FIXPERTS

BY DAN KILLACKEY & EMILIA ZIOLEK

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Fixperts

Dan Killackey

3rd Year Product Design Student

Hi I'm Dan Killackey, I'm studying Product Design. With a keen eye for detail and a flair for innovation & aesthetics I'm excited to begin this project with my fixteam.

Our Fixperts Team

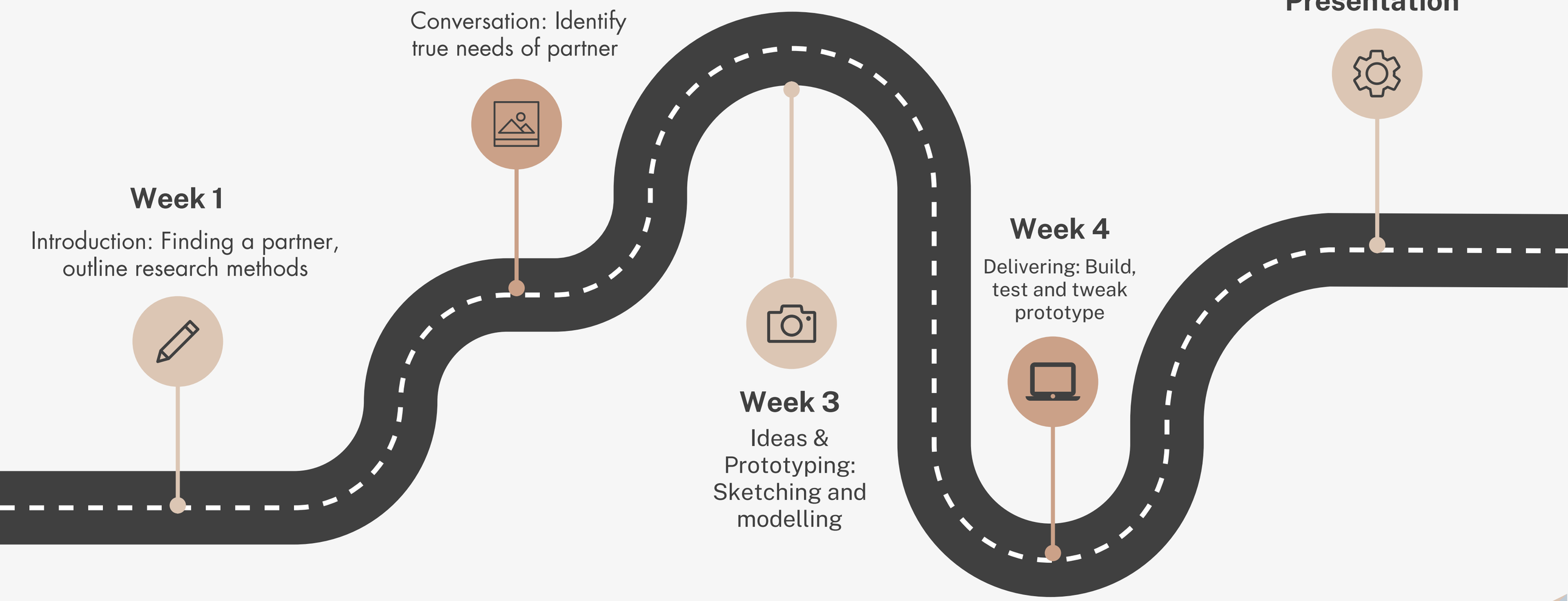
Our task is to find an individual who struggles with something that everyone else takes for granted and design a solution that helps them with it. We had four weeks to complete this project.

My name is Emilia Ziolek, I'm now in my third year of Product Design. My interests are digital art and design for sustainability & circular economy. I'm really looking forward to developing and improving new skills during this project.

Emilia Ziolek

3rd Year Product Design Student

PROJECT TIMELINE



PLAN FOR FIXPERT FILM

Fix Film Plan on Microsoft Teams (Here for Reference)

What should be in a Fix Film?

Fixperts

Your Fix Film should capture the story of the people, the problem and the fix. Placing emphasis on the relationship between Fix Partner and the Fixperts team. Films that highlight insights and show the design process are of great value to other Fixperts.

1 

Add your film title

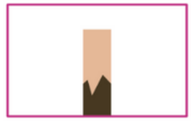
2 
Introduce the Fix Partner

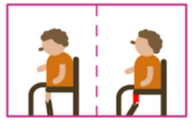
3 
Introduce the team

4 
Capture the conversation with the Fix Partner

5 
Identify a problem

6 
Explore possible solutions

7 
Prototype

8 
Test and improve

9 
Get feedback

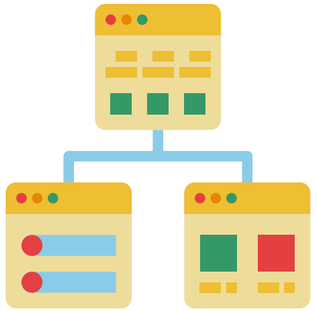
10 
Celebrate the fix!

11 

Include credits and thank everybody

What do we want in our film?

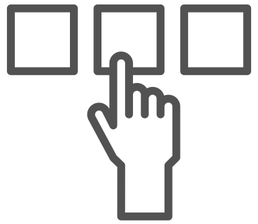
Continuity: Maintaining consistency in visual and narrative elements. For example: Flicking back to familiar shots to set a scene.



Uniformity: Having a structure to the film, an introduction to the user, an explanation, testing, conclusion, etc.

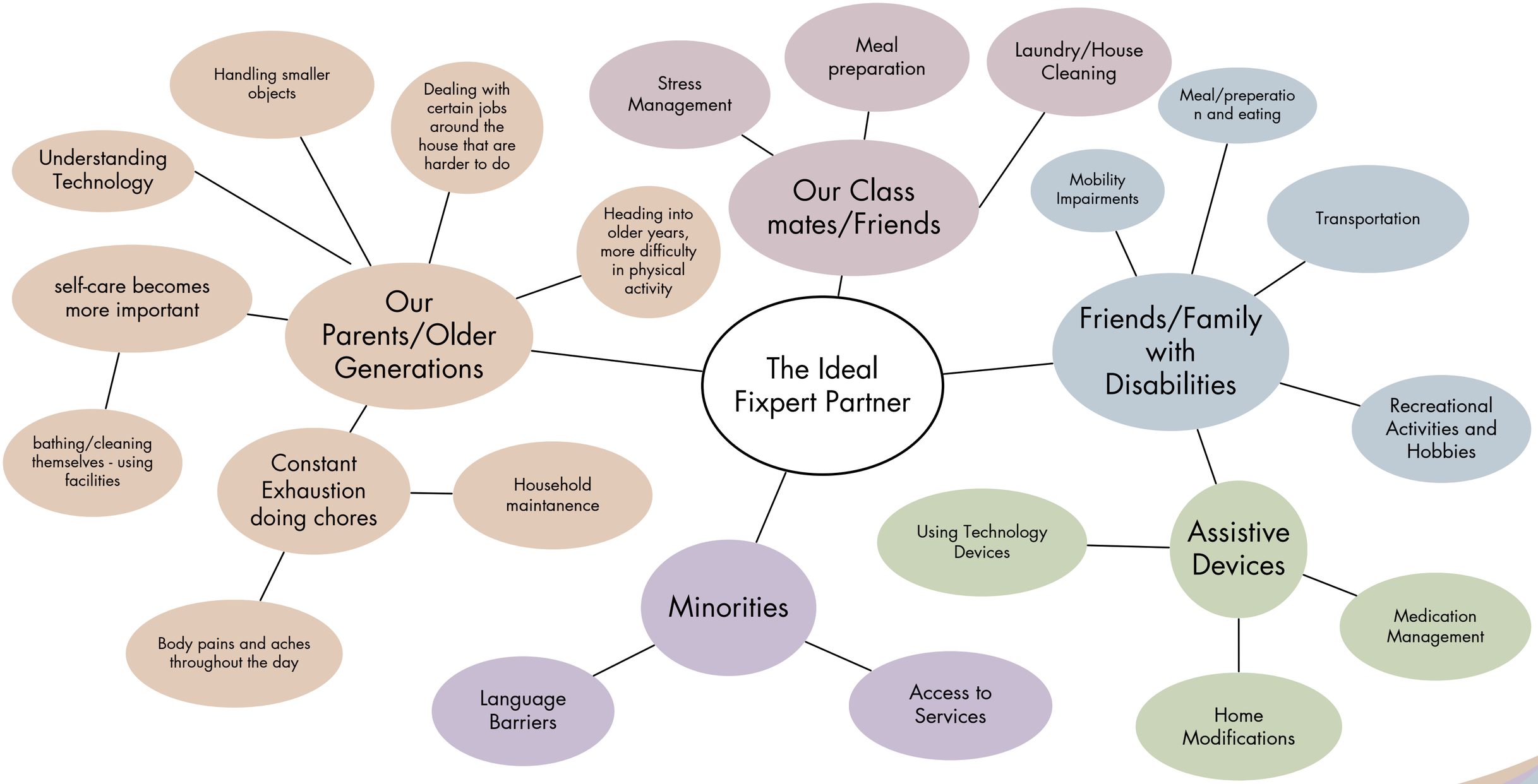
Cohesiveness: We want the viewer to be able to clearly hear the words. We want good crisp audio that isn't too quiet or lost in the ambience.

Visuals: We want the viewer to be able to clearly understand everything. We want the quality of video high enough for the viewer to see what's going on.



CHOOSING A FIXPERT PARTNER

CHOOSING A FIXPERT PARTNER

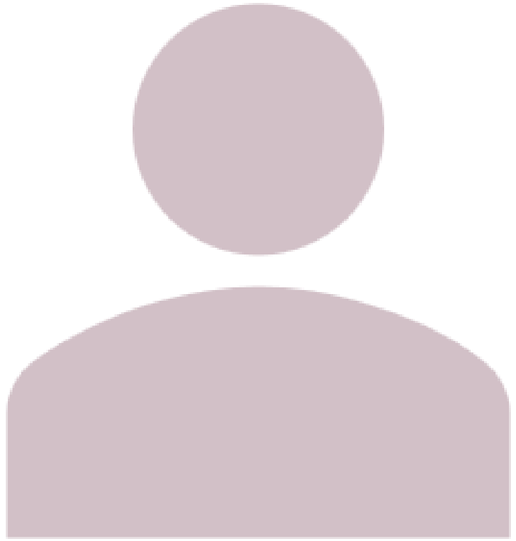


CHOOSING A FIXPERT PARTNER

USER PROFILE

ALYSSA FLANNERY

Recovering from Swimming Injury



Gender	:	Female
Age	:	28
Relation	:	Friend
Description	:	Pulled her shoulder and is in a cast, finds struggle in everyday activity.

USER PROFILE

MICK WHITE

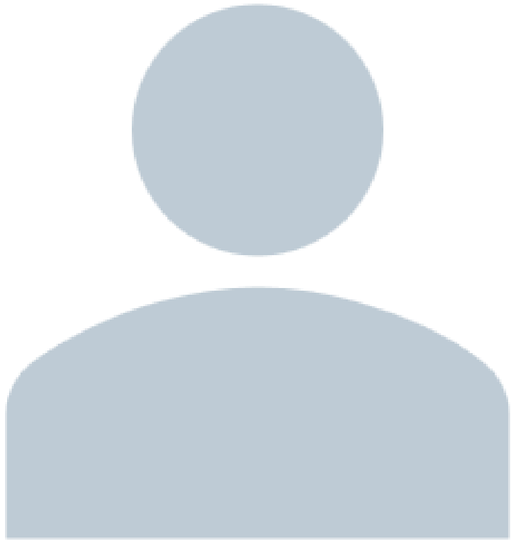
Lumbago

Gender	:	Male
Age	:	94
Relation	:	Gran Uncle
Description	:	Suffers from bad back problems, trouble with mobility

USER PROFILE

TOM DUGGAN

Dexterity Issues



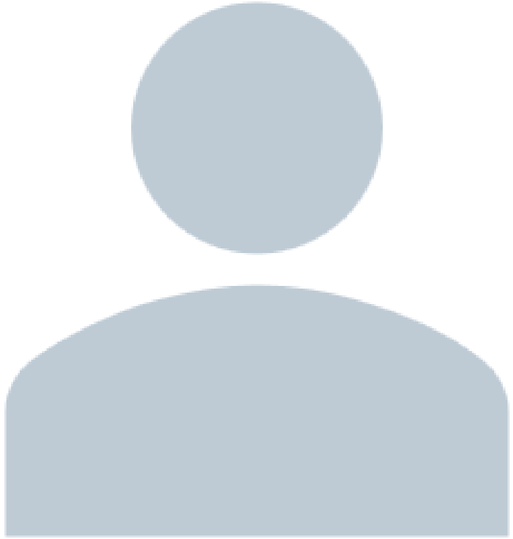
Gender	:	Male
Age	:	49
Relation	:	Family Friend
Description	:	Has struggled to perform precision tasks and issues with motor skills.

CHOOSING A FIXPERT PARTNER

USER PROFILE

ANN KILLACKEY

Issues with Nasal Breathing



Gender	:	Female
Age	:	55
Relation (To Us)	:	Dan's Mother
Description	:	Issues with breathing through her nose, causing health complications in the future.

USER PROFILE

ABILENE RYAN

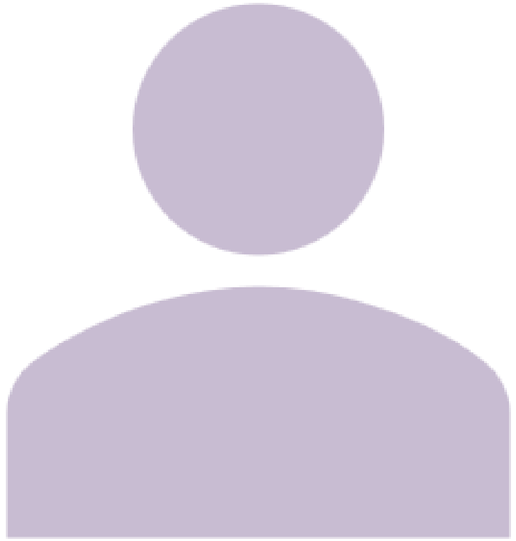
Type 1 Diabetes

Gender	:	Female
Age	:	22
Relation (To Us)	:	Cousin
Description	:	Has had type 1 diabetes her whole life leading to many daily struggles.

USER PROFILE

GREG ZIOLEK

Lumbago



Gender	:	Male
Age	:	45
Relation (To Us)	:	Emilia's Father
Description	:	Suffers from back problems, most uncomfortable during working and sleeping.

*Pictures are not disclosed due to privacy concerns.

ANN KILLACKEY

Call Taker

Hi, I'm Ann Killackey, I'm 55 years old, I'm a mother of three, and I work as a Call Taker in Shannon Doc. I live in Ardnacrusha Co. Clare with my son, Dan.

Our Fixperts Partner

Our partner is Ann for this Fixperts project. We decided to choose her for the project because she is easily accessible so that we can conduct a good observational/research study. She has a condition that gives us a lot of room to experiment with possible solutions. Most of all she was willing to help us out on this project.

THE PROBLEM

Ann has a deviated septum, causing her to have Nasal Obstruction. The deviation can obstruct one or both nasal passages, making it difficult to breathe through the affected nostrils. This can lead to a feeling of nasal stuffiness/dry throat and reduced airflow.

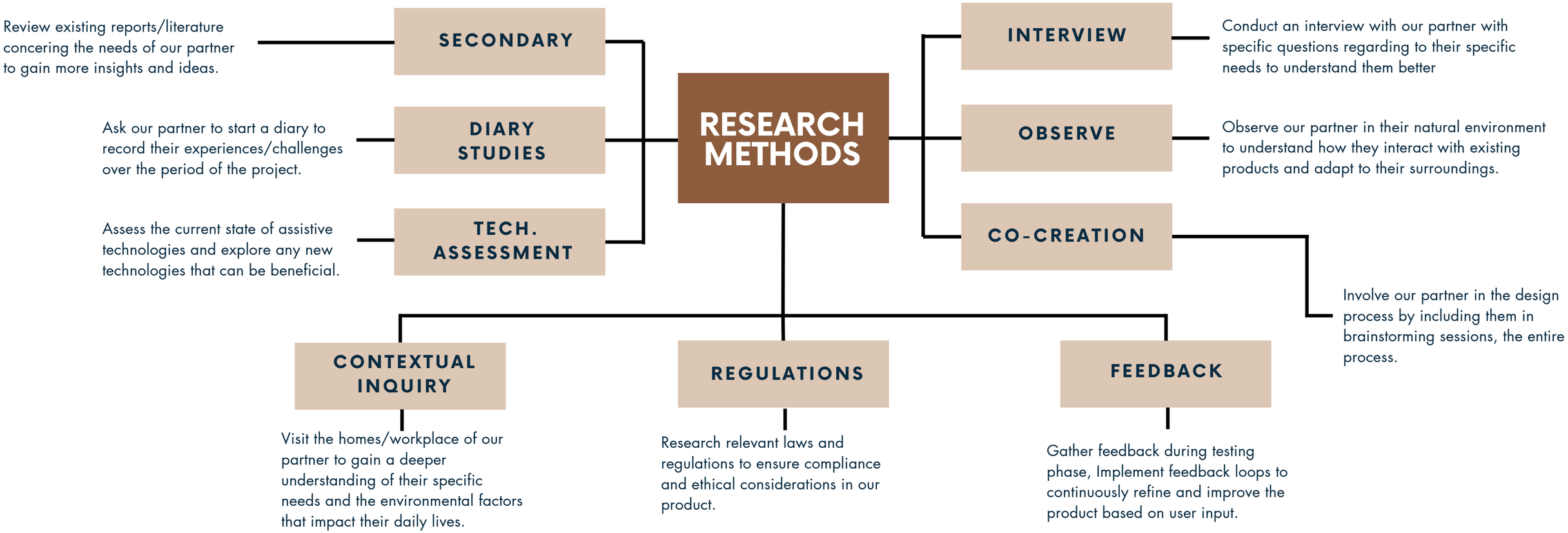
Treatment for a deviated septum and associated nasal problems typically depends on the impact of the individual's quality of life. In Ireland, you could be on the ENT waiting list for 2+ years just to get a consultation.

We want to help ease the struggle of everyday living, so it's essential to focus on developing a solution that addresses specific needs and enhances quality of life.

RESEARCH

RESEARCH
PLANNING OUR METHODS

Here is a diagram of all the research methods we hope to use.



RESEARCH
TIMELINE

DIARY STUDIES

Tuesday 12th Sept. - Ask our partner can they start a short diary to pay attention and document their daily occurrences.

OBSERVE

Wednesday 13th Sept. - Visit our partner and observe their activities in their environment.

CONTEXTUAL INQUIRY

Wednesday 13th Sept. - Visit our partner to have a look at the environment they live in.

SECONDARY R.

Thursday 14th Sept. - Look for information/resources online about the problem.

TECH ASSESS.

Thursday 14th Sept. - Look for existing solutions/technologies and their advantages/disadvantages.

REGULATIONS

Thursday 14th Sept. - Research online for existing regulations regarding products/designs.

INTERVIEW

Friday 15th Sept. - Conduct an interview on our partner.

CO-CREATION

During process/ideation/prototyping.

FEEDBACK

During process/ideation/prototyping.

EMILIA DAN

RESEARCH
DIARY STUDIES

We asked Ann to keep a short diary for the rest of the week so we could have more talk points/find anything that wasn't mentioned.

TUESDAY 12TH SEPTEMBER

- Woke up dehydrated with a dry mouth from mouth breathing while sleeping.
- Went for a walk and had to mouth breathe as didn't want to wear the band in public.

WEDNESDAY 13TH SEPTEMBER

- Disturbed sleep due to dry mouth and nasal congestion.
- Eating ice-cream and had a sharp sensation in the teeth.

THURSDAY 14TH SEPTEMBER

- Drank a bit the night before and woke up a few times during the night very dehydrated.
- Almost forgot to put on the band before I went to sleep.

FRIDAY 15TH SEPTEMBER

- Forgot to take the band off and wore it out in public before noticing.
- Band left glue residue on nose.

SATURDAY 16TH SEPTEMBER

- Band left a red mark across nose after putting on too tight night before.
- Was drinking cold water and had a sharp sensation in the teeth.

SUNDAY 17TH SEPTEMBER

- Had difficulty breathing through nose.

RESEARCH
FIELD NOTES – ANN'S STORY

THE WORK/HOME ENVIRONMENT

Ann lives in an enchanting household located on the verge of Ardnacrusha, Limerick. The pebbled driveway is long and comes with a fair share of surprise in its dips and lumps. The garden is sprinkled with birch trees and cats, who both spend their days basking in the little sunshine Ireland offers. The house is quite old, built in a Tudor style with noticeable elegance in masonry and stonework.

We enter the house, in which we greet Ann in the doorway. The space looks quite complex in the layout of the rooms, with an intriguing choice of curtains - that wasn't bad by any means. We followed Ann into the kitchen where she invited us to sit down and have something small to eat. The kitchen was tidy in its appearance, with a large window opening the space above the sink. There were no alarming things that stuck out to me that could lead to worsening her condition - like a leaky pipe or the ventilation system in the utility we checked out later.

Ann works in Shannon Doc. over at St.Camillus Hospital on Shelbourne Rd. While visiting her work was not possible at this time I've personally been inside the hospital. It is quite a busy place, with a lot of different services and departments. The building itself is quite old, sitting with a displeasing shade of yellow. I could imagine the space inside the hospital would have to be of good quality, after all, there are sick patients who need access to clean water, air, etc.

OUTSIDE OF THE HOME

As mentioned Ann works at a very people-centered place, and her days mostly consist of talking to various people. While interacting with people, Ann has a few things on her mind that 'prevent' her from fully having a full experience.

There are a few conscious decisions she makes like making sure she doesn't have bad breath - therefore she chews gum often as a habit. She is also aware that people might catch her breathing through her mouth through the noise she makes which potentially limits her from having a nice and safe experience. In a closed environment, this issue becomes more prominent with a quieter and more private space. She is used to covering her mouth in a lot of situations, sometimes for comfort and other times just to not get her condition noticed by others in non-active environments like general meetings.

THE OBSERVATIONS

Ann would often reach for a glass of water while she was cooking something in the kitchen, watching TV, or reading a book. She'd always fill it from the tap and let it sit for a while, getting it to room temperature. As we learned later people with this condition have quite sensitive teeth because of the air constantly coming through their mouth causing the erosion of the tooth's enamel.

We also didn't hear her breathing any differently, this might have been a slight indication that she might have found us being there uncomfortable and wanted to hide her condition. She would often raise her hand to her nose, covering her mouth with it completely. She later told us that sometimes she puts her hand up to her face to lift her nose back a bit, opening up the airway in her nose.

There were many other experiences she recounted to us, all of which gave us the conclusion that her condition had various impacts throughout her daily life. Some were bigger than others, like having to get up to adjust to a problem, while others were as simple as lifting her hand to her face.

RESEARCH
FINDINGS

OBSERVATIONS

These are the findings we observed during the week, confined into separate topics to help us understand the data better.

PAIN/DISCOMFORT

- Difficulty breathing through the nose, engaging the mouth to breathe instead of providing enough oxygen.
- Often experiences poor sleep quality and discomfort during nighttime.
- Teeth have gotten quite sensitive, leading to some pain when drinking cold liquids or vice versa.
- A lot of difficulty breathing during sickness or other infections.

TIME OF DAY

- More probability of catching a sickness in public environments (due to lack of air filtration in the mouth)
- Disrupt sleep patterns through constant dryness of the throat by getting water.
- During meal times might get hard to breathe while eating certain types of food.

SOCIAL INTERACTIONS

- Self-conscious during interactions with strangers.
- Covers mouth to avoid confrontation in some instances.
- Takes care in maintaining appearance/have good breath at all times.
- Can be an iffy topic to mention in a conversation.
- Quiet environments can cause more discomfort

COPING STRATEGIES

- Tries multiple sleeping devices that have been purchased online (hard to find the right one)
- Tries devices that discourage users from using the mouth
- Tries various breathing exercises throughout the day.

OTHER

- A lot of anticipation while waiting on the long surgery list to get their condition list.
- Snoring can also be a problem.

ENVIRONMENT

- Air quality can strongly affect the immune system since the air isn't filtered when you breathe through your mouth.
- Seasonal changes can be more severe, and more prone to sickness.
- Humidity can also affect how much water to drink.

HYGIENIE

- Good skin care around the nose is necessary from the equipment that she uses.
- Handwashing to prevent germs from getting to the face and inhaling.

RESEARCH
SECONDARY RESEARCH

VISIBLE CONSEQUENCES OF MOUTH BREATHING

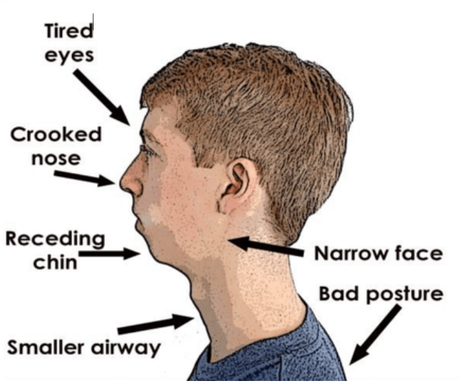


FIG 1. Profile of a Heavy Mouth Breather

FIG 3. Open bite caused from mouth breathing

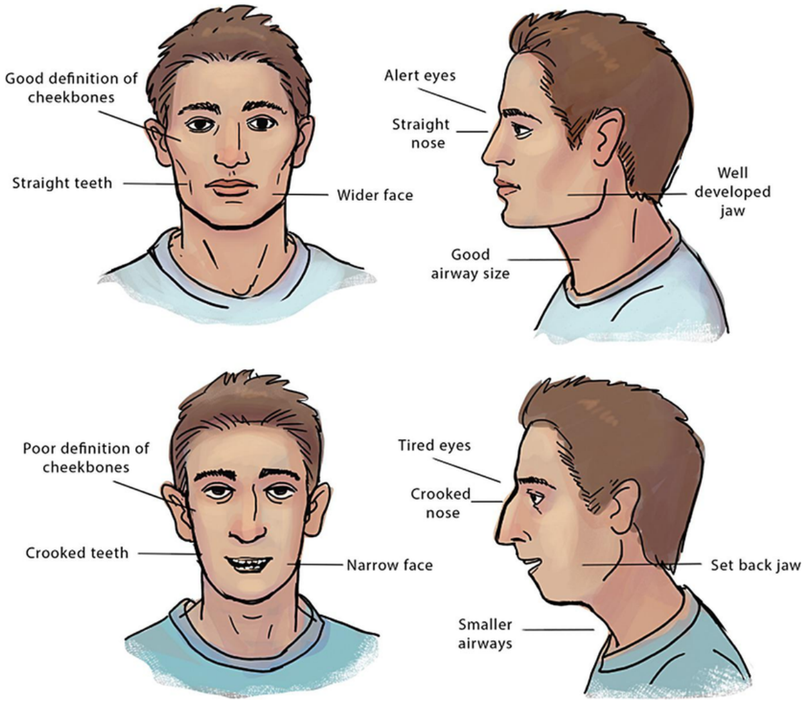


FIG 2. Difference between mouth breathing and nose breathing.

Facial Changes: Prolonged mouth breathing, especially during childhood, can impact facial development. It may result in:

- Long Face: The face may appear elongated, with changes in the position of the upper and lower jaw. (Like in FIG 1.)
- Open-Mouth Posture: Chronic mouth breathers may habitually keep their mouths open, which can affect facial muscle tone and posture.

Dental Health

Your saliva helps balance the pH level in your mouth and flush away unwanted bacteria. Mouth breathing dehydrates your tissue and limits saliva production, compromising dental health and proper oral posture.

INVISIBLE CONSEQUENCES OF MOUTH BREATHING

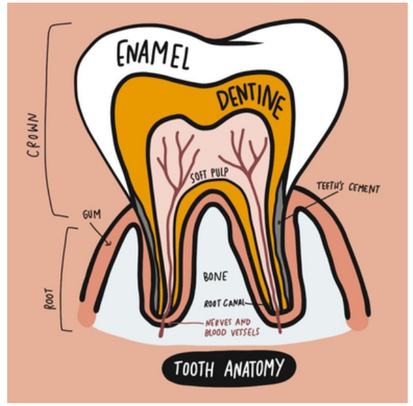


FIG 5. Diagram of the tooth and where the enamel is located.

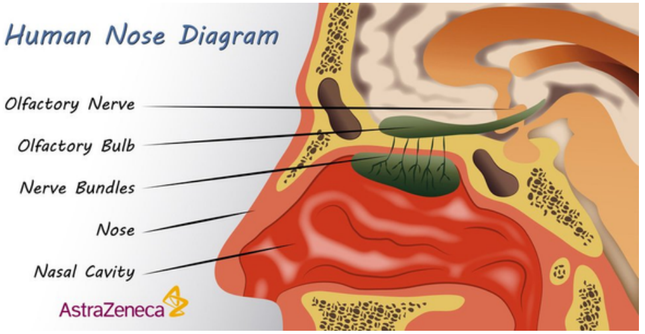


FIG 4. Diagram showing how the human nose catches particles through the olfactory bulb.

Psychosocial Impact:

- Self-Consciousness: Individuals who mouth breathe may feel self-conscious about their breathing, which can affect self-esteem and social interactions.
- Fatigue and Irritability: Poor sleep quality due to mouth breathing can lead to daytime fatigue, irritability, and difficulty concentrating.

Cognitive Effects:

- Some research suggests that chronic mouth breathing may impact cognitive function, including memory and attention, due to reduced oxygen intake.

Respiratory Problems:

- Reduced Lung Efficiency: Mouth breathing may not effectively filter, warm, and humidify inhaled air, which can make it harder for the lungs to work efficiently. This can affect overall respiratory health and oxygen uptake.
- Increased Respiratory Infections: Mouth breathing can increase the risk of respiratory infections because unfiltered air can introduce more pathogens directly into the respiratory system.

RESEARCH
SECONDARY RESEARCH

IMPACT ON QUALITY OF LIFE

A deviated septum can have a significant impact on a person's quality of life. Nasal congestion can cause poor sleep quality and fatigue during the day. Sinus infections can cause facial pain and headaches. Snoring and sleep apnea are common sleep disturbances. Food enjoyment can be impacted by a reduced sense of smell and taste. A dry mouth caused by mouth breathing increases the risk of dental problems.

These physical symptoms can lead to emotional problems, such as daytime fatigue, low self-esteem, and stress from dealing with chronic symptoms and medical treatments. A deviated septum can have an impact on a person's physical, emotional, and social well-being.

Furthermore, a deviated septum has a significant psychological impact. Persistent discomfort and changes in appearance can lead to body image issues. Coping with chronic symptoms, medical consultations, and potential surgical interventions can all add stress and anxiety to your life. Social interactions may be affected, especially if speech or facial changes are noticeable. Sleep disturbances, such as snoring, can strain relationships.

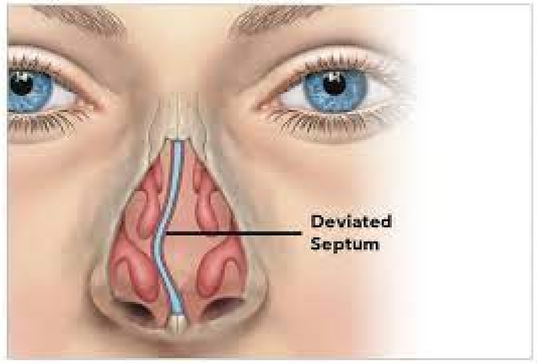


FIG 1. Diagram of a deviated septum

FIG 2. Picture of someone with an extreme case of a deviated septum.

SURGERY (IRELAND)

The severity of the condition, the healthcare facility, and the individual's specific circumstances all influence the experience of surgery for a deviated septum, also known as septoplasty, in Ireland.

In most cases, A participant will need to wait upwards of two years for a consultation. Surgery is a big decision to make and not everyone will undertake it for different reasons. It takes between 3-6 months to fully feel the benefits of surgery, however it is a permanent solution to a deviated septum.

FIG 3. Picture of a medical examination during a consultation.

REGULATIONS

Most importantly regarding devices used for deviated septums there are Manufacturer and Distributor Responsibilities. Medical device manufacturers and distributors must meet specific quality assurance, risk management, and post-market surveillance requirements. They are in charge of ensuring that their products are both safe and effective. Medical devices, including those used in septoplasty, must also bear the CE marking, which indicates that the product meets the essential requirements of the European Union's Medical Devices Directive (now replaced by the Medical Devices Regulation, MDR).

FIG 4. Picture of a medical device on the user.

RESEARCH
TECH ACCESS

We asked Ann about the devices she's tried to see what issues arose.

FIG 1. Nose Ring Device

-Too small, doesn't improve airflow

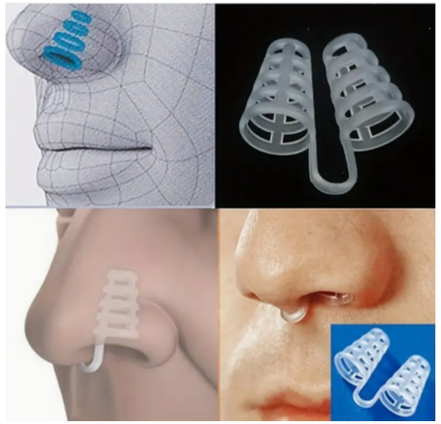
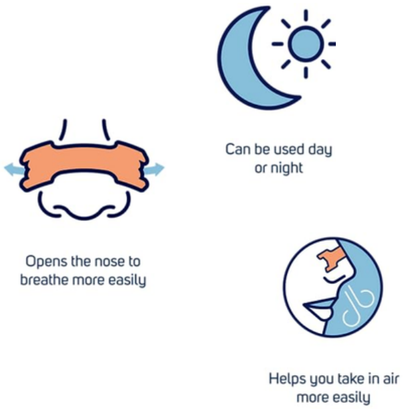


FIG 3. Anti-Snoring Nose Clip

Uncomfortable in nose & falls out

FIG 5. Nasal Strips



These are the strips Ann uses at night to help her breathe through her nose. While they are not perfect they have been the best solution so far to helping her breathe better

FIG 2. Mouth Tape for sleeping

-Doesn't work, uncomfortable.

FIG 4. Head Sling

-Uncomfortable.

FIG 6. Nose Air Purifier

-Doesn't improve airflow and is uncomfortable.

RESEARCH
INTERVIEW STRUCTURE

1. Welcome
Thank you for letting me have an interview with you today, this session is scheduled to run no longer than 40 minutes. Before we begin, I'll explain how the session works and ask some additional questions.

2. Agenda
Today I'm responsible for conducting an interview regarding the struggle that you have agreed to discuss with me today.

- I will be asking you some background questions.
- I will record this session - this footage won't be seen outside of the team.

3. Background Questions

- Please tell me your name, age, and occupation.
- Do you have any other underlying conditions we should know about?
- Is there anything you'd like to request for the duration of this interview?

4. Interview Questions
Ask participant around ~10 questions from list. Remember to engage and expand their answers by asking additional questions that relate to the topic.

5. End (Regards).
Thank the participant for letting us interview them, engage in small talk to let them relax a little bit. Ask them what went well/not.

RESEARCH
INTERVIEW QUESTIONS

1. When did you first notice you had this problem?
2. How has your problem affected your daily life and routines?
3. Can you share specific instances or situations where your nasal condition caused discomfort, pain, or inconvenience?
4. Have you sought medical advice or treatment for your deviated septum? If so, what treatments or interventions have you tried?
5. Do you know the negative effects of mouth breathing?
6. Have there been any lifestyle adjustments or modifications you've had to make due to your nasal condition?
7. Can you describe any ongoing challenges in preventing further complications and health problems?
8. Would you prefer a solution that is more physical like an object that helps you breathe? Or something different like an exercise?
9. How do you envision a temporary solution before your surgery?
10. Is there anything else you'd like to add?

RESEARCH
INTERVIEW TRANSCRIPT - HIGHLIGHTS

1. When did you first notice you had this problem?
I've always been aware that I've had a problem in my nose but when a friend of mine had an operation for a deviated septum, I realized I also had the same problem.

2. How has your problem affected your daily life and routines?
I feel dehydrated when I wake up and throughout the night so I don't get the best quality sleep. I sometimes wear nasal strips every night but I don't find them very effective.

3. Can you share specific instances or situations where your nasal condition caused discomfort, pain, or inconvenience?
I'm aware that when I'm around other people my mouth can be open unnecessarily and when I'm eating I'm also extremely aware that I need to keep my mouth shut because I struggle with that. It makes me very self conscious about myself.

4. Have you sought medical advice or treatment for your deviated septum? If so, what treatments or interventions have you tried?
Yes, I've gone to my GP who has referred me to a surgeon, but I'm currently on a waiting list. That was over nine months ago. And in the meantime, I have been using things like nasal dilators and strips, which are one size fits all and not necessarily benefit everybody in the same way.

5. Do you know the negative effects of mouth breathing?
Il know it's bad, but I don't know why.

6. Have there been any lifestyle adjustments or modifications you've had to make due to your nasal condition?
I wear nasal strips every night before I go to sleep to improve my condition and, uh, you mentioned there about teeth sensitivity and I have been aware of my sensitivity in my teeth for quite some time so I don't really enjoy cold drinks as much as other people.

7. Have there been any lifestyle adjustments or modifications you've had to make due to your nasal condition?
I wear nasal strips every night before I go to sleep to improve my condition and, uh, you mentioned there about teeth sensitivity and I have been aware of my sensitivity in my teeth for quite some time so I don't really enjoy cold drinks as much as other people.

8. Would you prefer a solution that is more physical like an object that helps you breathe? Or something different like an exercise?
I'd prefer something physical but more personalized for my nose.

9. How do you envision a temporary solution before your surgery?
Something not too obvious so I can wear it not just when I'm sleeping but throughout the day out in public. Also a product that can be reused as the nasal strips can only be used once and have to be thrown away. Keeping my mouth closed when I'm sleeping is another issue

10. Is there anything else you'd like add?
I hope you can design something that can help me breathe better and maybe even allow me to avoid getting surgery altogether.

DESIGN GUIDE

DESIGN GUIDE

MUST HAVES

01

Effective

A solution that is effective and works 100% of the time.

02

Ease Of Use

A solution that is quick, easy to control and understand.

03

Safe/Hygienic

A solution that guarantees the safety of the user during use.

04

Reusability

A solution that can be reused continuously for a long period of time.

05

Comfort

A solution that brings comfort and relief while being used.

NICE TO HAVES

06

Scent

Possibility of ‘scent’ on the solution for nicer experience.

07

Hygienic Storage

The solution to be stored in an additional safe compartment.

08

Additional Features

Enable the possibility of the product to have another useful feature.

09

Discreet

A solution that minimizes drawing attention to the user.

10

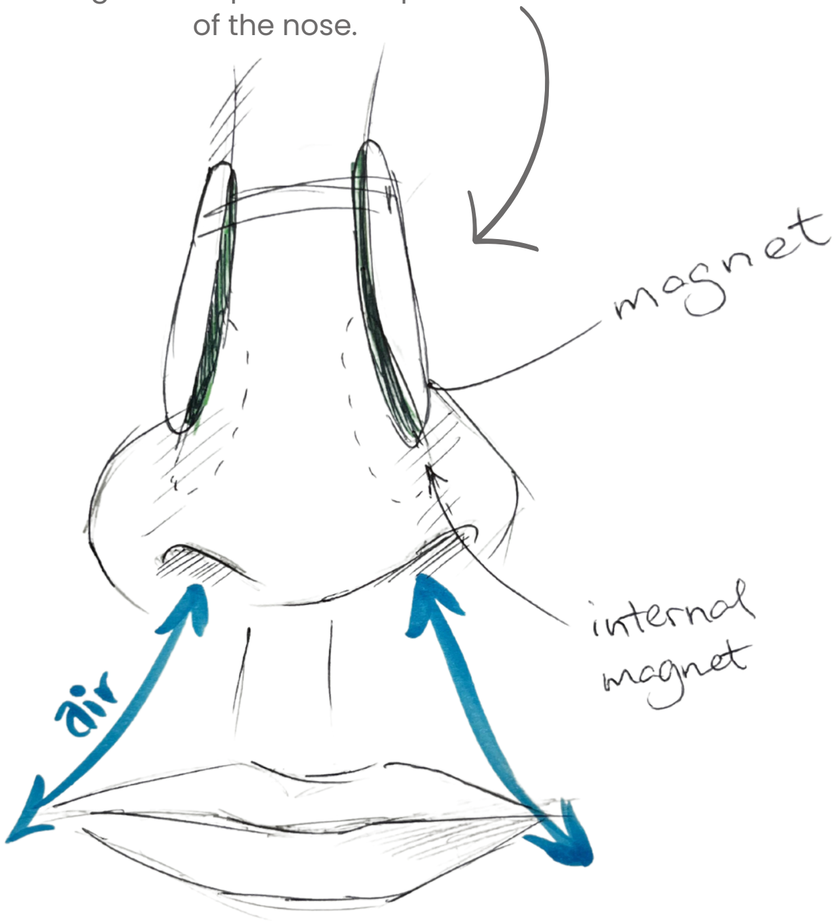
Aesthetic

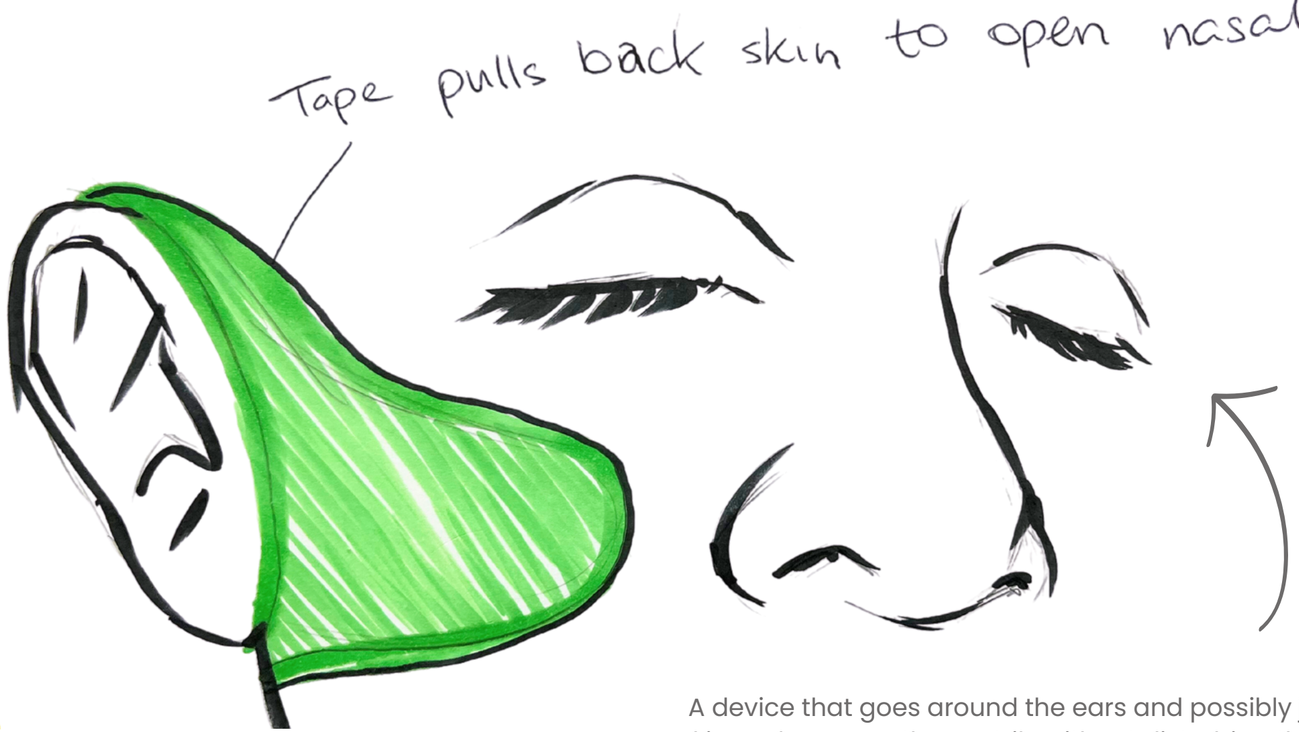
A solution that is pleasing from an aesthetic point of view.

IDEATION

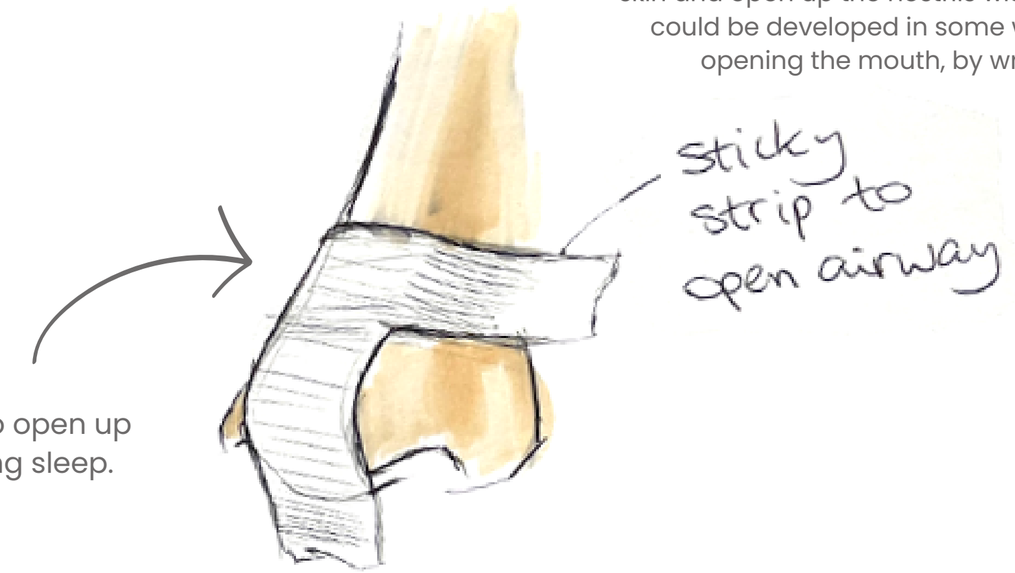
IDEATION
SKETCHING

Magnet device that clips onto the nose and an internal magnet that pulls and expands the walls of the nose.



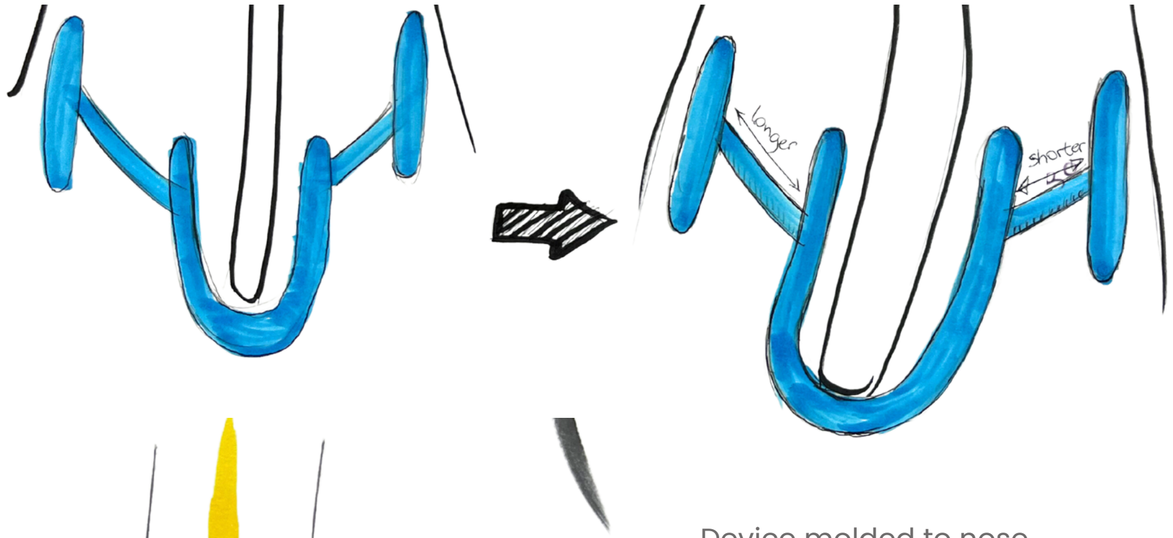


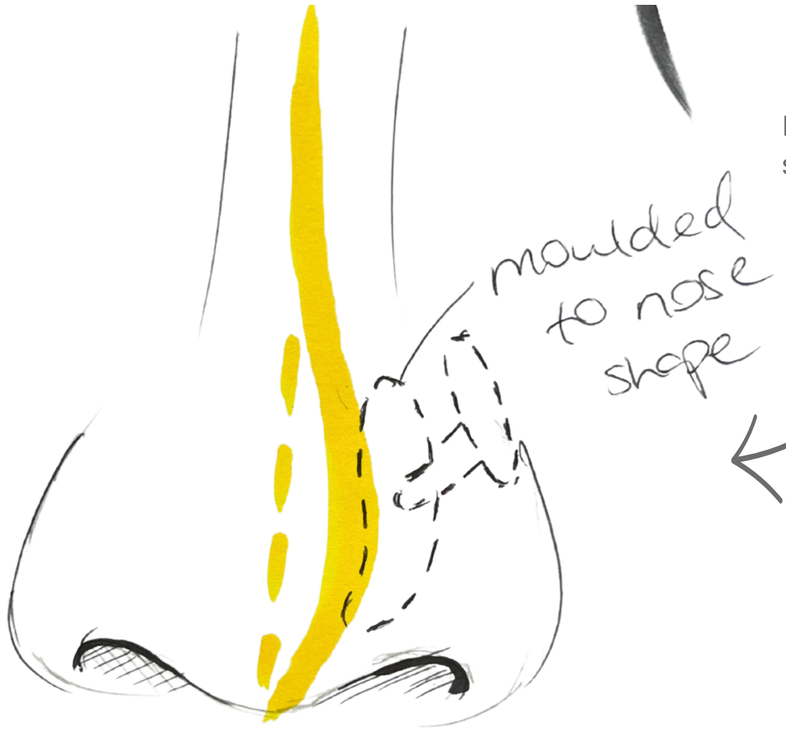
A device that goes around the ears and possibly jaw to pull back skin and open up the nostrils without disturbing the nose. The idea could be developed in some way to try prevent the user from opening the mouth, by wrapping around the jawline.



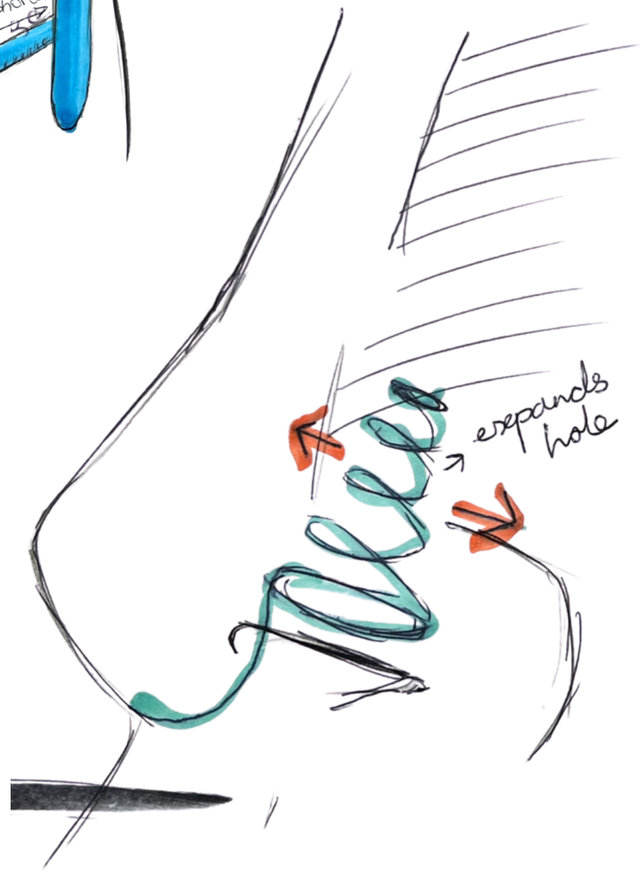
Tape that gently pulls back the nose to open up the airway to be put on the nose during sleep.

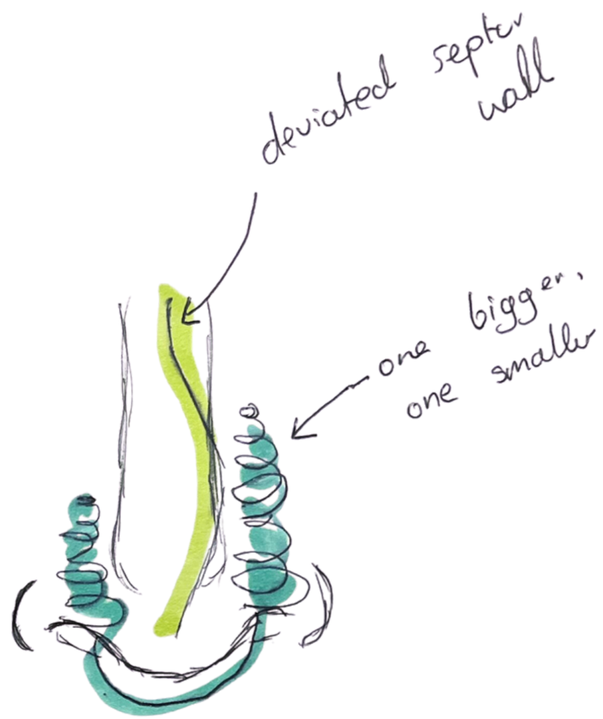
IDEATION
SKETCHING

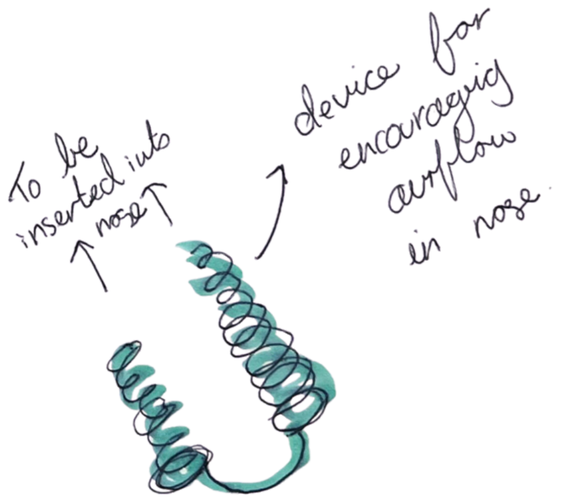




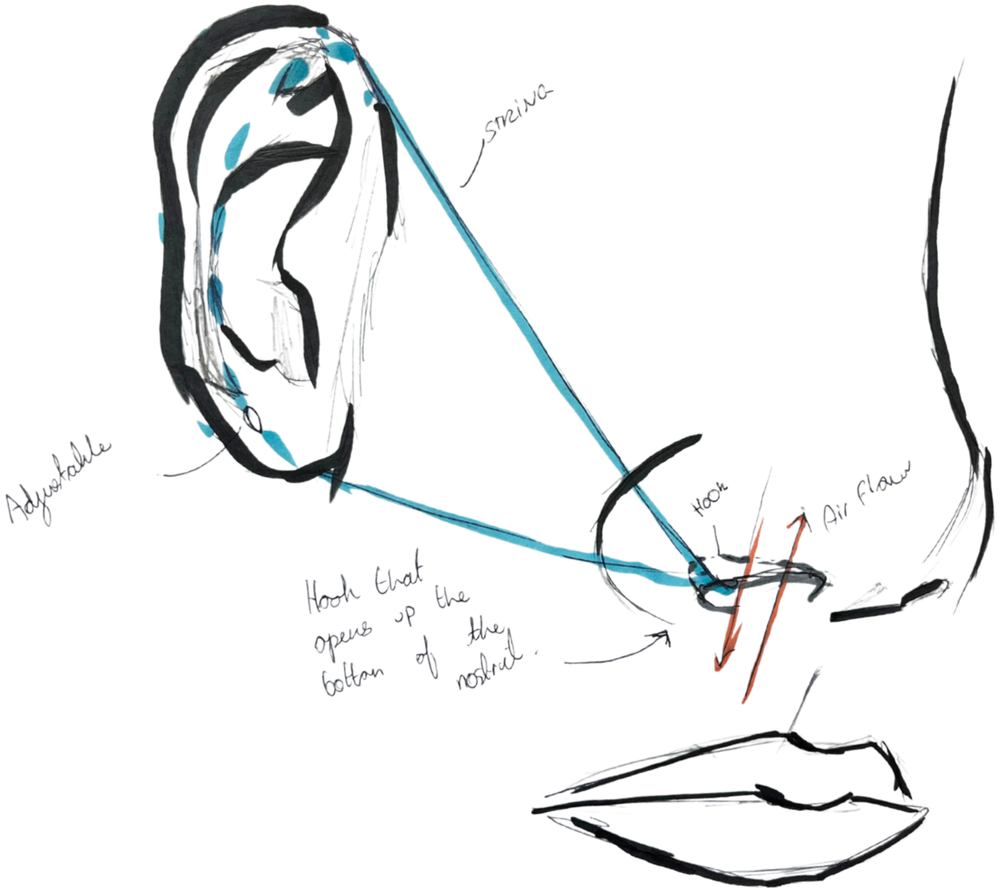
Device molded to nose shape inserted into the nose to open up the airway.

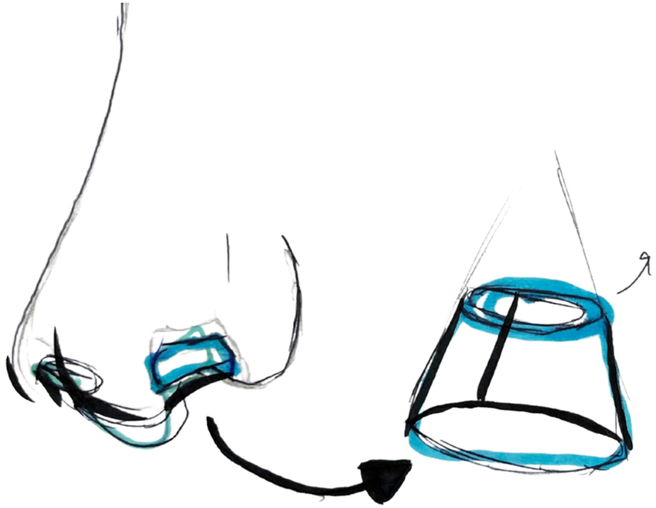






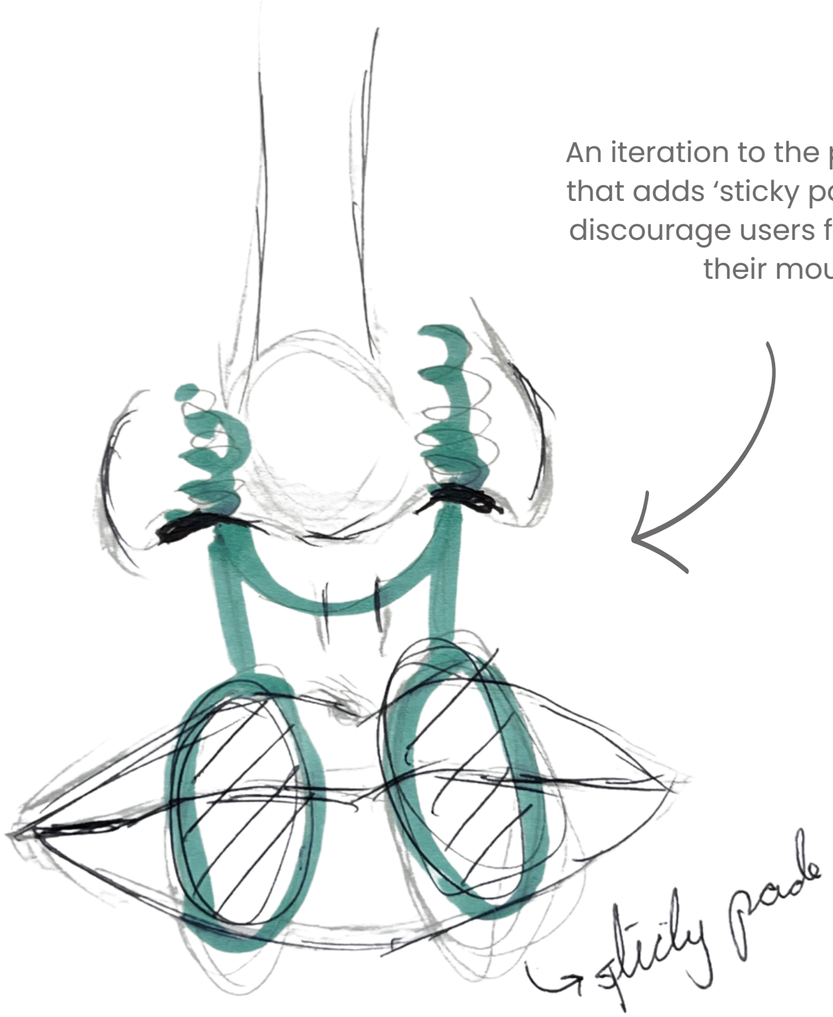
IDEATION
SKETCHING





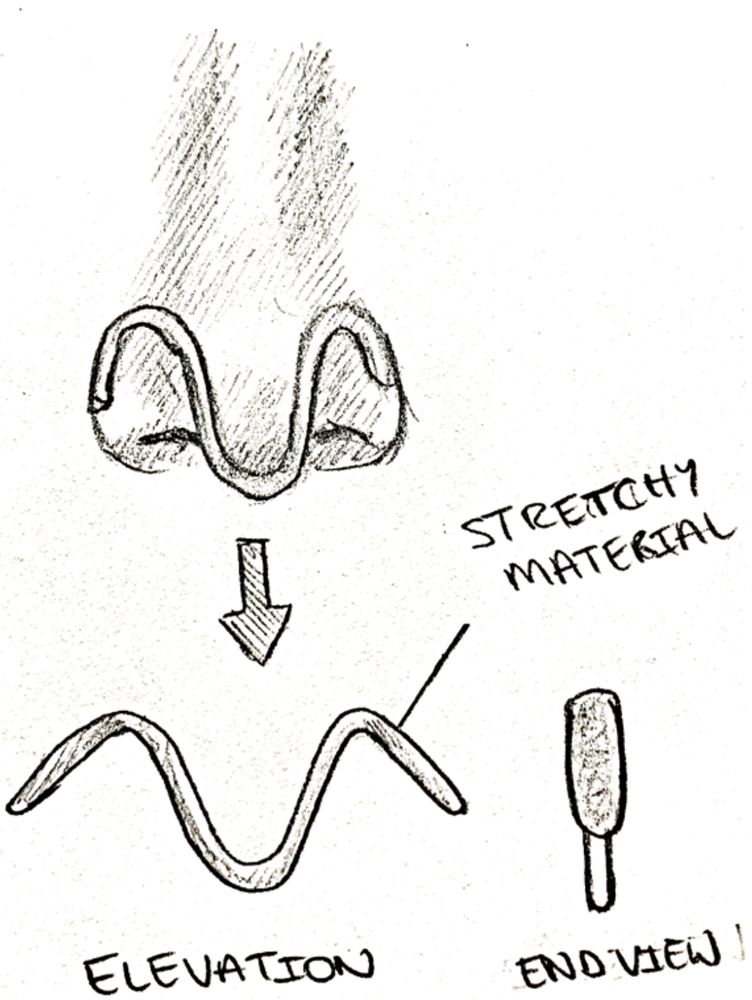
When the user wears glasses a device clips onto them and extends down to open the nose

IDEATION
SKETCHING

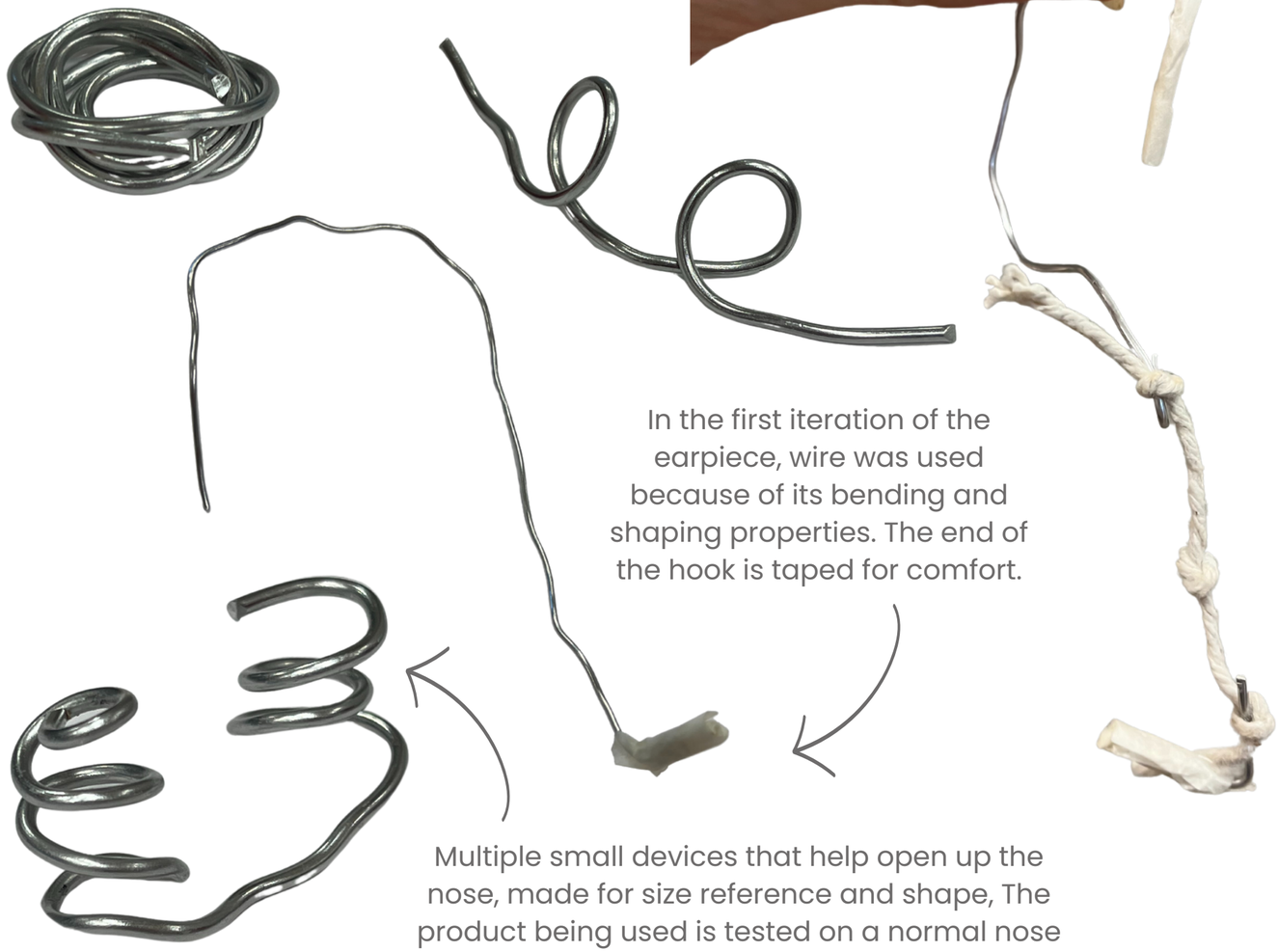


An iteration to the previous idea that adds ‘sticky pads’ that also discourage users from opening their mouth.

A material that hooks around the nose and lifts up the tip made out of material that is easily adjustable for comfort.



IDEATION
PROTOTYPING



In the first iteration of the earpiece, wire was used because of its bending and shaping properties. The end of the hook is taped for comfort.

Multiple small devices that help open up the nose, made for size reference and shape, The product being used is tested on a normal nose as we want to keep the device as low as possible.

Earpiece devices that helps hold one nostril open which minimizes contact with the nose.

IDEATION
FEEDBACK

We tried out this design on our fix-partner, Ann to gain some feedback for our next prototype

PROS

- Ann said she noticed an improvement in the airflow through her nose.
- It fit into her nose

&

CONS

- It was a bit uncomfortable
- Was a bit too thick
- Kept falling out of nose

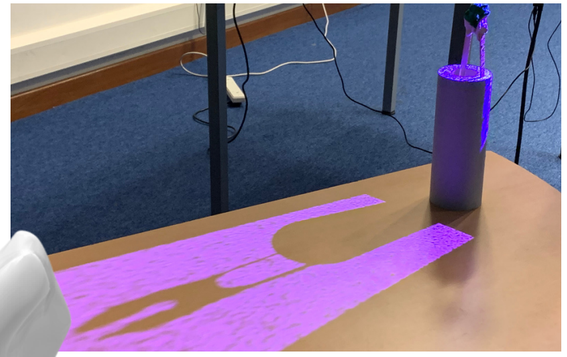
IDEATION
PROTOTYPING

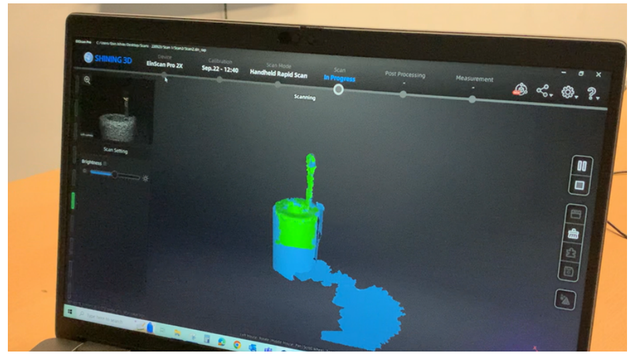
We wanted to give Ann the best product possible and to do that we thought the design should be specific to her nose. We considered using clay to mould the inside shape of her nose. This way we could work directly with her nose to make the solution as ergonomic as possible.

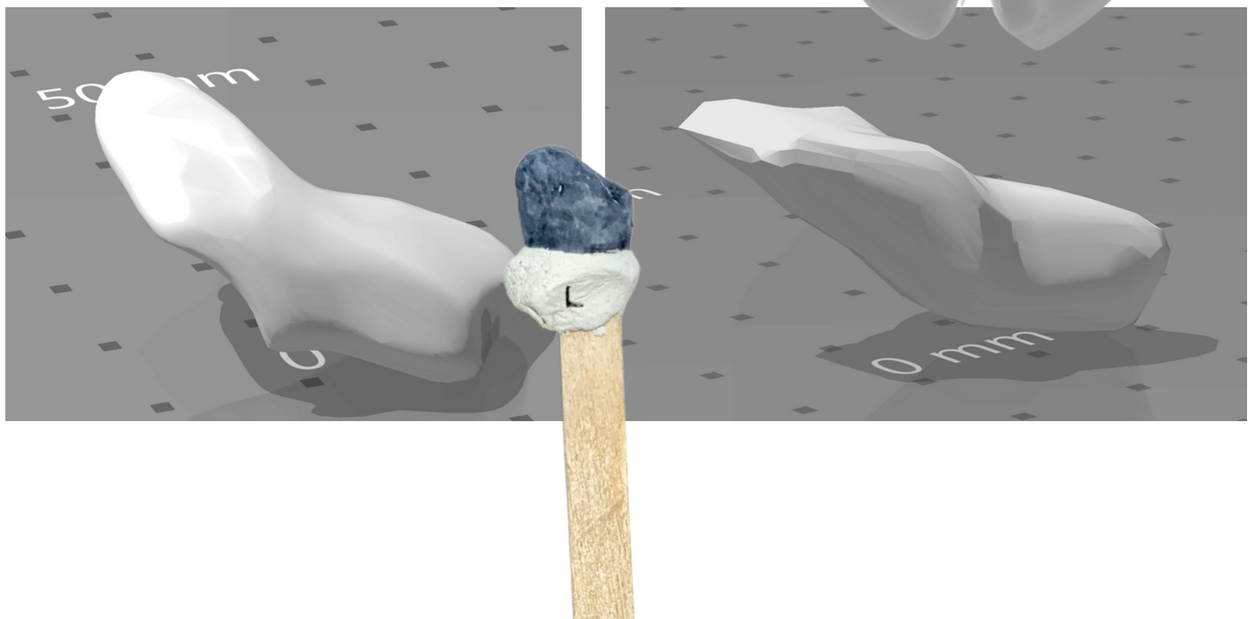
After they dried we started considering our options. We could try wrap materials and work around the moulds or we could 3D scan the moulds to bring them into a modelling software, and from there 3D print a solution specific to her nose shape. This is when our ideas narrowed down.

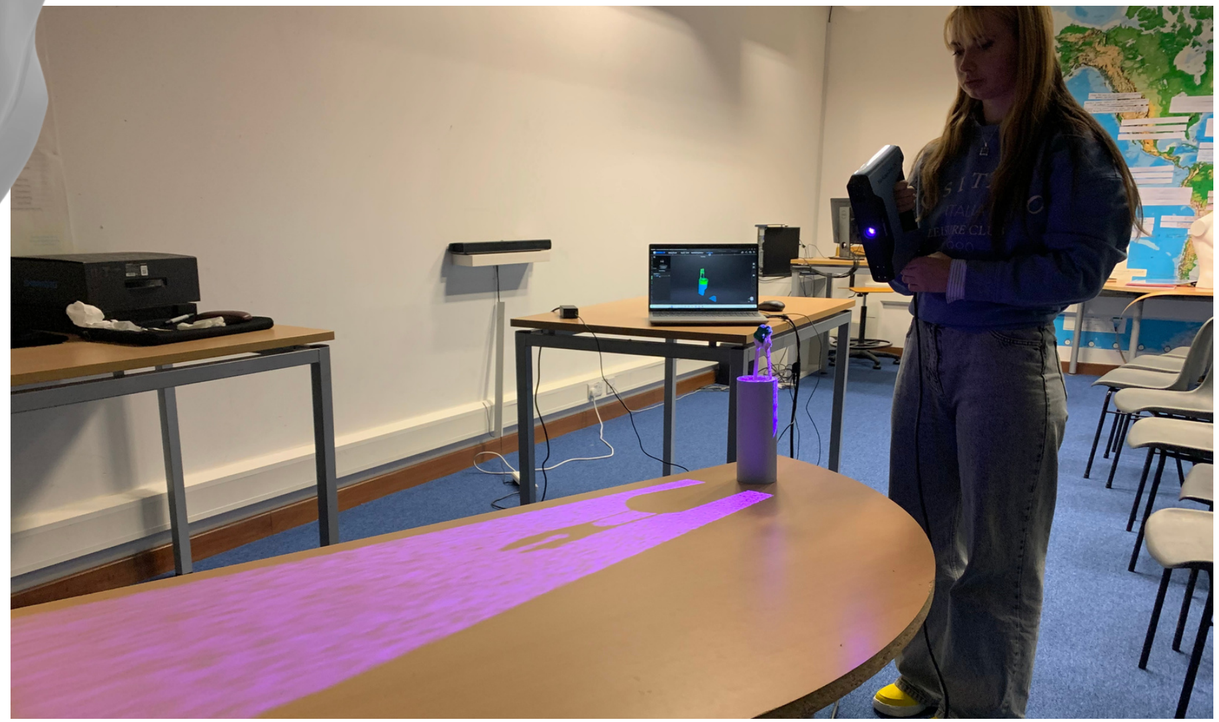
IDEATION
3D SCANNING

We 3D scanned the nose mold with the DSScan software provided to us by our lecturers. The entire process took about 1-2 hours. We learnt a lot from using this software and the scanner itself, like knowing that we must colour in the molds for the light to capture the mold.









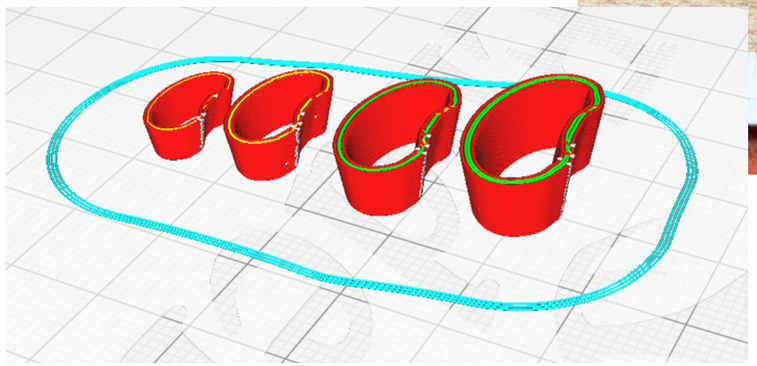
CONCEPT DEVELOPMENT

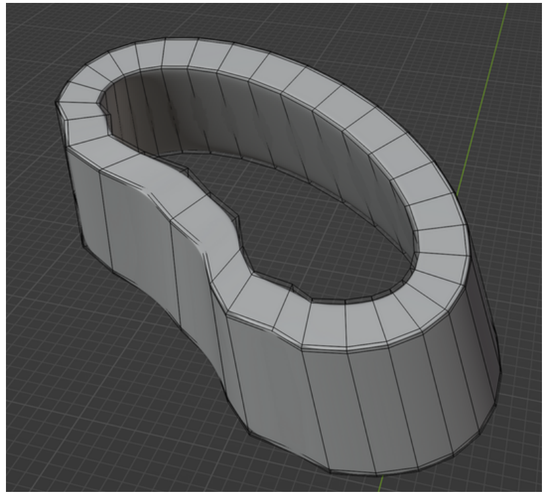
CONCEPT DEVELOPMENT
FIRST ITERATION

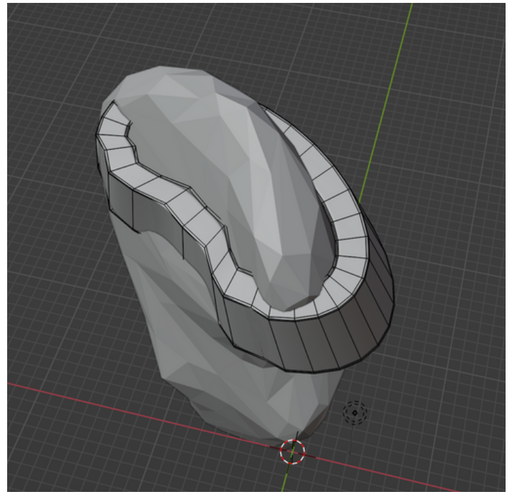
Here we made a few iterations of the very first shapes. How do we wrap the shape around another in the correct way? We tried out a simple ‘bean’ shape.

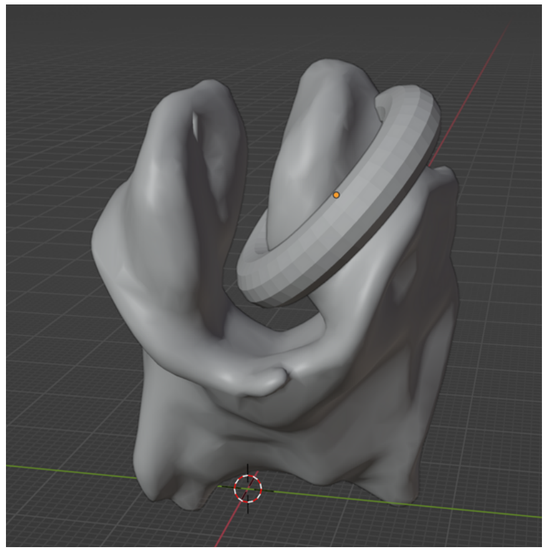
We brought the 3D mould scans into a modeling software called Blender. The aim was to get a model printed in different sizes with the correct shape best fit for our partner’s nose. Was this even a feasible approach with the comfort of the plastic for long periods of time.

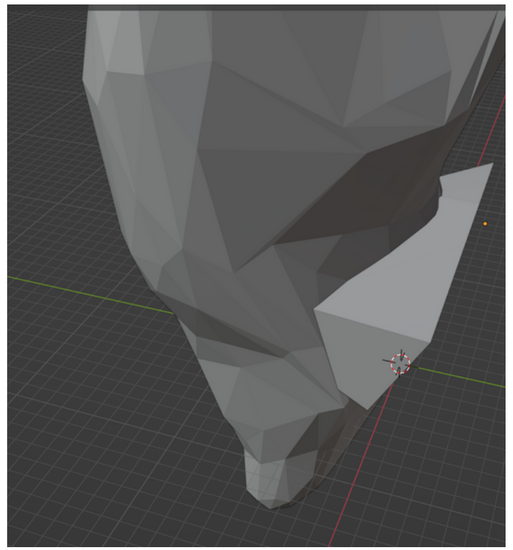
We brought the model into the Prusa slicer and duplicated it by a size difference of 2 mm. It took a total of 17 minutes to print.











CONCEPT DEVELOPMENT
FIXPARTNER FEEDBACK

We tried out this design on our fix-partner, here are some pros & cons we noted...

PROS

- There was a significant improvement in the airflow through her nose.
- It fit into her nose

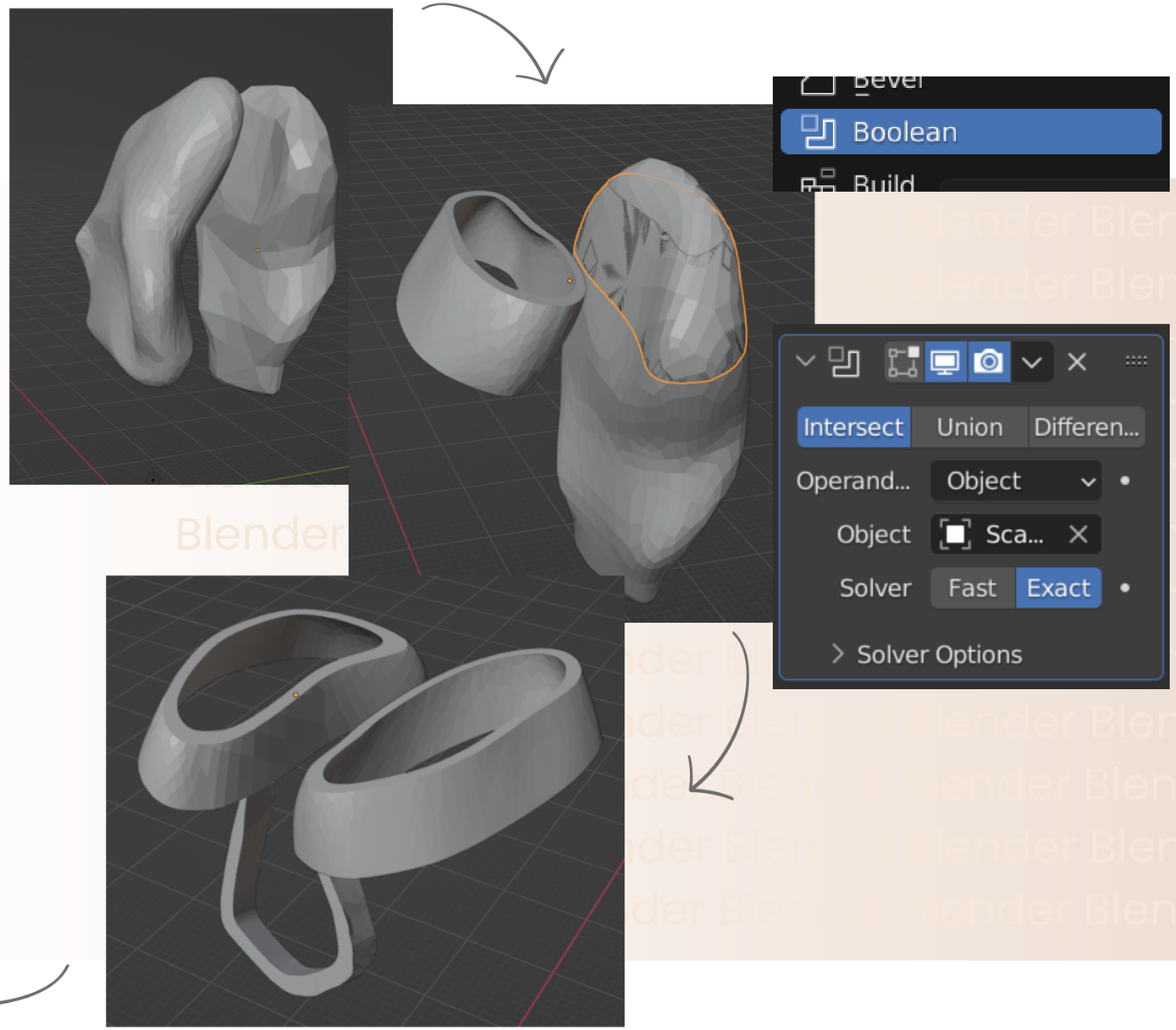
&

CONS

- The design was a bit too thick.
- It fell out of her nose.

CONCEPT DEVELOPMENT
SECOND ITERATION

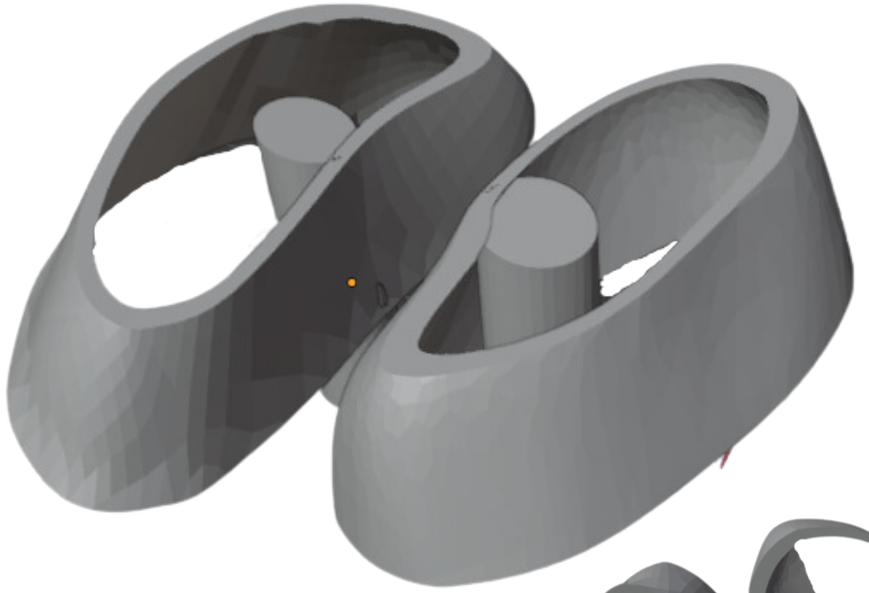
We found out about the ‘Boolean’ modifier which made the process much easier. It allowed us to transfer the shape of the mould onto another object, essentially creating a much more ergonomic and suited device for Ann’s nose. I 3D printed the design however the joining piece broke off. This design would probably work if it was injection moulded however we had to work with what we had and think around it

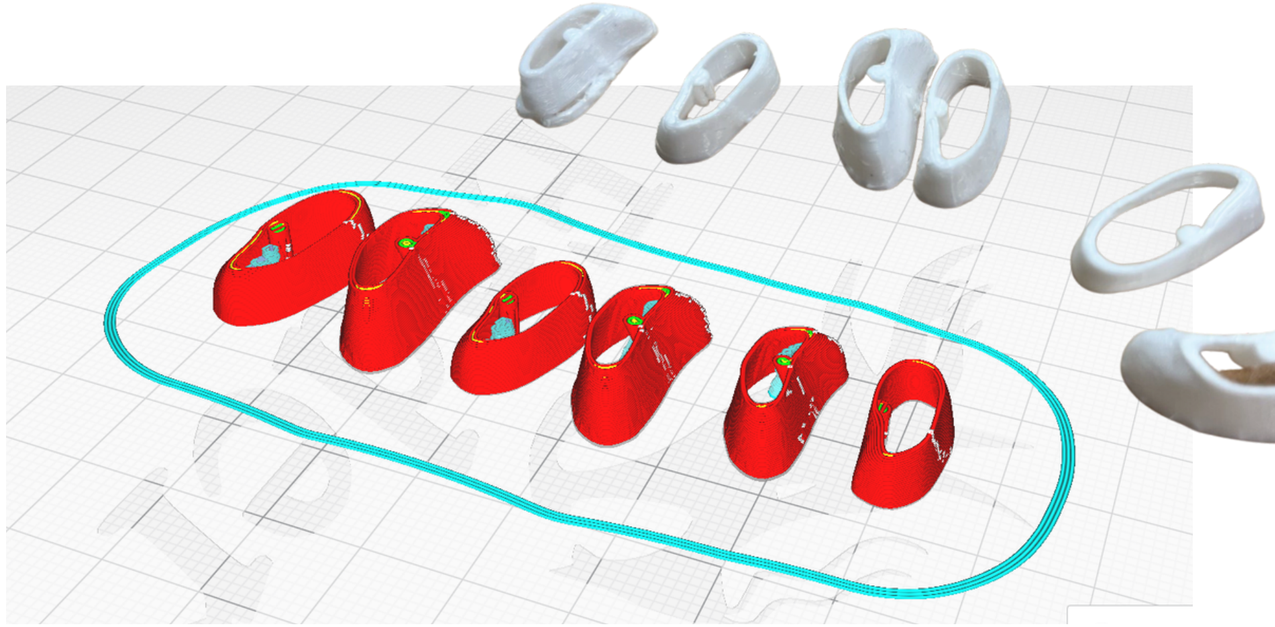


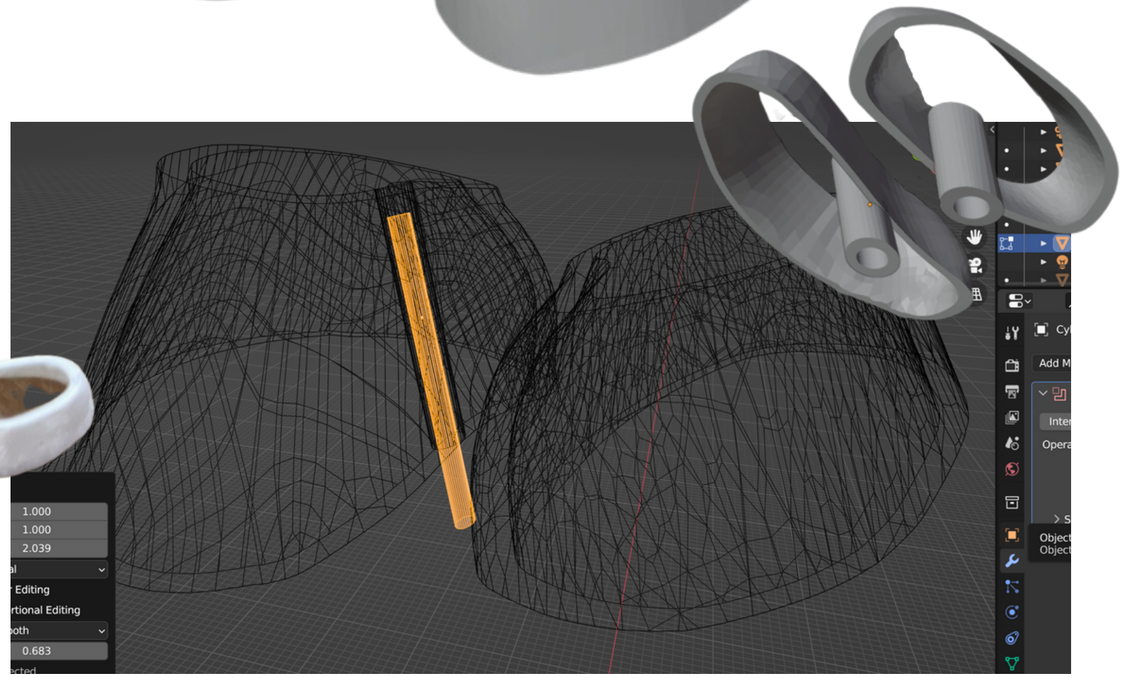
CONCEPT DEVELOPMENT
THIRD ITERATION

In this iteration, we thought more about how the two molds would be connected to each other, our main idea was to have a hole for the wire to go through and use adhesive to connect the two pieces, It would also allow for some adjustability with the bending properties of the wire.

Since we improved the shape to be more ergonomic, working with the right wall thickness that could be printed was really important, we duplicated a few models to print for Ann to try out to see which one is around the most comfortable.



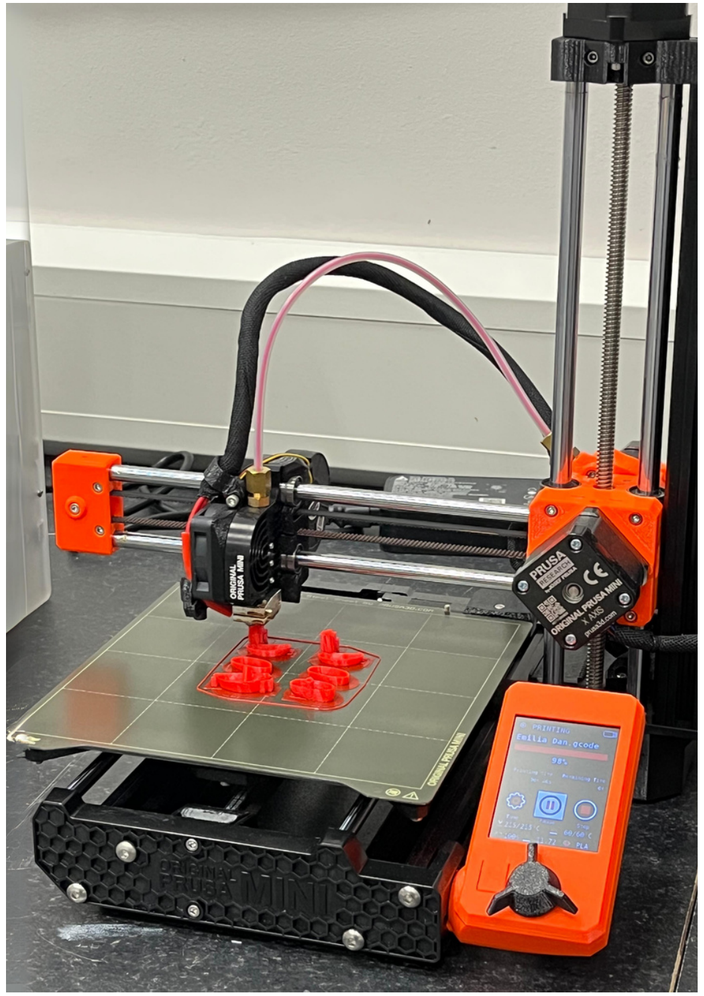


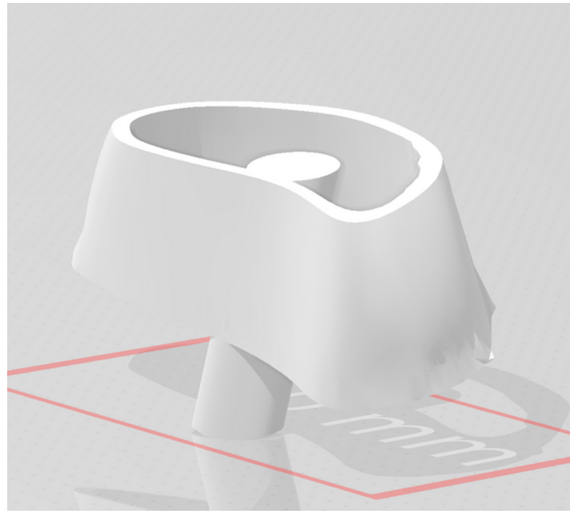


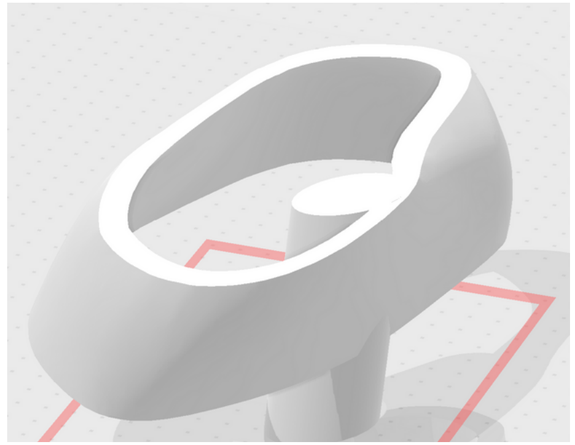
CONCEPT DEVELOPMENT
FINAL ITERATION

This was the final iteration of our prototype. Some adjustments have been made like thickening one side of the wall and extending the bosses that intake the attachment. We then experimented with different lengths of wire to see what felt the most comfortable for our fixpartner.

We printed the initial prototype at our home printer and used the better quality red PLA to print our final prototype of the device. We decided to call our device ‘Nose Beans’ as they resemble a bean shape and we originally looked up how to model a bean when we started the 3D prototyping phase.







CONCEPT DEVELOPMENT
FIXPARTNER FEEDBACK

We tried out our final design on our fix-partner, here's some of the feedback we noted...

PROS

- Drastically Improves airflow through nose.
- Is very discreet
- It's comfortable

&

CONS

- A softer material would be desired.

FINAL DESIGN

PROTOTYPING
BUILD PLAN SCHEDULE

TUESDAY 26TH SEPTEMBER

- Print and test (Dan) the first initial prototype for our fix partner, record videos for first use and acknowledge the correct measurement of the prototype.
- Organise Bill of materials and schedule of work for next week. (Emilia)

THURSDAY 28TH SEPTEMBER

- Continue with detailing the 3D prototype, refining and tackling any new problems/challenges along with tweaks and improvement (Emilia + Dan)
- Prepare models for 3D printing on Friday. (Emilia + Dan)

FRIDAY 29TH SEPTEMBER

- Print out new prototypes in the workshop. Evaluate and work on joining them together through different wiring methods and lengths (Emilia) + bringing them home to test (Dan).
- Start working on putting all videos together in one file. (Emilia + Dan)

TUESDAY 3RD OCTOBER

- Analyze the information gathered from prototyping with Ann and remodel/print the final prototype for Thursday. (Emilia + Dan)
- Work on the video/film the introduction in a proper environment and record the script.

THURSDAY 5TH OCTOBER

- Test the prototype with fix partner, record necessary feedback and video and prepare for the presentation on Friday.
- Finish editing the video. (Emilia + Dan)

FRIDAY 6TH OCTOBER

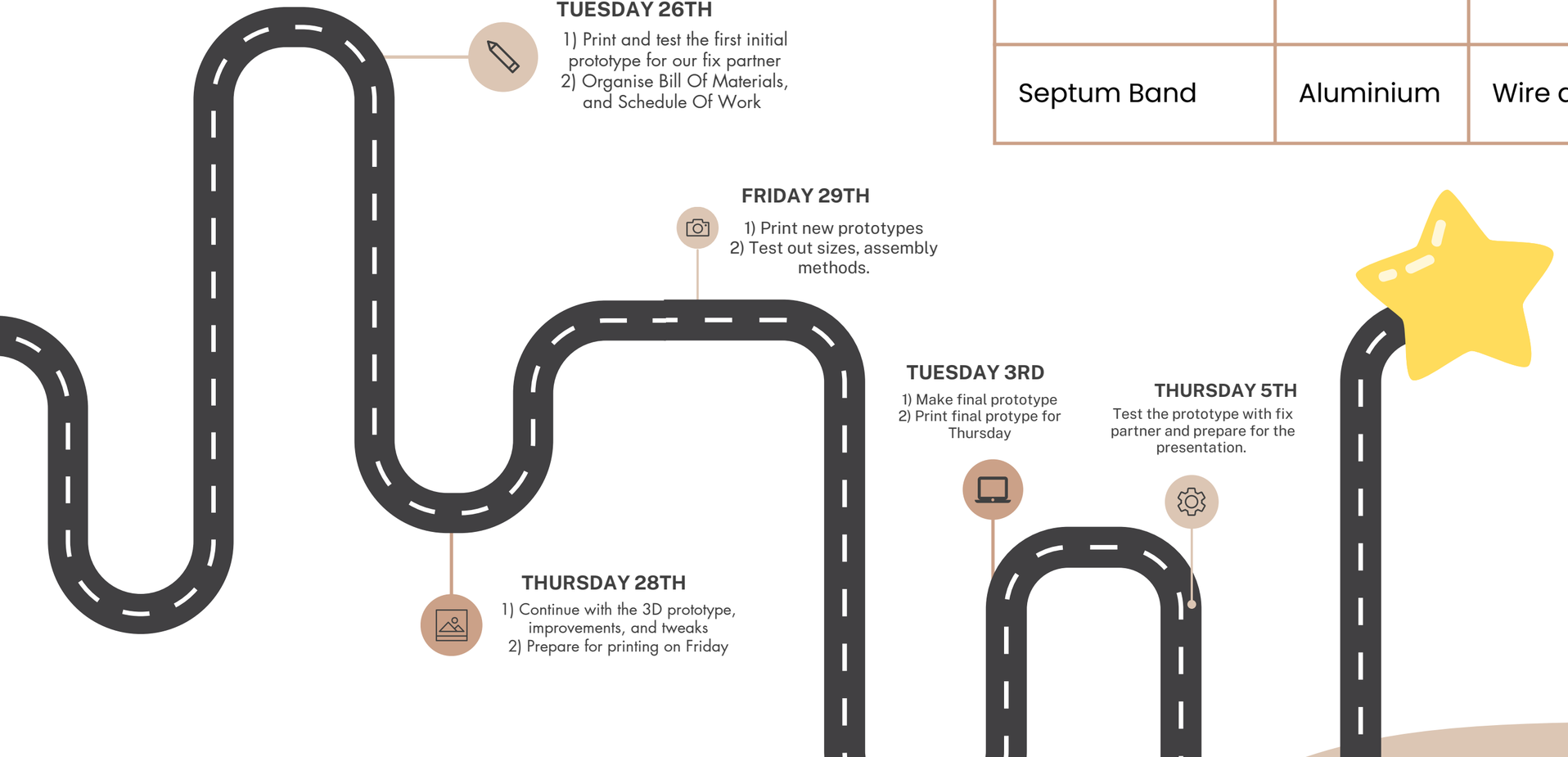
Fixperts Presentation!

PROTOTYPING
BUILD PLAN

BILL OF MATERIALS

Part Name	Material	Production Method	Assembly Method	Qty
Left Nose Bean	PLA	3D Printing	N/A	1
Right Nose Bean	PLA	3D Printing	N/A	1
Septum Band	Aluminium	Wire drawing	Adhesive	1

SCHEDULE OF WORK



TUESDAY 26TH

1) Print and test the first initial prototype for our fix partner
2) Organise Bill Of Materials, and Schedule Of Work

FRIDAY 29TH

1) Print new prototypes
2) Test out sizes, assembly methods.

THURSDAY 28TH

1) Continue with the 3D prototype, improvements, and tweaks
2) Prepare for printing on Friday

TUESDAY 3RD

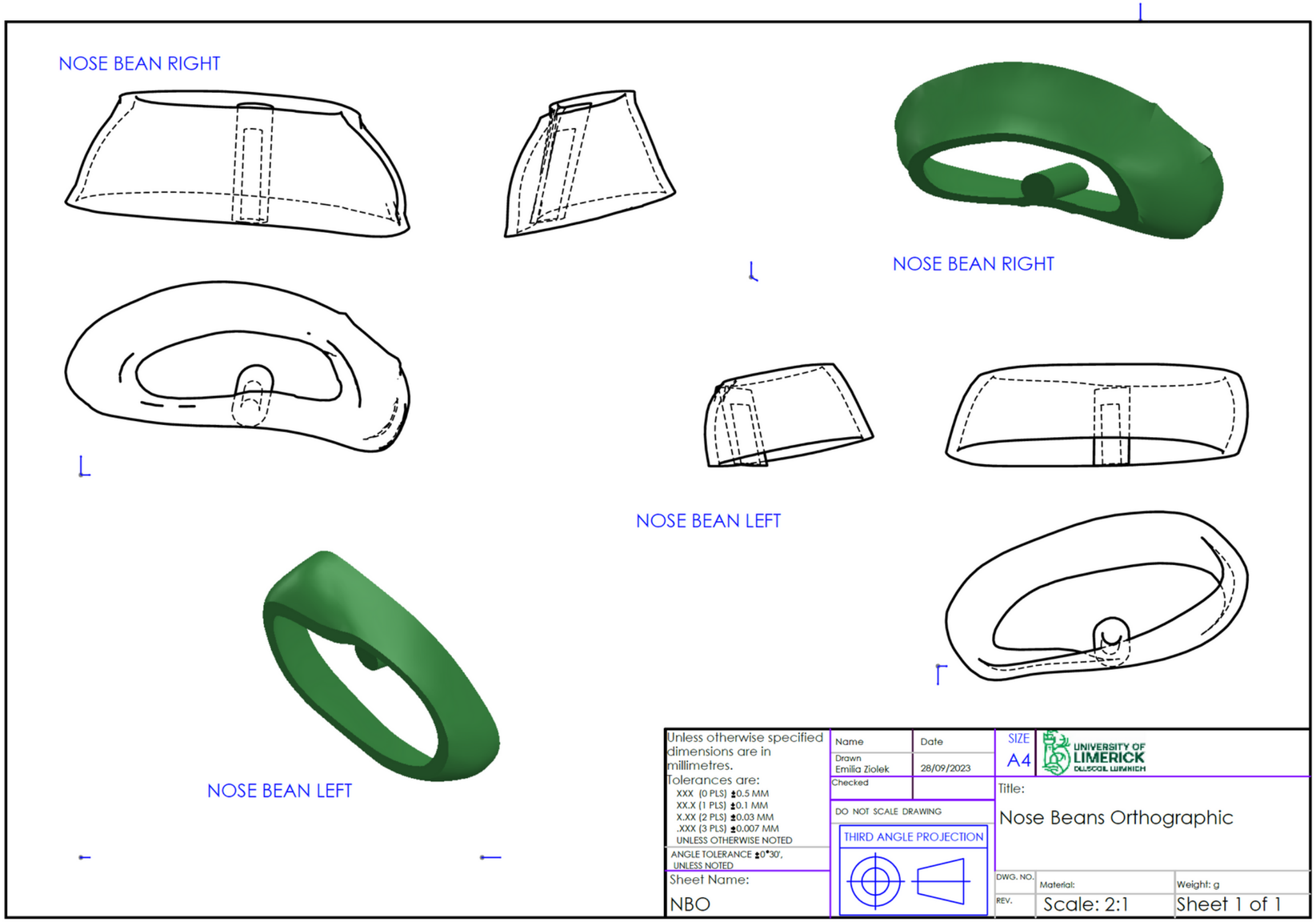
1) Make final prototype
2) Print final protype for Thursday

THURSDAY 5TH

Test the prototype with fix partner and prepare for the presentation.

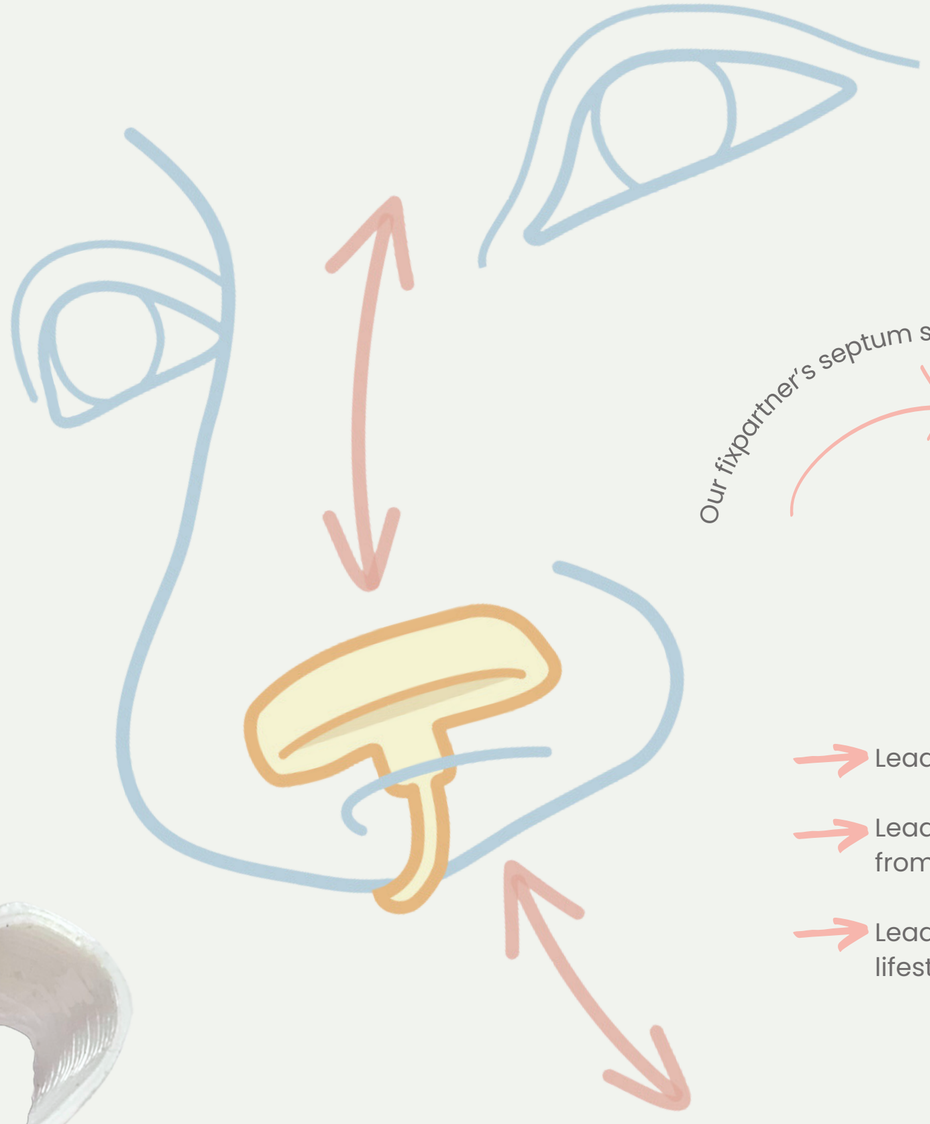
FINAL FIX PRESENTATION

PROTOTYPING
ORTHOGRAPHIC

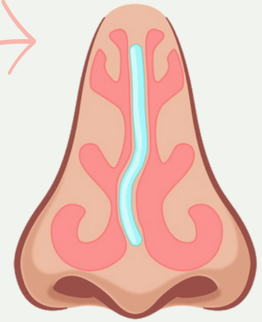


NOSE BEANS

BY EMILIA ZIOLEK AND DAN KILLACKEY



Our fixpartner's septum shape

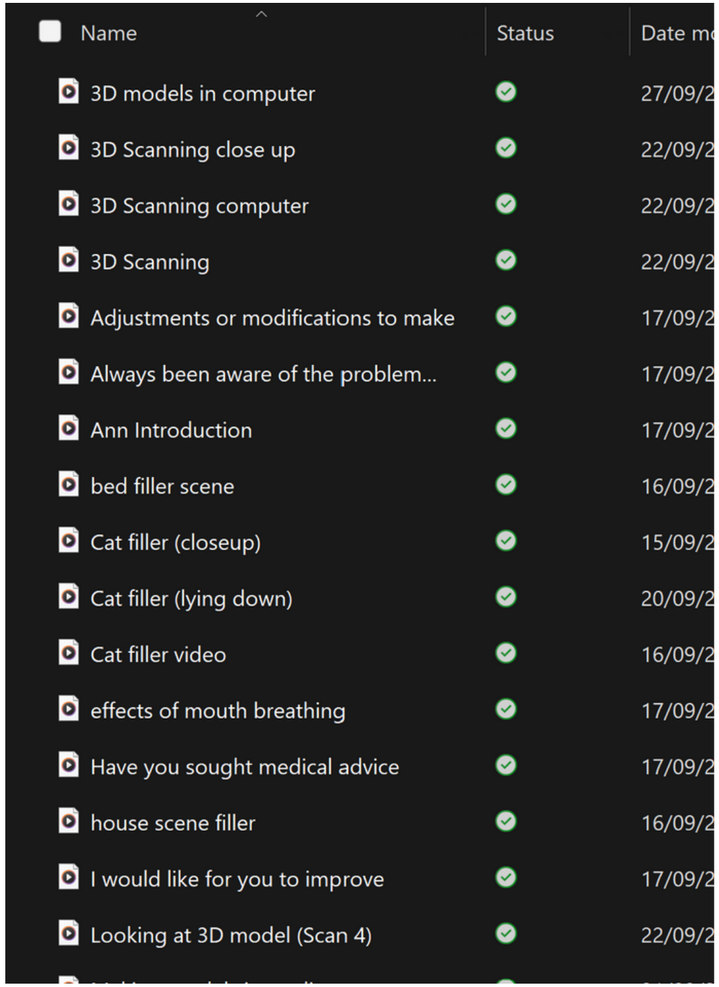


- Leads to breathing difficulties
- Leads to health problems from mouth breathing
- Leads to a 'self-conscious' lifestyle

OUR FIXPARTNER, ANN!

VIDEO LAYOUT

1. Introduce the project, who we are and who our fixpert partner is.
2. Cut to Interview where Ann introduces herself - show house and cats?
3. Show Ann answering questions.
4. At Q6. cut to slideshow of why mouth breathing is bad
5. Show Ann answering rest of questions
6. Cut to us creating the design guide.
7. Video of sketching and ideation - Voiceover?
8. Video of prototyping - String
9. Ann fiddling with string & using it
10. Video of colouring in nose moulds
11. Video of 3D scanning
12. Blender prototyping
13. Final Interaction



VIDEO SCRIPT

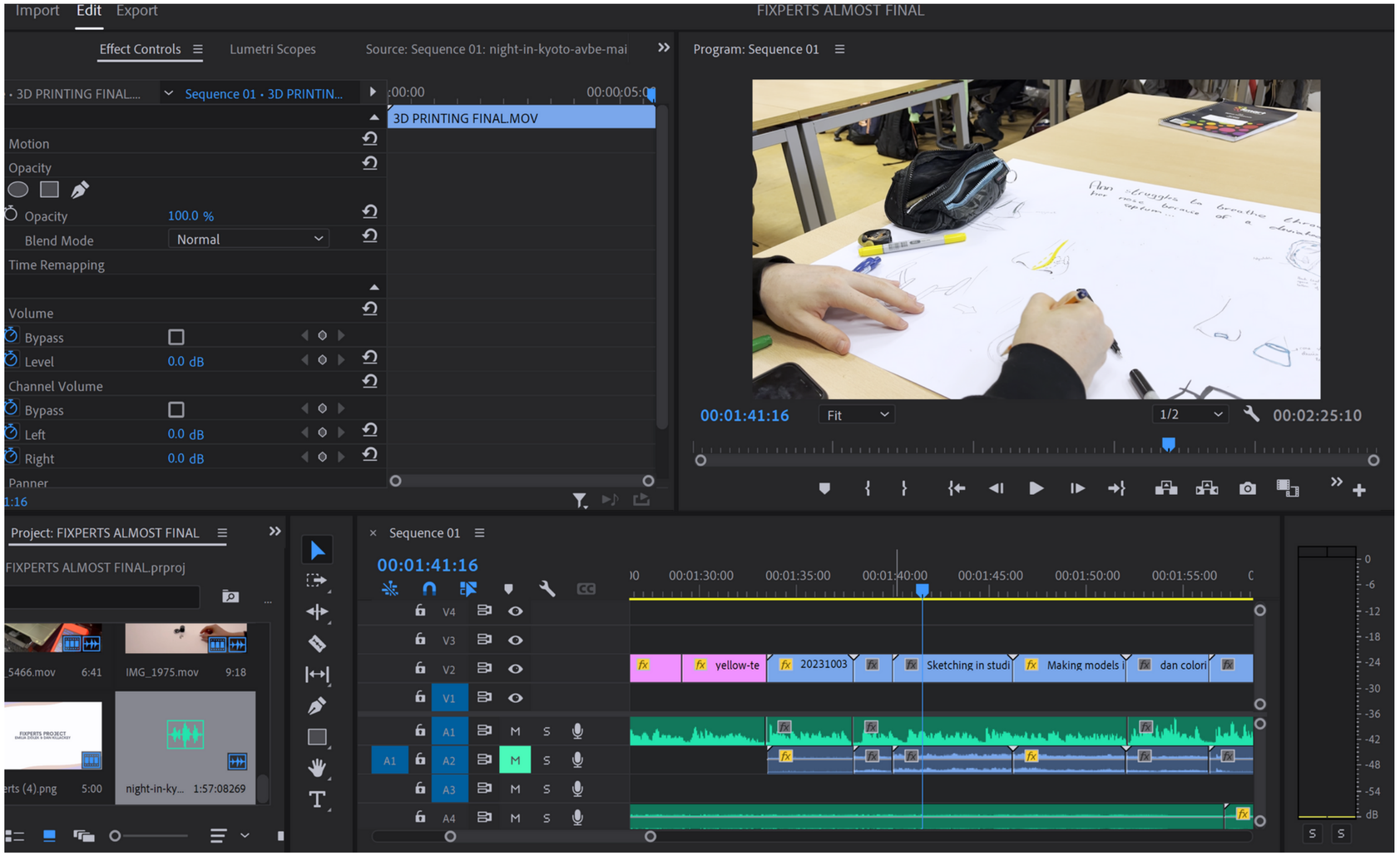
1. **Intro:** Hi guys I'm Emilia Ziolek and I'm Dan Killackey! Our Fixpert partner is Dan's Mom Ann. Ann struggles to breathe through her nose as she has a deviated septum. and we're here to help her out!
2. **Interview:** Hi I'm Ann...
3. (DO YOU KNOW THE NEGATIVE EFFECTS OF MOUTH BREATHING) I know mouth breathing is bad but I don't know why, Mouth breathing can have many negative side effects. It can affect your face shape and bone structure - nose hairs help filter the air when you inhale unlike when you breathe through your mouth. It can also cause dental issues as it can erode the enamel of your teeth.
4. **Interview: (**DAILY LIFE/ CAN YOU SHARE... INSTANCES THAT MADE YOU SELF-CONCIOUS/HOW DO YOU ENVISION A SOLUTION) Yes I...
5. After the interview, we created a design guide showing the wants and needs of our fixpartner.
6. Here you can see us beginning to ideate. We were looking for ways to open the nostril to encourage more airflow. We experimented wire and string which worked to an extent but we wanted it to be more discreet and specific to the shape of our partner's nose.
7. So then we got the idea to get the mould of our partner's nose using clay, and then 3D scan them so that we could directly work with the nose to make it as comfortable as possible.
8. We brought the scans into blender and began creating some designs - we then 3d printed about three different iterations of the product and tested them with our fix partner.
9. I think there's an improvement but...
10. Our final design is a small piece that goes inside of our fixpartner's nose, expanding her airway and encouraging nose breathing!
11. ANN'S FINAL VIDEO WITH PROTOTYPE

VIDEO CREATION & LINK

We created our video in Adobe Premiere Pro together. The system of labeling our clips really helped our process and it was quite easy to manouver the interface. We added some background music as some parts of the video were quiet. We also added some title cards for the questions to draw attention to them.

Our final video is just over 2 minutes long and portrays our entire four-week story from interview to process to final design.

Here is the link:
https://youtu.be/NNZZgVadoao



OUR REFLECTION

EMILIA'S REFLECTION

I really enjoyed this four-week project. It was not just about solving a specific problem but also about using my skills and creativity to improve someone's quality of life. It was an incredibly rewarding experience with a positive impact on our user. I learned a lot of new skills, especially using the 3D Scanner and it is something I will hopefully bring forward and remember on my future projects. There was a lot of interesting research methodologies that I implemented and multiple areas where we had to use quick problem-solving skills. If we were given more time I would have liked If we look at other materials, as the only con of our nose bean was the harsh plastic and maybe other solutions could have been explored with silicone etc.

DAN'S REFLECTION

I think the Fixperts project went really well. It was challenging at first trying to find a solution that improved our fixpartner's nasal airflow, while also being comfortable and discreet, but through iterative prototyping and feedback from Ann, we were able to refine our concept down to something that met her needs. I learned and developed many skills throughout this project including, problem solving, my Blender skills and knowledge of 3D printing and 3D scanning. If I were to do this project again I would investigate softer materials that could've been used for the final fix and perhaps, experiment with injection moulding.