

Hello, I'm Anna.  
Glad to meet you.

Portfolio 2021

A handwritten signature in black ink that reads "Hi". The letters are fluid and cursive, with the 'H' and 'i' connected.

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Inclusive Design  
University Project

Rock n' Learn  
University Project

Sake Vessels  
University Project

Other Projects in a Nutshell  
Internal and External Work

**Bio.** Hiya! I'm a third-year Product Design student at the University for the Creative Arts. My main interests are in Footwear and User-Centred Design. After I graduate, I will be taking a gap year to take up work experience and a volunteer program in Southeast Asia. After completion, I'm planning to join a Masters Program.

I hope you enjoy looking through my portfolio. If you are interested in my projects and skillset, please don't hesitate to contact me at:

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I look forward to hearing from you,

Anna

# 01

## Inclusive Design

Foot Orthosis and Shoe Design  
for Spinal Cord Injury Sufferers



## Brief:

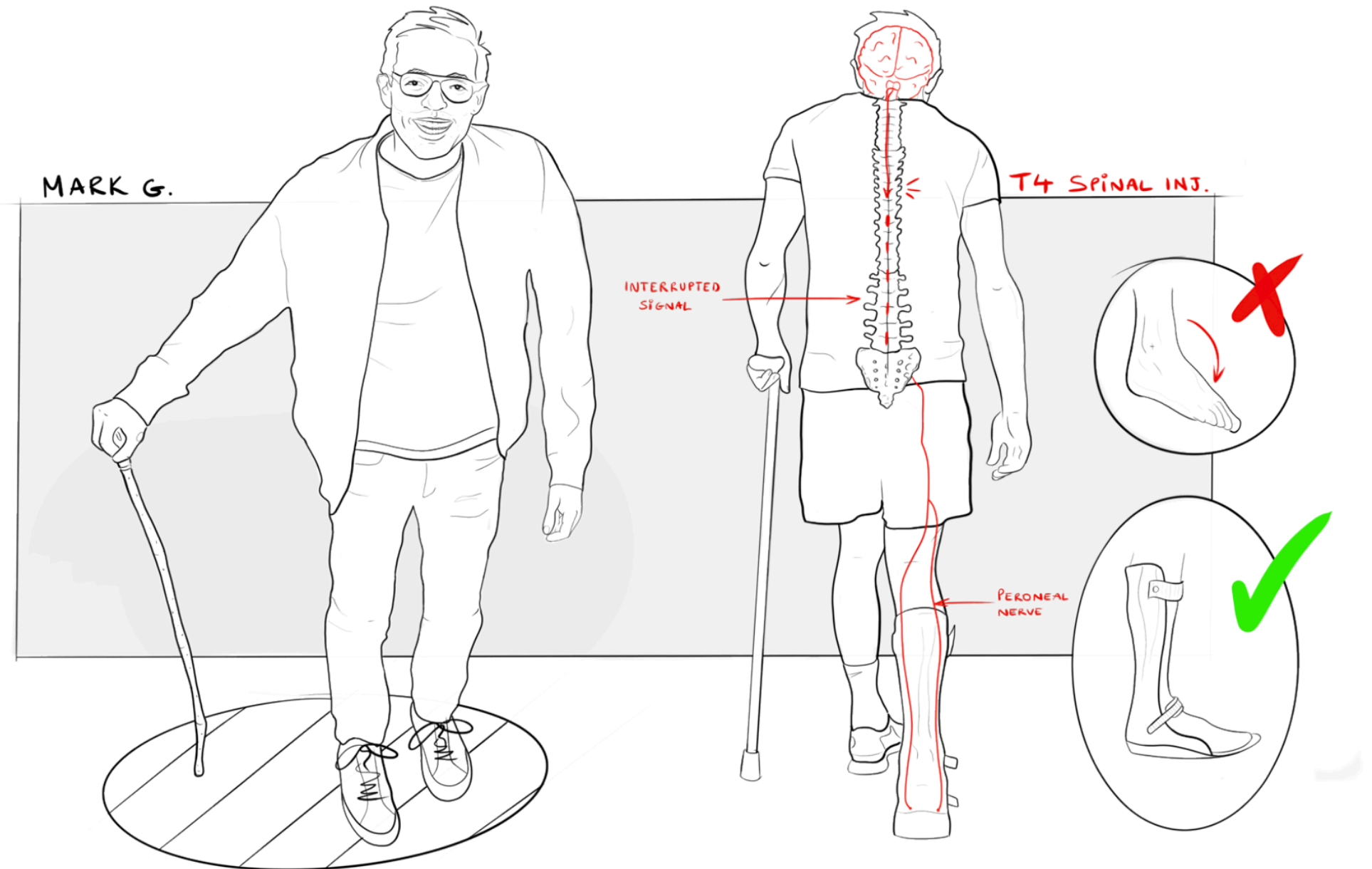
My task was to design a product that improves the lives of people with Spinal Cord Injury. When the spinal cord is injured, the messages travelling from the brain to the muscles and organs are interrupted. Generally speaking, the higher up the injury along the spinal cord, the more movement and sensations are lost.

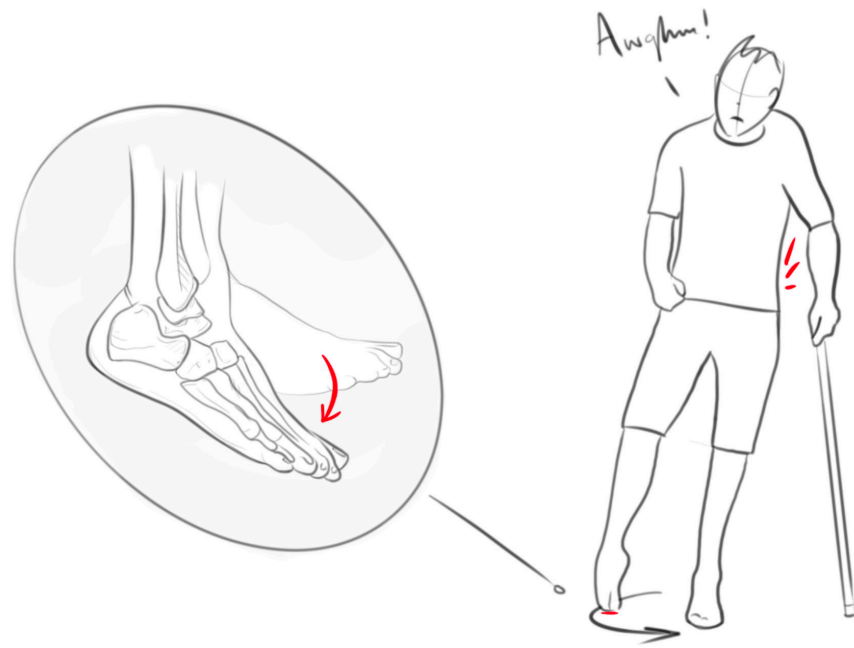
*"It's all about Independence."*

- Mark Gower

## Design Problem: Drop Foot

I decided to investigate drop foot; caused by the paralysis of the ankle and foot dorsiflexors. People with drop foot have to flex the hip to lift their foot high enough above the ground.





People with drop foot have difficulty walking as their foot gets caught during the swing phase of the gait pattern. Walking may also result in additional back pain.



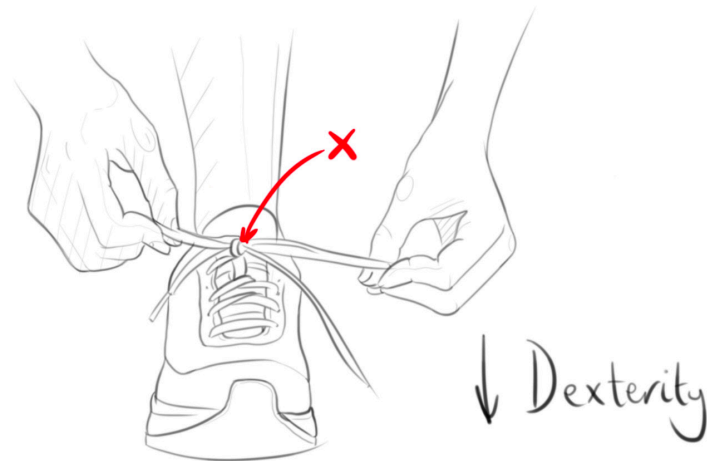
Many drop foot sufferers use an ankle-foot orthosis (AFO) to keep their drop foot at 90 degrees. However, AFO's are rigid and uncomfortable (Gower, 2020).



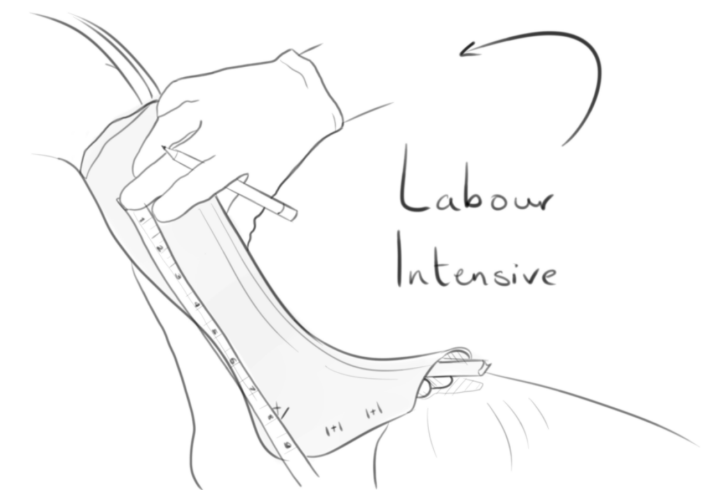
Putting the AFO inside of a shoe is difficult. During user analysis, Mark struggled to insert the AFO even when using a shoe horn.



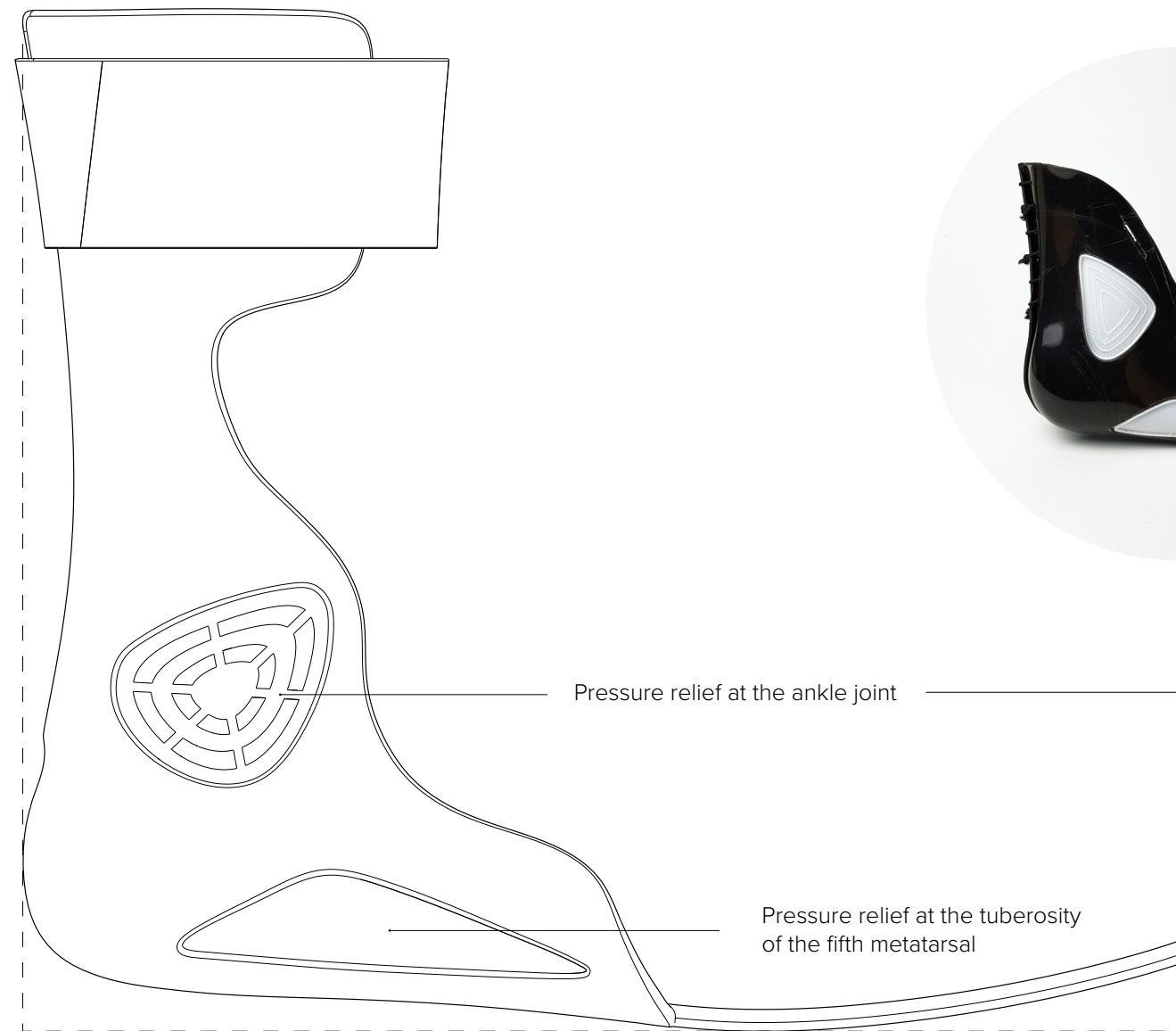
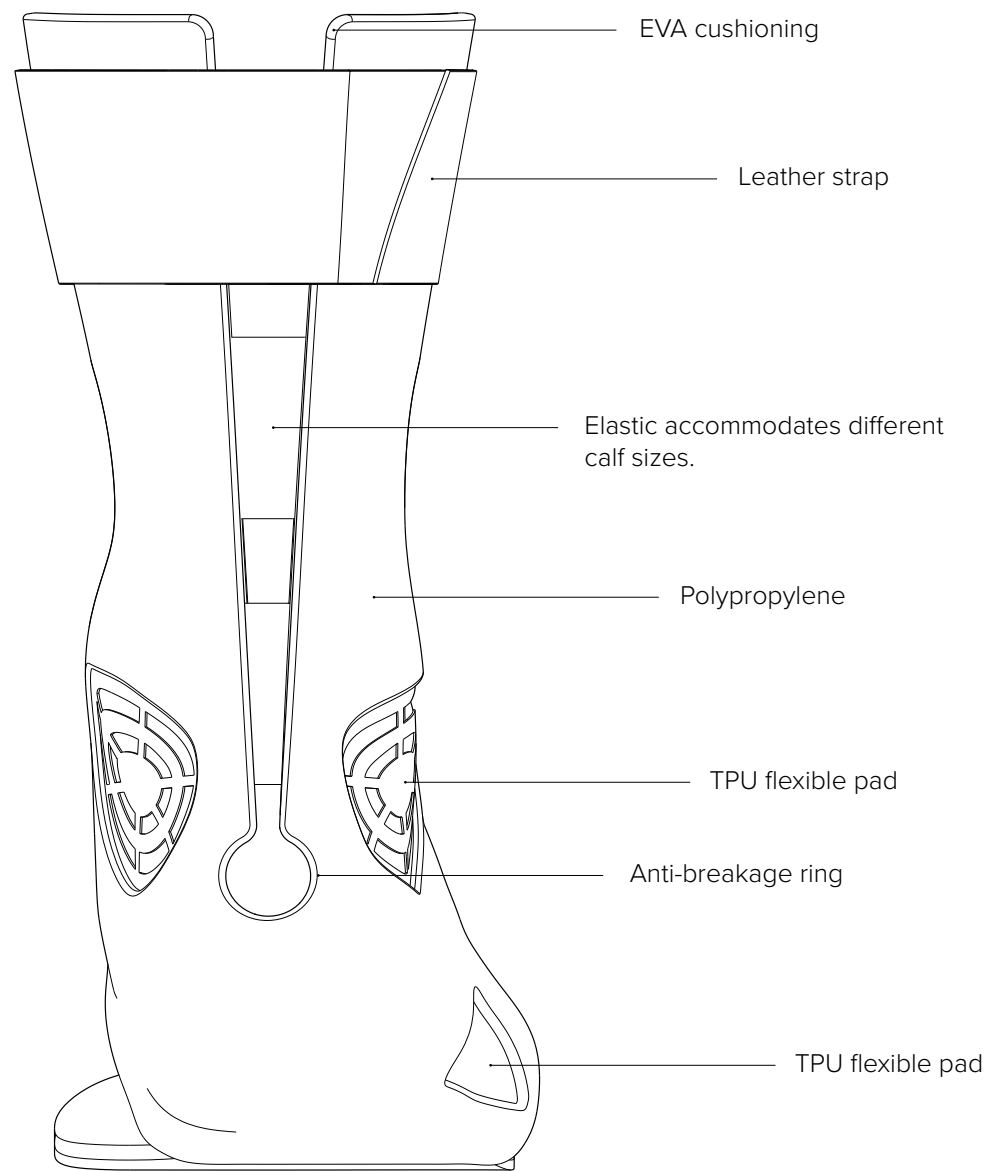
AFO's are difficult to hide and may cause unwanted attention. Poor aesthetics decrease user confidence and could facilitate stigmatisation.



Some users with spinal cord injuries have poor hand dexterity. As a result, fastening mechanisms need to be adapted to avoid discrimination.



Custom made AFO's are expensive and time-consuming to manufacture. The user has little choice over the final appearance of the product.



The TPU pads relieved the pressure at the ankle and the fifth metatarsal (above: early prototype).

## Design for Adjustability

Mark refused to wear his orthosis primarily due to its rigidity and resulting pressure points. This inspired me to create a material composite. The TPU pads relieve the pressure at the ankle and the fifth metatarsal tuberosity, while the polypropylene's rigidity keeps the foot at 90 degrees. The ankle pad is perforated to allow for breathability, especially important during the summer season.





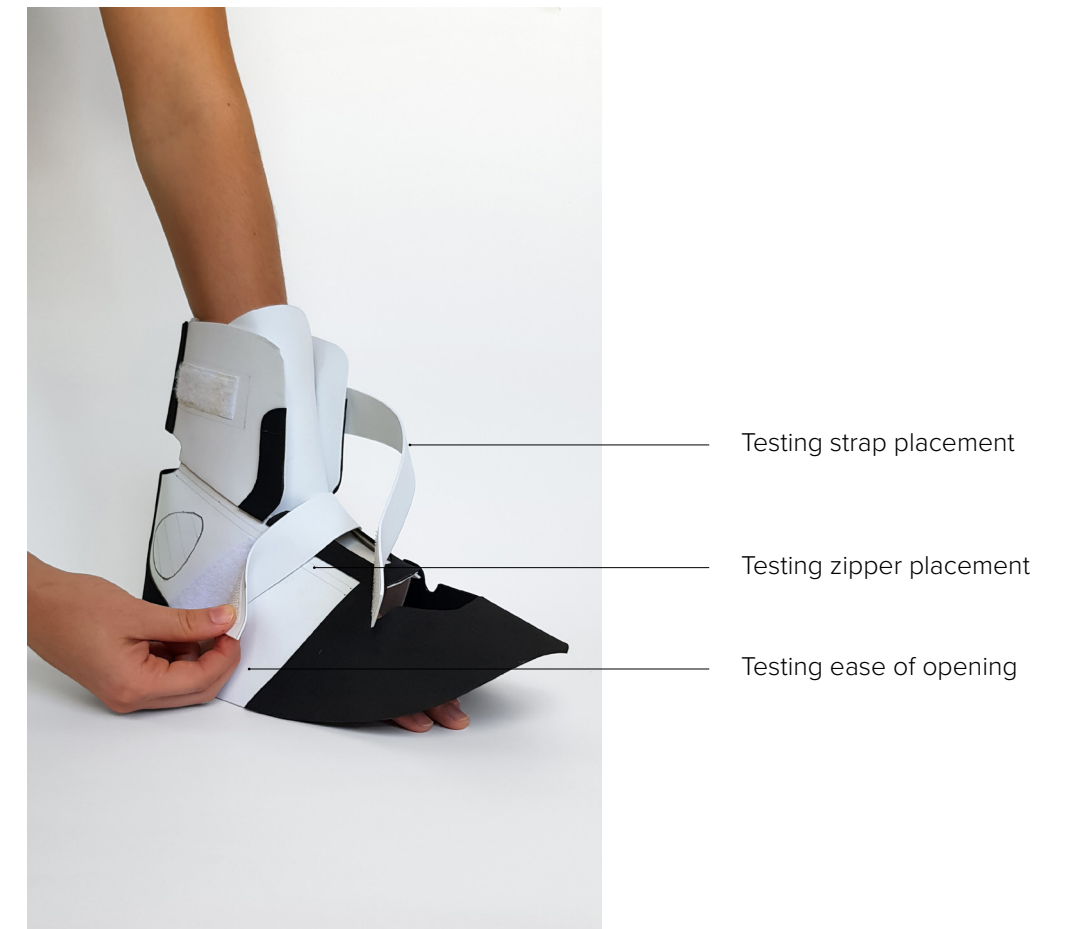
*“The TPU is great! However, the height of the orthosis and the straps need to be adjusted to keep the foot against the back of the orthosis.”*

During this project, I used Co-Design methodologies, involving the user in the design process to make decisions based on their needs. This included a series of interviews and testing sessions. I found the testing sessions most beneficial as I could analyse my user’s movement and the suitability of the prototypes by observation. For example, I noticed my user’s foot wasn’t stabilised enough, so I increased the orthosis height and the width of the strap.

Mark indicates where he needs extra support.



I noticed that Mark struggled to put his foot inside of the shoe. For this reason, I made an accessible shoe entry system, featured on the following slide.



## Design for Accessible Entry

Mark struggled to put his shoes on with his AFO. As a result, I carefully integrated a zipper opening in the shoe. The next focus, but equally as important, was aesthetics. Knowing that stigma is only reinforced when attempting to hide an assistive device (suggesting there is something to be ashamed of), I decided to expose the orthosis through cut-outs in the upper.





*Mark selects a grey shoe in size 41. At this point, a user without drop foot could go to checkout. However, Mark also needs the shoe shell.*

*Mark selects the blue shell to contrast with his shoe colour selection. He orders two, one for each foot.*

*Next, Mark sees a computer model of his colour combination, which helps him decide whether to continue to purchase or to change colourways.*

Above, Marks Selection.

## Service Design

1) Select shoe colour and shoe size.

2) Add supportive shell (optional) and choose shell colour. Select which foot requires the shell (select *both* if the shell is needed in both feet).

3) Shell and insoles added by the retailer. Product sent to the customer or delivered in-store.

Size: 41

Colour: Grey and White colourway  
With Shell? (Yes) Blue Speckled

## Increased Independence, Comfort and Aesthetics: Superhuman Series.

I believe that design plays an essential role in integrating all members of society. I designed the superhuman shoe to improve access for people using AFO's. However, it can similarly be worn by able-bodied individuals, facilitating inclusion. For those who suffered spinal cord injuries, the supportive shell is a more comfortable alternative to rigid AFO's and provides the user with the freedom to choose their shell colour according to their preference.



02

# Rock n' Learn

Individual University Project



## Brief

My task was to produce a stool and an accompanying piece of furniture. I was asked to consider the production, distribution and sustainability of the products. As part of the project, I had to create a stool prototype and CAD visuals of both pieces.

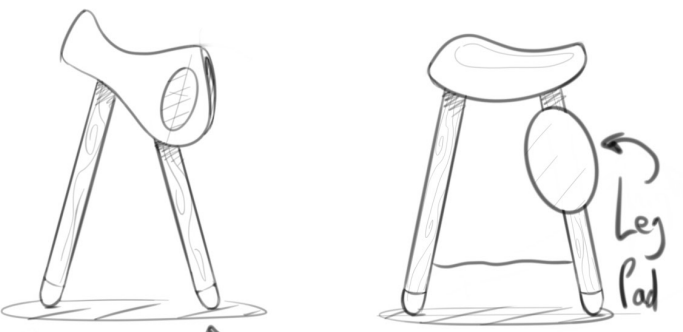
## Context

I decided that this was a good opportunity to investigate classroom furniture - a context which lacks good design and sustainability. My focus was on classroom stools and tables; improving their ergonomics and allowing for recycling at the end of the product lifecycle.

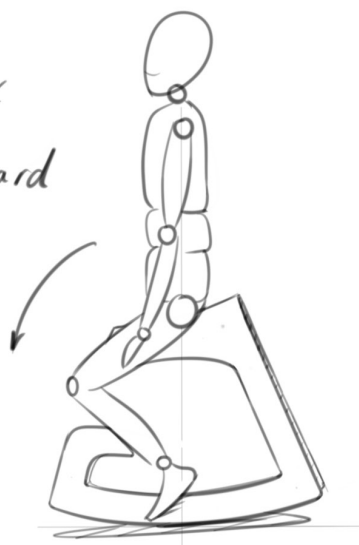
During my research, I came across saddle stools. After understanding the saddles ergonomic benefits, I realised it could provide a fun and healthy alternative compared to traditional, 90-degree classroom seating. The main challenge became taking the saddle's ergonomic benefits (complex geometry) while making the product as sustainable as possible.



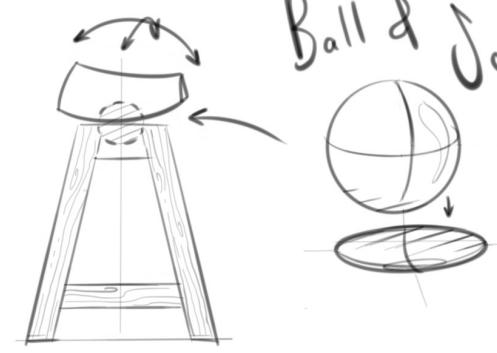
Curve  
Perched Seating (120°)  
Saddle Inspo.



Rock Forward



Ball & Socket



Gentle Angle



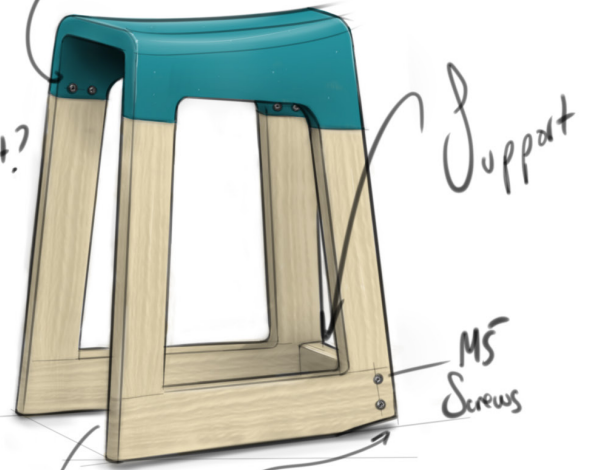
Rubber Feet



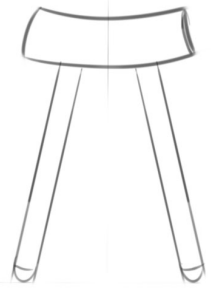
Foot Support?



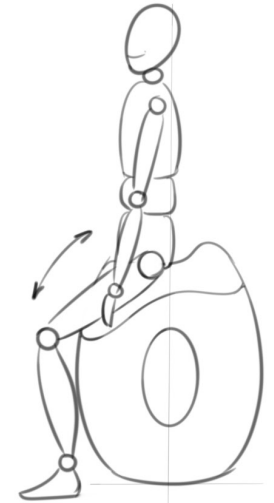
Hidden Screws



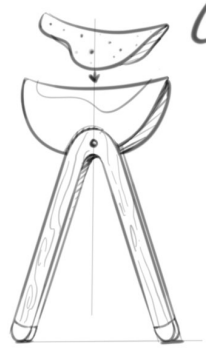
Simplified



Donut Shape



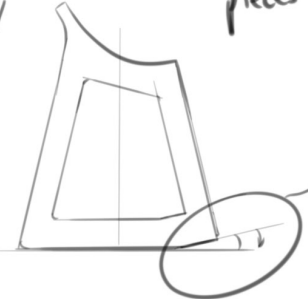
Cushion



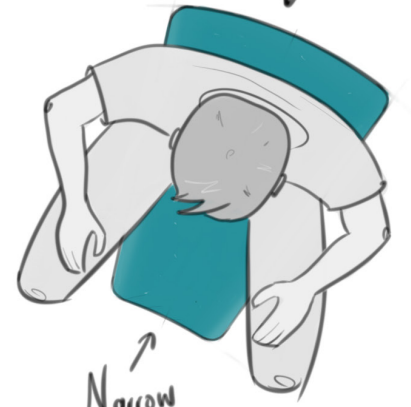
Safe Rocking



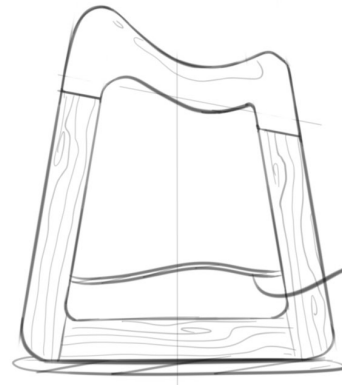
7x wood pieces



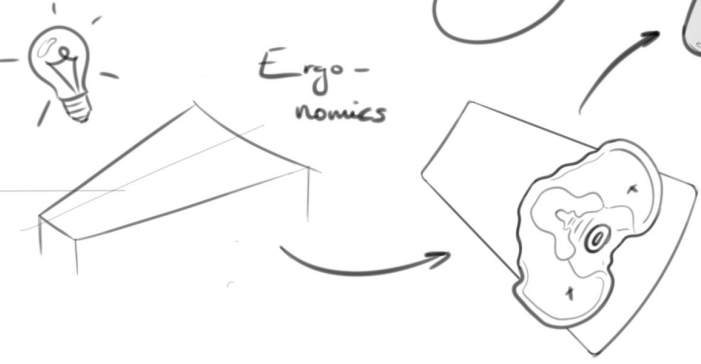
Wide for Hips



for different leg heights



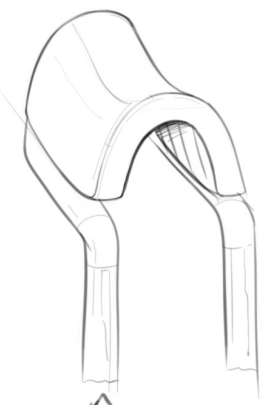
Ergonomics

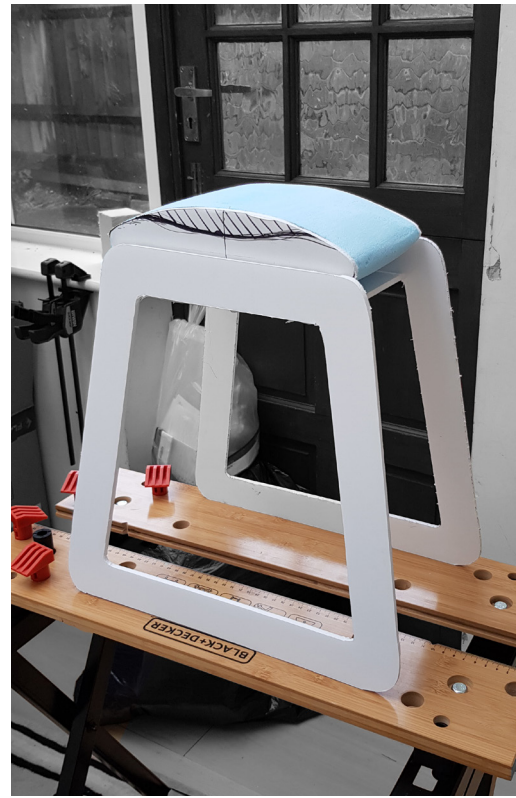


Narrow at Front



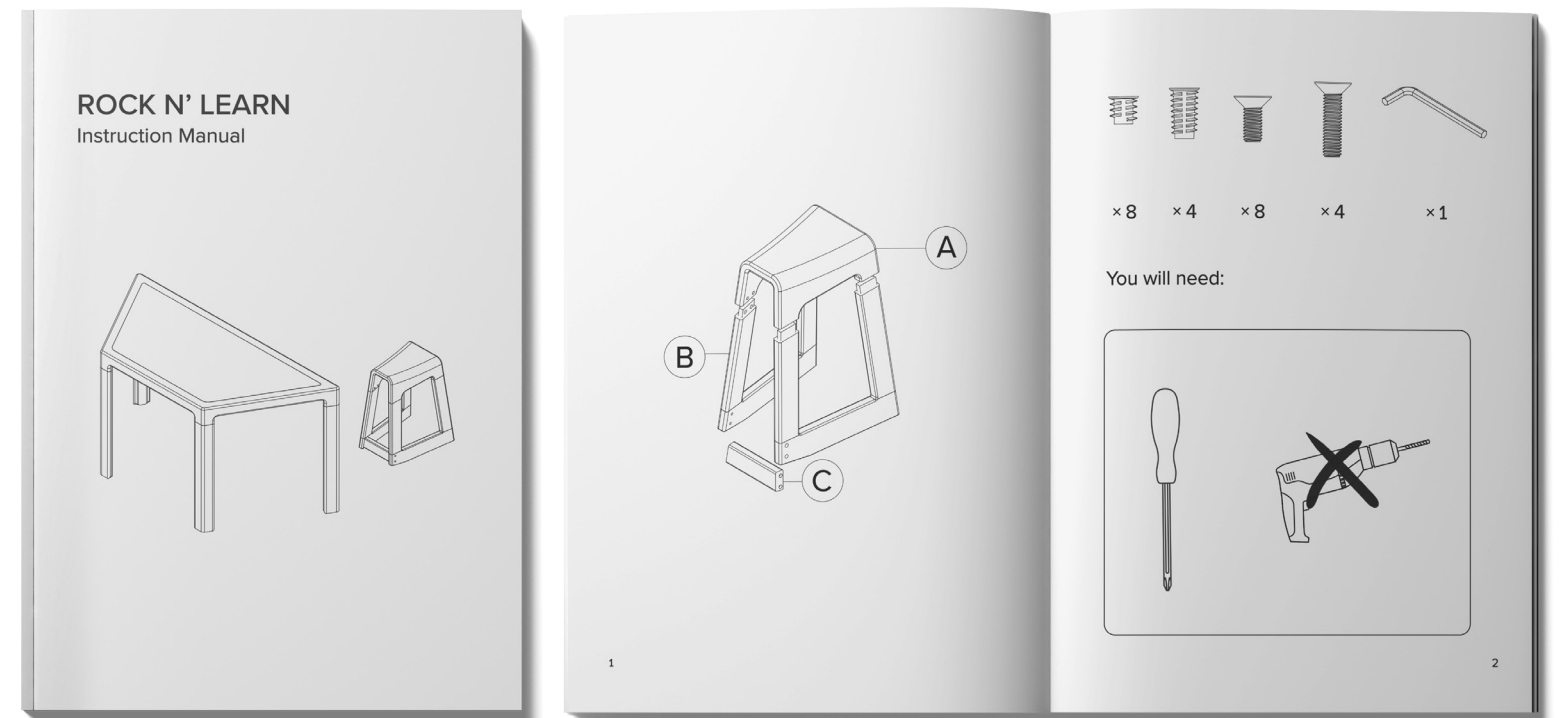
Tubular Steel

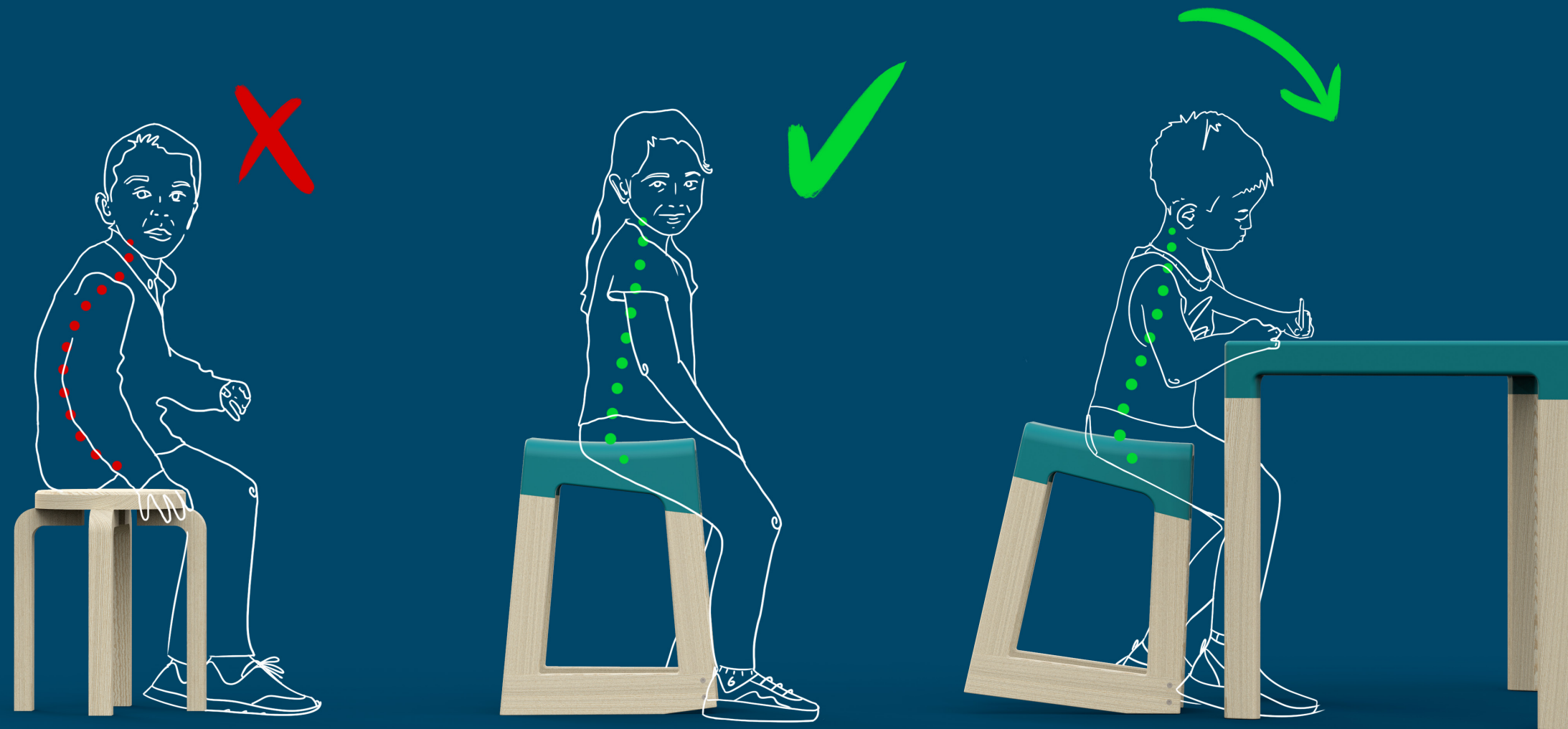




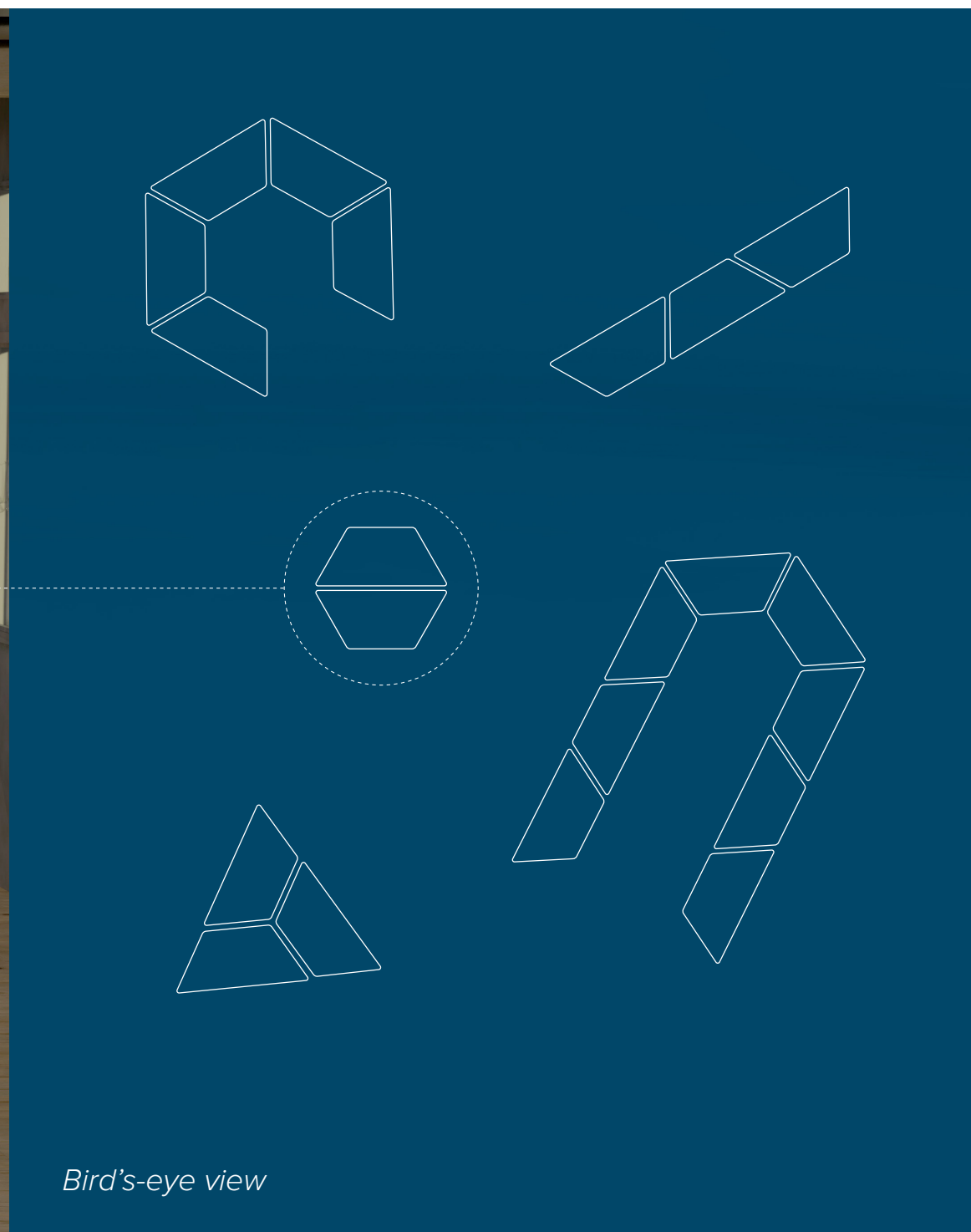
## Development

Initially, I tried multiple Ideas to see what worked best. In the end, I reached the trapezium-shaped seat and table solution. For the seat, this shape allows the hip bones enough space but doesn't require significant hip abduction due to the narrow front. For the table, the form allows adaptability in the classroom (illustrated ahead). Modelling at full scale also helped me choose the best manufacturing solutions including the use of screws and inserts for the joints (see above).





Here you can see how the saddle stool differs from traditional classroom seating. The perched position aligns the spine in a natural position making it easier to sit upright and more difficult to slouch! Moreover, all blood vessels in the legs are in a more open position, improving circulation. This enhances concentration levels. Finally, the ability to rock allows the child to lean over their table during reading or writing activities preventing the typical hunch back posture.



Bird's-eye view

The table suits different classroom activities. During group work, the children can sit together around a *hexagon formation* promoting collaboration. Alternatively, during board based learning when the focus is on the teacher, a *horse-shoe* arrangement or a *straight layout* can be applied.





## Making a Stool Fun!

The final stool prototype features pinewood legs and a polypropylene seat. This combination creates overall durability and allows the seat to take the ergonomic saddle shape (designed to be roto-moulded). The overall structure is easy to disassemble, allowing for repair or recycling at the end of the product lifecycle. Most importantly, though, look at John, he's having a blast!

03

# Sake Vessels

Individual University Project



## Brief

My task was to produce one serving vessel and two drinking cups/glasses, which respond to the traditions, culture, craftsmanship, drink ingredients of a heritage rich beverage. In terms of manufacturing the prototype, I was asked to use slip casting and a 3D printing process.

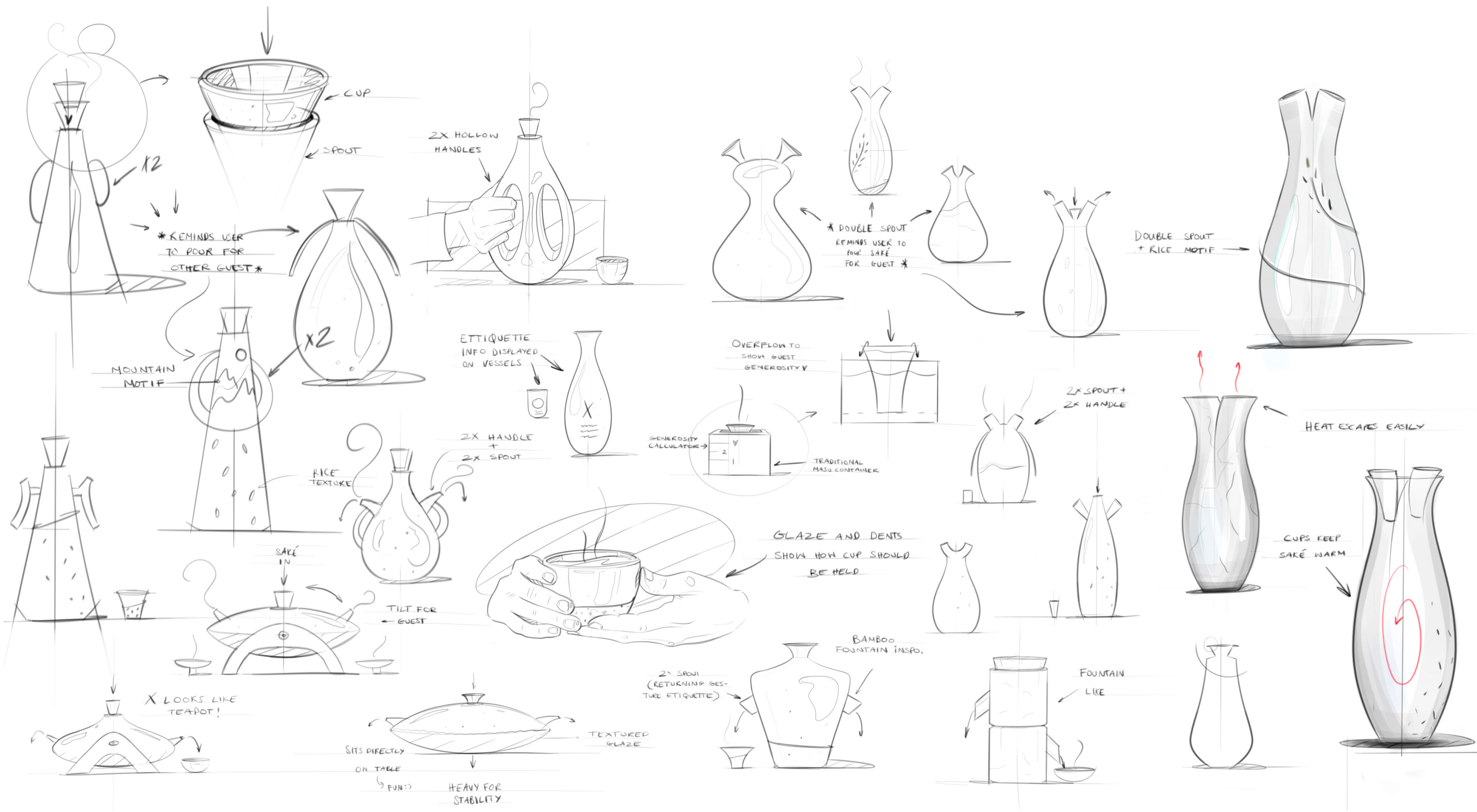
## Beverage

I decided to investigate Sake; a Japanese alcoholic beverage made using rice, koji and water. It is served either hot or cold with each variation requiring a different type of vessel. For this reason, I selected the warm version, which is more suited for ceramics, therefore more suitable for this ceramic-based unit.

## Drinking Etiquette

The inspiration that drove my design was the unique drinking etiquette in Japan. Specifically, it was the act of returning the pouring gesture. When one person pours Sake for the whole party, one other person must then pour Sake for the pourer to acknowledge their enjoyment. This tradition inspired the dual spout in the serving vessel.





\* REMINDS USER TO POUR FOR OTHER GUEST \*

2X HOLLOW HANDLES

\* DOUBLE SPOUT REMINDS USER TO POUR SAKÉ FOR GUEST \*

DOUBLE SPOUT + RICE MOTIF

MOUNTAIN MOTIF

ETIQUETTE INFO DISPLAYED ON VESSELS

OVERFLOW TO SHOW GUEST GENEROSITY

2X SPOUT + 2X HANDLE

HEAT ESCAPES EASILY

2X HANDLE + 2X SPOUT

GENEROSITY CALCULATOR

TRADITIONAL MASU CONTAINER

RICE TEXTURE

GLAZE AND DENTS SHOW HOW CUP SHOULD BE HELD

CUPS KEEP SAKÉ WARM

X LOOKS LIKE TEAPOT!

SITS DIRECTLY ON TABLE

HEAVY FOR STABILITY

2X SPOUT (RETURNING GESTURE ETIQUETTE)

BAMBOO FOUNTAIN INSPO.

FOUNTAIN LIKE

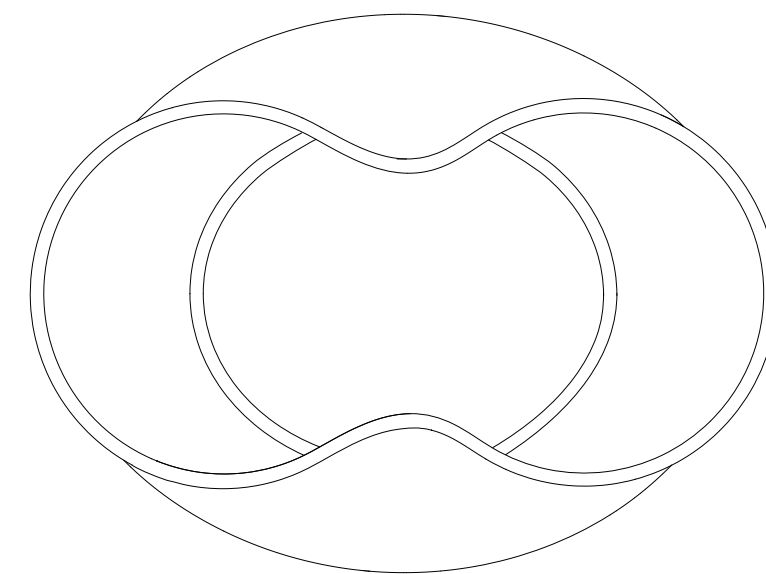
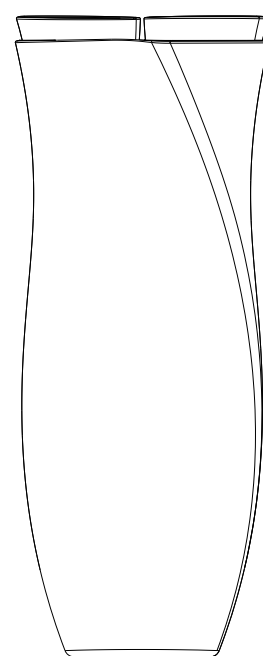
TEXTURED GLAZE

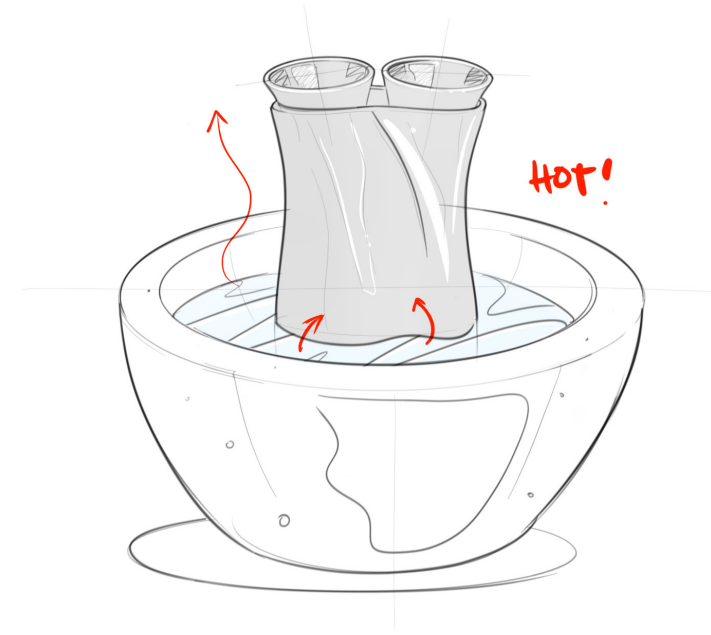
FUN?



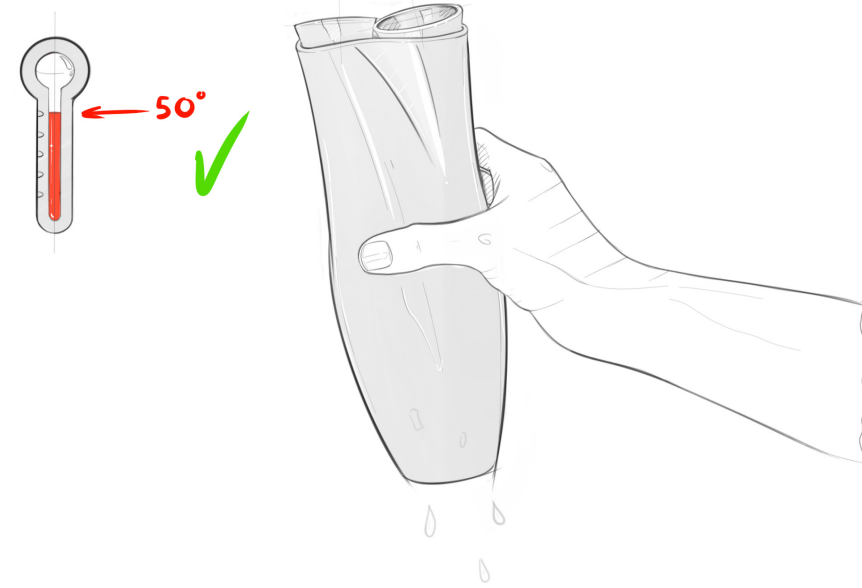
## Form Development

During the development of the flask design, the two spouts morphed into a more symbolic “dual spout”. The form became more elegant and ergonomic. Throughout the development, I had to ensure the cups would fit inside the flask to prevent the heat from escaping, which also had a second function of warming the cups up before drinking.





1. The Sake is poured into the serving vessel and placed into a hot water bath. It heats up slowly to the required temperature of 50 degrees Celcius.



2. Once the Sake reaches 50 degrees Celcius, the flask is removed from the bath and dried down with a towel. It is now ready to be served.



3. The guests take out the warm cups and are ready to enjoy the Sake with their meal.



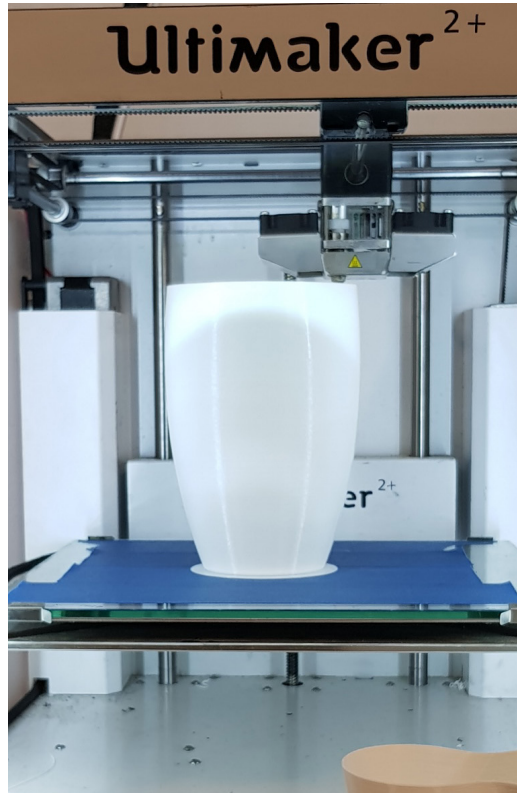
4. Now comes the crucial part! The guests must pour the sake for each other to acknowledge their enjoyment. The dual spout reminds them to do so.



5. They will then toast with the traditional term for cheers "kanpai!". If one person is of higher status, their cup should be higher than that of the person with lower status.



6. Although Sake has a similar strength to wine, the small cups encourage the guests to enjoy the drink slowly and repeat the refill ritual.



Flask 3D print



Mould making (plaster)



Slip casting (stoneware)



Testing rice pattern



Final prototype



Cup detail

## Manufacturing Prototype

To manufacture the prototype, I started by 3D printing the vessels. I filled the prints with plaster to seal them and add weight necessary for mould making. The flask mould was a multi-part mould while the cup mould was a simple drop out mould. I then used the traditional slip casting process and stoneware slip to make the final product. Finally, the vessels were bisque fired, glazed, and then fired again at a higher temperature to set the glaze ready for use.



## Kanpai!

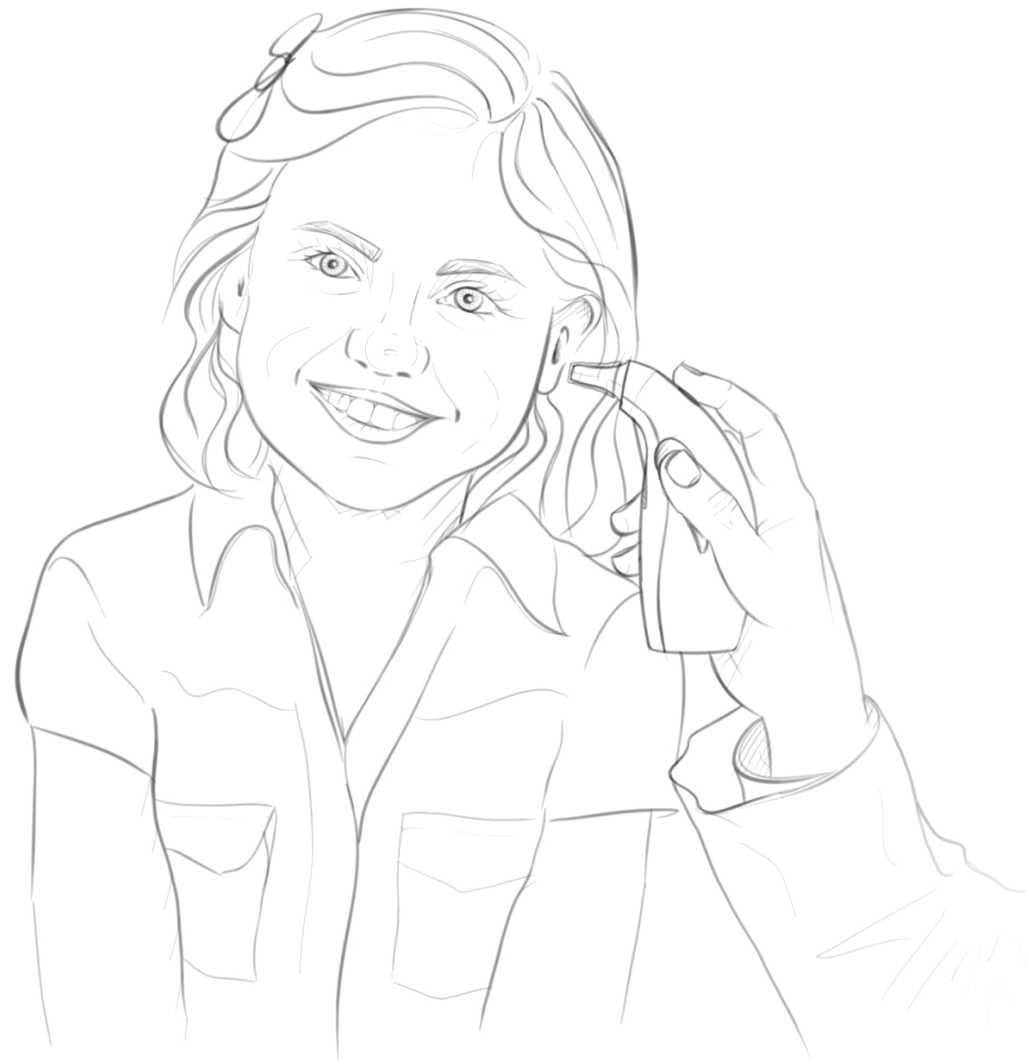
The final product adds to the overall drinking experience. It reflects tradition through materials (stoneware) and the manufacturing process (slip casting). In terms of the user, the dual spout reminds them to follow the traditional drinking etiquette and return the pouring gesture to acknowledge the other guest's pleasure. The cups sit inside of the flask before serving, which adds a pleasant sensory element to the drinking ritual. A balance of tradition, generosity and pleasure, let's cheers to that... Kanpai!





**OX**

*Other Projects in a Nutshell*



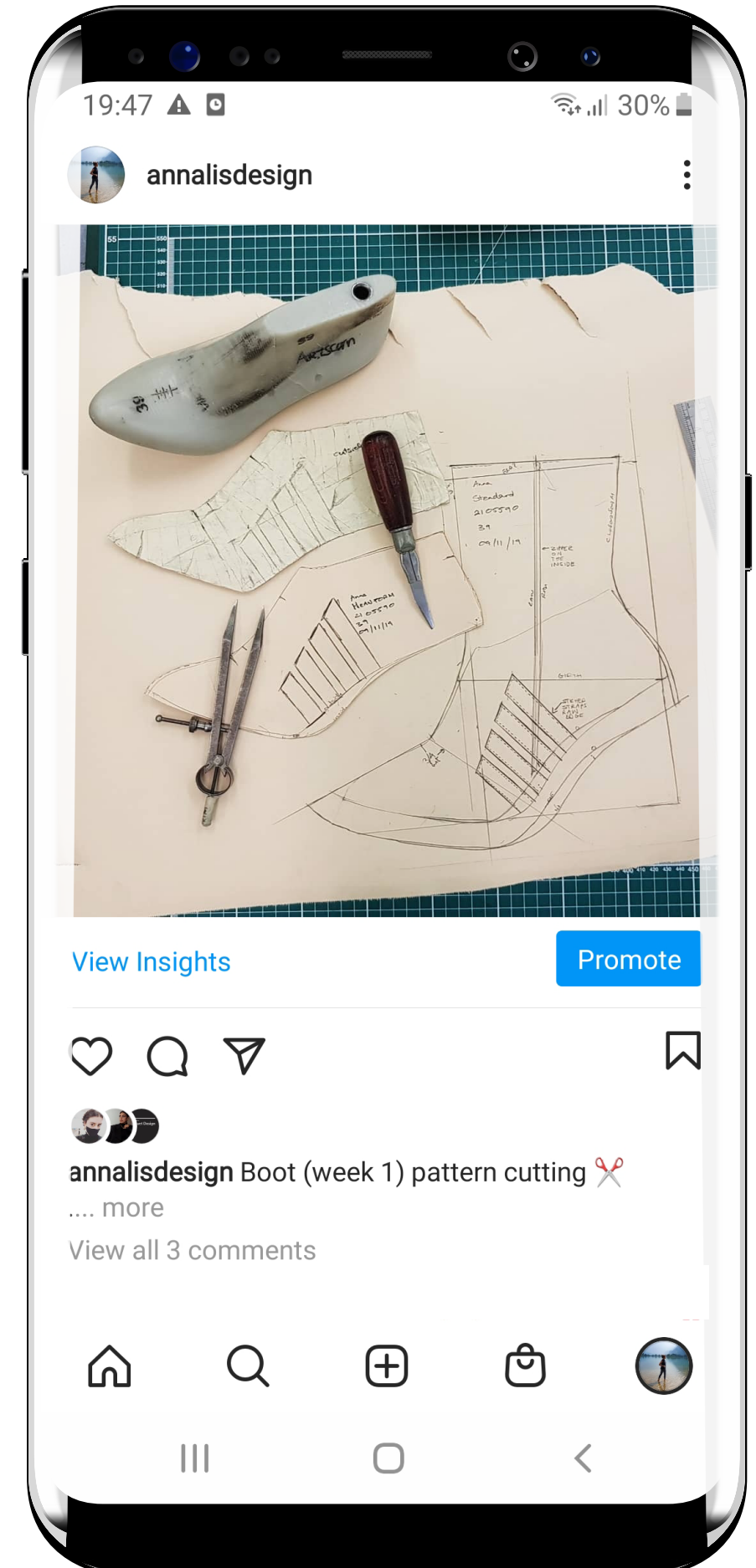
## Paediatric Thermometer

This project focused on reverse engineering an Inner Ear Thermometer; finding flaws, and choosing a specific user to re-design the product. I decided to design a paediatric thermometer that was more user friendly for the patient (the child) and the doctor. The outcome was a penguin-shaped product which can put young children at ease and provide an ergonomic shape for the doctor.



## Shoe Making Course

I attended a course at the London College of Fashion in Footwear Design. I gained skills needed to develop footwear through the making of shoe samples: a classic peep toe, a boot and a sneaker. I also gained an insight into the industry by meeting industry professionals and shoemakers. If you would like to see the details of the manufacturing processes, visit my design Instagram @annalisdg.



# Pizzicato

*Coming Soon!*



# Thank you

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