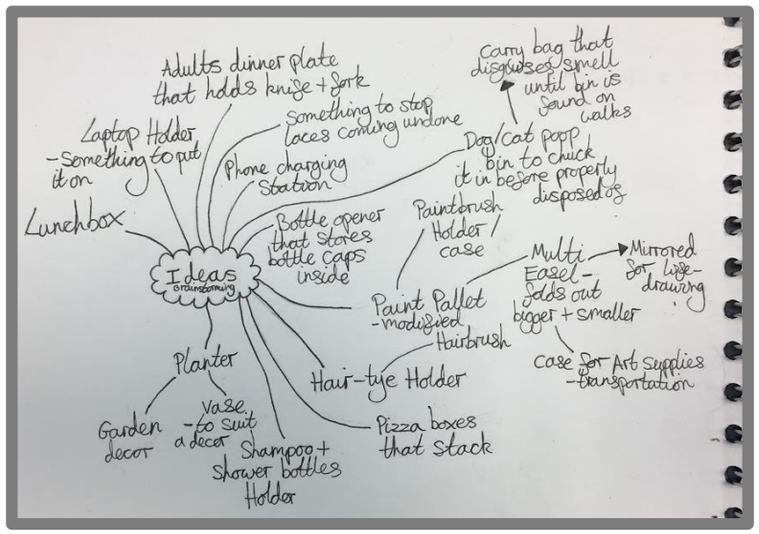
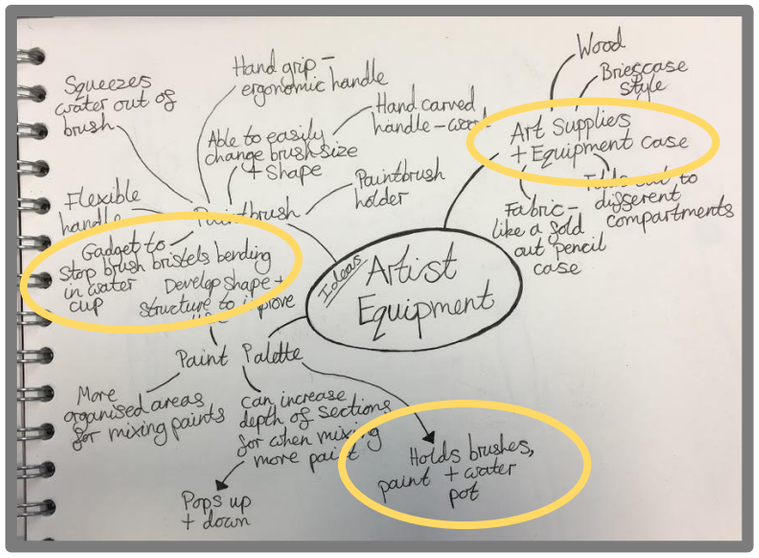
A2 Project

Cerys Organ

6124

1. Investigations of the context

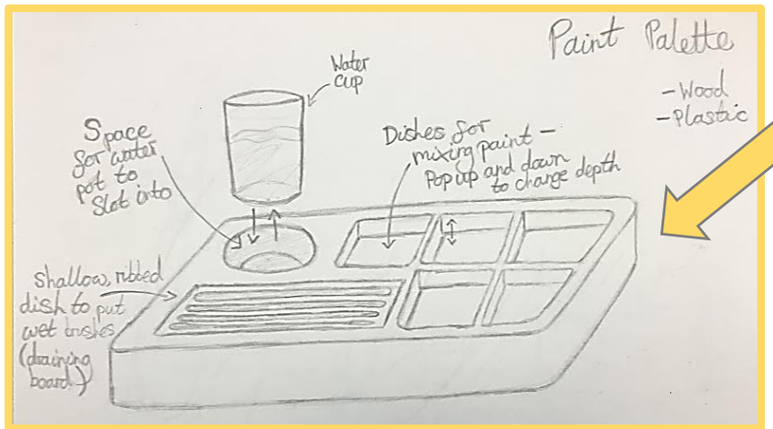




I showed an A-Level Art Student my design ideas to find out what she liked the most.

I brainstormed a variety of ideas for what my 'innovative' product design could be. I came to the decision that I wanted my **Target Market** to be **Artists**.

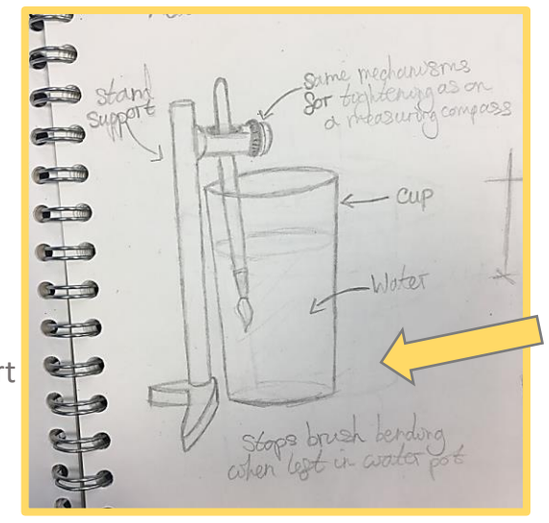
Multifunction Paint Palette Idea



My stakeholder **Rachel** liked the idea of having a product that **has elements for all the different needs** whilst painting; *"This would be useful for schools as students would be able to keep their desks tidier."*

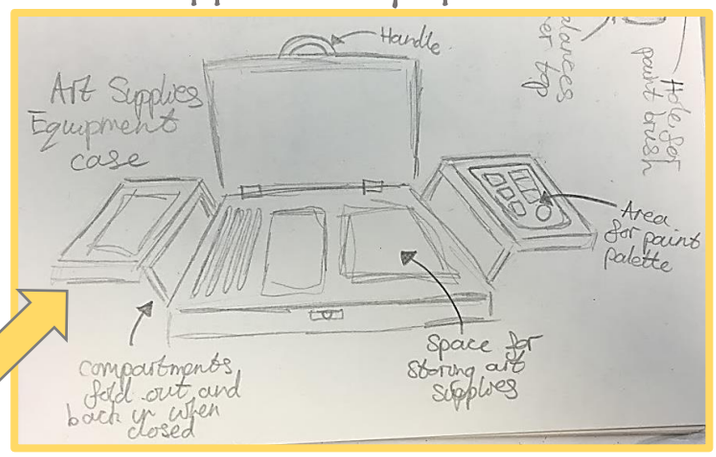
I want to design something that makes it **easier** for artists to **use** their **materials** and improves the quality of their experience painting.

Paint Brush Holder



My stakeholders **Anna** and **Kay** liked the idea of having a **small, compact gadget** that helped to keep their brushes in good condition.

Art Supplies & Equipment Case



I picked out 3 ideas to discuss with some potential end users and came to the conclusion as to which product would have the **most market potential**.

I discovered that this idea has already been done lots of times before and there are a lot of good **existing variations** of Art equipment cases already – not very innovative.

hobbycraft

2. Design Brief

Design Brief

I am intending to design and produce a prototype for a paint brush holder. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an **innovative** and **practical** design that is easy and simple to use. The main purpose of the holder is to **prevent** brushes becoming **permanently misshapen** after being left in a water glass.

Potential Users/Stakeholders

My target market will most likely involve anyone interested in art and more specifically, painting.

Anna Kirby: A Level Art Student at Wallingford Sixth Form - *"I do painting regularly as I am always doing projects for school, I would definitely be interested in investing in something that has the potential to keep my brushes in good condition."*

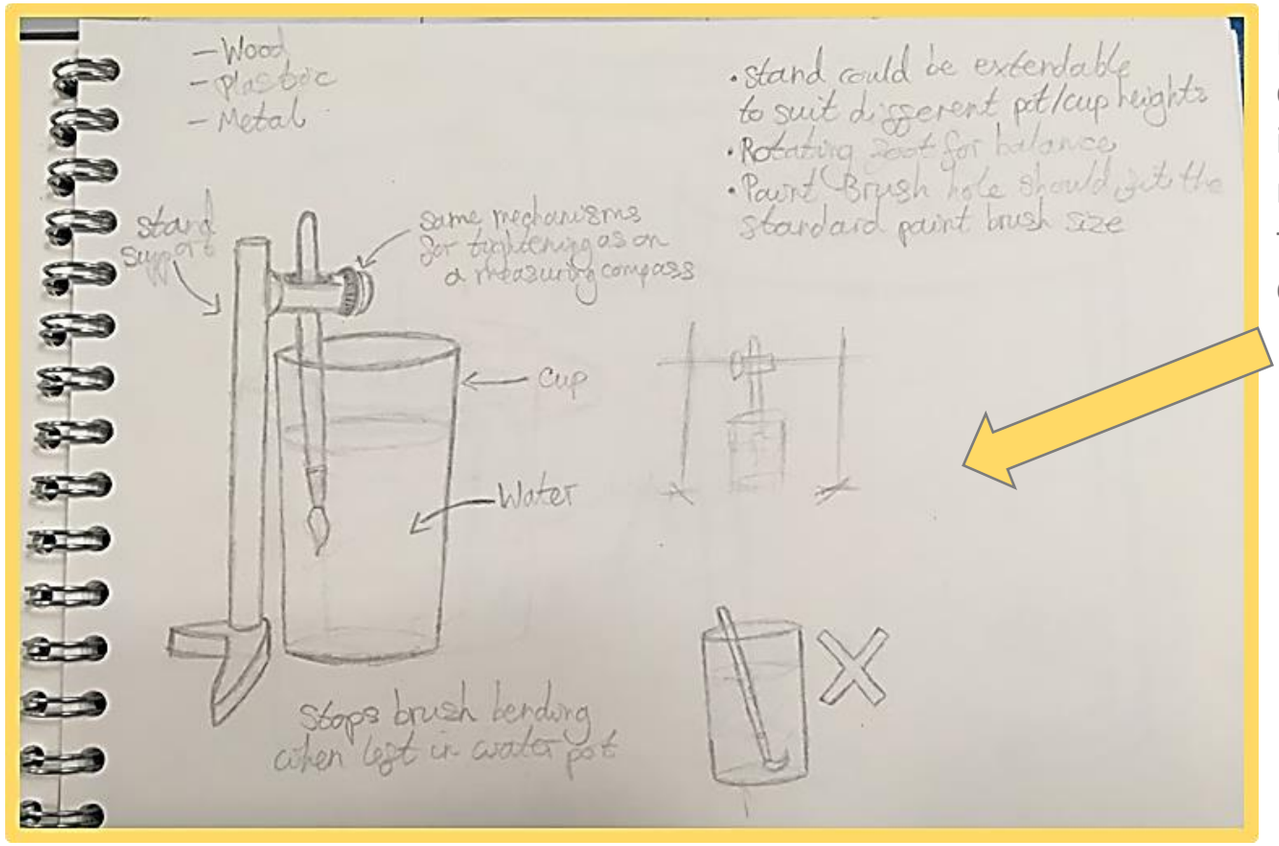
Rachel Ellis: Art Teacher at Wallingford School – *"I teach a lot of students who are constantly using the paint brushes supplied by the school. It is difficult to maintain the condition of the paint brushes we use as they are often left in pots for long periods of time which results in them becoming damaged and unusable."*

Kay Organ: Casual Artist – *"I am a stay at home mum and I often have other jobs I need to keep on top of, as well as painting. Sometimes I have to abandon painting to go and do something else so I would definitely benefit from something to help keep my brushes in good condition."*

General Issue; When painting, artists often use multiple paint brushes at once, tending to leave them in the water glass whilst using a different brush. This is an issue because it can cause permanent damage to the brush as it becomes misshapen – making it useless for painting.

The hairs on the brush get bent at an awkward angle which makes painting **difficult.**

This is the problem that the holder will be designed to prevent.
As you can see, the bristles bend over when the brush is in the glass/pot.



I sketched out the concept of my initial idea to give me a starting point for what I want to create.

Important Initial Technical Considerations:

- Height
- Adjustable Element
- Balance and Weight
- Paint Brush Sizes

3. Investigation of Existing Products & Designs

Most similar existing designs are <u>temporary</u> structures that have been <u>handmade</u>. They therefore **lack visual and technical details** and would not be successful as end products. But as you can see it is a problem that people have tried to solve.

I asked my stakeholders what they liked and disliked about these similar existing products

"I like the contrast of the clear plastic with the wood as it makes the holder look less chunky and more open." – **Kay Organ**

"I like that these designs hold multiple paint brushes at once." – **Anna Kirby**

Not very attractive designs

"I like how this design clips onto either side of the water container. It seems to be made to fit only one size – would be more practical if adjustable." – **Rachel Ellis**

More stylised design, attractive - metalwork

Can hold different sized brushes

Made of polystyrene – not very sustainable

Will fit onto most paint buckets – adjustable. Quick and easy to use

More practical to transport – smaller scale.

Only holds 1 paint brush at a time – better suited for larger brushes

Holds paintbrushes above/out of water/paint

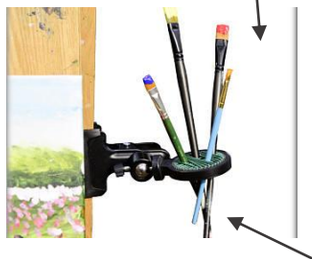
"I think this design has a clever concept as the paint brush is held by a magnet." – **Kay Organ**

Negative – Relies on all paint brushes having a magnetic element.

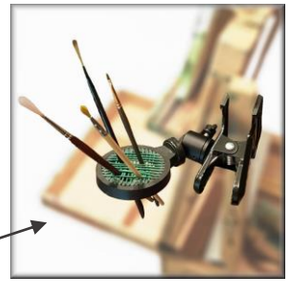
Plastic – strong and durable

Lacks colour but has a monochrome look to it – unlikely to offend anyone

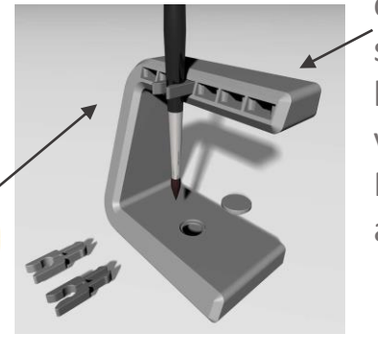
Strong, sturdy clip to attach to easel, can adjust to sit at different angles.



Woven rubber/string stretched across a metal circle – grips brushes when poked through gaps.



"I don't think it has a very artistic feel to it – lacks colour." – **Anna Kirby**



inter-changeable sized clips to hold brushes of various sizes. Modernised appearance.

My product would most likely be sold in ***small, local art shops*** alongside other similar products that **help make artists lives easier**. Most artists buy their supplies from sources close to them. Often artists need certain supplies unexpectedly, if my product was sold alongside other useful art gadgets it would attract the attention of the target market.

4. Investigation into Market Potential

My product would most likely have a market potential with **schools** and **art supply shops**.

I visited Poppy Craft, a small Arts and Crafts supply shop in Wallingford.

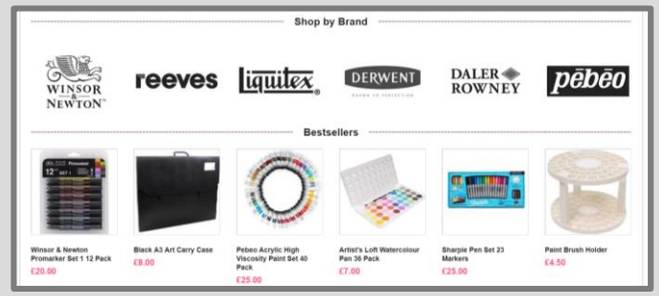
They often hold craft events where they teach people how to do a variety of different things, often involving some painting. My product would help keep the work spaces tidy.

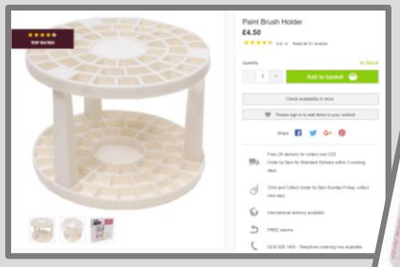
It sells products such as ***ink cartridges, block stamps, paint, paper, stencils*** and other small things that artists/crafters might need.

My product would sell well alongside other similar products sold in this shop. **Some of the brands they sell are;**

- Sizzix, ranger, DCWV, graphic 45, Wow, paperArtsy, Dovecraft, BoBunny, DecoArt, Prima, Sweet Dixie, Trimmits, Stixx2, Cosmic Shimmer product and Decopatch.

Hobby Craft, is a large Arts and Crafts supply Company.





Product description

This **paint brush holder** is ideal for storing a wide range of different size brushes. By storing upright, bristle shape is maintained by allowing the brushes to dry naturally which helps to extend brush life. It also makes finding the brush you want easier!

- Compact and easy to dismantle and store
- Brushes not included

Hobbycraft Brush Stand

Product code: 566734

The most similar product to my idea that they sell is this Paint Brush Holder. **One problem** is that if you use it to dry wet brushes, the water/paint will drip down the handle because they are held upright rather than upside down.

Organised at last

01 Sep 2018

GENERAL CRAFTS INTERMEDIATE

alahpainter

Fed up with having all my brushes stuffed into jam jars I bought three holders and can now find the right brush immediately A well made, sturdy product.

0 0 Report

4 / 5

Good item

29 Aug 2018

Debn1

This brush holder is sturdy and holds a good amount of brushes.

0 0 Report

5 / 5

Brush holder

25 Aug 2018

Jorjie

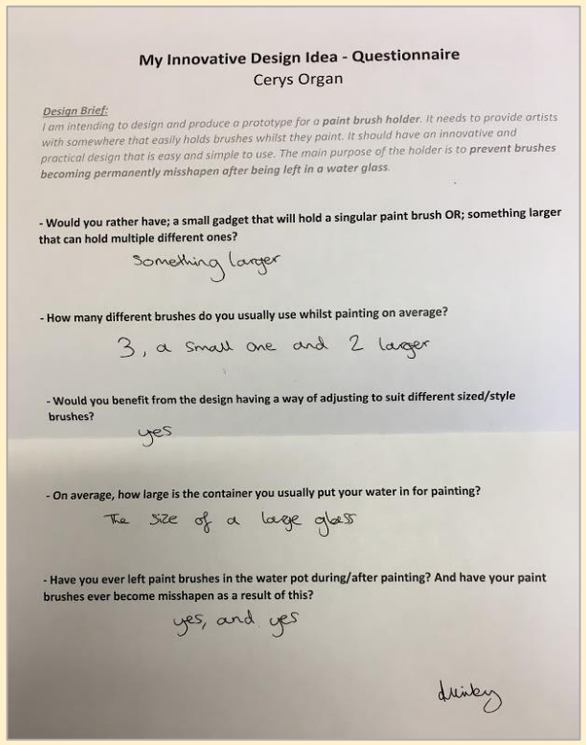
Really handy for when painting. It's cheap but good for the money. Easy to put together and to take apart, therefore does not take up storage space when not using.

I think my product would offer people an alternative that is more practical for painters.

My product idea will appeal to these companies because it would be popular with their target markets.

Technical Requirements: ***Sturdy, holds multiple paint brushes of a variety of sizes, compact and easy to store***

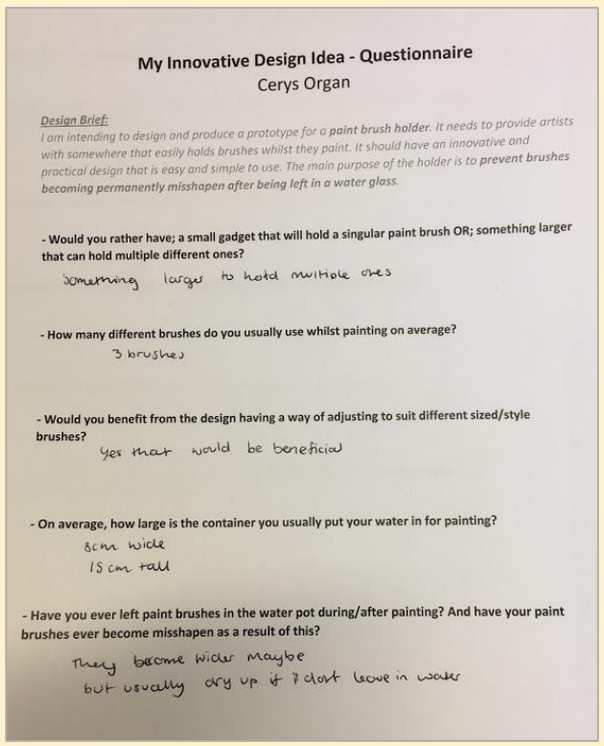
5. Market Potential & Stakeholder Feedback



My Innovative Design Idea - Questionnaire
Cerys Organ

Design Brief:
*I am intending to design and produce a prototype for a **paint brush holder**. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an innovative and practical design that is easy and simple to use. The main purpose of the holder is to **prevent brushes becoming permanently misshapen after being left in a water glass**.*

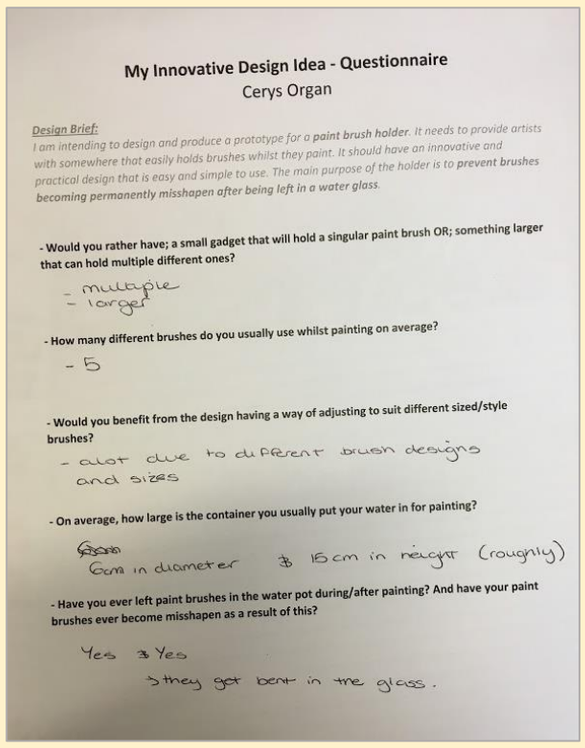
- Would you rather have; a small gadget that will hold a singular paint brush OR; something larger that can hold multiple different ones?
  Something larger
- How many different brushes do you usually use whilst painting on average?
  3, a small one and 2 larger
- Would you benefit from the design having a way of adjusting to suit different sized/style brushes?
  yes
- On average, how large is the container you usually put your water in for painting?
  The size of a large glass
- Have you ever left paint brushes in the water pot during/after painting? And have your paint brushes ever become misshapen as a result of this?
  yes, and yes



My Innovative Design Idea - Questionnaire
Cerys Organ

Design Brief:
*I am intending to design and produce a prototype for a **paint brush holder**. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an innovative and practical design that is easy and simple to use. The main purpose of the holder is to **prevent brushes becoming permanently misshapen after being left in a water glass**.*

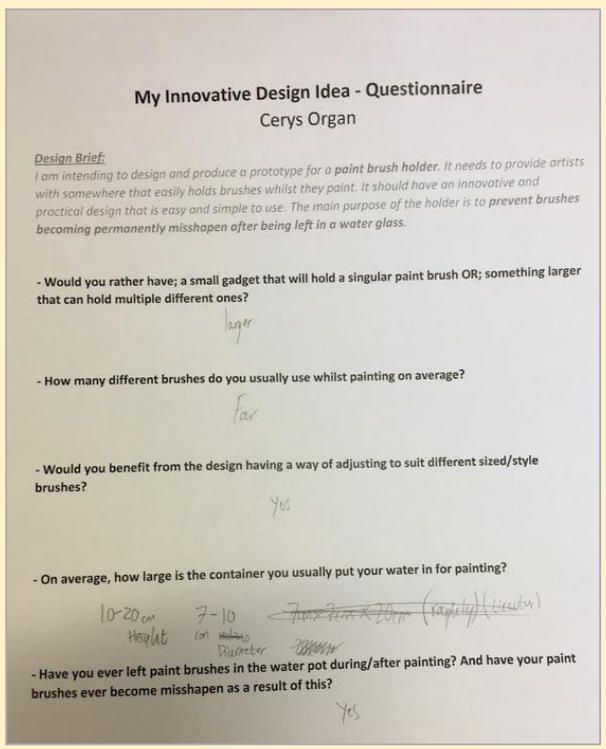
- Would you rather have; a small gadget that will hold a singular paint brush OR; something larger that can hold multiple different ones?
  Something larger to hold multiple ones
- How many different brushes do you usually use whilst painting on average?
  3 brushes
- Would you benefit from the design having a way of adjusting to suit different sized/style brushes?
  yes that would be beneficial
- On average, how large is the container you usually put your water in for painting?
  8cm wide
  15 cm tall
- Have you ever left paint brushes in the water pot during/after painting? And have your paint brushes ever become misshapen as a result of this?
  They become wider maybe
  but usually dry up if I don't leave in water



My Innovative Design Idea - Questionnaire
Cerys Organ

Design Brief:
*I am intending to design and produce a prototype for a **paint brush holder**. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an innovative and practical design that is easy and simple to use. The main purpose of the holder is to **prevent brushes becoming permanently misshapen after being left in a water glass**.*

- Would you rather have; a small gadget that will hold a singular paint brush OR; something larger that can hold multiple different ones?
  - multiple
  - larger
- How many different brushes do you usually use whilst painting on average?
  - 5
- Would you benefit from the design having a way of adjusting to suit different sized/style brushes?
  - a lot due to different brush designs and sizes
- On average, how large is the container you usually put your water in for painting?
  6cm in diameter & 15cm in height (roughly)
- Have you ever left paint brushes in the water pot during/after painting? And have your paint brushes ever become misshapen as a result of this?
  Yes & Yes
  > they get bent in the glass.

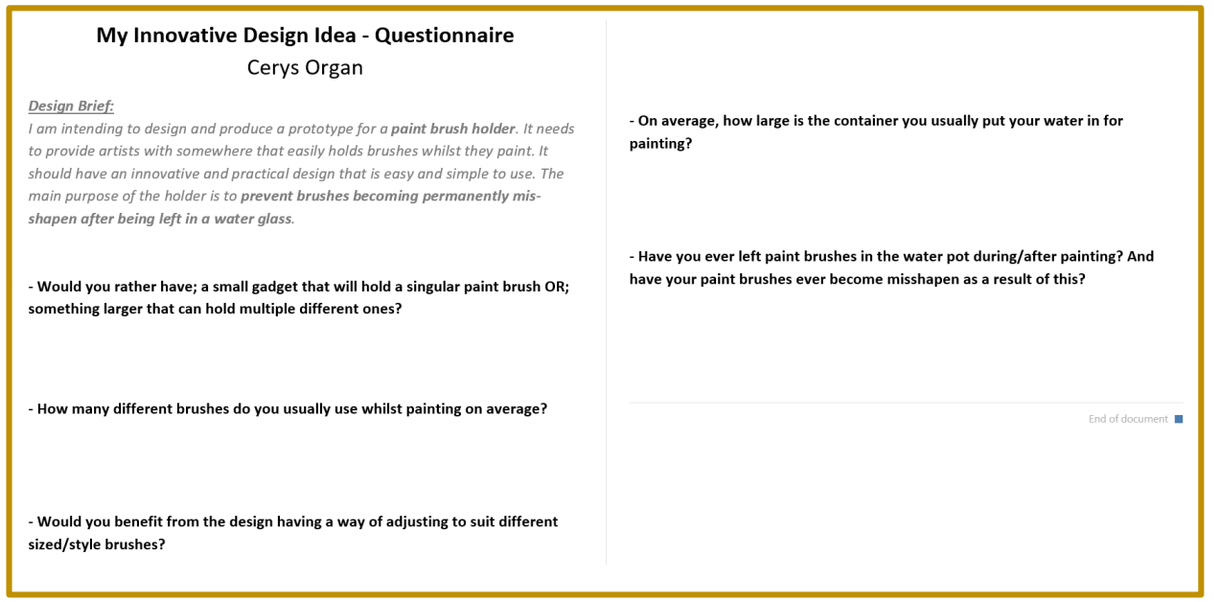


My Innovative Design Idea - Questionnaire
Cerys Organ

Design Brief:
*I am intending to design and produce a prototype for a **paint brush holder**. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an innovative and practical design that is easy and simple to use. The main purpose of the holder is to **prevent brushes becoming permanently misshapen after being left in a water glass**.*

- Would you rather have; a small gadget that will hold a singular paint brush OR; something larger that can hold multiple different ones?
  larger
- How many different brushes do you usually use whilst painting on average?
  four
- Would you benefit from the design having a way of adjusting to suit different sized/style brushes?
  Yes
- On average, how large is the container you usually put your water in for painting?
  10-20cm Height, 7-10cm Diameter
- Have you ever left paint brushes in the water pot during/after painting? And have your paint brushes ever become misshapen as a result of this?
  Yes

I made a **Questionnaire** to help me gather information on potential important factors for my design and got students from an art class to fill it out.



My Innovative Design Idea - Questionnaire
Cerys Organ

Design Brief:
*I am intending to design and produce a prototype for a **paint brush holder**. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an innovative and practical design that is easy and simple to use. The main purpose of the holder is to **prevent brushes becoming permanently mis-shapen after being left in a water glass**.*

- Would you rather have; a small gadget that will hold a singular paint brush OR; something larger that can hold multiple different ones?
- How many different brushes do you usually use whilst painting on average?
- Would you benefit from the design having a way of adjusting to suit different sized/style brushes?
- On average, how large is the container you usually put your water in for painting?
- Have you ever left paint brushes in the water pot during/after painting? And have your paint brushes ever become misshapen as a result of this?

End of document

In conclusion from this feedback, it is clear that these students experience the problem I am attempting to solve. Overall, it seems that they would prefer a holder that can hold **3-5** paint brushes of **different** size and work with a **fairly large** water pot/glass (**10-20cm tall, 6-10cm wide**)

6. Market Potential & Non-Technical Specification

I visited an Art class at **Wallingford school** whilst the students were busy painting to find out how they lay out their art supplies when working.

The Paint Brush not in use is left in the water pot - will get **damaged**

The amount of space taken up by a paint palette & water pot is on average about **210 × 297mm**

Different artists work differently and set up their spaces in different ways, but **the common mistake of leaving paint brushes face down in water when not in use seems to reoccur a lot**.

My design needs to tackle this problem and meet specific requirements to improve artists experience while painting.

These are some of the needs and wants I have collected from stakeholders and potential users that my product will need to fulfil in order to be suitable for my target market.

I need to research into different ways of making my paint brush holder **adjustable** to **fit different brush sizes** as this is a main technical element that needs to be met in the final product.

If my product was to be sold to **schools**, I would need to take costs into consideration as they have **a restricted budget for Art materials and supplies**.

Average Budgets:
- Primary Schools in 2016/17 = £1,048,000
- Secondary Schools in 2016//17 is £4,617,000

Average Amount Spent on Resources:
- Primary Schools spent £41,780 on school resources in 2016/17
- Secondary Schools spent £172,560 on resources in 2016//17

The **Wallingford School Art Department** gets £1,000 to spend on art supplies, materials and equipment **each year**.

Non-Technical Specification

Potential User & Stakeholder Initial Needs and Wants	Requirements	Reasoning
Structure & Functions	Strong and sturdy base, balanced Suitable Size and Scale Can hold paint brushes of different sizes (adjustable?) Durable Material (such as plastic)	- Won't tip over when in use - Doesn't take up too much space in a workspace - Artists use lots of different sized brushes - Won't break and will last a long time
Other Elements	Easy to Clean Compact & easy to store Attractive Design Affordable	- To clean off paint after use - Doesn't take up lots of space when not in use - Blends in with surroundings/doesn't look obscene or out of place - Broader range of potential buyers

7. Exploration of Materials & Possible Technical Requirements

Because artists use paint brushes of a variety of sizes, it is **important** that the holder fits the majority of paint brushes used most often by artists.

Measuring Compass

The **adjustable** concept that measuring compasses use to hold a pencil in place **could work for holding paint brushes.** It is a very simple concept but it works effectively.

There is a designated hole for the pencil to fit through, it is **held into place by winding a plastic wheel** so that it sits tightly against the pencil.

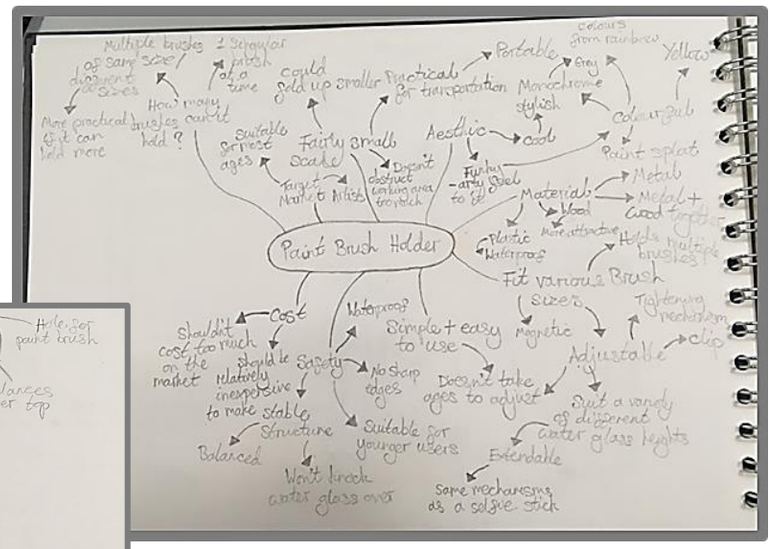
Pencil held in place

Neodymium Magnet - 5mm

These magnets are **small and lightweight** and can be **easily embedded into things**. They could be useful for holding paint brushes in place as they could be **embedded into the handles** so they can attach to the holder quickly and easily.

Multi-purpose Velcro Straps

These straps **can be adjusted to fit various sizes** which would be useful concerning the variety of paint brush sizes. They are **easy to adjust** and **moderately strong**. However, they are quite thick so it might affect the use of the paint brush.

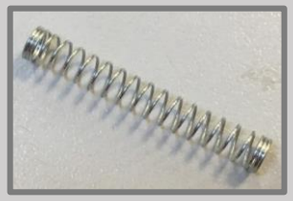


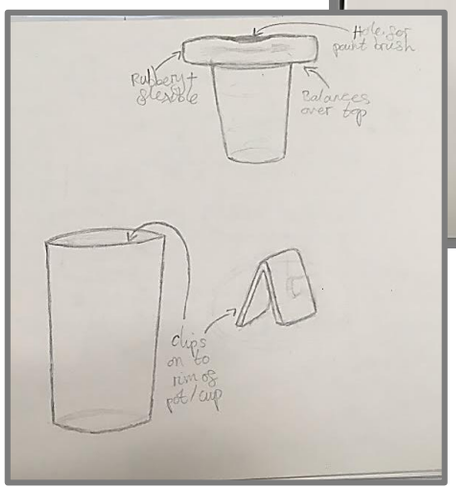
Bulldog Clips

A bulldog clip **temporarily but firmly** holds sheets of paper together. It's made of a rectangular sheet of **springy steel**, curved into a cylinder with flat steel strips for the handles and jaws. These clips **can latch onto things very tightly**; they stay closed unless squeezed open so it is unlikely to fall off or come loose.

Metal Spring

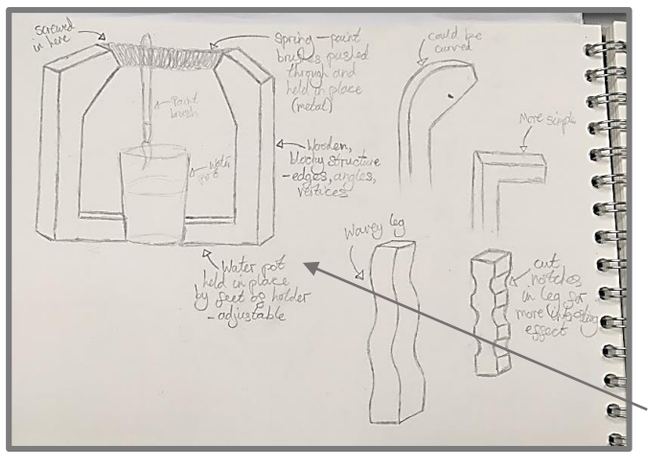
Metal Springs can be **stretched** so that the gaps are large or small. Even after stretching to a large size it **will return to its smallest state after use**. This would be effective for holding various sized paint brushes.

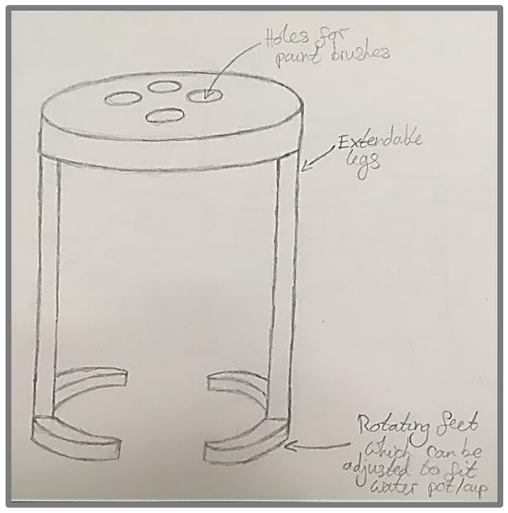




Initial Product Requirements:

- Help to **increase brush lifespan**
- **Strong, stable** structure
- **Easy and simple** to use
- **Attractive** appearance
- **Adjustable** for different size brushes
- Easily **transportable**

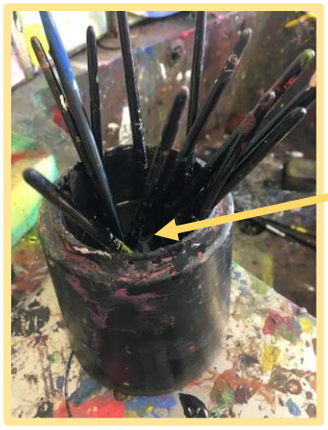




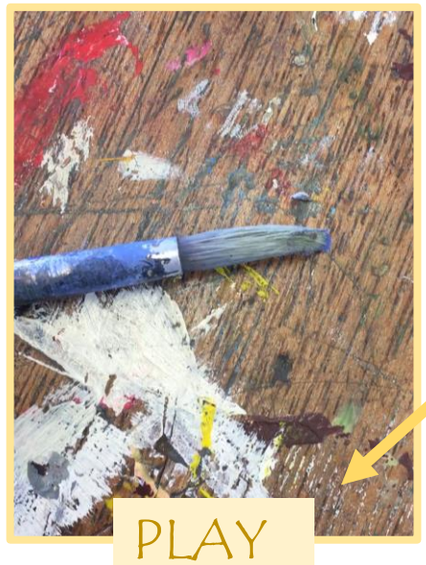
The design with the spring looks and functions too similarly to the temporary 'hand-made' examples I found – **not** very attractive

8. Exploration of Possible Technical Requirements – Paint Brush types, sizes and styles

Example Scenario

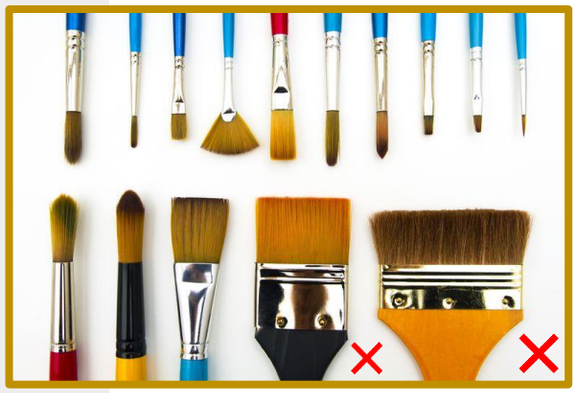


This photo was taken in one of the Art classrooms at **Wallingford School** – it shows a handful of paint brushes that have just been left on the side in a water pot. It is clear that they have been left there over a long period of time as every single brush has deformed brush hairs.



The **brush hairs are dry and deformed** and don't flow together - this makes painting with it highly inaccurate – **a useless paint brush.**

I think the holder will be the most secure if it attaches to the *handle* of the brushes. However, *different brands/types* of paint brush generally have different styled handles with different designs, shapes, lengths and thicknesses.
This increases the variety of sizes my design needs to be compatible with. It must be comprehensive in the types of brushes it can hold.



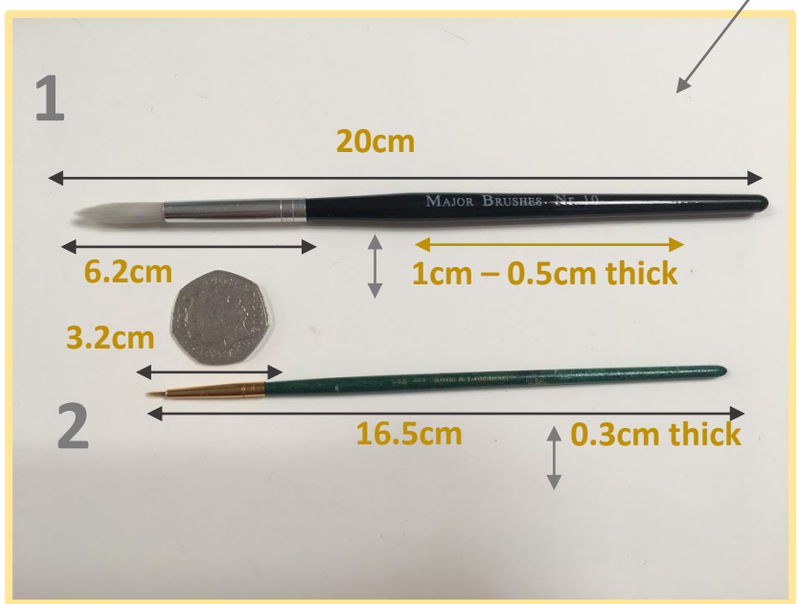
Personally, I use these 2 paint brushes the most often and although they are similar in shape and style, they both have significantly different handle thicknesses;

1 – Most generic size and shape; the majority of the schools supply are this type.

2 – Small, handle is lighter and thinner to correspond to how small the brush is. This is probably around the thinnest type of handle you will find.

The paint brushes used most often by the artists in my target market tend to be **smaller**. Most of these brushes have a rounded handle and there is quite a small difference in their size.

It is unlikely that I will be able to design a holder that is compatible for ***ALL*** brush sizes, types and styles as there are so many different variants; it's unrealistic.

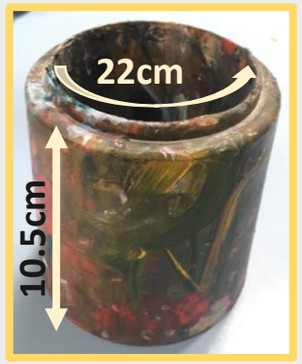


9. Possible Technical Requirements & Investigations of Existing Products

Different Types of Water Pot

Tea Mug

Small Glass



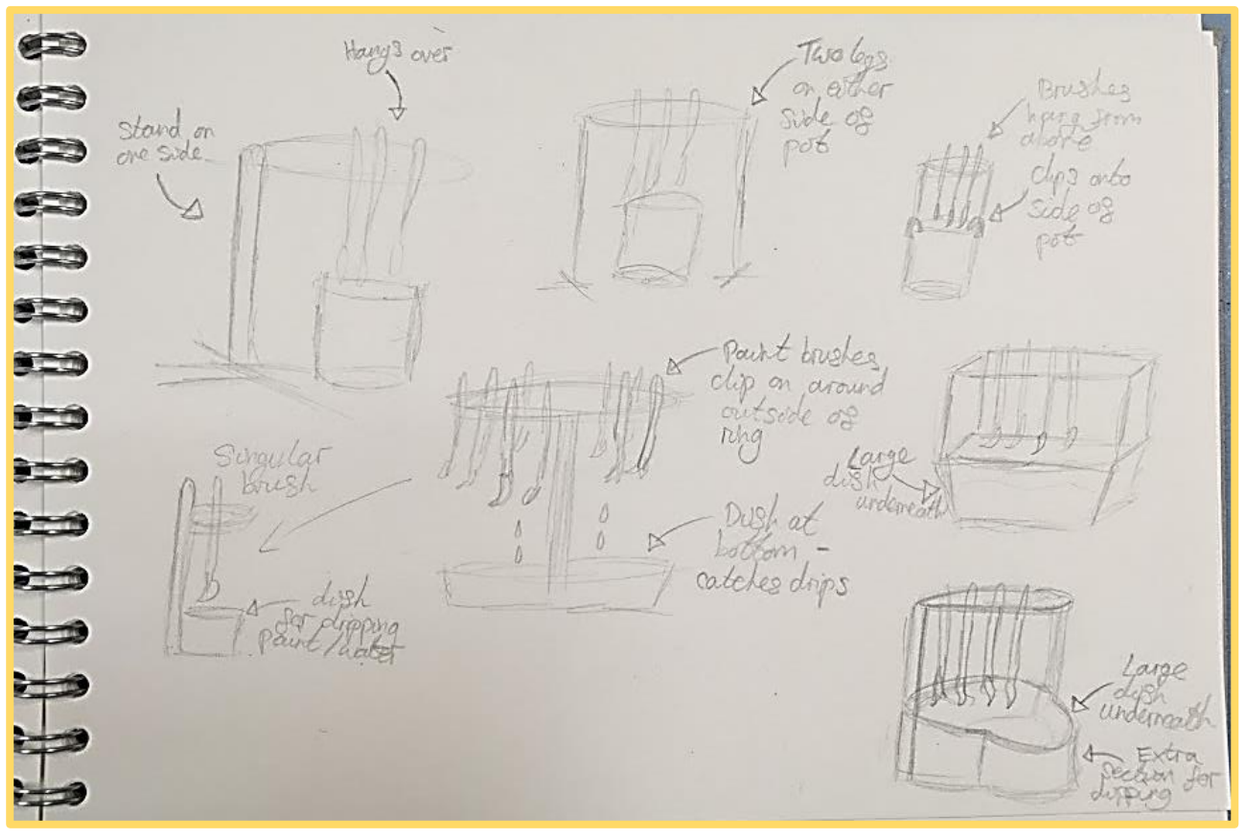
Paint Pot

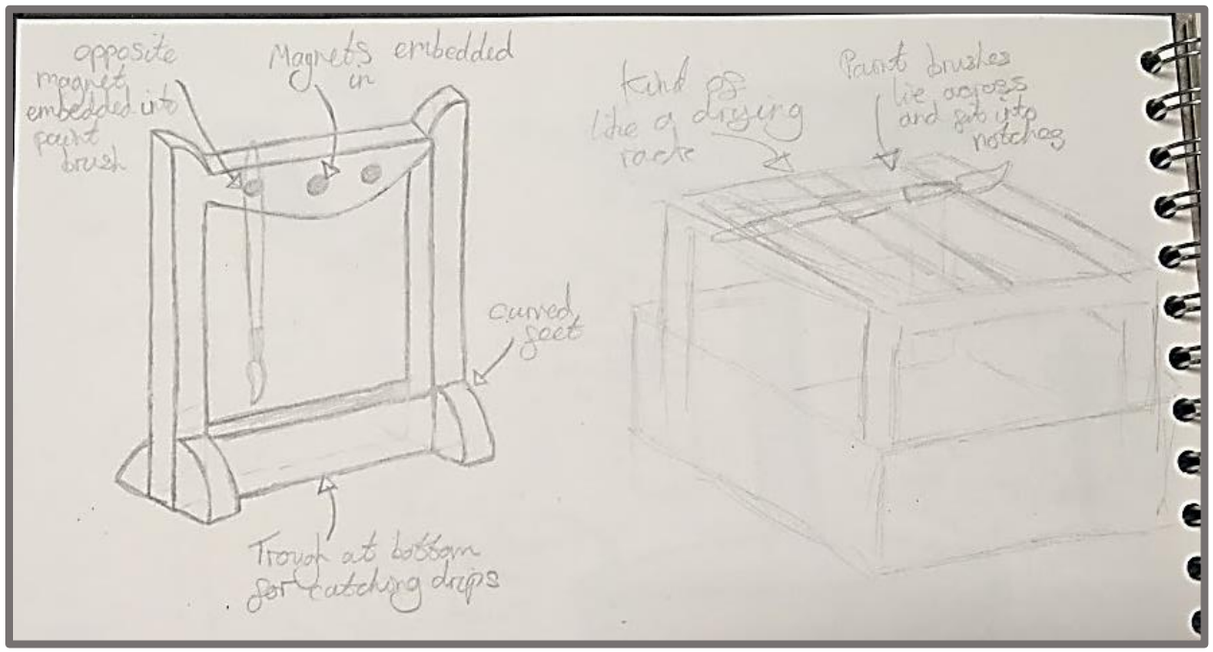
I gathered together these water pots and they are actually very **similarly sized.** This is useful knowledge as it means that it won't be too difficult to design a holder that fits the majority. However, after sketching some more ideas I concluded that I could incorporate a built in dish/water pot to the holder instead.

Most of the pots used for holding water are **random household items** such as old mugs and any kind of waterproof container. This means that it's difficult to come up with a generalised scale. **It might be more practical to design a holder that features its own water pot/dish.**

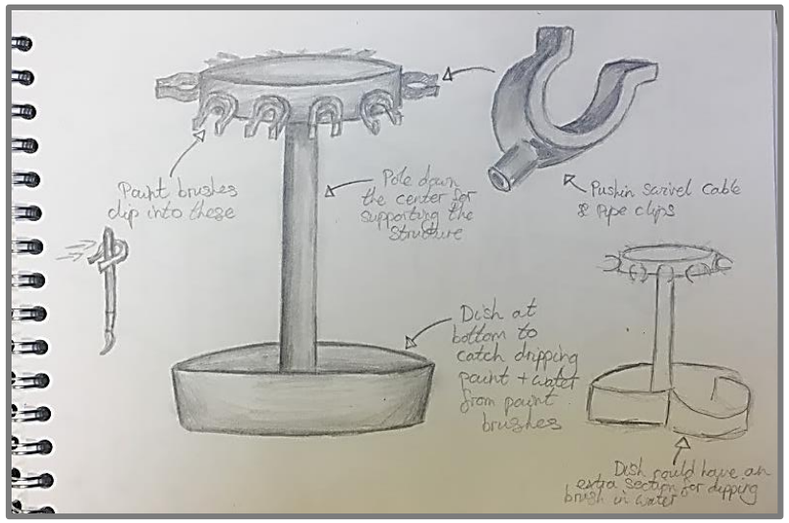
I found these two designs on the internet but I can see problems and complications with them that wouldn't be ideal; ***there are no adjustable components.***

I did some quick sketches of ideas and came up with some more designs with a slight variant of functions and components.

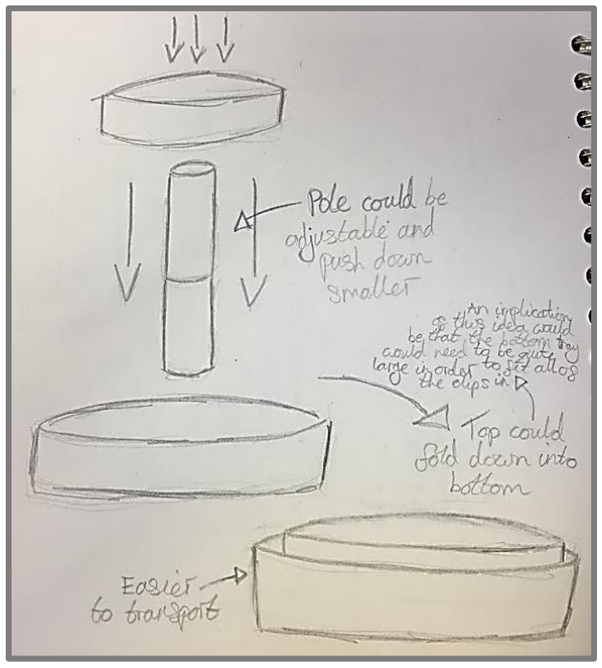


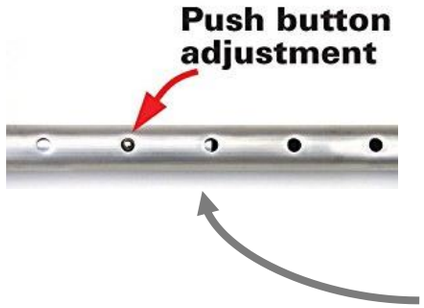


10. Exploration into Materials & Possible Technical Requirements

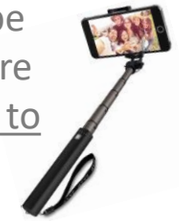


I further developed one of my ideas for a holder that includes a <u>water dish</u> underneath to catch the drips from the paint brushes.

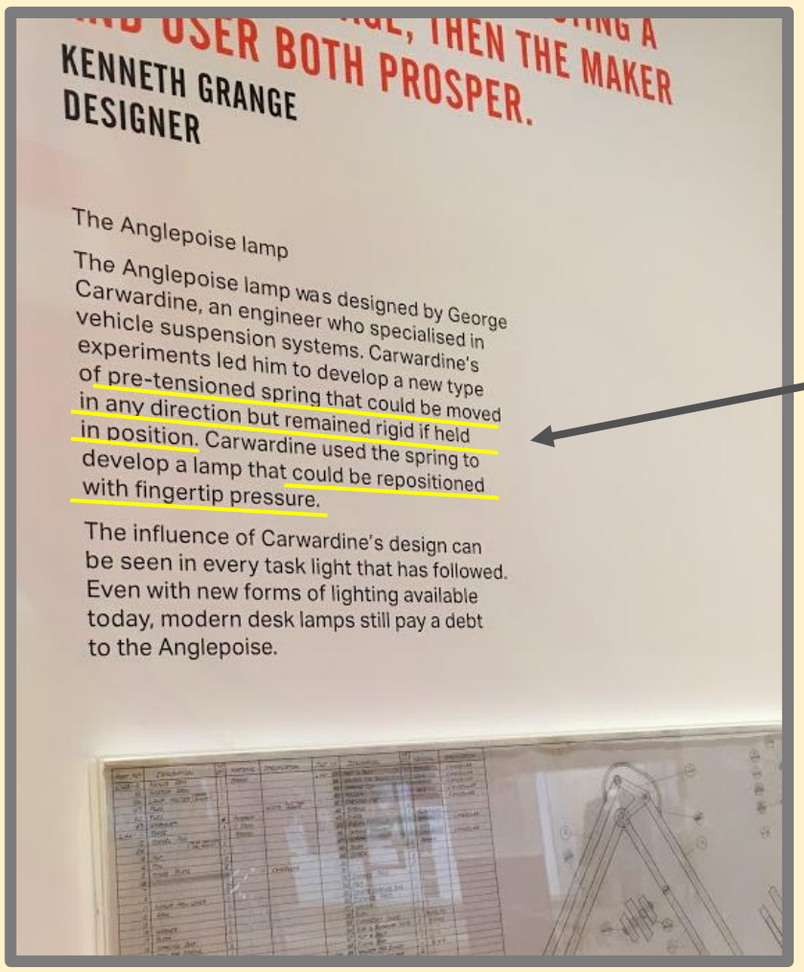




The pole in the centre could have the same adjustable mechanisms as a **selfie stick** – can be folded up so it's more <u>compact</u> and <u>easier to transport.</u>



Another way of making the pole have an <u>adjustable height</u> would be to use push buttons – this would probably be **easier to construct** than the extendable slide mechanism.



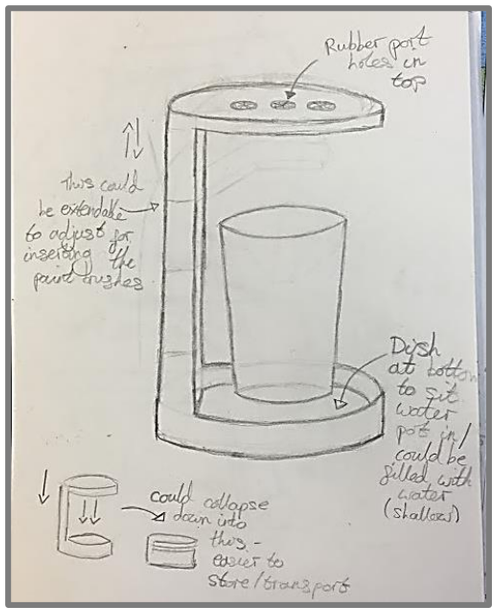
<u>I visited</u> a design museum in London and found these lamp designs by **Kenneth Grange**. I was interested in the mechanisms of how they can be **adjusted to different heights and angles.**

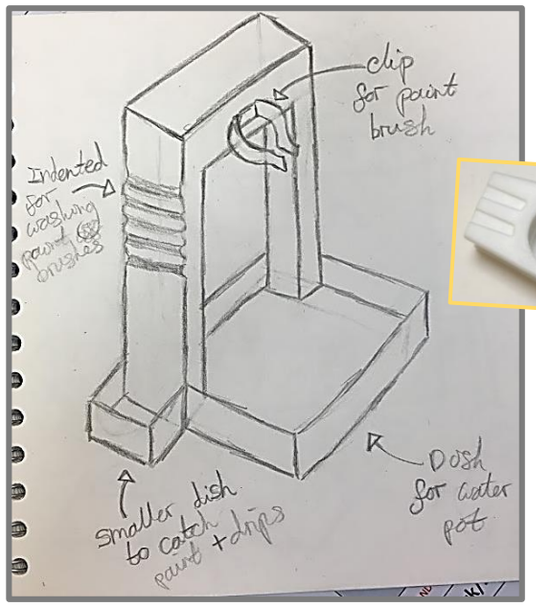
However, I think this design is a little <u>too complex</u> for how I want the holder to function.

<u>I also looked at</u> how the hole that the straw goes though on the lid of a Mc Donald's cup **grips the straw tightly** enough that it can be **suspended** above the drink inside the cup.

The plastic is sharp and very <u>weak</u>

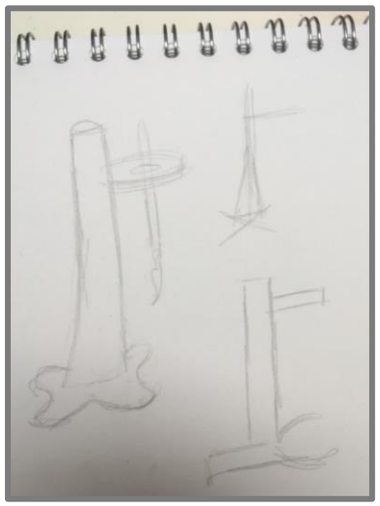
11. Exploration of Materials & Possible Technical Requirements





The hole that the paint brush goes through could have the **rubber port hole** design to **grip** the brush.

These rubber headphone ports have the same gripping design but they're stronger and don't split like the plastic alternative.



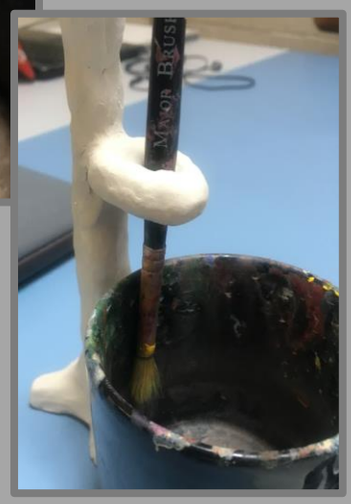
I think my idea to incorporate a water dish/pot into the same design as the paint brush holder was worth the consideration; but I also think it would be **more efficient** to design something that adapts to fit its use. It would also be **smaller and more practical**.

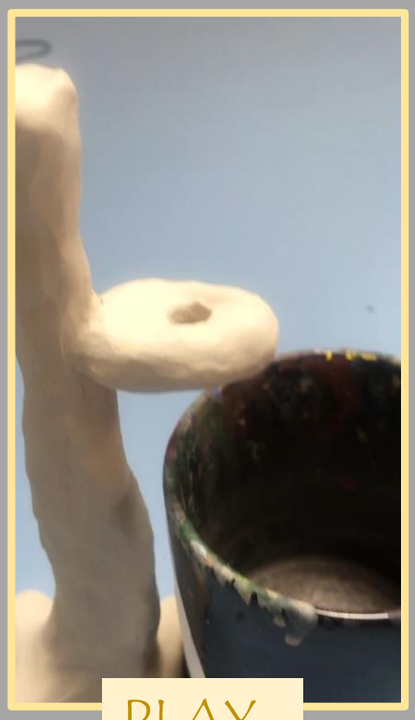
Clay Modelling

I used modelling clay to create a basic model. This design would only hold a singular paint brush, which isn't ideal but it displays the basic concept I'm going for.

*The height of the model made it quite **unstable**, I added more feet onto the base to **balance** the structure – the main support would need to be a **stiff** material.*

The hairs on the brush would get **damaged** if you had to push it down through the top, so it would need to be **inserted by the handle first.**





PLAY

12. Possible Technical Requirements – Methods for holding a Paint brush

The **straw** that fits into the lid of a Mc Donald's drinks cup is **roughly the same size as an average paint brush** – the only difference is that the paint brush is slightly heavier which may effect how it holds it.

PLAY

I put the plastic lid on top of a clear glass to test whether it could hold a paint brush in the same way as a straw.

It was a success.

PLAY

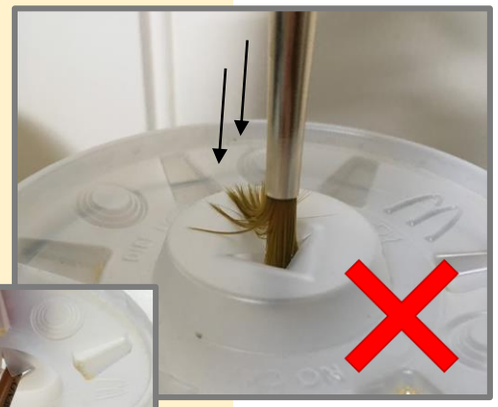
The paint brush can be seen **suspended** above the bottom of the glass just by the grip of the porthole.

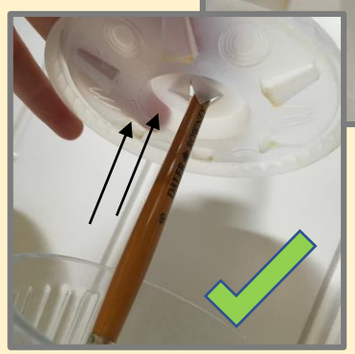
The paint brush can be <u>adjusted</u> by moving it up and down so that it sits at **different heights** inside the glass.

Upside

Underside

If you try to push the paint brush in through the top, it **splays the brush hairs**. This would cause <u>damage</u> to the brush which would make the use of the holder completely pointless.





Instead, the paint brush **would need to be inserted from the underside with the handle first.**
This makes incorporating the porthole <u>more difficult</u> as there needs to be enough room to insert the paint brush whilst also having the water pot underneath.

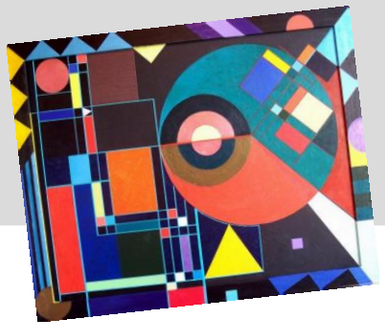
The plastic splits easily and becomes very sharp – Danger hazard. If I use portholes I will need to find a more suitable and <u>durable material</u> such as **rubber**.

13. Design Ideas

Tate Modern Museum

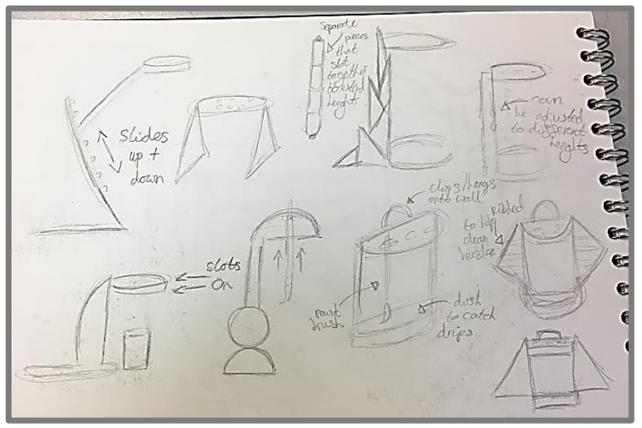
I visited the Tate Modern Museum.
I thought I could get some ideas from some of the artwork that could inspire the design of my paint brush holder.

I was struggling to come up with a **shape/form** for the design so I thought I could inspire it by the shapes in abstract and minimalist art.



There are often a lot of different shapes within abstract paintings.

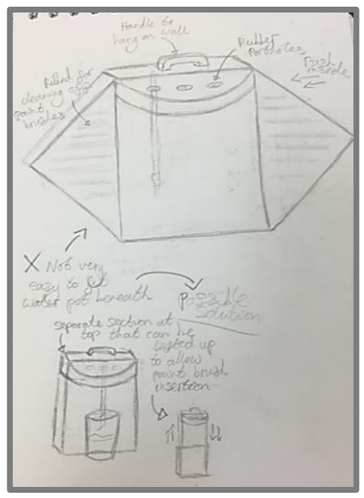
The design could be made to look more *"artsy"* by giving it a paint splat decorative design to fit in with an *artists aesthetic*.



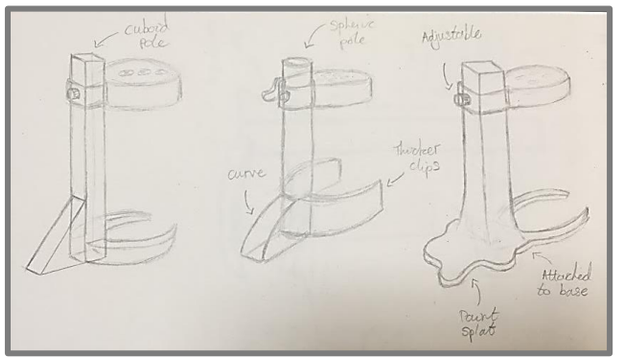
I found some Hose Pipe Clamps which seem to also have a similar concept where it is possible to adjust the tightness around.

Problem!

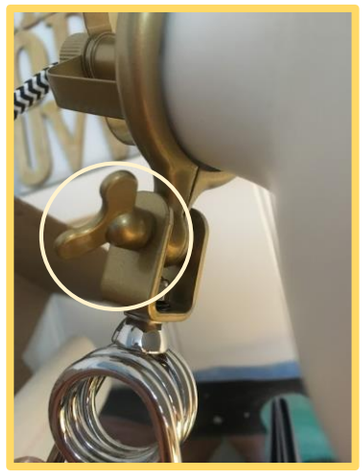
I need to come up with a design that resolves the problem with the paint brushes needing to be **inserted from underneath** – handle first through the portholes.
The issue then is that the water pot will be an **obstruction** and the **angle** to insert the paint brush is **too awkward and difficult**.



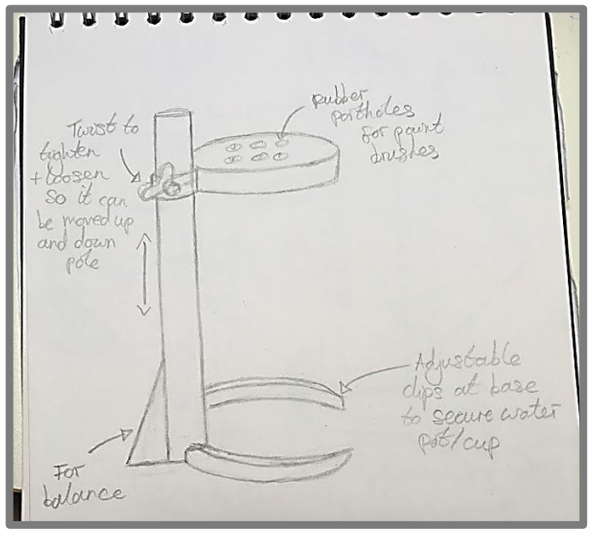
I came up with another different concept for the design but I think it would still be too large.



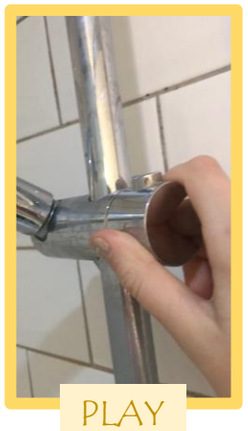
A variation of possible design structure ideas.



This Lamp from home uses the same mechanism with a screw that **tightens and loosens** when twisted so that the lamp head can be moved to point at **different angles**.



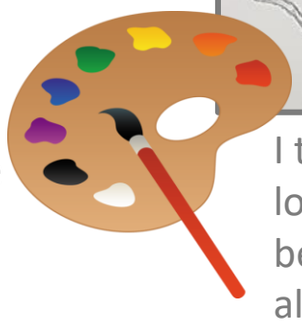
The Shower Head in my shower has the same concept but with a different type of handle.

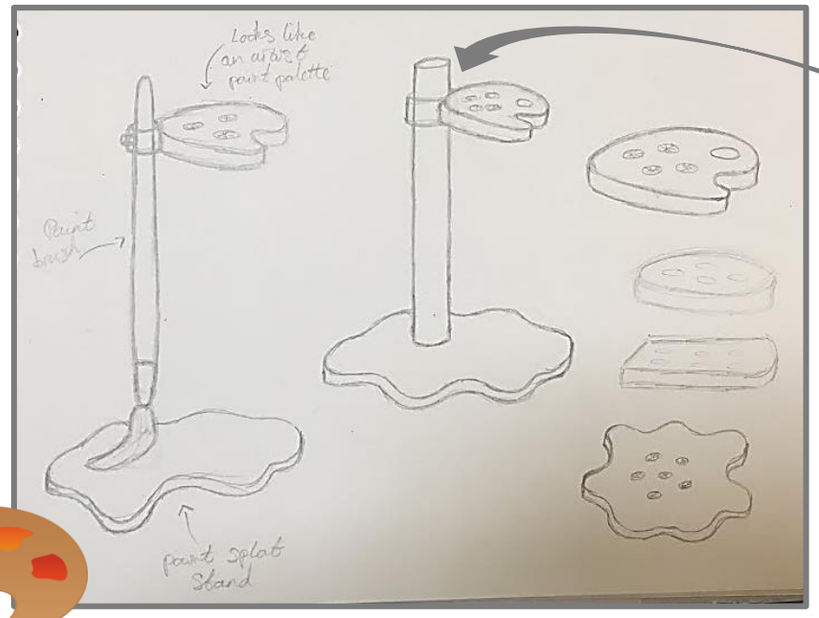


It can **easily** move up and down the main supporting pole but when tightened, it is fixed into place and **secure**.

14. Exploration of Materials & Possible Technical Requirements

My stakeholder Anna thought that inspiring an element of the holder by an **artist's paint palette** would help make the design look more *"artsy"*.



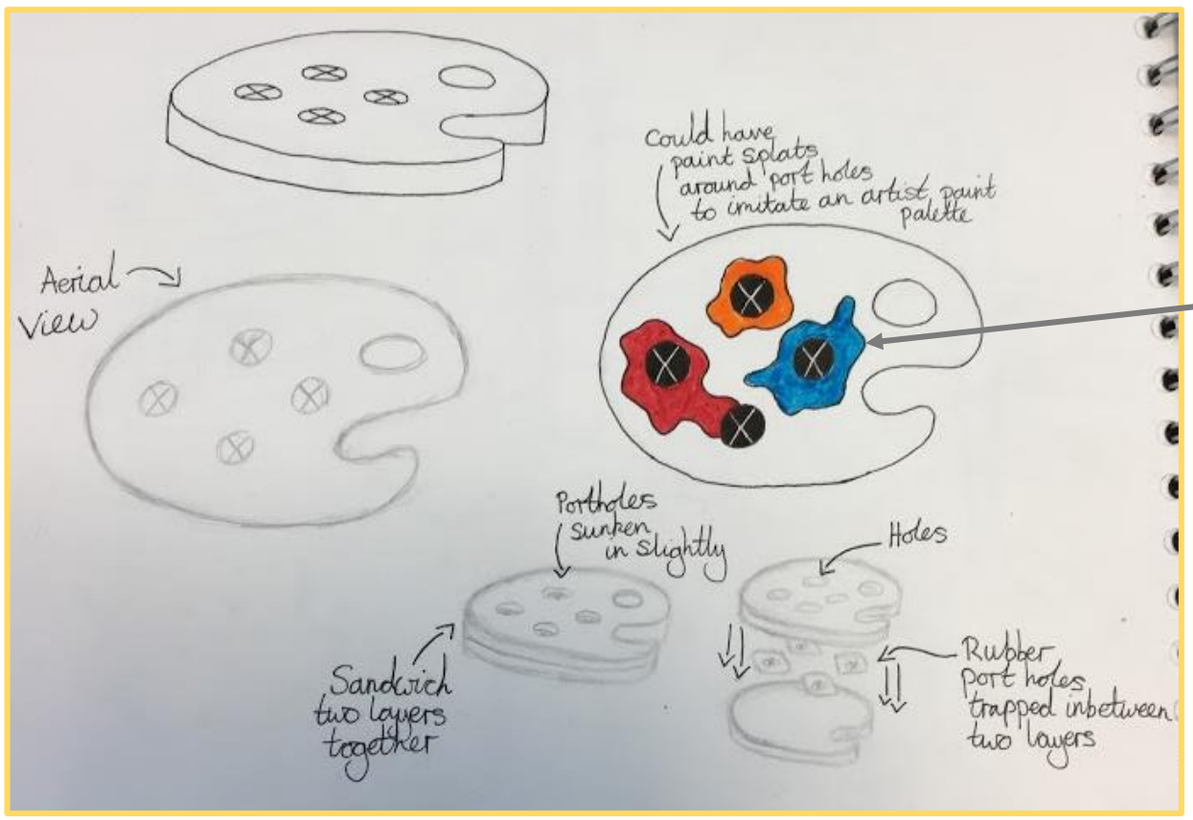


I tried to come up with some more **creative** looking designs. I need to find a balance between practical and functioning whilst also being stylish and attractive.

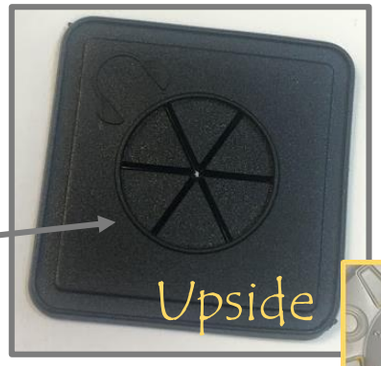
Hose Pipe Clamp

- Quite **fiddly** to use
- **Not** that attractive

To **loosen and tighten**, twist the screw around in a circle.



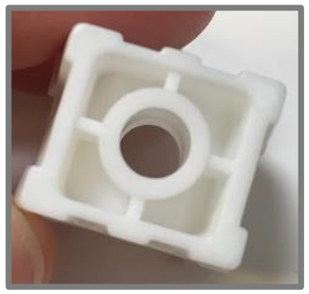
Rubber Headphone Port

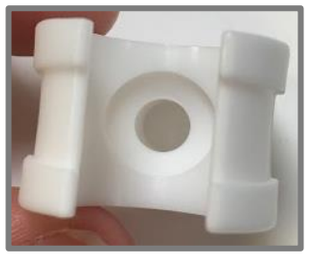


It holds an **average sized** paint brush **firmly** and it is easy to insert.

- Only come in black rubber
- **Unattractive**
- **Difficult** to secure into a design

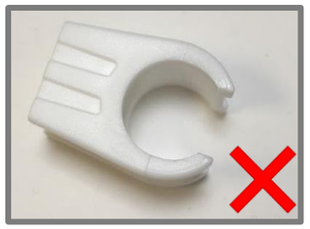
15. Exploration of Materials & Possible Technical Requirements



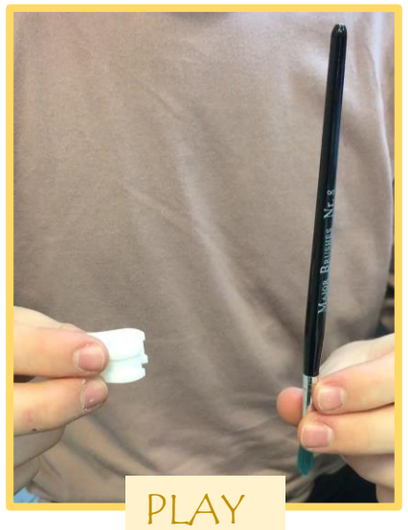


Plastic Pipe Clip

15mm

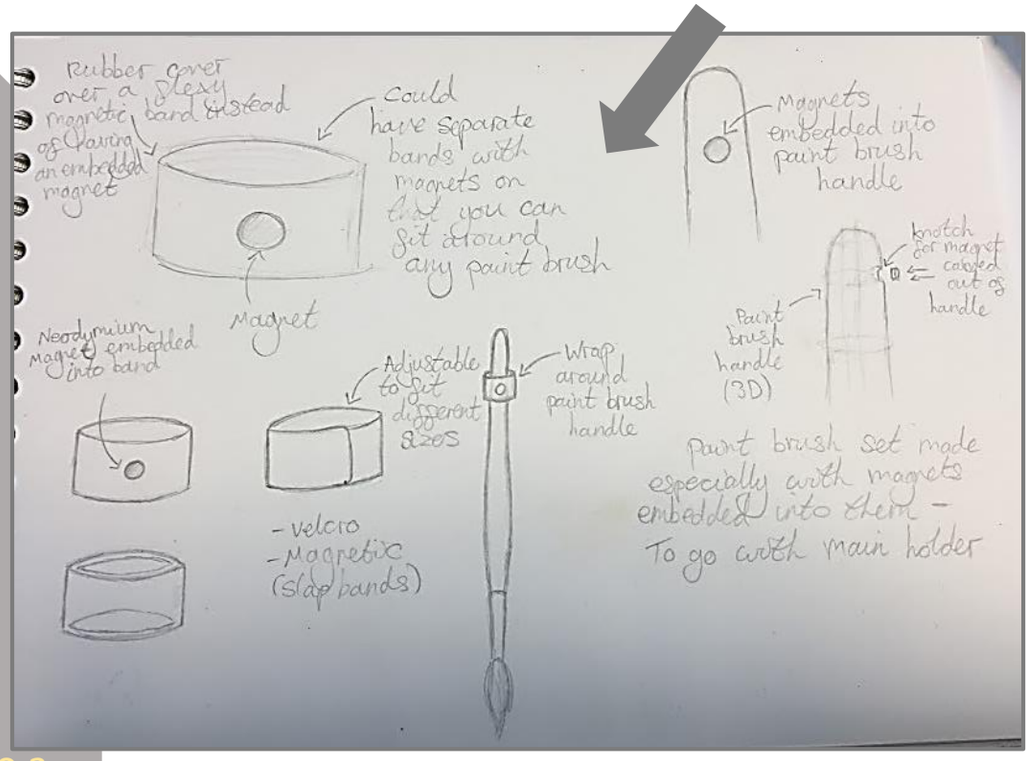


These clips are **too large** for the average sized paint brush. **They don't hold in place whatsoever.**



A smaller size would have worked but *15mm* was the smallest I could find.

I had an idea that there could be an additional **magnetic strap** to fit around *any* paint brush.

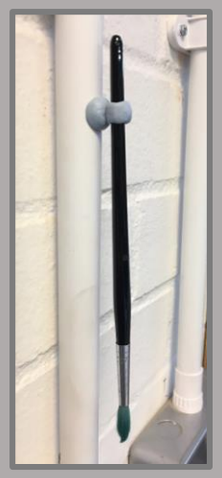


Alternative Method of holding the Paint Brush

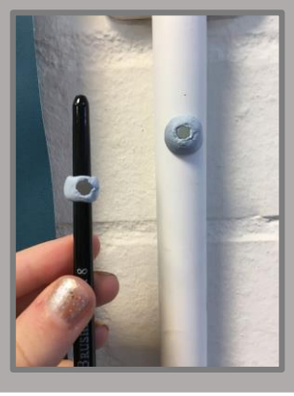
Neodymium Magnet

5mm x 1mm

These magnets are tiny but are still **very strong**.



Embedding in/attaching on a magnet, might be a more efficient method of holding the paintbrushes as it requires less *'fiddling around'* than the other methods I've looked at.



I attached a magnet to a paint brush by embedding it into some blue tack and then securely moulding it around the handle.

However, this would still be just as *'fiddly'* as the first methods I looked at so I don't think I will develop it any further.

16. Exploration of Materials & Design Developments

Vacuum Forming

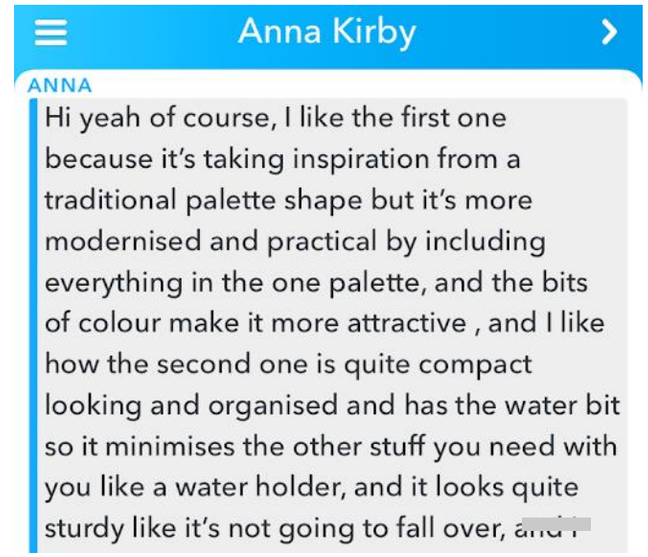



I looked at an example of **vacuum forming** as I thought this could be a possible finish for my product. To start this process I would need to make **a base** out of a material such as **wood** which can then be vacuum formed to make the same shape but in plastic.

This process is ***fast and simple*** and would allow my product to be mass produced.

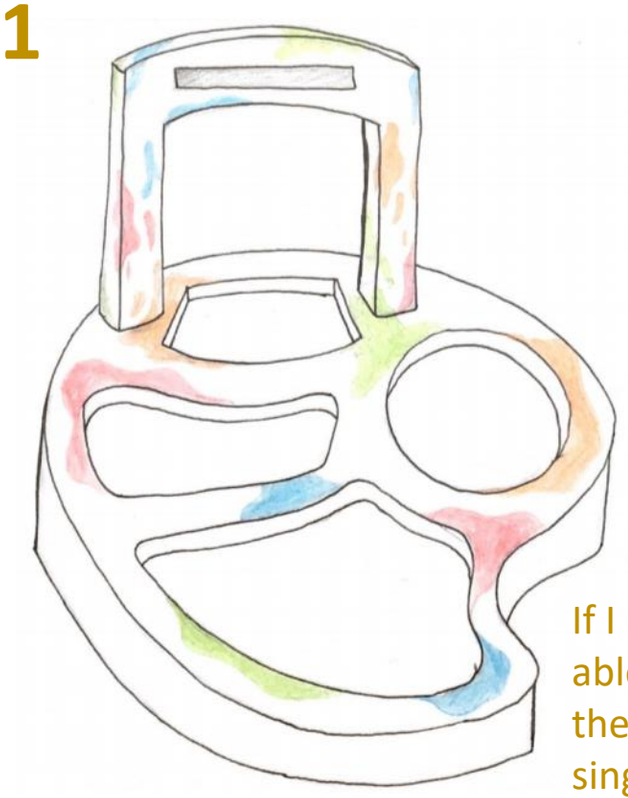
Polystyrene Plastic Sheets

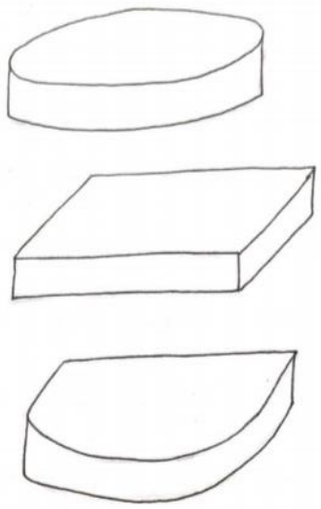
Key Factors the design needs to satisfy;
- Waterproof
- Hard-wearing
- Sturdy
- Attractive



The water pot would need to be **removable** or it wouldn't be practical - to empty it the whole product would have to be turned upside down.

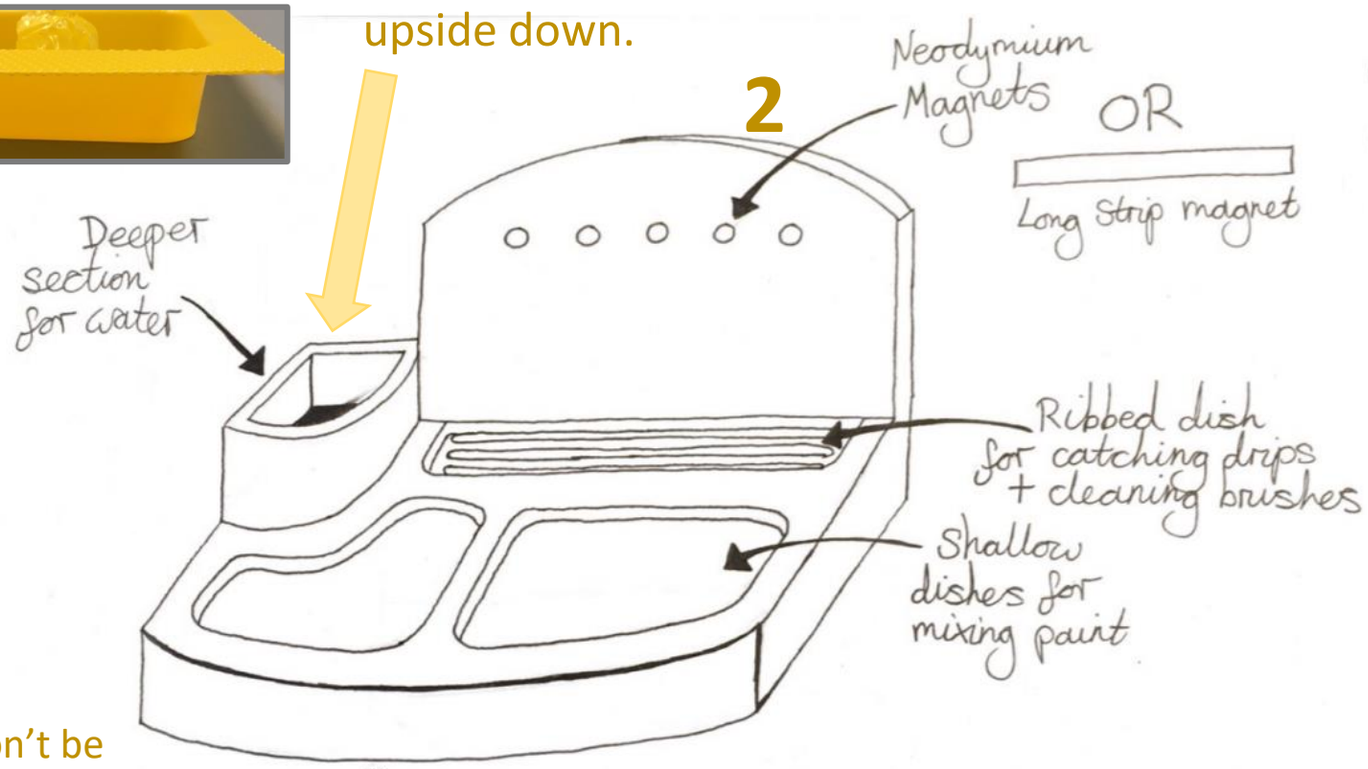
1





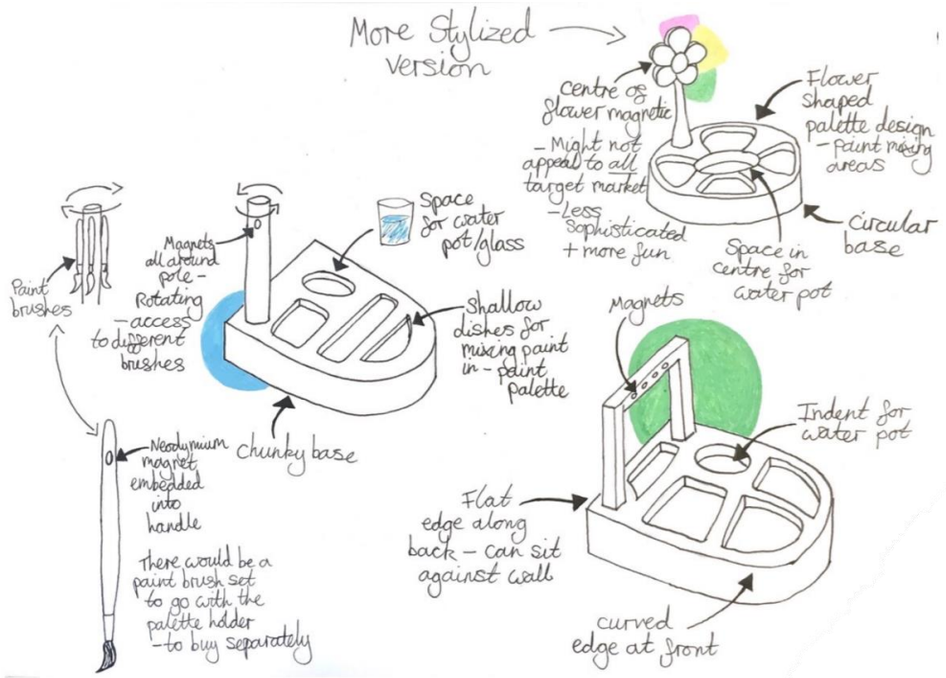
If I use **vacuum forming** I won't be able to have any coloured pattern on the surface as it will only work with a singular coloured sheet.

2

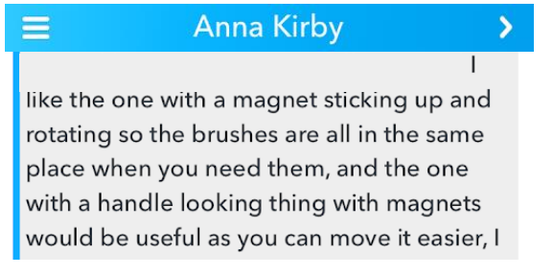


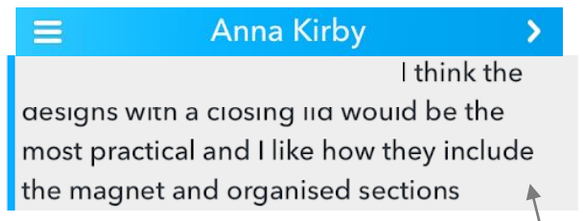
I've decided to develop the idea of involving a palette base with the holding element of the product further because I think it meets the most requirements from my potential users.

17. Stakeholder Feedback on Design Ideas

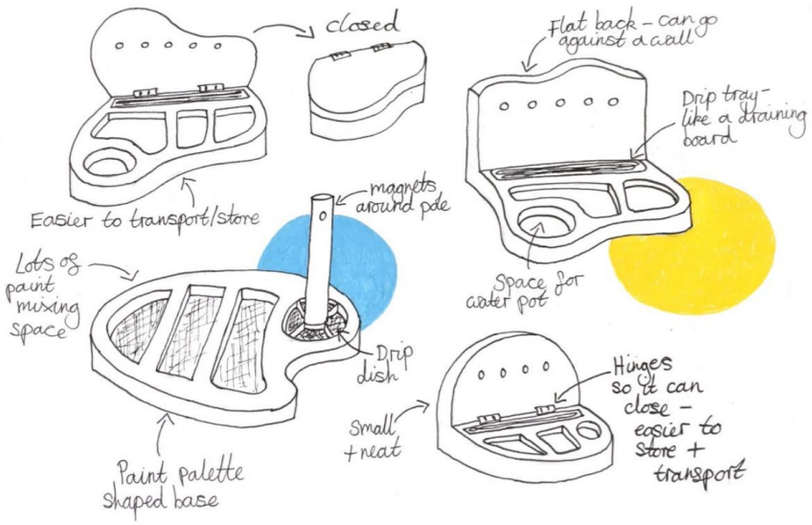


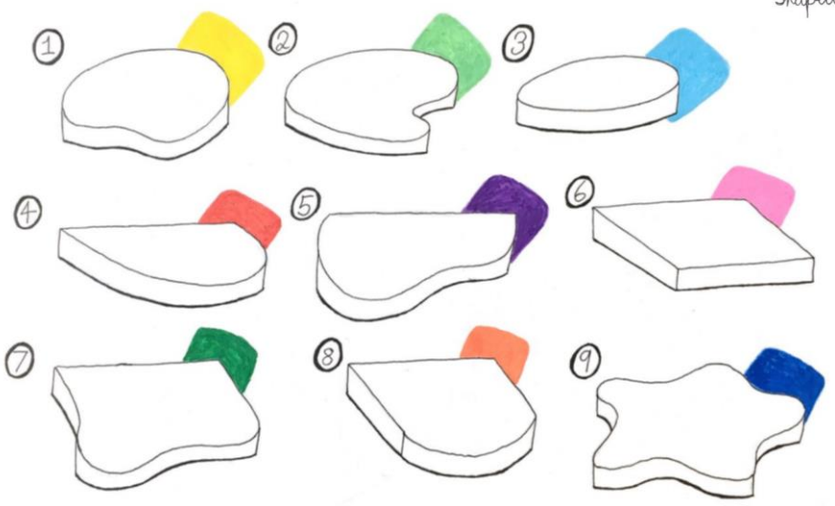
Could include more sections for mixing paint.





Casual Feedback conversation over a social media app with a **potential user** about my designs.





1
2 ★★★★
3 ★
4
5 ★★★
6 ★★
7
8
9 ★

"I like that **design 2** looks like a traditional paint palette shape." – a potential user

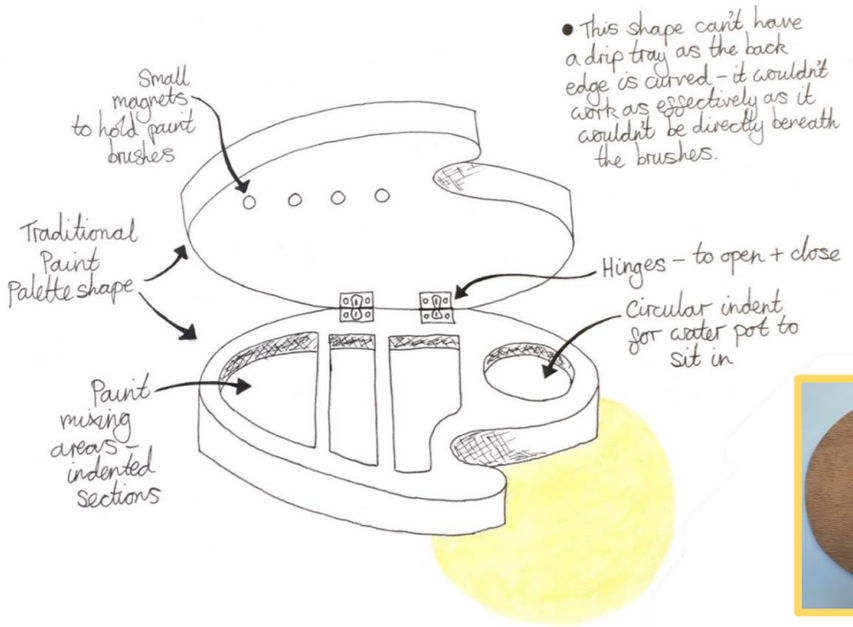
Potential User & Stakeholder feedback

Kay Organ *- "These are all great looking design ideas that I would be happy to have on my desk.*

- *I like the idea of the hinged lid design as it makes the product more compact and portable.*
- *I think that ease of cleaning is very important.*
- *I love that the brushes will store so easily using magnets. This would allow for easier change between brush type and colour, which will help the artist to be more organised and tidy.*
- *I love the idea that the brush storage area is joined onto the mixing palette and that there is also a slot for an added water pot.*
- *I prefer the designs with the drip trays below the brush storage.*
- *I prefer the designs with the indent for added water pot for ease of filling/changing water.*
- *I think that the strength of the magnet is important as too strong and it will be awkward to remove the brush with one hand."*

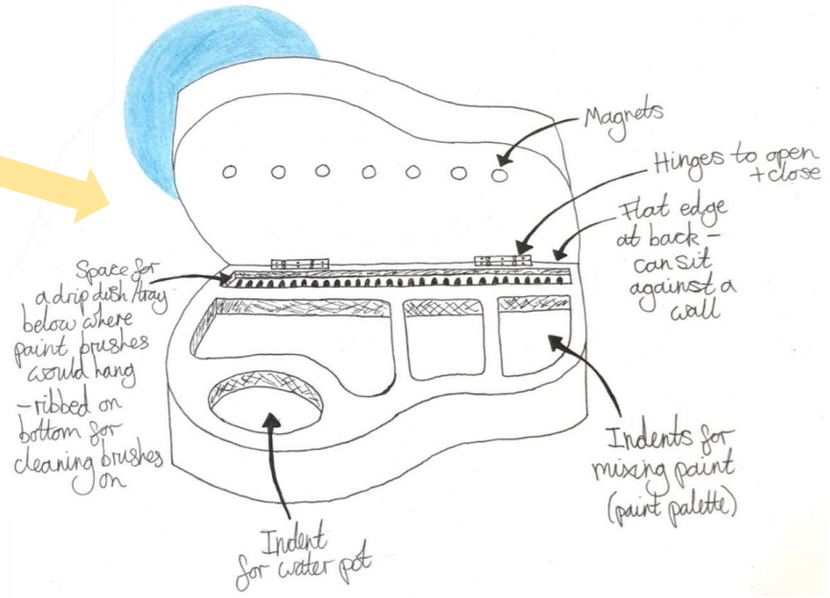
I discussed my design ideas with one of my stakeholders.

18. Developed Design Ideas



In order for the hinge to be attached, there will need to be **a space between it and the drip tray** – this might cause the paint brushes to drip water/paint onto the hinges which would **not** be ideal.

Based off of a traditional **Paint Palette** shape



Hinges

I looked at the hinges on this Record Player – the hinge I would use might not have to be as strong as the silver metal ones because the lid of the design wont be as **heavy**.

Quadrant Hinges

These hinges limit the lid so that **it can't fall back more than 95 degrees** when open so it stays upright.

This is important if the holder needs to **remain securely open when in use.**

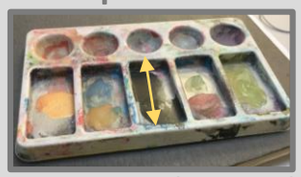
Jewellery box Hinges.

This type of hinge is less industrial and is more suitable for a **lightweight** product.

Hook Clasps

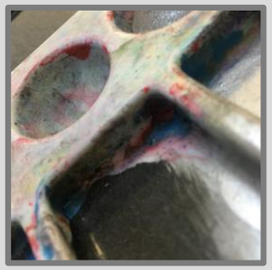
The holder needs a way to fasten shut so that it is secure when not in use.

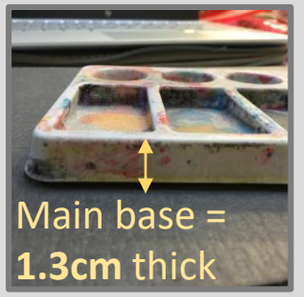
Upside

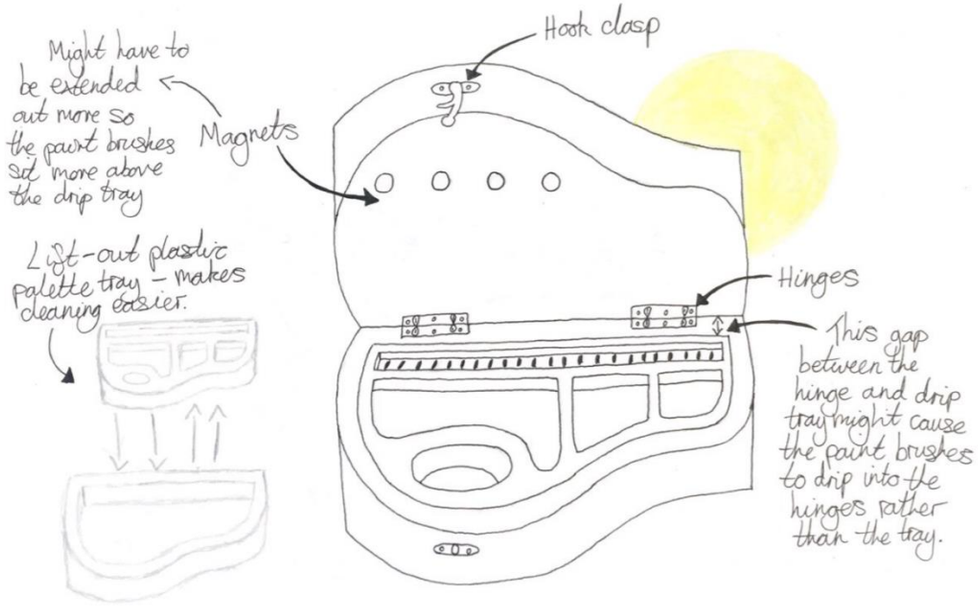


The rectangular indents have a sloped base, the end nearer the circular indents is deeper than the opposite end.

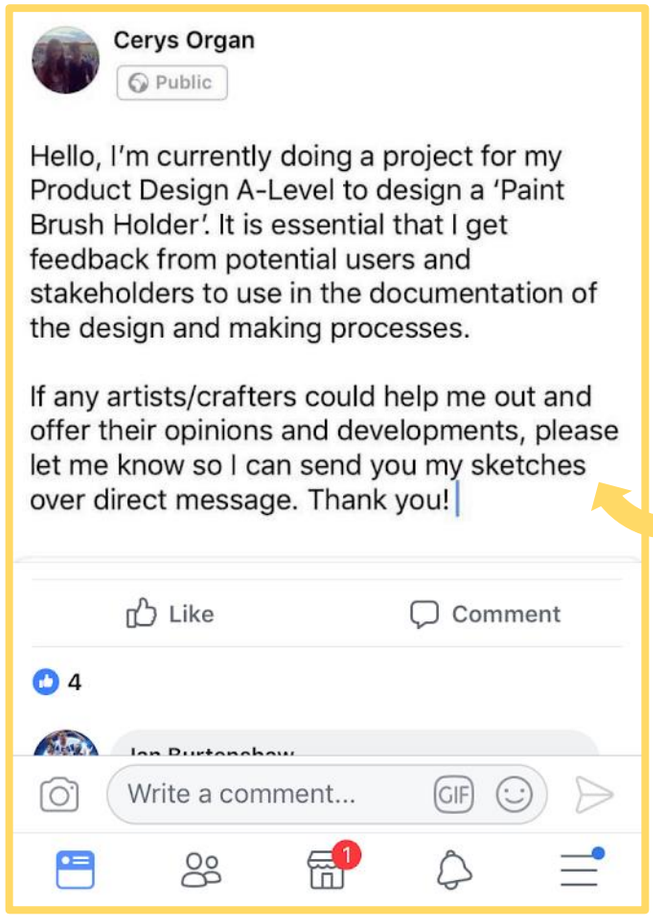
Underside



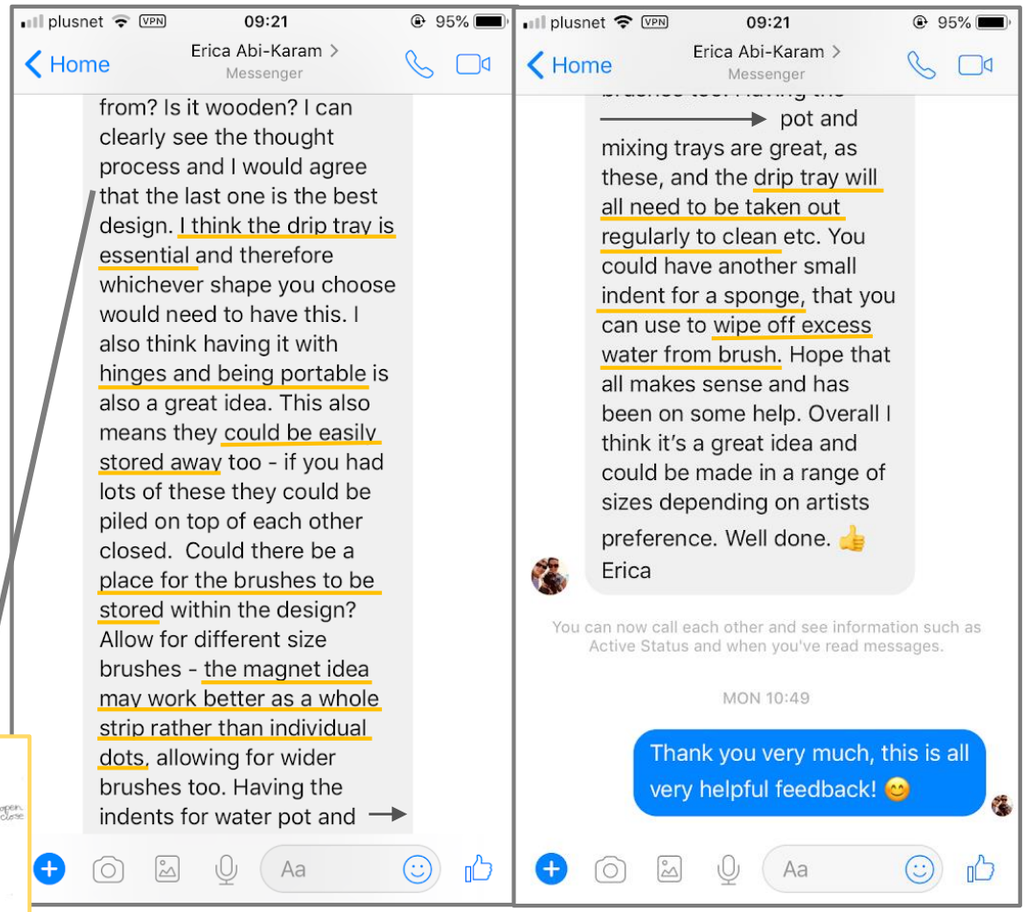


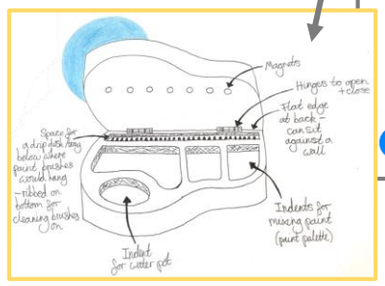


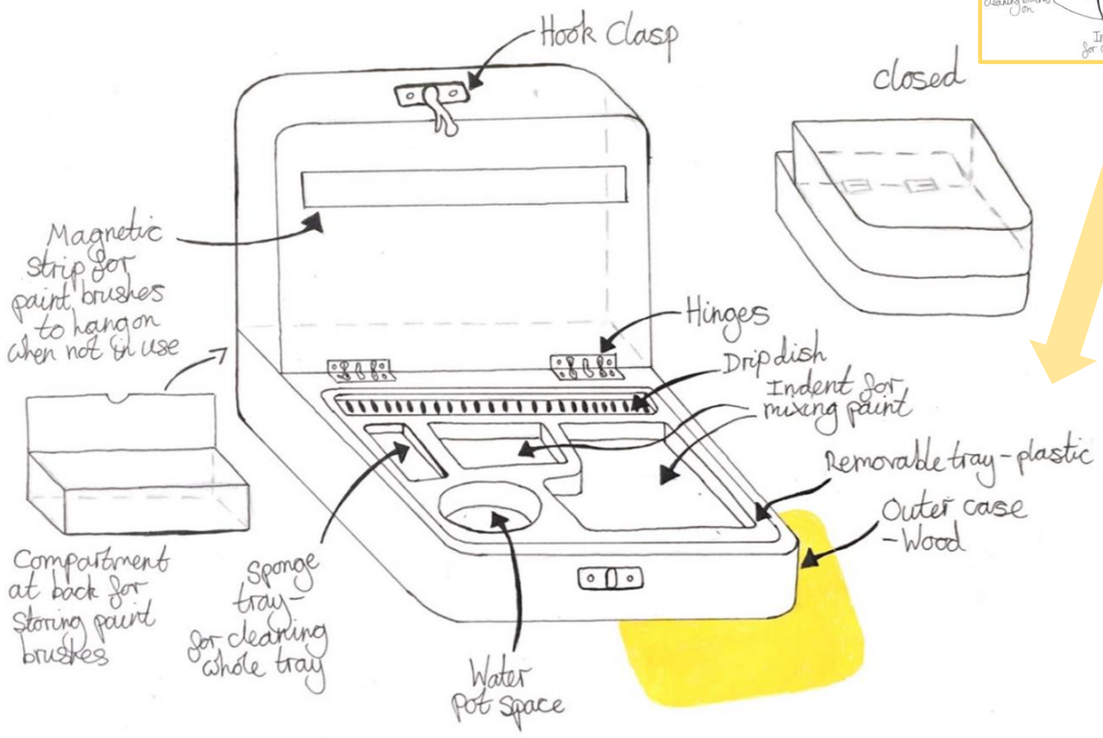
19. Stakeholder Feedback



I posted on **Facebook** *(a social media website)* in a local group; **"Bygone Wallingford" -** where people in the Wallingford area are able to share photographs of the history of the town**.** I asked for any local artists/designers to send me **feedback** on my designs - they are potential users of my product and their views are important for its development.



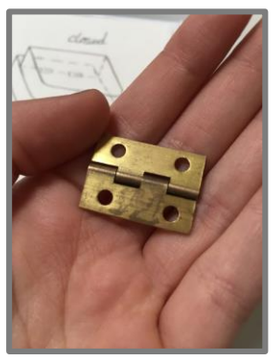


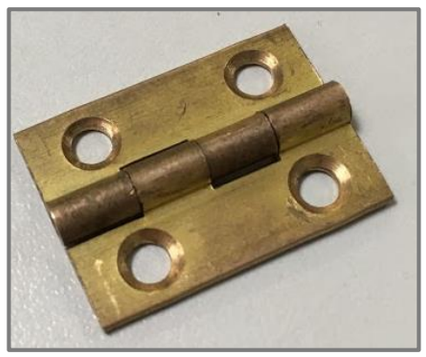


I developed the design so that it includes the features from my feedback.

Erica Abi-Karam – Owns a pottery café where you go to paint your own pot **'Busy Brush Café'.**

busybrush craft · coffee · cake





Small metal hinge

Magnetic Tape – would allow for larger/wider brushes or just more brushes to be held.

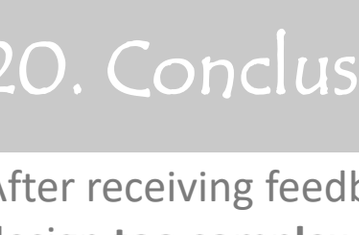
20. Conclusions from Stakeholder Feedback

After receiving feedback on my designs, I decided that I was trying to make the design **too complex** and moving too far away from the original, **simple** purpose.

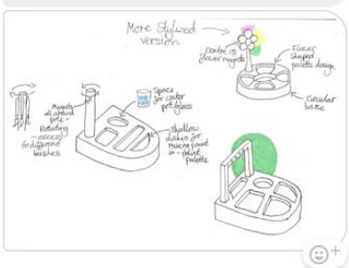
Natalie White – Art Hobbyist, with a degree in Art Foundation & Interior Architecture

When you paint you need to change the water often so a detachable/separate water holder would be advantageous.

I liked this set up the best. Not sure about the curved box. I like a nice square/ rectangle box/tin. But I definitely like the magnetic idea. I constantly just balance my brush across my water jar.



I feel the need for sturdiness in this holder. Robustness. If my paintbrush is stuck to a magnet I want to be able to remove it without the holder tipping. Thinking about the placing a paintbrush temporarily... what about a groove in the holder where the brush tip pokes out of the end to "air" it..... hmmm hope that makes sense. It needs to be easily pickupable! (hey I'm doing really well my english here aren't I?)



On this one I really liked the pole with the paintbrushes..... Perhaps that could be a thing that rests in the closed holder in a groove and you assemble?... It could sit in "a drip tray" affair.

It is all very exciting.

I am less enamoured of the "interesting" shapes. But I'm pretty old school and certainly not down with the kids....

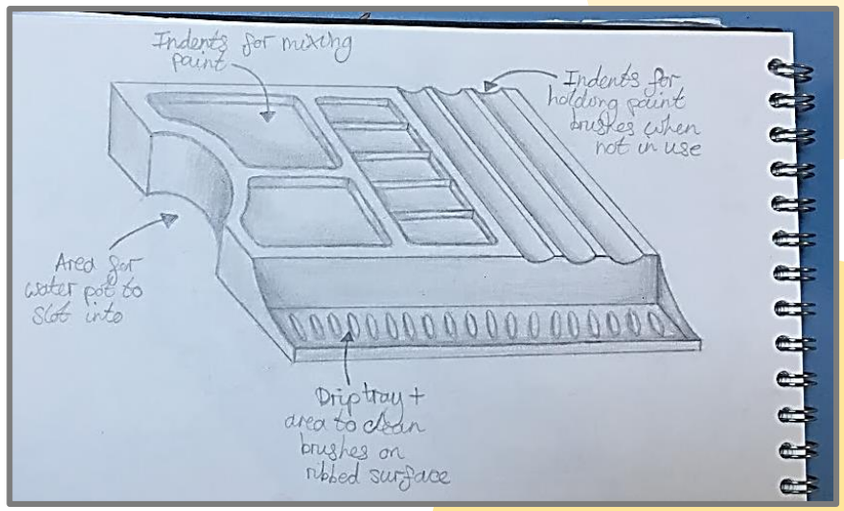
Bottom right of this one... I like the way the hinge sits... gives it the sturdiness thing I was imagining.

Certainly looks like a lot of thought has gone into it... I would reiterate the feeling of it being solid, compact and useful rather than gimmicky.

Okay I've finished now.... Hope that helps. Let me know how it goes.

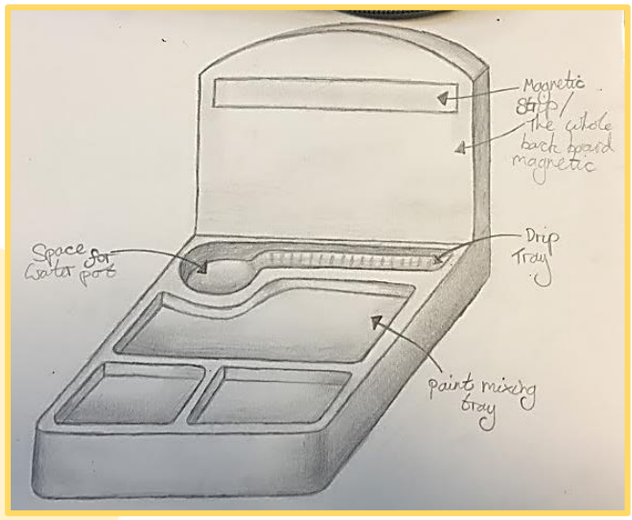
Aa

The hinge idea would have made the design more portable but it **over complicates** the product.

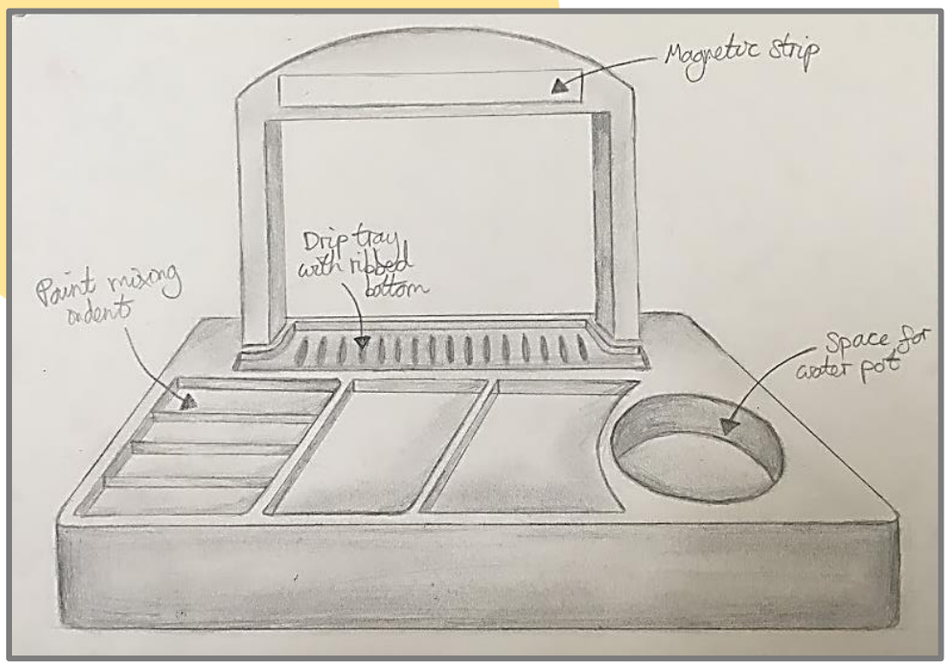


"Solid, Compact and useful rather than gimmicky."

The paint brushes **don't** necessarily have to hang **above/into the water pot**, the 'drip tray' would catch any drips instead.



In response to my feedback I came up with some more **simple structures** which focus more on their function than their design.



21. Development of Final Design

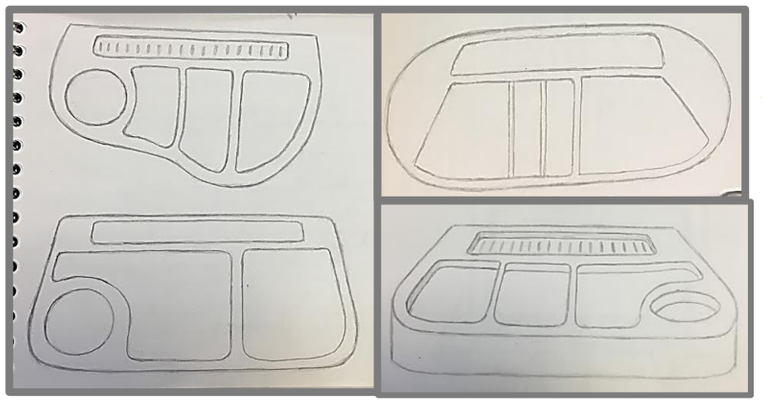
I've decided to go with the design concept that includes these features;

- Paint palette base for mixing paint
- Space for holding a water pot
- Suspended area for holding paint brushes
- Area underneath paint brushes to catch any drips

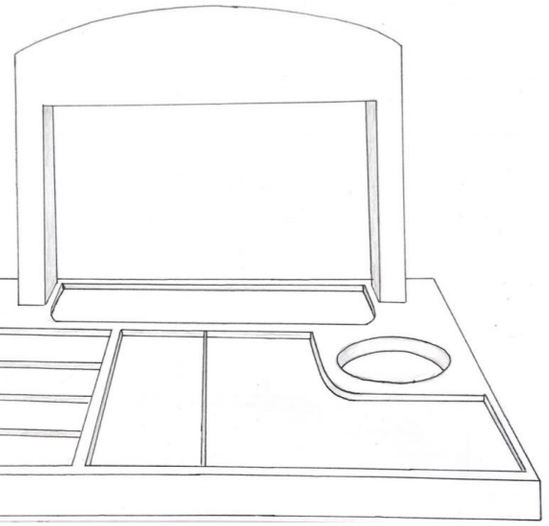
Specific Stakeholder Needs/Wants;

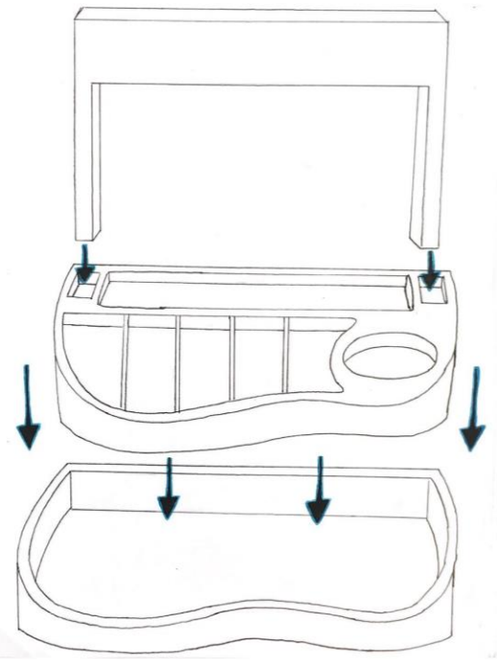
- Easy and simple to use
  - *Brushes are easily accessible and removable*
  - *Easy to clean*
  - *Easy to store*
- Simple but stylish and fun design
- Not too large – suitable for workspace

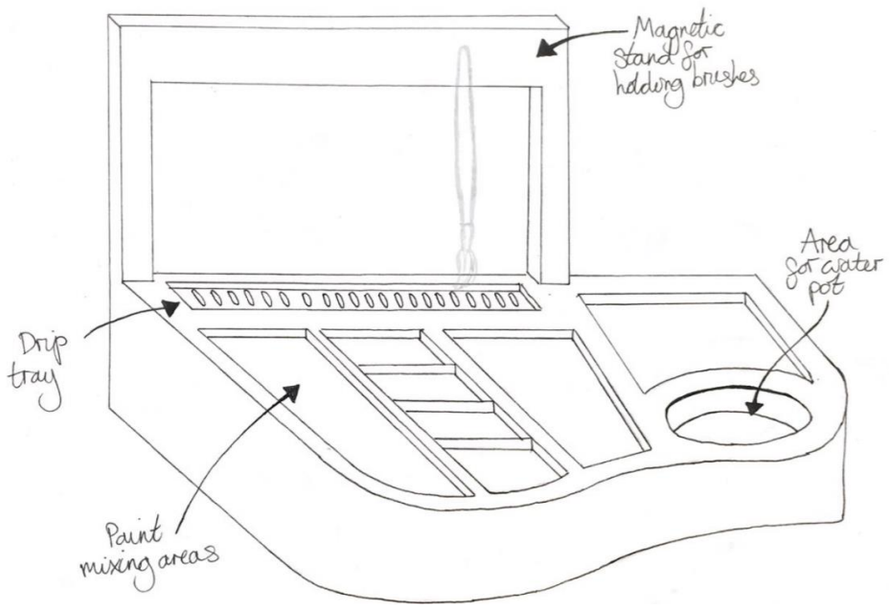
I need to work out what the layout and shape of the palette base will look like

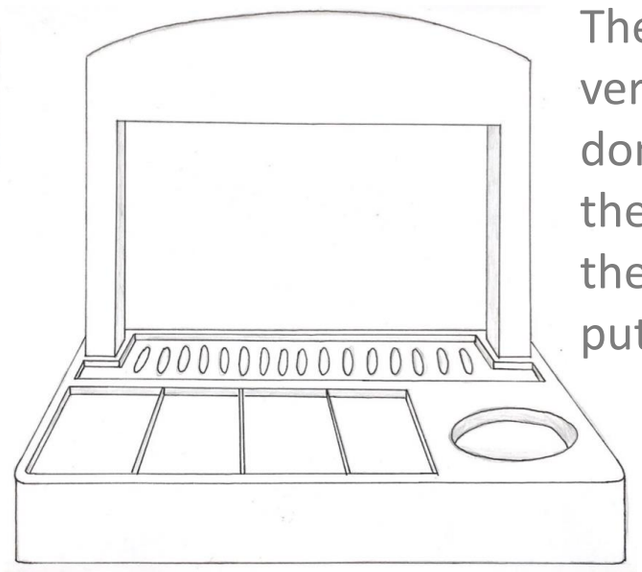


My mature target market preferred a more **simple** shape and design, whereas my younger target market preferred the more **unusual** shapes and styles.









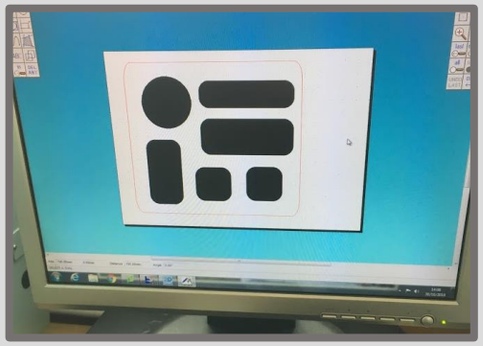
These designs are all very **angular and basic**. I don't think they portray the **funky character** of the product I intend to put across.

I need to try and design something with **a contrast of both simple and funky** to meet the requirements of a broader target market.

Having a **removable tray** inside the main base could make cleaning it **easier** but it may also be an **unnecessary complicated** function.

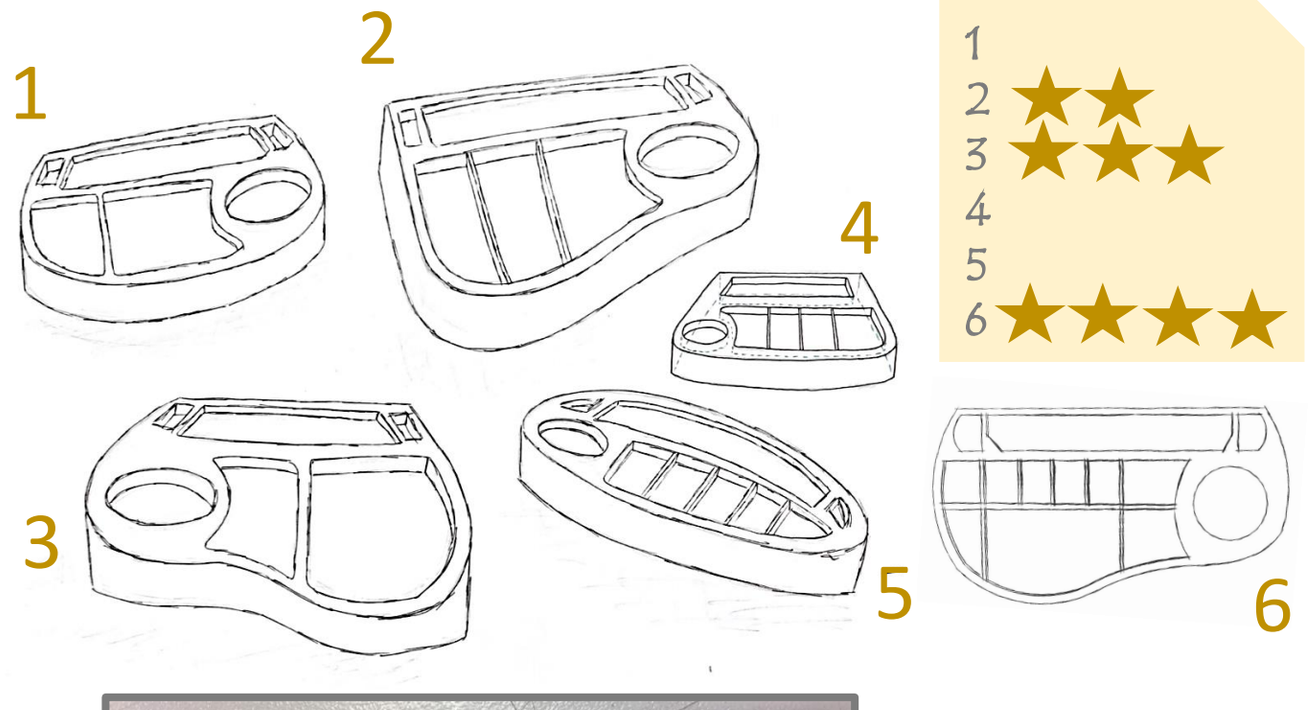
22. Development of Final Design & Exploration of Materials

I designed a basic layout for the palette base on **CAD**.



I then used the **3D Router** to cut my design out of wood.

This method works well for my product because it allows me to cut out indents and it **doesn't go all the way through** the wood.

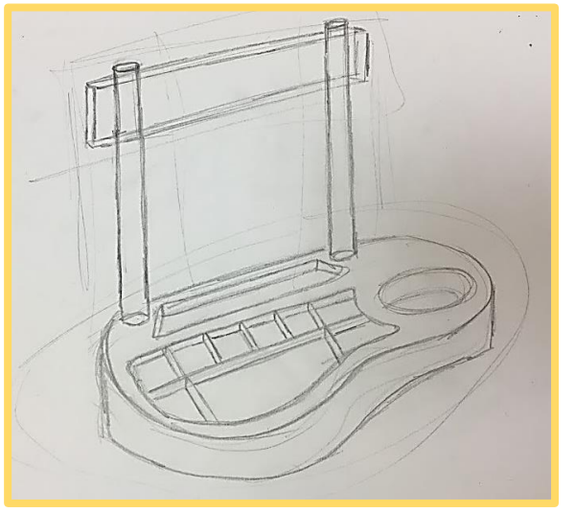


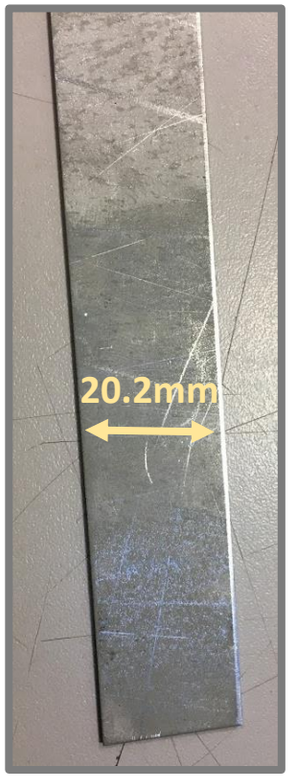
1 ★★
2 ★★★
3
4 ★★★★
5
6

I will then **vacuum form** a plastic sheet over the top of the wooden base so that it is made from a lighter material that is easier to clean.

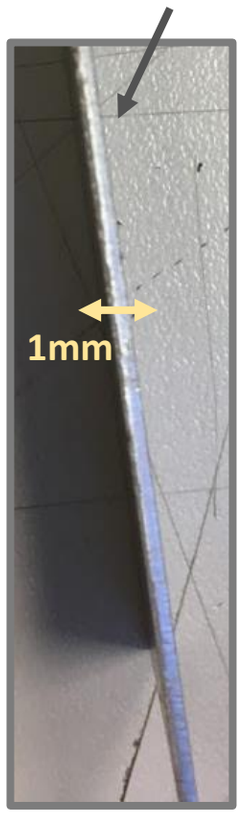
Mild Steel Rod

I could use this material for the supporting poles





Mild Steel Sheet

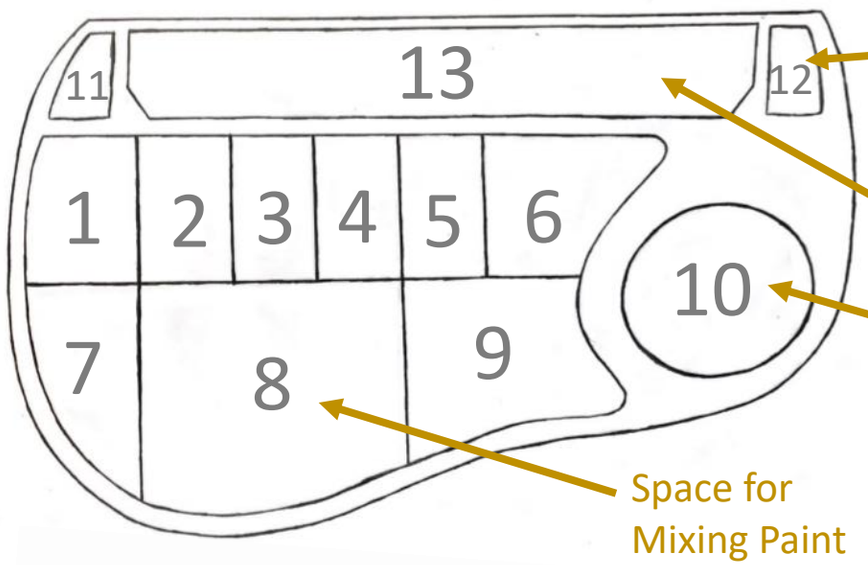


I tested the strength of the magnets on the Mild Steel Sheet by sellotaping a magnet to a paint brush. It seems to work effectively – **not too strong.**

I think that by making the stand out of a **magnetic** material it makes it more **practical** as it doesn't limit the space for the paint brushes.

PLAY

23. Development of Final Design Solution



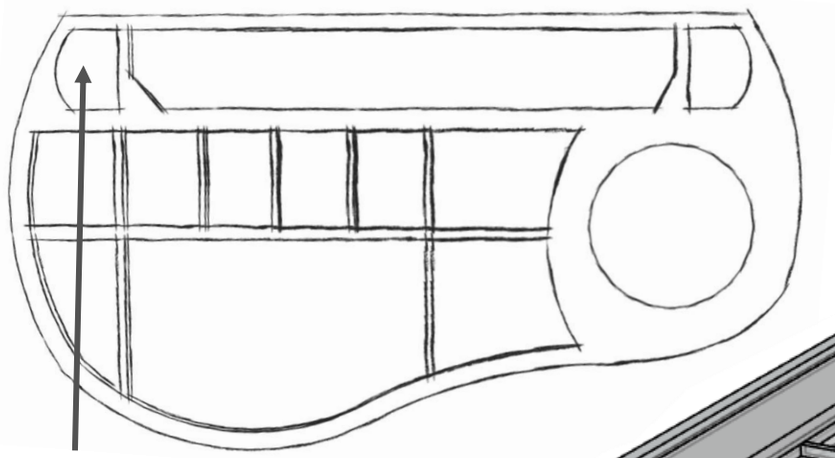
Holes for legs of element that suspends paint brushes

Drip Tray

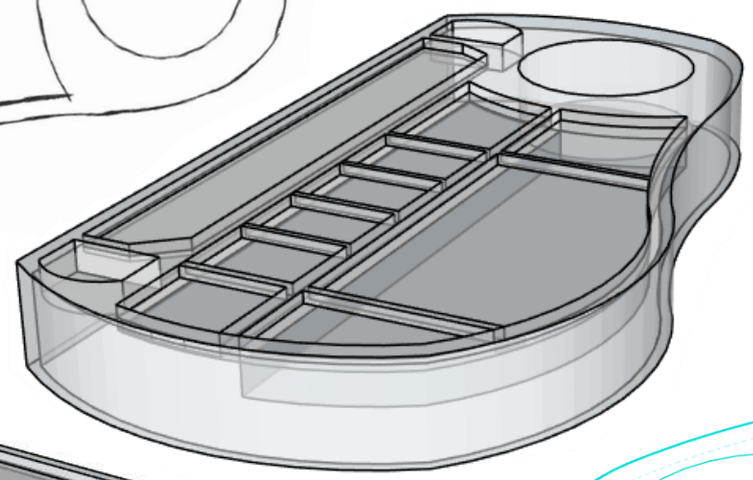
Space for Water Pot

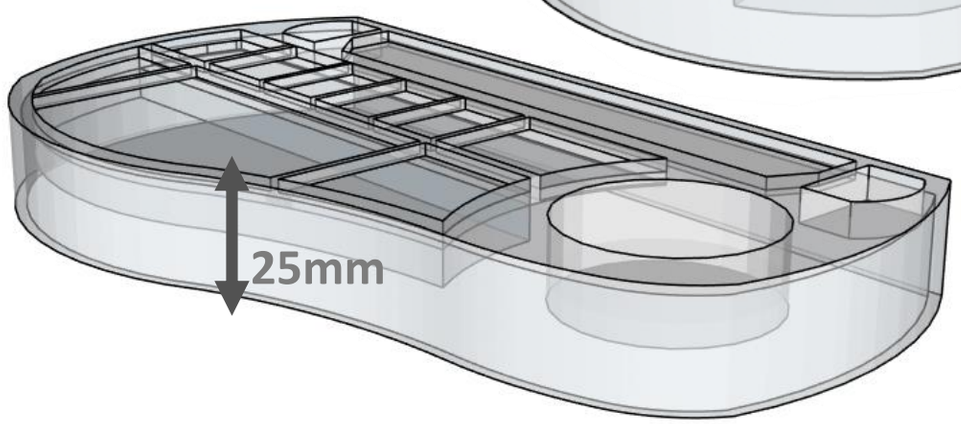
Space for Mixing Paint

I sketched a 2D plan of the top surface of the paint palette base and then **rendered** it to get an idea as to what it could look like in **3D**

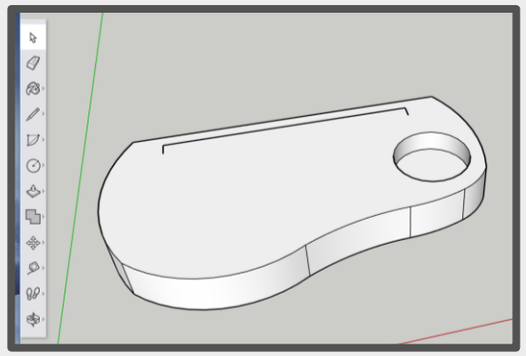


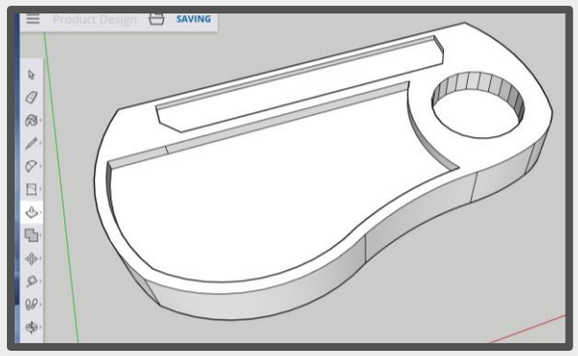
The shape of these holes will depend on the **shape of the supporting poles**

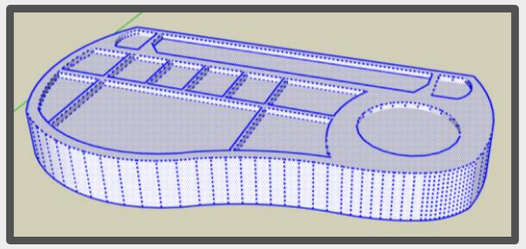


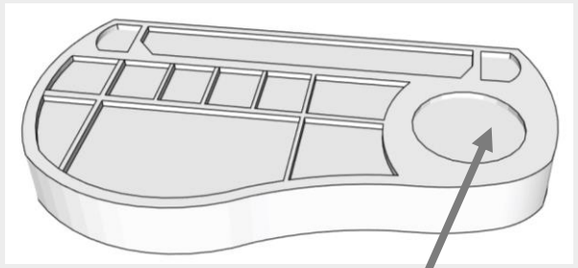


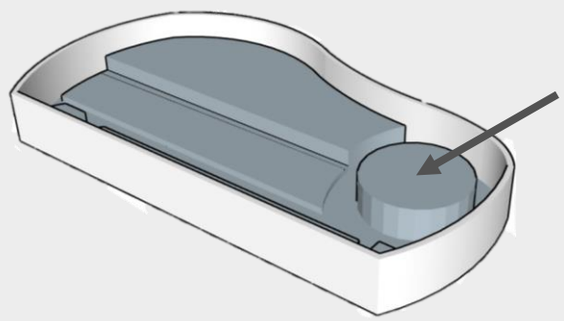
I made a **Digital 3D model** of the **palette base** of my product to bring it to life more.



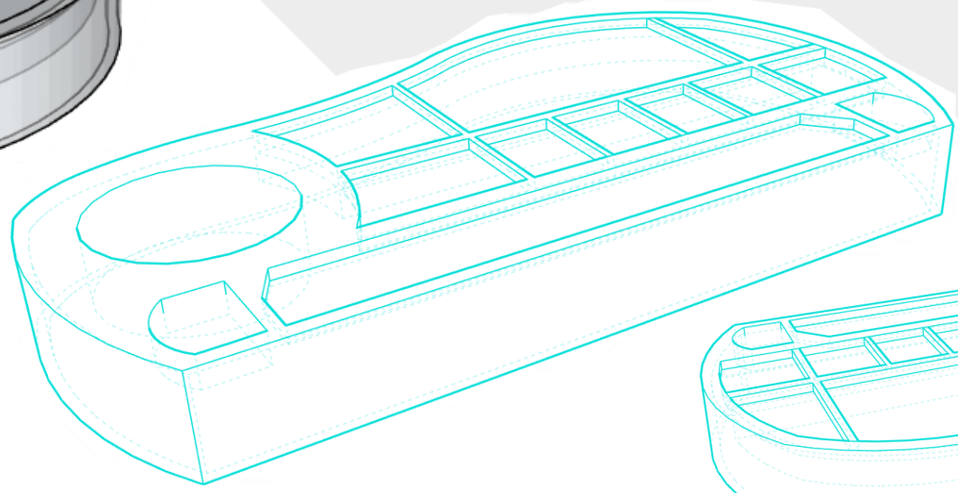


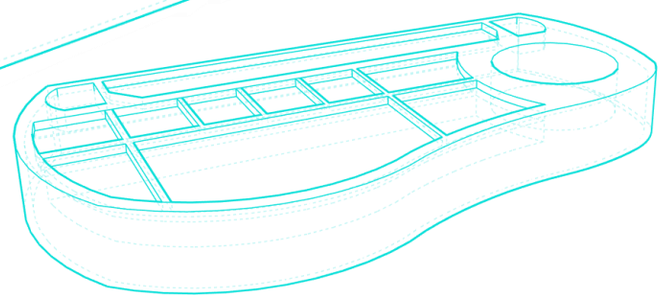






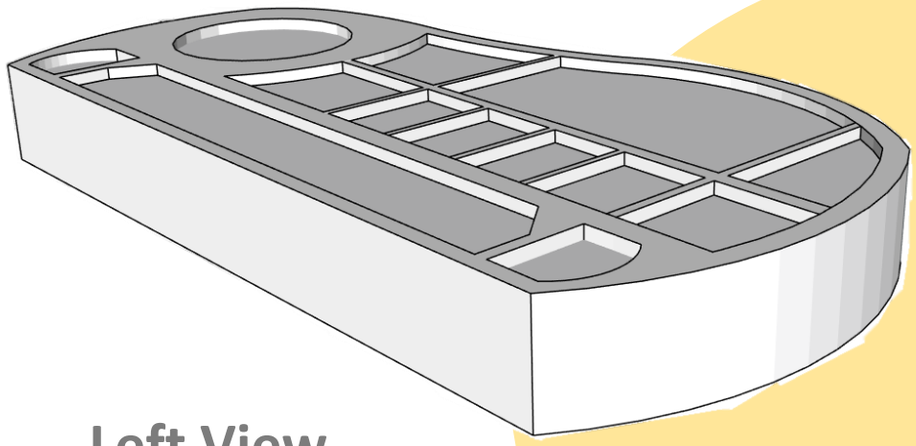
For some reason the water pot space looks shallow in some images of my model but it is supposed to be deeper.





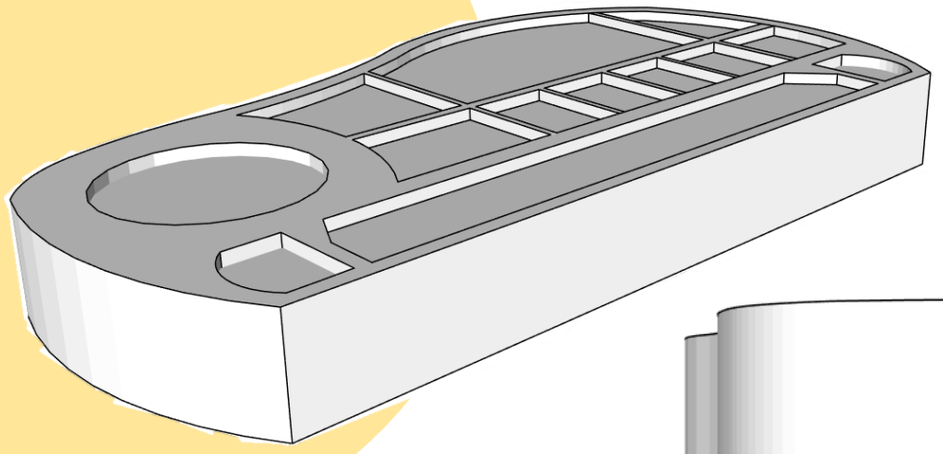
24. Development of Final Design Solution

Back-Left Iso View

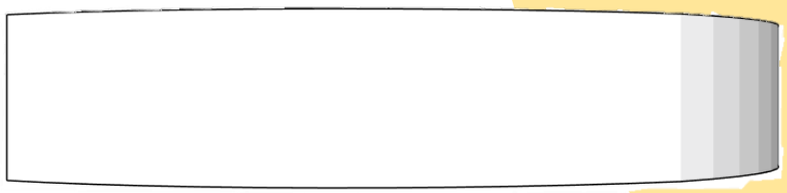


Back View

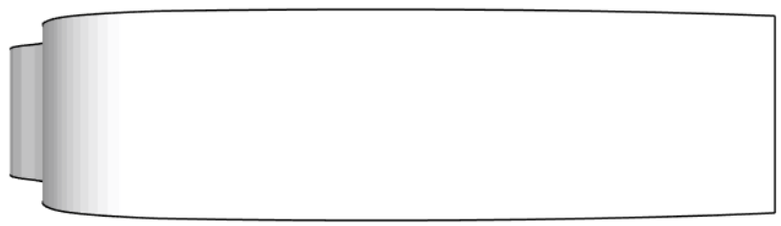
Back-Right Iso View



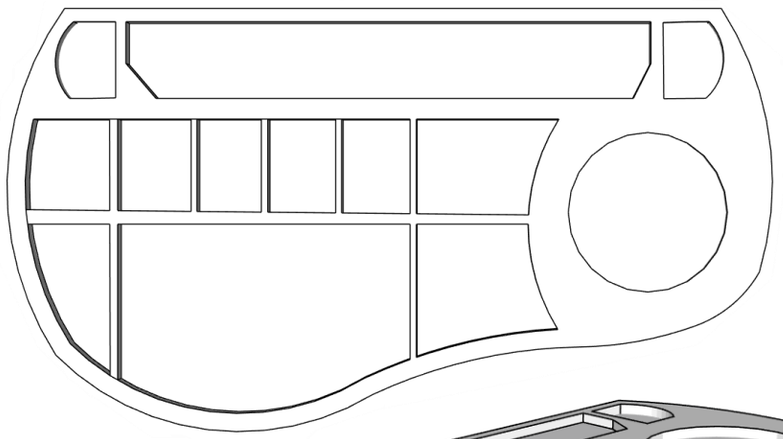
Left View



Right View

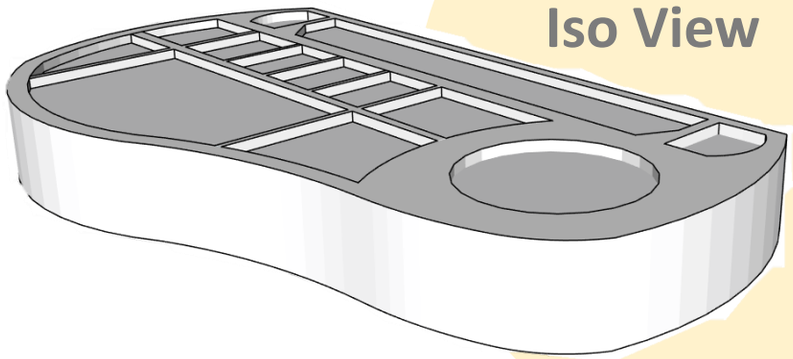


Top View

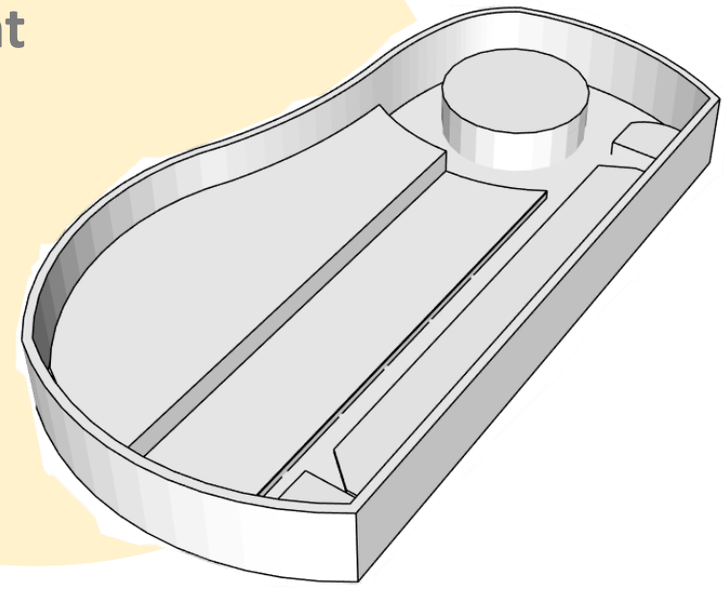


Front View

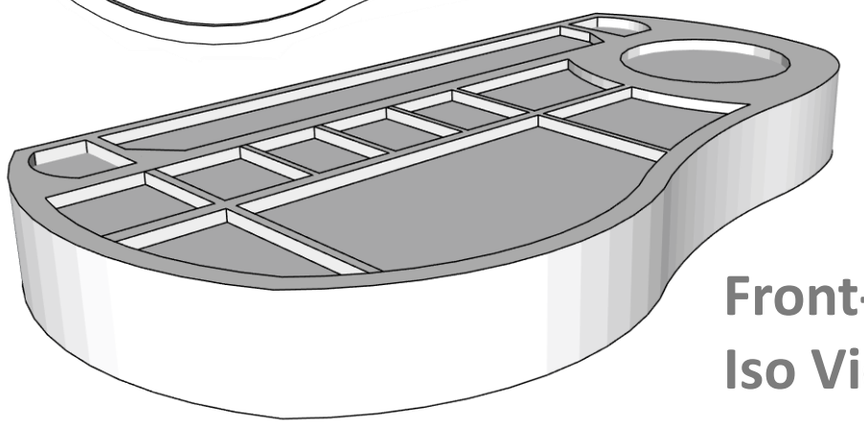
Front-Right Iso View



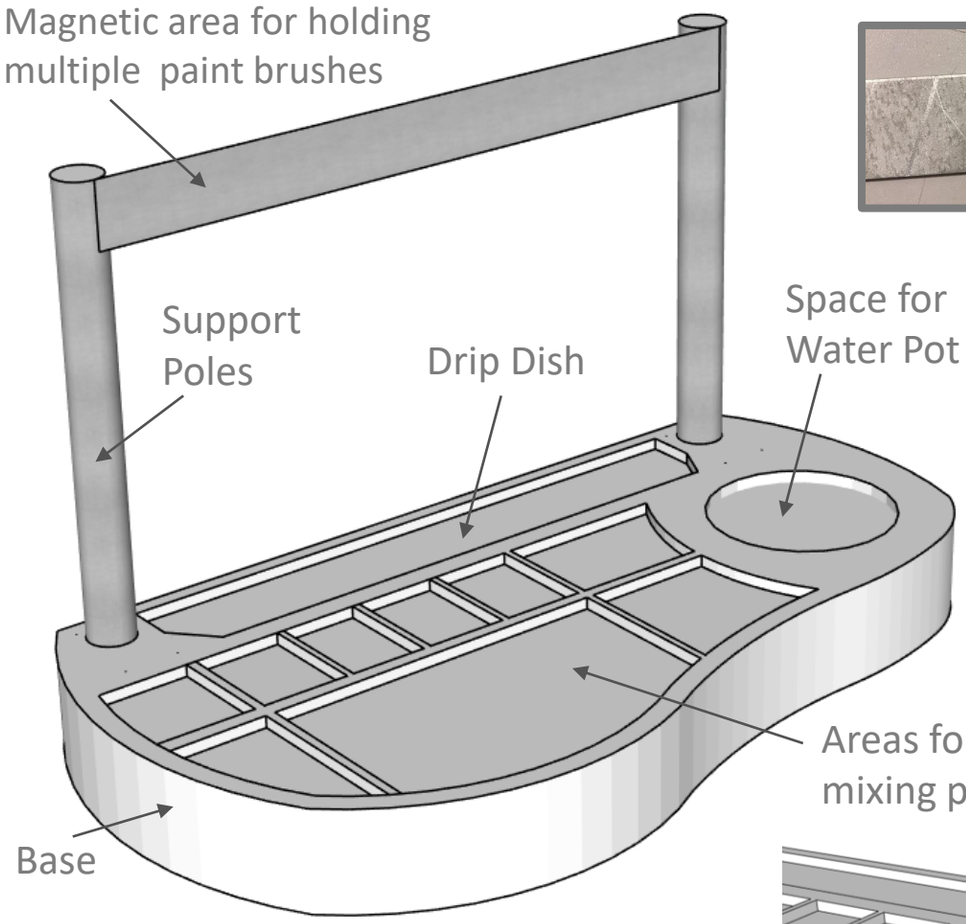
Bottom View

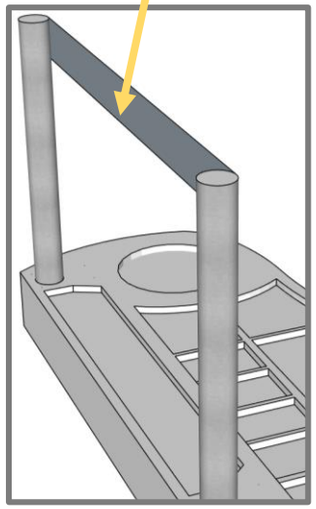


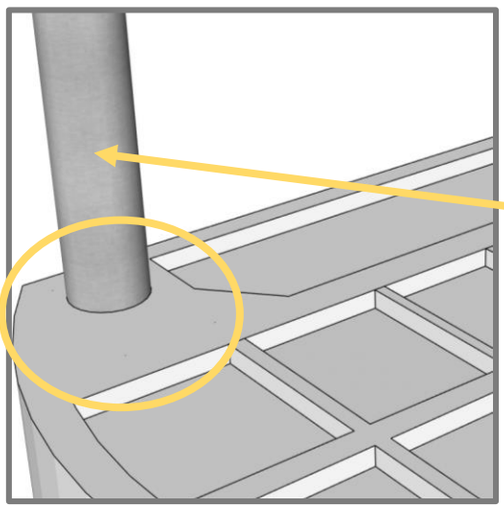
Front-Left Iso View



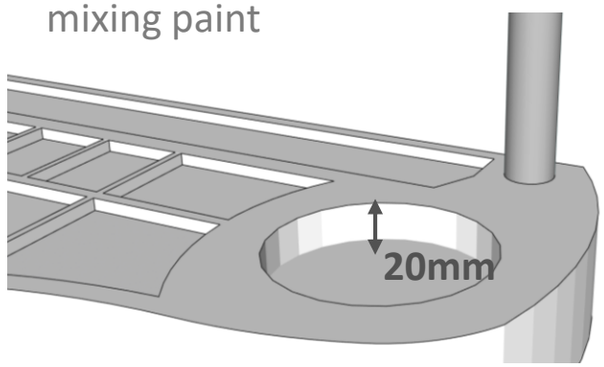
25. Developments of Final Design Solution

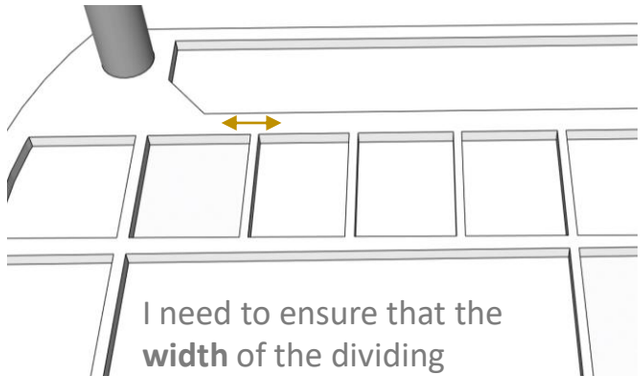






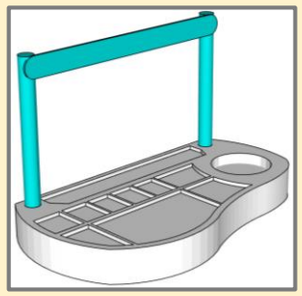
After it's been **vacuum formed** I will <u>drill a hole</u> into either side of the drip tray and insert the mild steel rods.



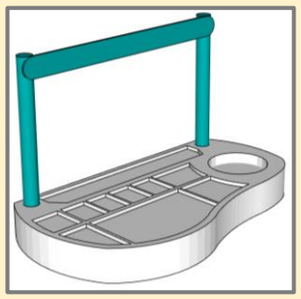


I need to ensure that the **width** of the dividing sections isn't too thin or the plastic will <u>**break**</u> and be <u>**too weak**</u> once vacuum formed.

Colour Variations

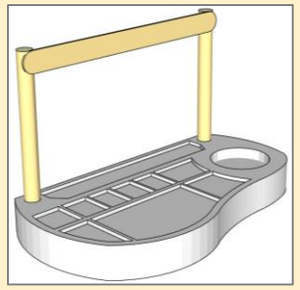


Light Blue



Turquoise Blue

White/grey



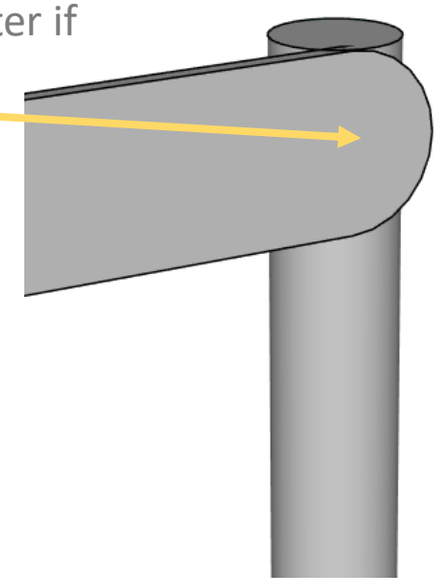
Yellow

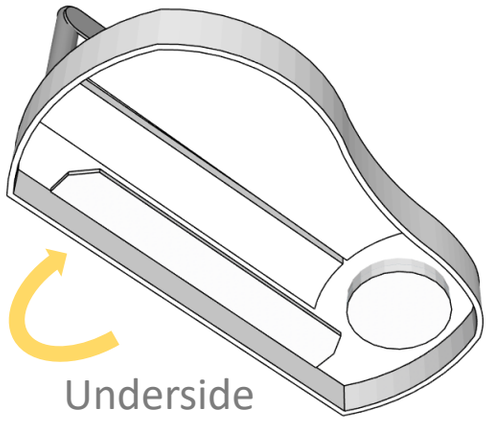
Royal Blue

Black

The metal structure could be **Powder Coated** in a colour to give my product <u>a finer finish.</u>

The end would look better if it was **rounded** off as it gives the product a **smoother** look.

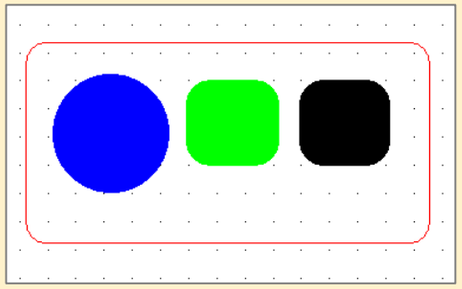




Underside

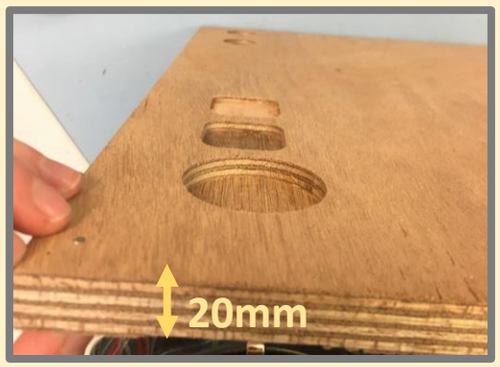
26. Exploration of Materials & Planning for Making

Testing Different Depths



I used **2D Design** first to draw the layout, each colour signifies a different depth; **blue** being the **deepest** and **black** being the **shallowest** ***(in my test)***

9mm deep **6mm deep** **4mm deep**



20mm Thick MDF

However, I think the **palette base** would be better if it was **25mm – 30mm** so the cup holder can be a deeper depth & it would sit higher above the work surface.

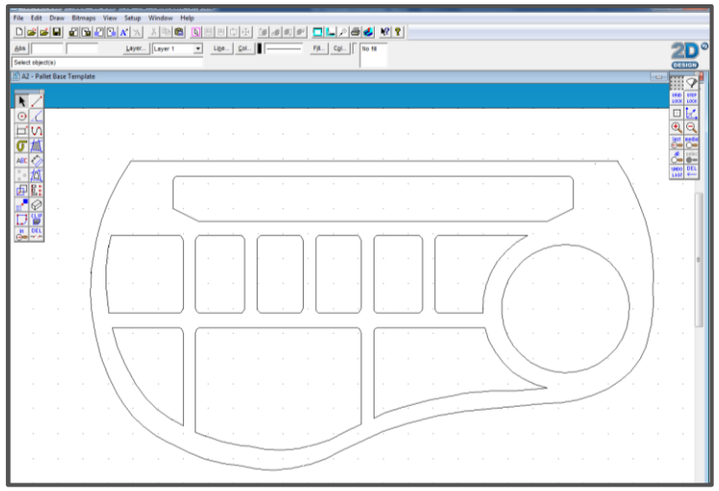
Materials Needed:

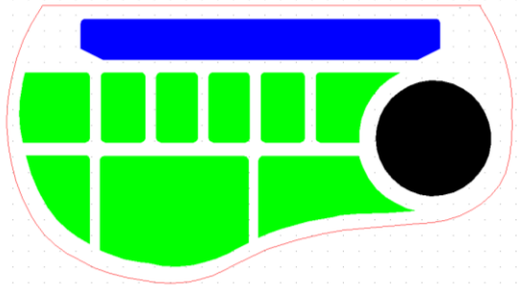
- Wood
- Mild Steel Rod
- Mild Steel Sheet
- Polystyrene Plastic Sheet

Equipment Needed:

- 3D Router
- Sandpaper
- Drill
- Dr Sticker

I made a template of the palette base on **2D Design** so that I could use the **3D Router** to cut it out of wood.





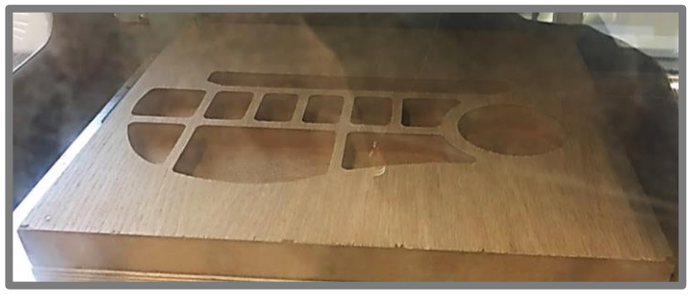
Depth of Sections:
Black = **20**mm
Green = **15**mm
Blue = **10**mm

The **3D Router** seemed to work sufficiently so I attempted to try and cut out a **test run** of the palette base.

I think that the **depths could be shallower** for the **drip tray** and **paint mixing areas**, **6/8mm** would probably be better.

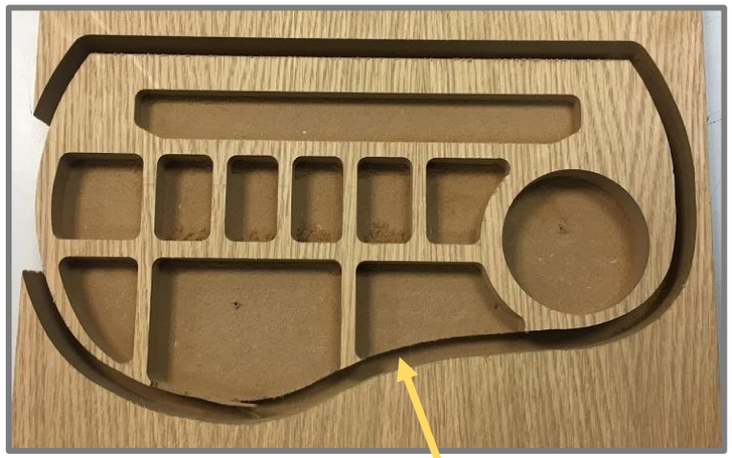
PLAY

The **3D Router** cuts **very accurately** but it does take quite a long time depending on the depth of the section it's cutting.



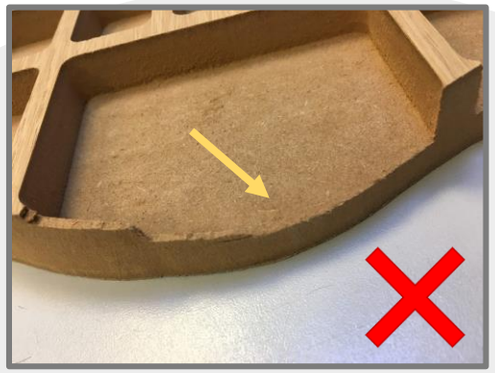
27. Exploration of Materials & Planning for Making

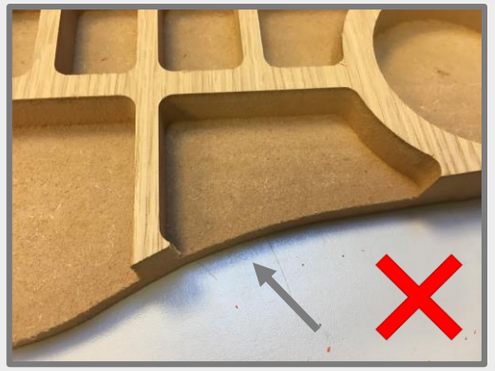
Problem!

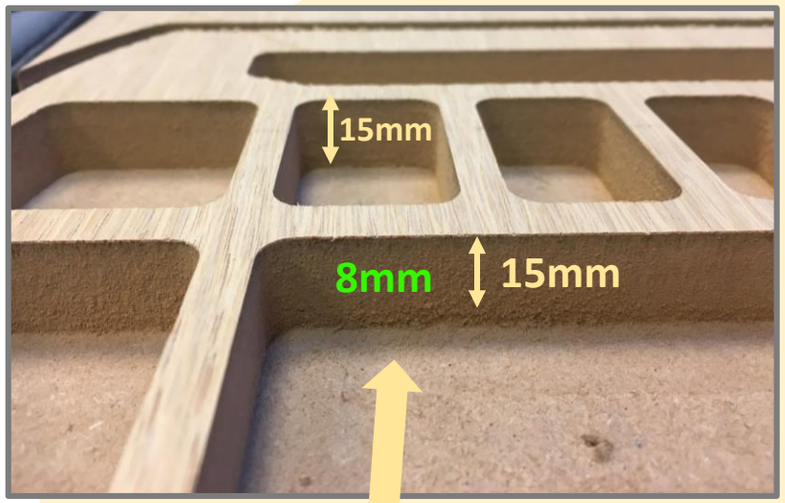


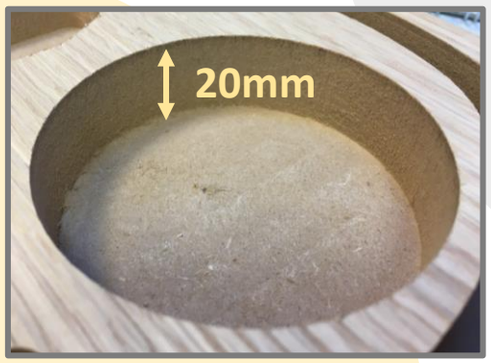
The front edge of the palette base was **too thin** so it **broke** off when the **3D Router** cut around the edge.

I need to **adjust** my **CAD design** so that this won't happen again by **increasing the thickness** of the outer front edge.

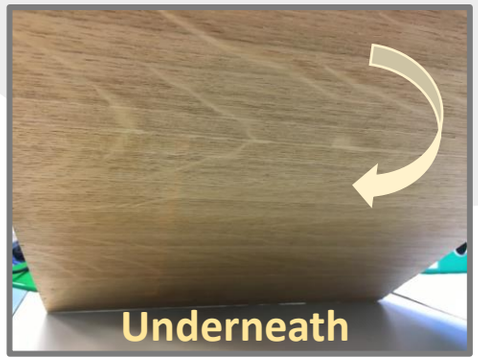


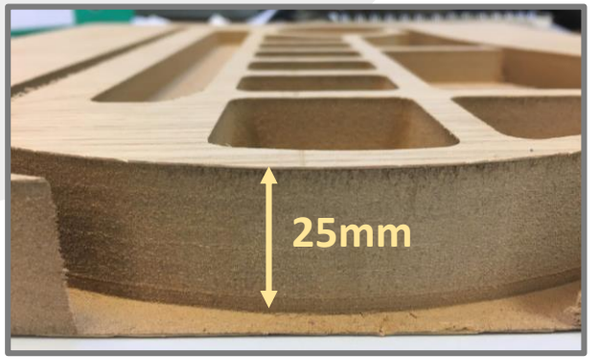




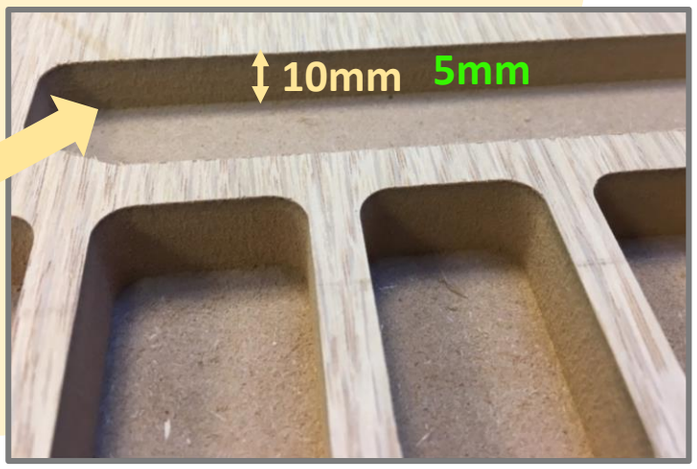


The **depth** of the **water pot** space seems to be **correct** so I won't need to change this.





However, I think that the other sections need to be **shallower depths** as in comparison to most pain palettes, these are much **too deep**.



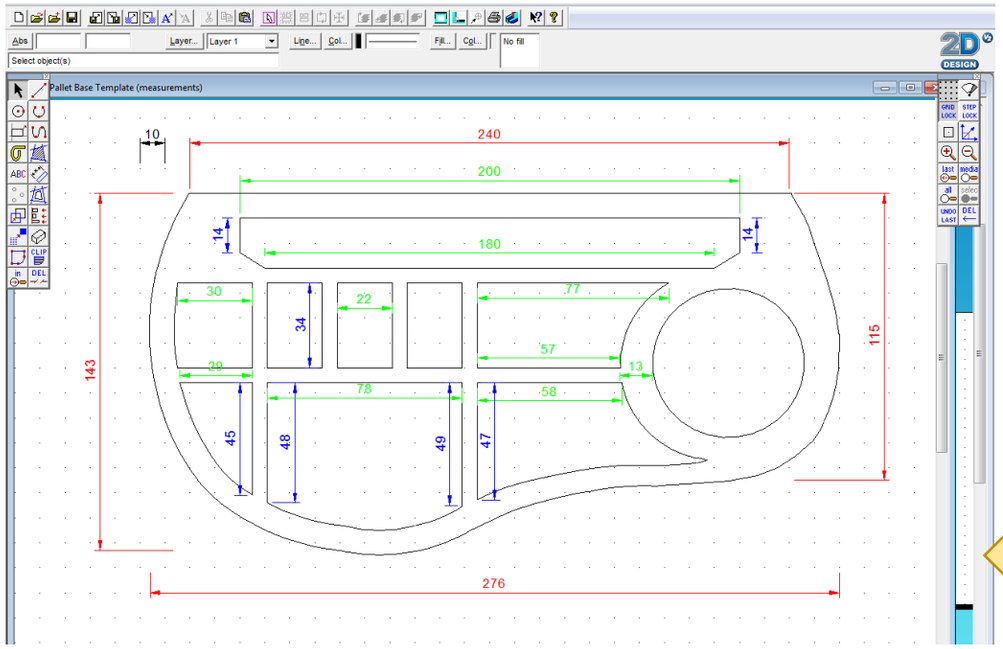
The **3D Router** can't **fully** cut through the wood so I had to cut around the edge after.

28. Planning for Making

Steps	Process	Equipment	Notes
1	Draw out design for **palette base** on **2D Design**.	2D Design Program, PC	Ensure that all lengths and angles are **correct and to scale.**
2	**Set up CAD Drawing so that it can be used by a 3D Router to cut out the design by allocating colours to specific sections.**	2D Design Program, PC	Make sure **colours used are set to the correct depths for the assigned sections**.
3	Secure block of MDF inside 3D Router and set up machine to cut out palette base design.	MDF, 3D Router, Nails, Hammer, CAD Drawing	Ensure that the wood is **secure and positioned in line with the edge** so that it won't move whilst cutting.
4	**Cut excess wood off** from around palette base using a **cutting knife.**	MDF Palette Base, Cutting Knife	Be careful to do this **neatly** so the outside edge **doesn't get damaged**.
5	**Sand down all rough edges and surfaces** so that the wood is **smooth.**	MDF Palette Base, Sand Paper	Don't leave any **sharp/rough areas** that would affect the finish after vacuum forming.
6	**Use a Pillar Drill to drill in several tiny holes** in each indent so that the vacuum former can form into them.	MDF Palette Base, Pillar Drill, 1mm Drill Bit	Make sure to drill holes in each corner of the indents so that there is **an even distribution**.
7	Use **Vacuum Former** to vacuum form a sheet of **Polystyrene Plastic over the MDF model of the palette base.**	MDF Palette Base, Vacuum Former, A3 Polystyrene Plastic Sheet	Make sure the polystyrene plastic is **securely fastened over with no gaps for air to escape.**
8	**Wait for furnace to heat up plastic so it's flexible to touch and then vacuum form model.**	MDF Palette Base, Vacuum Former, A3 Polystyrene Plastic Sheet	**Monitor** this process at all times to ensure the furnace **doesn't get too hot and burn/over melt the plastic.**
10	**Cut off excess plastic from around the outside of palette base with a cutting knife.**	Vacuum Formed MDF Palette Base, Cutting Knife	Make sure **to cut off excess plastic as neatly as possible so that it isn't sharp**.
11	**Drill holes into palette base for mild steel rods using a Pillar Drill.**	Vacuum Formed MDF Palette Base, Pillar Drill, 6mm Drill Bit	Mark out where holes are going with a marker before drilling to **ensure holes are in the correct place.**
12	**Cut Mild Steel Rods to size with a metal saw and file down any rough edges with wet & dry cloth/a metal file.**	Mild Steel Rod, Metal Saw, Wet & Dry Cloth/metal file	Ensure both rods are **exactly the same length** and that they both fit inside the holes in the palette base.
13	**Cut Mild Steel Sheet to size** and use **a metal file to round off corners on either end. Then use wet & dry cloth to strip steel down to it's raw finish.**	Mild Steel Sheet, Metal Saw, Metal File, Wet & Dry Cloth	Make sure that both ends of the sheet have been equally rounded so they look **symmetrical.**
14	**Braze the mild steel rods to the back of the mild steel sheet on either side. Clean up any messy areas with wet & dry cloth for a smooth finish for spray painting.**	Mild Steel Rods (cut to size), Mild Steel Sheet (Shaped & cut to size), Brazing Rod, Wet & Dry Cloth	Make sure the rods are **positioned correctly and symmetrically on either side**.
15	**Spray paint the mild steel rods and sheet all over.**	Brazed Steel Rods & Sheet, Spray Paint	The spray **painting may require a couple of coats before the steel is fully covered all over**.
16	**Once paint is dry, slot rods into holes on palette base so the paint brush holder is secure.**	Vacuum Formed Palette Base, Spray Painted Paint Brush Holder (brazed rods & sheet)	Ensure that both rods have been fully pushed into the holes so that it sits evenly.
17	**Use a sticker machine to cut out the text for the logo using Doctor Sticker. Then transfer onto finished product.**	Sticker Machine, PC, Doctor Sticker Program, Coloured Plastic Sticker Sheet, Scissors	Make sure the font and size is correct and will fit on the desired area.
18	**Use Pillar Drill to drill an indent into the handle of a paint brush for magnet.**	Paint Brush, Pillar Drill, 5mm Magnet	Make sure the indent isn't too deep or too shallow for magnet.
19	**Glue magnet into hole in the paint brush handle with super glue and sand down surface so that the magnet is flush with the wood of the handle.**	Paint Brush, Super Glue, Magnet, Sand Paper	Check that the magnet doesn't fall out and is secure in the handle.

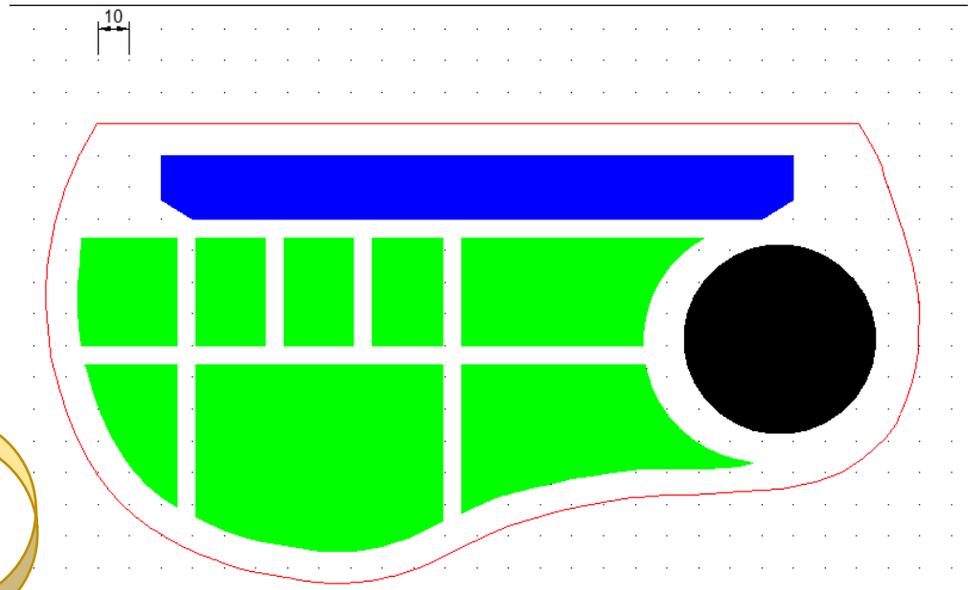
29. Planning for Making & Technical Specification

Measurements



I did a technical drawing on **2D Design**. This enables someone to understand how to **accurately** scale my product when making more the same.

I re-drew the template on **2D design** so that the outside edge was **the same distance** away from the indented sections all the way around the front edge. This will stop it from breaking again. I also made sure that each section was **drawn accurately and to scale**.



Depth of Sections:

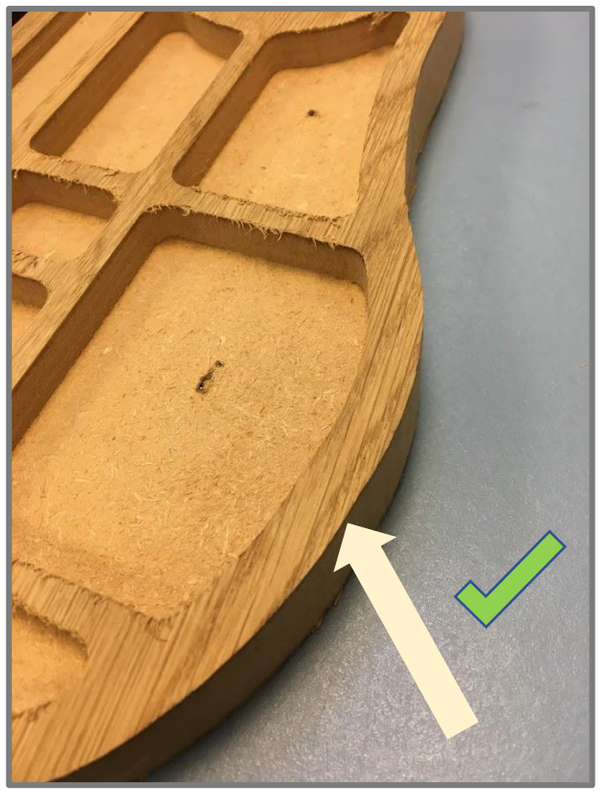
Black = **20**mm

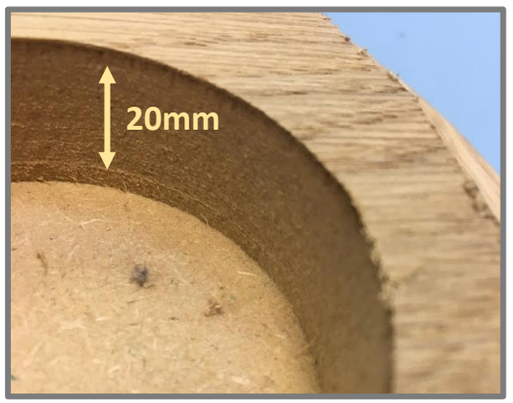
Green = **10**mm

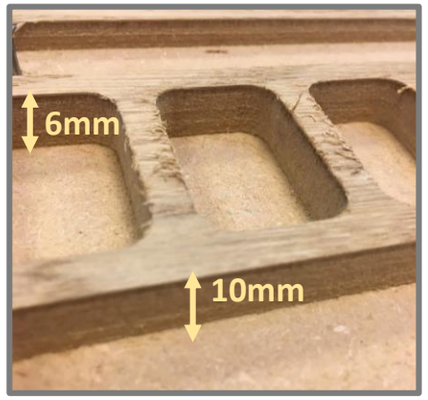
Blue = **6**mm

Base = **25**mm

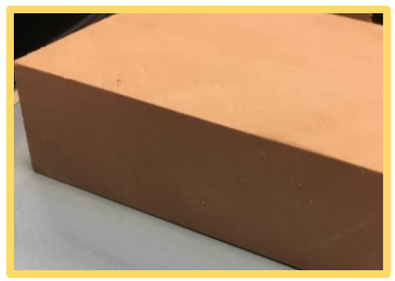
I cut out my design again using the **3D Router** and the front edge stayed in tact.







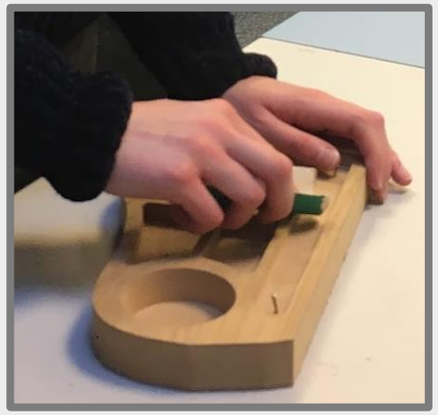
I changed the depths of the **Green** and **Blue** sections so that they were **shallower** because in my test model I thought they were a bit too deep.



I could also try cutting out my template using **modelling board**. This may produce a smoother finish and be more suitable for vacuum forming.

30. Planning for Making

Sanding



I sanded down the **edges** so that they weren't sharp. This is so that when it's **vacuum formed** the **plastic won't stretch too/split**.

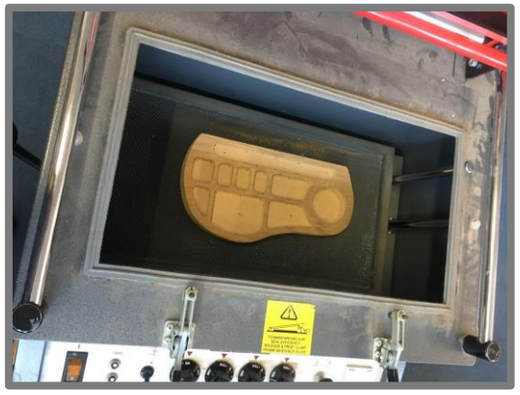
I will then use this wooden base as a **mould** to **vacuum form** a plastic model.

Drilling

I now need to **drill tiny holes** into the **corners** of each indented section using a **pillar drill**. This is so that the plastic will **suck inside** the shape of the sections rather than just pulling tight over the top.

I used a **1mm** drill bit

Vacuum Forming



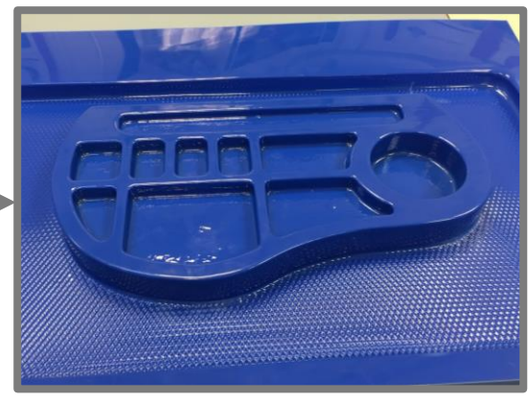
1) I put the wooden model in the centre of the grate

2) I then pulled the lever so that the grate sunk down inside the Vacuum Former.

3) Then I clamped down a sheet of blue polystyrene plastic over the surface of the hole.

4) I then slid the heater over the top of the plastic so that it would become flexible.

5) After a few minutes I then slid the heater was then slid back and the leaver was pulled again to bring the wooden model back towards the surface, causing the hot plastic to mould around the shape.



6) This created a perfect replica of the wooden model out of the polystyrene plastic.

31. Planning for Making

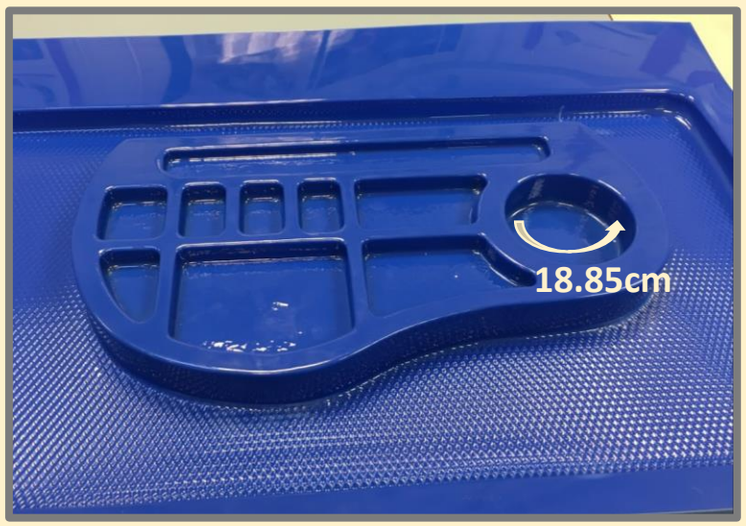
It got stuck!

The **Vacuum Former** moulds the plastic **so tightly** around the object you put inside it, sometimes the air gets trapped and makes it **difficult to remove** it from inside.

I had to make small holes in the **surface** of each indent to try and **release some of the air pressure** so the wooden mould would pop out.

Unfortunately after attempting to remove the wooden model from inside, **the plastic split in various places**. I will need to **think of a better way of removing it** for the final product **OR** use a **different material** such as **modelling board**, instead of wood.

I also need to consider how I **cut the excess material off** from around the edges of the mould.



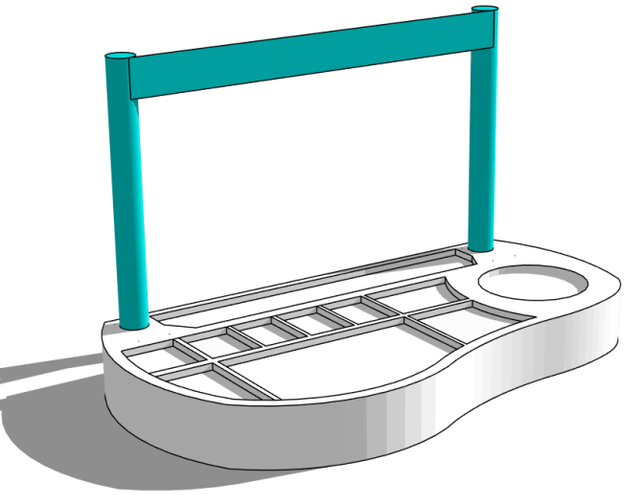
It needs to be **clean and accurate** with **no sharp edges**. I may need to work out a way to **vacuum form** the model so the plastic **folds under the bottom** edge slightly to make the cut cleaner.

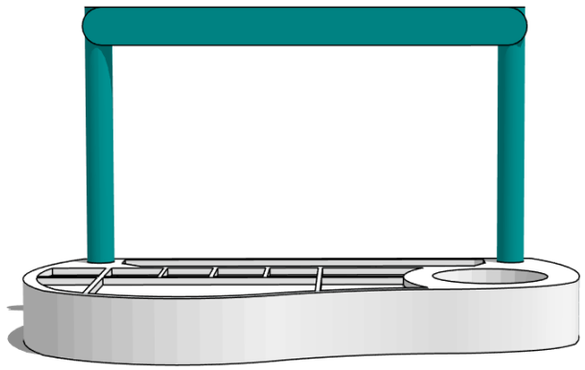
Problem…

This is the **only** glass shape that fits. I will need to **adjust the size** to be **larger** in my **2D Design** drawing and then **re-cut** the base using the **3D Router.**

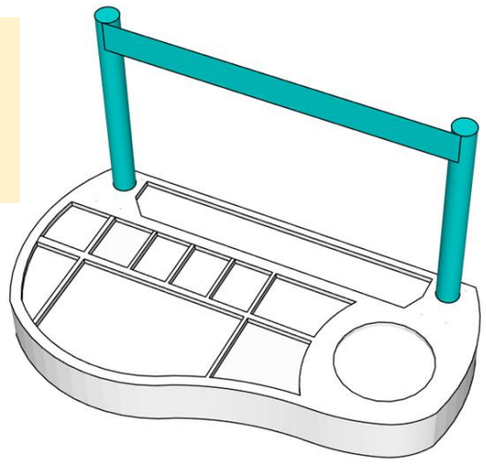
It needs to fit the size of an **average water glass**.

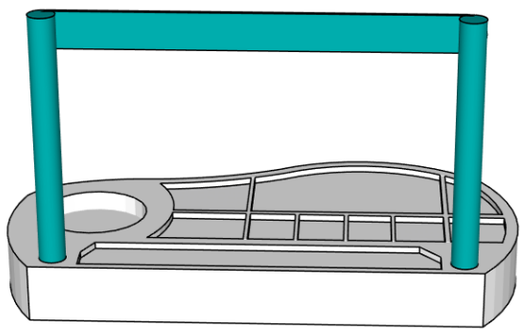
32. Final Design Solution

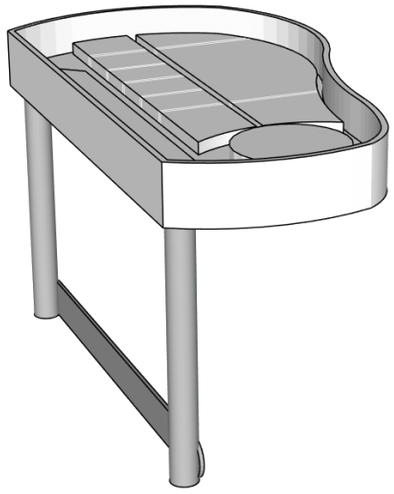


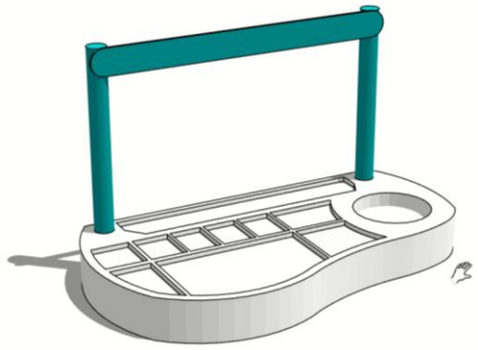


I think that a **light blue/turquoise** colour would work well with the white plastic base.









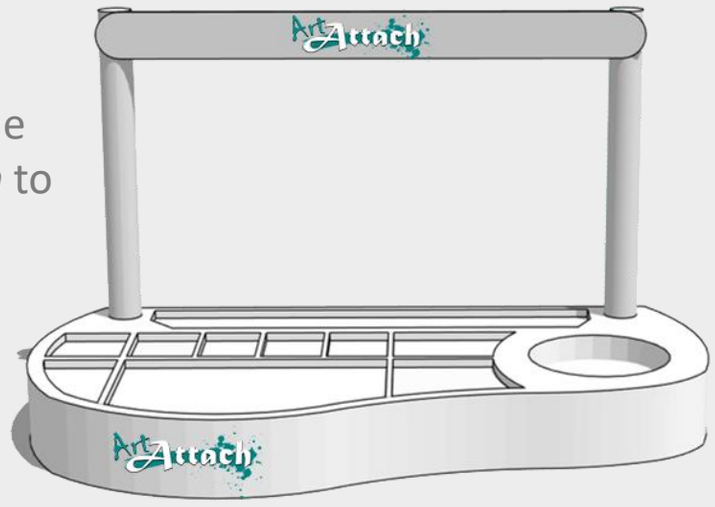
PLAY

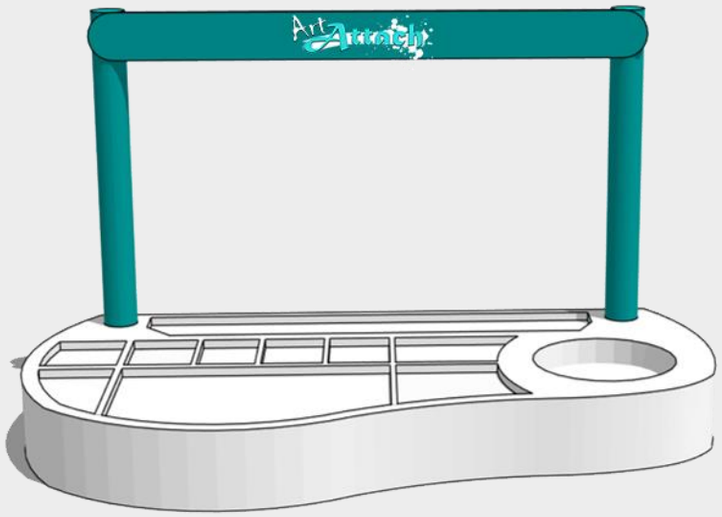
Art Attach

I designed my own logo for my product using Photoshop.

The name '**Art Attach'** is meant to refer to how the paint brushes will ***attach*** to the product.

The logo could also be **reversed** onto The blue colour.





Although the logo looks better on the light grey colour as the colours **contrast** better.

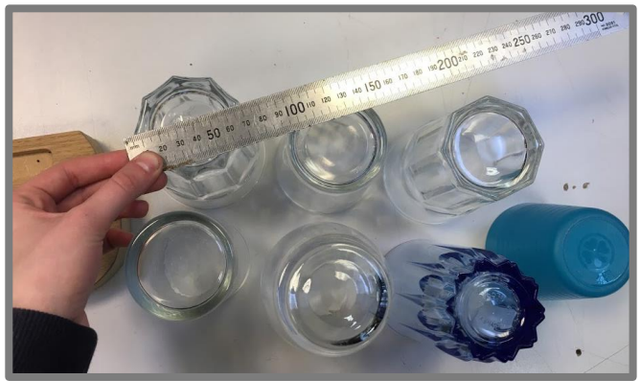
33. Development of Final Design Solutions

I created a poster to **advertise** my product as if it was going to be sold in a magazine.

I also made another colour alternative to see which looked better.

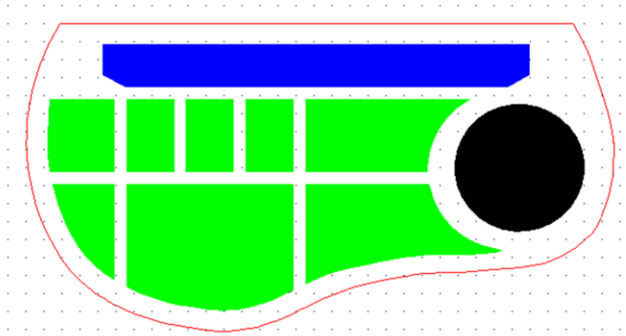
34. Making Final Product

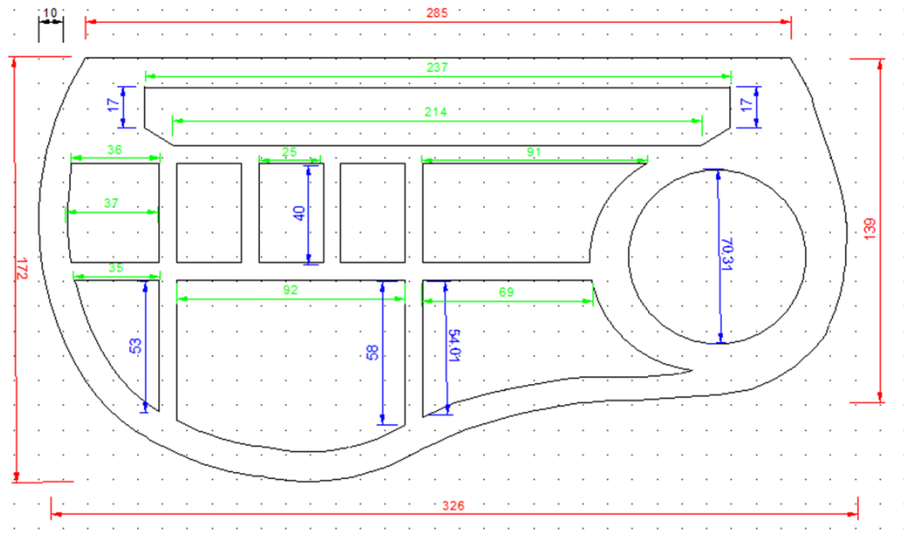
I gathered together a variety of average sized glasses of difference shapes and sizes.



The widest glass has around a **70mm diameter.**

I re-sized my **CAD** drawing to the **correct scale**. It should now fit the majority of average glass sizes stakeholders would own.



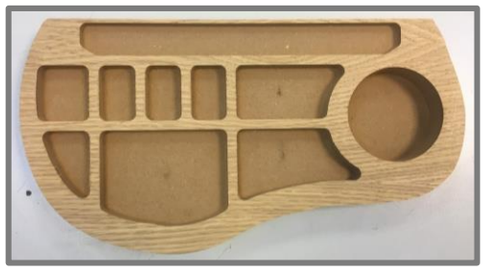


PLAY

The model I made was **too small** for all of these glasses as I made a **mistake** with the scale. I will therefore need to make a **larger** one for the final product.

I **pinned** the wood to the wooden base on the bottom of the **3D Router**. This **stops it from moving** whilst it cuts – keeps it accurate.

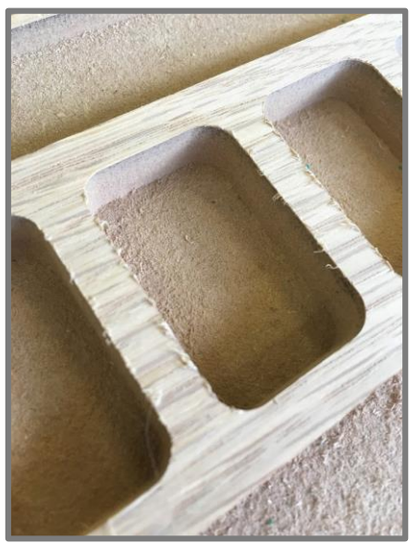
35. Making Final Product



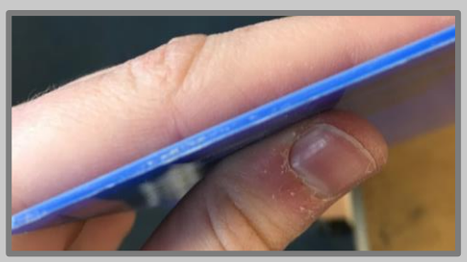
Now I need to **sand** it down so that I can **vacuum form** it again.

The **largest size** glass now fits in the indent. My product will now **fit the majority** of glass sizes which is **more practical** for my potential users.

I sanded down the **edges** so that they were **smooth** so that the plastic wouldn't **split/break** when **vacuum forming** around it.



There were **no** white polystyrene plastic sheets left so I had to use blue in my first **vacuum form** test. However I found a similar plastic sheet in white, the only difference is that it's slightly **thinner**.



I tested to see if the white plastic sheet would **vacuum form** to **the same quality and standard** as the blue using a test object.

I also **raised** the object slightly so that the plastic moulded **underneath** slightly, this made the cut **cleaner** when I cut the **excess plastic** off from around the edges.

36. Making Final Product

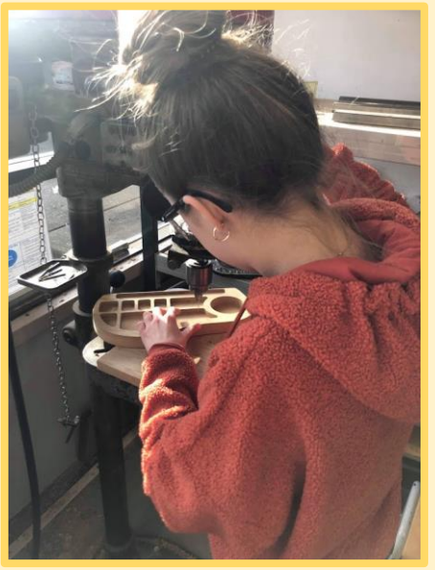
This model is **larger** than the previous model I made and the measurements are now correct.

I'm going to **vacuum form** this **white plastic sheet** over the top of the wooden model.

This is what happens when you **don't** switch the vacuum on **fast enough** *after* removing the heat because the plastic isn't soft enough to mould.

Error

Pillar Drill



I drilled holes in each **corner** of the indented sections of the palette using a **Pillar Drill.** I used a **1mm** size drill and went all the way through the wood ***(25mm).***

Safety First!
I made sure to wear goggles in case any wood/sawdust got into my eyes whilst drilling.

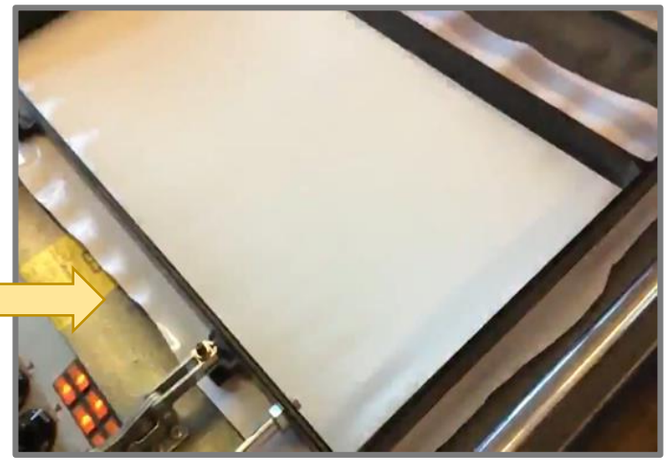
37. Making Final Product

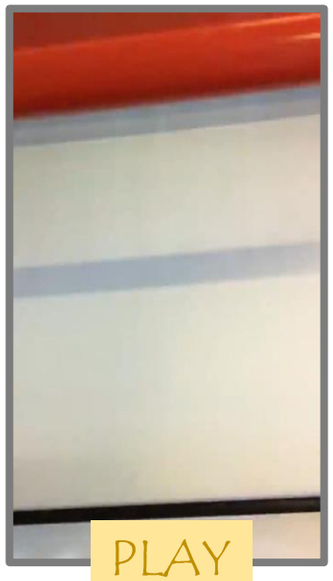
Vacuum Forming

I clamped down a sheet of white plastic over the top of the vacuum former.

I used 2 pieces of acrylic plastic to **raise** the wooden model off the bottom of the vacuum former. This meant that the plastic formed **underneath** slightly, making a **neater finish**.

PLAY

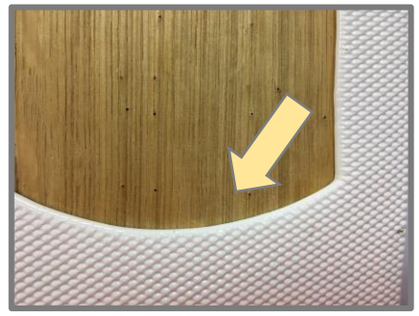


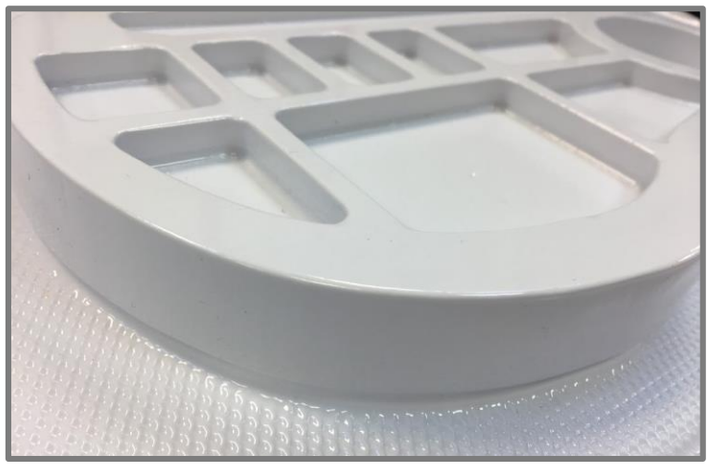


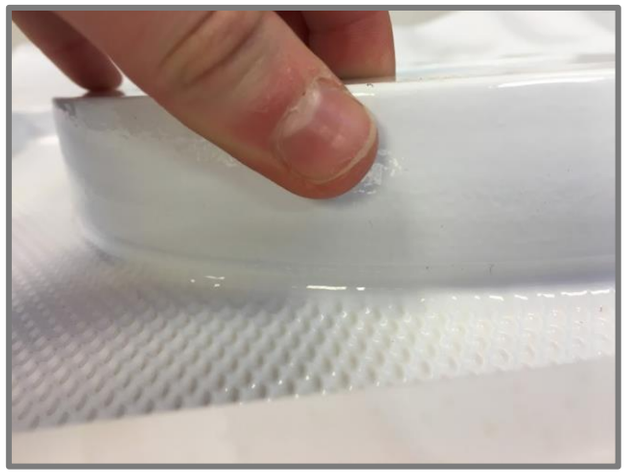
PLAY

The plastic should be heated up long enough so that when touched it billows and appears **flexible**.

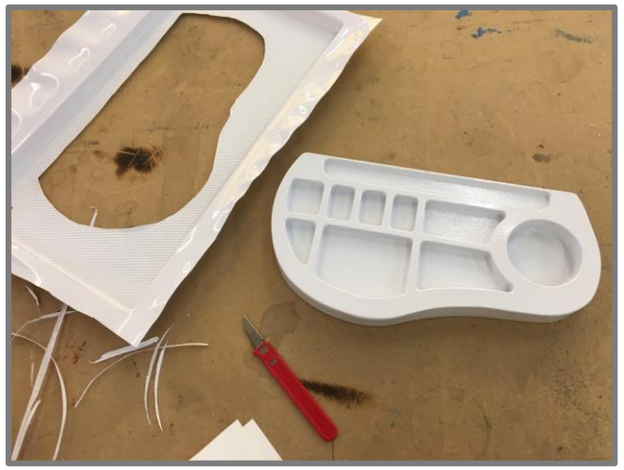
This time the plastic moulded **underneath** which will make the edge **neater** once I cut off the excess plastic.







38. Making Final Product



This worked really well but **unfortunately** the finish turned out a bit **bumpy** in some areas.

I cut off the **excess plastic** using a **cutting knife** so that the bottom edge was **neatly in line** to the edge of the wood.

I removed the plastic from the wooden mould and then sanded down the surface so that it was smoother.

I might have to **glue** this edge as it gapes very slightly away from the wood on the curve.

I'm going to **leave the wood inside** the plastic in the **final** model because it will make it **more stable** when I drill in the **metal paint brush holder**. I therefore **don't** need to be concerned about the plastic **splitting**.

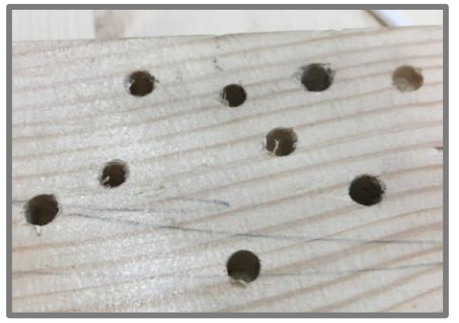
39. Making Final Product

After **sanding** down the wooden model a bit more, I **vacuum formed** it **again**. There were **no** lumps and bumps this time as the surface finish is much **smoother**.

By leaving the wood **inside** the plastic, it makes it more **sturdy** as it's heavier and is less likely to tip once I attach the paint brush holder.

I cut off **the excess plastic** using a cutting knife so that it was **neat to the edge**.

I cut **2 poles** so that they were both **15.5cm** long.



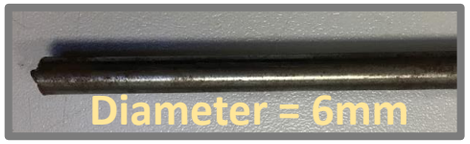
I tested drilling holes at **different depths** and using **various drill sizes** on a piece of scrap wood to see what fit the **6mm poles** the best.

Wet & Dry cloth smoothed out the **sharp edges**.

I discovered that the 5.5mm drill bit was the best fit.

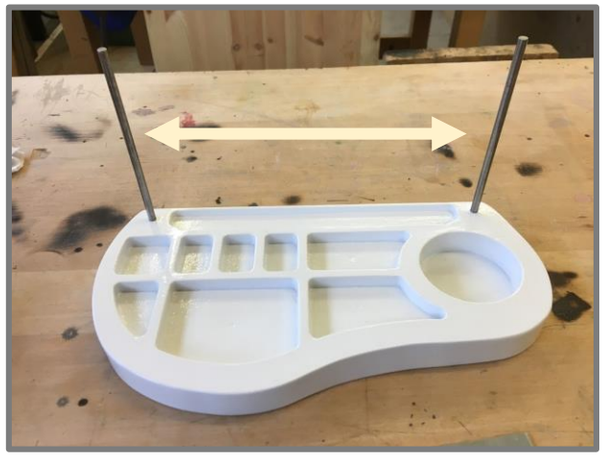
The **6mm** drill meant that the pole was slightly **unstable** whereas the **5.5mm** drill had a bit **more grip**.

The **height** of the stand depends on **where** the **magnet** is in the paint brush.



I used a **metal clamp** and a **metal saw** to cut the mild steel rod to **size**.

40. Making Final Product



The **depth** of the holes are <u>about</u> **2.3mm**/around **halfway** through.

I used the **Pillar drill** with the **5.5mm** drill bit to make the holes for the supporting poles either side of the drip tray.

I put my product on its back on top of some bricks so I **wouldn't burn the work surface** when **brazing**.

I cleaned the mild steel sheet down to the **raw metal** with a **wet-and-dry sheet** so that it has a **smooth finish**.

I then **rounded off** the <u>sharp</u> corners with a **metal file.**

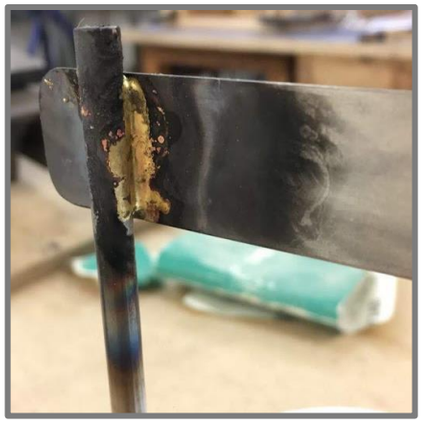
I then put a <u>small amount</u> of **Flux** onto the parts of the metal I wanted to **braze** together.

41. Making Final Product

Brazing

Safety First!

I made sure to wear **darkening goggles** to protect my eyes from the bright light of the flame.

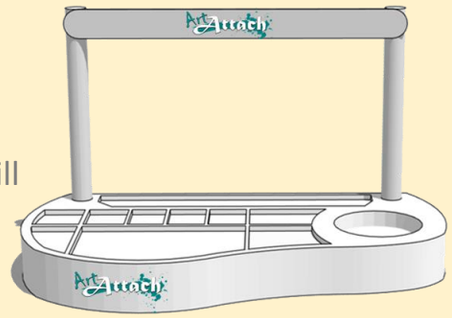


The, brazing left some marks & rough areas so I had to use **wet and dry cloth** to get rid of them.

After cleaning up the metal, it's now ready to be **spray painted** a colour. This will make it look more **finished**.

Spray Painting

I used an **Etch primer** for the undercoat which will make the spray paint **more durable** as it will stick better.

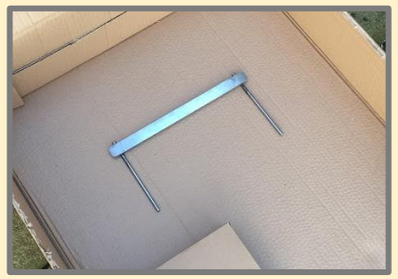


I decided to go for a **grey colour** as my **stakeholders** preferred my logo design in the turquoise colour.

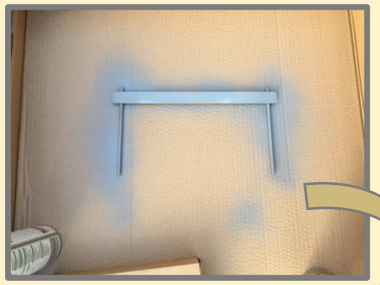
Safety First!

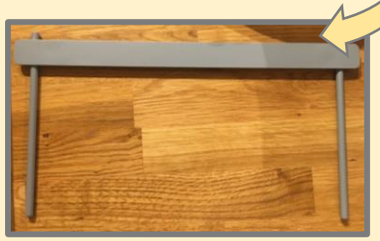
I set up an area to pray paint **outside** so the air was ventilated, and I wore a **mask** so I didn't breath in the fumes.

Priming

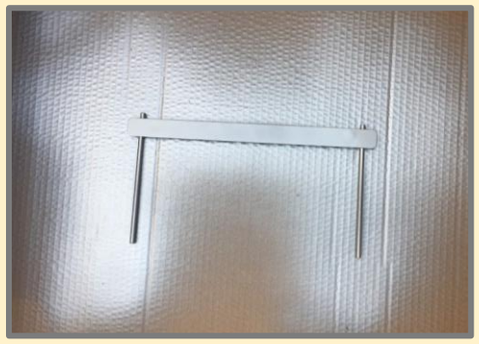


I had to wait ***10-15mins*** between coats of the primer; and ***24hours*** before spray painting.

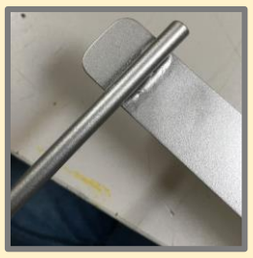


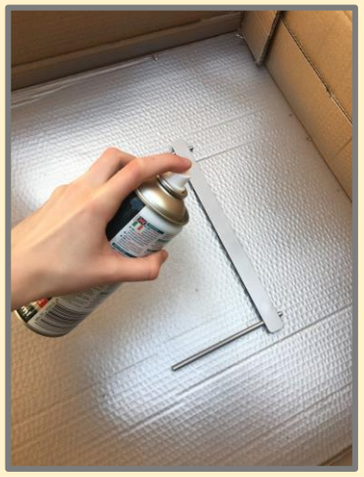


Spray Painting



I did **3 coats**, waiting **30 mins** in between each one.

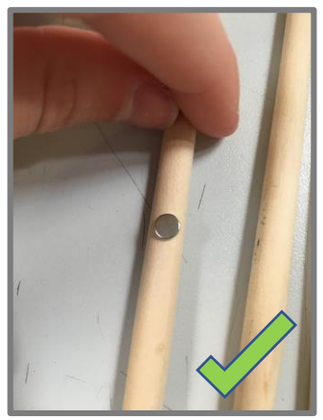


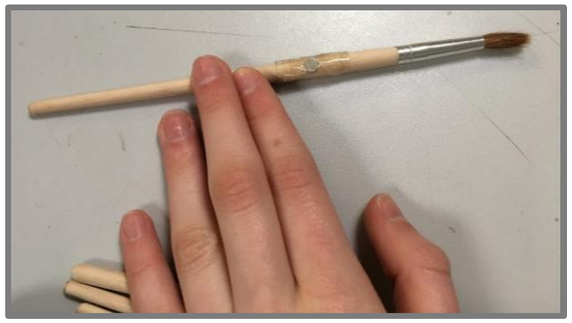


42. Making Final Product

Magnetic Paint Brushes

I bought some simple **paint brushes** of a few **similar sizes**. These are all brushes that are generally most often used whilst painting.





I tested out **different heights** by sellotaping a magnet to the handle in **different places** to find where was best.

The 5mm magnet will probably be a bit **too large** for the paint brush with the **thinner handles** so I would need to find a **smaller magnet** to suit this size. But the **larger handles fit the 5mm magnets perfectly**.

After drilling the hole I put the magnet inside and then **sanded down** the wood so that the magnet was **flush** with the edge.

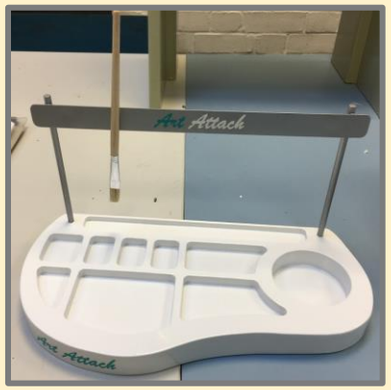
The magnets are **5mm** in **diameter** so I used a **5mm drill bit**.

I **clamped the paint brush inside a metal clamp** to keep it still and then used the **pillar drill** to make a **1mm deep hole** in the handle for the magnet to go into.

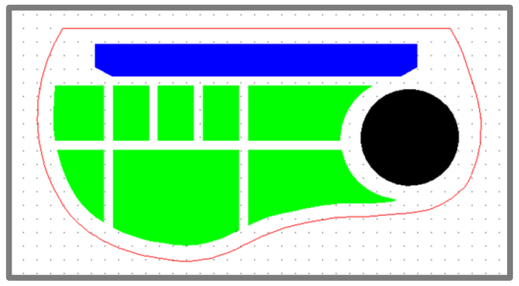
I used a **sticker machine** to cut out the wording for the **product logo**. I had to **simplify** the design to just a font as the machine couldn't print images.

I then stuck tape over the top and rubbed over the surface to make the wording stick. I could then **transfer** it onto my product.

I used a cutting knife to pick out the insides of the letters



43. Making Final Product – Step by step

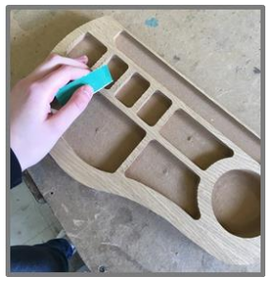


1) **2D Design** – colour fill each indented section according to required depth. **Blue = 6mm**, **Black = 20mm**, **Green = 10mm.** Make the outside line red.

2) Pin down **25mm** wood inside **3D Router.**

3) Wait for **3D Router** to cut out the palette base.

4) **Once complete**, remove pins and take out of Router.



5) Sand down all rough edges and surfaces.

6) Use **Pillar drill** to drill in air holes for **vacuum forming.**

7) Place wooden model in **Vacuum Former** with **2 pieces** of plastic underneath to raise it up.

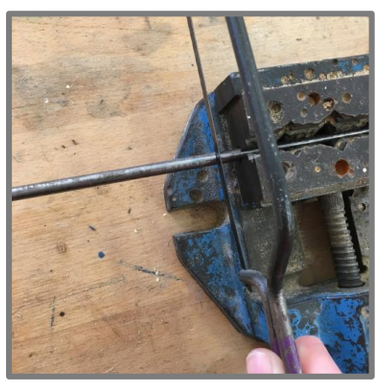
8) **Clamp down** white plastic sheet over the opening.

9) Wait for it to **heat up** plastic and then **vacuum.**

10) Take out vacuum formed palette base.

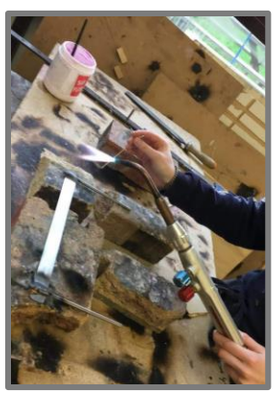
11) **Cut off** excess plastic with a knife.

12) Use **Pillar drill** to drill holes for supporting poles.

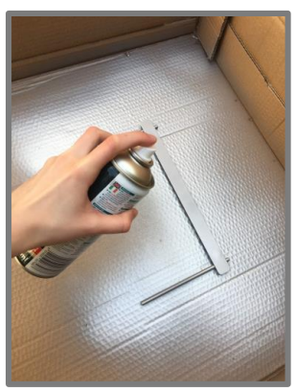


13) **Cut** mild steel rods and sheet to size using a metal saw.

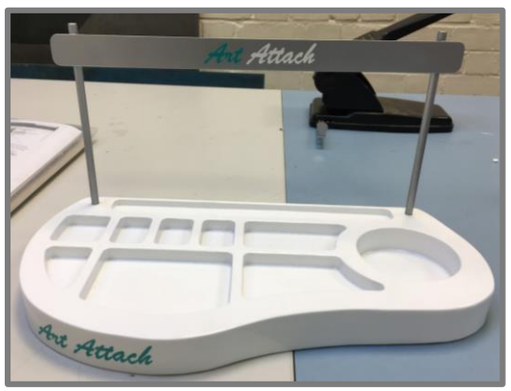
14) **Round off sharp corners** on mild steel sheet with a **file.**



15) **Braze** rods to steel sheet.



16) **Clean & polish** metal. Then **Prime & Spray Paint** metal.

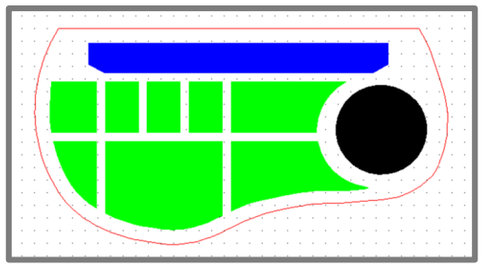


17) Put sticker of logo on - **Finish Product.**

When made by hand on my own, this product took a long time to produce. But if it was made on a production line it could be made **much faster**.

44. Technical Specification

A **Technical Specification** is **vital** for a **manufacturer** to make a product with **accurate measurements** to the design. Without one, the product might not turn out as the designer intended it to.



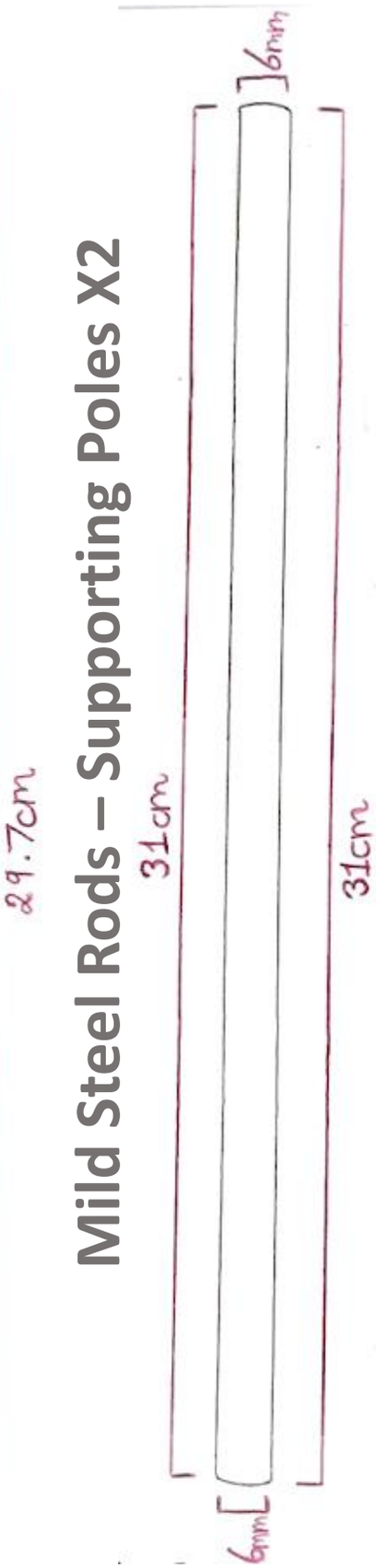
Depth of Sections:

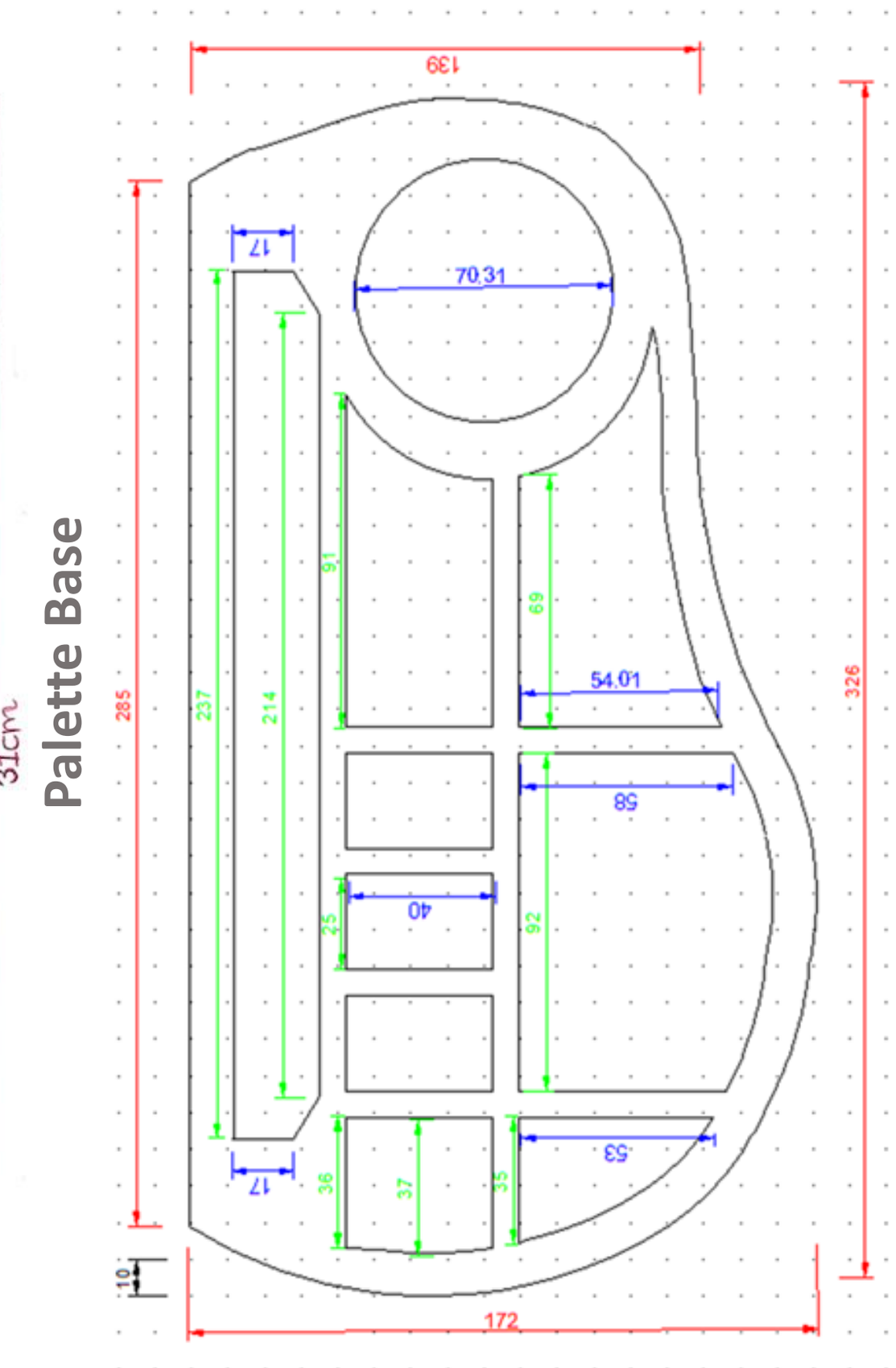
Black = **20**mm

Green = **10**mm

Blue = **6**mm

Base = **25**mm

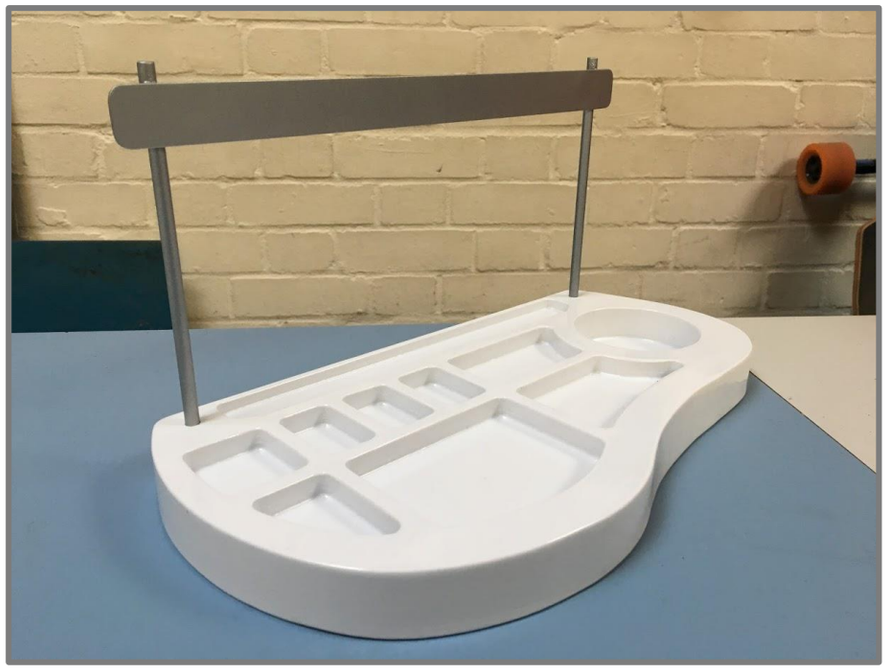




45. Risk Assessment

Equipment	Risk Level	Precautions Needed	Why Precautions are Needed
Pillar Drill	Low	• Safety Goggles must be worn • Long hair should be tied back • Keep fingers a safe distance away from drill	• Avoid splintered wood/sawdust going into eyes • Stops hair getting caught around drill and being pulled out • Prevent injury
Vacuum Former	Medium	• Monitor machine whilst in use at ALL times • Don't leave anything on top of furnace • Don't touch plastic until cool	• Could cause a fire if furnace gets too hot • You could burn your skin
3D Router	Low	• Monitor machine whilst in use at ALL times • Keep lid securely closed when in use • Ensure ventilation is turned on	• Ensure that no wood splinters off and gets stuck in the machinery/breaks anything • Stops sawdust escaping so you don't breath it in
Cutting Knife	Medium	• Cut away from your hands • Use a cutting mat/other appropriate surface	• Reduces risk of cutting yourself • Prevents damage to work surfaces
Brazing Flame	High	• Safety Goggles must be worn • Long hair should be tied back • Work on non-flammable surface • Make sure work space is clear of flammable objects • Don't touch metal until it has been cooled under cold water	• Prevents damage to eyes from looking closely at bright flame • Stops hair getting in the way/getting burnt • Ensures nothing catches fire • You could burn your skin
Metal Saw	Medium	• Clamp metal being sawed • Cut away from hands	• Prevents slipping and cutting yourself • Reduce risk of cutting yourself
Spray Paint/Primer	Low	• Ensure room is well ventilated/do it outside • Wear a mask & Safety goggles	• Reduces risk of breathing in toxic fumes
Metal File	Low	• Clamp material to keep it still while filing	• Avoid slipping and injuring yourself

46. Feasibility – Testing relating to requirements



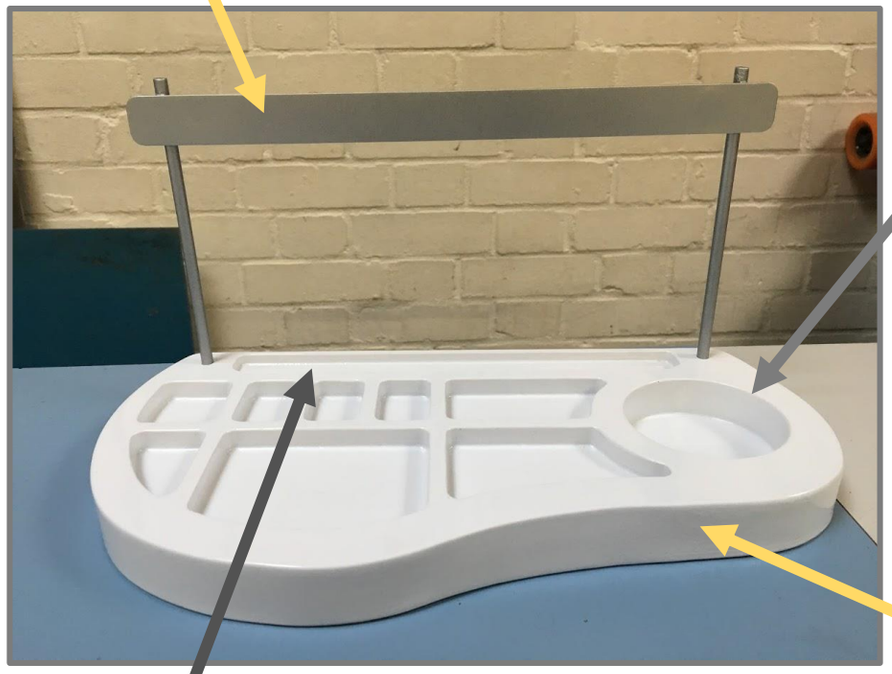
Design Brief

I am intending to design and produce a prototype for a paint brush holder. It needs to provide artists with somewhere that easily holds brushes whilst they paint. It should have an **innovative** and **practical** design that is easy and simple to use. The main purpose of the holder is to **prevent** brushes becoming **permanently misshapen** after being left in a water glass.

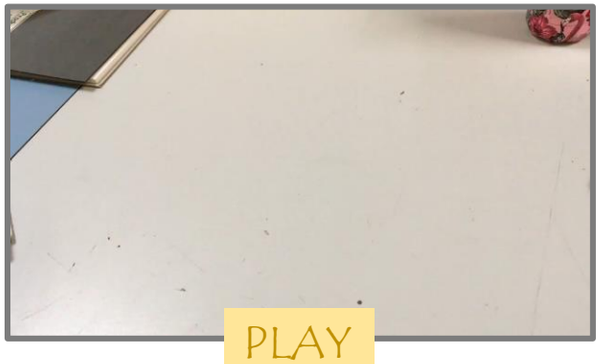
Simple & minimalistic design

Easily holds brushes – magnetic, **lots of space** for **multiple brushes**

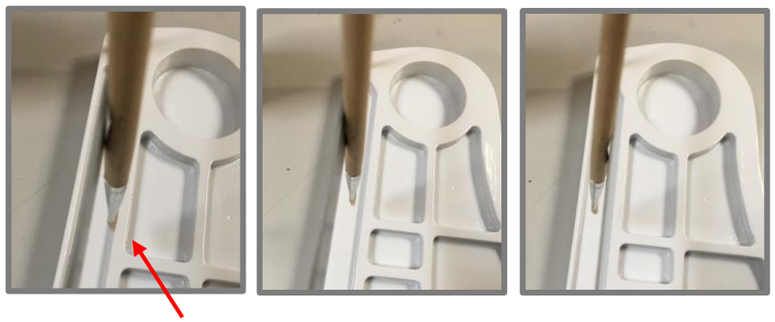
Magnets are **not too strong** – attaching and removing is **quick & easy**



Area for water pot fits **various sizes**



Strong & stable structure

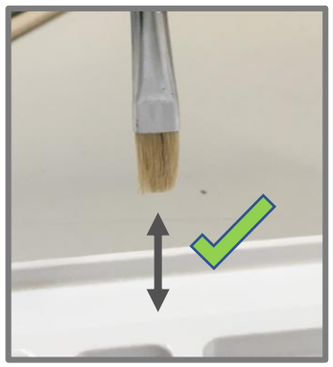


However, depending on the brush, some stick out a bit too far

If you put the brush on the back it hangs over the drip tray better.

Tray underneath catches any drips of paint/water from hanging paint brushes

Waterproof Surface



Brush **doesn't** get misshapen as it's **elevated**

47. Feasibility – Comparison to existing products

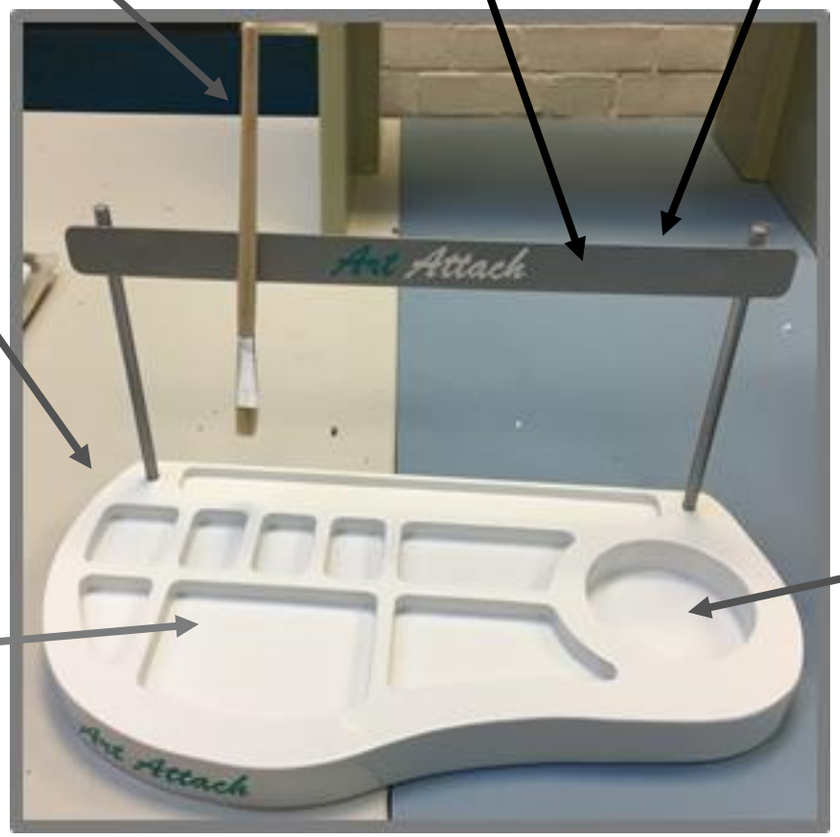
This palette has no where to put your brushes

Both palette designs have smooth, waterproof surfaces

Can hold multiple different sized paint brushes at once

The shape of the palette is a similar shape to a traditional palette

The finish on the metal is more attractive – smooth and evenly coloured



Easier to attach and remove brushes on my design

This product looks unattractive – raw metal & flimsy structure

Has same function as my design but doesn't incorporate the paint palette

My design has an area to put a water glass/pot whereas none of the other designs do

The brushes have to stand upside down – paint/water will drip down handle

My product has about the same amount of space for mixing paint, if not more.

My design is more stylish and minimalistic

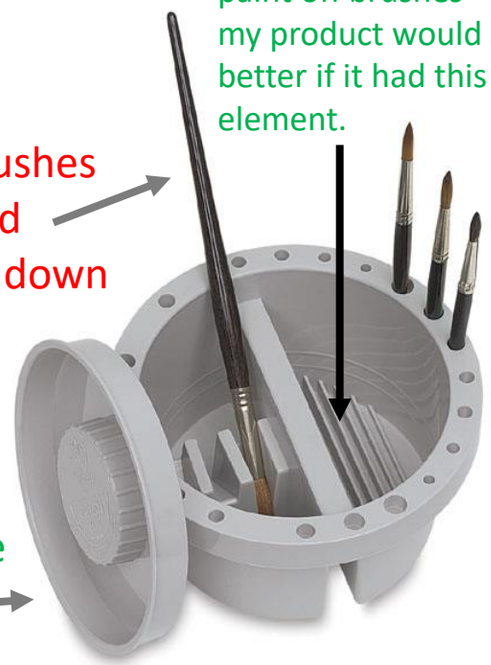
All 3 of these designs are stable and sturdy

Wood would need to be treated with water resistant varnish

This product would be easier to transport/store because it's more compact and small

This product has an area to scrape excess paint off brushes – my product would be better if it had this element.

The brushes are held upside down




Art Attach
Art Attach


Art Attach
Art Attach


Art Attach


Art Attach


Art Attach

This was the original logo I designed for my product, but **due to the printing machine I had available to me I couldn't use it as the design was too complex**. If made in mass production, more **advanced technology** could be used to print the more detailed logo on the product.

I set up my product on a **white backdrop** in a **Soft box**. This allowed me to get **high quality** photographs from **various angles** of my product. These could then be **photoshopped** and used in **adverts** for **magazines/websites**.

50. 360° View of Product

PLAY

Art

Art, Attach & Relax

Attach

A simple & stylish design with a purpose of; lenghthening paint brush lifespan, creating a more organised work space and making your painting experience easier & hassle free.

Comes with it's own set of magnetic paint brushes

£39.99

*Get 25% off all Daler Rowney Magnetic brush sets when you buy this product

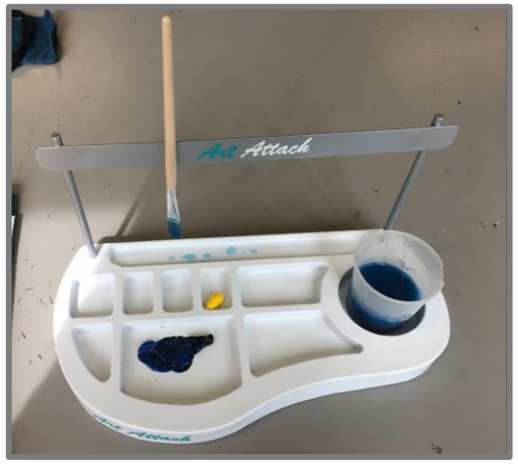
ONLY Valid until 30.09.19

This is an example of what an advert for my product could look like in a magazine.

52. Feasibility – Stakeholder/Potential User Testing & Feedback

Stakeholder & Technical Requirements	Has the requirement been met?	Requirements met?
Lightweight & Easy to transport	Leaving the wooden mould inside makes the product much more balanced and stable, but it also makes it quite heavy to carry around.	✗
Attractive but simple design	Neutral, minimalistic colours and shapes	✓
Works with a variety of brush sizes	Magnets can be put into different sized paint brushes	✓
Can hold various water pot sizes	The average glass size used by artists fits inside the indent	✓
Water Resistant	Plastic/metal doesn't absorb water/paint	✓
Strong & stable structure	Doesn't move/tip over when in use	✓
Easy to store, doesn't take up too much space	It doesn't take up too much work-space but it's difficult to store because of the paint brush holder; if it's removed it's just loose & could get lost	✗
Safe for children to use (Ages 10+)	No sharp/pointy edges – can't injure themselves on it	✓
Easy to clean	No because there is exposed wood underneath and inside holes when paint brush holder is removed that water could go on	✗

I let Michael **test** my product prototype, he is an **GCSE art student -** a potential user.

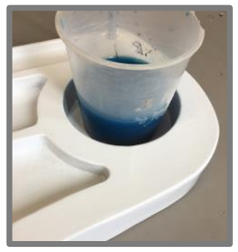


Michael; *"It's really easy to use and there's lots of space for mixing paint in."*

I also spoke to some other **A-Level Art Students** and got some **feedback** on my design.

PLAY

Emily Holmes; *"It could be made out of a lighter material so it's easier to transport. However, I think it's great for keeping and using in a studio."*



PLAY

The drip tray works **effectively** and acrylic paint washes/wipes off with water **easily**.

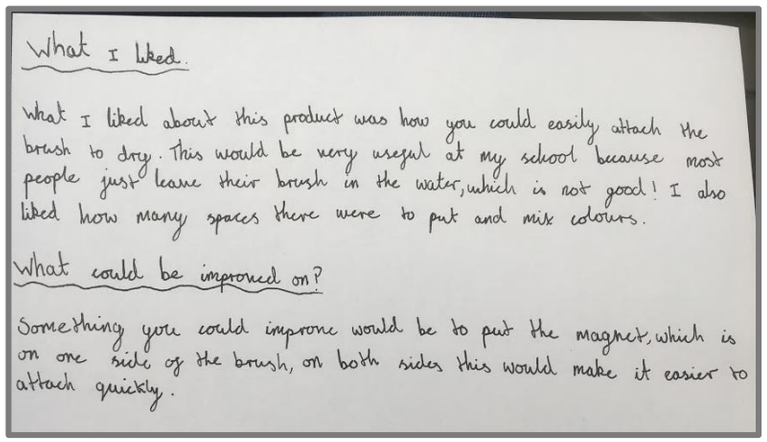
Ben Kahn; *"Overall I think it's a great product, it looks stylish and I like the size of it. One development could be to add a feature where you could clean your brushes on."*

53. Feasibility – Stakeholder/Potential User Testing & Feedback

Ferne is 11 years old and she likes painting at school and in her spare time afterschool. I let her test out my product to see what she thought about it.

Paint used: Watercolours

- Easy to blend & mix on plastic surface



What I liked.

What I liked about this product was how you could easily attach the brush to dry. This would be very useful at my school because most people just leave their brush in the water, which is not good! I also liked how many spaces there were to put and mix colours.

What could be improved on?

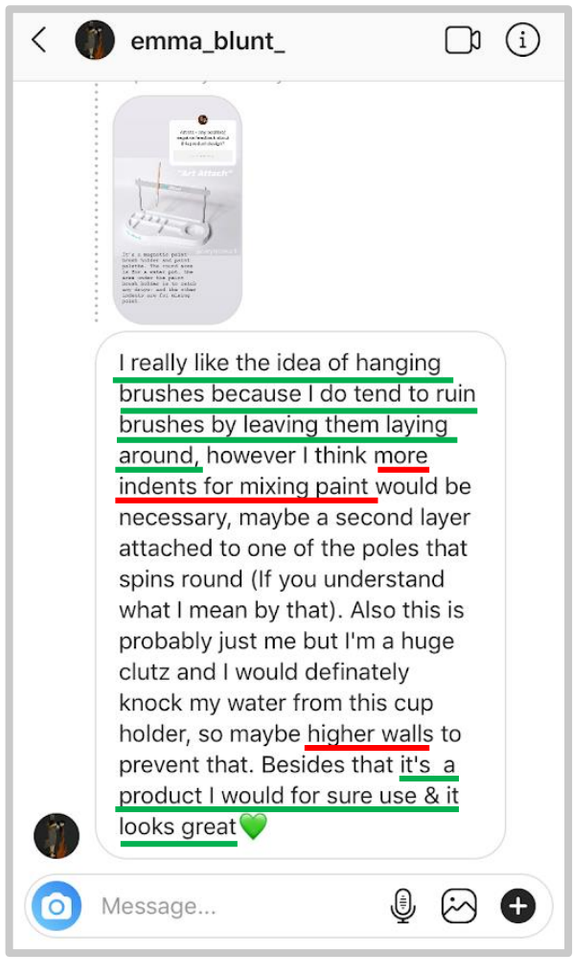
Something you could improve would be to put the magnet, which is on one side of the brush, on both sides this would make it easier to attach quickly.

"Just doing my art,
Just attaching my brush,
Art Attach!"

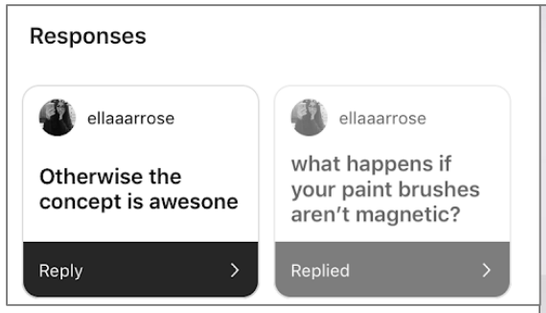
Feedback:

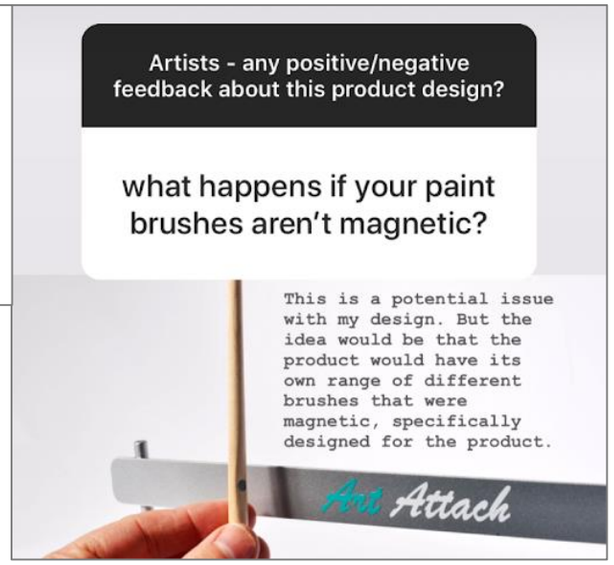
- *Brushes attach easily*
- *Keeps brushes in good condition – **meets initial design brief criteria***
- *Enough space for mixing paint*

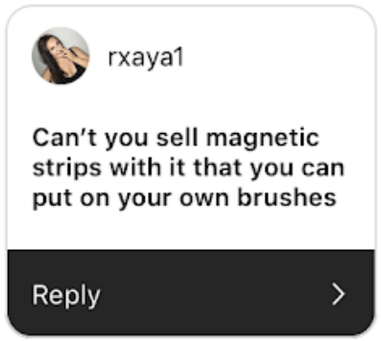
54. Feasibility – Potential User Feedback & Future Design Developments

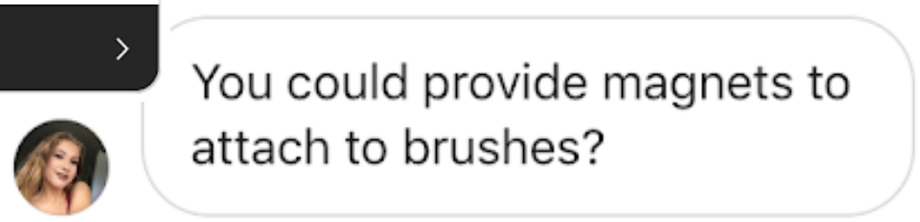


I put up a post on social media asking for **positive/negative feedback** on my product from any **artists/artistic people** *(potential users)*.



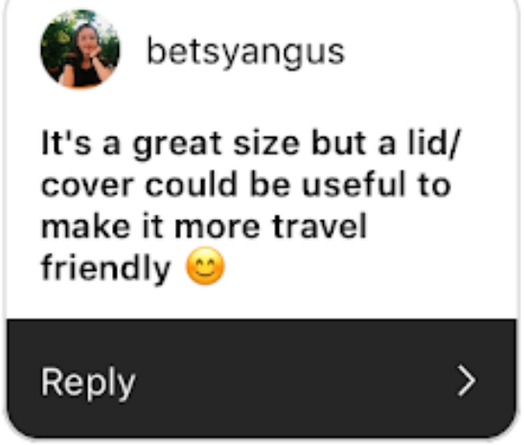




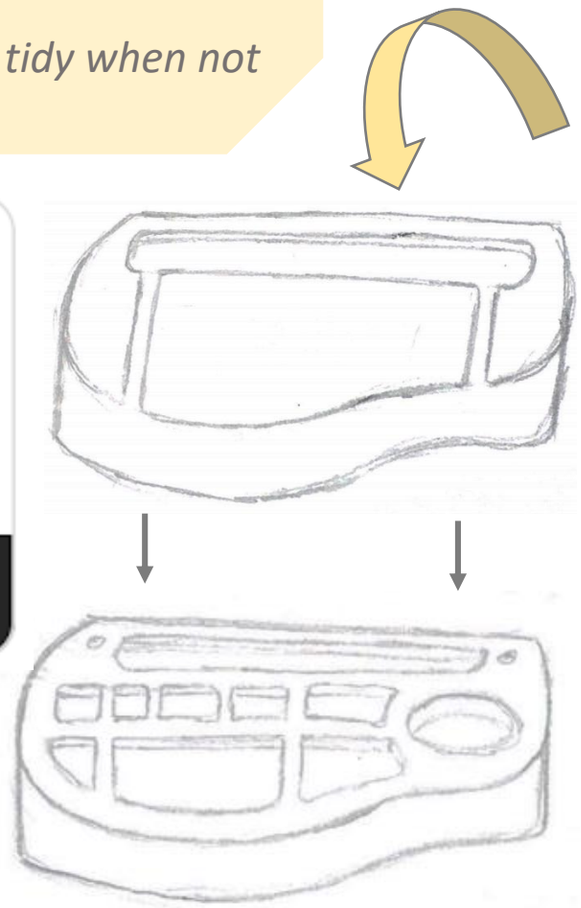


Future Design Developments:

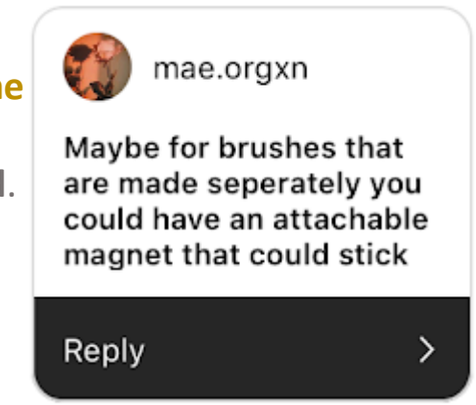
- *Alternative way of **embedding magnets** into brushes so that product can be used with **any** paint brush*
- *More secure area for water pot*
- *A lid to keep tidy when not in use*

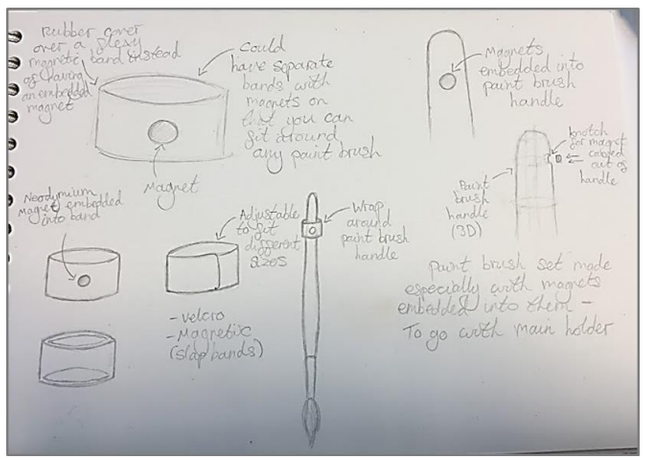


Most people seem to <u>like</u> the **style and visual appearance** of the design – **Simple, neutral colours and minimalistic – appeals to a wider market** & not just one style.



The palette base could have a **lid that fits over the top** when the **paint brush holder has been removed**. The holder could the be slotted into an indent in the top of the lid – **Easier to store/transport.**





Referring back to my previous idea of making a magnetic strap that could fit around the handle of *<u>any</u>* paint brush. Might be a more versatile additional feature.

55. Critical Evaluation of Design Solution

Strengths:

- Stable – **doesn't tip over/wobble/move around the table when in use**
- Paint brushes can be easily attached and removed
- Waterproof
- Attractive but simple design – **Minimalistic**
- Neat and tidy
- Fits the majority of average water glass sizes
- Doesn't take up too much workspace

Weaknesses:

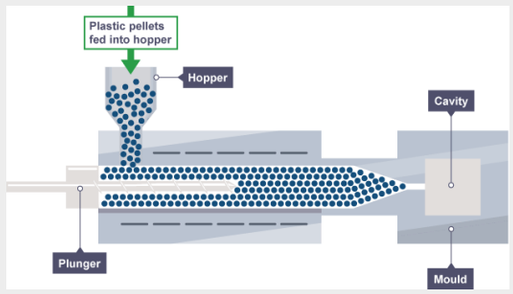
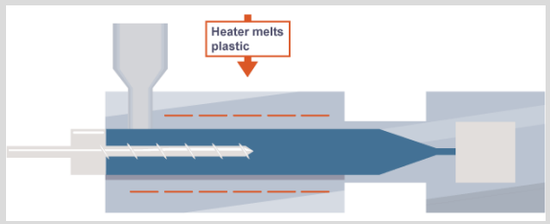
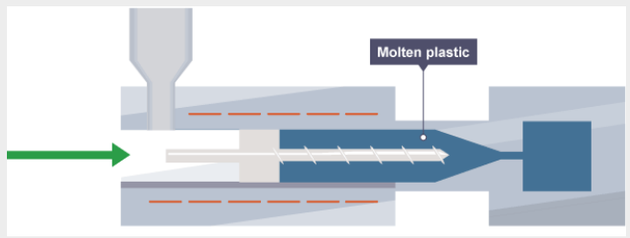
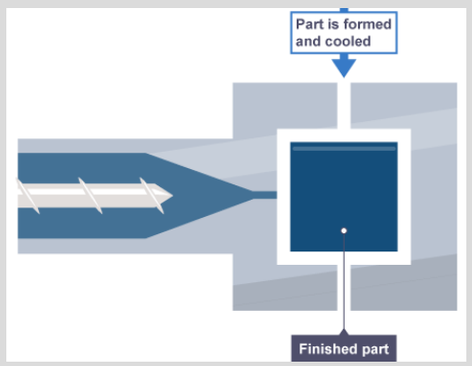
- Not sealed underneath. The wood will absorb water when you wash it – **wood will eventually begin to rot which reduces products life-span**
- The plastic lifts up underneath and could split if pulled. It's also fairly sharp which creates an **injury hazard**
- You can slightly see the grain of the wood through the plastic
- Only paint brushes with magnets will attach to the metal – **users will have to buy specific brushes**
- Difficult to transport because of weight – **too heavy**

Design Solutions:

- Use **Injection moulding** to make the palette base so that it's entirely made of plastic & no wood – **easier to clean as it would all be waterproof.**
- Use a **thicker plastic** for vacuum forming that would conceal the wood grain **OR** use a different material for the mould with no surface texture *(modelling board).*
- When **mass produced**, my product could be made using much **simpler processes** with less stages - the palette base could be made using **Injection Moulding** – **this would make it lighter and easier to transport.**
- Make magnetic paint brushes in **lots of different shapes, sizes and styles** for using with my product specifically.
  OR
  My product could **partner with a paint brush brand**.
  OR
  It could include a pack of **sticky magnets** that can be attached to *any* paint brush.
- The paint brush holder could **fold down and slot in somewhere on the palette base/lid – this would make storing it easier.**

56. Critical Evaluation of Design Solution

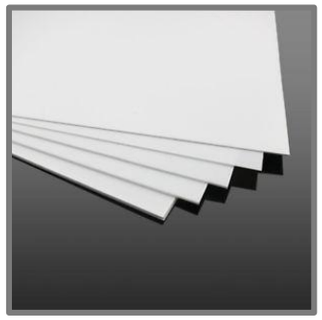
Injection Moulding Process:

	Diagram	Stage
1		**Granular plastic** is held in a **hopper**.
2		It's moved by an **Archimedean screw** along a **heated tube** called the **heating chamber**.
3		Once the polymer has been melted, **it's pushed into a mould** with a **hydraulic ram** - the hydraulic ram **ensures just enough material is injected** into the mould each time.
4		The mould is then **cooled** so that the **moulded plastic can be removed**.

*This is the process that could be used to create the **palette base instead of vacuum forming,** if made in **Mass production**.*

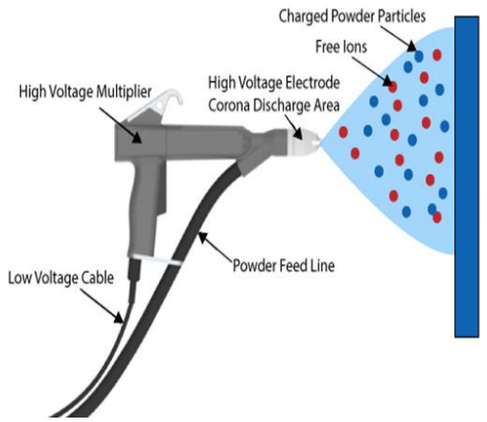
Using **ABS** instead of **Polystyrene** plastic to make the palette base could be a better material because of its qualities;

- High impact
- Excellent tenacity
- Easy to shape
- Flexible
- Lightweight



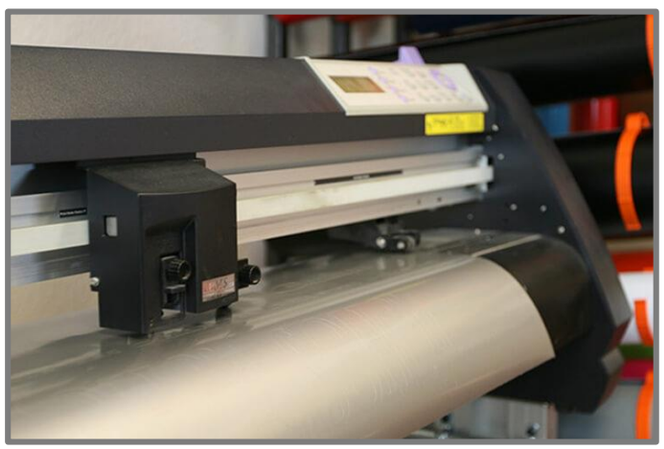
Powder Coating **instead of** spray painting the mild steel.

- Smoother finish



Vinyl to make product **Logo**

- Can print images rather than just text



57. Critical Evaluation of Design Solution

Estimated cost of Production if Manufactured

Material	Size / Amount	Cost	Amount Needed *(per product)*	Total Unit Cost
ABS Sheet *(Acrylonitrile Butadiene Styrene)*	1372 x 660mm	£15.70	29.7 x 42.0cm	**£2.62**
Mild Steel Rod	31cm	£3.95	31cm	**£3.95**
Mild Steel Sheet	1250 x 1250mm	£22.03	29.7 x 2.2cm	**0.10p**
Powder Coating	50cm	£5.00	60.7cm	**£6.07**
Vinyl Decal	4 Stickers	£1.79	3 Stickers	**£1.34**
Paint Brushes	12	£5.99	5	**£2.45**
Neodymium Magnet	50 x 5mm	£6.22	5 x 5mm	**0.62p**
Labour	Per hour	£7.38	20mins	**£2.46**

Mass Producing **200** products.

Total Cost when made in Small Batches = £19.61 *(£20.51 boxed)*

Trade sale to Retailer = £40.82, to Retail at **£79.99**

This is a bit **too expensive**, however, if production was scaled up to **1000+** you would expect the costs to halve. Producing an **end product** sold for around **£39.99** instead.

I would expect **£40** to be a realistic price for this Product.

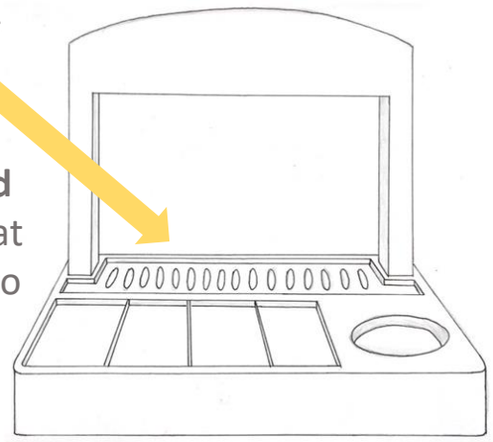
Packaging Example

Corrugated brown box;

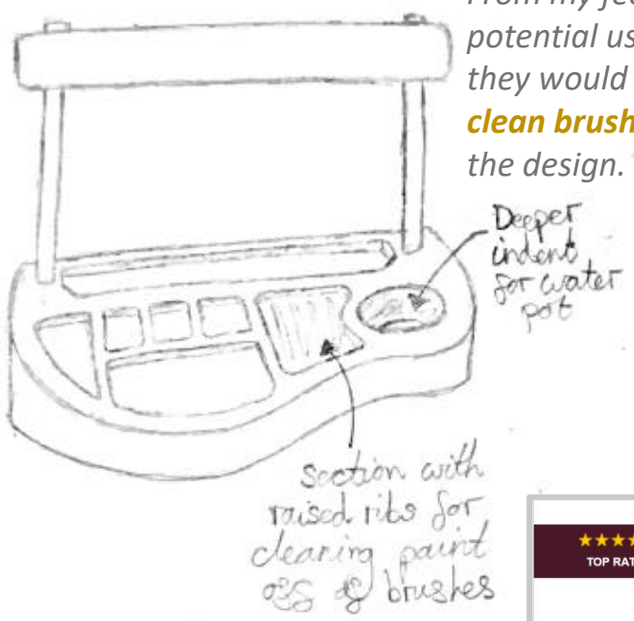
- Batches of 200 = 0.70p each
- Print cost = 0.20p
- Small Batch box cost = 0.90p each

58. Future Design Development

Going back to one of my **earlier design ideas**, the drip tray could have the **raised ribbed section** so that it's multi functional to ***1)*** *catch drips* ***& 2)*** *provide an area to clean brushes.*



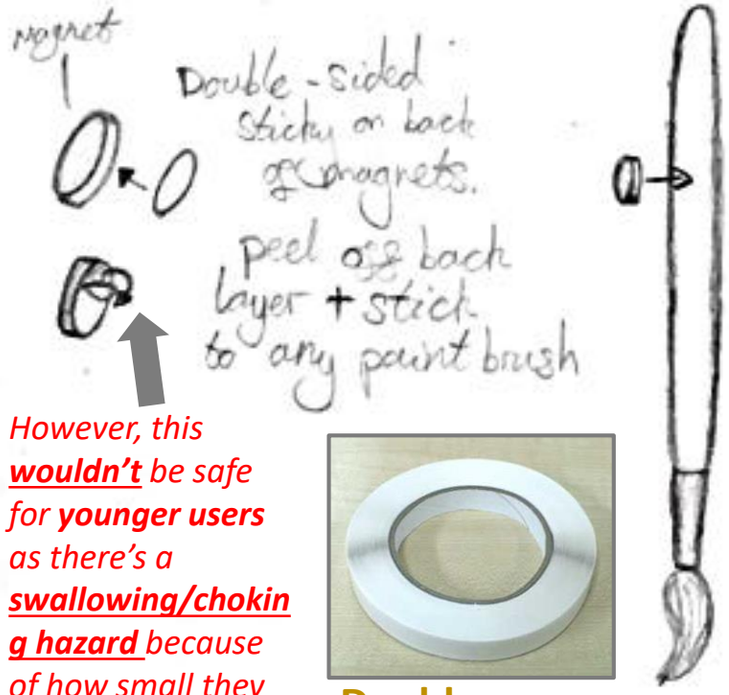
From my feedback, potential users said that they would like ***an area to clean brushes*** *included in the design.*



These are the **most reasonable solutions** I've come up with regarding the magnetic paint brushes;

1. **Partner** with a **popular art brand** to make magnetic brushes that can be used with my product.
2. **Include a set of brushes with the product** & sell additional brushes you can buy specifically for the product.
3. **Sell a magnetic clip on accessory** that can be used to attach to *any* paint brush.

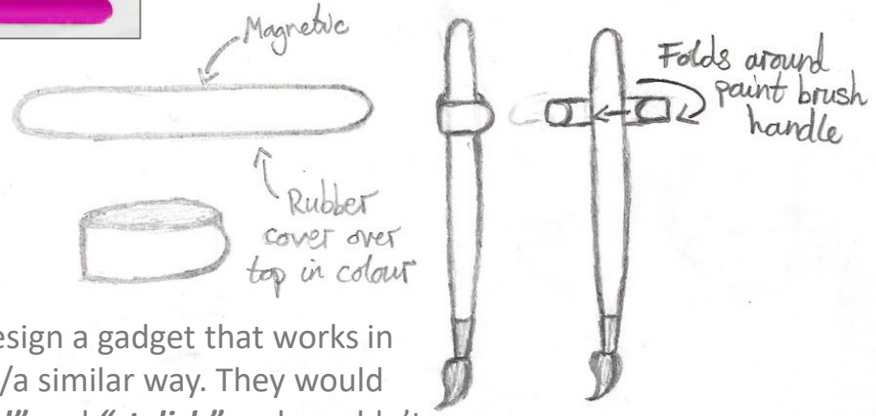
Some ideas for methods to tackle the issue that some users would rather carry on using **their own specific paint brushes;**



However, this ***wouldn't*** *be safe for* ***younger users*** *as there's a* ***swallowing/choking hazard*** *because of how small they are.*

Double-sided Tape

Slap bands can **adjust to different sizes** and can be **easily and securely attached** around objects.



I could design a gadget that works in the same/a similar way. They would look ***"cool"*** and ***"stylish"*** and wouldn't be too difficult to use; **safe for children.**

Overall my product **works well** and fits *most* of the initial stakeholder requirements.

'Daler Rowney' is a **popular paint brush brand**. **Hobbycraft** also stocks a lot of their products which would be the ideal store for my product to be sold.