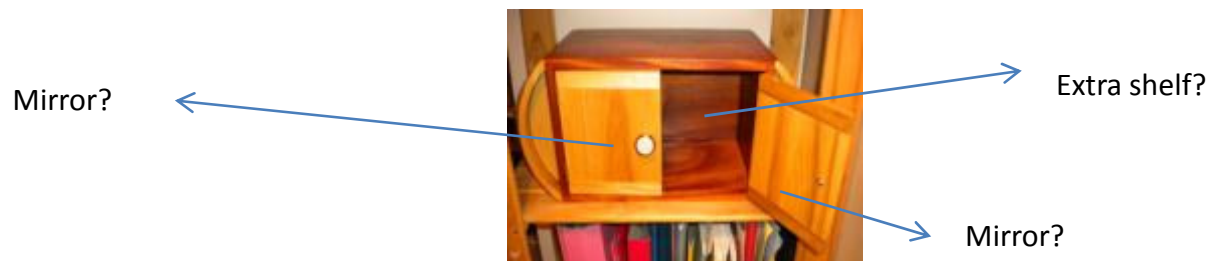
Evaluation

My Personal Evaluation:

I am very pleased with how my jewellery cabinet turned out. I like the curvilinear sides and also how the hardwoods contrast. Unfortunately, I ran out of time and did not get a chance to put a drawer on the bottom of my box, make lids for the curvilinear side storage, put dowels into the pockets to create extra storage or make an inner compartment. This obviously made my design slightly different from what I was planning to do but I do feel that I have done a considerable amount of work on my product.

The best parts of the design for me have to be the fact that it has a very modern look that I believe is suitable for all ages, the curvilinear sides and also the professional look by using a veneer. I am happy with the size of the jewellery box and I think that it is appropriate for what it needs to contain.

If I could change my product I would have completed it to have the drawer, inner storage section, dowels and lids for the pockets on the curvilinear sides. However, if I had managed to complete this I think I still I would be inclined to maybe add a small shelf inside the box for extra room. I could have also added a mirror which would give the jewellery box an extra use.



I think that as it has quite a professional look and is made out of high quality hardwoods, I would price this at around £40-50 pounds. I think that its unique selling point is the curvilinear sides mainly, but also the overall shape of the jewellery box which I believe is quite unique in its market. I also think that my target market can be all ages as it has a modern look, but is not particularly suited to a certain age bracket. I think that maybe the older generations might prefer a more traditional style but they may also see that my design is quite unique and prefer an alternative more interesting and modern look.

Overall, I am very pleased with my final product and think that it was successful for what I was aiming to achieve.

