modular shelving unit

Ella Lemaire

brief/background information

Problem 1; Functionality

During market research, I discovered that there was limited storage available for **larger sized items**, for example A4 folders didn't fit on the shelves. This was because the spacing between the shelves was standardised, and therefore only designed to fit certain sized objects, so didn't consider any variation.

Problem 2; Space

Space is sometimes not available, whether it be a living room already equipped with furniture or a bedroom with limited floor space; by making use of empty walls to hang units for storing belongings, space is preserved.

Problem 3; Aesthetics

Storage units generally have a **standardised box shape**, or sometimes just consist of shelves. When asking people what design they found aesthetically pleasing, most gave the impression they'd prefer a unit out of the ordinary, more modern and stylish than a regular unit.

Target audience

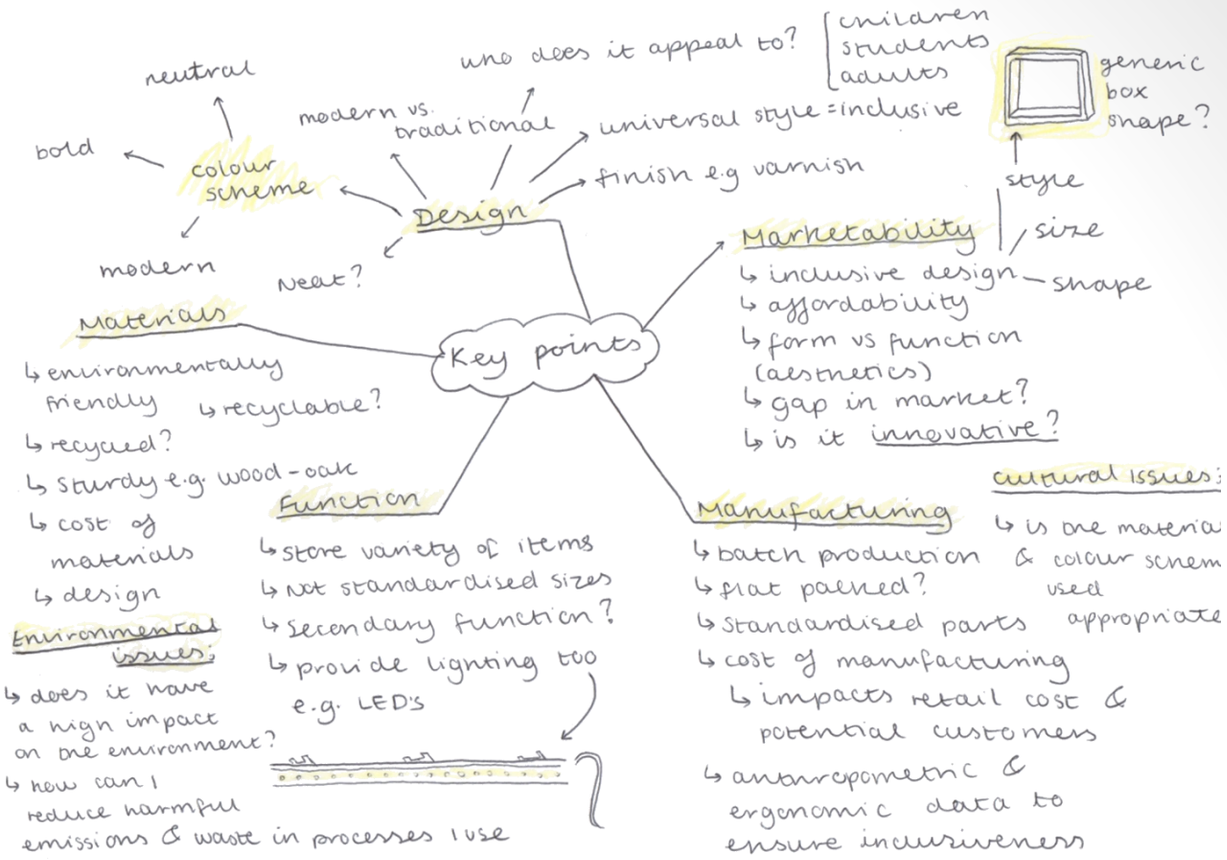
My target market would ideally be any person in need of storage. It has the potential to be aimed at young adults/ students in need of space to store school books, or alternatively children who may have smaller rooms so have limited space; in which case it would also need to appeal to their parents who would be purchasing it for them.

Brief

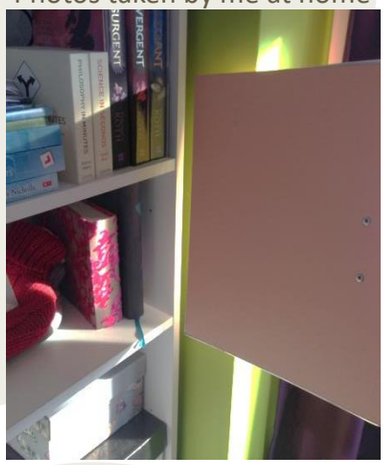
I am intending to design and produce a multipurpose storage unit to be hung up on a wall. It should be **innovative** and **stylish**, so appeals to a wide variety of audiences in need of storage space. As the product is to be placed on a wall, it doesn't impede upon the customers current living area , as well as being a **modern** and **eye catching** piece of furniture.

Marketing

I need to consider how to market my product effectively to my target audience, considering placement of adverts in magazines or bill boards outside furniture shops such as IKEA. The best way to go about this in order for my unit to be successful would be to create a strong brand identity, including an eye catching logo, images, and continuity within my adverts (such as colour schemes and fonts).



Photos taken by me at home



The client

Name: Robin
Age: 40
Occupation: IT consultant
Hobbies: Guitars
Likes/dislikes: I like **form over function**, I also like things that are **convenient to use.** I believe success of storage units depends on **ease of use** and style. My preferred style would be **a piece of furniture that stands out** and **makes a bold statement**.

Potential end user

Name: Esme
Age: 18
Occupation: Student
Hobbies: Drawing
Likes/dislikes: I'd like to be able to store my **folders and school work**. I like shelves to have a bit of **quirkiness**, maybe with an **unorthodox** shape. I'd prefer the unit to **be interactive** and perhaps be able to be **personalised** somehow. I'd also like there to be **different sections** within the unit to separate my belongings.

information, inspiration & influences

second hand research

My first inspiration came from pictures I found on the internet. I wanted to find units with **different sections** that could **separate** items, as this is what one of my clients requested. I also think this style looks particularly effective. Another request from my clients is that the design should be more **functional** than aesthetically pleasing, so I've kept this in mind when finding some existing products.

I like that this unit looks like it was once a traditional shelf which has been rearranged. The curves either end have an **unusual shape** which makes the unit look interesting, and not much – if any – space for holding items is lost in the curves, due to the smaller shelves protruding out. The **vertical shelves** however don't really have much function, although they do keep the **flow** of the design.

I like the use of circles here and that **different sizes** are used. The layout is **trendy** and can be **personalised** – the individual units can be put in different combinations etc. They've also thought to add a flat base inside the circle, as most items would have a flat underside, so would not sit as well on a curved surface. On the other hand, the lack of items that could be kept in the circles does bring the design down a bit, as not much can actually be stored in these spaces. **MDF** circular panels and shelves, and **flexiply** could be used for this design which would be simple to construct using a wood adhesive such as **PVA**. This materials would be appropriate for my product, and are accessible at school.

This design is very **organised** and looks quite **compact**. The circle containing all the shelves makes the unit look more bold than if it were simply the shelves on their own. My only criticism would be that due to the vertical shelves dividing the area up into sections, it would be **quite limiting** in the sense that if someone had an object slightly larger than one of the sections, it wouldn't be able to fit. Something like **pine** would be acceptable to use. Circles would be cut out on a **3D router** then layered together.

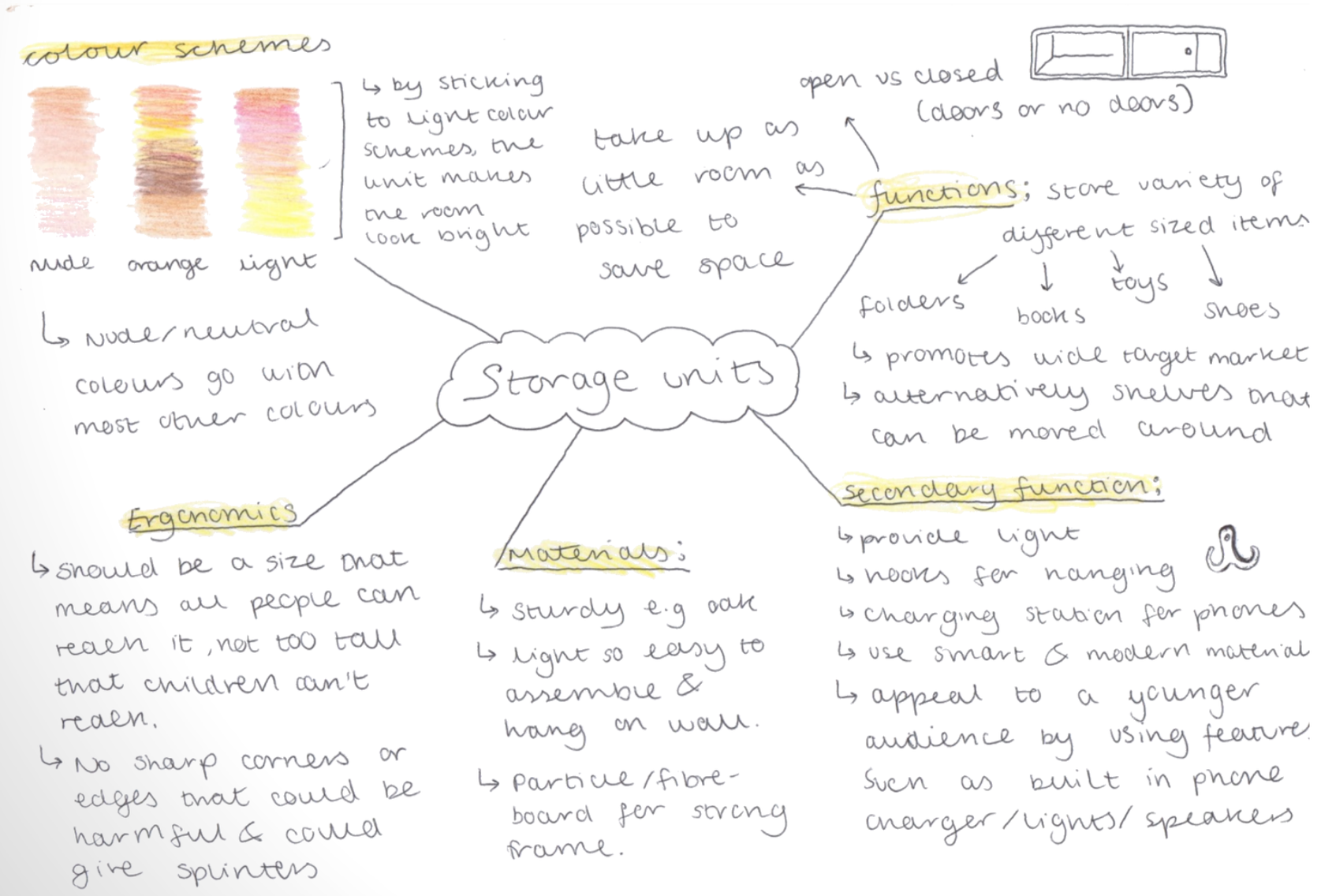
This design inspires me due to its **unusual structure**. The individual boxes are different shapes so can hold a variety of objects. Once the shelf is full, it will look very **unique** due to the angles of the objects – however to some, this could look quite messy and clustered. The material used for this would be MDF or beech, and the construction was probably a **mortise and tenon joint** or a **box joint,** which would be fairly straightforward to do, especially in a school setting where I will be constructing my product.

information, inspiration & influences

About IKEA – IKEA is well known for providing a range of home furnishing products that are affordable. These come flat-packed for customers to assemble. By 2020, they plan on being 100% renewable – producing as much energy as they consume. They have installed over 700,000 solar panels on IKEA buildings around the world, and are continually looking for ways to get the most out of the wood they use by designing products to minimise amount of material needed and increasing efficiency of manufacturing.

Photos found on IKEA website

After going to IKEA and looking at existing products, I created a mind map on the elements that make up a successful storage unit, based on how they are designed and manufactured in the shop.



THE IDEA

For the many people

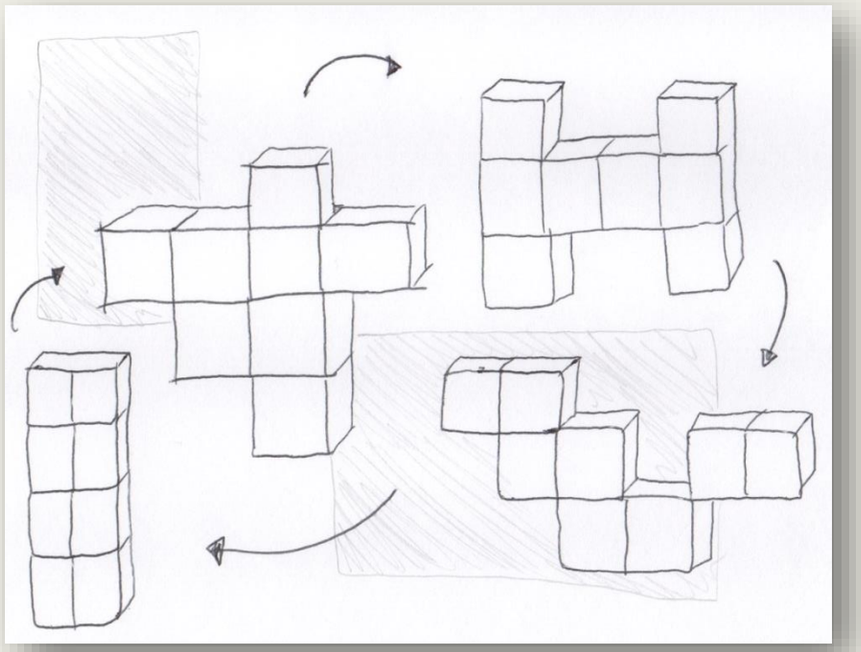
Just one year on from launching their Sustainable Strategy and 'People & Planet Positive', they've bought and are operating 224 wind turbines, have already installed over 700,000 solar panels, ensured that more than 76% of their cotton comes from more sustainable sources and 75% of all the lighting products sold in 2014 were LED or compatible with LED bulbs.

Information from the IKEA website: http://www.ikea.com/ms/en_GB/this-is-ikea/the-ikea-concept/index.html

information, inspiration & influences first hand research

Photo taken by me at IKEA

This shelving unit in IKEA consists of 5 open front boxes and 2 with doors at a standardised size. The customer can design their own unique unit by freely combining the individual cabinets. This creates a sense of individuality to the unit, giving it a more personal touch. The chipboard used for the unit was roughly 18mm thick, so implies I wouldn't need much material to create a sturdy unit. However for my product I would consider using a stronger material - such as **laminated flexiply** - to ensure strength. The unit in IKEA uses wedge dowels that click into the pre-drilled holes which allows the customer to easily assemble the unit.



Likes/dislikes

I like that this unit could appeal to a variety of audiences due to the numerous different styles it can be arranged in. However I believe the shape of the individual units is fairly generic and not very innovative.

Article Number	Packages	Width	Height	Length	Diameter	Weight
102.796.24	1	37 cm	9 cm	72 cm	-	8.45 kg

View more images

VALJE
Wall cabinet with 2 doors, white

£117

Article Number : 090.465.98

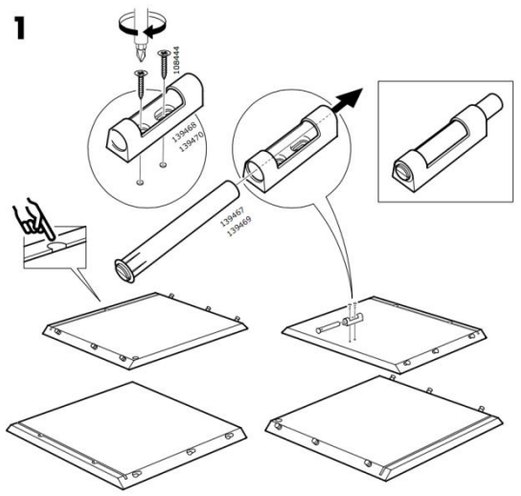
You can create your own unique solution by freely combining cabinets of different sizes, with or without doors and drawers.
Read more

1 Add to basket Save to list

Check stock availability at your local store.
choose Ok
Prices and products may vary in store and online

Assembly instructions & manuals
Downloads

Services



The product needs many pages of instructions in order to explain how it should be assembled. This limits its target audience already to customers who have the time and ability to put the unit together. In this respect, inclusiveness hasn't been considered as for example children may not be able to assemble this on their own.

I believe this is fairly costly considering the quality of material – chipboard – isn't the most sturdy or reliable option for a unit with the requirements of storing heavy items. Also, the unit is flat packed which might be cheaper and more cost effective in terms of storing and transporting, however can be very time consuming and difficult to assemble.

This unit comes in a variation of colours and even sizes (for example the large door in the picture on the right). Despite the very traditional shape of the individual boxes, the overall look is very appealing; it's modern, unique and personal.

information, inspiration & influences first hand research

Photo taken by me at IKEA

Name: BILLY
Function: Bookcase
Size: 200x237x28 cm
Colour: White, birch veneer, oak
Price: £187
(price reflects selected options)

Description
This bookshelf has **adjustable shelves**, allowing the customer to **customise** their storage as required. The relatively deep shelves – 28cm – allow storage of some larger items, such as folders which can be seen in the picture.

Materials
The base material used for the unit consists of **Particleboard, Oak veneer** and **paper**. This combination creates a very **sturdy** and reliable bookcase. A lot of cases produced from cheaper material such as chipboard can feel flimsy and even bend when excessive weight is applied. The back of the case is produced from **Fiberboard**, which is less sturdy than the base, however this is suitable as little if any weight will be applied to the back of the bookshelf. I probably wouldn't consider using these materials for my product as it wouldn't be as strong as I'd like, instead I would use materials such as **MDF** and **flexiply beech**.

Manufacturing
The particleboard is produced by the combination of wood chippings glued together to create large sheets. These are then **die cut** to the desired size. An advantage of this is that many parts can be cut from the same sheet, which **reduces waste material**.

Aesthetics
This unit has a **sophisticated** look to it, due to the simple and tidy style. The glass cabinet feature slightly off centre could be described as **traditional with a twist**, and keeps the design looking interesting. A clear acrylic lacquer gives a professional finish to the display.

Ergonomics
Due to the **height** of some of the shelves, I doubt the target audience would be children, as they may not be able to reach.

Environment
On the IKEA website, it states that this unit is **recyclable**, and that it has been manufactured from **renewable materials**.

BILLY
Bookcase, oak
£210
People & Planet
Height extension unit/bookcase:
At least 50% (weight) of this product is made from wood fibre, a renewable material.
Product is possible to recycle or use for energy recovery, if available in your community.

Name: BESTÅ
Function: Wall cabinet
Size: 60x128x30 cm
Colour: Various
Price: £116
(price of two cabinets only)

Description
These **space-saving** cabinets make the most of wall space. The doors can have either a **soft-closing** or a **push-open** function. These features give the unit a very **modern** and **ergonomically friendly** feel, as they have considered alternatives to handles which may be more appealing to someone looking for a cabinet with a different style.

Photo taken by me at IKEA

Materials
A frame (top and bottom panel, and a side panel) as well as the door, is manufactured from **Fibreboard, Particleboard, Honeycomb structure recycled paper filling, Foil and ABS plastic**. This complex combination of materials ensures its strength and durability. However a combination like this would be hard to create at school.

Manufacturing
Large sheets of **particle** and **Fibreboard** would be die cut to the size of the panels. The panels would be **batch produced.**

Photo from IKEA website

Aesthetics
This product has a very **distinctive modern style** which would appeal to a selective target audience, it probably wouldn't interest a younger audience due to the simplicity. The doors keep the units looking **neat and tidy**, whereas open front or glass covered cabinets can look **messy and unorganised**. I also like how the units can be arranged in different styles, making the design more **personal.**

Ergonomics
The **push-open** feature is very ergonomically friendly, as it can be opened at any height. Also the **soft-closing** element can ensure fingers don't get trapped.

design specification

*The first points are the **musts**, second points are ones I **should** consider, and third points I **could** consider.*

FUNCTION

1) The storage unit must have the ability to store larger items such as A4 folders, (315mmx285mm).

2) It should have inter-changeable units so people can choose their own style.

3) It could use space effectively – for example one side of the shelf, items can be held and on the other, items could be hung from hooks.

3) AESTHETICS

1) It must be suited to a typical household style, considering the average size of walls.

2) It should blend into the environment – for example if the costumers have modern furniture, it should match this.

3) The shelving unit could appeal to the majority of age groups.

MANUFACTURING

1) The storage unit must be cost effective to produce, this way it can appeal to many target audiences as it will be an affordable storage system for them.

2) It should consider time, how long is the manufacturing process of the storage unit? This could put potential customers off if it takes a long time to be produced.

3) My shelving unit could be a self-assembly project or a finished piece.

MATERIALS

1) Due to the amount of items it will hold, the material/s must be strong.

2) The material/s for the shelving unit should be durable so it has a long life span and therefore customers can get their moneys worth.

COST

1) When doing research on the prices of storage units , I found the prices can vary between about £150 - £600 (for good quality ones). To keep my unit affordable, the cost of the materials must be less than £300, the overall price will depend on a variety of things such as the time spent manufacturing etc.

ERGONOMICS

1) The shelving unit must be easy for the costumer to use, for example there's no doors that might make it hard to store things behind.

2) All the compartments should be accessible for people of different heights.

3) The proportions of my design (e.g. height and spacing between compartments inside the unit), could be based upon anthropometric data, however that might mean its more specific to a certain age range.

SAFETY

1) As the product needs to be interactive, the finish edges needs to be comfortable for the customer to use, for example smooth edges and rounded corners.

2) If any areas are interchangeable – such as individual shelves – they should be an appropriate weight so the customer doesn't strain themselves during the process of removing them.

MARKETABILITY

1) To increase popularity, the shelving unit must appeal to a variety of target audiences, for example both genders, different age ranges etc.

2) To be able to sell well, my shelving unit should fill a gap in the market – it should be innovative, modern and aesthetically appealing whilst still meeting all the necessary requirements to allow it to function well.

SIZE

1) The unit must be able to fit on all average sized typical living room walls. I will base my measurements on my client's wall sizes, which are 2.4mx3.05m

2) If the product isn't flat packed, transportation may be difficult due to its large size. I will need to research average car boot dimensions, and ensure the packaging doesn't exceed these measurements, alternatively look at potential delivery charges if it is too big to fit in the customers car.

ENVIRONMENTAL IMPLICATIONS

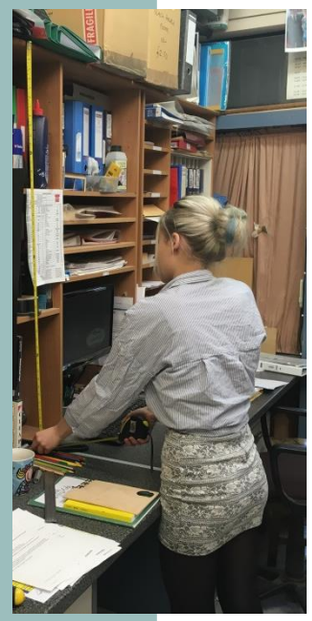
1) The materials used in the shelving unit must be recyclable so it can be disposed of in the most environmentally friendly way possible.

2) The shelves should be made from sustainably sourced materials.

KEY POINTS:

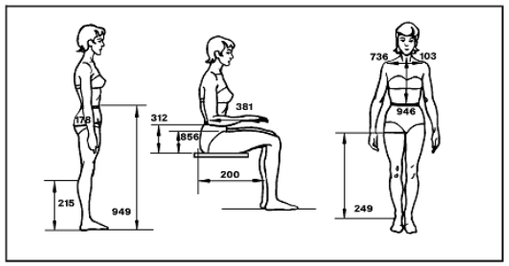
- The storage unit must have the ability to store large items.
- It must be suited to a typical household style.
- It must be cost effective to manufacture.
- The material must be strong in order to hold heavier items.
- To keep the unit affordable, the materials should cost under £300.
- The shelving unit must be easy for the customers to use.
- The finished edges should be comfortable for the customers.
- The design must appeal to a variety of target audiences.
- Based on typical dimensions, the unit should fit onto most walls.
- All materials must be recyclable so it can be disposed of in the most environmentally friendly way possible.

information, inspiration & influences first hand research



These shelving units can be personalised by arranging the shelves. This is ideal for an office setting ,like in the pictures, as it means that different sized folders and work can fit and even be separated so it doesn't get lost amongst other work.

Here I measured a group of three shelving units in an office setting to get an idea of the measurements my product will need. I will also need to consider anthropometric data when deciding the measurements of my unit, will it be able to be comfortably used by all target audiences?



These are the measurements of one individual unit.

Materials available for me to use:

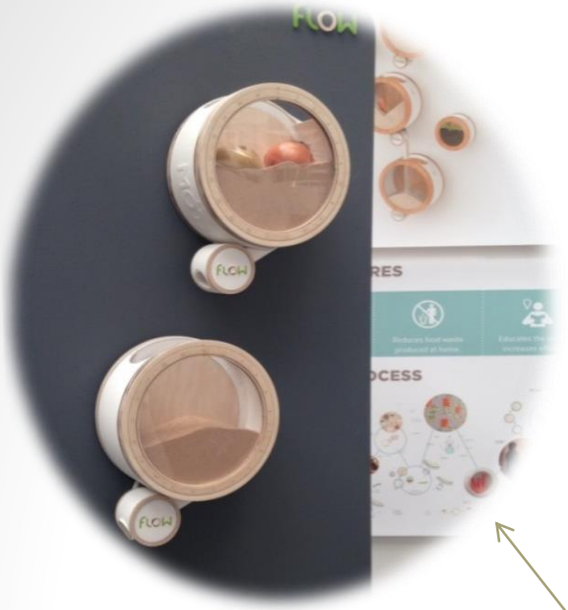
Material	Hard/soft?	Working properties & characteristics	Example of use	Finish	Cost (per m)
Oak	Hard wood	Planed, glued, drilled, sawn, open-grained, tough, hard	Used for structure in buildings, and interior furniture	Varnish, Danish oil, stained, painted	£6.40
Pine	Soft wood	Planed, glued, drilled, sawn, light weight, straight grained,	Indoor furniture	Whitened, pickled, painted, oil	£6.54
MDF	Man-made board	Planed, glued, drilled, sawn, laser -cut	Batch produced furniture, e.g. table tops, display cabinets	Varnish, stained, painted, veneers, PVC film, laminates , edging	£11.00
Plywood	Man-made board	Planed, glued, drilled, sawn, laser-cut	Doors, stairs and flooring	Varnish, Danish oil, stained, painted	£11.50
Flexiply	Man-made board	Bent, planed, glued, drilled, sawn, close-grained	Curved edges on furniture, toys	Varnish, Danish oil, stained, painted	£27.00
Mild steel tube	N/A	Brazed, malleable, ductile	Frames	Powder coated	£5.50

These are the six main materials that are available for me to use for my product. After comparing their properties and uses against my specification and use for my unit, I think the most appropriate materials to use would be pine, oak, or MDF. Perhaps even flexiply depending on the shape of the unit, e.g. curved.

initial ideas

After looking at curved existing products at IKEA, the new designer's exhibition and on the internet, I have decided to design and make a **circular shelving unit**.

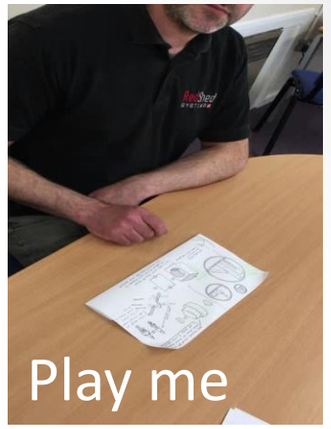
Photos taken by me at the new designer's exhibition



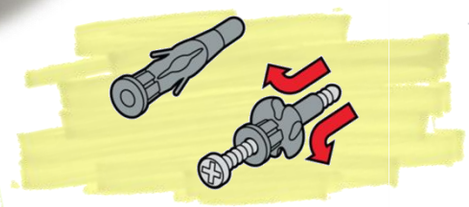
This wall mounted fruit storage system keeps items of food fresh. I like the glass panel allowing people to see inside of the unit, as it makes it look modern

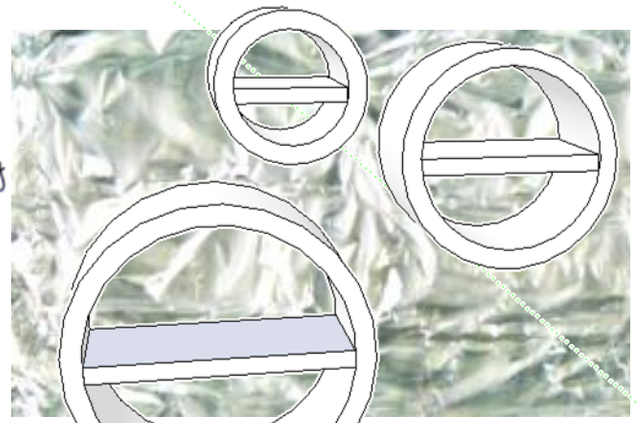
These hanging LED lights I found in the New designers exhibition are simplistic in structure and design, yet the choice of material – silicon – gives a modern and professional finish.

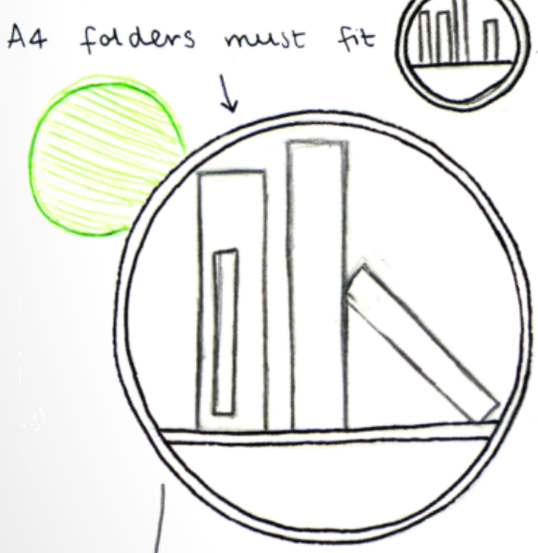
Client feedback:
I like the idea of a circular unit, I think its an unusual design for shelving, however I would consider making the material thicker so its more sturdy.



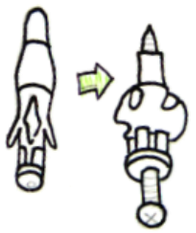
a unit like this would be made in 4 pieces - 2 panels made of MDF, a flexiply outerskin, & an MDF shelf. So overall it wouldn't be too expensive to manufacture commercially.



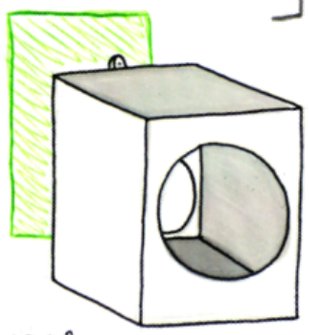




the shelves would fit inside each other to make packaging a lot easier & more efficient

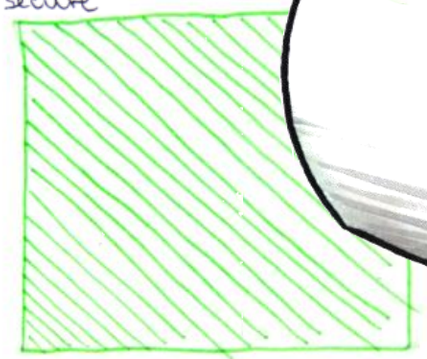


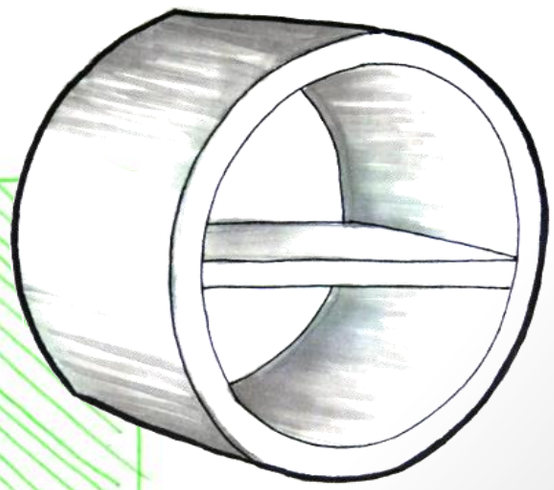
wall plugs in pre-drilled holes in the walls would make it secure



the shelf within the circle unit simply falls into place

a cube unit may be easier to attach to the wall, however I'd still want to keep the circle feature

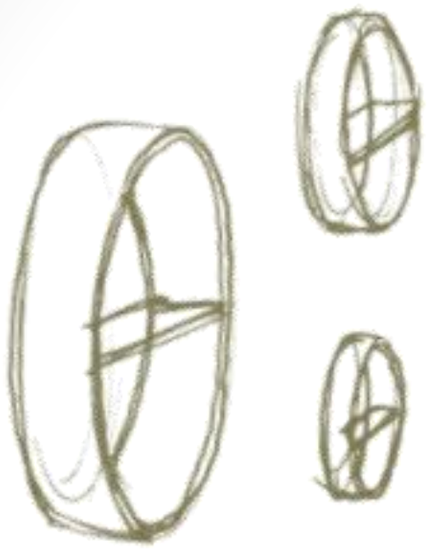


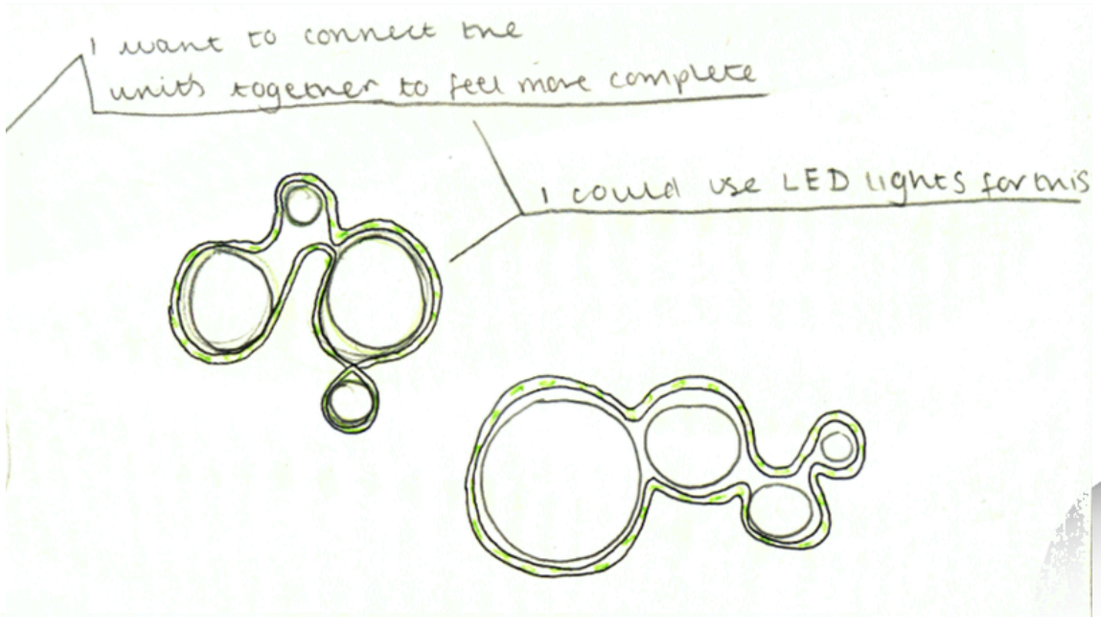


initial ideas

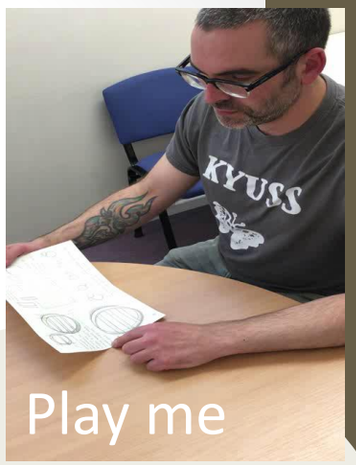
I have decided to design and produce a storage unit consisting of separate circular shelves. Perhaps only three or four circles of different sizes would be enough.

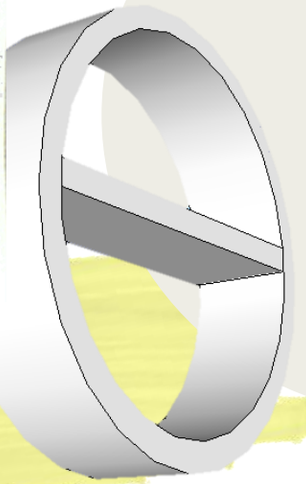
I need to experiment with different depths and ensure the units are wide enough to store all sized items – for example folders.



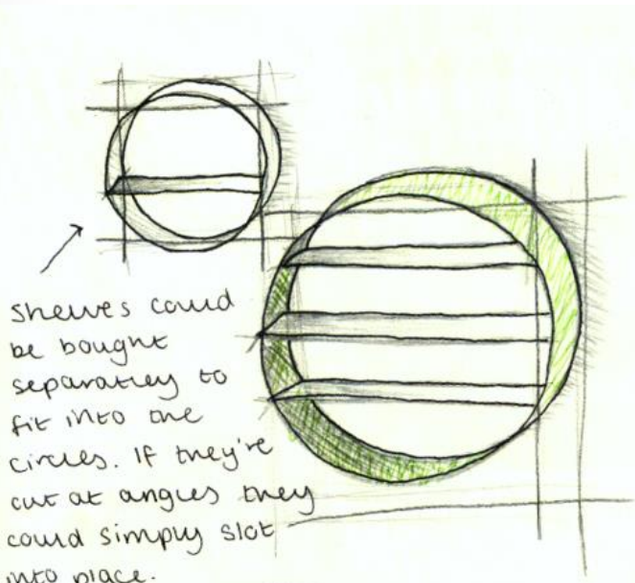


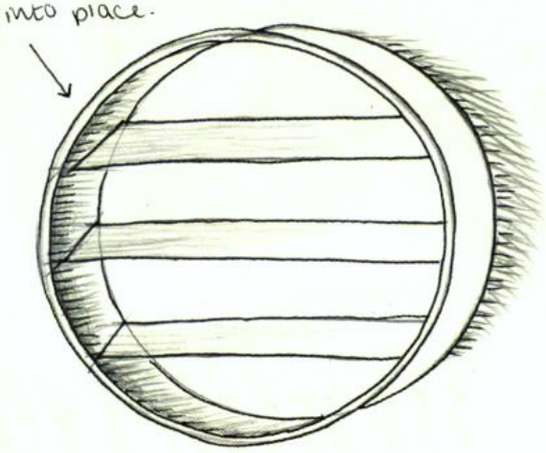
Client feedback: I like the idea of using circles, however I feel like it's been done before and could be more innovative. I'd like to see something with more circles, maybe more modular.

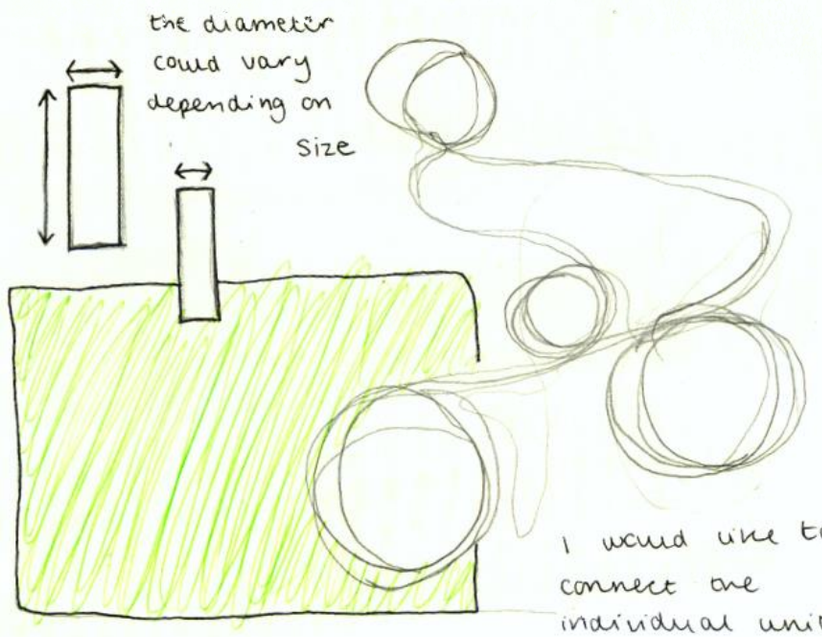


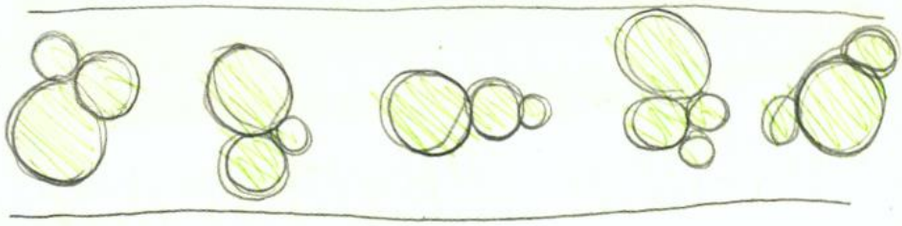


here I used Google Sketchup to draw out one of the units - I included a shelf inside which would be more suitable for a unit storing books or folders as it could fit more in. However it would leave empty space underneath.



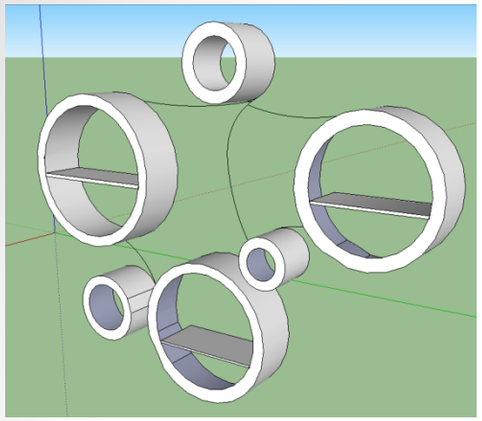






The layout of circles could change, making the design more personal & unique.

initial ideas

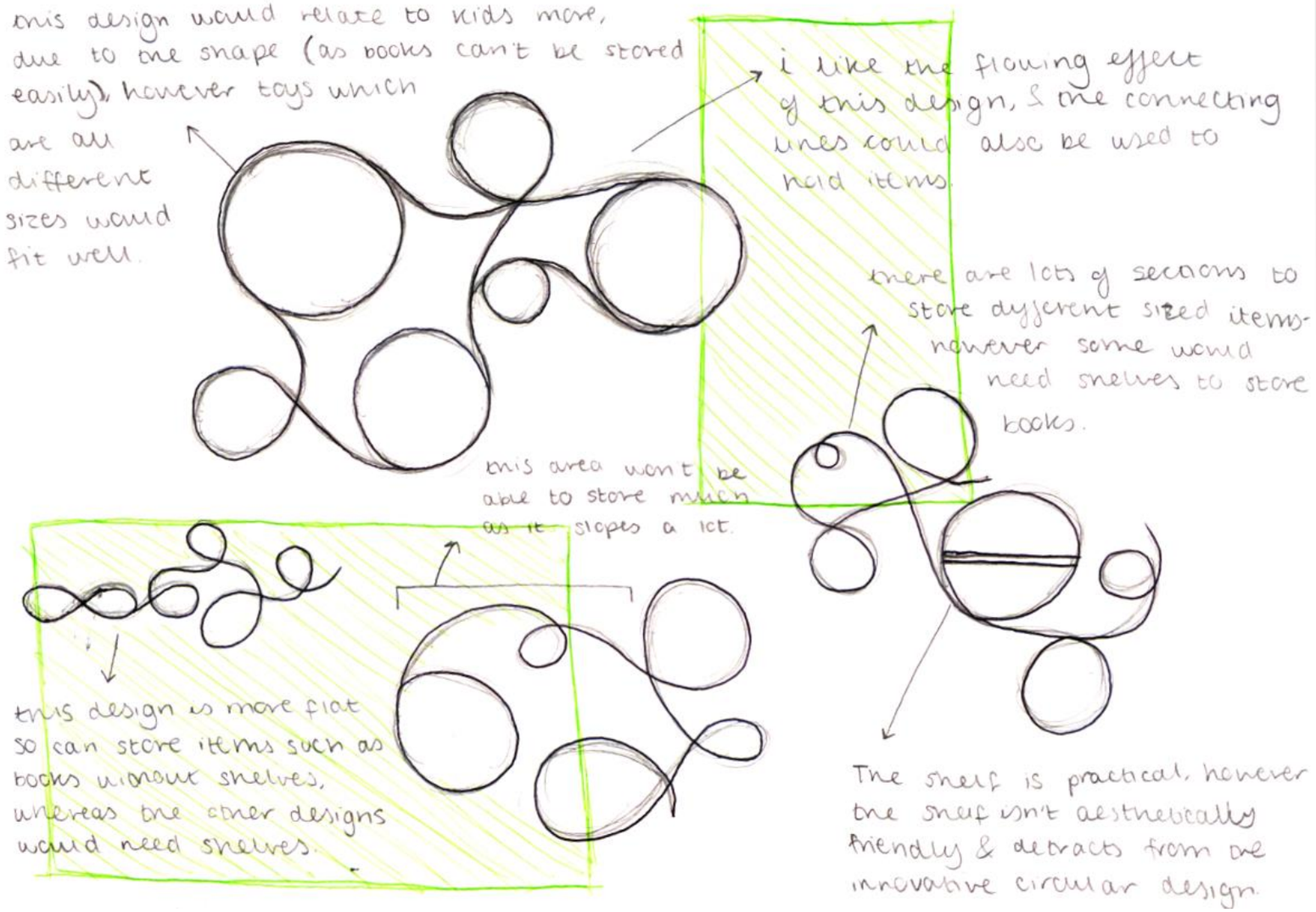


Play me

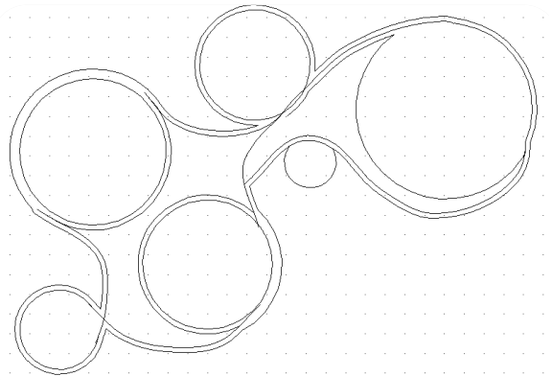
Student Feedback:
I like the flowing effect, however I don't think its very practical as it doesn't have any flat surfaces, and most belongings people store have flat sides. I think you could add some shelves in the circles so customers can store belongings such as books.

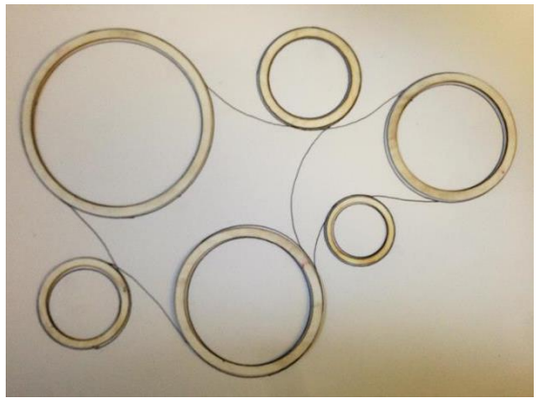
Response:
In response to this, I added shelves the three circles, as I don't think there is much point adding them to the smaller shelves as books may not be able to fit on them.

Client feedback:
I like this design, but its not particularly practical. Although I did want more circular design, I think it would hard to store items in here as there aren't any shelves in place.

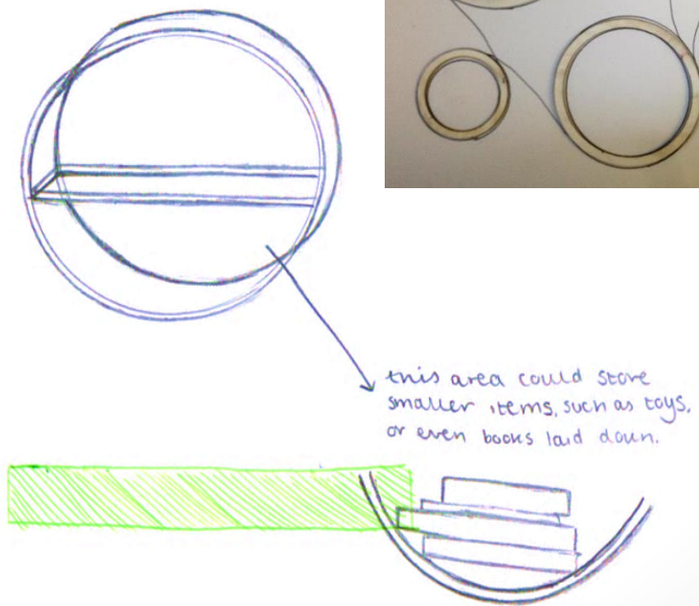


Here I used the laser cutter to make circles out of card. Then I placed them on a blank piece of paper and experimented with different layouts, drew lines connecting them.



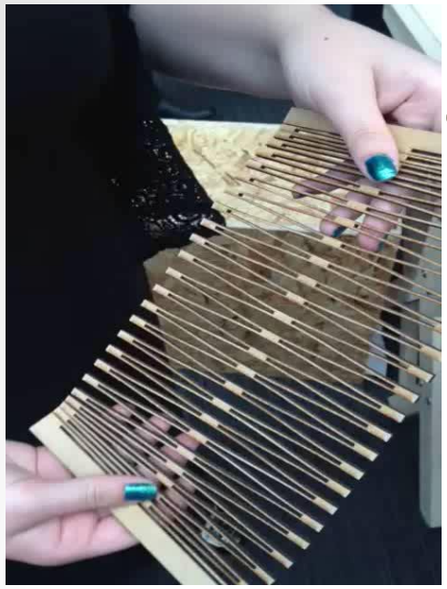


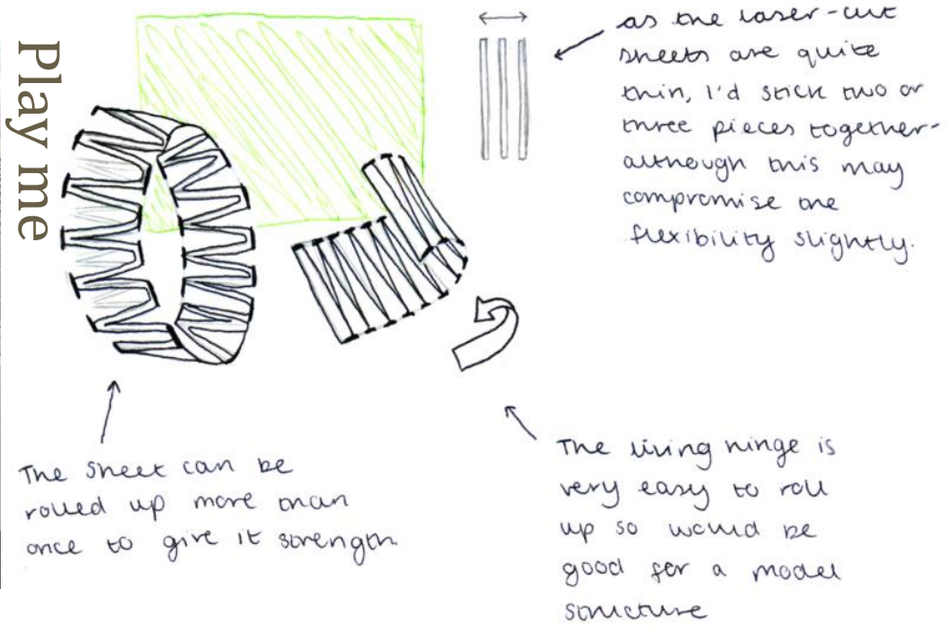
This design was hard to draw on 2D Design due to the complex structure. I also noticed during designing this, that there is limited space in between the circles to store items. The spaces are very small so limited to belongings of a certain size.



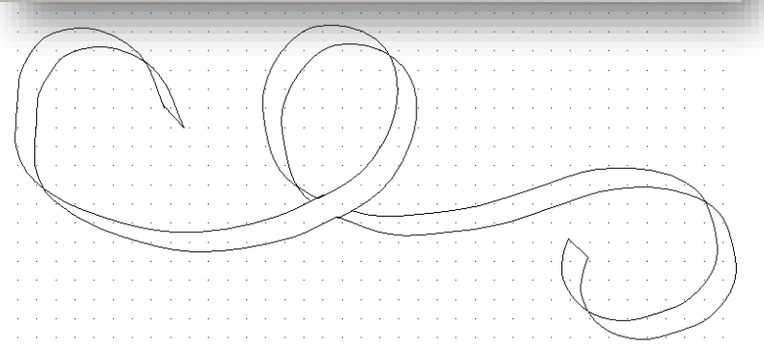
initial ideas

In response to my previous student feedback, I have designed a unit with more flat surfaces to hold items such as books more easily.

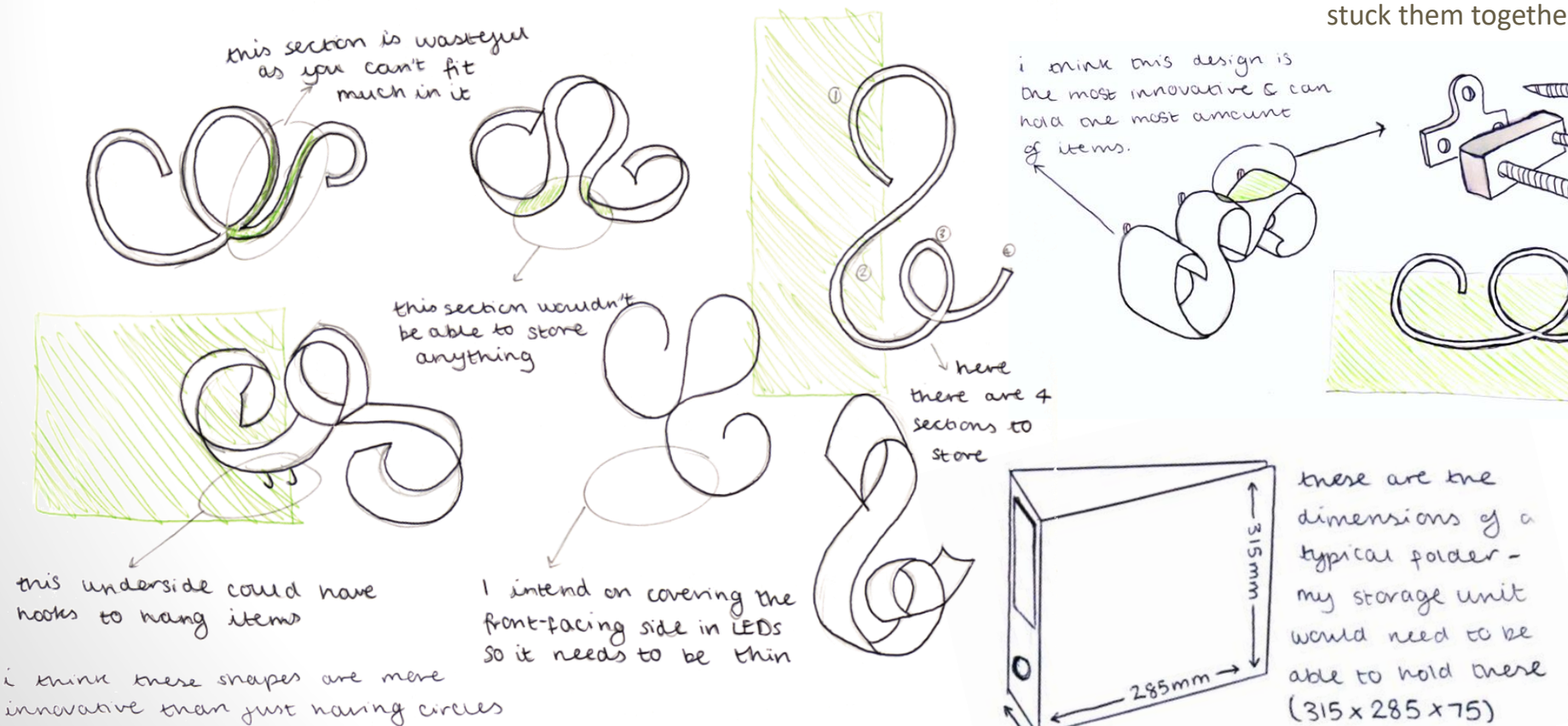


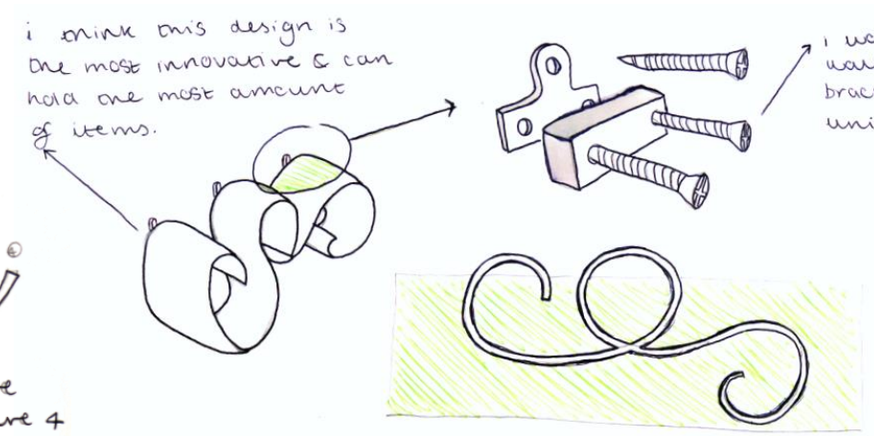


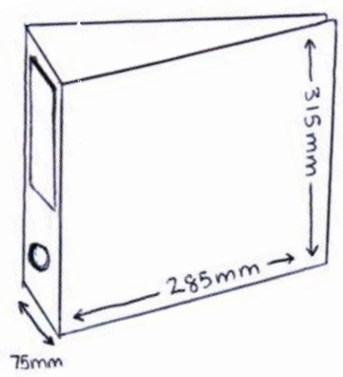
Living Hinge:
At the New Designer's Exhibition we found some samples of a living hinge technique, which is where a material (MDF here), is laser cut in thin lengths to create flexibility. This technique would work well to create model circle units, however I could use a few sheets to make it stronger.



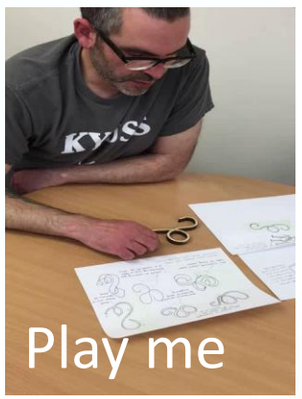
I used 2D Design to create this mock up of the unit, then I cut four of them out on the laser cutter and stuck them together.





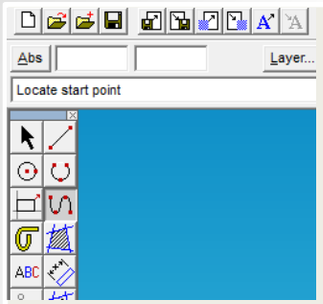


these are the dimensions of a typical folder - my storage unit would need to be able to hold these (315 x 285 x 75)

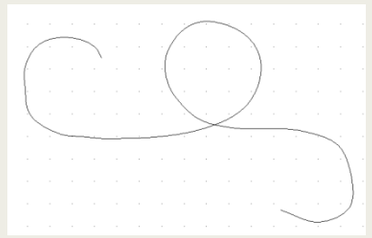


Client feedback: This design is more innovative than the previous circle idea, yet its still simple which is good – traditional with a twist. I think it would benefit from flat surfaces.

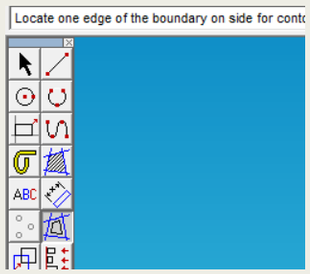
developing ideas



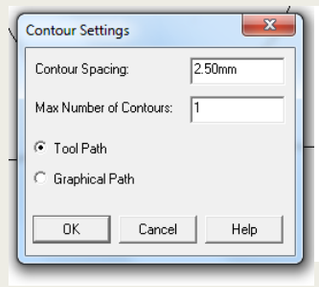
First I selected the Path tool on 2D Design.



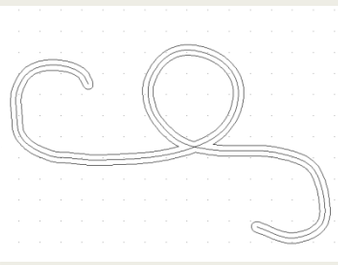
Next, I drew a rough shape of my design.



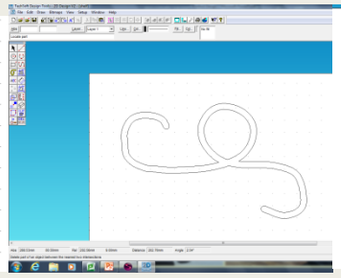
Then I selected the Contour tool.



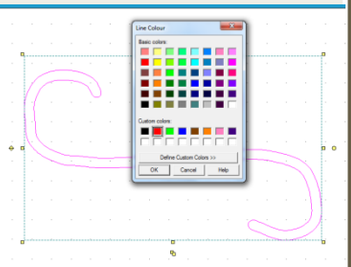
This window pops up, you can change the width.



By clicking on the design, it creates a border around it.



Then by clicking the Delete tool, I deleted the inside line.

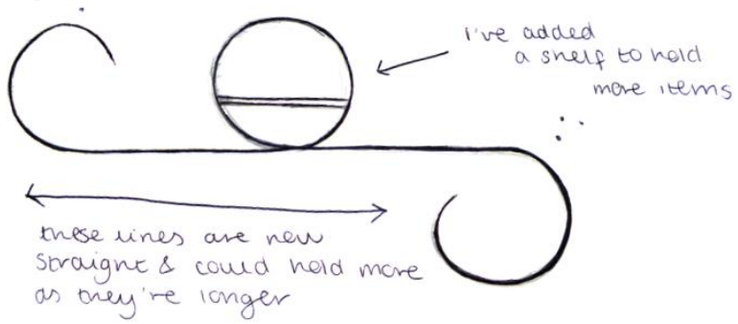


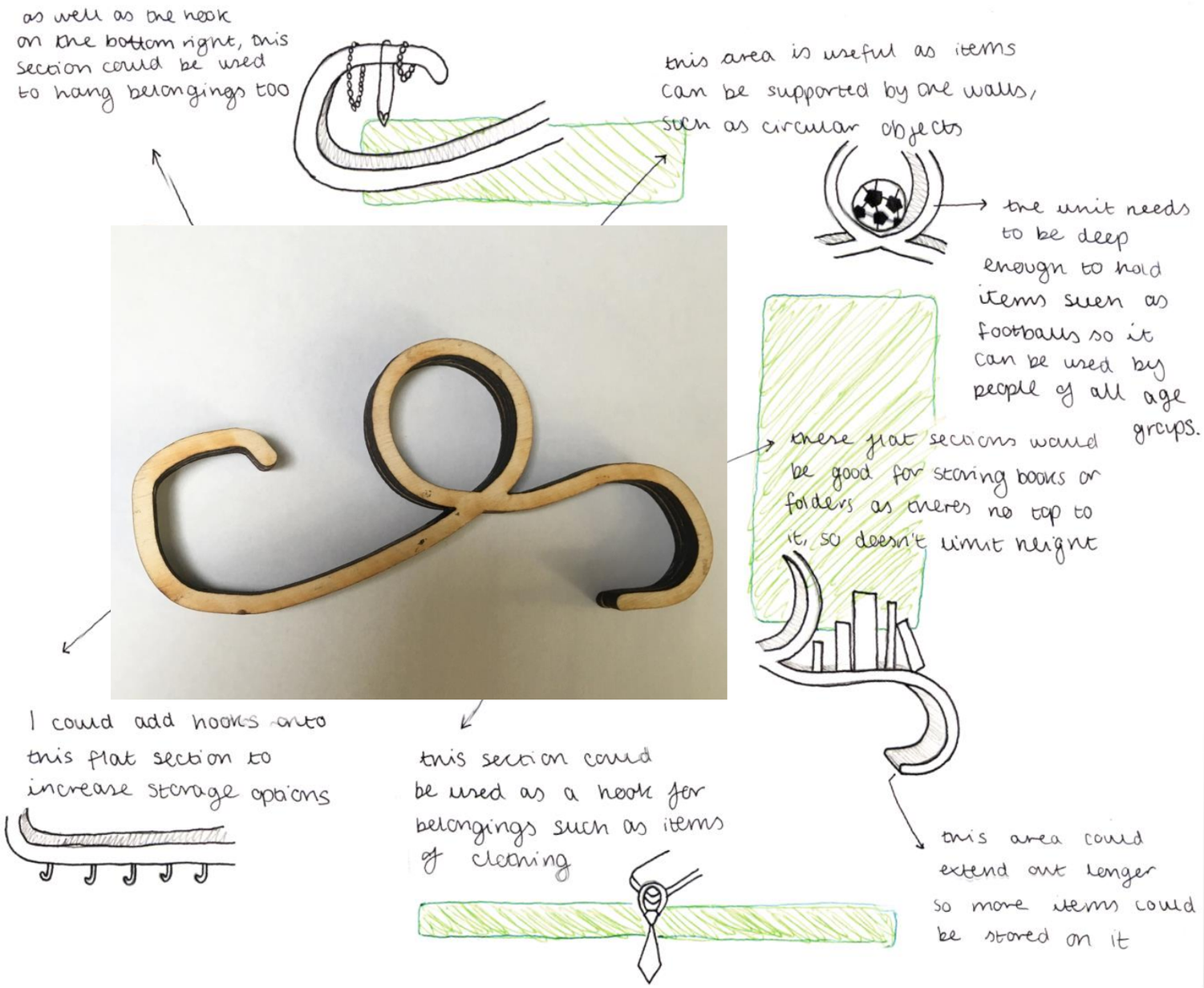
Finally I changed the design to red so it cuts on the Laser Cutter.

Client Feedback:

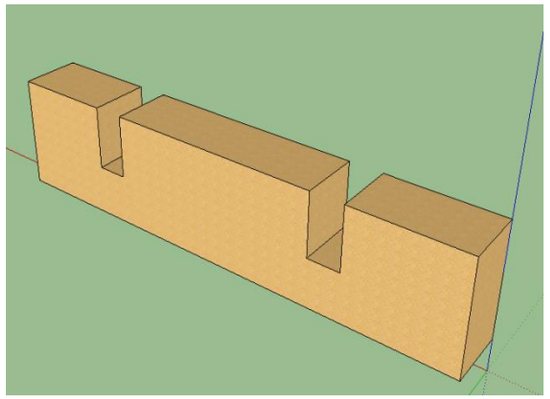
I would make the two lengths either side of the circle parallel, possibly make them a mirror image of each other (but flipped), so they are symmetrical. Also slightly increase the length of the right side so it could hold more items. Finally, I would add a shelf in the middle circle as most items people tend to store are flat – such as books or folders.

Response:



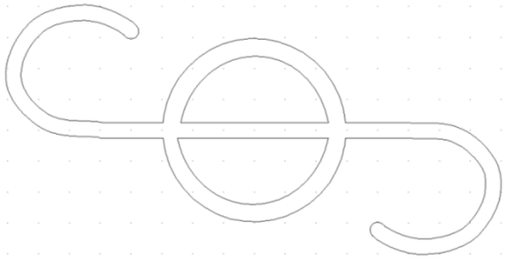


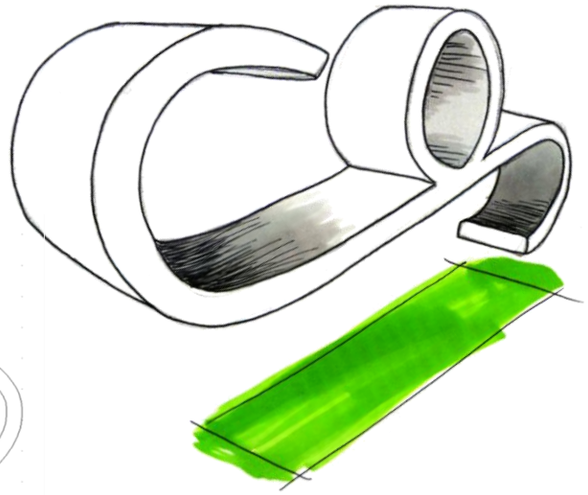
developing ideas



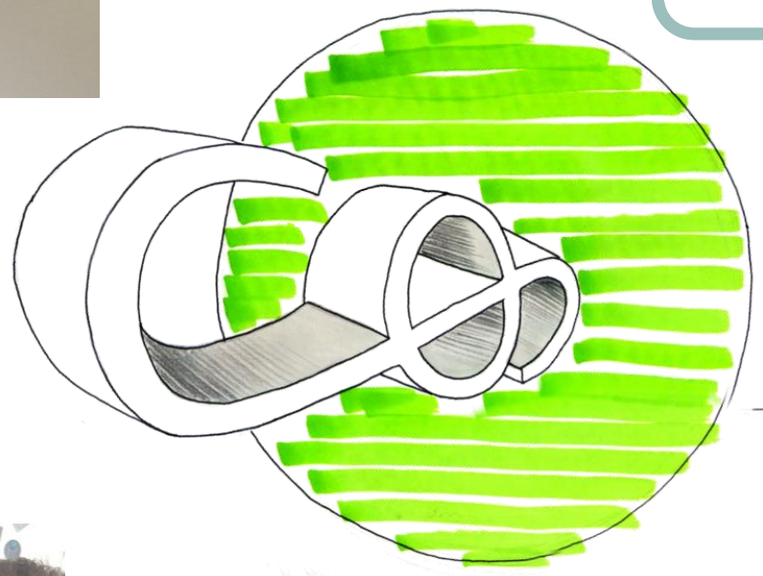
In response to my client feedback, I designed a model with symmetrical sides and increased the length of the right side so both are the same, and the unit can hold more items. However, I didn't include a shelf in the middle as my client suggested, instead I have improved my design to incorporate this shelf into the already existing line. This would make manufacturing the model much more simple. To attach the circle and main structure (both in school and industry), I would use a slot joint.

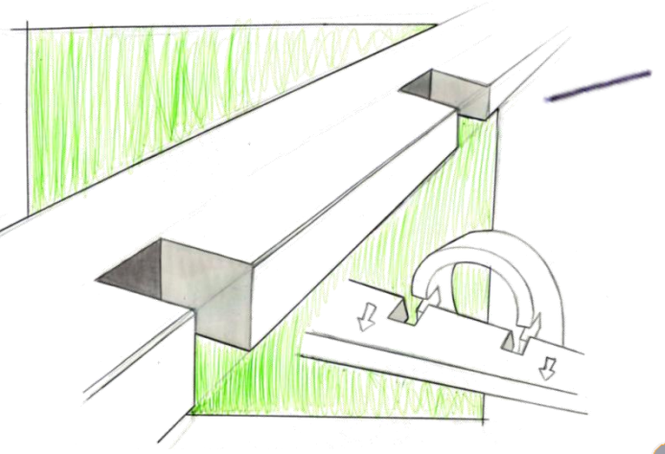
here I used Google sketchup to create two slot joints





this design looks more symmetrical than my previous one. It would also save space & materials. The manufacturing would also be more simple

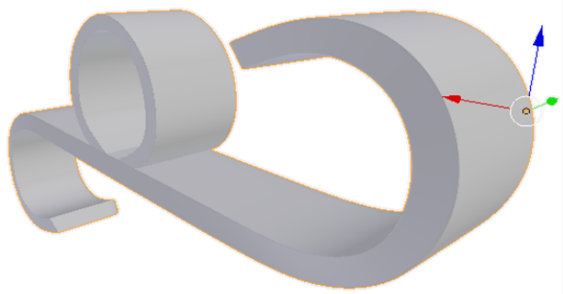




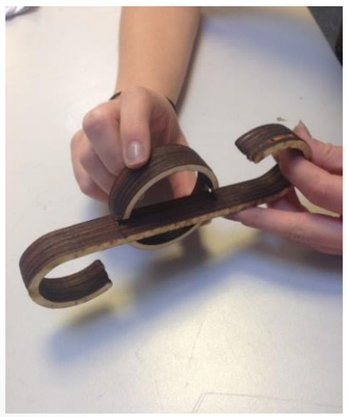
the slots in the main structure go halfway back, as do the ones in the circle. This creates a sturdy final piece that needs no extra adhesive.

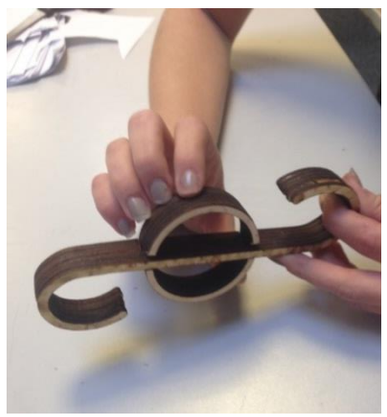
Student Feedback
The design is different and unusual which I like, however I think inside the circle could get quite dark because all the areas would be insulated, therefore I think you should add LED's to the structure. This would also emphasis the quirky shape.

the circle structure would slot in to these

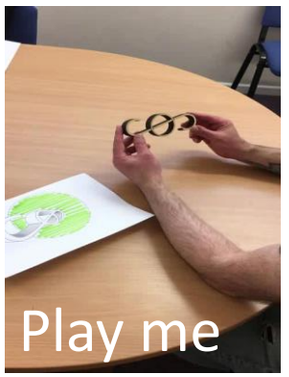


This model was created using Blender.





Here I show how the model is slotted together. As you can see, the slots only go halfway through both the circle and main unit, keeping them sturdy and strong.

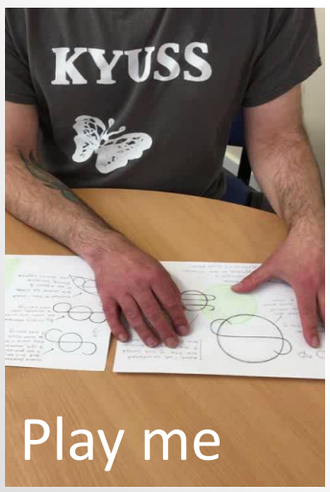


Client feedback:
This is definitely better than the previous design, however it feels quite 2D, and I think would progress further with a more modular approach, with interchangeable sections.

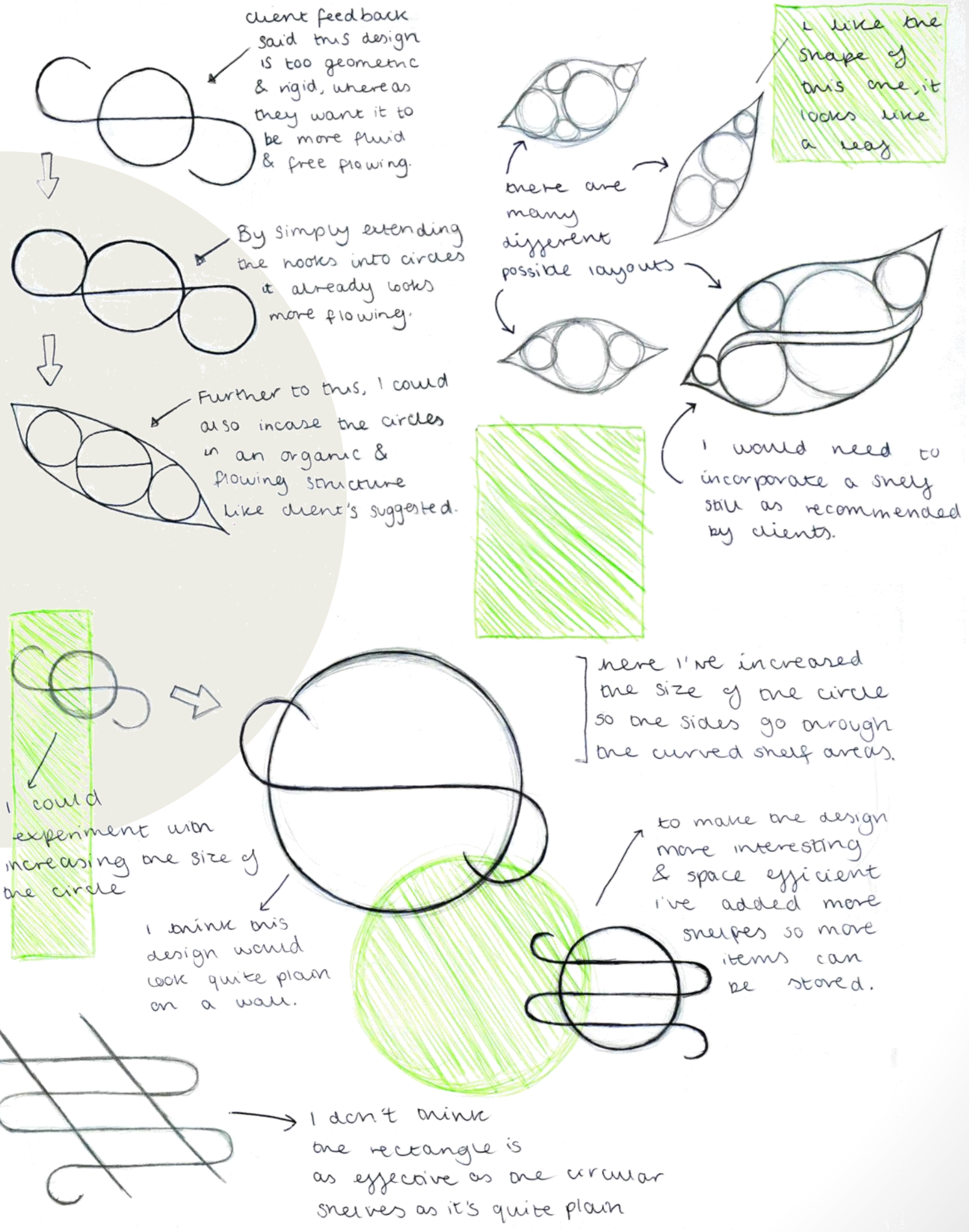
developing ideas

Student feedback:
The slotting mechanism works well and would be easy to build by the customers. It would also ease manufacturing (production and cost), as the product wouldn't have to be cut out of one big piece. However it might be quite heavy and a hassle when it comes to putting it up and dissembling it again. Older and younger audiences may struggle.

Student recommendations:
The structure is quite rigid and not an organic, free flowing shape. To improve the unit further I would recommend using a more fluid shape. Maybe through the use of more curved areas the unit could look more flowing.

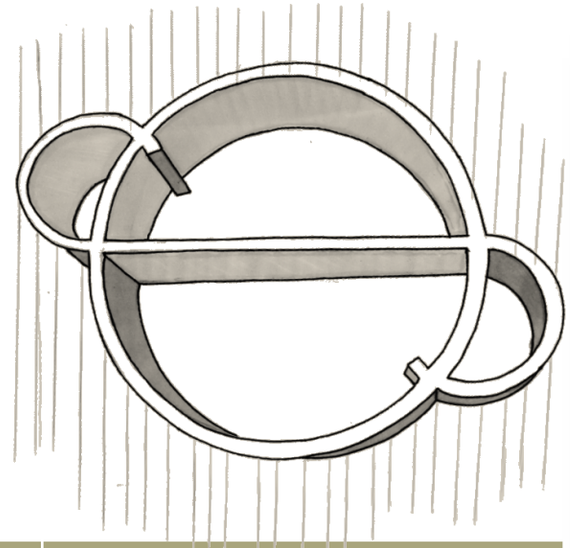


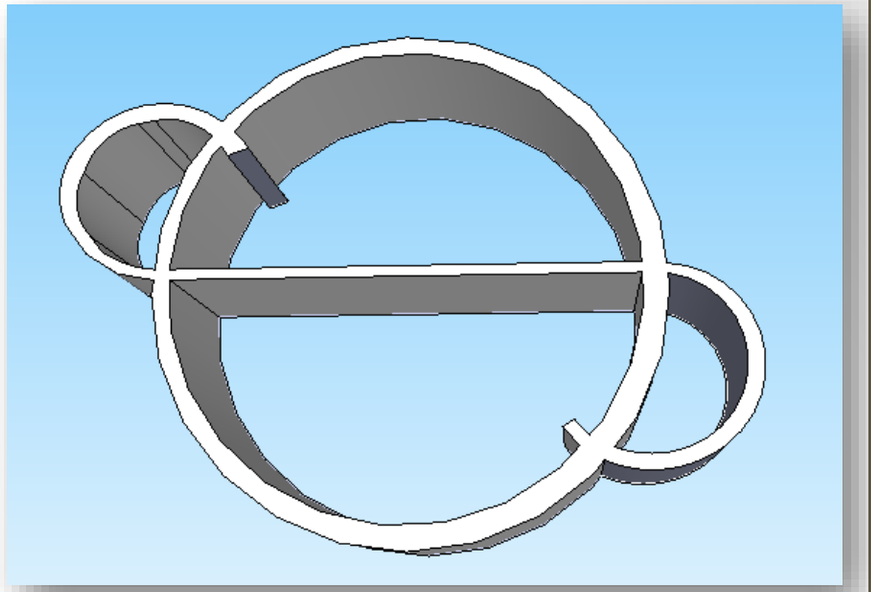
Client feedback:
The bottom design would need more storage space, for example more shelves. I am particularly interested in how the top leaf looking design develops.

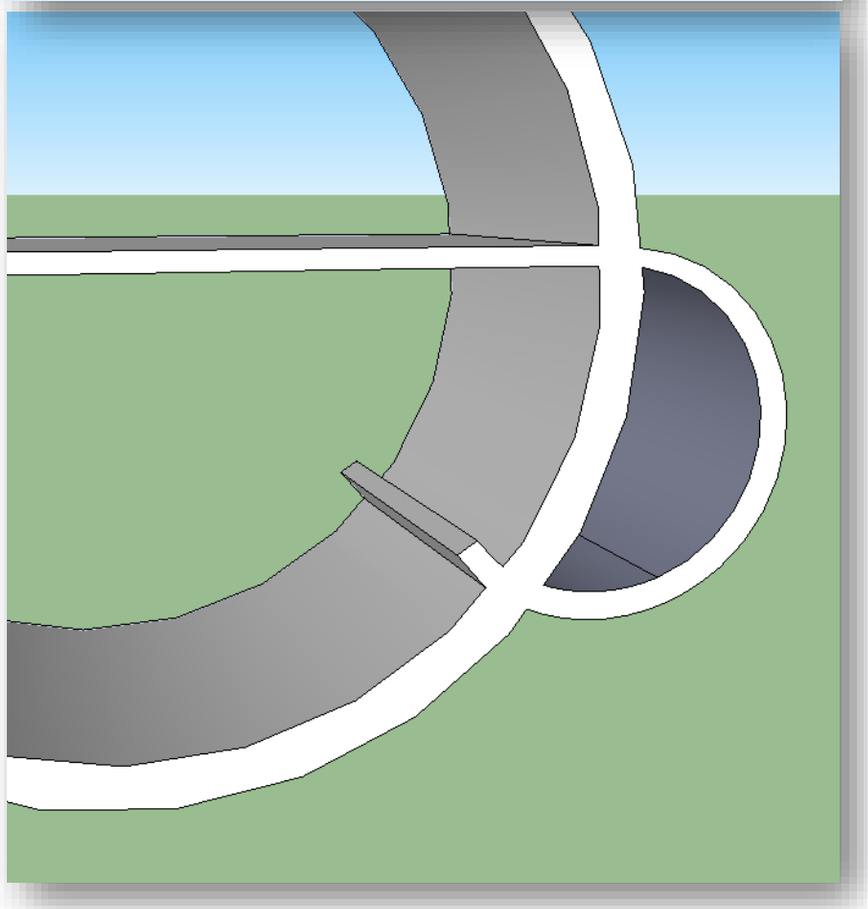


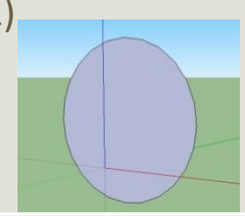
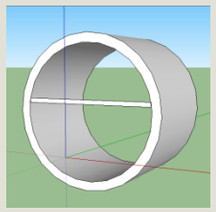
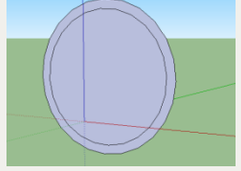
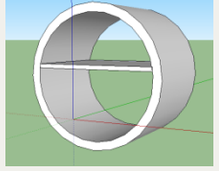
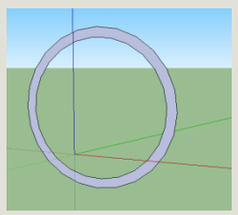
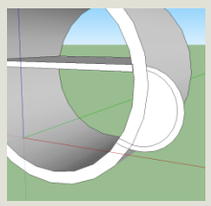
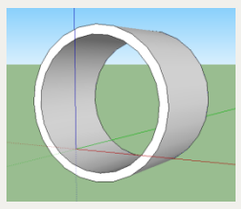
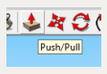
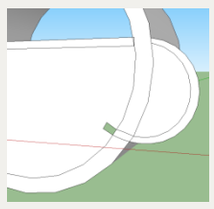
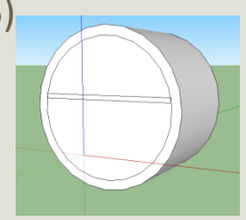
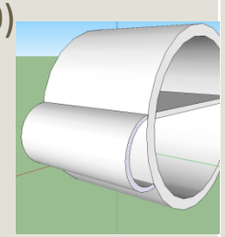
developing ideas

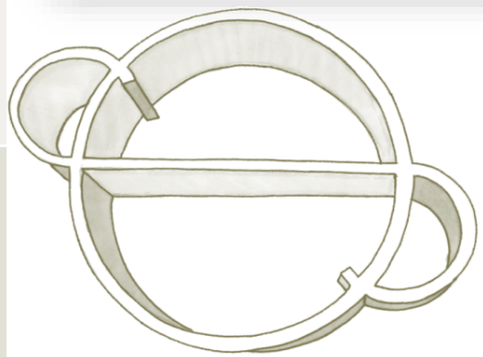
here I developed an idea on my previous page where I increased the circle, allowing more items to be stored (e.g in bottom half of circle). However I think it could use more shelves to store more items with flat bottoms e.g books.





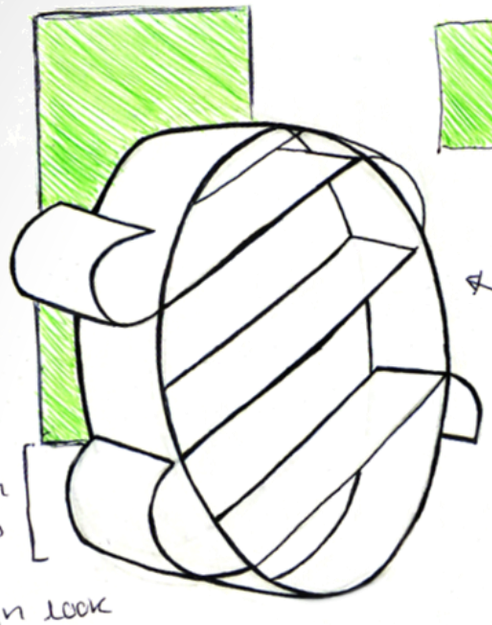


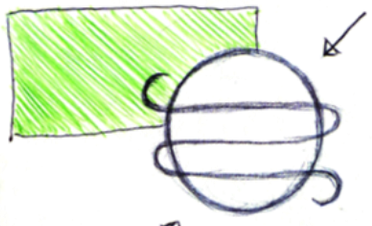
Picture	Description	Picture	Description
1) 	First, I selected the circle tool and drew a circle on the green axis.	6) 	Next I deleted the filled in areas either side of the rectangle.
2) 	I then found the midpoint off that circle, then drew another one slightly smaller, creating a border.	7) 	By using the Push/Pull tool again, I extruded the shelf to the same width as the cylinder.
3) 	Then I clicked the inside of the smaller circle and deleted it so I was left with just the border.	8) 	To create the curved area, I selected the Arc tool and starting from where the shelf would continue through the circle, I drew the outside and inside curves.
4) 	By using the Push/Pull tool I selected the surface and extruded it to create the 3D cylinder. 	9) 	The effect I was going for was that the curve would go back into the circle slightly – so to do this I used the Line tool and drew the end of the curve inside the circle.
5) 	To create the shelf, I drew a rectangle across the middle of the circle, which filled in the semi-circles either side	10) 	I deleted the areas that filled in in this process, then extruded the curve. This process is the same for the curve on the other side.



I like this section where the curve goes back through the circle as it looks more fluid and flowing. I did this in response to my client feedback.

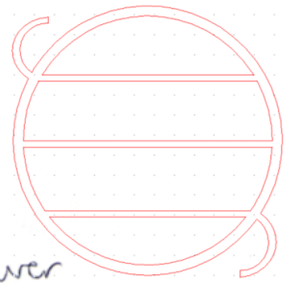
developing ideas



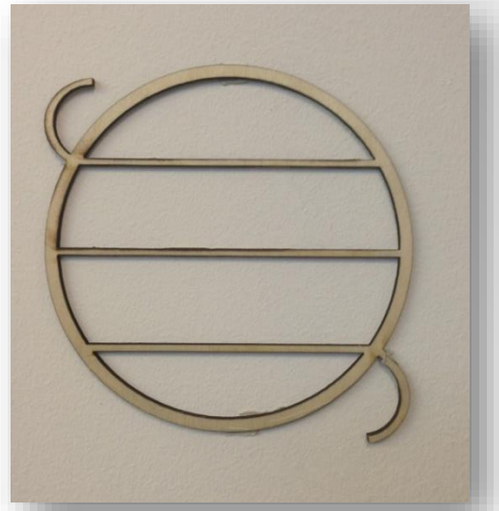


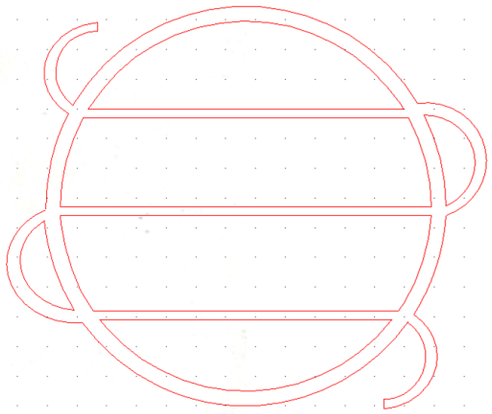
the design is modern & unique, however still has the traditional shelf layout, but with a twist.

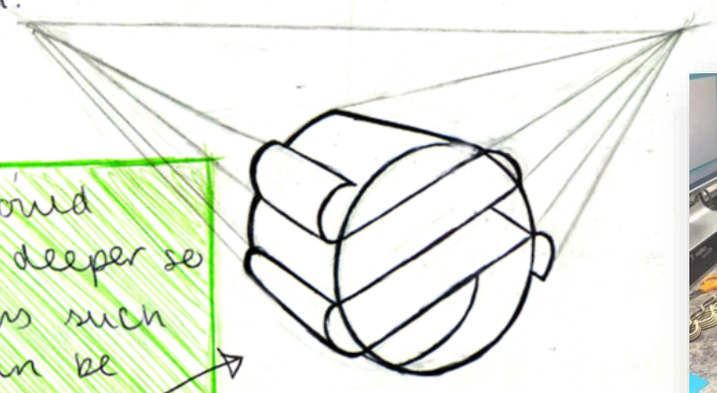
this design is more functional than the previous one, as more shelves mean more items can be stored.

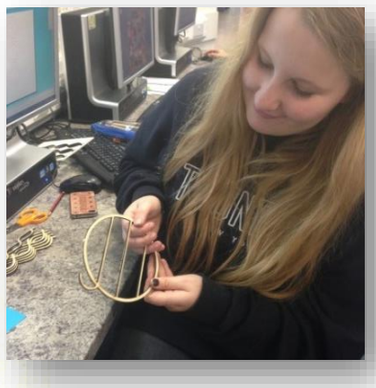


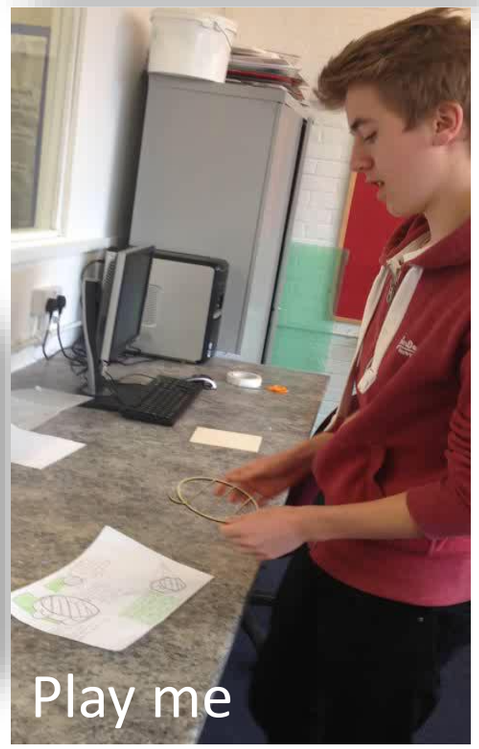
These designs were created using 2D Design, and then cut using the laser cutter.



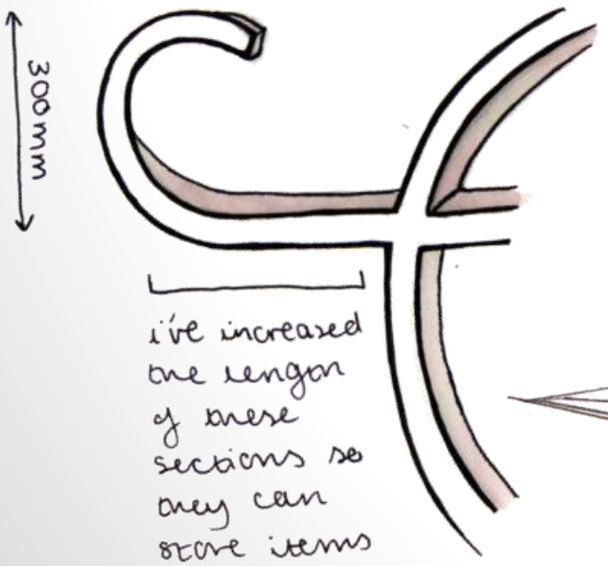




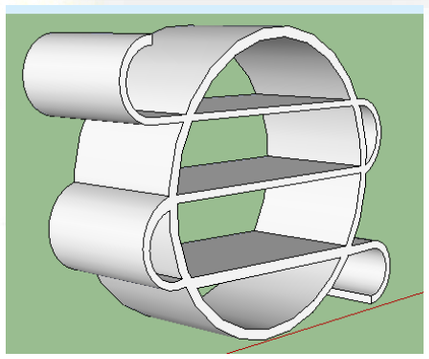


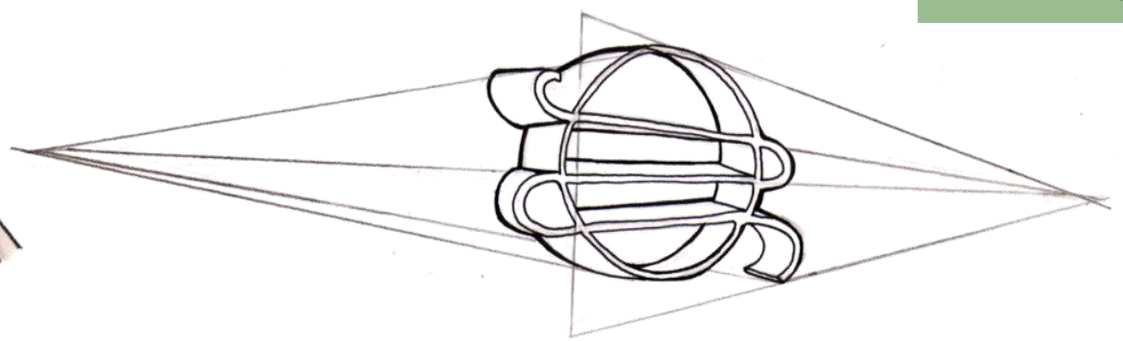


Response:



in response to my student feedback, I increased the lengths of the curved sections so they're more functional. To improve my design further, another suggestion was that I make the unit more interactive - for example make the shelves removeable.



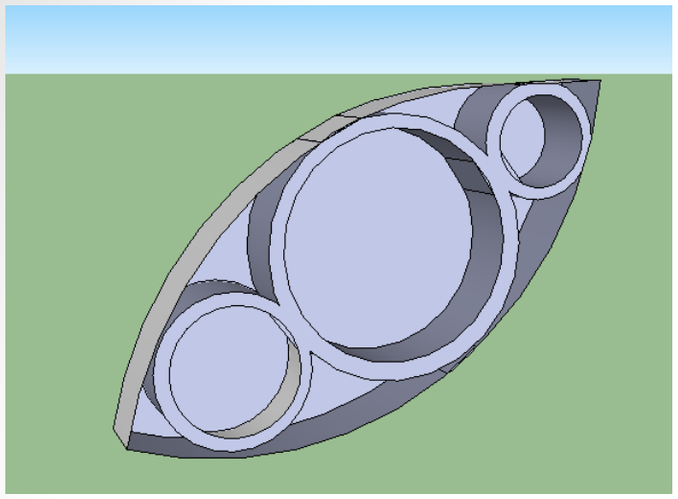


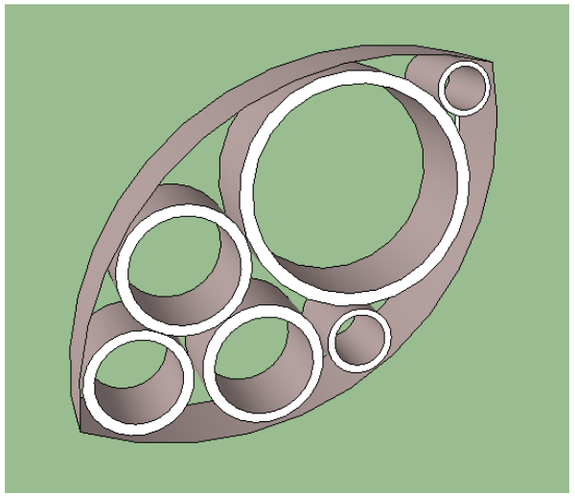
Client feedback:
This design flows better than the last one, however it is a bit too static, so the customer can't interact with it – e.g. move the units around so they're more interactive.

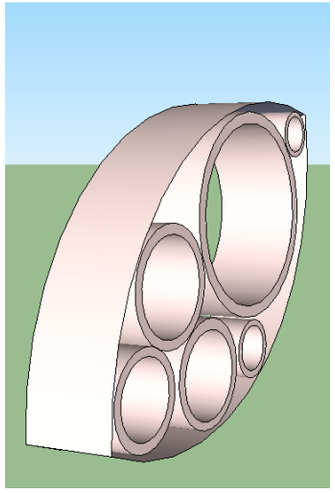
Response:
The curves on the end could be extended so that they can be used as shelves as at the moment they don't really have a function. Therefore they're a waste of money and materials.

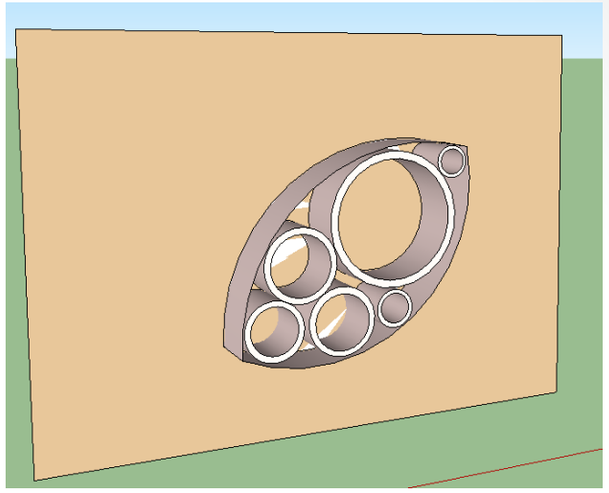
developing ideas

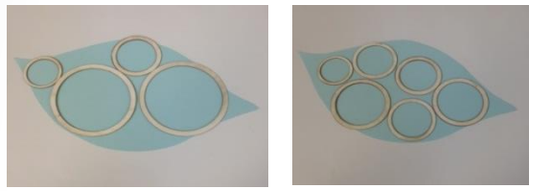
In response to my previous design, I have made the unit more interactive and moveable by creating individual units that can be removed and rearranged inside the model. This creates a much more flowing effect.

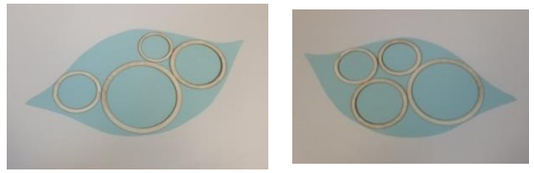


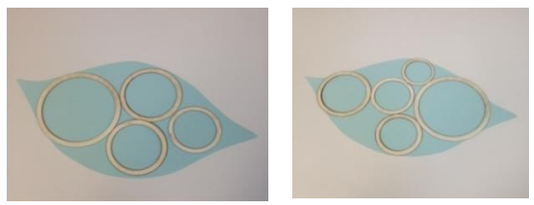


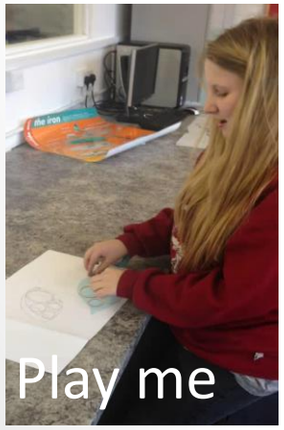


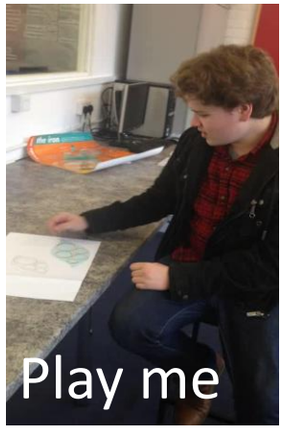


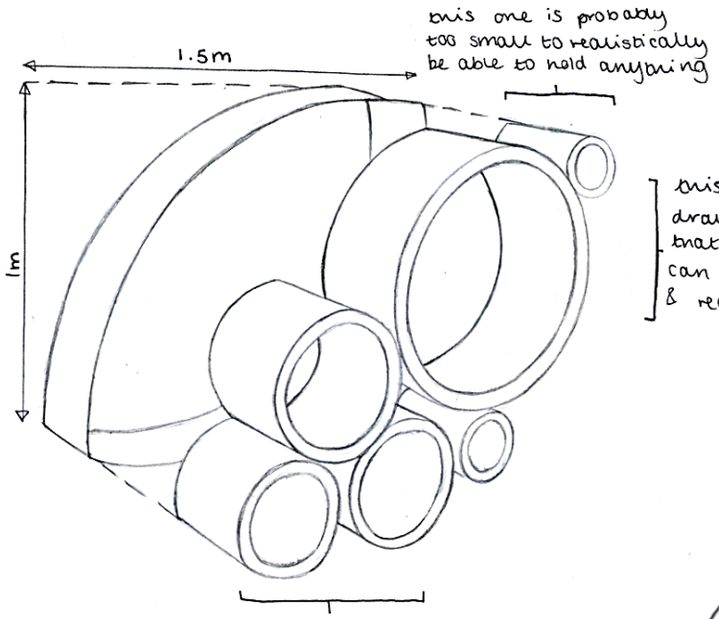






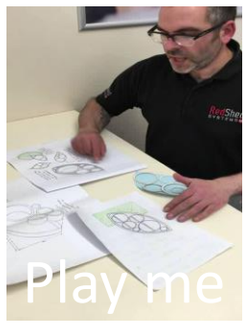




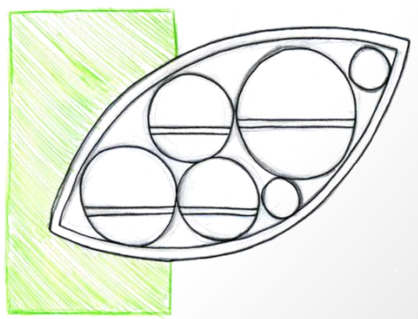


Here I created my design on SketchUp. I added a wall background in one of them to get an idea of the sizes and proportion.

Student feedback: I like that you can customise it and put the individual circles wherever you want. However I think there should be shelves in the circles so you don't waste as much space. I also like that the shape resembles a leaf.
Student feedback: I like that the design isn't static, it's very interactive, but the circles should have shelves in otherwise you waste lots of space.

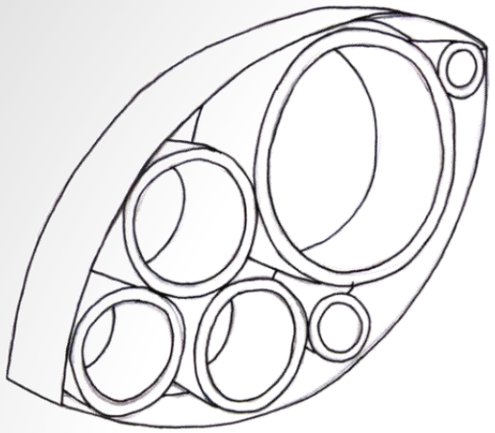


Client feedback:
I really like the interactive element on this design, I also like that the modules can be rearranged, but think the material should be slightly thicker so it's sturdier.

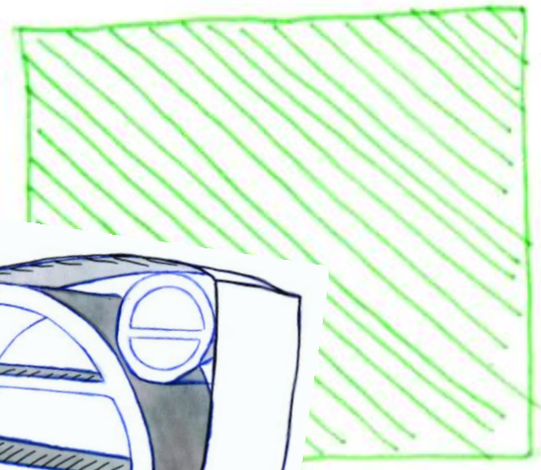


developing ideas

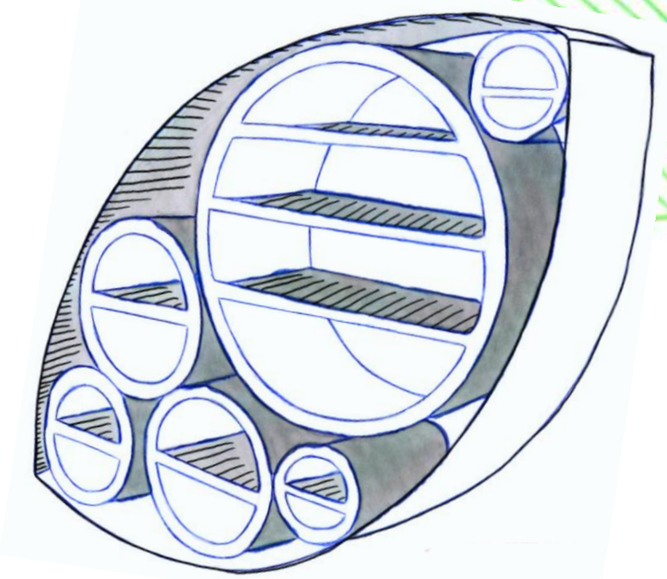
First I designed my unit on Sketchup, then I created the model on 2D Design and cut it out on the Laser Cutter. I cut two designs out so it would give the model a 3D effect when laying them out to create the different variations pictured below.



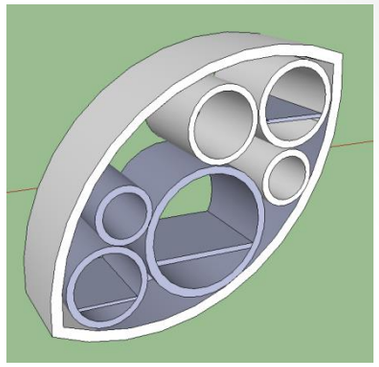
add shelves to the larger circles to increase it's storage capacity



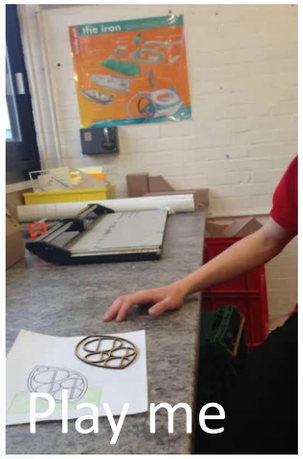
I could potentially add doors to some of the circles to make the unit look more professional



response;

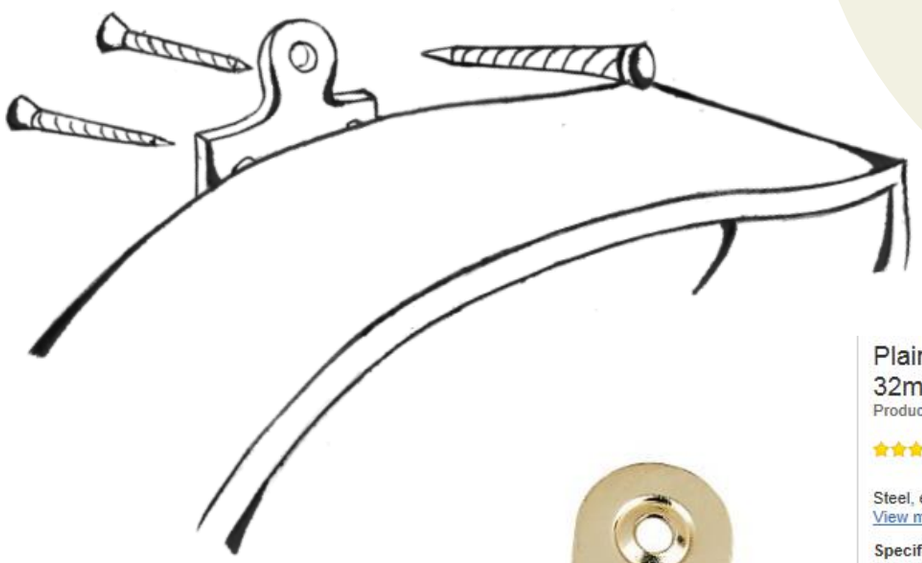


Client feedback:
The overall shape is effective, and I like the way that the individual circles fit inside. Perhaps there are too many shelves, making it look less flowing and organic, and the material should be thicker in order to support the items it will be storing.



Third party feedback:

The design has improved due to the shelves, this means you can store more items. However you should find a balance of the weight so it's light enough to move, b heavy enough to b secure. Also you could find a way to fix it to the wall.



Plain Mirror Plates Electro Brass 32 x 32 x 32mm Pack of 10
Product Code: 14529

View reviews (6) View Question & Answer

Steel, electro brass mirror plates for hanging mirrors or pictures.
View more information

Specifications:
Fixings not supplied.

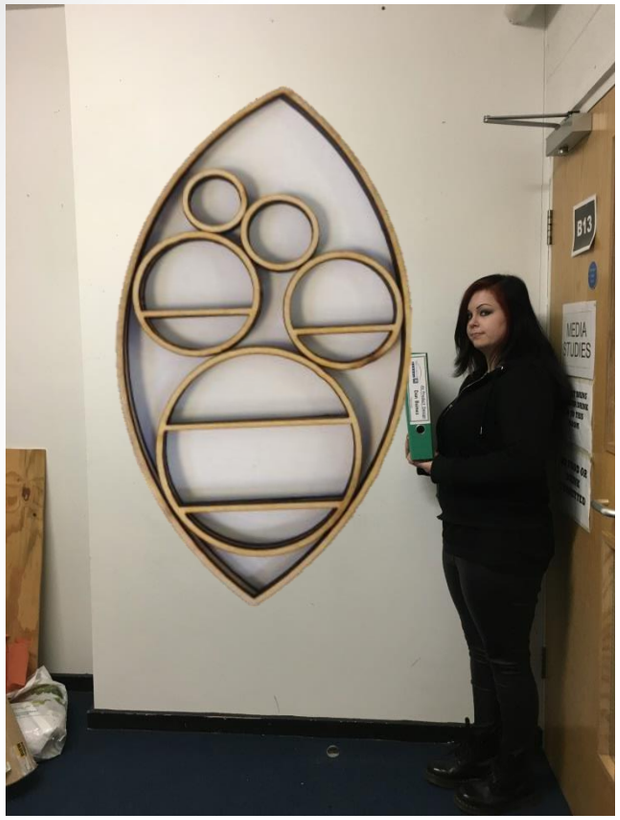
Specification

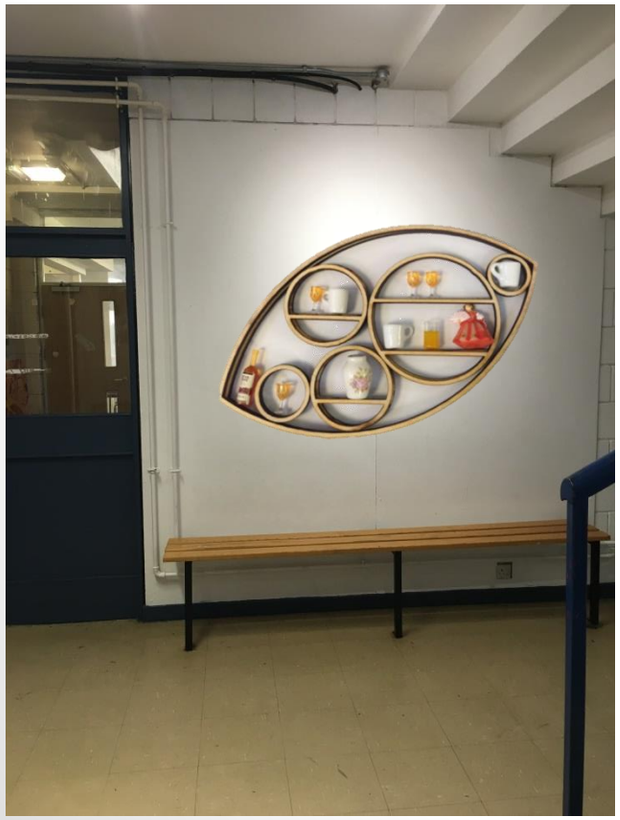
Colour	Electro Brass
Construction Material (Ironmongery)	Steel
Fixings Supplied	Fixings not supplied
Model No	308H
Pack Size	10
Product Height	32 mm
Product Length	32 mm
Product Type	Plain Mirror Plates
Product Width	32 mm
Total Product Weight	0.384 kg

I could use brass plates to attach the main leaf shape to the wall. To ensure it is secure, I would probably use either two or three on the top, and one each side on the bottom section. The plates are cheap at £1.49 for a pack of 10.

developing ideas

placement in school:





Here I have experimented with different sizes my unit could potentially be. I have done this by super imposing pictures of my laser-cut model onto walls around the school (photos on the left). In both pictures the unit looked like it fit into the surroundings well. This may have been because there was another wooden feature close by though (such as the door and bench). In the first picture I asked someone to stand next to the wall holding a folder, so I could see how large the unit would need to be in order to store items this size.

The second picture at school was taken from further back, to see what it would look like in relation to its surroundings.

Next I found some pictures of the interior of a house and super imposed my unit onto the walls in different positions. The first picture – where the unit is diagonal – looks quite trendy in the environment and I think is a good size in relation to the room.

The second picture where my model is vertical is showing that it can be placed slightly differently depending on how much wall space is available. These two positions are only a few of many; the storage unit could be horizontal, diagonal in the opposite way etc. This means there are fewer restrictions when deciding where it could go in the customers house. This also means the unit can be made more personal for the customer, meaning it may appeal to more people. Another way it could be made more personal is by being able to rearrange the individual circles inside. The customer could also purchase more circles of different sizes as well so there would be an even larger variety of layouts possible.

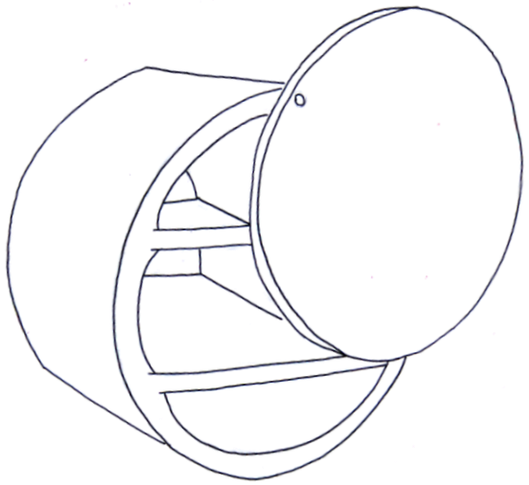
marketing to target audience:

developing ideas

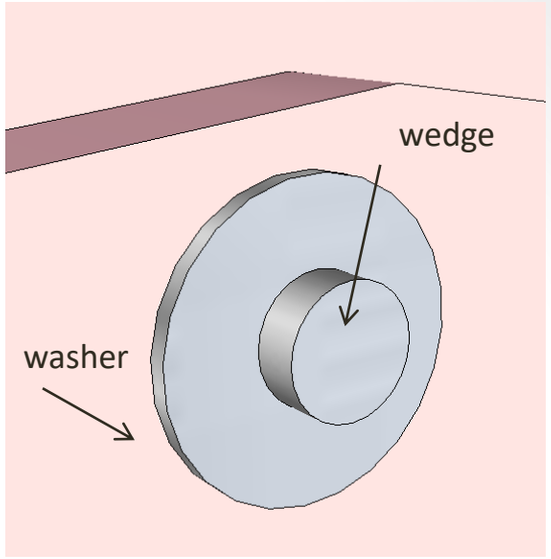
To make my design more interactive, I could add a swinging door in front of the individual circles. This would also make the unit more interactive for the customers.

Inspiration:

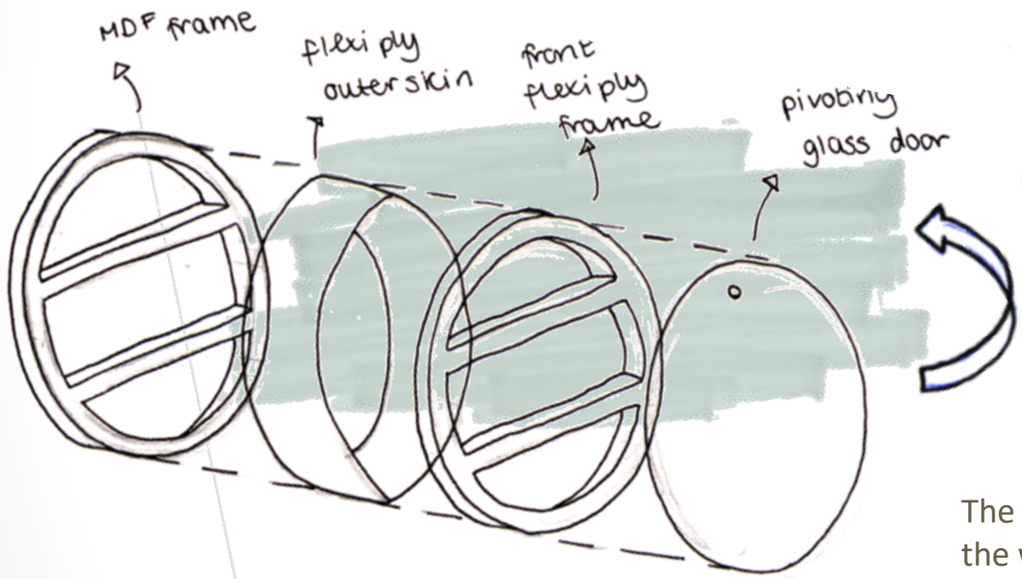
My inspiration for the rotation doors is from items such as this storage unit. A **central pivot** connects the three circular containers, allowing them to rotate around. I will experiment using this mechanism to create doors to cover some of my circular units.

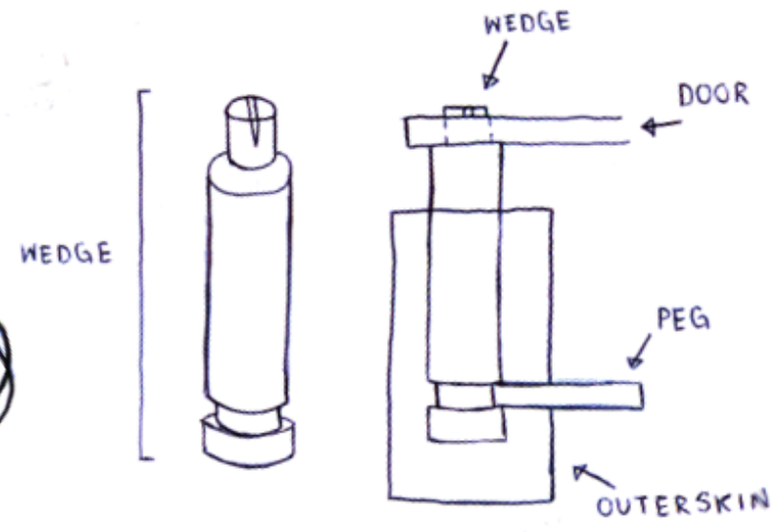


the wedge would be a good mechanism & would be successful as it allows the door to turn all the way around. However it would mean the door would hang down & wouldn't be able to hold itself up. This could be quite dangerous when it swings down.

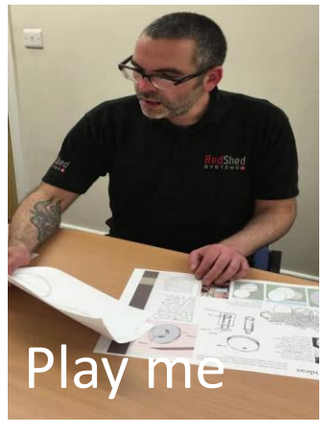


Exploded drawing:

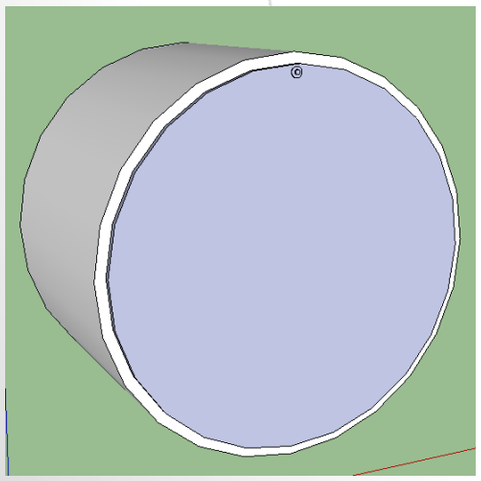


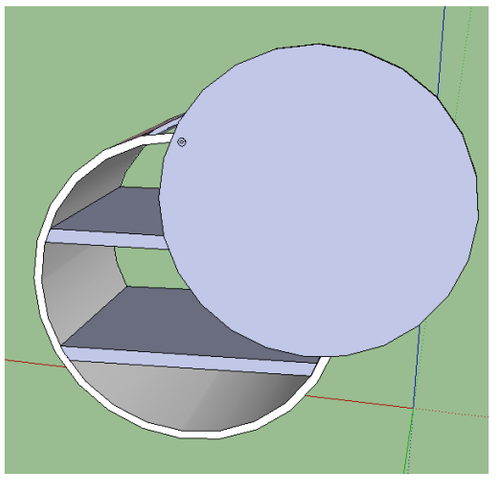


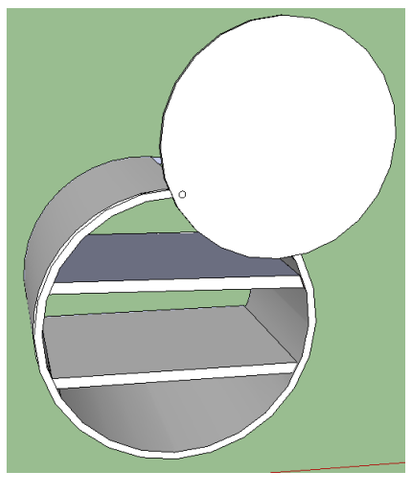
The door would be able to swing all the way around the unit.

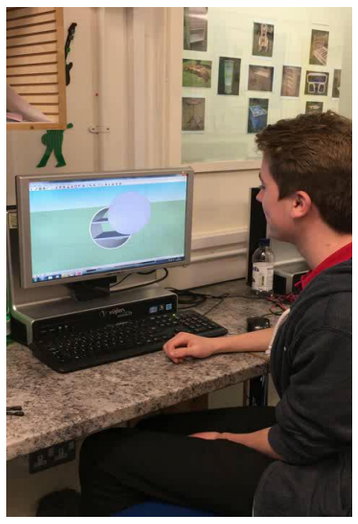


Client feedback: I do like the idea of the doors, but I think that it should be a more functional unit instead of a display unit, so I would so go without the doors.





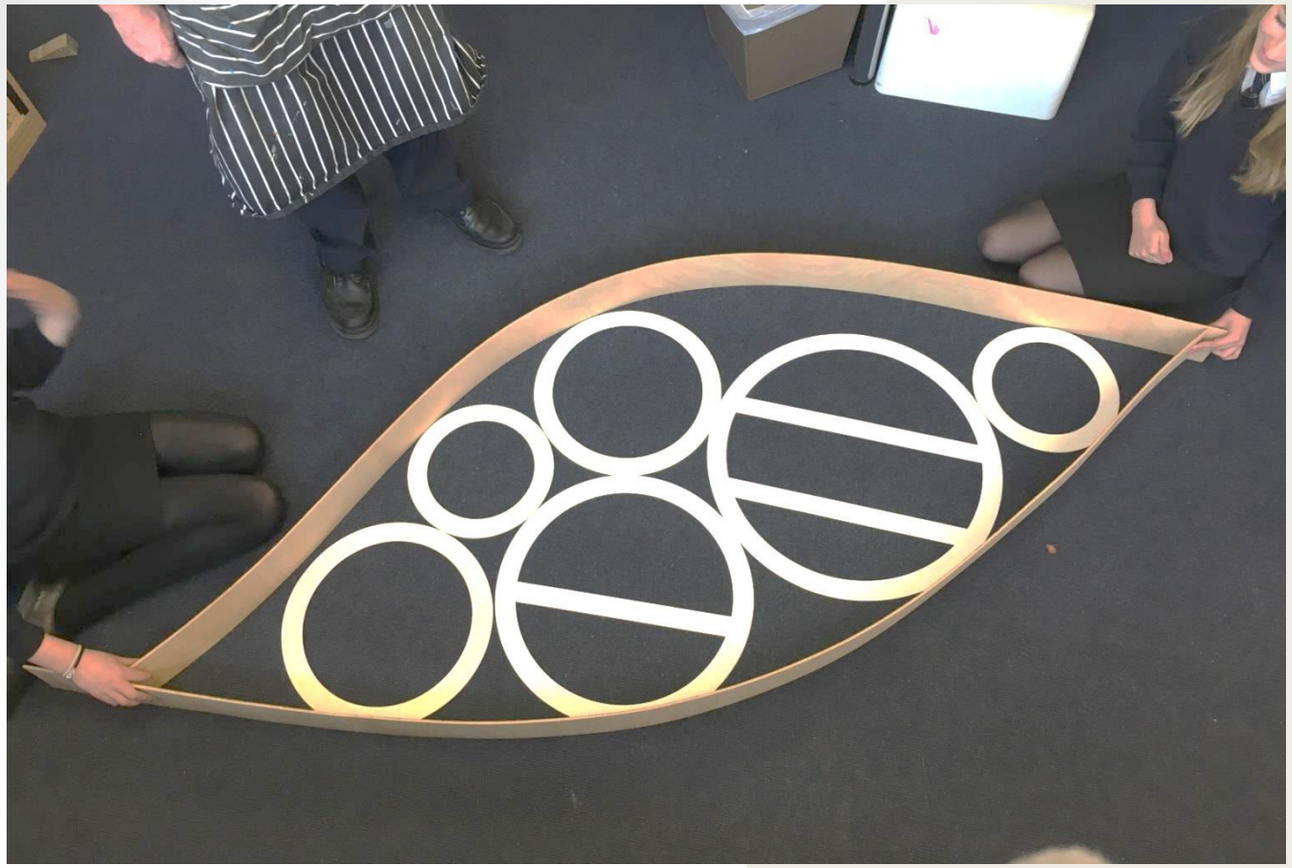




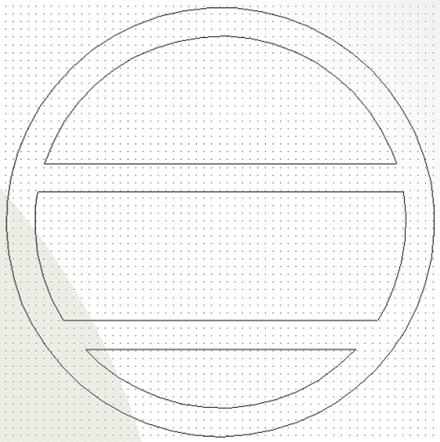
Third party feedback:

The idea of the swinging door is good because you can lock belongings away, however it could be quite flimsy and break. The door could be made out of glass so you could see behind into the circle. **However it restricts the size of the items you can store.**

developing ideas

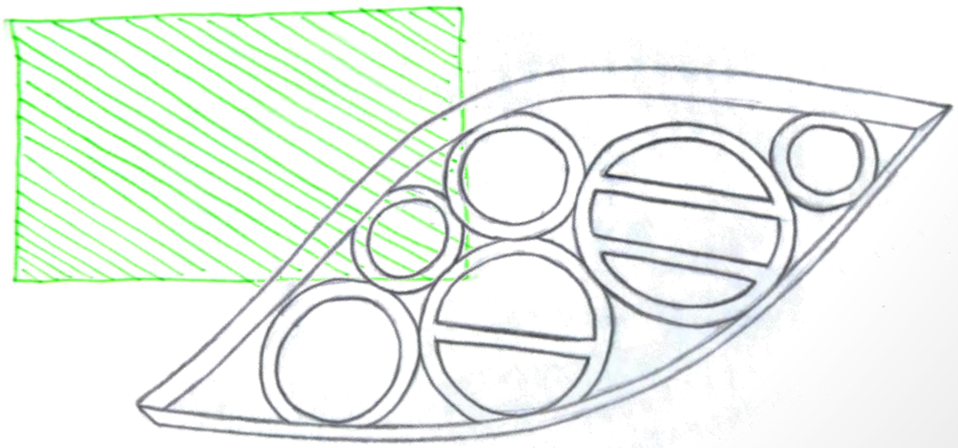


In response to previous feedback, I will not be adding in the glass doors as it limits the depth of the objects that can be stored, and being able to store a variety of sized items in my unit is one of my key points in my specification.



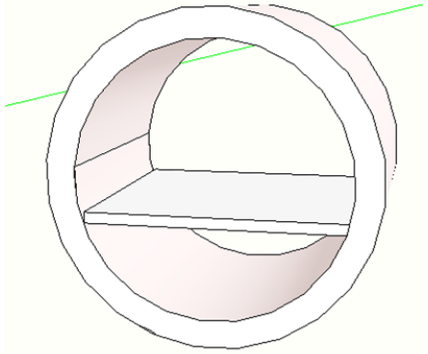
Using a laser cutter I created a model of my final design to scale. I experimented with various layouts of the paper circles and looked at how many could fit in the leaf shape. The circles vary in sizes, from 600mm to 300mm. There are less gaps between these circles than I originally thought there would be, which makes the design look more aesthetically pleasing as it is more full. However it does mean that people won't be able to store as many items in between the circles which was what I was originally imagining.

This was also a good opportunity to experiment with some different variations of the outer casing. By using two pieces of flexiply, I was able to easily manipulate the leaf shape. In doing this, I found that a more symmetrical shape was more aesthetically pleasing, but one that was slightly larger on the bottom was able to fit more circles as it increased the size.

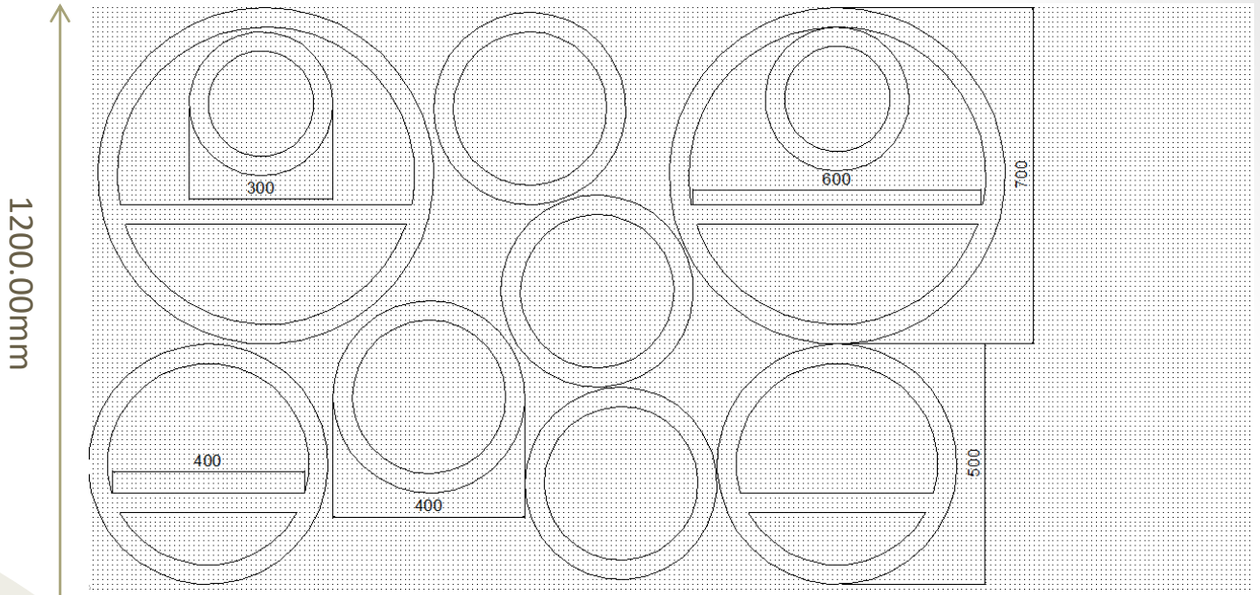


developing ideas

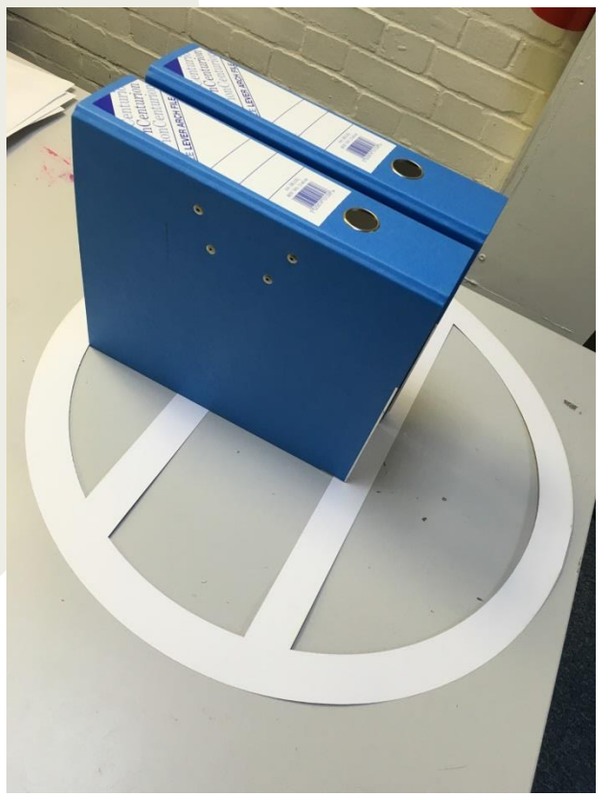
After placing my largest circle unit on a wall, I realised it was too small to have two shelves inside it in order to fit A4 folders. And even if I removed one of the shelves, there would still not be much room to fit many folders in. Therefore I will redesign this circle so it only has one shelf in it, and perhaps even make it slightly larger. At the moment the largest one is 600mm in diameter, so I could consider changing this to anywhere between 650mm and 700mm.



Here I looked at the width of the folders and therefore how far the circles would have to come out in order for items to fit inside and not hang out. The length of this folder is 285mm, and considering that folders come in different shapes and sizes, I might need to slightly increase this size to allow for variation. 300mm would probably be the maximum depth, as I still need to consider my specification which states that the unit shouldn't take up too much wall space.



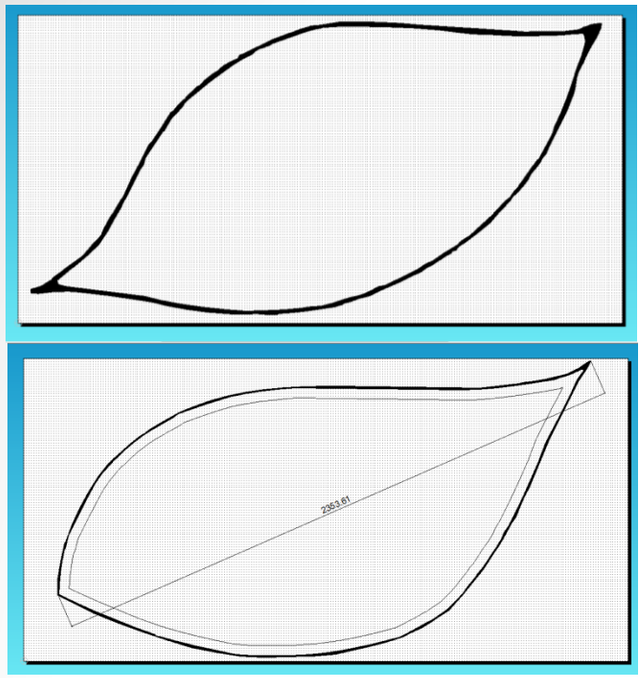
This would be the final size of all of the circles, the largest being 700mm, and the smallest at about 300mm. I drew two of each circle, one being the front panel and the second being the back panel. Once these are cut out, I will be able to put flexiply between these panels.

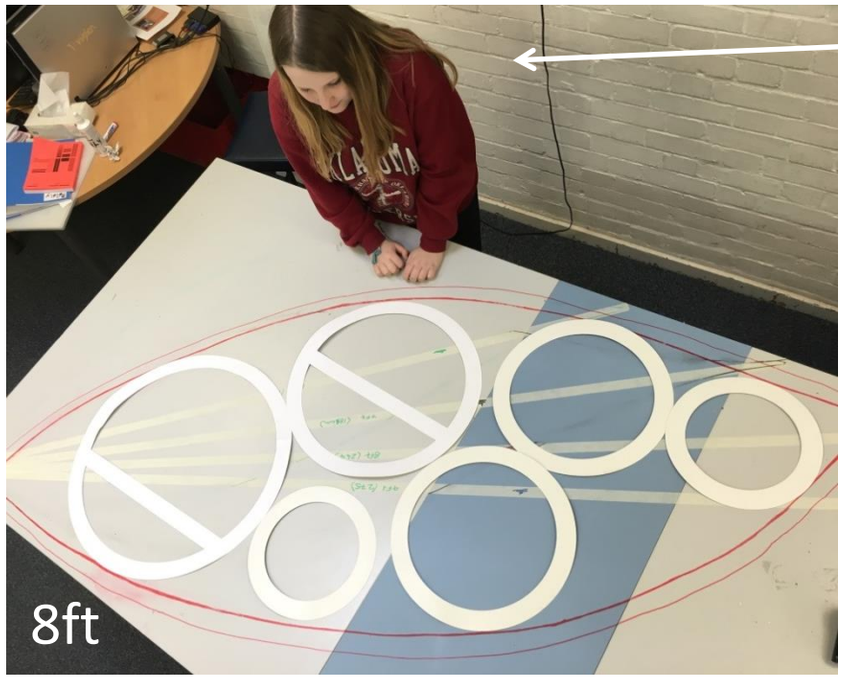


When looking at the positioning of the two shelves, I realised that the one slightly higher up (the one the folders are sat on in this picture), was too high, and the folders wouldn't fit in the circle. However in the other two pictures, the folder is sitting on the shelf that is slightly lower, and here it fits well. So to improve my design further, I will lower the positioning of the shelf, allowing items to fit better. There is an issue here in that by moving the shelf further down, less things will be able to be stored as the shelf will be slightly shorter, however I think this is a risk I would be willing to take.

developing ideas

Before I started making my product, I needed to decide on the exact shape of the leaf in order to make storage as efficient as possible, also what size it should be.

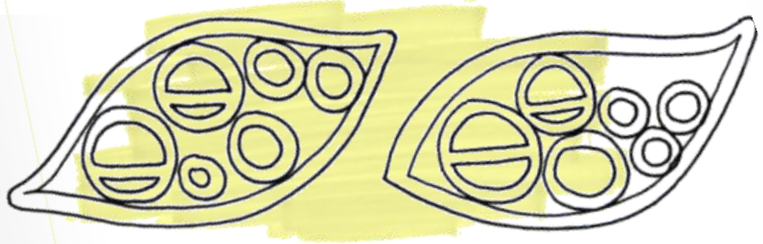




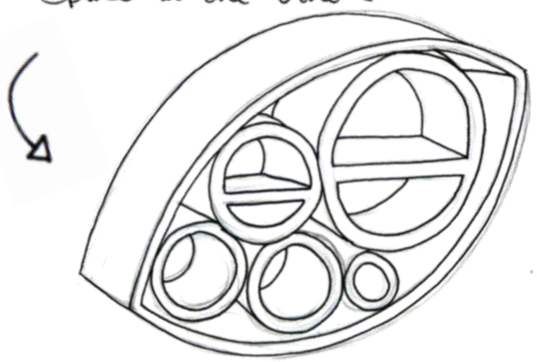
The client

to gauge the size for my final product, I trialed a range of sizes. I used a masking tape grid to mark out 6-9ft diagonal layouts. This enabled me to try out the shelving layout & also see the best sizing for the finished unit.

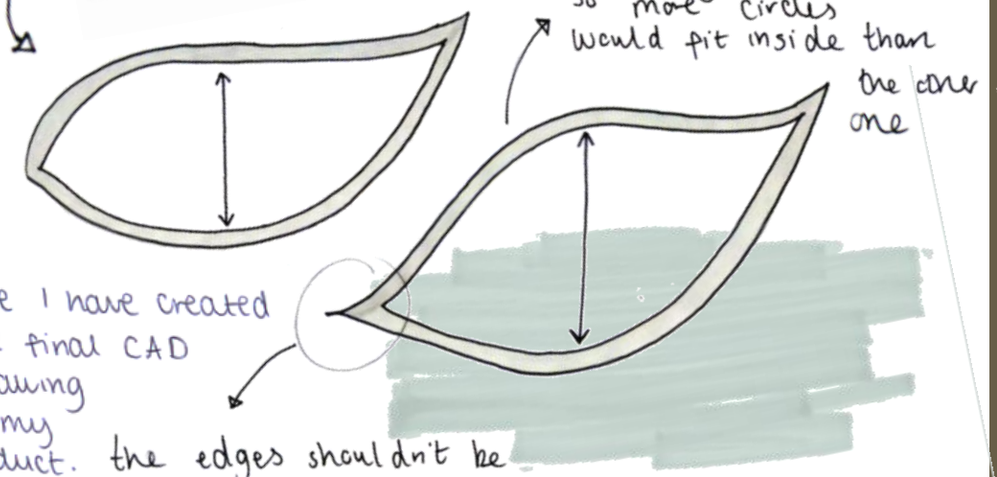
by slightly altering the thickness of the leaf shape, it completely changes how much space is inside & how many circles I can fit in it.

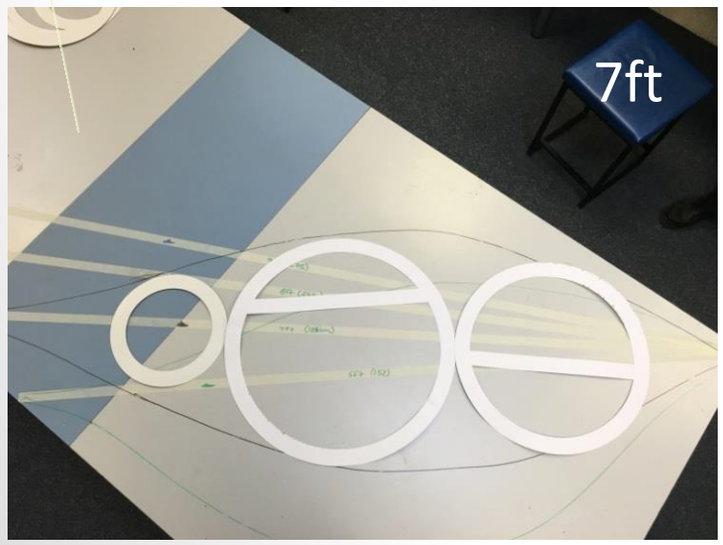


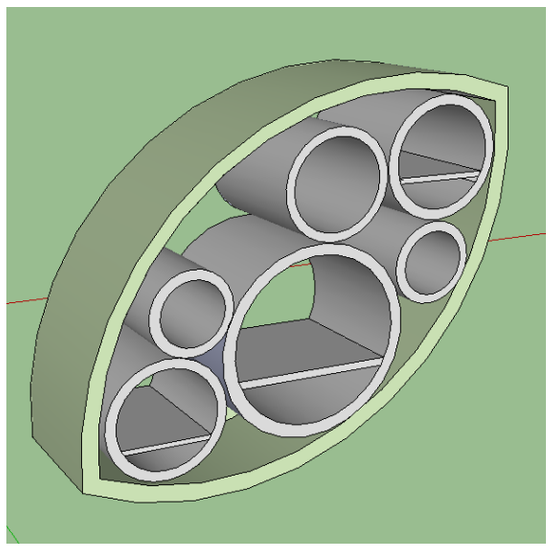
the corners of this design are more efficient & don't waste as much materials or space as the others.



a design like this with a flat top would be useful as it could be used as a shelf







here I have created the final CAD drawing of my product.

the edges shouldn't be as sharp as this as it could be dangerous.

i found that 6ft & 7ft were too small, and I could only fit a few circles in them. This wouldn't be very efficient in terms of storage.

plan of making

Here I have created a basic 10 step plan of making that I should try and follow during the production of my shelving unit.

1

First I will make the dimensions of the leaf shape and circular panels of my design and sent them off to Contrax to be cut out of 18mm MDF using a 3D router.

2

To ensure the overall depth of my shelving unit conformed to standardised shelving sizes, I will measure a regular sized folder and other various house hold items before cutting support rods out of pine to stick between the front and back panels.

3

After the PVA glue has set and the rods are secure on the panels, I will measure the inside of the circles and leaf shape and cut flexiply on the circular saw. I then will glue this piece of flexiply on the inside of the circle and leaf shape, and use clamps to secure it as it dries.

4

For the circles with shelves, I will measure the length of both the top and under side of the shelf panel, and use the circular saw to cut out pieces of MDF, which I will then glue and clamp in place.

5

Using a similar technique, I will cut out another piece of flexiply to cover the outside of the circle/leaf shape. I will need to glue the rods outside face and the edge of the panels to ensure the flexiply will stick. I will then use ratchet straps to secure it whilst it dries.

6

Next, to neaten the edges up, I will use the circular saw to trim any overhanging bits of flexiply.

7

Using an electric sander, I will smooth down the sides so that the flexiply outer-casing is flush with the panels. This step is important in making the product look more professional overall.

8

Using 100 grit sand paper, I will round all of the edges to make them smooth.

9

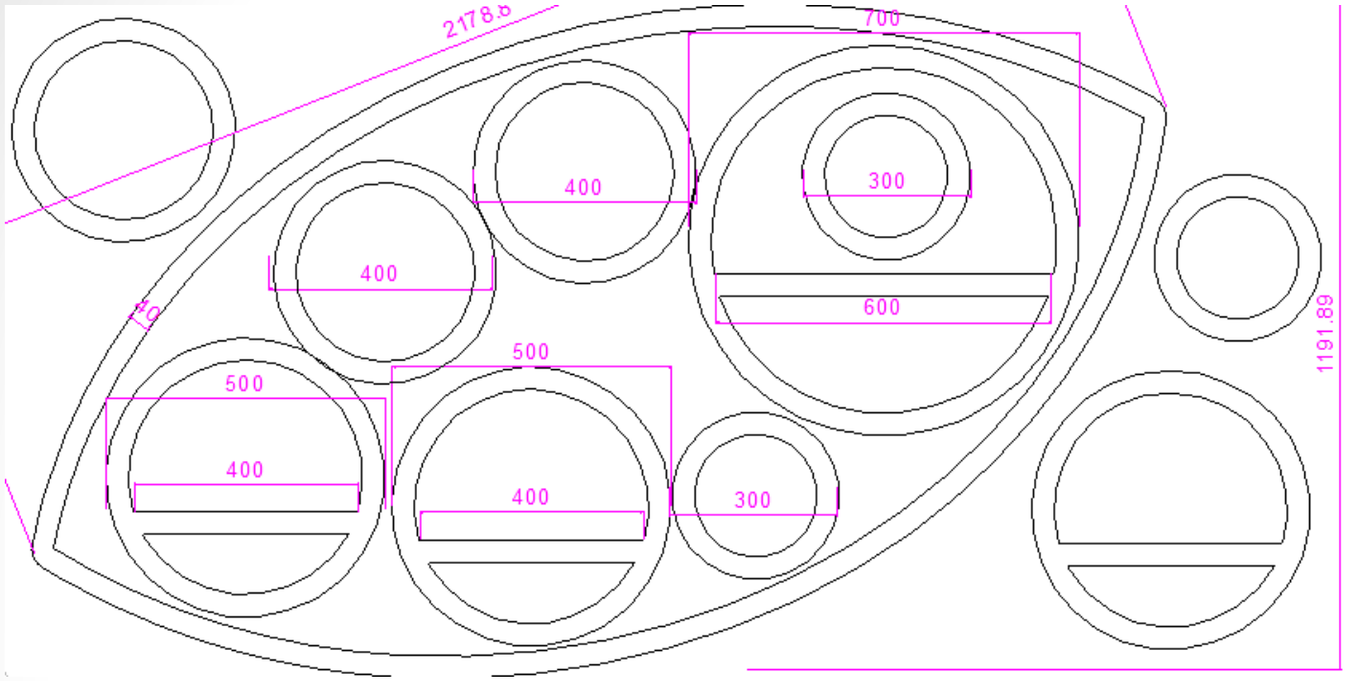
I will use decorators caulk (or another filler), to fill in any gaps. After this I should do a white undercoat on all pieces.

10

Finally, I will paint my large leaf shape and all individual circular units using an eggshell paint in my desired colour. I might need 2 coats of this to get a professional finish.

making the product

In order to produce my shelving unit, I will need to get a front and back panel of each individual component cut out. As I don't have access to the necessary equipment to do this, I have outsourced this to a local company who is willing to cut these panels out. Once this is done, I can then attach the front and back panels together by creating a flexiply outer-skin and encasing them. I encountered some problems outsourcing these panels, such as people leaving the company, and not having all of the panels cut out.



i drew my design on 2D Design & included all of the measurements to send off to the company. with this, they were able to cut it out of MDF using a 3D router.

RE: Wallingford School A level project cutting request

2 March 2016 at 16:04

Hi Ella,

Thank you for your email and information about your piece. We could cut it out of one single piece of 30mm MDF if you'd rather? As I mentioned to one of your classmates, Robin, the CNC uses a round cutter and therefore leaves a radius in some corners which would need to be finished by hand. When I draw up your piece for the CNC you will see what I mean.

What is the communication between you and your classmates like? I'm just wondering if you guys share information because then it saves me saying the same things multiple times.

I will draw up your piece as soon as I get a chance (hopefully this week), once you are happy with it I will send a quote through to be signed off by your school. Could you give me the measurement of the radii of the large lemon – shaped component?

Best wishes,

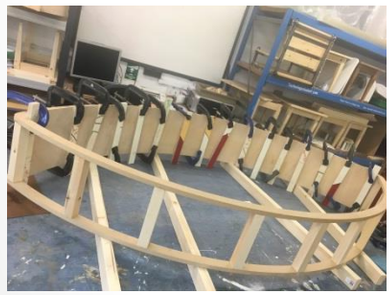
Sam

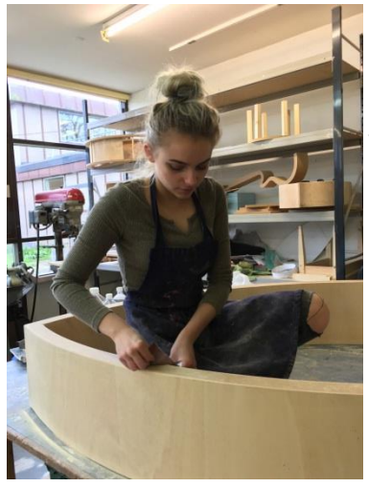
CONTRAX FURNITURE

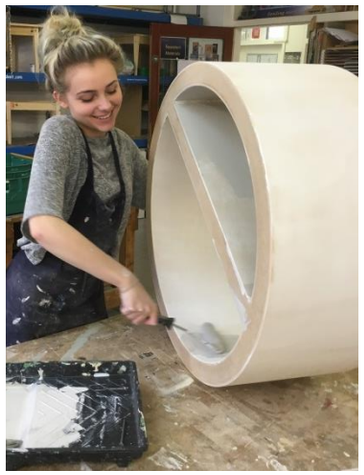
Photos taken by me of the arrangement of my panels, the panels at Contrax Furniture, and the 3D router that was used to cut my product.

making the product

1

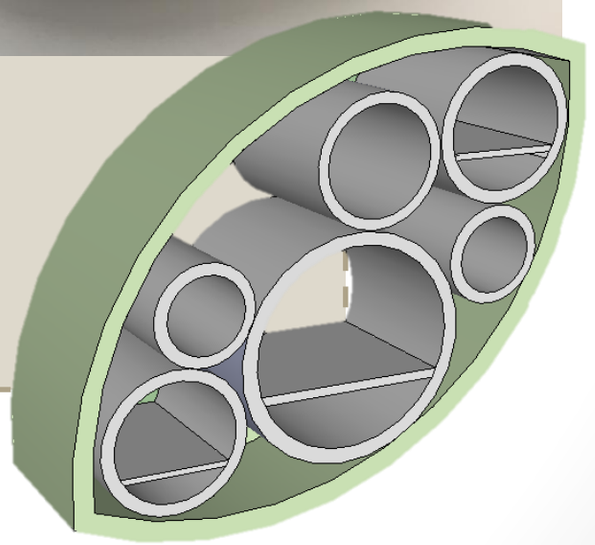






1. I went to Contrax to pick up my panels, and realised my drawings had only been cut out once, but in order to make my unit, I needed 2 of each piece. There was a problem with communication as the man who I had first emailed left the company.
2. After I had the second set of panels cut, I could start gluing the pine rods onto the panels using a rub joint. A problem arose here as if the angle of the baton was slightly off, it made the whole unit slightly wonky when I glued the front panel on top.
3. I then cut out flexiply and glued it to the outside and inside of the unit. I discovered here that the ratchet strap buckle left a dent in the flexiply, and meant that there were some imperfections in the join, meaning it wasn't flush against the panel.
4. Due to the angle where the shelf and circle meet being fairly large, it meant I had to file and sand the MDF shelves by hand in order for them to fit in properly. In some cases, I had to use a lot of filler in these sections for it to look flush and professional.
5. Using the circular saw to trim the overhanging flexiply edges was fairly tricky, as some pieces were overhanging slightly more, and sometimes the saw cut into the MDF panel, meaning I had to use a belt sander to level it out.
6. Using an electric sander and sanding by hand gave a much more refined finish to the unit.
7. Some smaller areas were harder to get to when painting, leaving a slightly patchy finish, but through painting a second coat, these areas were smoothed out.

final product



French Grey and Purbeck Stone eggshell Farrow and Ball paint. I used French Grey for the leaf, and Purbeck Stone for the circular units.

marketing and presentation

Unique Selling Proposition
The unique selling proposition refers to the feature that differentiates a product to similar existing products in order for it to be more successful in marketing to the public. My USP is the **modular, interchangeable element**. During second hand research, I noticed that there was a lack of products that were **interactive**, so I attempted to fill that gap in the market.

4 P's of Marketing
Product – As my design is very unique and not too similar to any other shelving units, I must make it clear to the audience what it is, and what it is capable of (being **interchangeable**).

Price – The price of my product should take into consideration a few issues, such as the target audience, how much can they afford spending? As well as the **material** I have used, how much will I need to sell it for in order for it to make a comfortable profit? I also need to take the **modern and original style** into consideration, and that there aren't many other similar products available on the market.

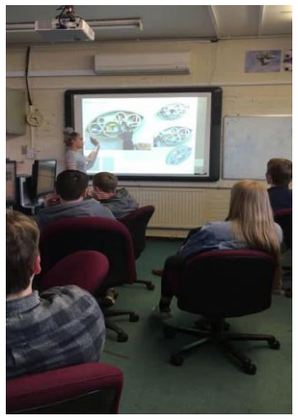
Promotion – When promoting my product, I need to consider suitable means of marketing and advertising, for example on the TV, posters, bill boards, magazines, social media sites etc., that are likely to be seen by my target audience. For example, some people may not be on social media sites, so I should include more than one mean of promoting to ensure my target audience sees it.

Place – I should consider the placement of my advertising, for example on a bill board outside **IKEA** would be ideal as people who are visiting **IKEA** might be looking to buy new furniture and would see this on their way there. Other places could include modern furniture magazines such as **Furniture World** or **Ideal Home**, where people look for ideas on how to furnish their home with modern, high quality pieces.

Packaging my product
Due to the complexity of the design, as well as the many circular units, it wouldn't be able to be sold as a flat packed piece of furniture. This could put potential companies off the product (such as **IKEA** who only sell flat packed furniture). Due to the large amount of flexiply and MDF used, a lot of protection would be needed when transporting, as the wood can be easily chipped. I would need to use foam sheets or bubble wrap around each circular unit. After all of the protection is added, the units probably won't all fit into the leaf shape, so I will need to consider using multiple boxes. However, the smaller units can fit in some of the larger ones, which will save space. Due to the large size, my product would probably not fit in the average sized car, so delivery may be expensive.

Final Price
After looking at similar existing products in shops such IKEA, and considering different factors such as the target audience, the amount of material used, and the unique design, I have decided that the price for this unit would be **£675**. I think this is a fair price that is affordable, and won't scare the target audience away, but will also provide a fairly sufficient profit margin.

Boxed storage systems sold in IKEA vary from £55 to £600, depending on the amount of boxes, arrangement and even the finish. Some units are equipped with a soft-close door or push-open door.



This is a clip from part of a marketing presentation I did in front of my class. I included detail about the USP of my unit , which was the interactive element, the innovative shape, and even the finish (colour scheme etc.). My presentation was very image heavy in order to appeal to the younger target audience. This was also a perfect opportunity to see how successful my brand identity, including the logo and name etc., would be if I marketed my product commercially, and even got some positive feedback from peers about this.

marketing and presentation

Here I have considered branding and the packaging my unit would come in. The green of the leaf is very subtle against the brown box which I think makes it look very sophisticated, along with the simplicity of the imagery and text.

evolve

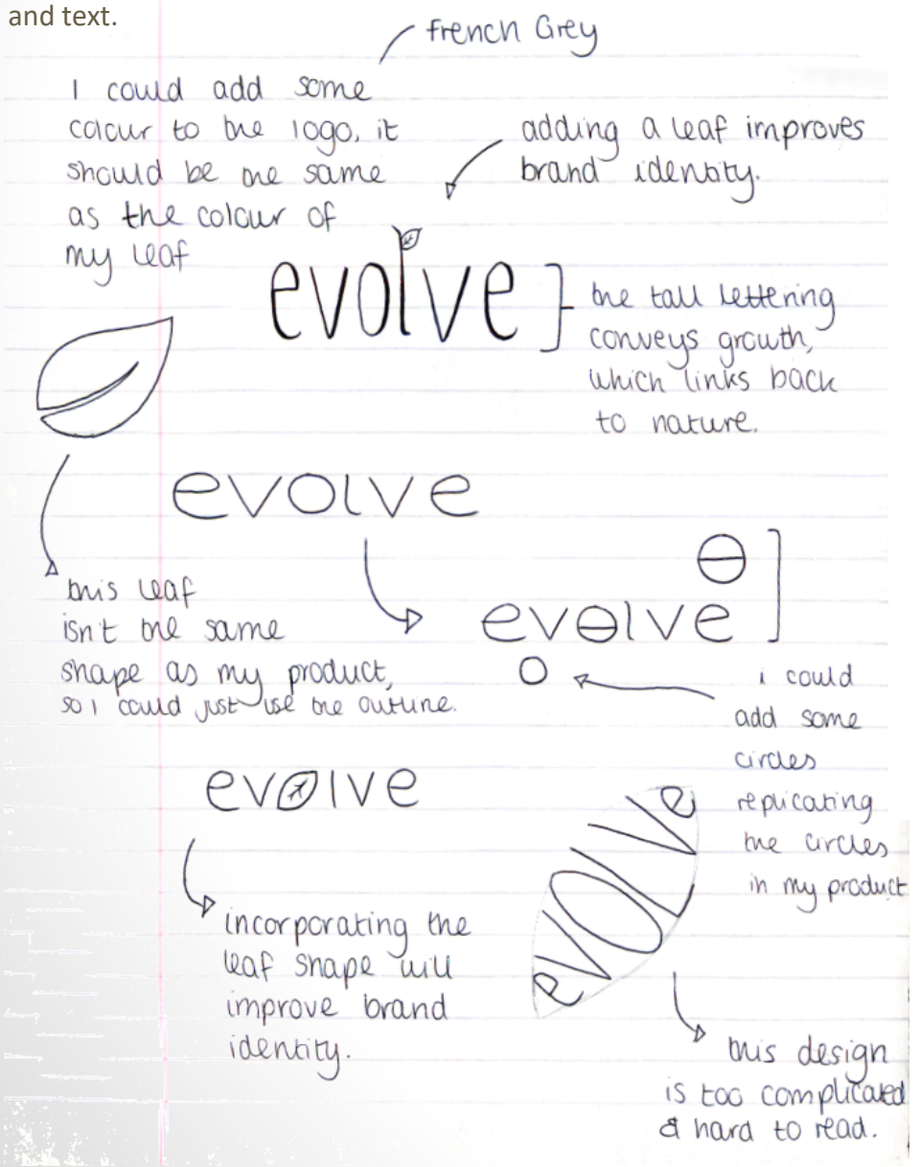
evolve

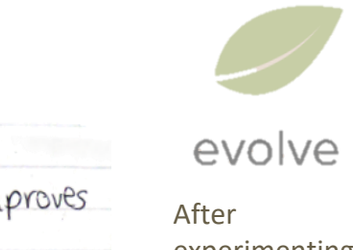
evolve

evolve

evolve

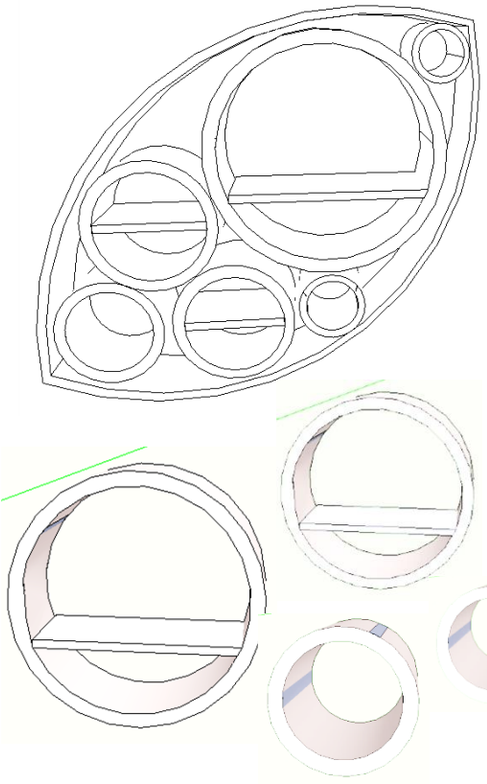
evolve





After experimenting with some different fonts and styles that include a leaf shape, I decided to go with a fairly straightforward logo which has grey lettering, complimented with a pale green leaf. This would be more effective to the target audience as it's easier to read than a more elaborate logo, for example one with the 'o' as a leaf silhouette.

I think the name **evolve** is an effective name for my product as it portrays a sense of **nature** (evolution), which is relevant as the design is based on the shape of a **leaf**. The word isn't too dissimilar to 'environment', which could put emphasis on the fact that the product is **eco-friendly**, which is likely to broaden the target audience. The word could also convey that the unit is interactive, suggesting there is evolution in the way it can be designed by **rearranging** the circular units to create a more personal outcome for each customer. I will stick to a neutral colour scheme and design when it comes to the logo, fonts and packaging to make it look eco-friendly .

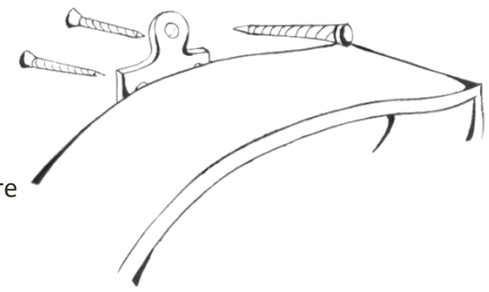


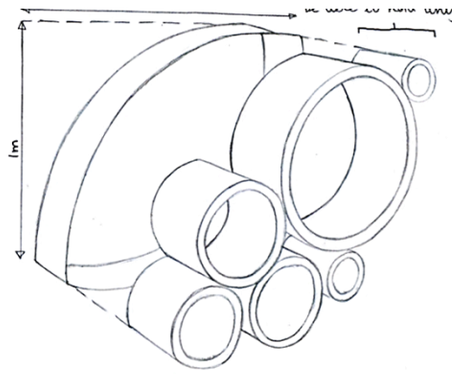
evolve

This pack includes:

x1 Large leaf-shaped structure
x1 Large circle with shelf
x2 Medium circle with shelf
x1 Medium shelf without shelf
x2 Small shelf without shelf
x6 Brass plates
x19 18mm screws
x19 wall plugs
x1 Instruction booklet

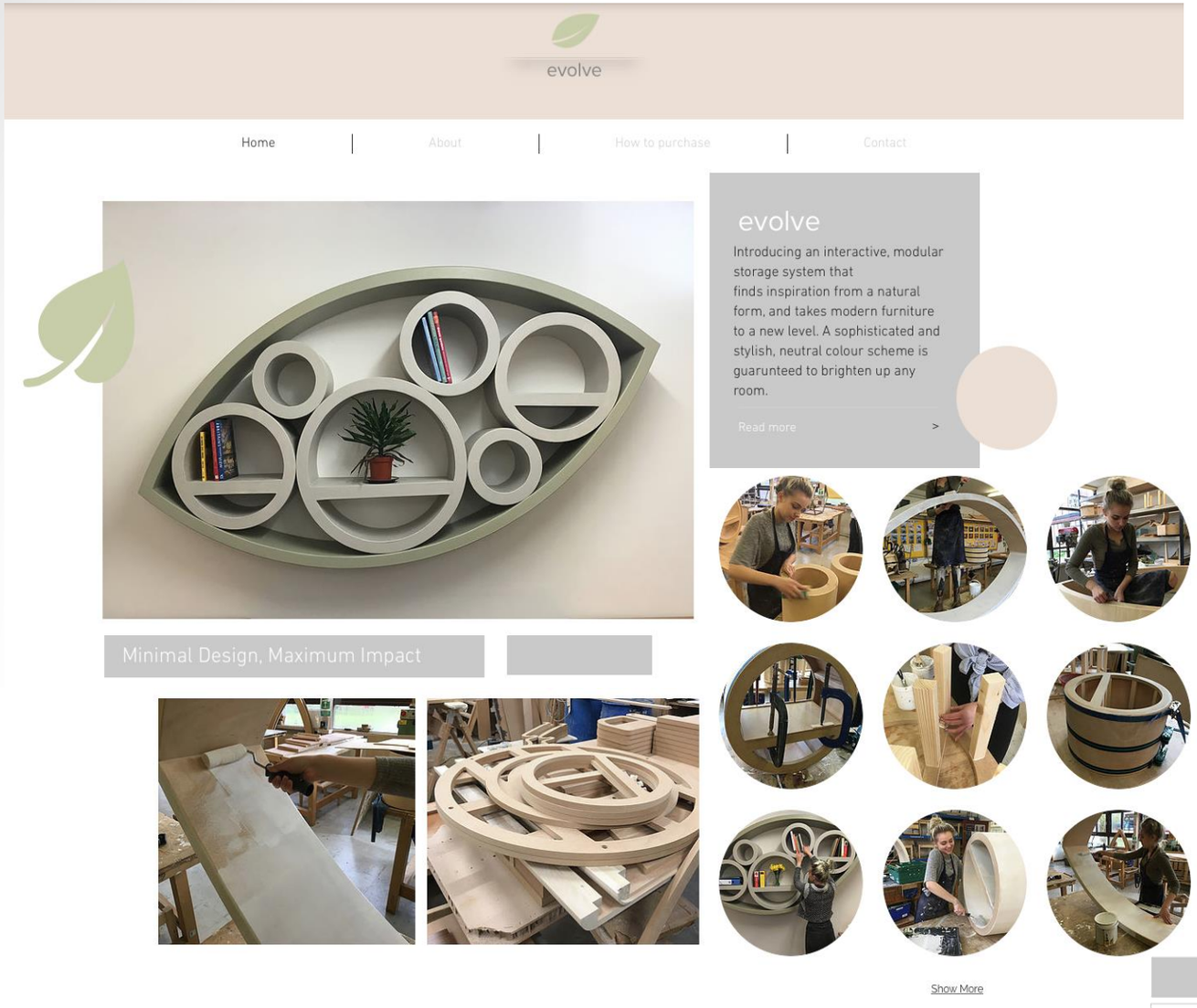
1) Screw 3 brass plates onto the top of the leaf shape, and 3 onto the under side.
2) Position on the wall and mark areas to drill and put in wall plugs.
3) Only insert circular units once the structure is safely attached to the wall.





There are many possible arrangements for the circles to fit in the leaf shape, inside this booklet a few of these variations are displayed for inspiration, as well as what items could possibly be stored in each layout.

marketing and presentation

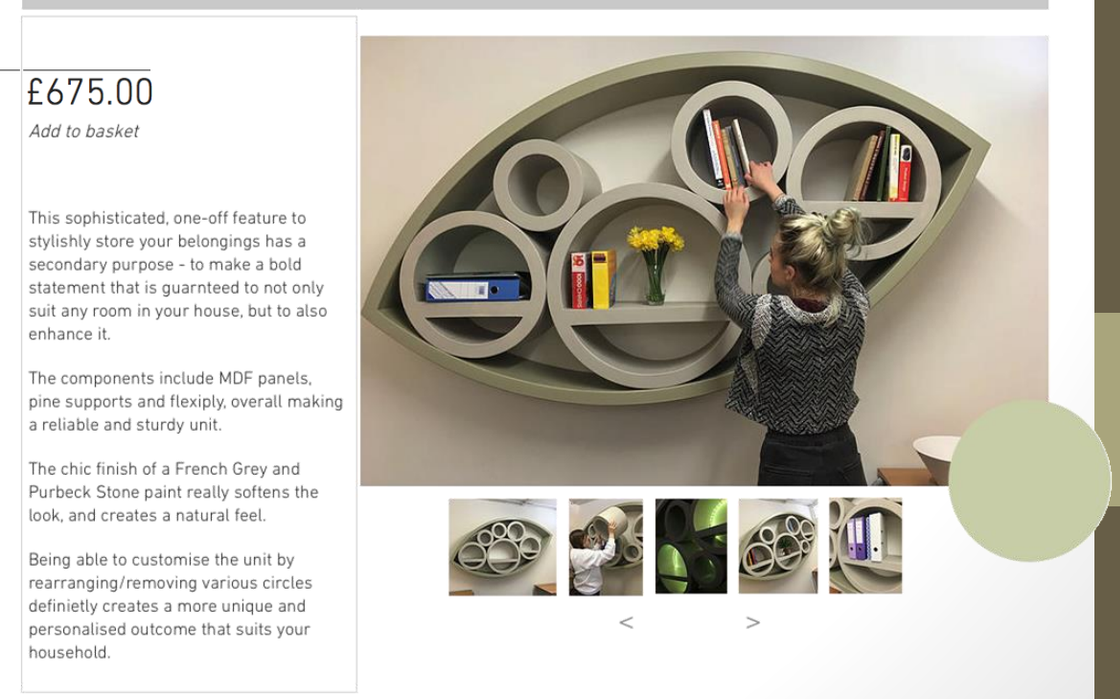


Here I have created a website using Wix to show how my product could be marketed to potential companies or customers. I have considered **branding** and **logos** that are in keeping with the design of my product. **Continuity** within my work (colour schemes, logos, fonts etc.), is important as it will make my product more recognisable to my target audience. I have kept my colour palette very neutral throughout my work, including beige, light pink, gray and green. This is in response to other similar products and companies that also have a theme of nature using pale colours, in particular pale greens, for example National Trust.

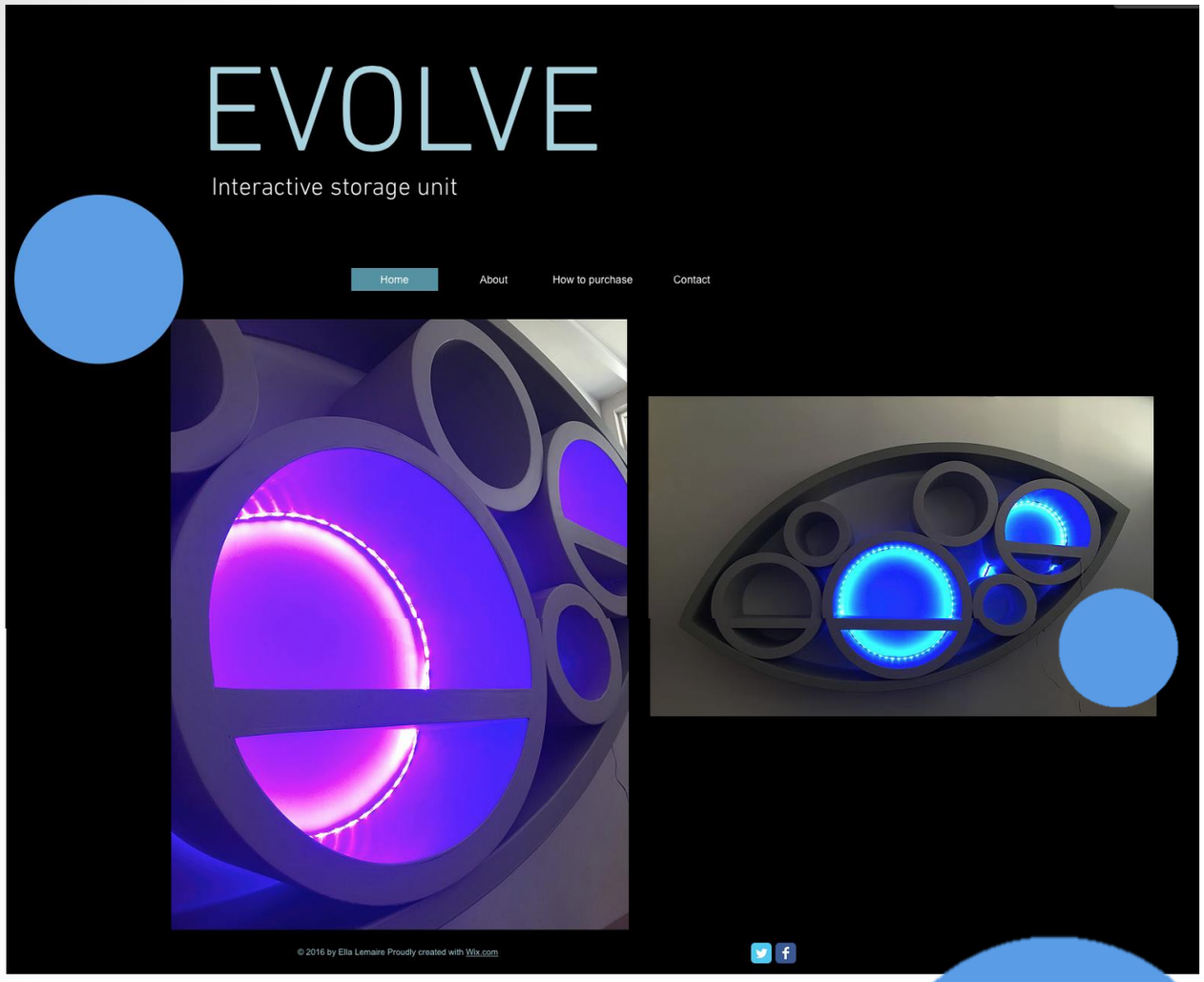
CompoClay™ National Trust National Trust National Trust

The 'Home' section on my website is very image heavy, including the final, **refined** piece of work, sophisticatedly photographed and presented, as well as more rough photos of the manufacturing process arranged in 9 circles slightly lower down. These manufacturing photos are important to show the product is a one-off design, and had lots of time dedicated to constructing it, which conveys a sense of **quality**. I have also included a brief description of the product which concisely states the intended style of the unit.

When the customer clicks on 'About', they will find information about the price, materials, finish, and the **unique selling points** (such as the interchangeable circular units). I have kept the information concise so the audience focuses on the pictures. I have included a variety of pictures here, the first one being of me interacting with the unit. I have used this picture so people can get an idea of scale, and it shows the ease of use. I have also included a picture of a peer removing one of the circles; again this conveys ease of use.



marketing and presentation



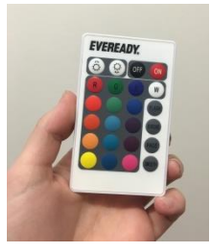
In order to broaden my target audience, I have added **LED lights** to the inside of my circles and then created another website to market this updated unit in a very different style to my previous ideas.

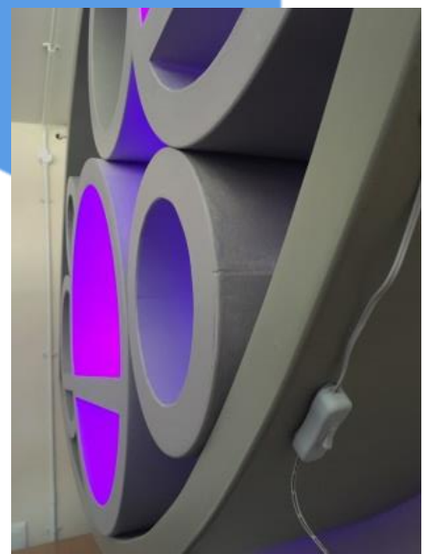
I think this design is **less inclusive** than the other style, as it probably wouldn't suit a typical household. However, it could appeal to a **younger audience** – perhaps children and teenagers, as the LEDs make the unit more interesting to look at and can also serve a **secondary purpose**, to act as a light source. The lights also add more emphasise to the structures, which I think gives a completely different feel to the unit compared to my original chic, natural look.

If I market my product to a younger audience, I would need to reconsider the **price**, as children and teenagers won't have the same income as an older audience. Therefore I should consider **reducing** the **materials and construction time** (whilst still maintaining it's **unique selling proposition**), in order to make it **affordable** for them.

In this website, I have used the same font (DIN Next Light), as in my previous design, however through the use of capitals and a neon blue colour, the affect differs dramatically. This wording (combined with the LEDs in the pictures) stands out particularly well against the black background, and I think this is something that a younger audience would be drawn to, making the promotion even more successful.

The strip of LED lights can change colours and has a variety of different settings to use such as '**strobe**', and '**fade**'. I don't think these features would appeal to my previously stated target audience.





In comparison to my other website, I have included very little information about the unit on the front page. This keeps the viewers attention solely on the pictures (in particular the LEDs). Using this technique also highlights the **unique selling proposition** to the customer - which is the interchangeable circular units in their stylish arrangement.

testing and independent evaluation

testing to the specification

Not met met

1) The storage unit must have the ability to store larger items (e.g. folders).
I believe I have met this point as there are a number of different ways items such as
folders will fit in the unit. However, if there is something that is slightly too large,
circles can always be removed to create room for it.

2) It must be suited to a typical household style.
My design isn't suited to the typical household style, as it is very modern and it wouldn't be in keeping with my client's household. This decreases my target audience size and potentially will make my shelving unit less successful when marketing to the general public.

3) It must be cost effective to manufacture.
The materials I have used for this altogether cost £145.50, which includes 3x sheets of flexiply, 4x rods of pine, a water-based undercoat paint and 2x tins of Farrow and Ball paint. However this doesn't include the cost of Contrax cutting out the panels, or the time I spent constructing it.

4) The material must be strong in order to hold heavier items.
The pine support rods I have used will ensure the unit stays sturdy and distributes weight equally across the unit.

5) To keep the unit affordable, it materials of the product must cost no more than £300.
Overall the costs of materials and outsourced service would be less than £300, however I would probably market it at about £675, due to the size of the unit, and the one off, innovative design. This is an affordable amount.

Wallingford SCHOOL 1659

St George's Road, Wallingford, Oxfords
Telephone: 01491 837 115 Fax
Email: office.4140@wallin
Web: www.wallin

Headteacher: NJ Willis
Email: head.4140@wallingfordschool.com

25th April 2016

Product Design Practical Project Costs

Student – Ella Lemaire

Material	Cost per Metre/Sheet	Total
3 Sheets Flexiply	£27.00	£81.00
4 of 2400x40x40 batons	£2.50	£10.00
Water-based Primer/Undercoat		£7.00
Laser/Model Making Material		£7.50
Grand Total to pay		**£105.50**

6) The shelving unit must be easy for the customers to use/the finished edges must be comfortable for the customer.
Clients and peers have said that due to the weight of some of the circles, it may not be that easy to rearrange it. It would also depend on the height of the unit – if it is placed quite high up then it may be dangerous to move. The edges have been sanded down, but in order to keep the design aesthetically pleasing, they are still quite sharp to create defined outlines on the structures. These may be less comfortable to use than units with more rounded sides.

7) The design must appeal to a variety of target audiences
After posting pictures of the final image on social media and asking various people to come and look at it, a lot of people were very interested in the idea, and found the design innovative.

8) Based on typical dimensions, the unit should fit onto all walls.
My client's average wall size was 2.4mx3.05m and although the unit from end to end is 7ft, it can be hung on the wall at an angle. If the wall is narrow, it can be hung with the joints at the top and bottom.

9) All materials must be recyclable so it can be disposed of in the most environmentally friendly way possible.
Flexiply and pine is recyclable, however the MDF panels are not, and would need to be incinerated or put in landfill. This makes disposal quite difficult as it would be hard to separate the MDF panels from the recyclable pine and flexiply. The MDF is made from recycled hard and soft wood residuals, so in that respect it's still fairly eco-friendly.

testing and independent evaluation

strengths

An end user states that the interactive element is handy, especially when dealing with items of varying sizes. For example if a larger item doesn't fit in a circle, the circle can be removed and a larger space is left.

The unit has a secondary function as a light source. By adding in the LED lights, not only have I increased the target audience (LEDs could appeal to a younger audience), but I have also provided customers the opportunity to personalise the unit even further.

The style of the unit is modern and sleek, with reference to shapes from nature, and a chic, sophisticated colour scheme that is universal to the majority of rooms. Therefore the product is aesthetically pleasing.

The design has a very distinguishable USP **(unique selling proposition)**, which is the modular, interchangeable element. This makes it stand out from other existing products, therefore having an advantage in marketing.

weaknesses

Where the flexiply has come away slightly from the MDF panels, there are slight gaps, meaning the faces aren't flush. The amount and size of these gaps would only increase over time, meaning it would need touch-ups every few years in order for it to have a clean finish.

The smaller circles are very light and easy to manage, however the larger circles are more awkward and heavy to rearrange. This could potentially cause a risk of injury when people reposition them.

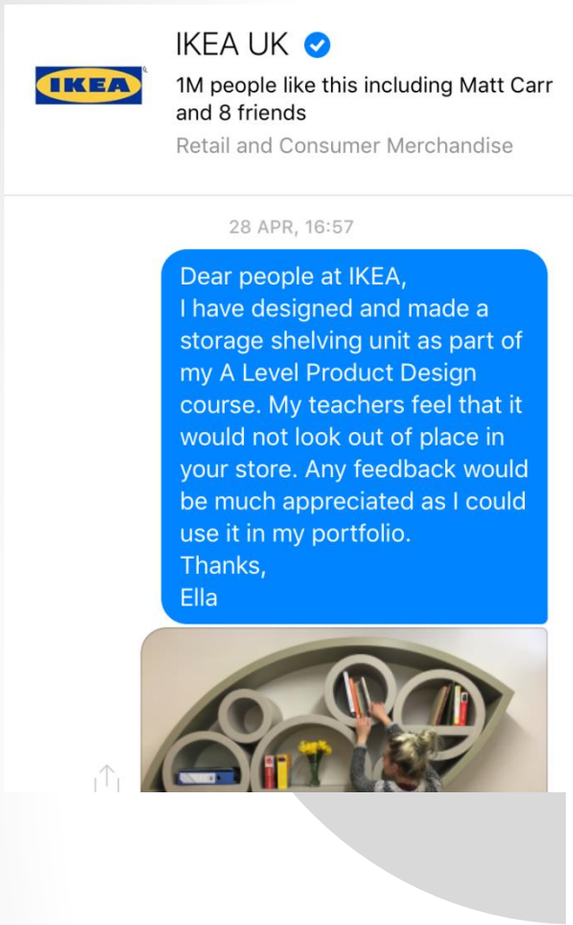
The product is very large, so there could be issues with delivery to and the assembly of the product in a smaller house. This makes the product less inclusive, as it doesn't take variations of house sizes into consideration.

When altering the composition of the circles, it may be hard to judge if all of the shelves are level. This may lead to products sliding down the shelves or even falling off. It also affects the overall aesthetics of the unit, making it look less professional.

testing and independent evaluation

independent evaluation

Here I have gathered feedback from peers, my client, potential end users and from **IKEA** in order to reflect on my final product.



I got in contact with an **IKEA** employee through Facebook, and asked for some feedback on my unit. Some strengths included the **modular capabilities** and the **lighting element**. However, due to it's unusual shape, it would be difficult to manufacture an item like this, as IKEA only sell **flat packed** furniture. This was helpful as it made me think about the packaging and delivery of my product, and that perhaps it's not very **practical** or **eco-friendly** to batch produce and package.

Hi Ella,

Thanks for your message. I have to say that this is one impressive unit! Shame I can't get hold of one!

I would like to praise the design with it modular capabilities which is something IKEA do enjoy being able to offer. The lighting also offers a great contrast and adds a very special flair

Constructively the only section I would critique would be from an IKEA perspective we would find it hard to produce something like this due to the rounded shapes being hard to package without being "flatpack".

Thanks for sharing this! If it were up to me that would get an A* 😊

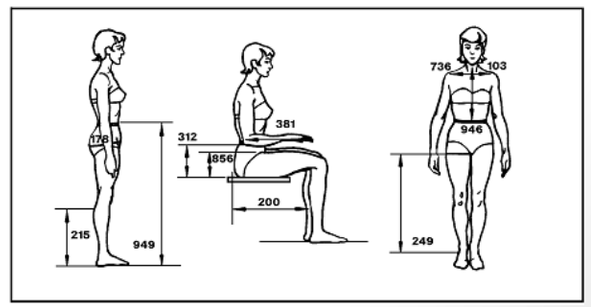
Connor
IKEA UK

Client testing

I arranged for my client to test out my product here using some items. He mentioned that he really liked how the unit could be '**personalised**', through the use of different coloured LED lights and various arrangements of circles, which could match different rooms. He also said that it was very '**accessible**', as there aren't any doors on them, and it can be arranged depending on the customers height. One issue he brought up was that it was very large, so this would make delivery hard, and that I should consider **'producing a range of sizes'.**

Testing

I asked a representative of my target market to conduct a test on the unit, involving placing her everyday items onto the shelves and rearranging the individual circles to suit her needs. As is shown in the photo on the right of her placing folders into the unit, the
shelf in the largest circle is easily accessible and is at a suitable height for her to place the item with ease, suggesting that anthropometric data has been considered. As shown in the photos to the right, she is easily capable of organising the circles and placing them where she desires, with minimal effort. This can suggest that the circles are lightweight and
easy to maneuver.



independent evaluation

After posting pictures of my product on social media sites such as **Facebook** and **Instagram** as a trial advertising strategy for marketing, I received many comments and a few questions about the idea and production of the unit, such as what materials I used. I was also given some constructive criticism regarding the **practicality** due to the size. After seeing the responses, I think advertising online would be a successful form of marketing.

Wallingford School

Wallingford School added 3 new photos.
Wednesday at 09:39 ·

You may remember our post last week with the rather unusual sight of Ella, Year 13 in what looked like a boat...!

This week we are proud to present the finished product, Ella's leaf shelf...a stunning design!

You, Adam Paxford and 248 others

Tim Titchener
Love to see some details on how this was produced. Very interesting design. Well done on high quality product.
Wednesday at 18:51 · Like · Reply

Faithy King
I would definitely recommend Rycotewood furniture college if she wants to develop in design or make. (I'm currently studying my BAhons)
Wednesday at 17:52 · Like · 3 · Reply

Faithy King Replied · 2 Replies

Rachel Smith
Absolutely fab! Congratulations Ella.....and Mrs Wright as well 👍
Wednesday at 17:44 · Like · 1 · Reply

Donna Isaac
Blood, Sweat and tears but well worth it xx
Wednesday at 22:58 · Like · Reply

Anne Maureen Bridgeman
When is it going into production?
Wednesday at 21:07 · Like · 1 · Reply

Lizzie Tandy
Beautiful! Great piece 😊
Wednesday at 10:02 · Like · Reply

Claire Louise Jury
Stunning piece of design!
Wednesday at 09:40 · Like · Reply

Sarah Millward
Wow..That's lovely. Well done!
Wednesday at 11:59 · Like · Reply

Trish Earl
Lovely, well done
Wednesday at 16:03 · Like · Reply

Selma Mian Halsall
Superb. Very original
Wednesday at 11:57 · Like · Reply

Fiona Prince
Wow amazing !!
Wednesday at 10:42 · Like · Reply

Yvonne Hammond
That's lovely!! Can all the parts inside move around?
Wednesday at 19:57 · Like · 1 · Reply

Rachel Littlewood
Wow! Well done Ella 👏😁 x
Wednesday at 10:14 · Unlike · 1 · Reply

Emma Jane
That's seriously impressive! I hope nobody copies this 😕
Wednesday at 21:48 · Like · Reply

Margaret Bowler
Had a look at it today, it's fantastic. Well done!!
Wednesday at 19:18 · Like · Reply

Susie Barber
That is really impressive! Well done
Wednesday at 12:18 · Like · Reply

David Ross
Fabulous. Glad to be part of the "running errand team "
Wednesday at 15:47 · Like · Reply

Sian Hawkes
That's beautiful x
25 April at 22:44 · Like · 1 · Reply

Graham Pitt
oh wow that looks amazing well done Ella
25 April at 22:45 · Like · 1 · Reply

Heidi Harris
Very cool
25 April at 23:54 · Like · 1 · Reply

Emily Bowers
That's fantastic!
26 April at 04:17 · Like · 1 · Reply

Jane Ellingworth
That is so cool! X
26 April at 09:22 · Like · 1 · Reply

Jan Parkinson
That is absolutely brilliant!
26 April at 11:53 · Like · 1 · Reply

Peter Eldridge
Can I please put in an order for a garden shed
26 April at 12:16 · Like · 1 · Reply

Sinead Quinn
Oh wow !! That's fantastic .
Wednesday at 09:56 · Like · Reply

Helen Moss-Black
I love this! Impressive stuff.
Saturday at 13:53 · Like · Reply

Petra Rushton
Wow. Fabulous.
Wednesday at 10:45 · Like · Reply

Helen Archer
I love it
Wednesday at 16:20 · Like · Reply

Claire Gorvin
This is amazing!
Wednesday at 10:15 · Like · Reply

Becky Maitland
Fantastic - I love it!
Wednesday at 10:04 · Like · Reply

Sue Cleaver
This is brilliant
Wednesday at 20:31 · Like · Reply

51 likes

deanydesigns 6d
The amazing coursework piece one of my 6th formers has made 🔨🍴✒️✏️💚💚💚

flamingbeads 6d
Oh my❤️❤️❤️ I'd have this in my home😃👍x

pandagourgh 6d
Wow!

kirstymcalynn 6d
Wow!!!!

creativelypaleo 6d
That is amazing! 👏🏻

pedrosplaques 6d
Oh wow!!

frofunky 6d
Oh my goodness 😍I'd buy that 👌🏾

lexiemakes 6d
Wow!

parisloopy 6d
That is amazing!

apocketfullofclouds 6d
That's brilliant! What's it made from? It looks like concrete but I'm guessing it would be too heavy x

deanydesigns 6d
@apocketfullofclouds it's made of pine, MDF and flexiply... Has got a bit of weight to it....

apocketfullofclouds 6d
It's very clever, I see a bright future ahead!

feistytapas 6d
Amazing design

review and reflection

My original design brief: At the beginning of my project, I aimed to introduce a multipurpose storage unit to be hung on a hall, that has a new and innovative style , appealing to a variety of audiences in need of storage space. The product should not impede upon the customers current living area and should conform to the average household style in order to make it realistic for selling.

Looking back at my brief now, I feel like there are some sections I have met, however others not as much. The multipurpose element has been met, as the circular units vary in sizes, allowing different household items to be stored in them. The multipurpose element could also refer to the LED light feature I added. After receiving third party feedback from a selection of potential end users and clients, I would say that the style is generally inclusive to a variety of people, and not exclusive to one audience. However, the size of the product has been critiqued by a few people that represent the target audience, as it may not fit in their homes, and therefore could possibly impede upon their current living area.

Decisions I made during designing: When I first starting designing my product, I focused on the use of individual circular units with shelves. These were a good starting point, as I then went on to look at a way of connecting these circular units, through slightly haphazard and unusual shapes or even LED lights. Although these designs had an organic, flowing structure to them, they didn't look as refined as existing products, and didn't have a distinguishable USP, which would have made them less successful in marketing. Next, I took a more linear approach to my designs, whilst still incorporating a circle theme in the design somewhere. These looked more professional due to the regular structures. By experimenting with the structure that encased the circles, I then came to the leaf design.

Solutions to problems:
I had three main problems I needed to address, which were to do with the functionality of the average unit, in that sometimes larger items don't fit, the availability of space in rooms for furniture, and the general aesthetics of a standard unit. In terms of functionality, I think I have found a suitable solution through creating individual, interchangeable units which can provide extra space for large items when removed. Although my unit is wall mounted, it is still very large, and there may be difficulty with the packaging, delivery and assembly of the unit. I don't think I have addressed this problem as well as I could have, so if I were to manufacture another, I would perhaps consider creating a smaller scale version with more attention given to the packaging. Aesthetically I think I have achieved my goal of designing a modern and stylish unit, and believe there is definitely a gap in the market for a product of this design.

Quality of control in making:
Throughout the making process, I took various measures to ensure that my end product would have a high quality and professional finish. This included using a measuring tape to measure the inside and outside of the MDF panels in order to cut the correct size flexiply that would fit securely in/around the circular units. Once the PVA had dried between the panels and supports, I used a planer to ensured that the pine supports were flush with the MDF panels. This would ensure a smooth finish when adding the flexiply. Sanding and filing was a large part of the quality control process, and it was here that my product started to take the form of a final, refined, professional piece of furniture.

Problems that arose during the making:
One of the first problems I encountered was that the PVA glue took a long time to dry which slowed down the manufacturing process, as I had to leave the structures for at least 24 hours before doing anything else to them.
Another problem I found was that when I was weighing the glued support rods down to ensure they stuck, the weights were sometimes accidently moved or jogged by people, which lead to the support rods pivoting slightly. Even with one rod slightly off centre, it meant that the finished product wasn't perfectly aligned and therefore gave the appearance that it was wonky.
When gluing the flexiply sheets to the inside and outside of the circles (not so much on the large leaf shape), it didn't stick down in some places. This left gaps between the MDF panels and flexiply. I was able to fill in these gaps afterwards with decorators caulk, and once this was painted over, it wasn't noticeable.

Industrial and commercial production:
In order for my product to be successful on an industrial scale, there are a few things I would need to consider. Firstly, the manufacturing method would need to be a lot more efficient if I was to batch produce it. One way I could ensure it is efficient is by rearranging the layout of all components on the MDF sheet to get the most amount of panels cut out of one piece as possible, this would save materials in the long term, therefore reducing costs. I should also consider how to get a high quality finish without spending as long on it; using spray paint could be a quicker and cheaper alternative to painting, and could also potentially create a more flawless finish.

review and reflection

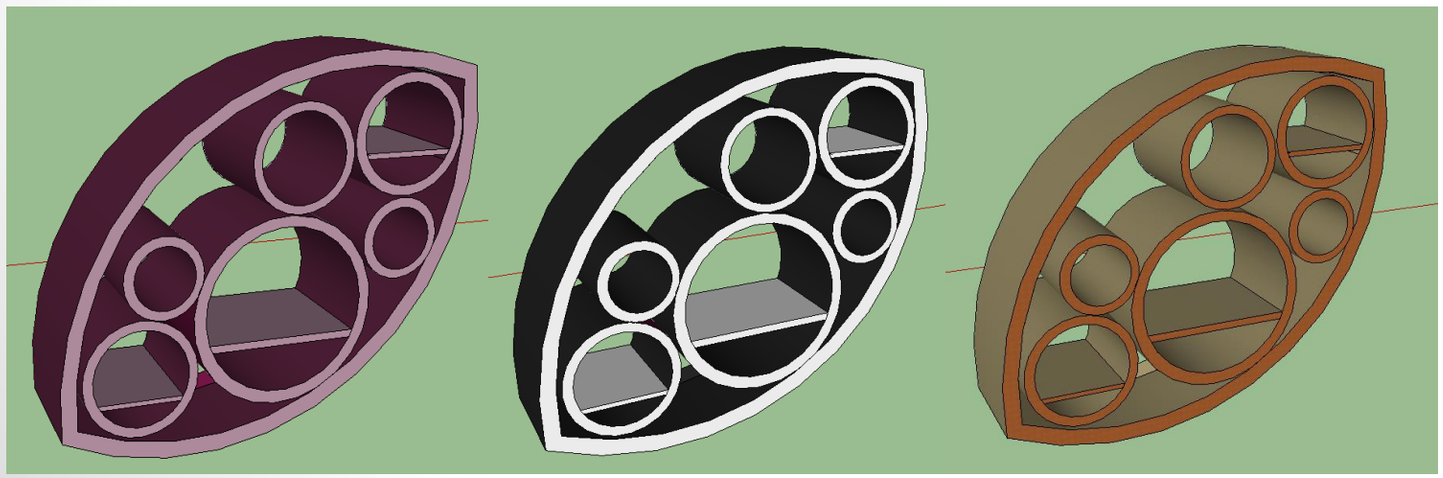
wider impact

Life-Cycle Analysis

1) **Raw material acquisition** – The MDF I used came from recycled hard and soft wood residuals, which required energy to produce. Pine support rods came from harvesting pine trees, which also requires energy to produce. The flexiply is from a renewable source, made from ply. Flexiply would require the most amount of energy to produce due to the three thin layers.
2) **Material processing & transportation** – Transporting the materials to the factory, this may be a global process depending on where the materials are bought. It would also involve the transportation of the finished product to retail outlets.
3) **Product manufacturing & assembly** – As I constructed my product in school, (apart from the MDF panels), I relied on the school to provide the energy for the lighting and machinery, whereas commercially, I would need to provide the energy for lighting, heating, machinery etc. for the workers.
4) **Product life** – Using my product without the LEDs would require no energy, apart from using a power tool to drill the product into the wall. If the customer decides to include the LED lights, the energy impact would still be very little as power consumption is rated at 12W
5) **End of life** – The flexiply and pine structures are recyclable, however As MDF isn't recyclable, it would either need to be incinerated or put in a landfill site.

Success of product in market-place

If my product was sold commercially, I think it would be successful for a number of reasons. The first reason being that it has a very distinguishable USP, that fills a gap in the market. Another being that it has a very sleek, modern design with neutral colours that has the potential to suit many household styles. Another reason is I think it would be successful is due to the secondary function as a light feature. The LEDs add a twist to the originally chic design, and therefore extend the target audience to people who are looking for a more exciting design. One reason that it may not be successful if manufactured commercially would be due to the immense size.



Moral, ethical & sustainable issues

- To introduce a new product on the market, I would need to employ people to manufacture the unit, therefore decreasing unemployment levels in the local area.
- I should consider the code of conduct, and provide a safe workplace for the people manufacturing the product. Quality control checks and risk assessments would need to be carried out to ensure the work stations are safe to use.
- The product is safe for people to use as there are no small pieces, however when moving the interchangeable units, its possible for people to trap their fingers.
- All of my products are manufactured from different types of wood, which can be grown, so the materials are sustainable and there is no risk of shortage. However I need to carefully consider how it would be best to source these materials (where from).

Economic/manufacturing issues

- Only using three types of wood makes manufacturing easier. MDF, pine and beech (flexiply), are relatively cheap and easy to source, so I wouldn't need to purchase these raw materials globally. This is beneficial to the economy as it supports local businesses selling wood, and also won't leave a large carbon footprint.
- As I have made my product as a one-off, I have only bought enough material for one unit. Commercially, I would need to purchase a lot more material, however buying in bulk would actually reduce costs in the long term, and therefore create a larger profit margin in retail.

Future developments

To develop my product further, I should think of a way that I can package and deliver it with more ease, using less protective equipment such as bubble wrap. This could be done by decreasing the size of the product, or at least providing a variety of different sizes to buy. Another development I could consider is the finish. A neutral colour scheme works well in most houses, however, some people might look for a piece that looks funky with bright colours, or alternatively, an even more natural finish that focuses on a good quality wood and varnish.