HOW CAN EXHIBITION WASTE BE REDUCED THROUGH DESIGN?

Tom Evans
2005200

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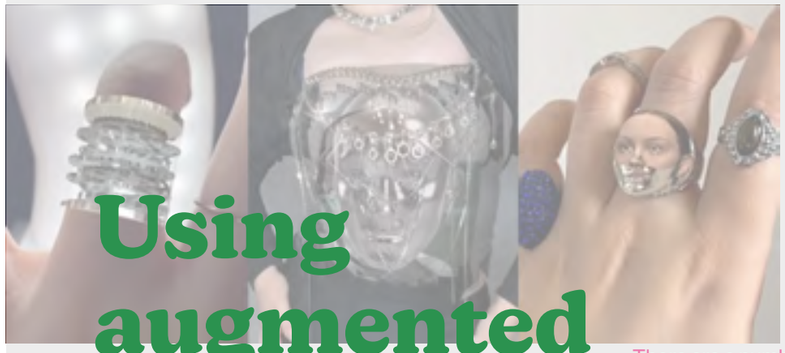
Using augmented reality to combat fast fashion

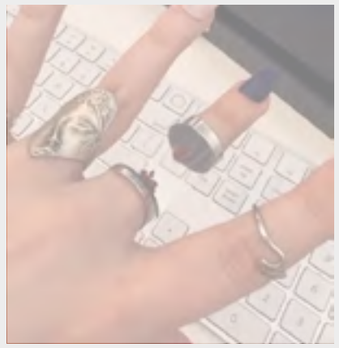
Augmented Reality

"A technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view." (Oxford Languages, 2023)

https://piperzy.com/



https://www.reddit.com/r/ThatsInsane/comments/14bmryr/the_artist_under_the_pseudonym_piper_zy_was_one/?rdt=48691



Digital try-ons

Some companies are already using AR to allow people to try on/view clothes without having to come into the store. "When customers experience products before purchasing them, it deepens their sense of ownership" (Johnson, 2021)

AR can also be used to draw more customers into stores, as the technology is still fairly new and exciting to most of the general public, the novelty may encourage consumers to enter the store to experience more of it.

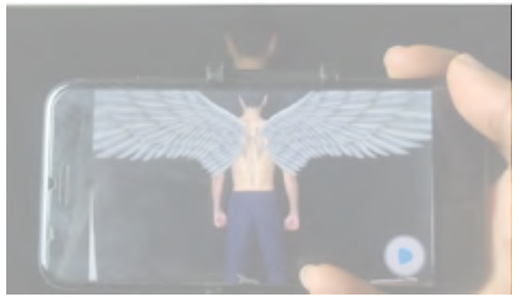
AR also opens up the options for outside brands to sponsor and promote themselves, both in the stores, and on the clothing itself.

There are a number of pros and cons to using AR to allow potential customers to view the clothes.

Pros
- Will give people more confidence in how clothes will look/can be styled when they order online.
- Allows people with health conditions that may make them unable to visit shops to try clothes on from home.
- Will increase online orders for retailers.
- Accessible to everyone with a smartphone.

Cons
-Could exacerbate problems with high street shops closing down as more people will order online instead of visiting physical stores.
- Exacerbate mental health problems among agoraphobes and similar disorders.
- Will require camera access – may result in security breaches.

Augmented reality tattoos and body art



https://www.voguebusiness.com/technology/why-ar-clothing-try-on-is-nearly-here

Adding AR capability to tattoos means motion could be added to body art, adding a new dimension to the designs. Motion could involve full animations or could be something as simple as hue shift.

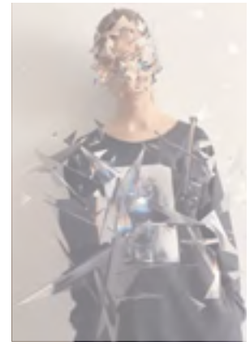
Having AR as an option for tattoo artists could add another level of income for them, or alternatively it could promote collaboration with other designers in order to develop the AR elements of the designs.

As well as being used to add to existing tattoos, AR could be used to preview/place the tattoo on the body before committing to the design. This could save people from regretting the tattoo down the line, and will help with making sure the placement of the design is perfect.

At home customisation

Using AR opens the door for unlimited user customisation after the garments are bought. Even a basic t-shirt printed with an AR capable design could be customised by the purchaser to display any design they want when the garment is viewed through a phone or AR glasses.

https://www.notjustalabel.com/collection/finchukraine/augmented-reality-clothing-finch-x-fffface

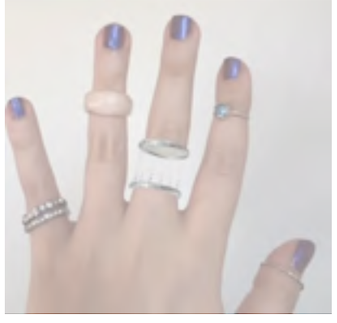


Unfortunately, this also opens the clothing up to the possibility of the user displaying offensive content using the AR. In order to combat this its likely brands would instead allow users to select from premade designs, limiting the customisation options.

Piper ZY - AR designer

Piper ZY is a designer who primarily creates AR jewellery, and has used her unique design style and medium to work on campaign for Doc Martens, Lego, and other big brands.

The part of Piper's designs, particularly the rings, that stands out the most to me is the way she has managed to display the background behind the rings through them. This process is hard to make look natural, particularly when the AR is rendered real time as the camera that is being used to view the designs has to work out what should be seen through the fingers, and then render it in place so that it accurately meshes with the background that can be seen around the edge of the fingers.



https://www.instagram.com/p/CwTm-RyEKIUG/

Fig. 01 - Fig. 05 - Augmented reality being used for fashion

Screen-printing

“Screen-printing is a process where ink is forced through a mesh screen onto a surface. Making certain areas of the screen impervious to printing ink creates a stencil, which blocks the printing ink from passing through the screen. The ink that passes through forms the printed image.” (The Metropolitan Museum of Art, n.d.)

https://krisandrews-mall.com/Assume-Nothing-Screen-Print

Kris Andrew Small

Kris Andrew Small is a Sydney based designer specialising in typography, pattern, and collage. The style of Kris’ design work lends itself perfectly to the practice of screen printing, bold typography can be printed and overlayed onto other textures using various silkscreens in order to create a bright and exciting collage.

Kris has worked with a number of large companies during his time as a designer, solidifying his style, and even branching out into 3D illustration and animation.

In an interview with Wonderland Magazine Kris revealed that one of his favourite designs he’s produced is a piece called ‘Wild Night’, a screen-print that was created in Bangkok.

https://krisandrews-mall.com/Wild-Night

Screen-printing from home

The main method from creating the meshes used in screen-printing is to use an emulsion and expose the design onto the mesh. This process requires evenly coating the blank mesh with the emulsion, a water-resistant polymer called polyvinyl acetate. Once the screen has completely dried a positive of the design you want to transfer onto needs to be placed on top of the screen, before being exposed onto it. There are multiple ways to do this, including using machines that make use of UV lights, or simply by leaving the screen outside in the sunlight.

There is also a more DIY approach to creating screens, in which the design you wish to print is cut out of a hard plastic sheet, which is then placed on top of the screen-printing mesh. While this method is much more beginner friendly, not requiring any chemicals or leaving the mesh to expose, it does limit the complexity of the design.

https://obby.co.uk/blog/top-7-best-screen-printing-kits-uk-starter-sets

Waste produced by the design industry

In terms of design industry waste, I want to focus on the process of producing and shipping large amounts of print media, such as posters and leaflets. Many small-scale designers such as myself will use external printing companies when manufacturing their work, which then requires the outcomes to be shipped to them.

https://zerowastememoirs.com/a-complete-guide-to-paper-composting/

When printing this way there will also be a large number of test print carried out to ensure the paper, ink colours, and size is right for the final print run. These test prints will be discarded as waste before the final print run is complete.

The nature of screen printing as a DIY process means that little mistakes, such as misaligned printing plates, add to the charm of the final piece, therefore making the designer less likely to discard them and try again. These designs with slight errors can then be sold or given away as ‘one off’ version of the product.

Fig. 06 - Fig. 08 - Screen printed designs and processes

Fig. 09 - Piles of waste paper

PEER FEEDBACK - INITIAL IDEAS

Fig. 10 - A photo of my work with feedback notes stuck to it

In class I got peer feedback on the research I undertook over summer to help expand on the initial ideas I had for research topics.

I presented a print out of my two research ideas, and my peers left comments on sticky notes for me to review. For my research into using augmented reality or extended reality as a way to combat fast fashion the feedback I received was:

"What outcomes could come from this?"

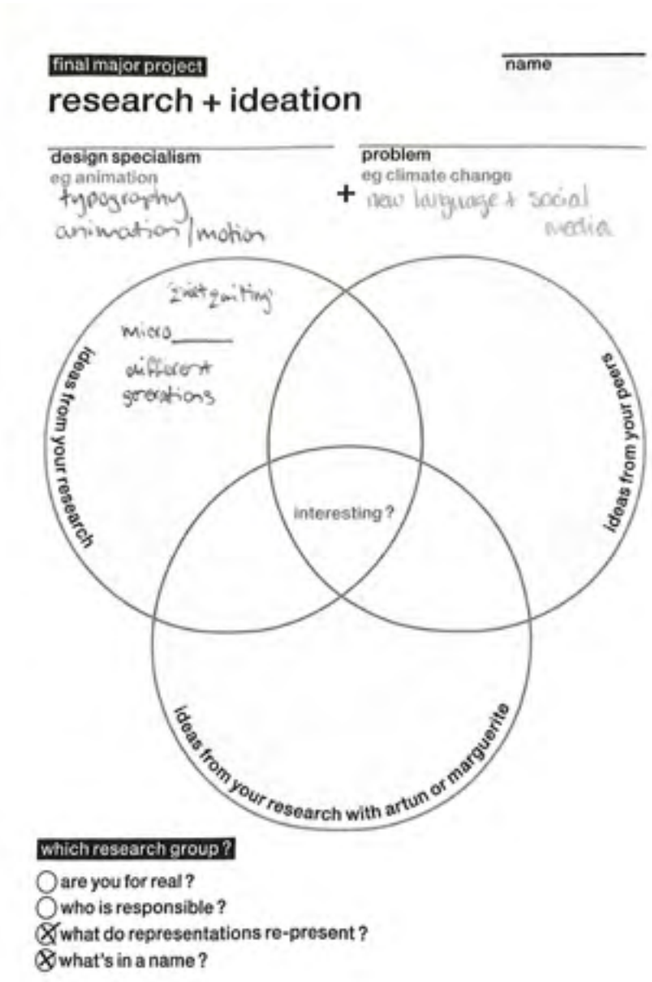
Feedback on my other research topic about using screen printing, in particular DIY screen printing, to reduce waste in the design industry was:

"Very interesting idea - specific problem to solve"

"Very good + unique specific idea"

Unfortunately the feedback at this stage was not very helpful in developing my ideas further.

VENN DIAGRAMS



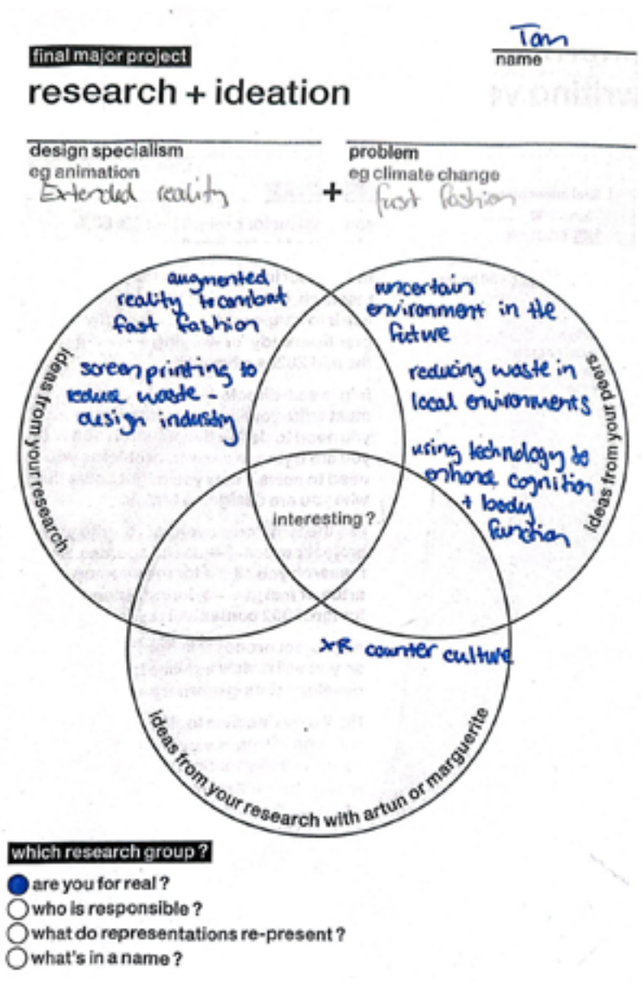


Fig. 11 - Fig. 13 - Venn diagrams with my research and ideation

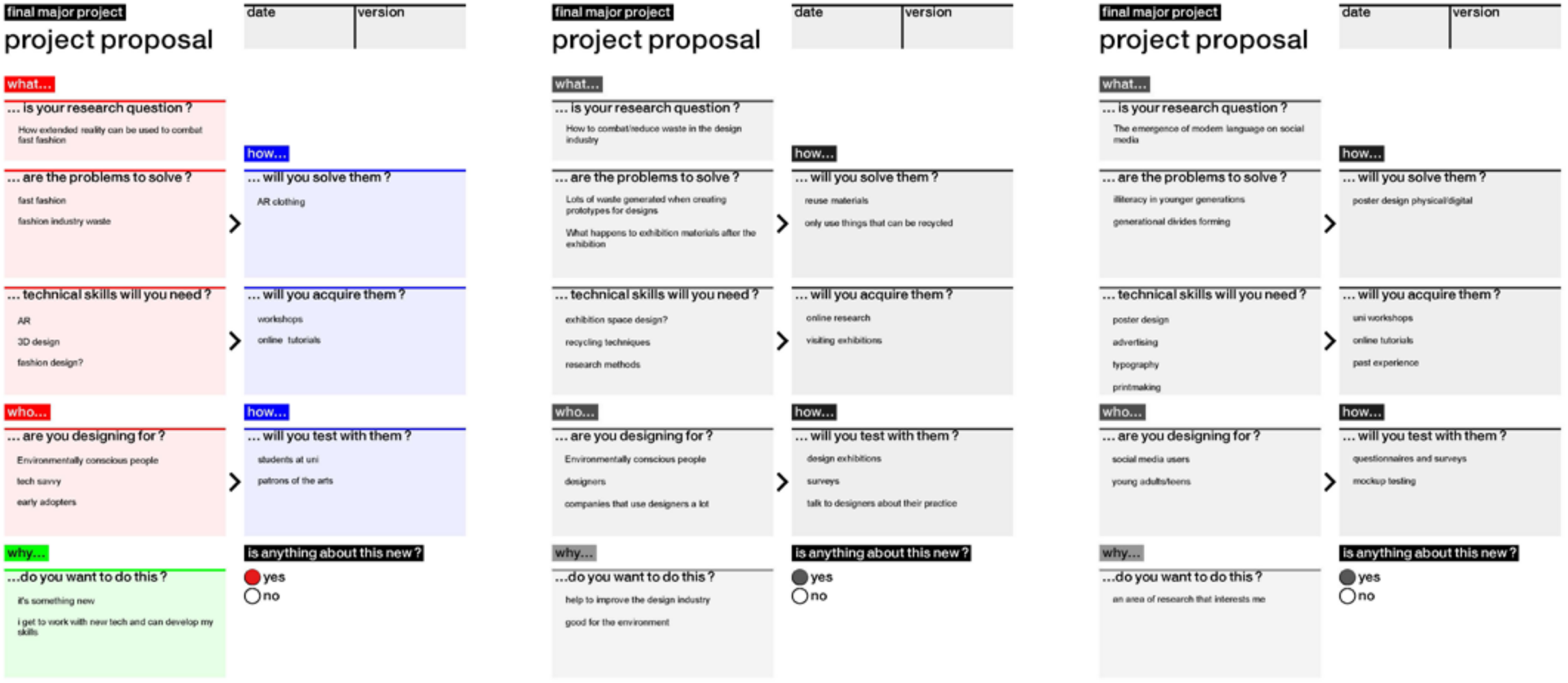
Following on from the research I undertook in preparation for this project over the summer I created a venn diagram for each idea that split the topics into types of research.

For each research idea I considered the problem that I would be exploring, as well as the different design techniques that could be applied to the project.

I used the venn diagram structure to write down information that I had learned about the topics from different areas of research; the research I did for the summer project, peer feedback I received from the pin up crit of the summer work, and research that carried over from my last contextual studies essay.

BRIEF PROPOSALS

Fig. 14 - Fig. 16 - Project proposals



Using the venn diagrams I created to outline the different potential subjects for my FMP, I broke down each brief into different sections to help create a project brief proposal for each topic.

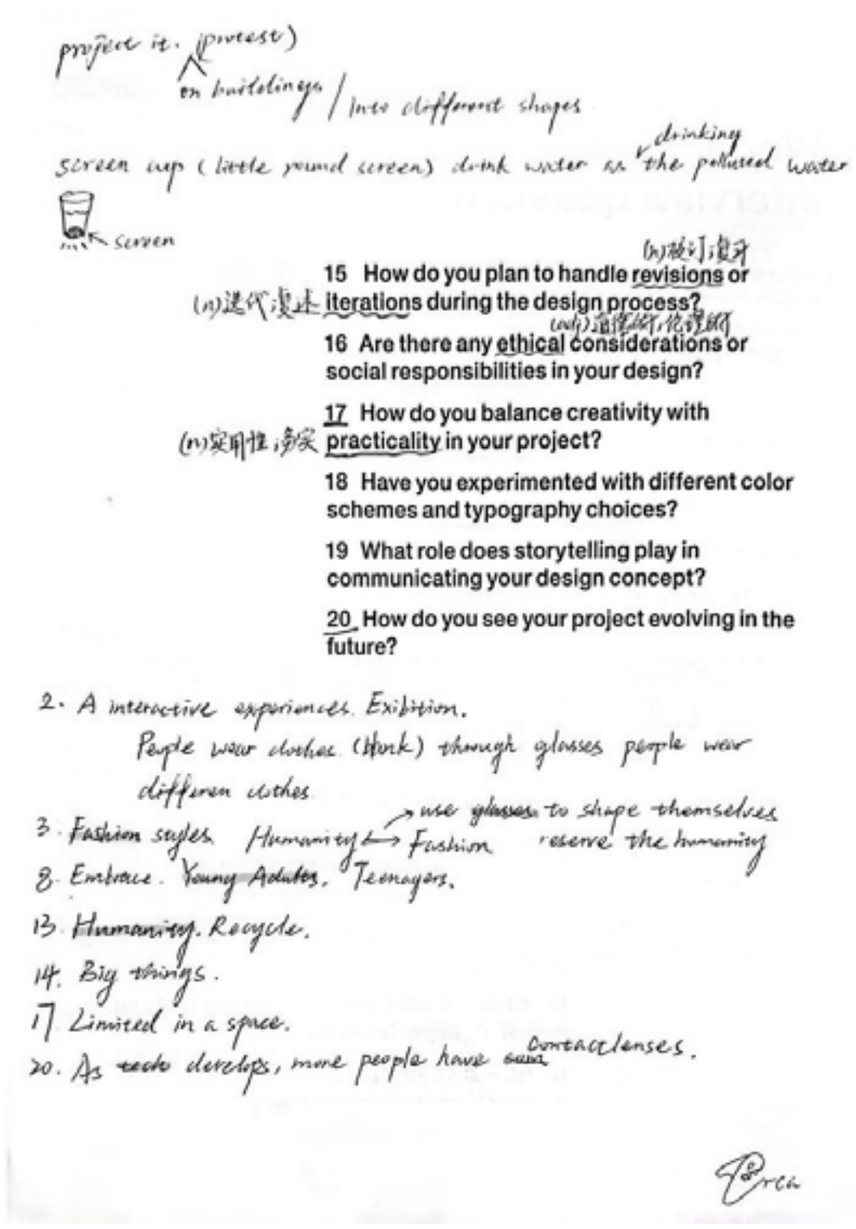
At this stage I selected the question ‘How extended reality can be used to combat fast fashion’ as the focus of my FMP project. This question related well to the essay I wrote in preparation for this project, which also focused on extended reality technologies.

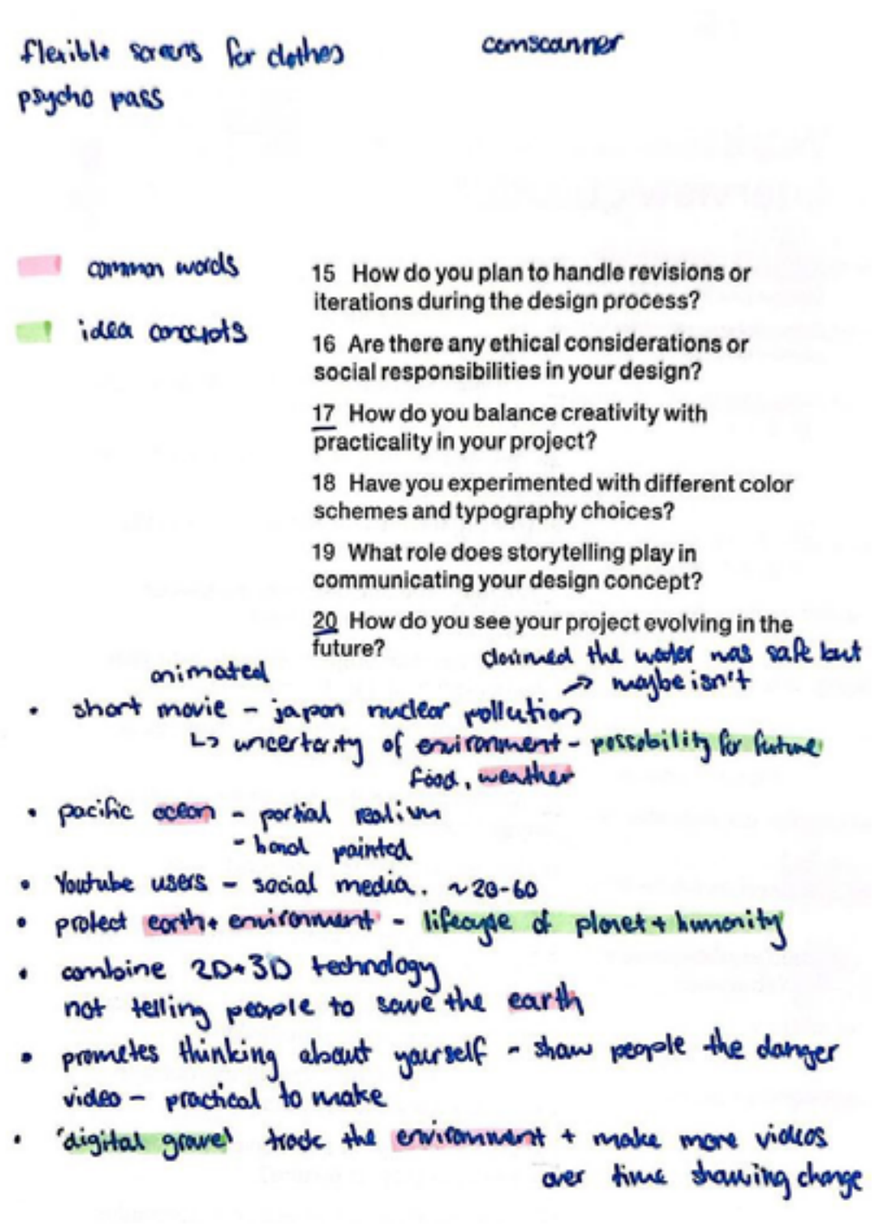
PEER FEEDBACK - BRIEF 01

Working with another person in my class I went through some questions regarding my project to help refine my brief proposal, and identify and areas that may cause issues further into the development.

Fig . 17 - Feedback questions about my project

Fig. 18 - feedback questions about a peers project





IDEA CARD ACTIVITY

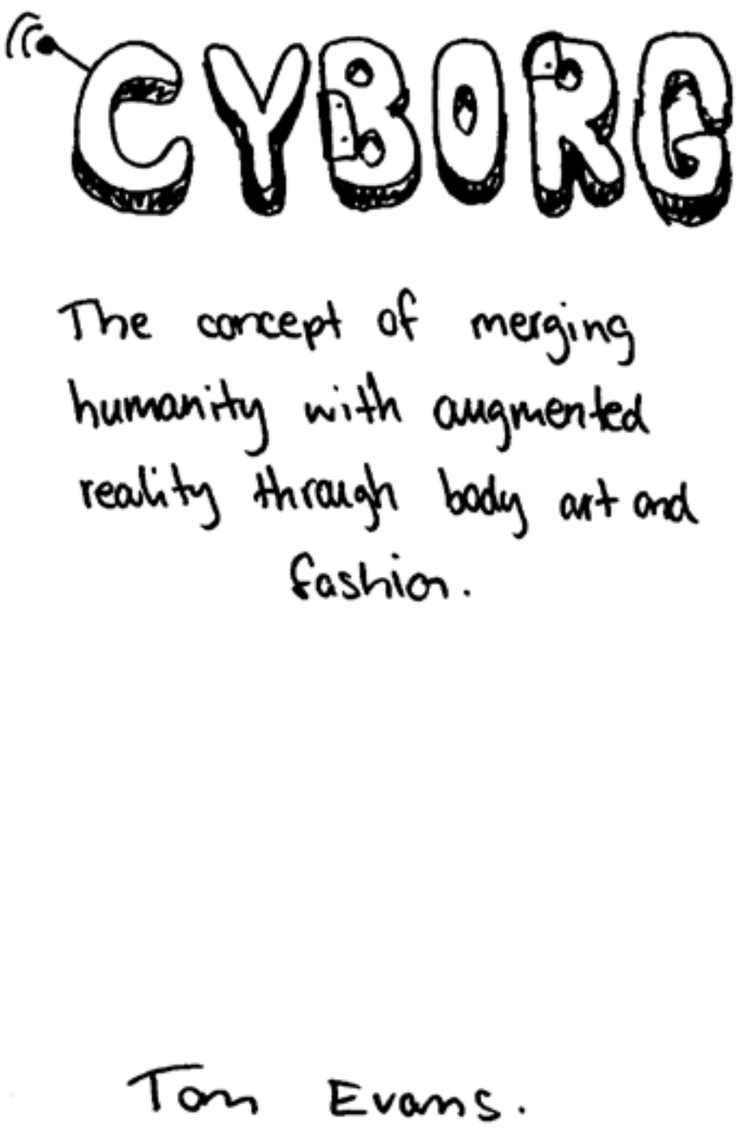


Fig . 19 - Front cover of my idea card

Fig. 20 - Inside page of my idea card

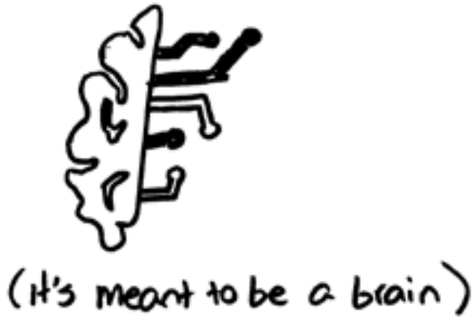
I did a workshop in class to help visualise my research idea, and to get inspiration from others.

I worked in a group of four; each person in the group created four copies of a card with one word to title their concept, a short description of the idea, and a drawing to illustrate it. We then swapped cards with other people in the group so that each person had four different idea cards, one of which was their own.

This is the card I created for my own idea.

IDEA CARD ACTIVITY

Fig . 21 - 26 - Idea cards given to me by my peers



These are the cards I received from the other people in my group.

REVISITING MY PROJECT PROPOSALS

Fig . 27 - Venn diagram with my research and ideation

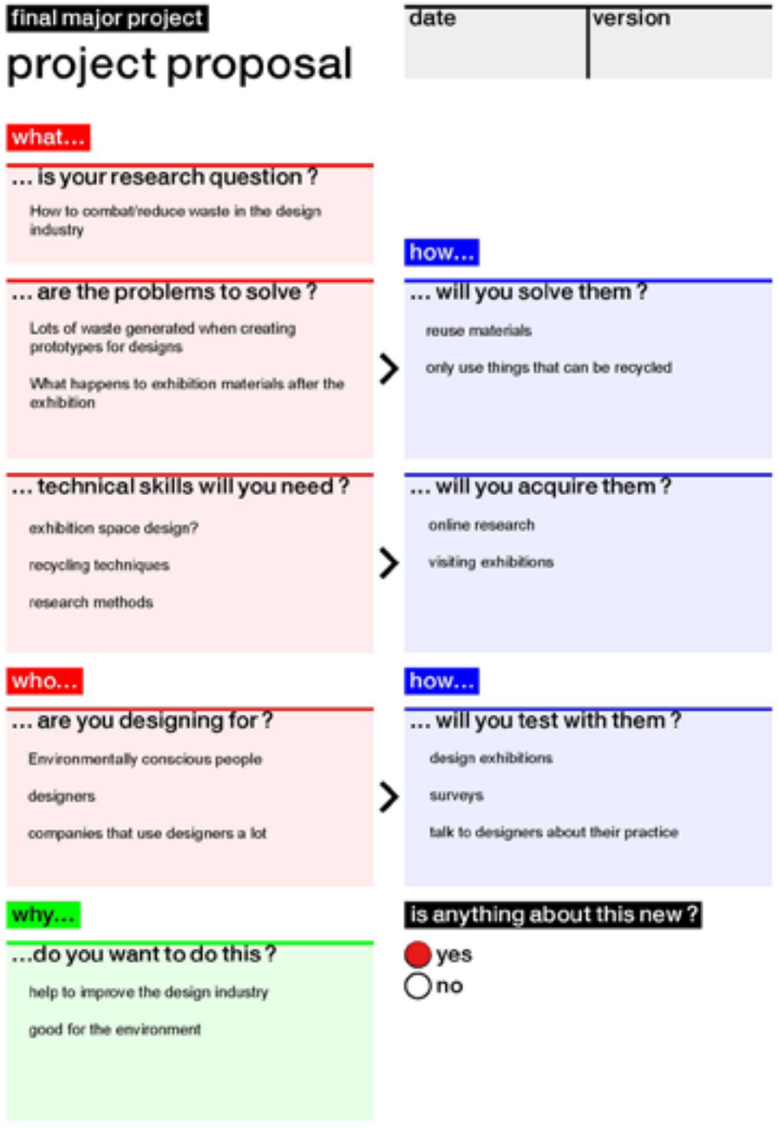


Fig. 28 - Project proposal

At this point in the idea generation of my project I decided that I was not happy with pursuing the question 'How can extended reality combat fast fashion'.

I went back to the initial project proposals and summer research I did, and decided to explore the idea of combating waste in the design industry.

I chose this brief as I felt closer to the problem, and I believe that by looking at my own wastefulness throughout the process of this project I can improve my own design processes, which will be a skill I can carry forwards into my future as a designer.

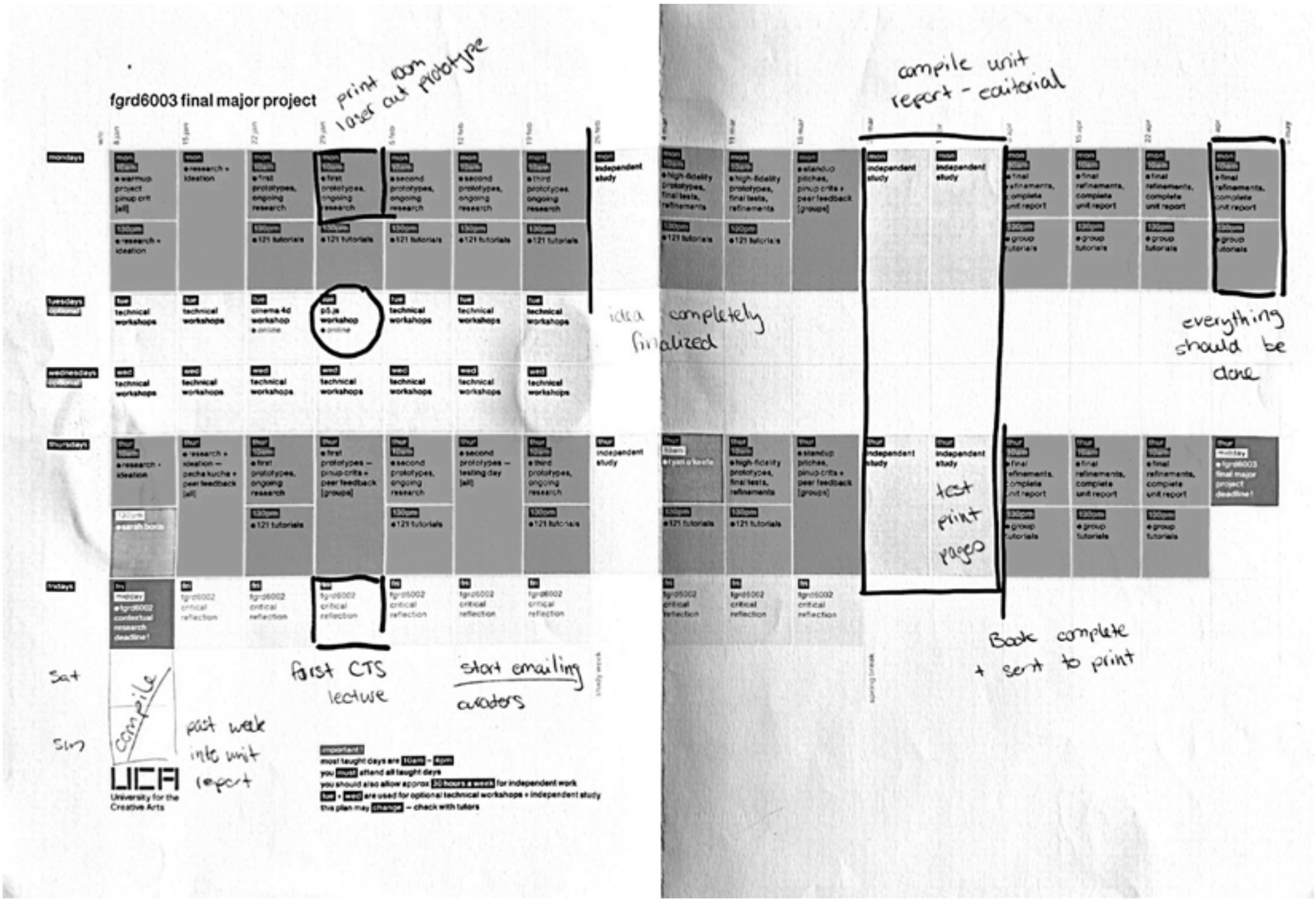
PROJECT SCHEDULE

To help manage my time and keep me on track for this project I took a timetable that covered the length of my Final Major Project, and annotated it with personal deadlines.

I noted down key areas of my project that would need to be completed, such as the peer reviews, when I would need to start prototyping, and the final deadline for sending prints out. I also added some personal goals, such as compiling the previous weeks work at weekends.

The aim of this timetable is to keep me on track with my goals, allowing me ample time to complete everything I need to. This will ensure my project meets my expectations, and ends up as something I can be proud of.

Fig. 29 - Annotated schedule for my project



RESEARCH QUESTION MINDMAP

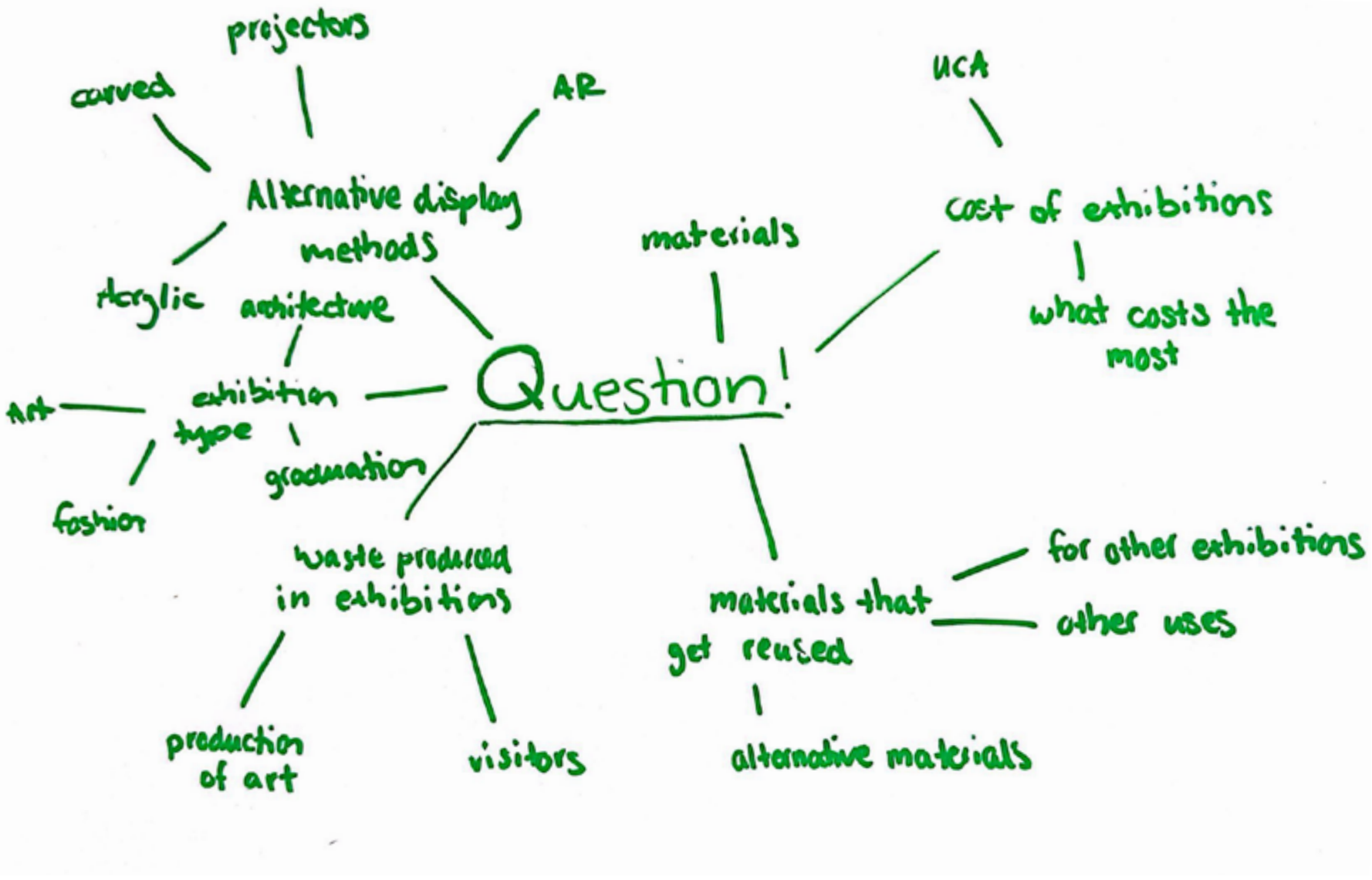


Fig. 30 - Research question mindmap

Now that I had settled on the research topic I want to follow for my FMP, I created a mindmap to help me narrow down my research question.

For the mindmap I focused on looking into where the most waste was produced by the design industry so that I could ensure my brief isn't too broad. I found that exhibitions of art and design can create a huge amount of waste materials, and carbon emissions through travel and transport, so I will focus my project on this.

RESEARCH QUESTION GENERATION

Once I had decided on the topic I would be exploring for my FMP I began to think about the research question I would be using.

I started by making a list of the first potential questions that came to me based on the previous mindmap so I could get some ideas down on paper.

From these options I settled on *'How can exhibition waste be reduced through design?'*

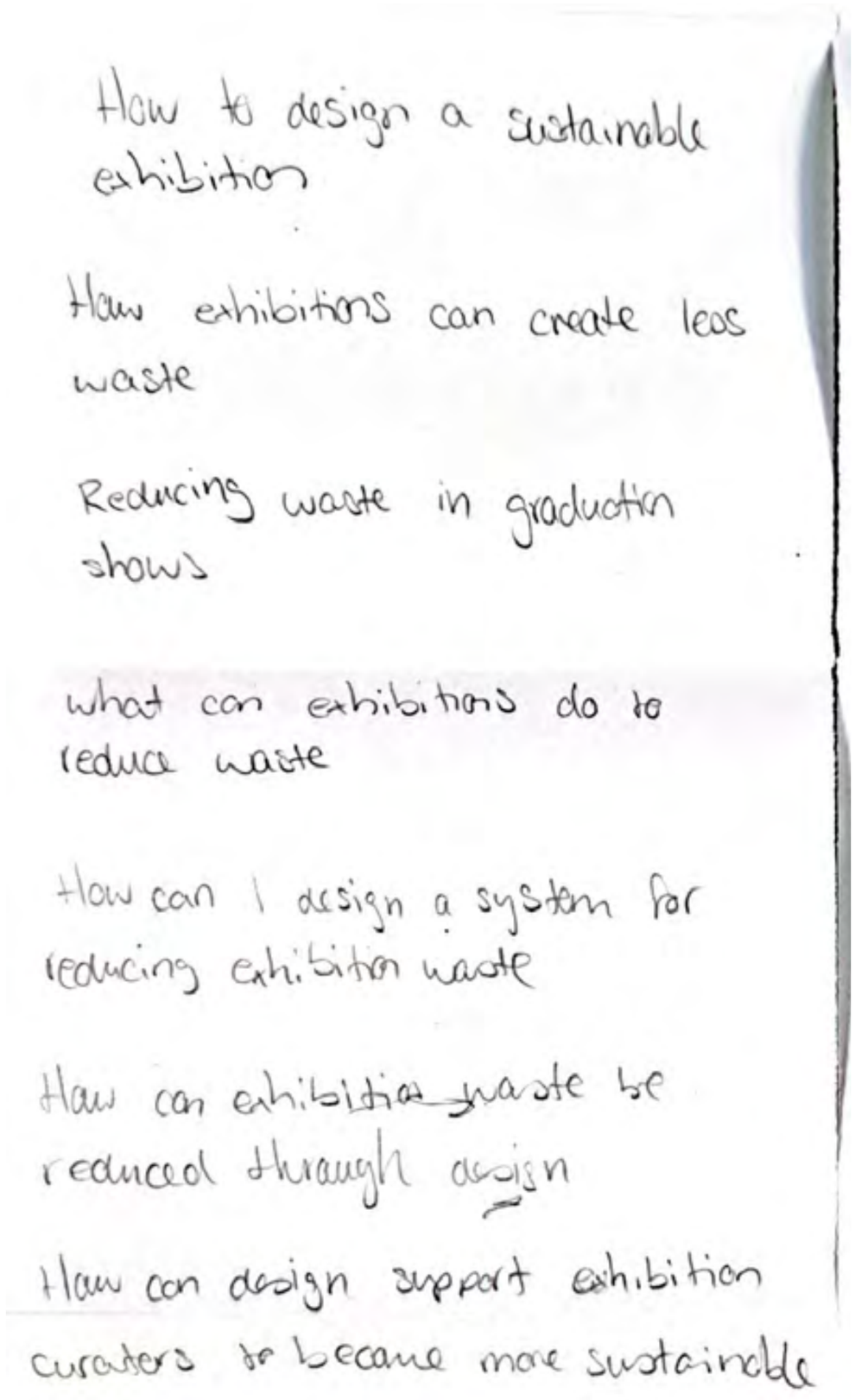
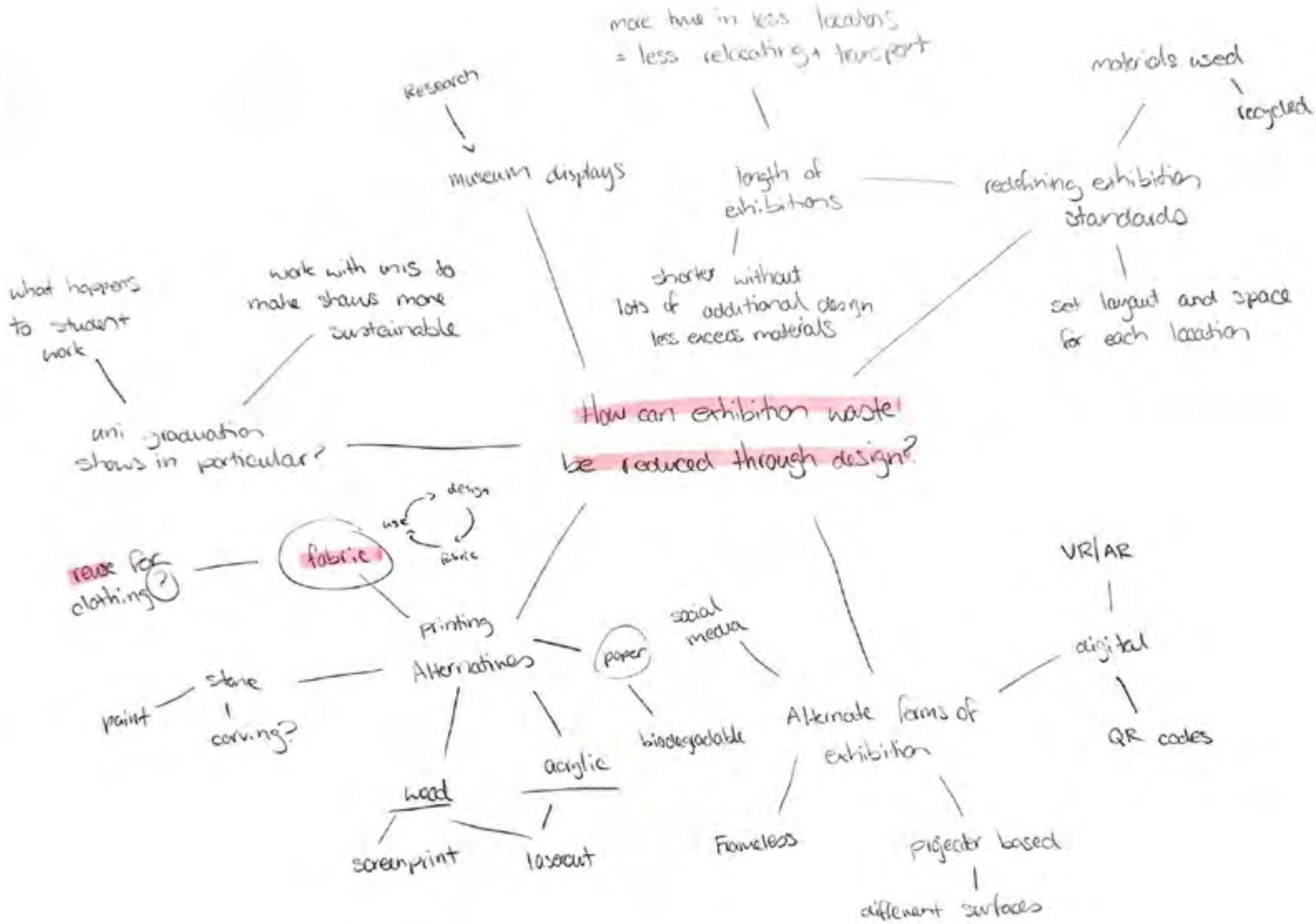


Fig . 31 - List of potential project names

RESEARCH MINDMAP

Fig. 32 - Research mindmap



Using my research question as a starting point I began to mindmap ideas for directions for my project. I focused on thinking about what different types of exhibition there is, such as degree show exhibitions, fine art or modern art exhibitions, and fashion shows, and then listed some ways exhibitions could be rethought to reducer the waste, such as moving to a more digital landscape.

I also thought about where the waste would be coming from, and what alternatives could be implemented in order to reduce the waste; for example changing the materials that are used in exhibitions, and what happens to them afterwards.

This mindmap gave me a number of different topics that I could then do further research into as a starting point for my FMP.

THE PROBLEM WITH EXHIBITION WASTE

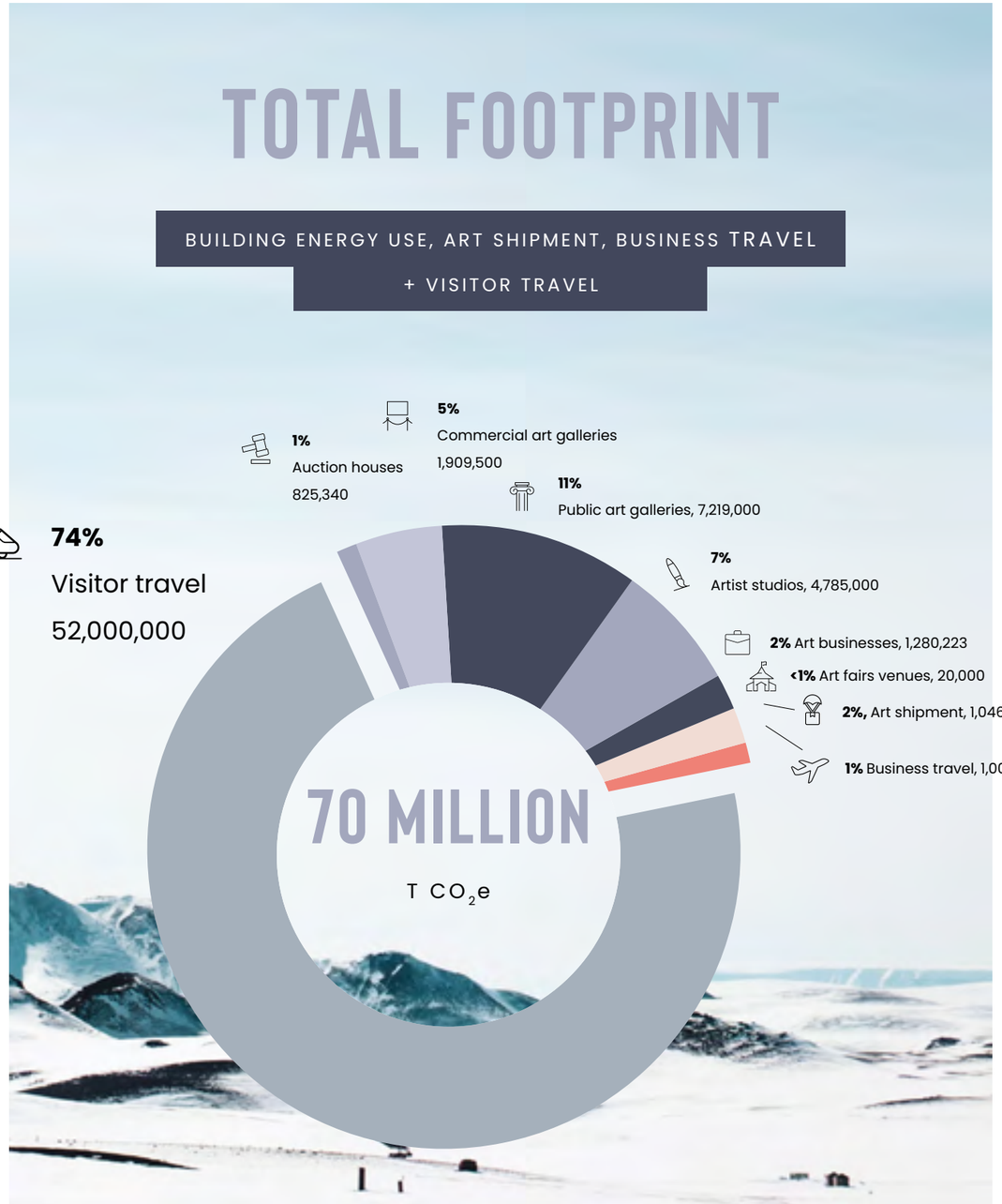
To begin my research into the sustainability of galleries and the exhibition industry I looked at the not-for-profit profit company Julie's Bicycle, and some of the reports they had created about the waste produced from exhibitions. *"Founded by the music industry in 2007 and now working across the arts and culture, JB has partnered with over 2000 organisations in the UK and internationally. Combining cultural and environmental expertise, Julie's Bicycle focuses on high-impact programmes and policy change to meet the climate crisis head-on."* (Julie's Bicycle, 2023).

At the beginning of 2021 Julie's Bicycle published a report on the carbon footprint of visual arts around the world, and how improvements could be made to move towards net zero. The report, named 'The Art of Zero', outlines the key areas in the exhibition industry where large amounts of CO2e are produced. According to the report:

- 7.2 million tonnes CO2e from 15,500 public art galleries
- 1.9 million tonnes CO2e from 19,000 commercial art galleries
- 825,000 tonnes CO2e from 14,230 auction houses
- 1.3 million tonnes CO2e from 261,270 art businesses
- 4.8 million tonnes CO2e from 2.9 million artist studios
- 20,000 tonnes CO2e from 100 major art fair venues

Alongside the emissions produced by the art galleries and similar institutions, the shipment of art and related business travels accounts for 2 millions tonnes of CO2e, and an estimated 52 millions tonnes of CO2e are released by visitors in travel related to the art world (Bottrill and Tickell, 2021).

Fig. 33 - A diagram from 'The Art of Zero' showing the carbon footprint of art exhibitions



ICE WATCH LONDON

Fig. 34 - A photograph of the 'IceWatch' exhibition outside the Tate Modern in London

In December 2018 artist Olafur Eliasson and geologist Minik Rosing exhibited 'Ice Watch' a public piece of artwork commenting on the ecological changes brought about by climate change. The project was created as a response to COP24 *"the global conferences, in the course of which action for climate policy is negotiated"* (web.archive.org, 2019), and coincided with the third anniversary of the Paris Agreement.

The exhibition consisted of twenty-four blocks of ice from the Nuup Kangerlua Fjord in Greenland which were placed outside the Tate Modern Gallery in London; the exhibition ran from the 11th December until all the ice had melted, which took until the 7th January. Visitors were encouraged to *"put [their] hands on the ice, listen to it, smell it, look at it – and witness the ecological changes our world is undergoing"* (Eliasson, n.d.).

In Greenland, the Nuur Kangerlua Fjord ice sheet loses the equivalent of 10,000 similar blocks of ice each second, and the ice used for this exhibition was collected from the water surrounding the glacier so as not to damage the ecosystem further. However, the transportation of the ice from Greenland to the UK required a

large amount of both resources and electricity. The ice first had to be moved from the ice sheet in Nuuk to Aalborg in Denmark using nine refrigerated containers; from there it was shipped to Immingham in the UK where it was then brought to London on trucks (Studio Olafur Eliasson, n.d.).

The total carbon footprint of the exhibition was 55 tonnes of CO2e, equal to 52 people flying from London to Greenland and back again. This carbon footprint calculation only includes the transportation of the ice, the exhibition itself, and the travel of people involved in the exhibition. The potential carbon footprint of visitors, which is usually the highest contributing factor in cases such as this, was not calculated or even predicted. In response to the carbon footprint of the Ice Watch exhibition, Studio Olafur Eliasson made an unspecified donation to the Woodland Trust to go towards carbon offsetting, that was stated to be *"in excess of the sum estimated for a traditional carbon offset"* (Julie's Bicycle, 2019).

Fig. 35 - Harvesting ice at Nuuk Port and Harbour, Greenland

Fig. 36 - A person experiencing the exhibition

‘SNAP IT, DON’T SCRAP IT’ CAMPAIGN

Fig. 37 - A photograph of Jonathon Summers-Mileman

While researching what existing galleries and creative spaces are already doing to combat waste in the exhibition sector, I learned about a campaign called ‘Snap it don’t scrap it’ that the Farnham Maltings. This campaign was launched in an effort to reduce the amount of paper waste produced by the gallery.

On the Farham Maltings website it states the campaign is *“designed to encourage audience members to take a picture instead of taking home a handout or flyer. This is a small way of reducing print waste”* (Farnham Maltings, n.d.). As well as this campaign, there is also an internal staff campaign called ‘lets go green’ created to help team members *“embrace and raise awareness about environmental sustainability”* (Farnham Maltings, n.d.).

I wanted to try and find more information about the campaigns, particularly ‘Snap it don’t scrap it’, so I emailed the environmental team at the Farnham Maltings to ask about the project, and whether they were seeing much success with it.

I got a response from Jonathon Summers-Mileman, the communications and marketing manager at the Farnham Maltings:

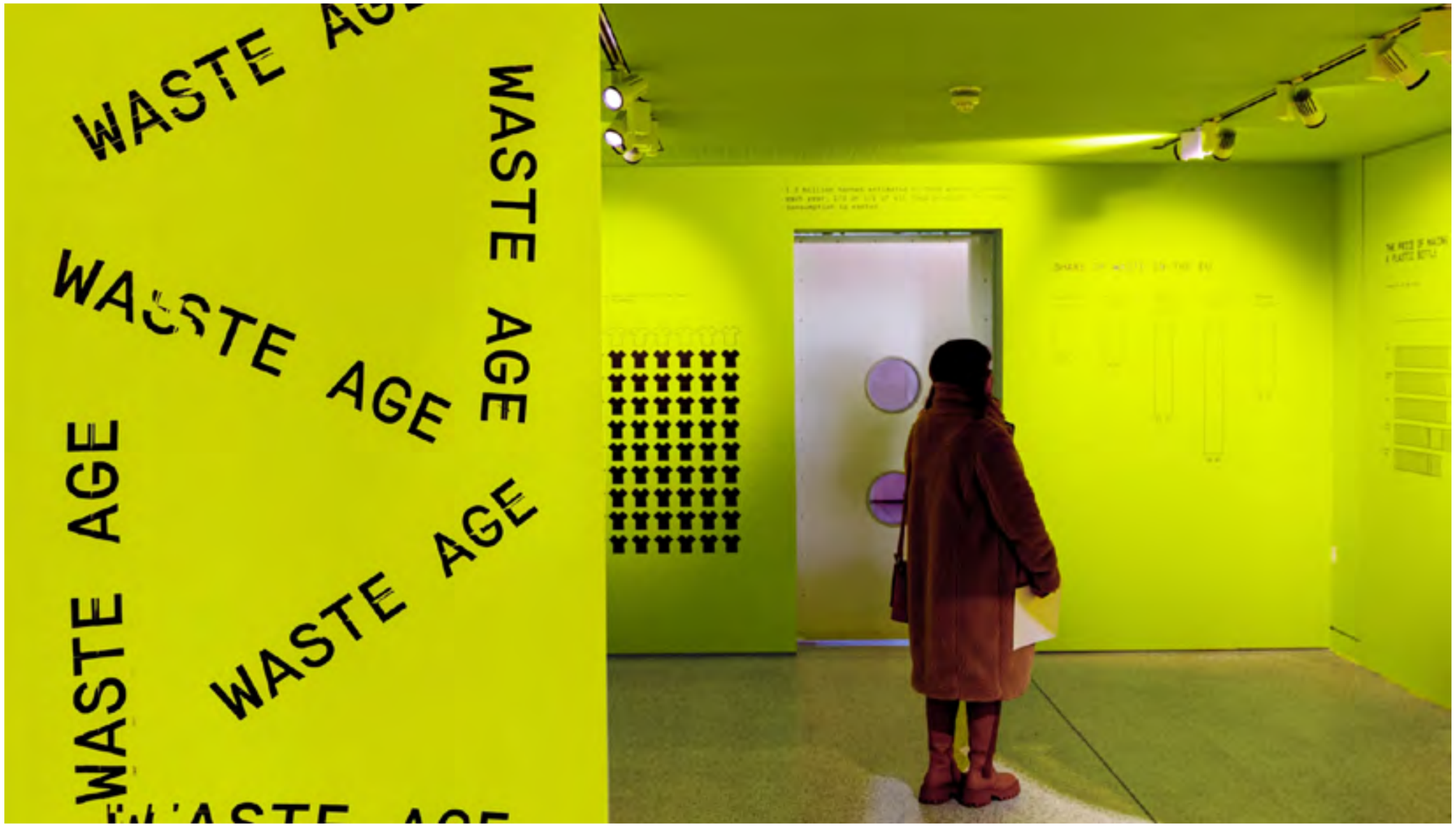
“Thank you for your email and for taking the time to read our green policy. Snap it, don’t scrap it is a scheme we have been doing for a number of years here at the Maltings to encourage audiences and visitors to take a picture of a flyer or poster for an event they are interested in rather than taking it and later recycling it. We also provide a QR code on the print which takes people directly to the event page on our website where there is more information about the event, often with further images and trailers for people to browse and hopefully book tickets.

The hope for this is that we can request and order less print for productions that come to the Maltings. We host over 500 events a year at Farnham Maltings and would get through an awful amount of paper if it wasn’t for schemes like this to try and reduce our impact. We tend to focus our marketing efforts digitally as well to reach new audiences whilst producing a season brochure which we monitor the uptake closely to make sure we are not wasting too much paper at the end of each season.

It is always nice to have a certain amount of print in the building to show that we are busy with lots of events for different audience types but we have to balance this with our commitments to reducing our environmental impact and the attitudes of our audiences who are great at pushing us to lead the way in making positive changes.” (Summers-Mileman, 2024)

WASTE AGE EXHIBITION DESIGN BY SPIN

Fig. 38 - Exhibition entrance environmental graphics at the Waste Age exhibition



The Design Museum in London hosted an exhibition from October 2021 until February 2022 called Waste Age: What Can Design Do? The identity, campaign, and exhibition design for the project was undertaken by London based studio SPIN.

Waste Age explored humanities relationships with waste, *"drawing attention to the role it performs in the economic systems destroying the planet, before highlighting the work of a new generation of visionary designers who are reimagining our ways of living"* (Spin, 2022). An important aspect of the exhibition was upholding the values that it sought to express, and therefore had to be designed carefully so as not to create excess waste and exacerbate the problem that it hoped to address. To achieve this, the Design Museum worked with an advisory panel of designers, campaigners, and scientists, to ensure the success of the exhibition.

I decided to focus my research on this particular exhibition, despite there being many others that explore the problem of waste in our world, due to the way SPIN undertook the task of designing for the Waste Age exhibition. Spin describes the design as *"stripped-back, aiming to be*

Fig. 39 - The Waste Age catalogue

informative and visually impactful in a way that conveyed the urgency of the exhibition's themes" (Spin, 2022). Keeping with the theme of the exhibition, SPIN ensured the work they created resulted in as little waste as possible. This was achieved by using hand-held printers fitted with water-based inks that printed directly onto the walls of the space for signage, cutting out the need for vinyl or plastic lettering. Any plastic that was used for captions was made from recycled materials, and the exhibition catalogue was printed using the *"world's first CarbonNeutral© printer, using vegetable-based inks, recycled stock for the cover and sustainable paper sources for the text"* (The Design Museum, n.d.).

A major part of SPIN's design for Waste Age was a typeface made entirely out of found materials as a way to reuse waste in the creation of the campaign. This typeface was used across posters for the exhibition, as well as being animated with subtle motion and projected onto some of the walls of the exhibition space; a way to produce design without printing and creating waste. I want to explore the idea of making my own typeface in a similar way to this in my own project, as well as exploring the idea of using projections as a replacement for printed matter.

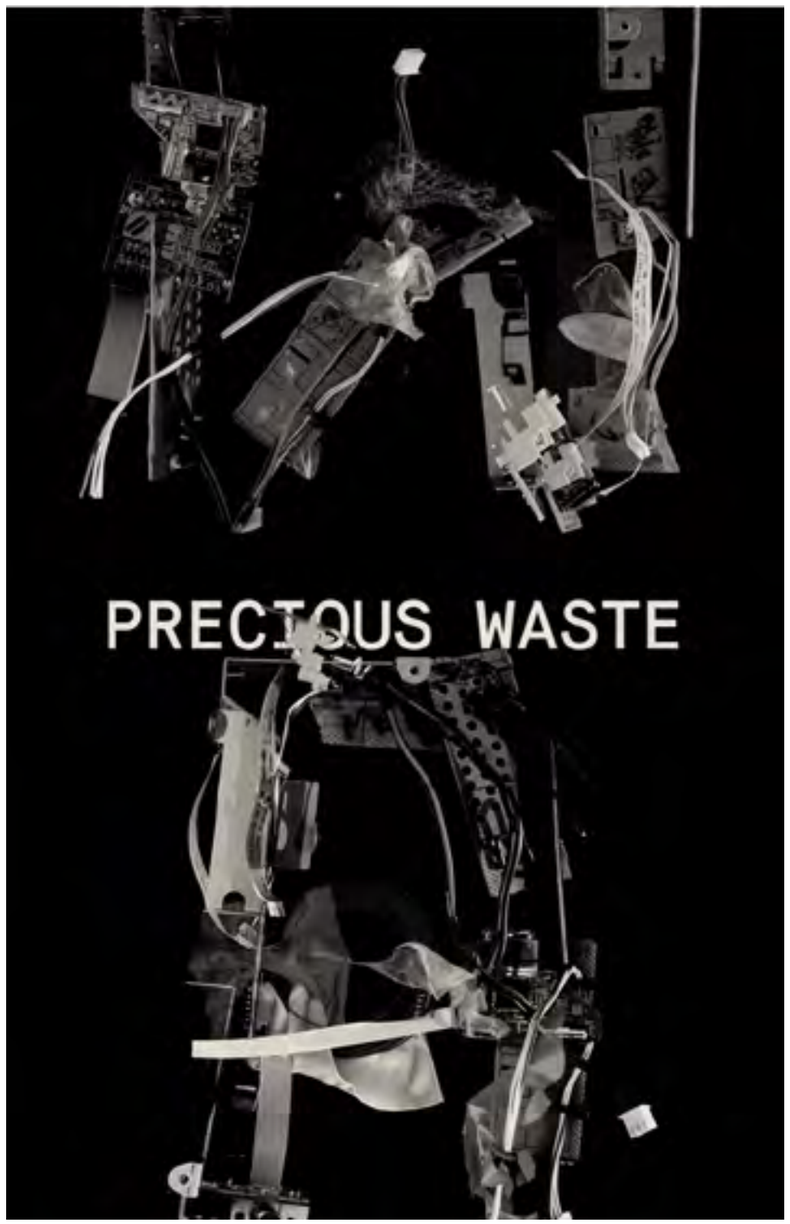


Fig. 40 - Animated section title using the typeface made by SPIN

ARTISTS COMMIT CLIMATE REPORTS

As part of my research, I wanted to explore existing organisations that were also trying to accomplish what I am with my FMP. One example of this is 'Artists Commit', a group started in New York in 2021 with the aim to promote a climate-conscious future for NYC galleries; *"Artists Commit is an artist-led collective committed to a climate-conscious, resilient, and equitable future"* (Artists Commit, n.d.). Since its creation, the collective has branched out, and now has signatures from artists all over the world committing to a greener future for the art world.

A key aspect of Artists Commit work to reduce exhibition waste is a database on their website of resources and plans that support the implementation of climate action in the arts sector. This database is available as a way for galleries and individual artists to have easy access to a huge resource bank of ways they can be improving their creative practices in order to reduce their impact on the environment. Within the database are articles such as a resource from the International Living Future Institute about a materials red list, which *"represents the 'worst in class' materials, chemicals, and elements known to pose serious risks to human health*

Fig. 41 - A chart showing the carbon emissions from a report on the 'Meditation Ocean' exhibition

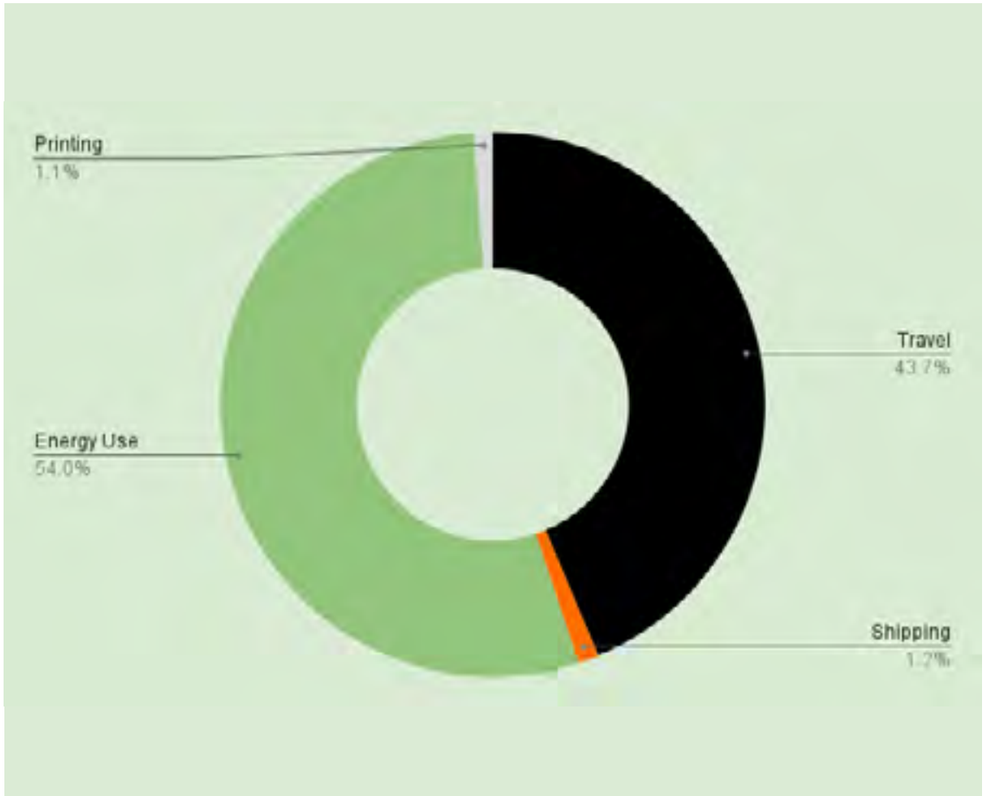


Fig. 42 - A video still from the 'Meditation Ocean' exhibition

and the greater ecosystem that are prevalent in the building products industry" (International Living Future Insitute, n.d.), and a report on a sustainable shipping campaign by the Gallery Climate Coalition (Gallery Climate Coalition, n.d.).

As well as the climate action database, Artists Commit also hosts a number of climate impact reports that outline the effects of individual exhibitions on the environment. These reports are created in collaboration with the curators of the exhibitions and the galleries hosting them, and allow the artists involved to assess their sustainability and reflect on it for their next project (Artists Commit, n.d.).

The database and collection of reports that Artists Commit has provided will be an essential resource for my project moving forwards as it will allow me to study real world cases of exhibition waste, as well as explore scientific studies into what the issues are and how they can be counteracted.

Fig. 43 - 'The Skin of Our Terrain IV' for Project Art Distribution

BRIEF PROPOSAL ZINE

Fig. 44 - Spreads from 'Notss Zine' by Jackkrit Anantakul

I created a small zine to illustrate my project brief, and to propose my initial ideas for outcome prototypes.

I began by using Pinterest to find some examples of graphic design zines that I could use as inspiration, and as a guideline for the layout and style of my own. The example in Fig. 43 really caught my eye as I felt the colour choice was very bold, and complemented the grungy style of the imagery well.

I decided to use the same colour palette for my own zine, as I wanted it to stand out and draw attention. I also really liked the simple image treatment that was used to keep the colours consistent throughout.

Other examples of zines I looked at also made strong use of bright, almost clashing colours, and many were designed with limited colour palettes to make the printing process easer.

Fig. 45 - Various zines created by designer Félicité Landrivon

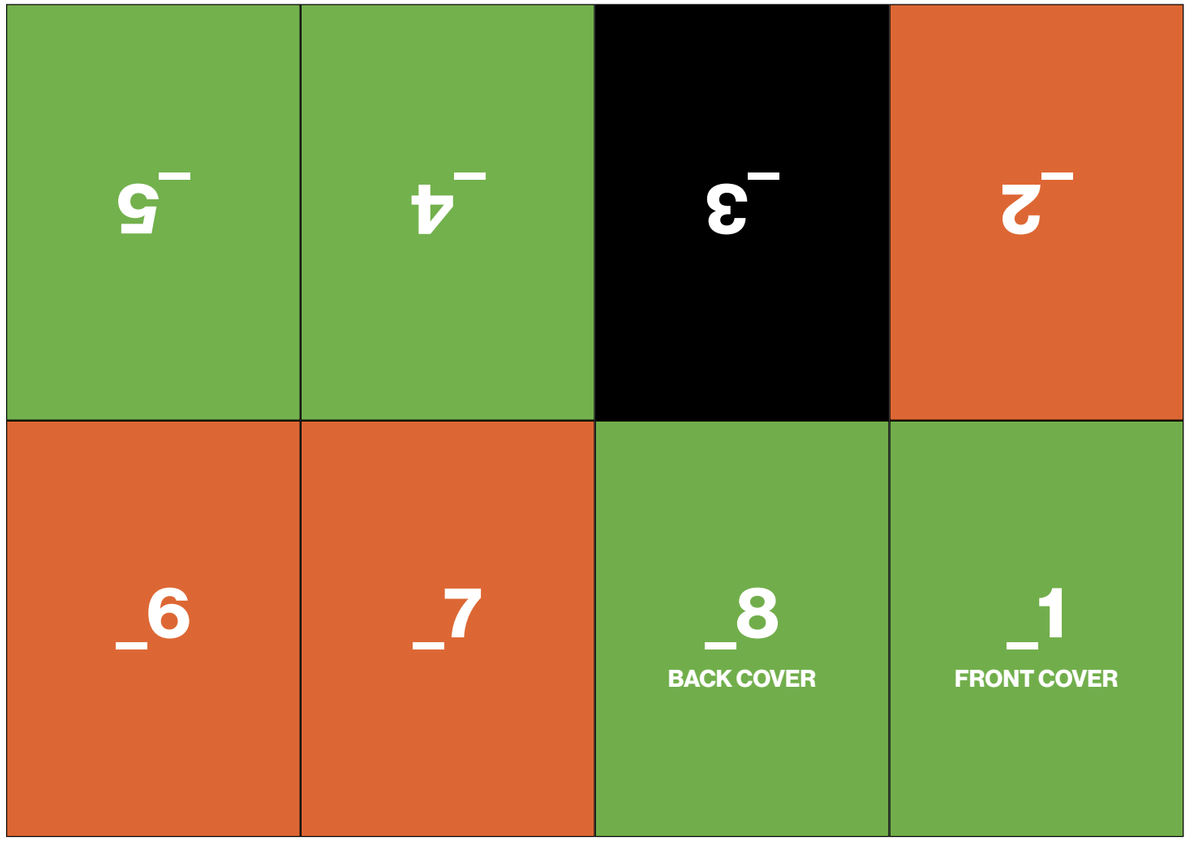


Fig. 46 - Layout for my zine showing where to put each panel

Fig. 47 - Layout for my zine with each panel in place

To design my own zine I first created a template for how the different panels would need to be laid out. As I was using the single sheet layout for my zine some of the elements would have to be printed upside down, so that when the zine was folded together they were aligned correctly; therefore I numbered each panel, using the text to signify the orientation.

I also decided to think about adding colour at this point, and used the layout to plan which pages would be in orange, and which would be green. I also added a black page to break up the pattern slightly, and to allow me to experiment with more colour combinations for my imagery.

For the individual panels I designed them separately from the layout so I could work on them oriented correctly. I made a spread for the project background, including some of the research I had looked at, a proposal for my current outcome prototype idea, and a page on schedule, noting down key deadlines for the brief.

I used images showing examples of waste in the design industry to illustrate the zine, and for the cover I included an image from the ‘Frameless’ exhibition in London, an immersive art experience that is using digital methods to reduce waste (Frameless, n.d.).

I made the images monotone, and used the halftone filter on some to make them all work cohesively together and with the zine.

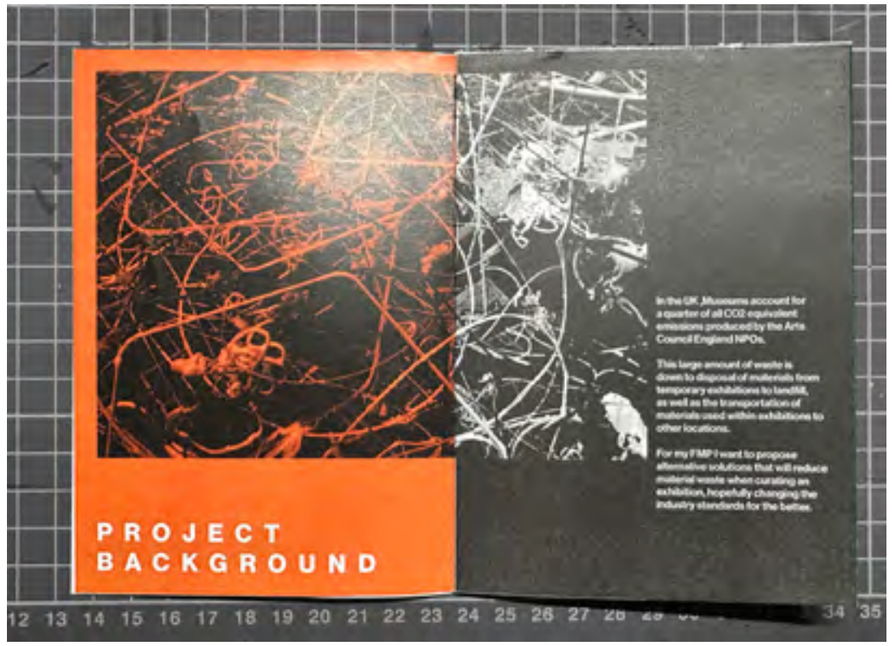
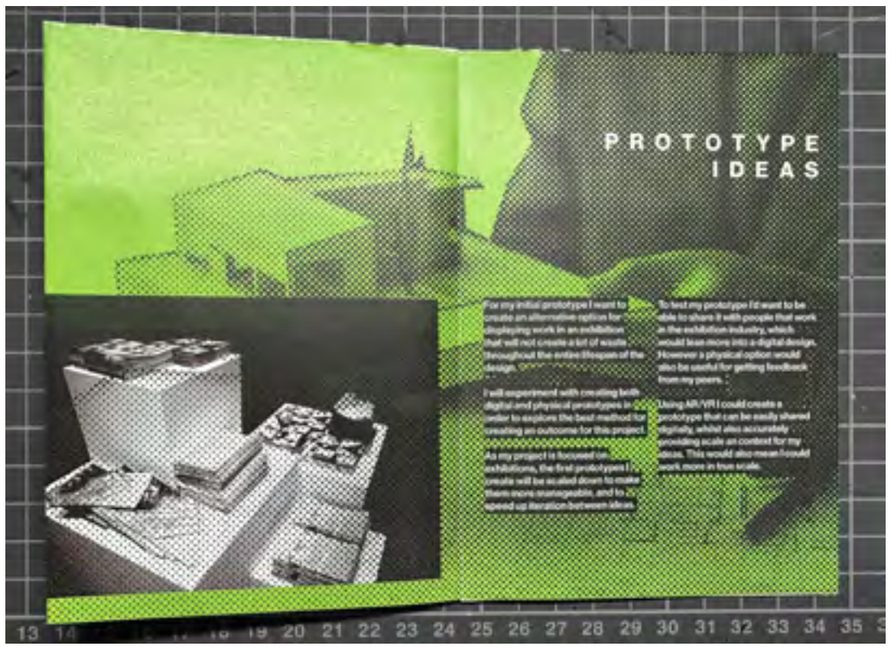


Fig. 48 - Fig. 51 - Show the physical spreads of my zine



These are the spreads of my zine once it was printed and folded. I printed the full layout in A3, so once it was folded down each size was A6, making it the perfect size to hand out as a project proposal.

PROTOTYPE 01 - SKETCH

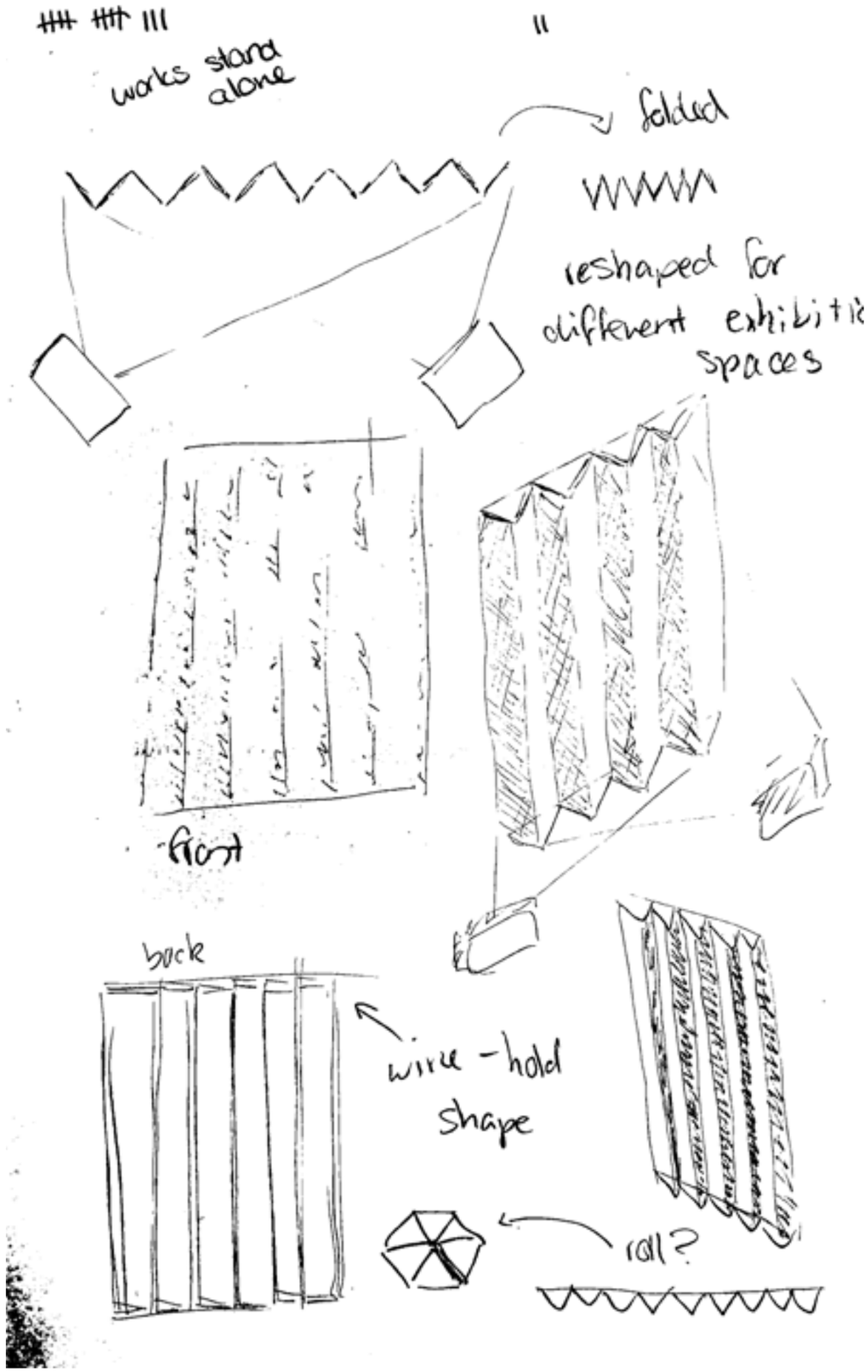


Fig. 52 - Initial sketches for my first prototype

I wanted to explore the idea of creating a system that could be implemented at galleries and exhibitions as an alternative to the traditional method of displaying artwork.

Currently, projectors are being used as a way to display art without the need for printing, meaning there will be no waste produced by test prints, or by the disposal of the art after the exhibition.

For my idea I wanted to expand on the idea of using projectors by combining them with other methods for displaying art. I took inspiration from lenticular printing, a process that allows two images to be displayed in one frame.

By combining the digital characteristics of projected images, such as the option to be animated and quickly changed, with the analogue display methods of lenticular printing I could create a more sustainable option for exhibitions.

In my sketches I explored the idea of having a model made of triangular prisms, that could be projected onto from two angles in a way that allowed two images to be displayed at a time. I considered that the model could either be a thin, paper structure that could easily be recycled after use, or it could be a more rigid structure that could be kept and reused, given to another location for use, or even sold as a stand alone sculpture.

LENTICULAR PRINTING - RESEARCH

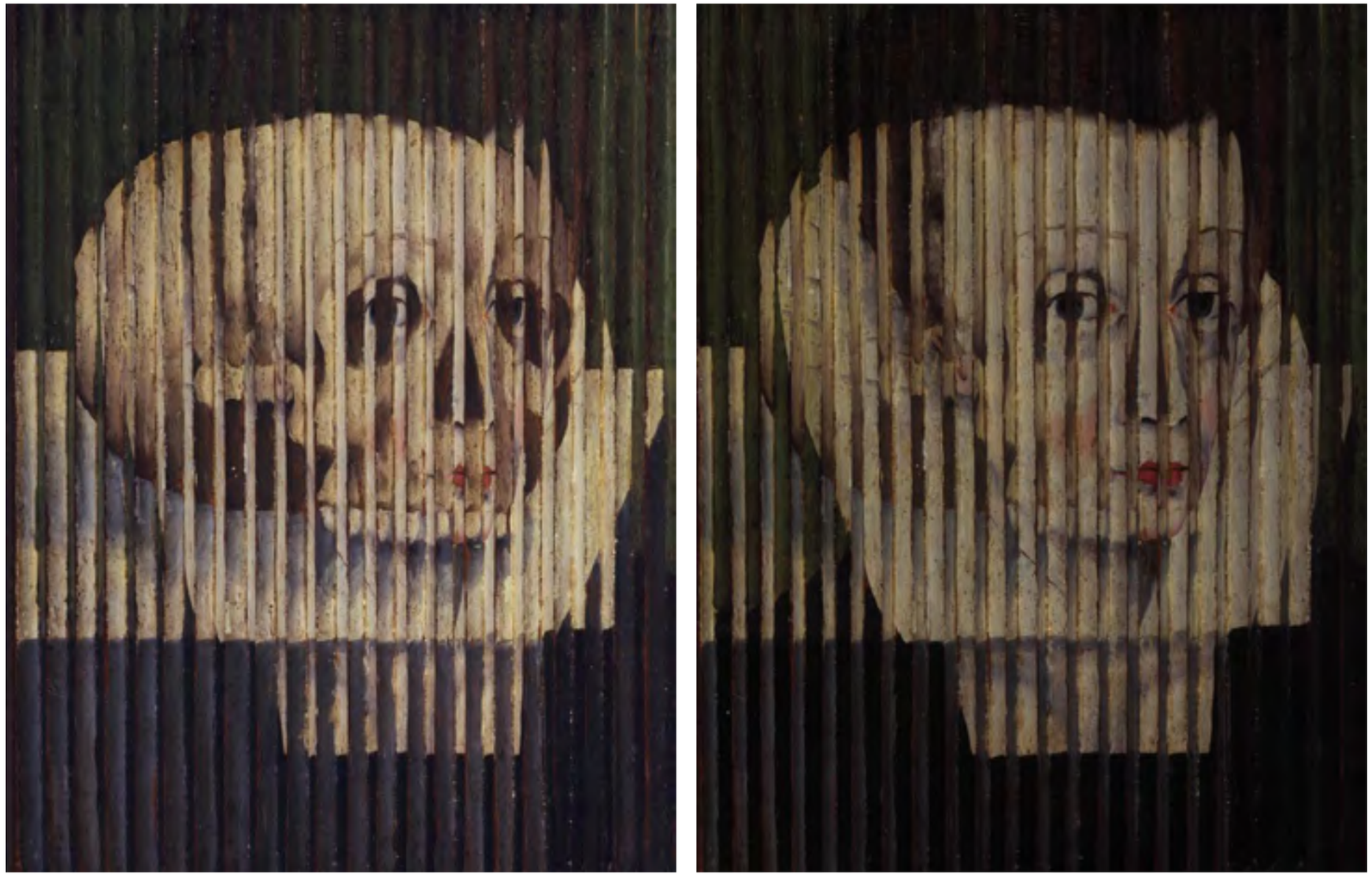
Before progressing further with this idea I wanted to research more into lenticular printing, particularly in relation to the sustainability of the process. The process that I wanted to explore in my prototype makes use of a very low-tech style of lenticular printing, only making use of folds in the paper to create multiple images.

This is a very rudimentary form of changing image and differs greatly from the lenticular printing that is more common today.

Originally, the effect was created using *"an accordion-like array of triangle shapes"* (World3D Lenticular Printing, 2020), which were then stuck onto a wall or similar flat surface. Each side of the triangle (except the one stuck to the wall) would have a separate image applied to it. The shape of the physical triangles is used to block the images from the viewer depending on where they stand, thus allowing two images to be displayed, but only one seen at a time. This type of display was called a 'Tabula Scalata'.

Over time this technology developed to become 3D lenticular. This modernised version of the printing method uses a lens over the artwork to block the view of one image while allowing the

Fig. 53 and Fig. 54 - Anamorphosis 'Mary, Queen of Scots, 1542 - 1587'



other to show through, instead of the physical geometry of the triangle. By simply changing the angle at which the print is viewed, the lens allows the other image to show through, drastically reducing the necessary viewing angles to make the technique work.

As well as this, the lens that makes the process work is much thinner, and therefore makes the whole illusion more seamless.

Further advancements in lens technology has even allowed for more than just two images to be used, meaning the process can display whole animations, albeit short ones. 3D lenticular also allows for the idea of depth to be shown in the images taking advantage of each eye being able to see slightly different perspectives.

For my own explorations into lenticular printing I want to keep the process as simple, and therefore waste free as possible. Due to this I only want to explore the Tabula Scalata style. By using mapped projectors to display the images on the triangles I can even cut out the need for printing, making the final object even easier to recycle or reuse.

Fig. 55 - Close up of some typography made with lenticular printing

PROTOTYPE 01 - PAPER MODEL

Taking what I learned from my research into lenticular printing, I used some texture images I had created for a previous project to test out the process. I wanted this prototype to just be a proof of concept, so I chose to omit the projector for now.

To make this work I placed two portrait A5 images onto a landscape A4 document, then sliced each into four segments and alternated them. I then printed the A4 document and folded it into a concertina pattern, with each fold being at a right angle.

When viewed from the front the two images can both be seen together and look a bit confusing, but from the sides only one image can be seen at a time.

From this prototype I learned that I would need to use a stronger material for further tests, as the paper warped a lot when folded making the effect less than perfect. I also find the fact that the image gets smaller to one side a bit of a problem, because if I wanted to include text or detailed images I would have to take the size discrepancy into consideration.

Fig. 56 - Fig. 58 - My experiments with lenticular printing

PROTOTYPE 01 - 3D RENDER

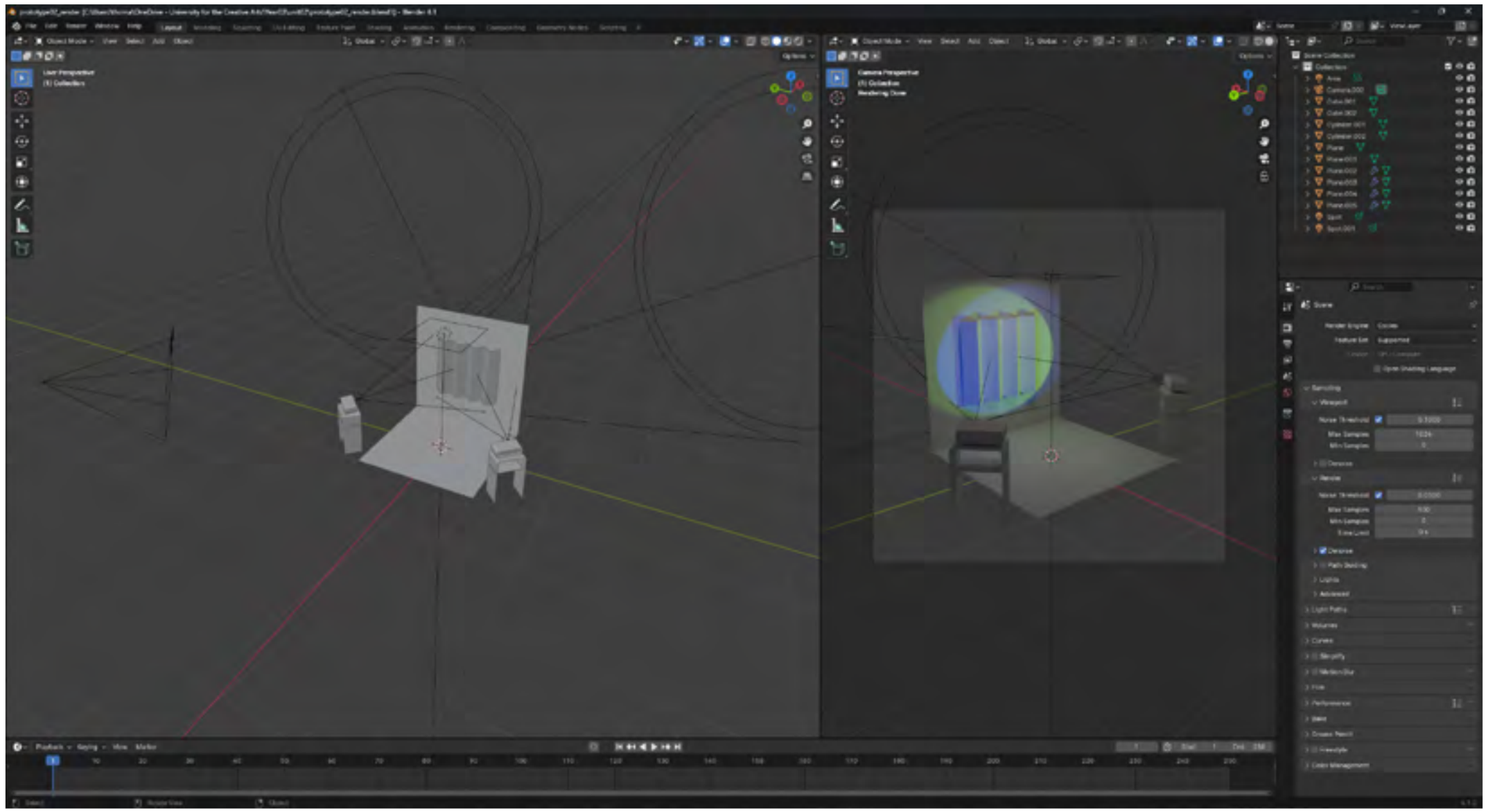
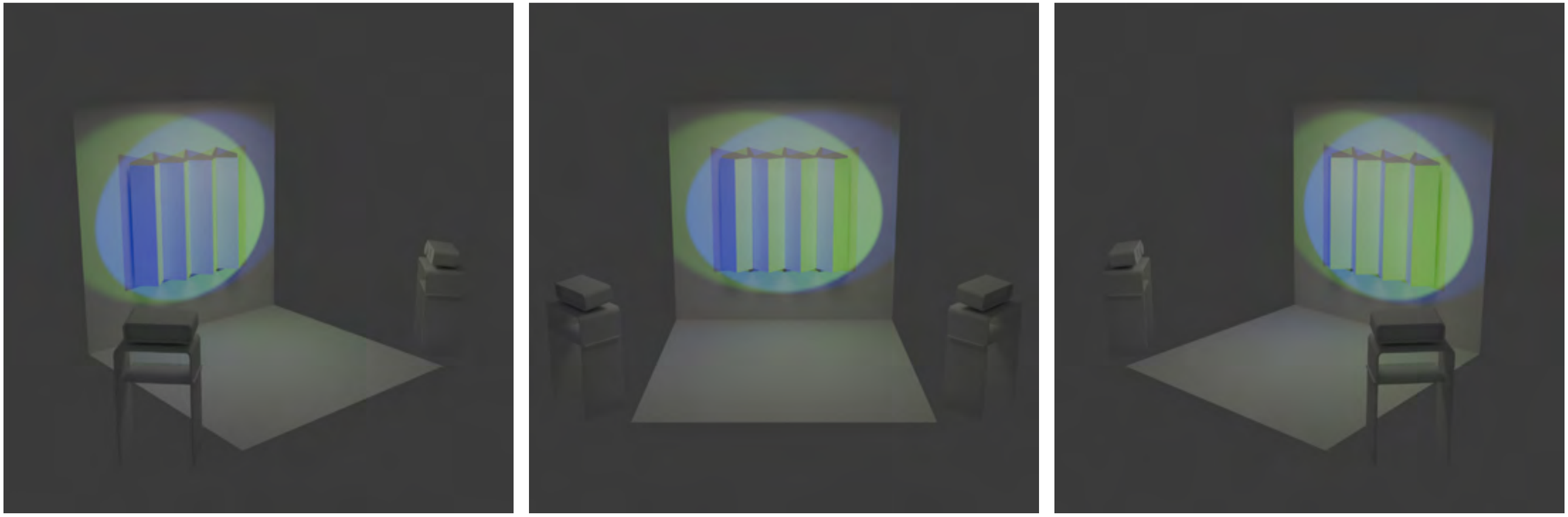


Fig. 59 - The viewport display of Blender showing the layout of my mockup

For the next iteration of my prototype I wanted to be able to explore the use of a projector. To start with I chose to use Blender to create a 3D render of how the projector would interact with the model. Using 3D software like this allows me to focus more on the light simulation without having to worry about the rigidity problems I noticed with the paper models.

In blender I created a mockup of a wall and floor, then using a plane that I extruded at alternating right angles I created the concertina shape of the model. I used different coloured lamps to mimic the projectors and placed them at 45 degrees to the model, meaning each lamp was aligned with the flat planes on each side.

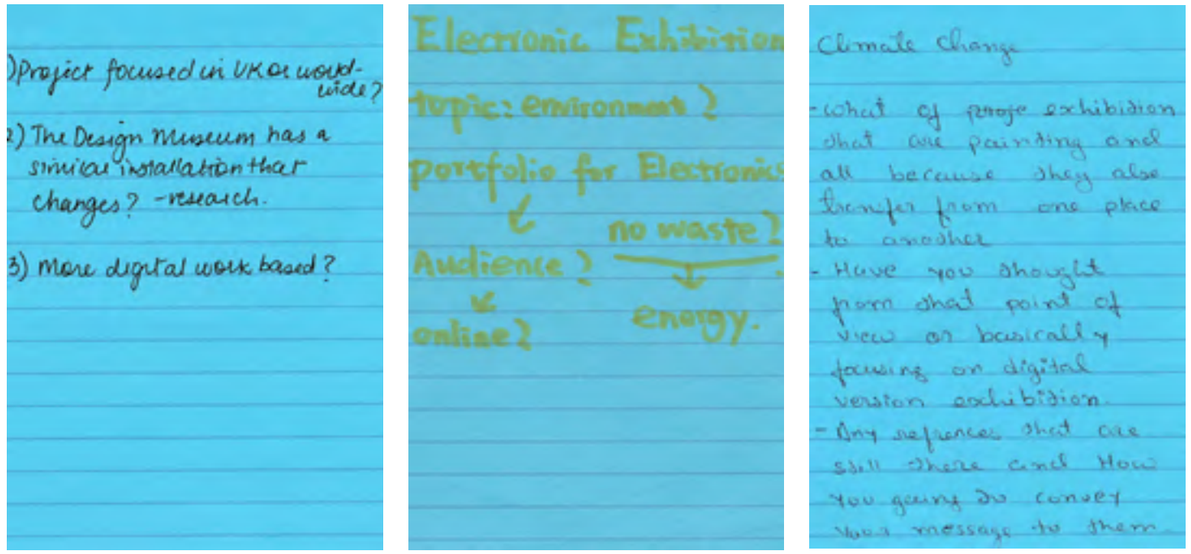
Fig. 60 - Fig. 62 - Renders showing my prototype from different angles



These renders show my 3D prototype from front view, angled to the left, and angled to the right. These angles are chosen to show how from each side, one of the two colours (representing the projectors) is more prevalent than the other. It is clear that the idea has worked to an extent, however towards the furthest point away from the projector the colours start to blend slightly.

I am worried that using this technique may not be legible enough, particularly if the designs displayed use text, as it may fade or even overlap slightly with the second image. This problem could be solved by using projection mapping software to alter where the projections fall, but this adds another level of complexity to the project, and it is therefore less accessible commercially.

PROTOTYPE 01 - PEER FEEDBACK



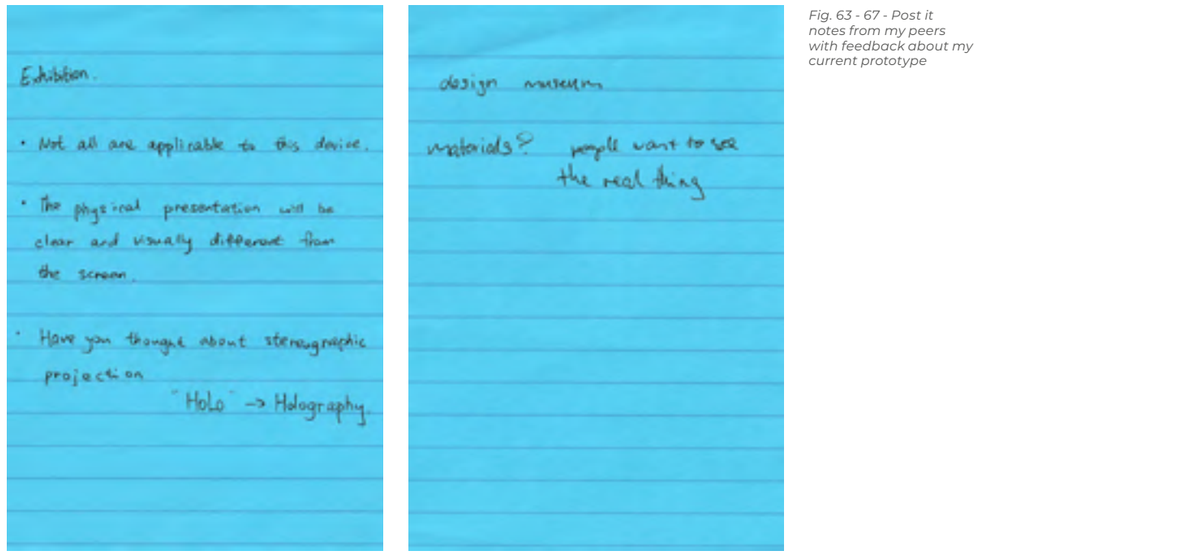


Fig. 63 - 67 - Post it notes from my peers with feedback about my current prototype

Using the physical and digital prototypes for my lenticular system, as well as the original sketches I made of the idea, I presented to a small peer group to get feedback.

Some of the key questions and concerns raised about the prototype were:

"What about exhibitions that are all paintings because they get transferred from one place to another?"

"Not all exhibitions are applicable to this device"

"Physical versions may look different to the projected ones"

"Who is the audience?"

In regards to the audience this project is aimed at, as well as the problem that it will only work for certain types of exhibition; I am designing this so it can be used by exhibition and museum curators as a way to display posters. This allows design exhibitions that are focused on poster design to reduce their footprint, as well as their environmental impact. As well as this, the system can be used as an alternative to signage, allowing it to display multiple important pieces of information at once, while also being simple to change due to its digital nature.

It was also suggested that I research into the Design Museum, as they currently have a piece of signage using a similar technology to my prototype idea.

‘DESIGNER MAKER USER’ - RESEARCH

Fig. 68 - Graphic wall outside the ‘Designer Maker User’ exhibition

From my feedback it was suggested I look at the ‘Designer User Maker’ permanent exhibition at the Design Museum in London. A key part of this exhibition is the graphic wall designed by Morag Myerscough.

The wall is made up of individual slats placed onto a triangular prism, each of which is able to rotate. Throughout the day the sign will rotate through each of the faces, displaying ‘DESIGNER’ ‘MAKER’ and ‘USER’ in turn.

Morag stated that this method was chosen over a digital wall because *“the rhythm of the mechanical wall is much nicer”* (Mysercough, 2016).

Despite the more limited number of applications this idea has compared to using a projector, it does have a lot more character, and the board is constructed from wood, which is sustainable.

VISIT TO OMNI

When discussing my prototype ideas with my tutor, it was suggested I research the company Omni. Omni is a company that works with galleries and artists to produce the prints and graphics they need; they make a wide range of different types media, including print, vinyl, CNC fabrication, and installation pieces.

As I'm planning on making a new system that can be used by museums and independent exhibitions, visiting Omni and seeing the way they work was helpful in showing me what areas of the prototype I needed to refine, and what other considerations I need to make.

While I was with Omni, I tried to find out as much about potential materials as possible. I noted in my first prototype that using a thin material such as paper for my model meant there was little structural integrity, and therefore the image ended up warped when projected onto it. A potential alternative would be DISPA board, a paper based material with *"a unique core of embossed formed paper"* that creates a *"smooth, bright white surface [offering] printing with optimal flatness, rigidity, and stability"* (Antalis, n.d.).

As well as being a strong material, DISPA board is also very sustainable due to it being made from recycled materials, and being recyclable in turn (Omni, n.d.). However, despite the material itself being sustainable, printing onto DISPA board has its own problems. The ink that Omni uses cannot be recycled itself, and therefore the ink must be scraped from the material before recycling through a process called de-inking.

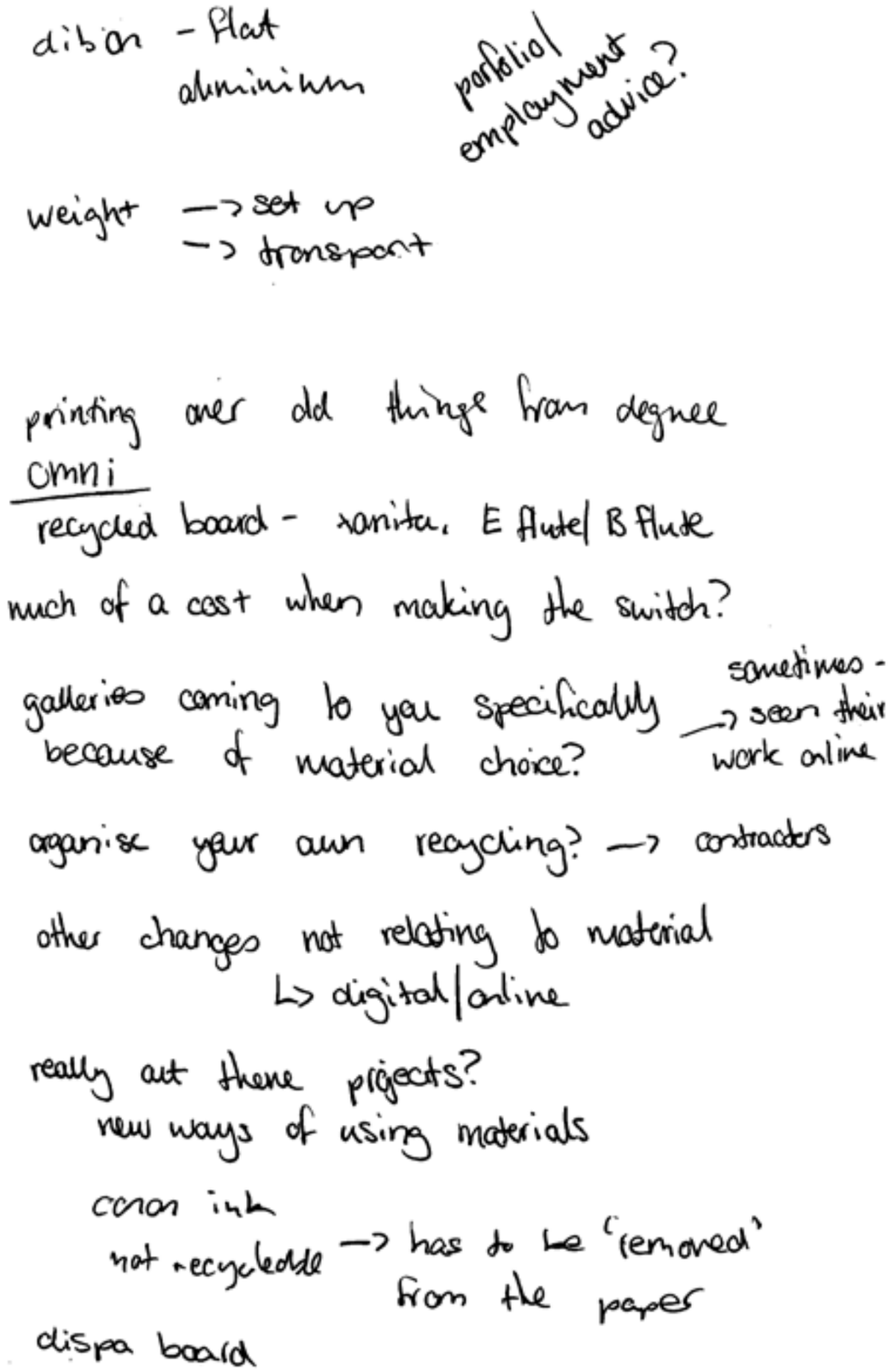


Fig. 69 - The notes I made on my visit to Omni

Fig. 70 - A piece of DISPA board given to me by OMNI

This is the piece of DISPA board I was given by OMNI so that I could experiment with the material for my project. The thickness of the board allows it to hold its structure well, but means it can't be folded; if I were to use this for my model I would have to slice and glue to board into shape.

This would mean I could only use this if I wanted to follow the approach of making the model also act as a sculpture when it wasn't being projected onto, and in that case I would rather use a more traditional sculpture material such as plaster.

DAVID CHIPPERFIELD - NEUES MUSEUM

During a brief discussion about my project with my tutor, it was recommended for me to look into the work of architect David Chipperfield for the Neues Museum in Berlin.

The museum, which originally completed construction in 1859, was left in ruins by bombing during the Second World War and left to nature for the following 50 years.

In his restoration of the museum, Chipperfield chose not recreate the building exactly as it had been, or propose a contemporary rethinking of it. Instead, considering the memory and meaning of the museum, he *"followed the principle of conservation, restoring what remained and carefully inserting new material into the existing fabric only where necessary"* (Chipperfield, 2009).

I found the idea of combining the modern, reconstructed, elements of the building with the original areas that had been damaged to be the perfect merge of history and repair. In my own project I want to mimic this through my own use of conflicting technologies: the traditional form of lenticular printing, and the more contemporary projection of images.

Fig. 71 - The exterior of the Neues Museum, showing some of the original building along with David Chipperfields work

Fig. 72 - Interior of the Neues Museum. Some of the original brickwork can be seen above contemporary construction works

Fig. 73 - Interior of the Neues Museum. Much of the original building still stands alongside the new grand staircase

RETHINKING MY PROJECT

Following from the creation of my first prototype, and the feedback and subsequent research that has come from it I decided to look back at the brief I wrote myself and tweak it to accommodate a new outcome idea. I believe my first prototype had potential, however I didn't fell that it was the best way for me to approach reducing exhibition waste.

I decided that for my second prototype I wanted to focus more on creating an exhibition myself that challenges the norm, and raises awareness about the problem of material waste produced by the design industry.

From my previous research I learned that a vast amount of the waste that comes from museums and exhibitions is due to the production and transportation of the artwork. If I can cut out the need for having my outcomes produced elsewhere and shipped to me, I can reduce the carbon footprint of my work drastically. As well as this, if I'm producing the outcomes fully from scratch I will have a much better understanding of the work and materials that went into them.

Reflecting on the research zine I made at the start of this project, the production and disposal of paper can be extremely wasteful processes. A single sheet of fresh A4 paper requires between 2 and 13 litres of water to be made (The World Counts, 2020), and in the western world the average person uses 147kg of paper per year (Paper on the Rocks, 2019). This results in huge amounts of water being used each year for a process that could very easily be altered to require less resources.

"Each tonne of recycled paper can avoid the use of 17 trees; 1,440 litres of oil; 2.3 cubic metres of landfill space; 4,000 kilowatts of energy and 26,500 litres of water" (The World Counts, 2020).

Based on this I've decided I want to explore creating my own paper for use in my project. One outcome that I have to create for my FMP is a printed copy of my process book, so I can experiment with making this myself, as well as posters that I can exhibit to raise awareness in other people.

Fig. 74 - Paper pulp in a factory

POSTER EXPERIMENTATION

I began to start experimenting with some of my initial ideas to create a poster design as a way to get some of my visual thoughts and ideas onto the paper.

I used a photograph that I found from my research into David Chipperfield's work on the Neues Museum as the basis of the design, deciding to focus on the merging of new and old.

I wanted the visual style to be quite harsh and punky, so I made use of threshold adjustment layers and bright colours. I then contradicted this with the typography, reflecting the way the new, modern, modifications to the Neues Museum juxtapose the damaged, traditional architecture.

For this first experiment I used a simple colour palette of blue, green, and yellow, focusing on colours commonly associated with environmentalism and sustainability.

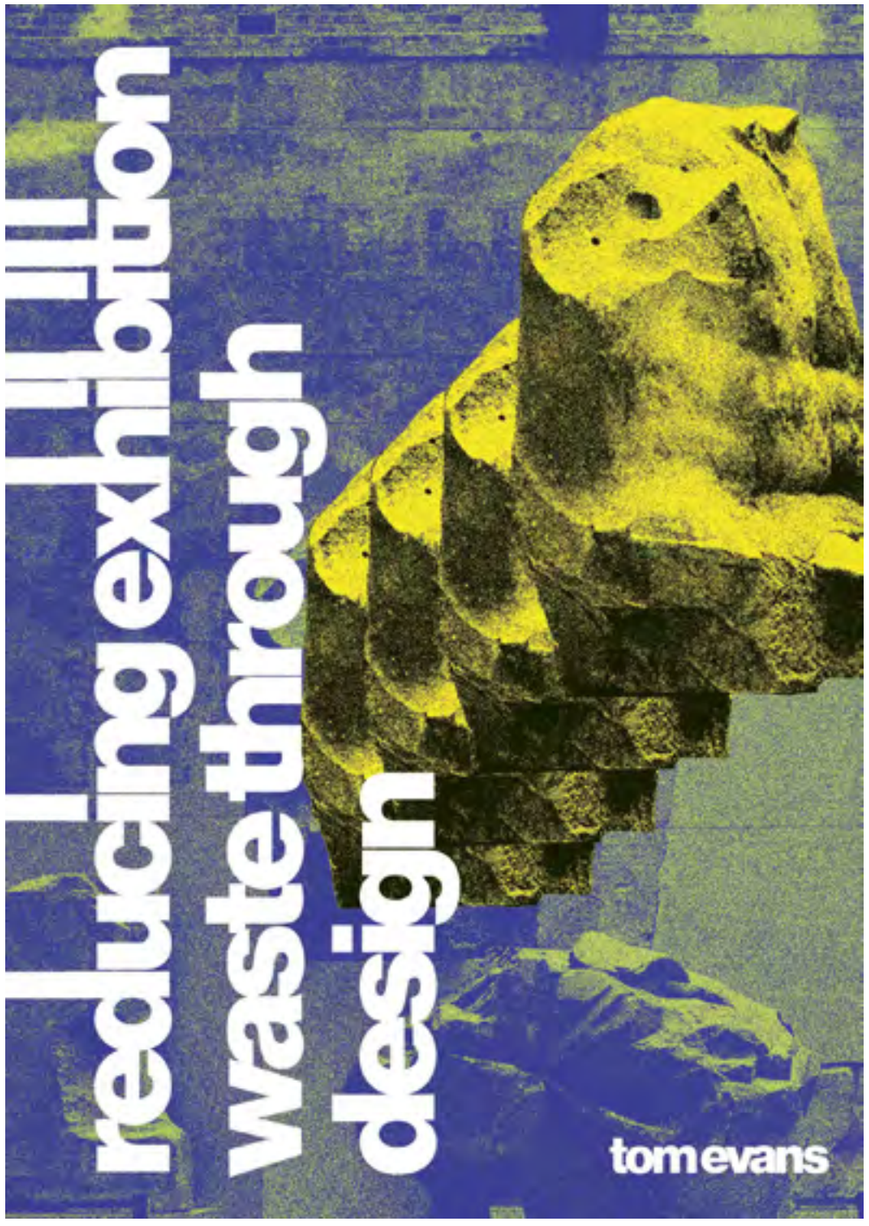
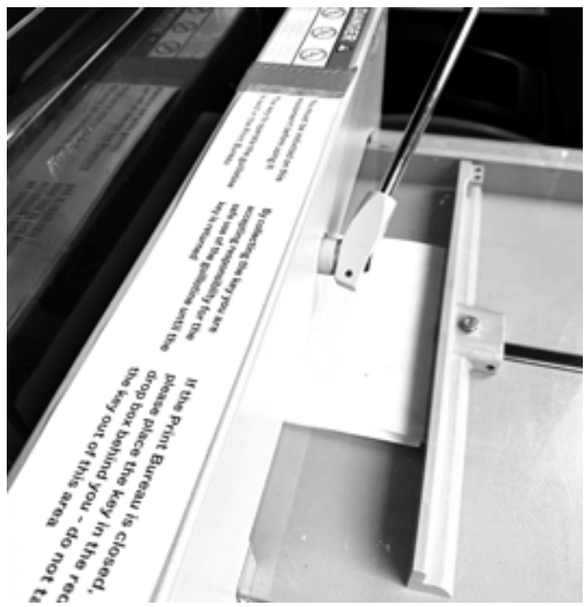
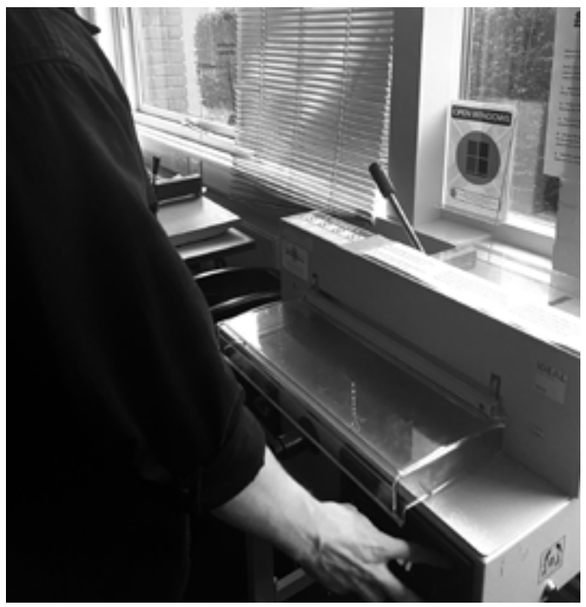


Fig. 75 and Fig. 76 - My first poster experiments

BOOKBINDING EXPERIMENTATION

Fig. 77 - Fig. 82 Show the process of using a perfect binding machine to bind a book





As the reduction of carbon footprints in the design world is a key aspect of my project I wanted my own work throughout my FMP to reflect this.

At the end of the project I will be producing a printed book recording my work on the brief, and I have decided that print and bind this book myself to as to cut out the process of having the book shipped to me from another printing company.

I made use of the Perfect Binding machine and the electric guillotine on campus to practice the process, and ensure I can successfully produce my own book for the end of the project.

For this test I used only paper that had already been printed on or used for something else so as not to create more waste through the process of prototyping.

BOOKBINDING OUTCOME

This is the outcome from my first bookbinding test. Overall the test was a success, I learned how to use the machines so I will be able to print and bind my own process book at the end of my FMP. However as I used recycled paper, not all the pieces were the same size, which resulted in some pages not being properly glued to the spine.

When it comes to making the actual outcome I will have to make sure the paper I use is all sized correctly so the final book is strong and will last a long time without losing pages of coming apart completely.

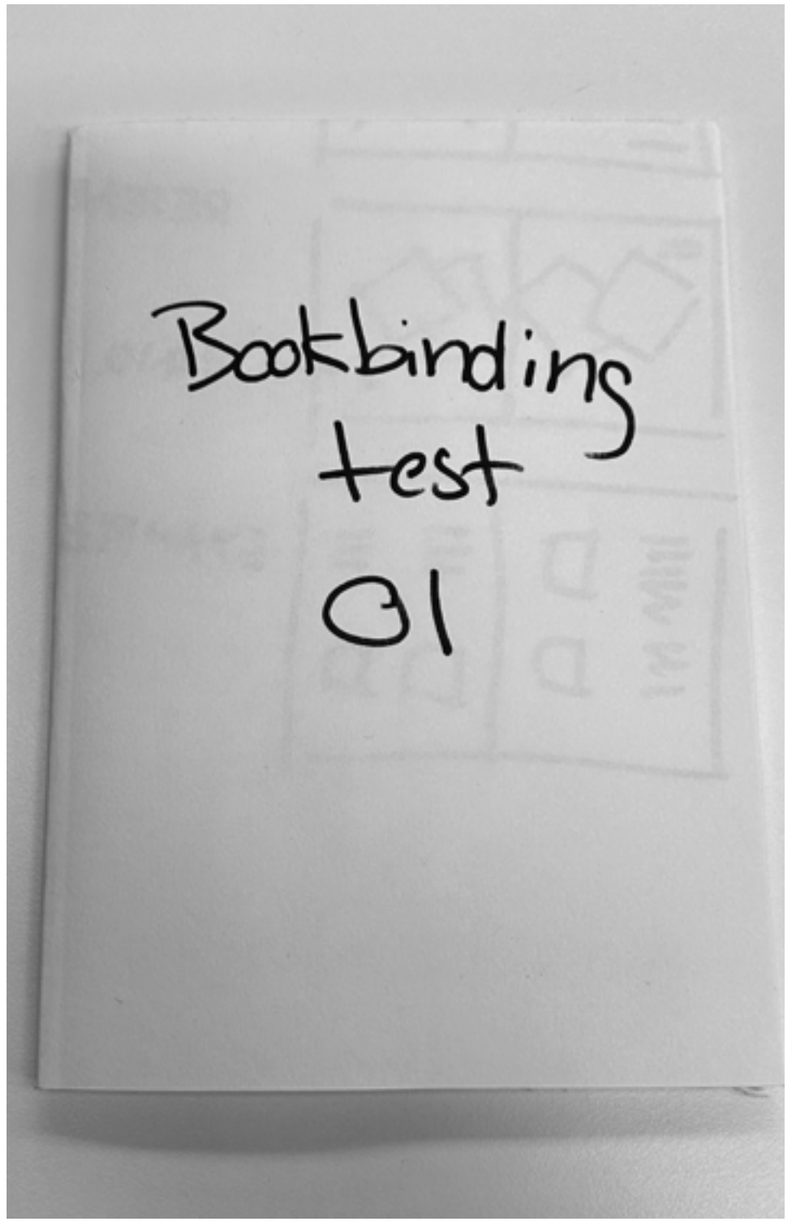
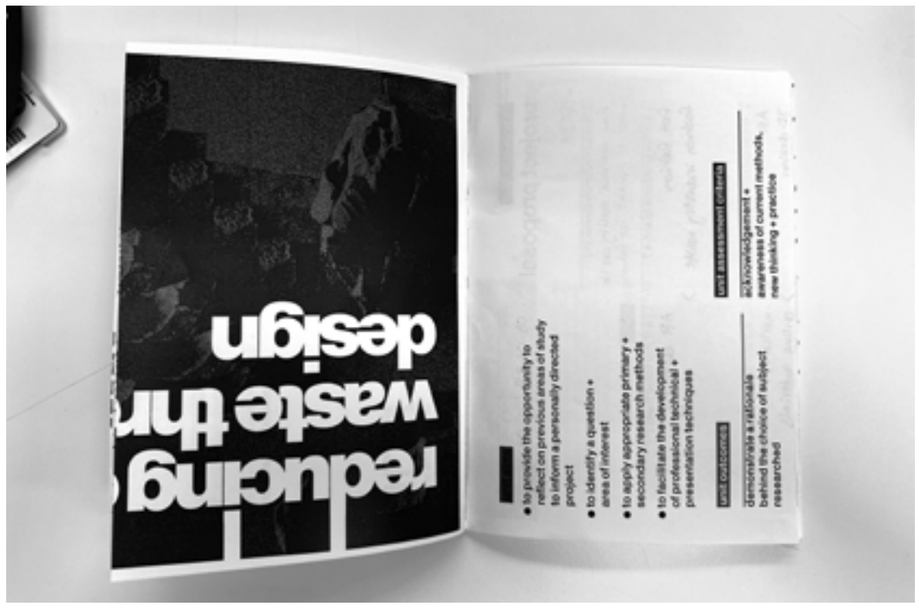


Fig. 83 - Fig. 85 Show the outcome of my book binding experimentation



OVERPRINT EXPERIMENTATION

I wanted to have a printed version of my poster to help me visualise what I was creating, but similarly to the book binding, I wanted to reduce the waste when printing it. I decided to find some scrap paper that had already been used for printing, and print over the top of it, recycling the paper.

I ended up really liking the effect this gave, with the information that was already on the paper showing through the poster I printed over the top. I scanned in this overprint experiment so I also had a digital version that I could then tweak more using Photoshop, and as a digital reference for if I wanted to try and recreate this effect.

This process could be used intentionally in the future as a way to merge information based posters with more visual, experimental ones. I like the idea of combining media in this way as it once again reflect the research into the Neues Museum.

Fig. 86 - A copy of my poster experiment printed onto paper that already had text printed on it

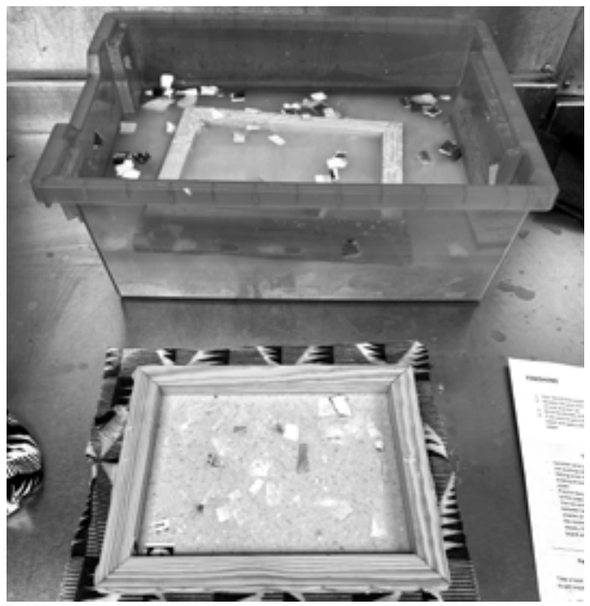
PAPER MAKING WORKSHOP

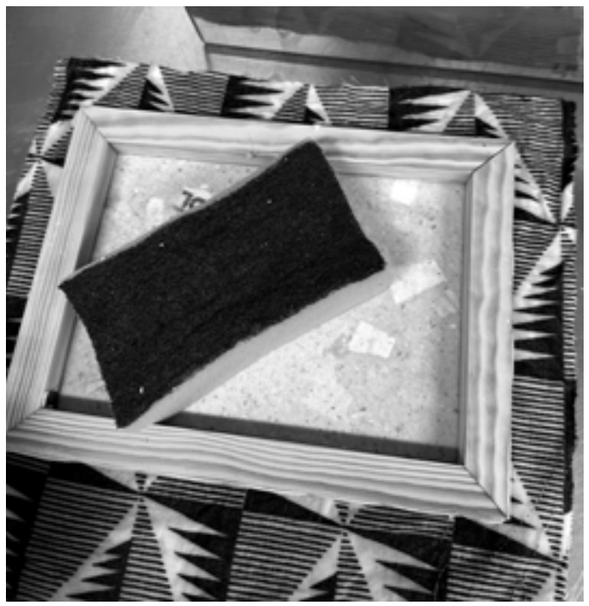
I was lucky enough that there was a paper making workshop being run on my campus for foundation students. I managed to attend this so I could learn the proper techniques for creating home-made recycled paper, and practice using the tools required. The workshop was great for me as I'm hoping to make my own paper to be used in the outcomes for my FMP.

To start, we had to soak paper in a small amount of water to soften it, then blend it into a pulp. There was some pre-shredded paper provided for the workshop; however much like with my poster, I didn't want to use fresh paper so I collected some pre-used paper waste and used that. The paper pulp was then put into a large tub with more water to thin it down. I also included some small ripped paper in here to add texture.

Then, I used a wooden mould and deckle to collect some of my pulp into the shape of a sheet of paper. Finally, I deposited the wet paper onto a piece of fabric and sponged out the majority of the water. This would then be left for several hours to dry completely.

Fig. 87 - Fig. 92 - Photos I took during a paper making workshop





PAPER MAKING WORKSHOP OUTCOMES

Fig. 93 - Scans of the paper I made in the workshop

The paper I made in the workshop came out okay, however there were a few issues I'll try to fix if I make more. When mixing my paper pulp into the water, I used to much paper. This resulted in too much material being collected on the deckle, and the paper being too thick once it dried.

For larger format paper this wouldn't be a problem, however at this small size it resulted in the paper warping as it dried. Also, some of the edges became folded when I was transferring the paper onto the fabric at the end of the process.

Further paper making

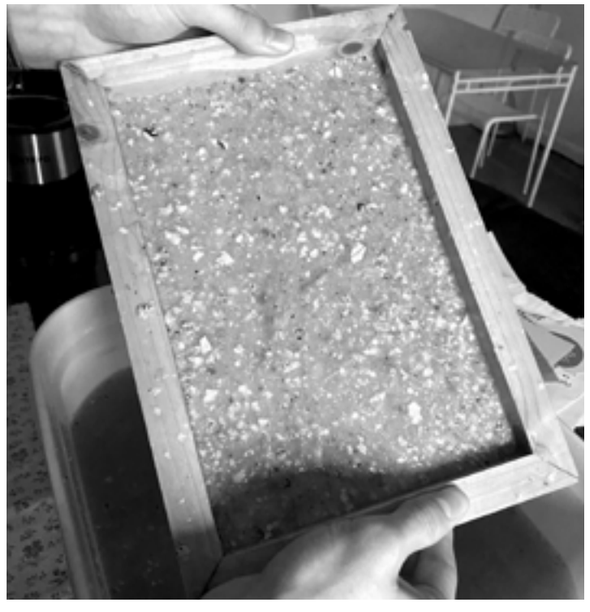


Fig. 94 - Fig. 97 - Photos I took while making paper at home

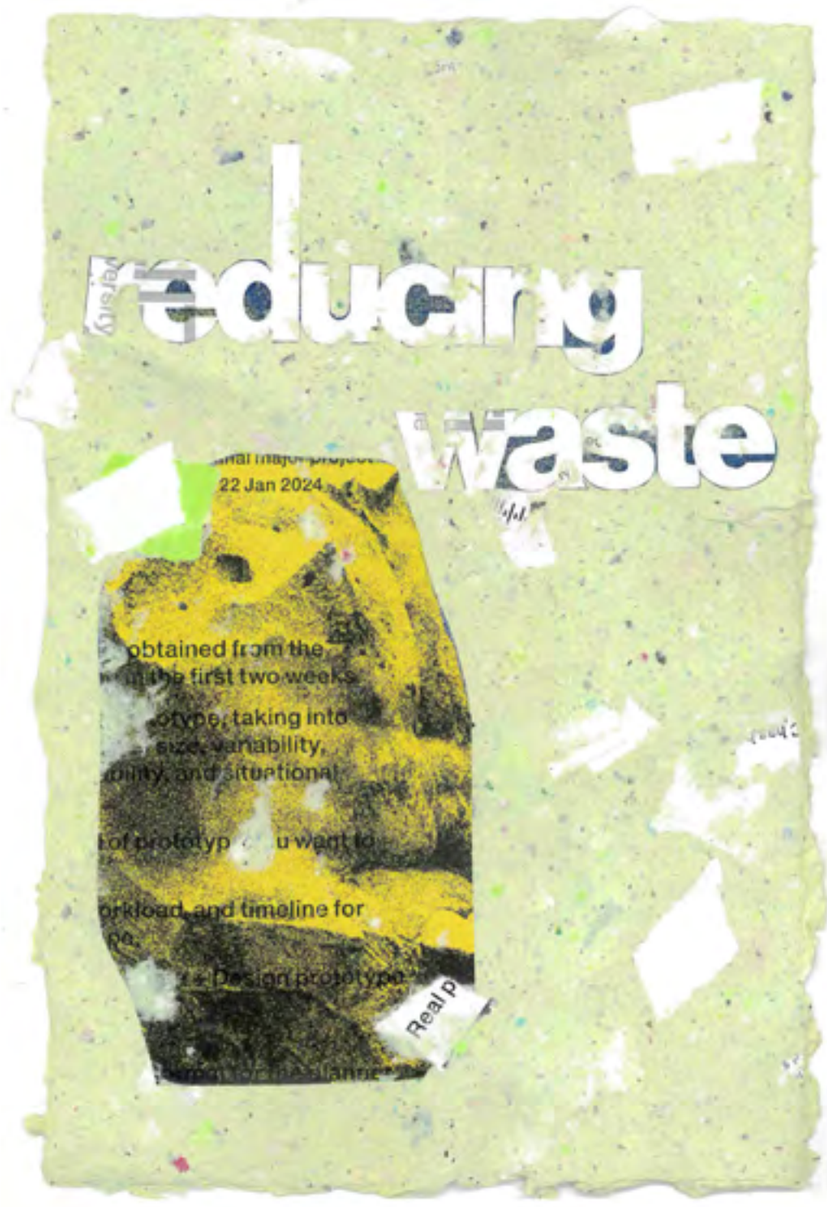
I was able to borrow some of the equipment used for paper making so I could continue experimenting with the process from home.

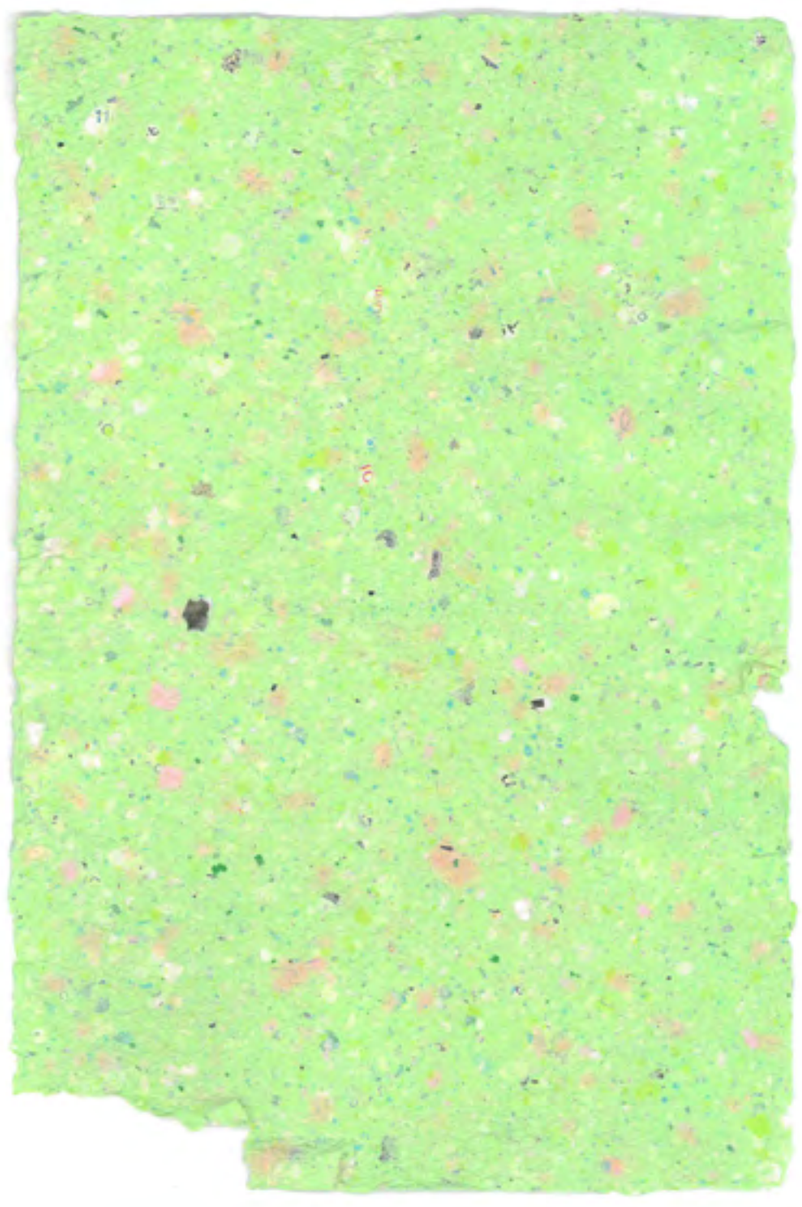
For my continued attempts with paper making tried to fix the issues I had previously. I made sure to thin my mixture down more, and when I used the deckle to collect material I checked the thickness before continuing with the process.

As well as trying to improve my paper, I also played around with adding to the paper mixture. For my first attempt I added some cut out sections of the overprint poster I made previously to see if I could design a poster without needing to print onto the home-made paper directly. I also tried adding more colour to my paper by using ripped up post-it-notes in the mixture, as well as blending the paper less so some specks of different colours appeared in the final product.

FURTHER PAPER MAKING OUTCOMES

Fig. 98 and Fig. 99 - Scans of the two pieces of paper I made at home





These are the two sheets of paper I made while continuing to experiment with the process at home. Compared to the two I made in the workshop, these are a much better thickness; the green speckled paper bends much like a standard sheet of printer paper.

They also managed to hold their shape much better, however I did damage the speckled paper slightly as one corner was slightly weaker than the others.

I think my texture and colour experiments also went well, the poster elements included in the first piece are legible, and have merged well with the rest of the paper. I don't think I will use this technique for any of my outcomes but it was fun to try. I think the texture of the speckled paper is nice and helps to make the sheet feel hand made.

POSTER EXPERIMENTATION 02

Fig. 100 - Fig. 103 Show different coloured variations of my second poster experiment

Using my experiments with making my own paper and placing pieces of image and type directly into the pulp before it dried, I was inspired to create a new poster. I wanted to iterate on my first poster experimentation, but make use of the paper as a part of it.

I scanned in the paper I made with embedded typography and images, then used Photoshop to tweak the position of certain elements, and add more colour to the design. I chose to use a scan of the paper instead of work completely digitally because I wanted to combine the two types of media to help enhance the meaning behind my designs. Also, I wanted to try and keep as much of the texture from the paper as possible, due to this I also overlayed a scan of the speckled paper over the design.

I then created several iterations exploring different colours, making sure to consider colours that I reflected the environment. The colours I chose also reflect the environment, helping to ground my design to the context. I also thought about whether the colours used could be created by using certain colours of pre-dyed paper in the process of making my own paper.

Fig. 104 and Fig. 105
Show different coloured variations of my second poster experiment

PROTOTYPE 02 - PEER FEEDBACK

For this peer review I presented my experiments with making my own paper for this project, as well as my first attempt at using the perfect binding machine to make a book.

A key piece of feedback I received from several people was to consider what I'll use my paper for, and the content I'll be trying to present.

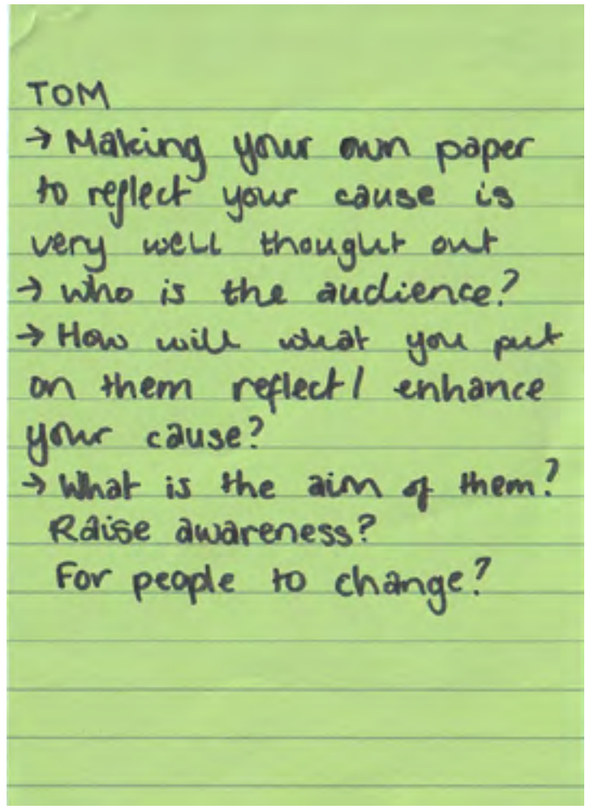
"How will what you put on [the posters] reflect/ enhance your cause"

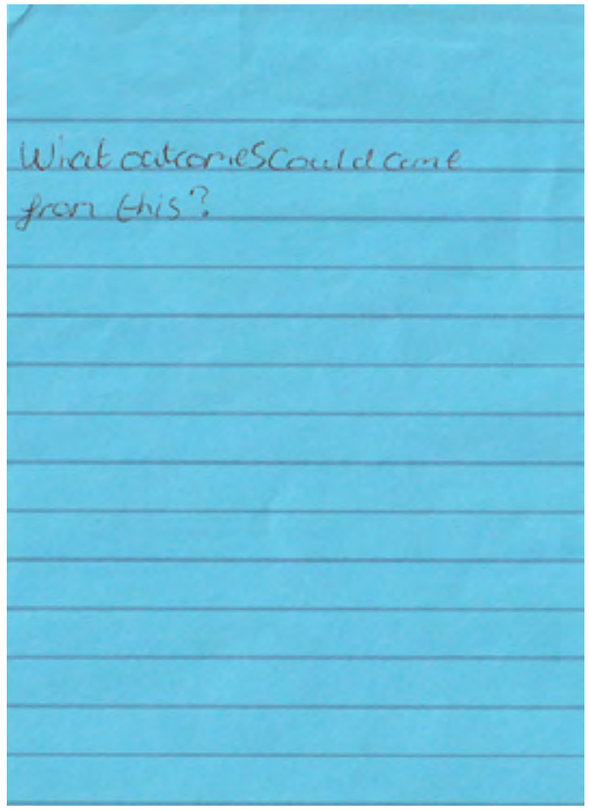
"What outcome could come from this"

"What is the aim of them"

To develop my project further I need to decide what I want to include on the posters I make with my hand-made paper. To do this I need to research existing exhibitions that are focused on reducing waste, such as the 'Waste Age' exhibition I looked at previously, and look into other artists creating similar posters.

I also need to think about how I will be using my paper to display my designs, I want to return to the idea of using a projector to contrast the roughness of the paper.





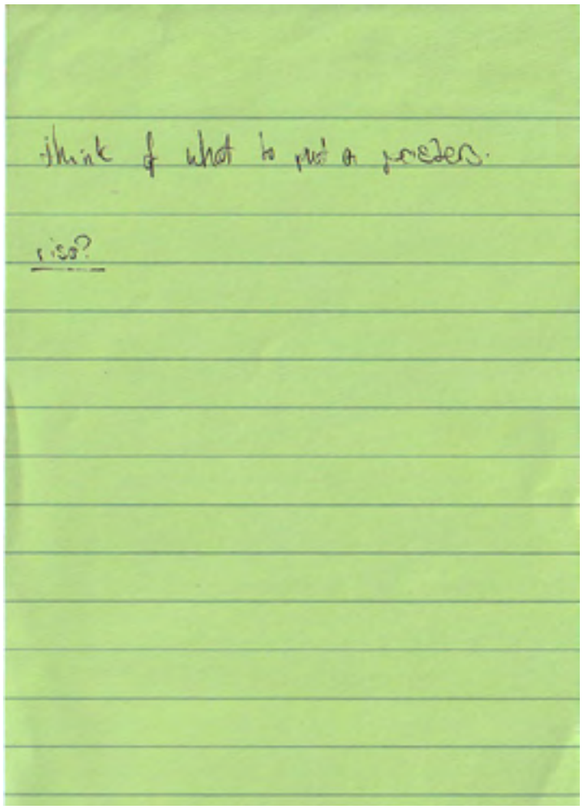
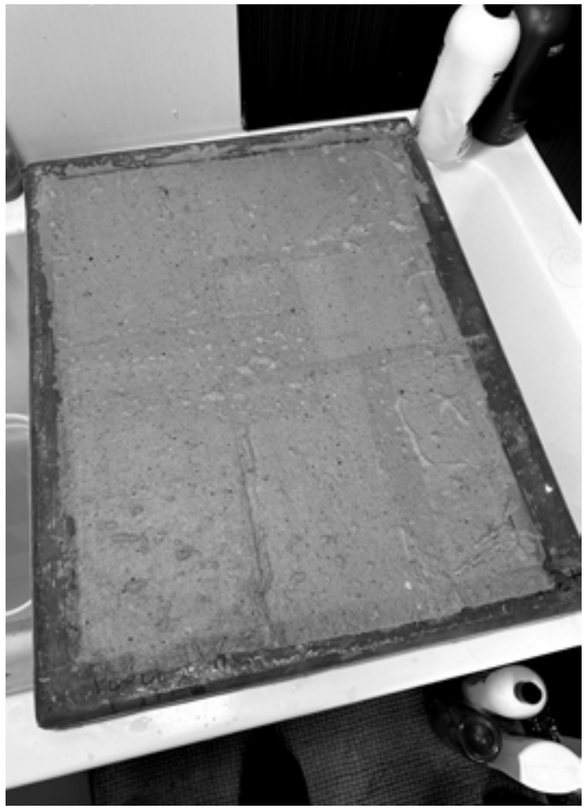


Fig. 106 - Fig. 108 - Post-it-notes with feedback about my second prototype

PAPER MAKING FOR SCREEN PRINTING

Fig. 109 - Fig. 112 - Photos I took when I was testing the process for making a larger sheet of paper



In preparation for a screen printing induction workshop I produced some larger pieces of paper so that I could print on them. I wanted to make sure I had a piece of my own paper for the screen printing so I could test how the ink reacts with it to ensure it will work okay for my final outcomes.

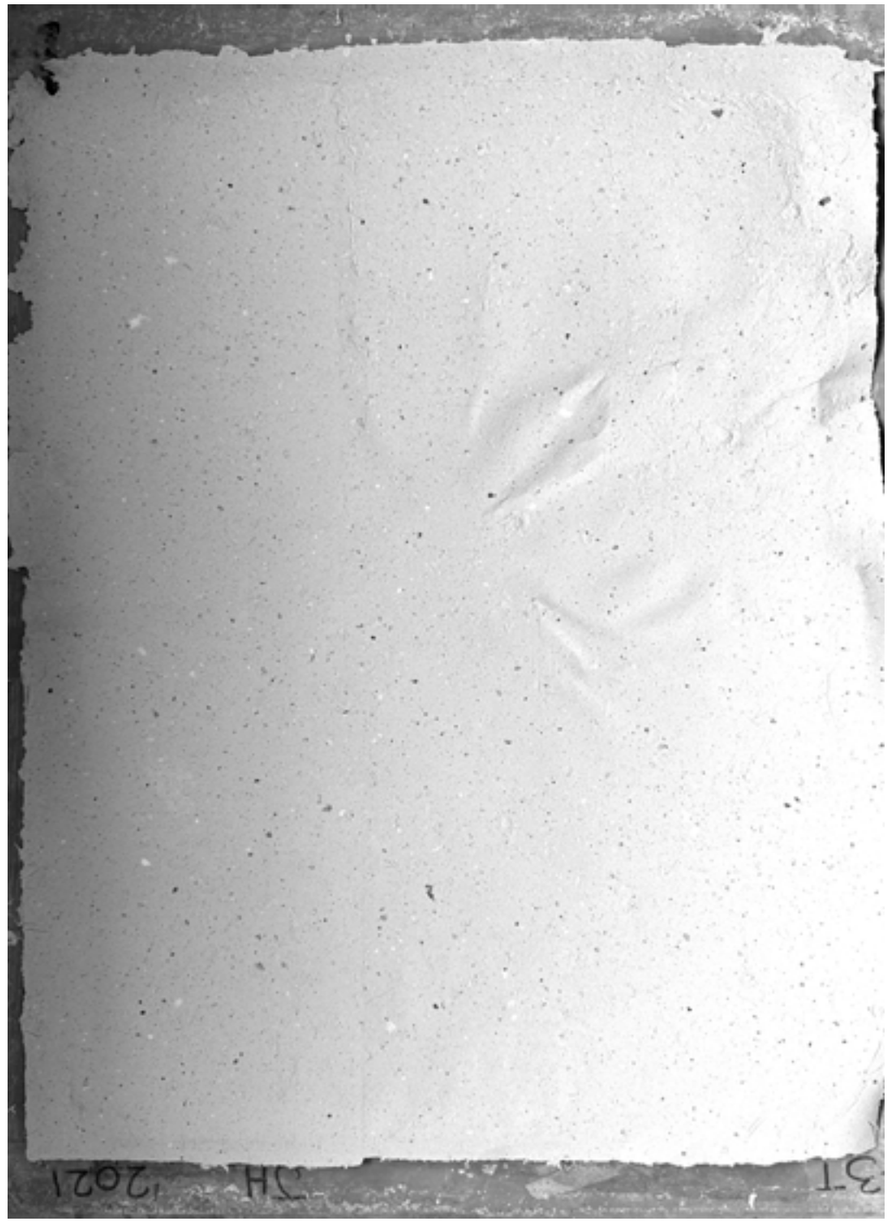
So that I could make big sheets of paper, I borrowed a silk screen designed for screen printing onto A3 paper.

To make the paper I followed the same steps as previously; I ripped some scrap paper up and soaked it in water, the blended it into a pulp and mixed it into a large tub of water. To make my sheets of paper larger I first tried pouring the paper mixture directly onto the screen, however this just resulted in the pulp clumping up, or being washed away by the water.

I then tried using the small mould and deckle that I used previously, and instead of placing the sheets of paper on fabric top dry I put them onto the silk screen. I repeated this placing smaller sheets all over the screen until it was completely covered, then added additional sheets over the top to reinforce areas where it might be too thin.

To dry the paper I simply left it on the frame, and used a mixture of an electric heater, and the radiators in my house.

Fig. 113 and Fig. 114 show the outcomes of my large scale paper making



This is the large paper I made to be used in my screen printing workshop. The different layers where I overlapped the smaller sheets is clear when the paper is backlit, however this shouldn't matter when the paper is displayed as it will be against a wall.

The thickness of the paper is also good for printing. I learned from my previous two paper making experiments, and ensured I wasn't loading the mould with too much material. I was able to make this sheet slightly thicker due to the size, which has also made it stronger and more durable.

The process of making this paper was difficult due to having to compile lots of smaller sheets to make it, however it is very manageable, and I should be able to repeat it to create enough sheets for my outcome posters.

CREATING A DESIGN FOR SCREEN PRINTING

Apart from the paper, the other item I needed for my screen print workshop is a design to print with. I wanted to keep this simple as a proof of concept, so I just took the design from my second poster test, and cleaned up all the texture.

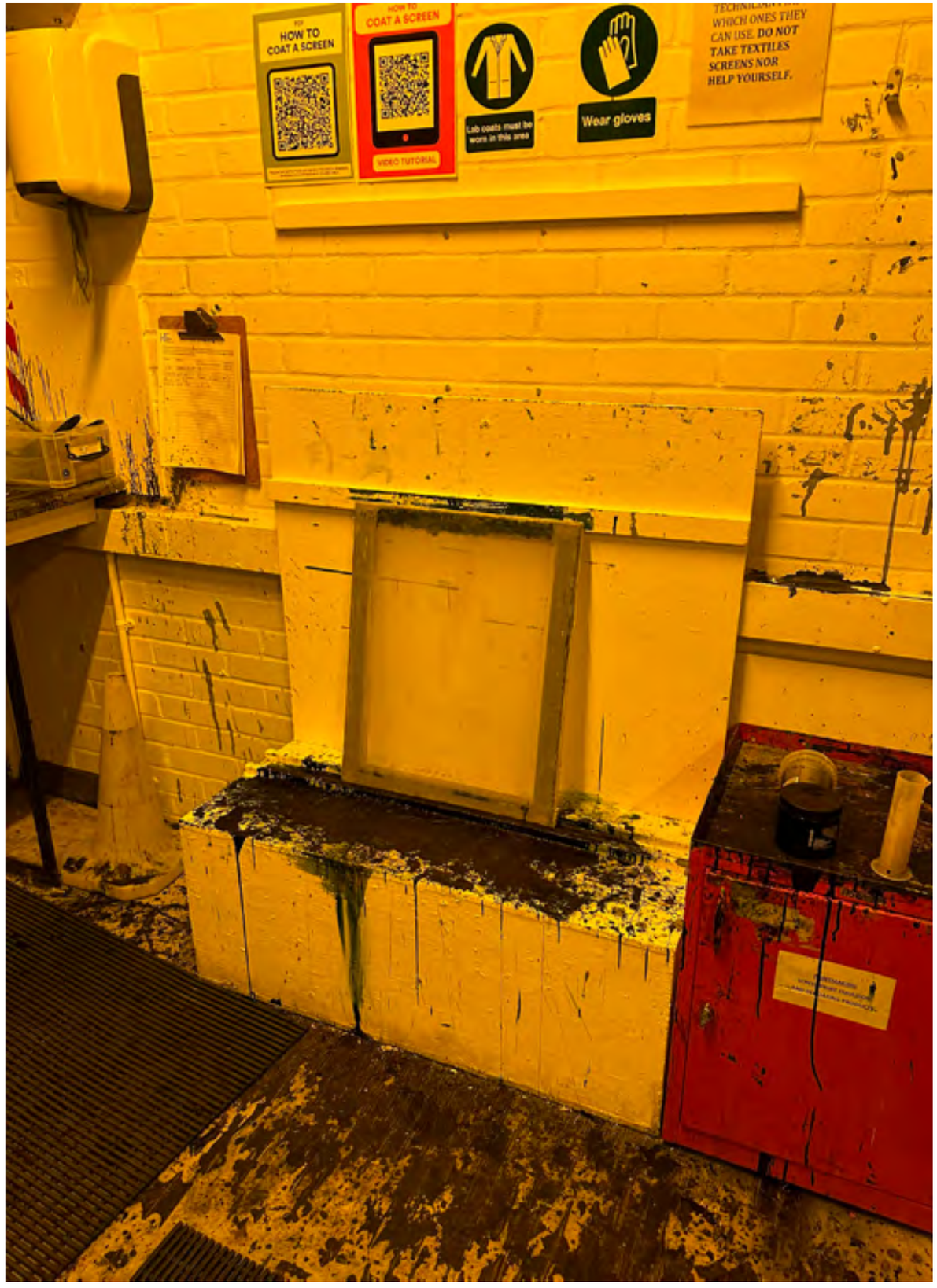
I made sure the image was completely black and white, then printed it onto acetate. This allows it to be placed on the screen and exposed, with the black elements blocking the light to the screen, not exposing those areas.

Fig. 115 - The design I created for my screen print workshop

Fig. 16 - My design printed an acetate ready to be exposed onto the screen

SCREEN PRINTING WORKSHOP

Fig. 117 - My silk screen set up ready for emulsion to be spread on it



I was able to take part in a quick screen printing workshop so that I would be able to use the print facilities later on in my project. This also meant I could test how the ink reacted with my recycled paper to ensure I wouldn't have any problems when creating my final outcomes.

To prepare my screen, I first set it up and spread the emulsion across the top surface. With the screen fully covered in emulsion I then placed it in a heated cupboard for about two hours so it could dry completely.

Once the screen was dry I used the exposure unit to add my design to it. I placed my design right side up on the surface of the exposure unit, then put the screen emulsion side down on top of it. I then placed the air tube within the centre of the frame and activated the vacuum, allowing the top of the unit to form to the screen inside. I let the screen expose for 1 minute and 45 seconds, allowing the emulsion around the design to cure without curing the design under the printed part of the acetate.

Finally, I needed to spray down the screen to wash away the emulsion that hadn't cured where the design was. This process had to be done carefully to ensure all the excess was washed away without removing any of the cured emulsion, which would effect the design. My screen was then placed back into the heated cupboard to dry until I was ready to print with it.

SCREEN PRINTING AND PAPER TESTS

Fig. 118 - Fig. 125 - Pictures of me over the process of screen printing my design

After leaving my prepared screen for a few days to dry I collected it from the heated cupboard so I could practice printing with it, and test how to ink reacted with different paper types.

The ink I was using was labelled as block printing ink, so to ensure it properly went through the screen I watered it down slightly. I then placed my screen over the paper, ensuring the design was aligned, and used some small weights to hold the corners down. I carefully spread the ink across the top of the screen, just above the design, and used a squeegee to spread the ink evenly across the screen.

Once I had printed onto each of the different paper types I had, I hosed down the screen to clear the excess ink off, and then placed it back into the heated cupboard to dry.

Fig. 126 - Each of the test prints on different papers

For my print tests I collected several different types and weights of paper, including some cartridge paper that was a similar weight and texture to my hand-made paper. As I am already planning to use my own paper for my outcomes, this test was mostly to see whether the ink bonded with it okay. The other paper stocks allowed me to test alternatives if mine didn't work, and I could then try to mimic the qualities of them for future paper iterations.

The screen ended up printing well, with all the design being clearly visible across the different paper types. The ink bonded well with my hand-made paper, and there were no issues with drying time, or ink bleed.

SEWING MACHINE TYPE WORKSHOP

Fig. 127 - Fig. 129 - Scans of the typography I made in the workshop

During my studio time I was able to take part in a quick workshop that covered using a sewing machine on paper to make typography. For this workshop all I had to do was sew onto paper as I would normally with fabric, using a foot that allowed the needle to be moved around freely.

I used this opportunity to experiment a little with a potential idea for my posters. I liked the use of thread to create the type, as to me it was reminiscent of fishing lines, a huge contributor to plastic pollution in the oceans.

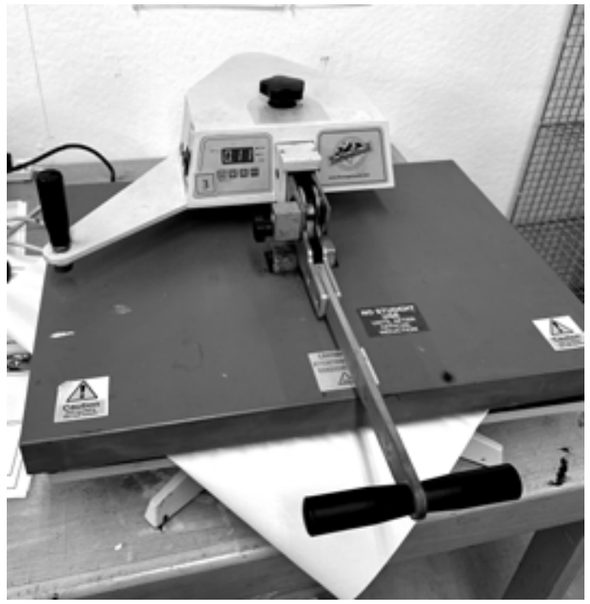
With the scanned in copy of my typography, I used Photoshop to adjust it to be pure black and white, and the experimented with adding colour.

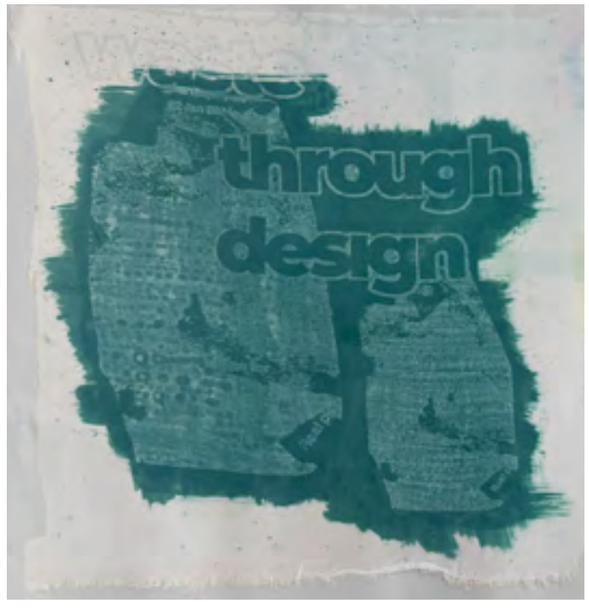
I like the outcome from this workshop, but I doubt I will use it further in my project, as I think the sewing will damage my paper too much. Also, I found the colour that I chose for this experiment, which was inspired by the waste age exhibition, worked well for my project, so going forwards I want to try and apply this colour to some of my other design elements to see how it works across my outcomes.

HEAT PRESS WORKSHOP

Fig. 130 - The heat press

Fig. 131 - Fig. 133 - The outcomes of the heat press workshop





Following on from the sewing machine workshop, I was also able to use the heat press to learn how I can apply my designs to fabric. This workshop will likely not affect my final outcomes, as I don't plan to use an fabric for them, however I thought I should take the opportunity to do the workshop anyway just in case I want or need to use the heat press in the future.

To use the heat press, all I had to do was place a piece of the coloured heat transfer paper onto the surface I wanted to transfer it to, in this case a piece of scrap fabric, and then place both of these into the heat press for about 30 seconds. The colour then gets transferred to the fabric.

I then used one of my old poster designs, and spread heat transfer paint over it. When the paint dried I used the same method of placing this over fabric and putting it in the heat press. where the design was printed on the paper, the paint didn't stick as well, so this area of the design was lighter on the fabric, allowing you to see all the details.

OUTCOME IDEATION AND PLANNING

Following on from the workshops I completed, I started to mind map ideas for my outcomes. I had already decided that I would be making and printing a set of posters using the techniques I learned in the workshops, but I needed to consider the content of them.

For the poster I started by writing down all the reasons I could think of that paper production and printing causes waste. I want the content of the poster to shock the audience, so I needed statistics that people are unlikely to know. I also though that instead of telling people about the problems with traditional paper making and printing, I could talk about the benefits of using recycled materials.

I also made a separate mind map exploring other options for outcomes. I noted here that I could use a projector, which is something I considered previously. As well as the posters, a book that explores the project could also work well, as for my FMP I already need to make a printed book of my process.

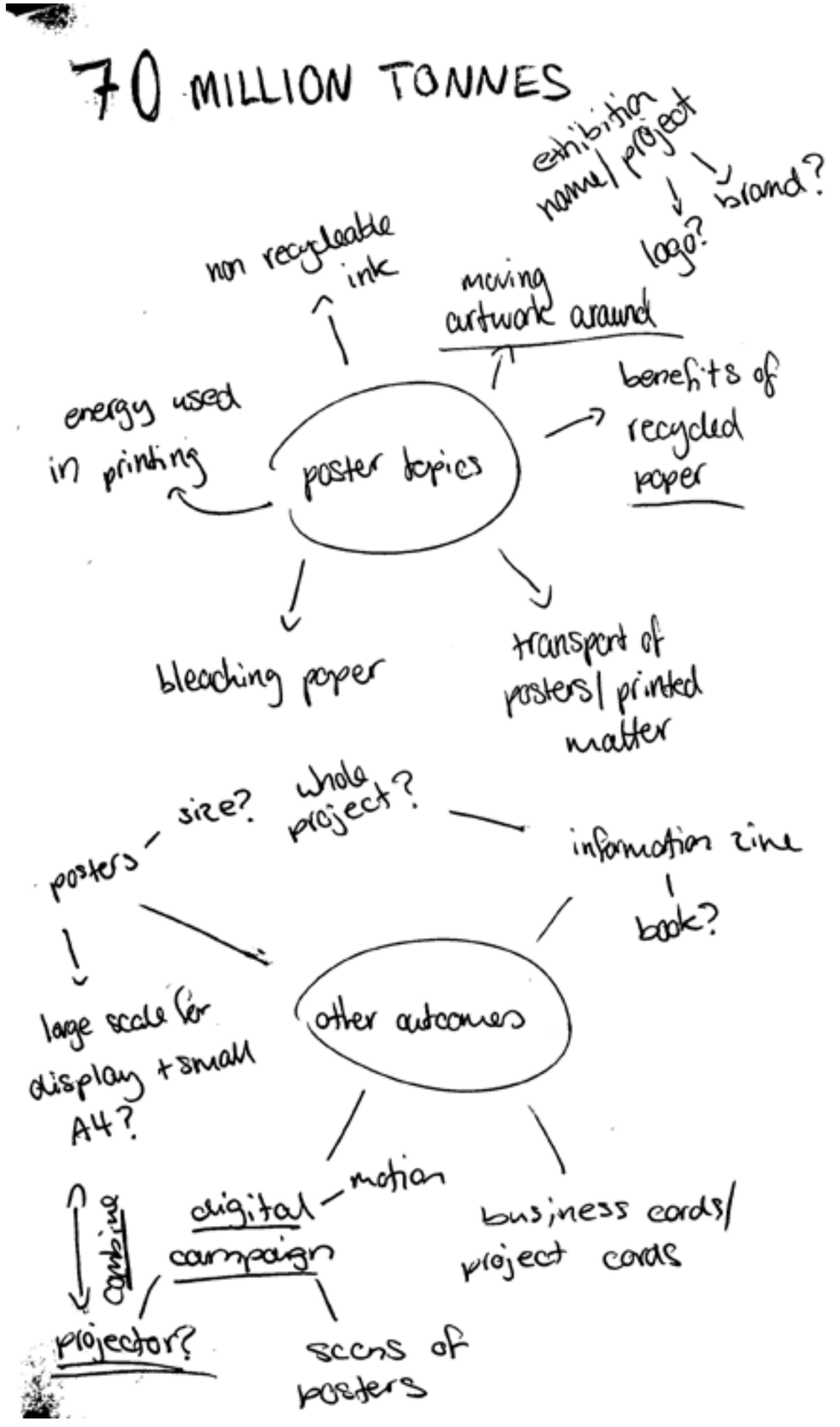


Fig. 134 - Sketched mind map of my final outcome ideas

TYPOGRAPHY AND LOGO EXPERIMENTS

In a short talk with my tutor, it was suggested that I create a name for my project/outcome that I could print on the posters to draw people in.

Initially I cam up with ‘Waste Through Design. Design Through Waste’ and began to explore some visual ways I could present this. I tried several different ways of expressing the name, such as using negative space as a way to reflect the text, however this title didn’t seem interesting enough.

My second idea was to take some of the research I had done previously and take a statistic that could then become the project title. Through my research, I had learned that worldwide the exhibition industry produces 70 million tonnes of CO2 emissions each year. I shortened this to ‘70 Mega Tonnes’ to make it a bit more punchy and impactful.

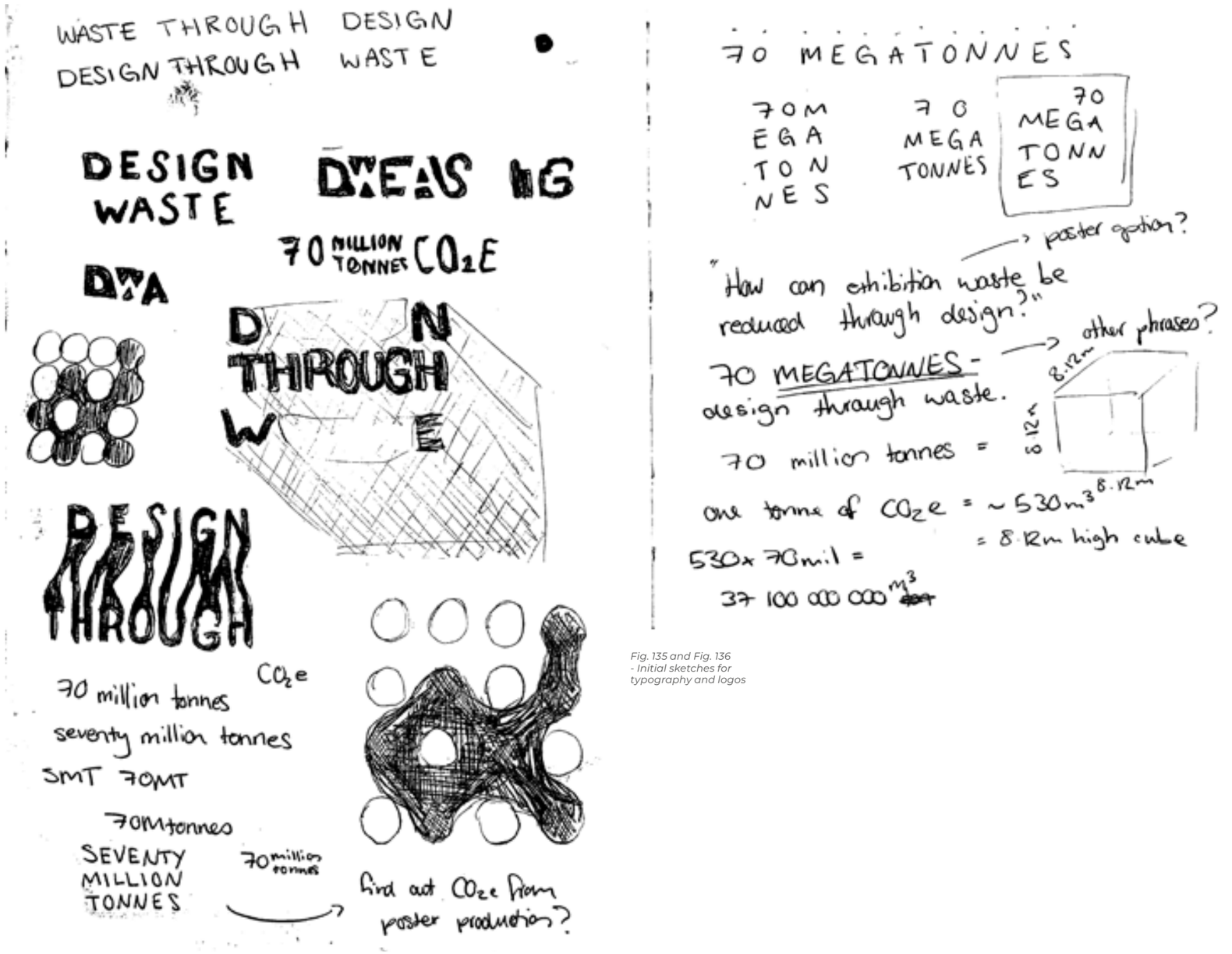


Fig. 135 and Fig. 136 - Initial sketches for typography and logos

TYPOGRAPHIC POSTER MOOD BOARD

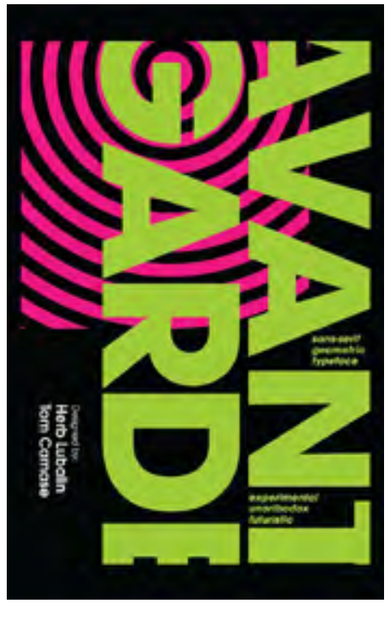
Fig. 137 - 145 - Posters that prominently feature typography in their designs

As I began to think about the outcomes I'd be making for my project, I created several mood boards of poster designs that I could use as inspiration.

The posters in this collection all use typography as a key feature of the design in various different ways. I really like the visual style of the masking tape typeface as it effectively conveys emotion, something that my poster will also need to accomplish.

SCREEN PRINT POSTER MOODBOARD

Fig. 146 - 152 - Posters that make use of screen printing or similar techniques



As well as my typography poster mood board, I also wanted to explore designs created using screen printing, and similar techniques.

While looking for inspiration for this mood board, I noticed a lot of the screen printing designs make use of opacity and overlapping printing. In my own designs I won't be using multiple layers of printing, instead I'll be trying to mimic this using a projector.

I found a lot of the design make use of very striking, bright colours. Thanks to the way screen printing works, the colours that I use will be very bright and colourful, meaning I should be able to mimic the green that I experimented with in the sewing machine workshop.

MASKING TAPE TYPOGRAPHY

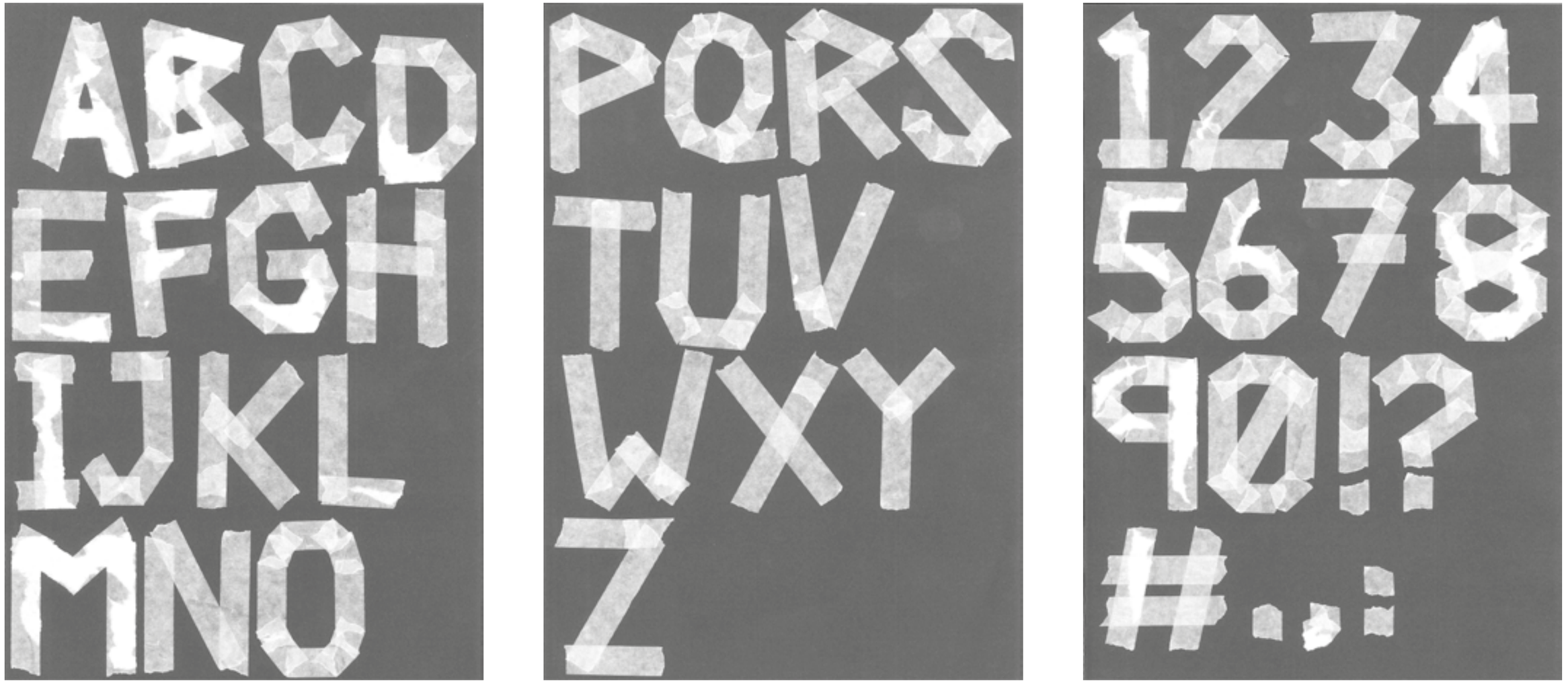


Fig. 153 - Fig. 155 - A typeface I created using masking tape

Inspired by the poster from my typography mood board, I attempted to make a typeface using masking tape.

I felt the grungy style of the typography would lend itself to my poster design well, and would help to make my message bold and interesting. The tape would also contrast well against the other design elements I include using the projector.

In order to make the masking tape show up when I scanned my typography in, I needed to construct it on a dark coloured paper. Initially I had used white paper, so I had to peel the tape off and re-stick it to some brown paper.

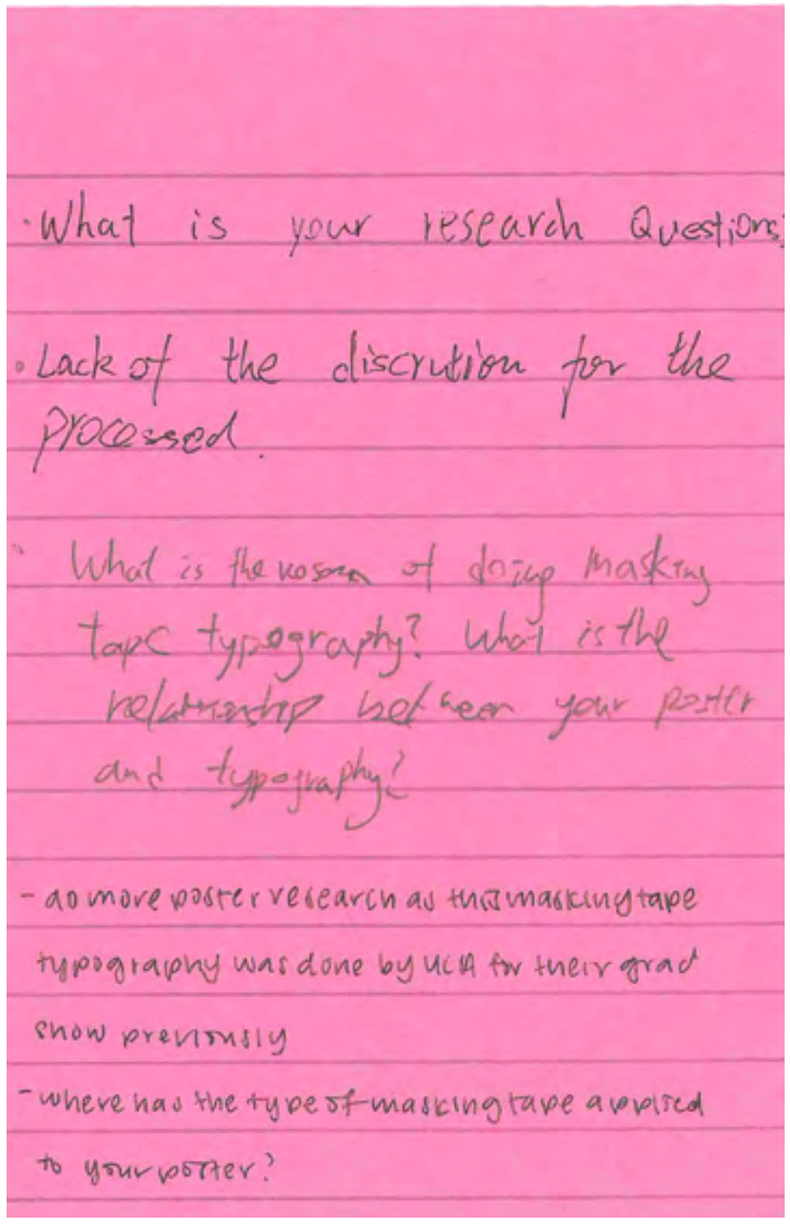
TYPOGRAPHY DIGITISATION

Fig. 156 - Fig. 158 - A digitised version of the typeface I created using masking tape

After making my masking type characters, I scanned them into my computer and used Photoshop to invert the colours. I also used the threshold effect to ensure the image was black and white instead of greyscale, as this would make it easier to experiment with colours. As I used a high resolution scanner for this, the threshold effect has preserved a lot of the texture of the tape ensuring the typography is still visually interesting.

PIN UP CRIT FEEDBACK

Fig. 159 - A post-it-note with feedback about my unit report



Just before the Easter break we had another peer feedback session in the studio. For this I prepared several pages that showed an overview of my project, from the ideation, to the research, so some of my prototyping and experimentation.

The majority of the feedback from this review was regarding my unit report, and how I've recorded my project.

"What is your research question?"

"Lack of description for the processes"

Some of the feedback covered elements that I had done, but I wasn't able to include in this review.

"How has the masking tape typography been applied to the poster?"

"What is the reason for the masking tape typography"

Fig. 160 and Fig. 161 Show the pages I presented for this feedback session

POSTER EXPERIMENTATION

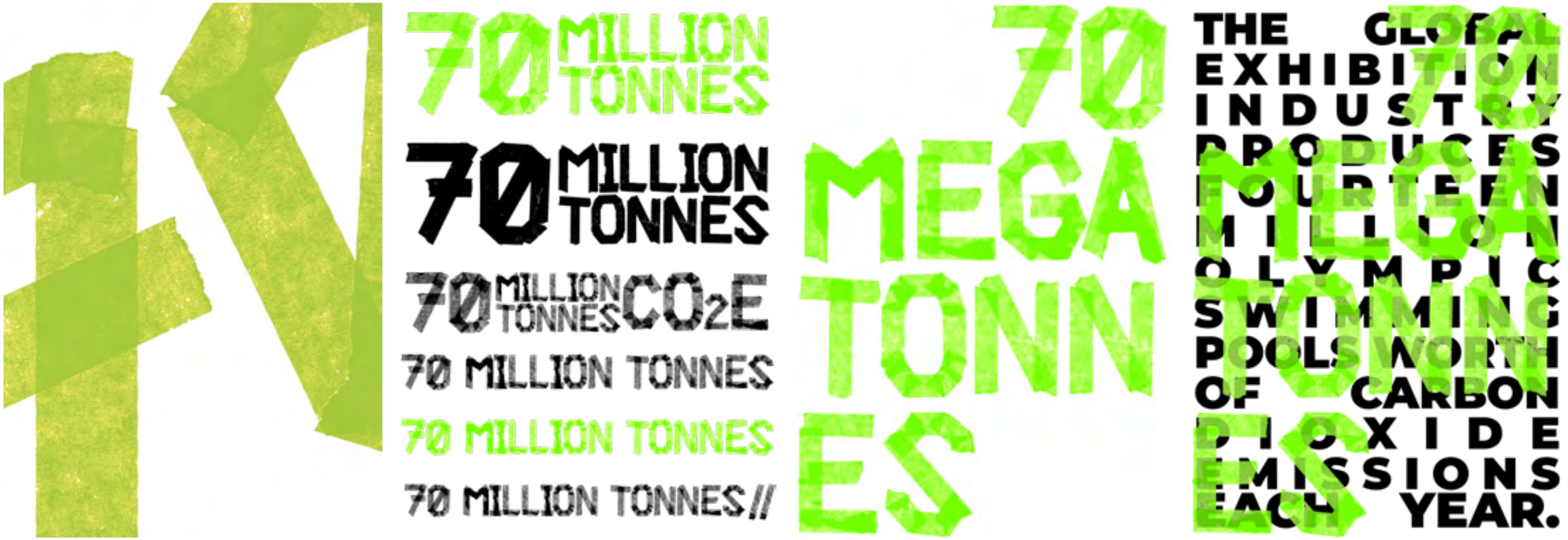


Fig. 162 - Fig. 165 - My first experiments with designing my outcome poster

I started using my masking tape typography to play around with layouts and designs for my posters. I already had somewhat of an idea from the sketches I did during the outcome ideation stage, however I wanted to try some other options too.

I tried abstracting the type and focusing more on the shapes, and negative space it created. I liked the option to be able to create patterns with this, however I felt it defeated the purpose of creating the name for my project as it couldn't be read, and therefore reduced the impact I was hoping to create with the posters. I did like the way the design filled the space, so I worked with that in mind for my next idea.

This design is based on the sketches I did earlier, filling the whole area of the poster with typography by splitting the words up. This design also allows for some negative space to balance out the block colour. Finally I made a version with more information in the background. I think this design works best as its punchy, whilst also communicating the relevant information.

Exhibition poster

POSTER TYPEFACE OPTIONS

Using the design from my poster experimentation as a base, I created a number of iterations using different background typefaces to choose which would be best for the project.

I knew I wanted a bold sans serif that would both fit which the heavy lines of the making tape typography, and contrast the grungy aspect of it. All typefaces were tested in size 22 pt, using optical kerning, and a tracking of 25. I tried a number of different typefaces, eventually settling on Montserrat Black.

Neue Haas Grotesk Display - 95 Black

the global exhibition industry 1234567890.

THE GLOBAL EXHIBITION INDUSTRY 1234567890.

Montserrat - Black

the global exhibition industry 1234567890.

THE GLOBAL EXHIBITION INDUSTRY 1234567890.

Futura PT - Extra Bold

the global exhibition industry 1234567890.

THE GLOBAL EXHIBITION INDUSTRY 1234567890.

Newake - Regular

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THE GLOBAL EXHIBITION INDUSTRY 1234567890.

POSTER LAYOUT EXPERIMENTS

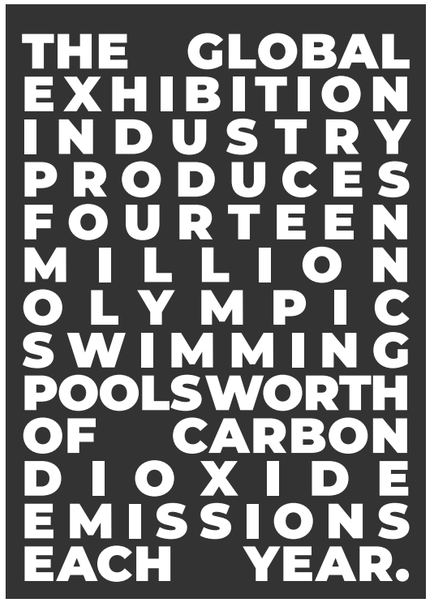


Fig. 166 - Fig. 173 - Various different poster layout options

Now that I had a typeface chosen for the secondary design element of my poster I began to play round with different layouts.

By using different alignment options, and various tracking and kerning sizes I was able to experiment with filling the space, or leaving negative space. As this text will have the screen printed design over the top of it, I decided I wanted it to fill the space, almost becoming a patterned background to the poster. Taking this into account, I settled with the first option.

This option is one I had previously been using as a place holder, but for this experiment I refined the design slightly, taking margins and size into account.

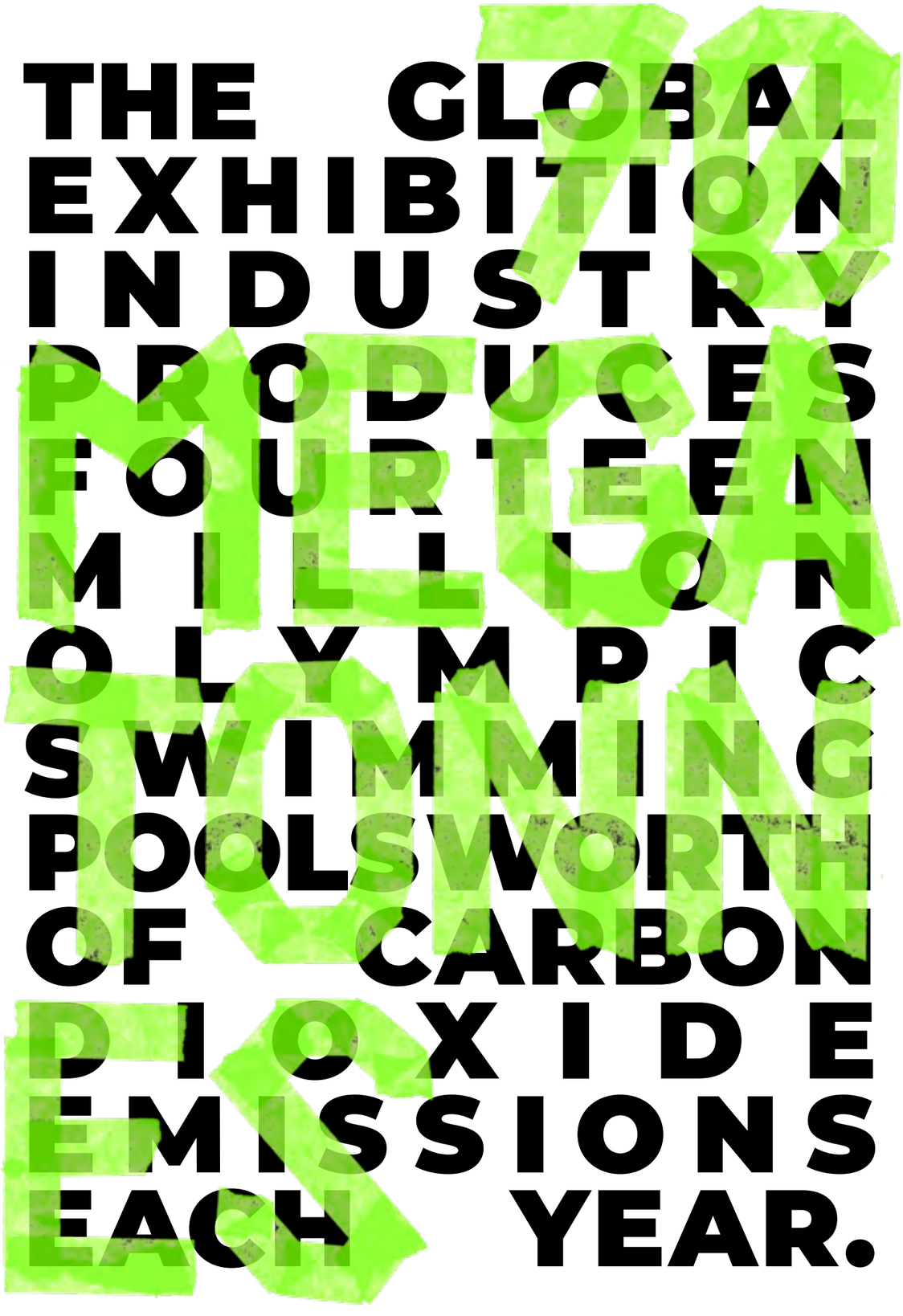


Fig. 174 - My final poster design for the exhibition

This is the final poster design for my project.

The green, primary elements will be screen printed onto hand made paper, then the secondary typography will be projected over the piece.

PROJECTOR EXPERIMENTS

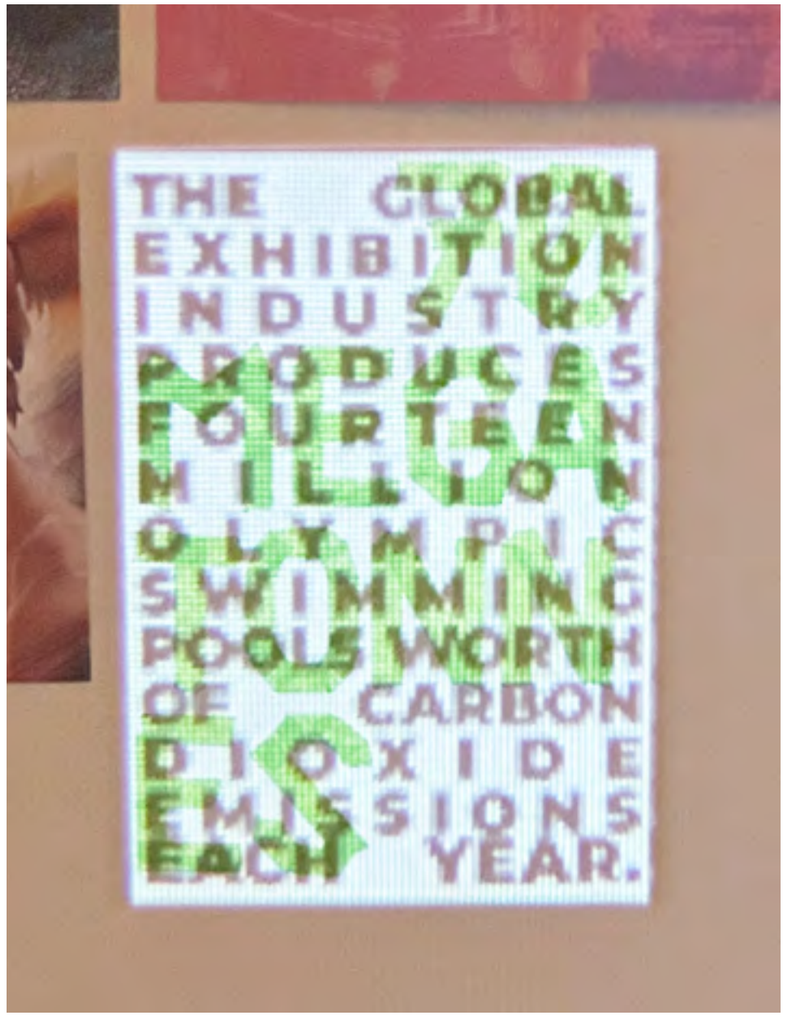
Using the layout I created for my posters, I started to experiment with using a projector to add the secondary elements to it.

To do this I printed out a version of the design I would be screen printing on A4 paper, then, using a small projector I have at home I lined up the secondary design elements to be displayed over the top.

The projector that I used to experiment with is not great, and makes the images very pixelated, however I was able to get a sense of how this outcome could work. I tested it both in low light, and daylight so I could make sure all the information was legible at all times.

In these test I noted the primary elements in green get a little lost in the brightness of the projector, however this is mostly due to the quality of the projector and how it adds a faint background grid into the image.

I can also combat this by using a slightly darker ink when printing the primary elements of my design, something that will happen anyway due to the scale and printing method of my final piece.



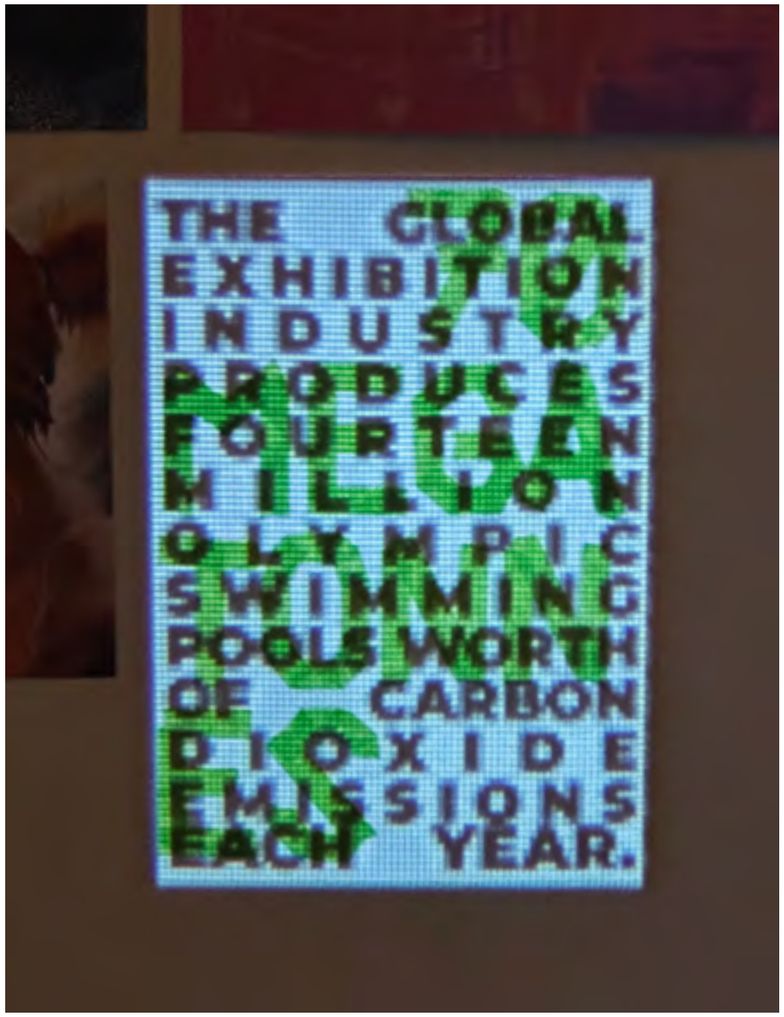


Fig. 175 and Fig. 176 show my tests of using a projector to show the secondary design elements of my poster

SCREEN PRINT AND PROJECTOR MOCKUP

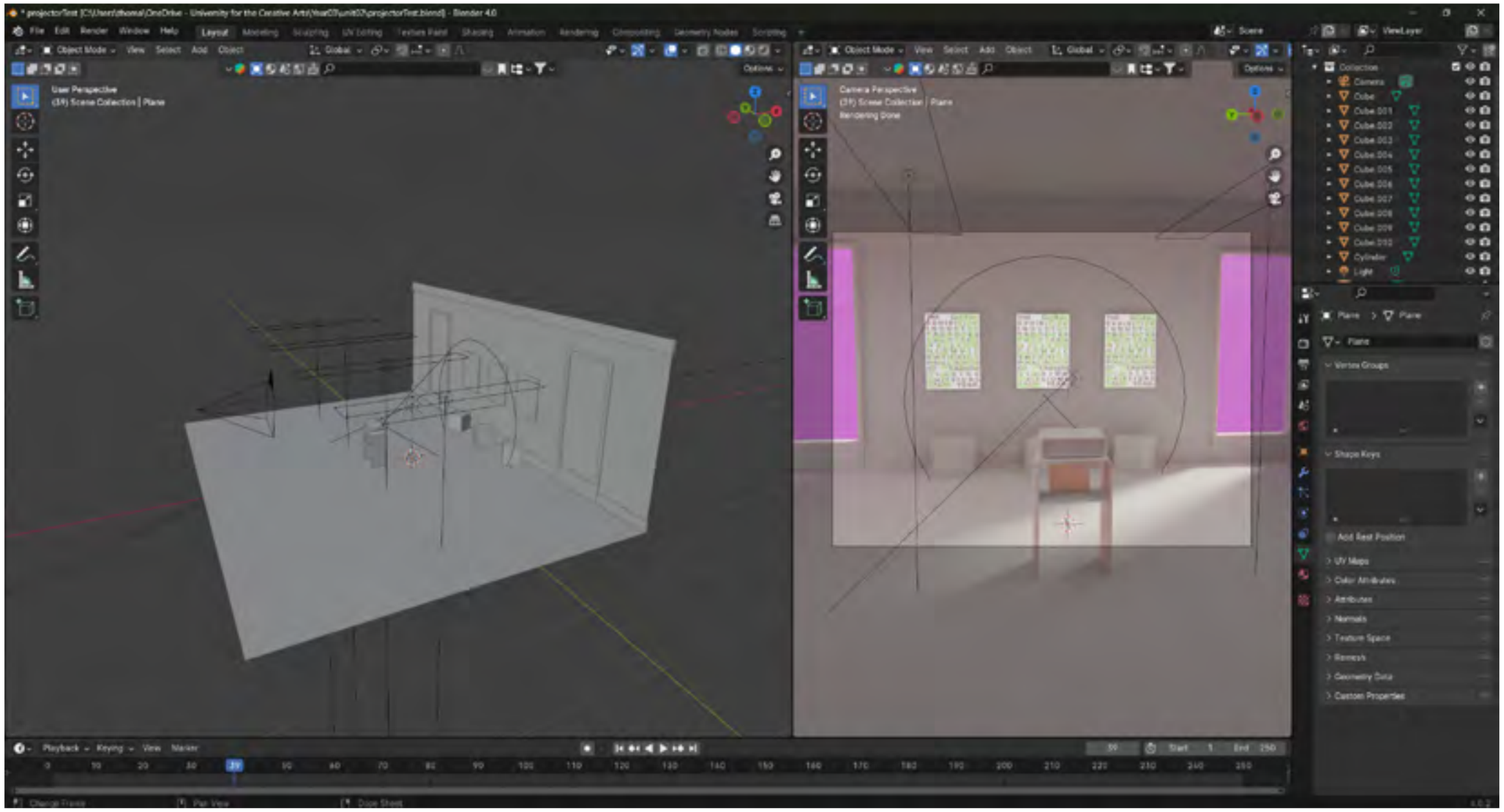


Fig. 177 - The viewport display of Blender showing my mockup

To further test the feasibility of using a projector for my secondary design elements, I used Blender to create a mockup of the design in situ.

Using Blender I was able to display my designs in a different environment so I could better see how the projector would interact with lighting in the room, and with the scale of the pieces.

For this I created a small room, with some realistically placed windows and lights, and then placed my design onto the wall. I also used an HDRI for the environment texture and lighting, which gives the scene realistic lighting from an image of the outdoors. This brought further life to the scene, and helped me visualise how my work will look in an exhibition.

The final render from this mockup is shown on the next page.

Fig. 178 - The final render of my mockup

Exhibition poster

POSTER SCREEN PRINTING

Fig. 179 - Fig. 184 - Photos from the process of preparing my screen

To create the screen for my poster outcome I used the techniques I had learned in the screen print workshop.

I began by coating my screen with emulsion, then leaving that to dry. Once it was dry I used the exposure machine to cure the emulsion around my design, before washing off the excess. Finally, once all the uncured emulsion had been cleaned from the screen I left it to dry in the heated cupboard for when I was ready to print.

Exhibition poster

Fig. 185 and Fig. 186 Show me doing some print tests with my screen

I decided to do some test print before printing onto my hand-made paper to ensure the screen was letting the ink through, and there weren't any issues with the design.

I collected some scrap paper for these test to help reduce the waste output of my project.
As with the screen prints I did previously, I was using block printing ink so I had to water it down slightly to be able to use it. These print tests were a good opportunity to make sure I had the right consistency of ink for when It came to doing my final prints.

Fig. 187 - The test print using different ink colours

As well as testing the performance of my screen and the consistency of the ink, I also wanted to experiment with different colours.

I managed to find a green ink that was very similar to the colour I had been using for my digital mockups. Alongside this I also used a hot pink, and a bright red and blue. I made sure to only choose bright colours that would be the most eye catching when displayed.

From these colour test I felt the hot pink was very eye catching, and definitely drew attention to itself, however I felt the colour didn't really match the themes of my project. I decided that the blue and green inks were the best match for my topic, the blue however wouldn't have stood out against the secondary design elements enough.

I settled on using the green ink, and moved on to my final prints.

Exhibition poster

Once I was satisfied with the quality of my screen, the colour choice, and the thickness of the ink I could do my final prints.

I made sure the screen was completely clean of any other ink before starting, then laid out the screen on top of my paper. I noticed as I was doing this that the paper was slightly smaller than the A2 paper I had done my practices on, and designed the screen for. This resulted in the printed design going right up the top and bottom edge of the paper. This was slightly annoying as when I was making the paper I had used a piece of A2 as a template so I thought it would all fit okay.

I considered remaking the paper and trying again, but ultimately I decided due to time constraints, I would just use these prints. Also, I felt the slightly cropped prints helped add to the hand-made feel of the posters, and when the secondary design elements are added the small mistakes might not be as noticable.

Fig. 188- My final screen printed posters using my hand-made paper

Exhibition poster

POSTER ANIMATION

Now that I had the printed sections of my poster completed, I could start creating the animations that will be projected over the top.

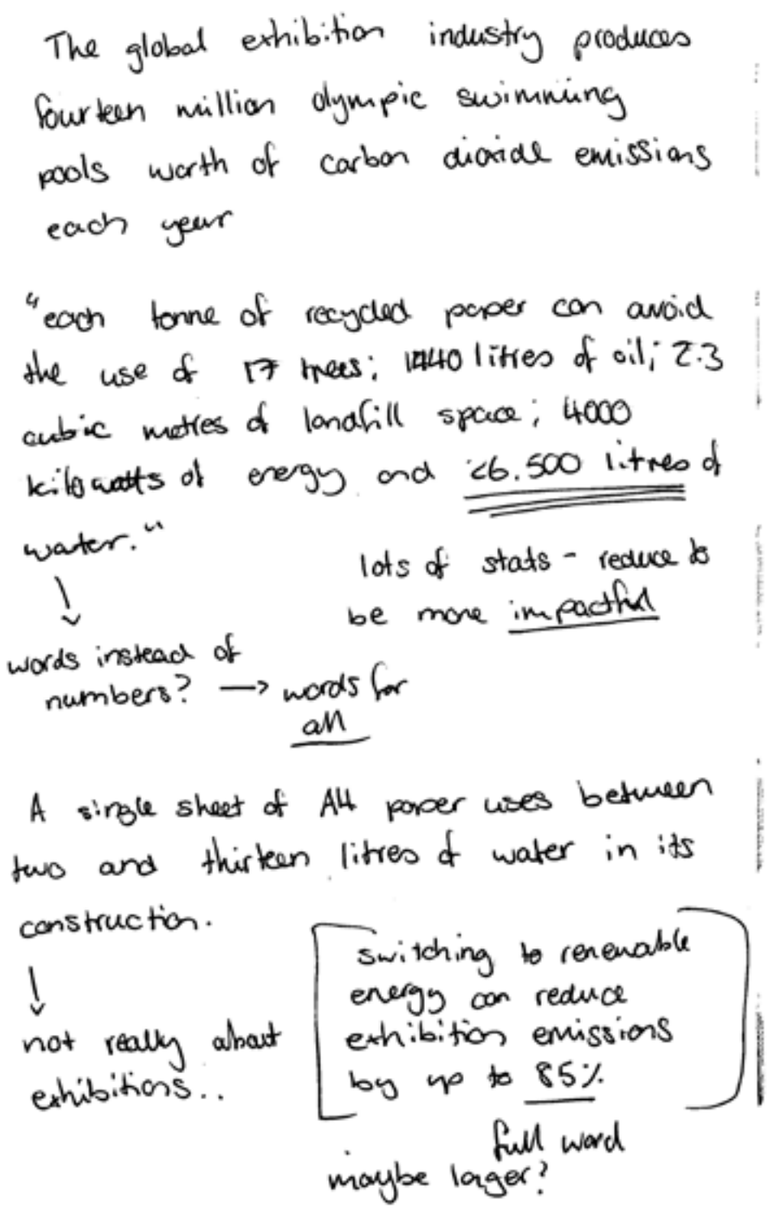
I already had one of the slogans for the poster from when I was experimenting with layouts, so I started by brainstorming the other two. I used information from my research that related to the waste produce by exhibitions, and settled on:

"The global exhibition industry produces fourteen Olympic swimming pools worth of carbon dioxide emissions each year."

"For every tonne of recycled paper, we can avoid the use of twenty six thousand five hundred litres of water."

"Making the switch to renewable energy can reduce exhibition emissions by up to eighty five percent, drastically cutting their impact."

I then sketched out some ideas for how I would add motion to the designs. I liked the idea of adding some subtle motion, and possibly some imagery related to climate change/waste.



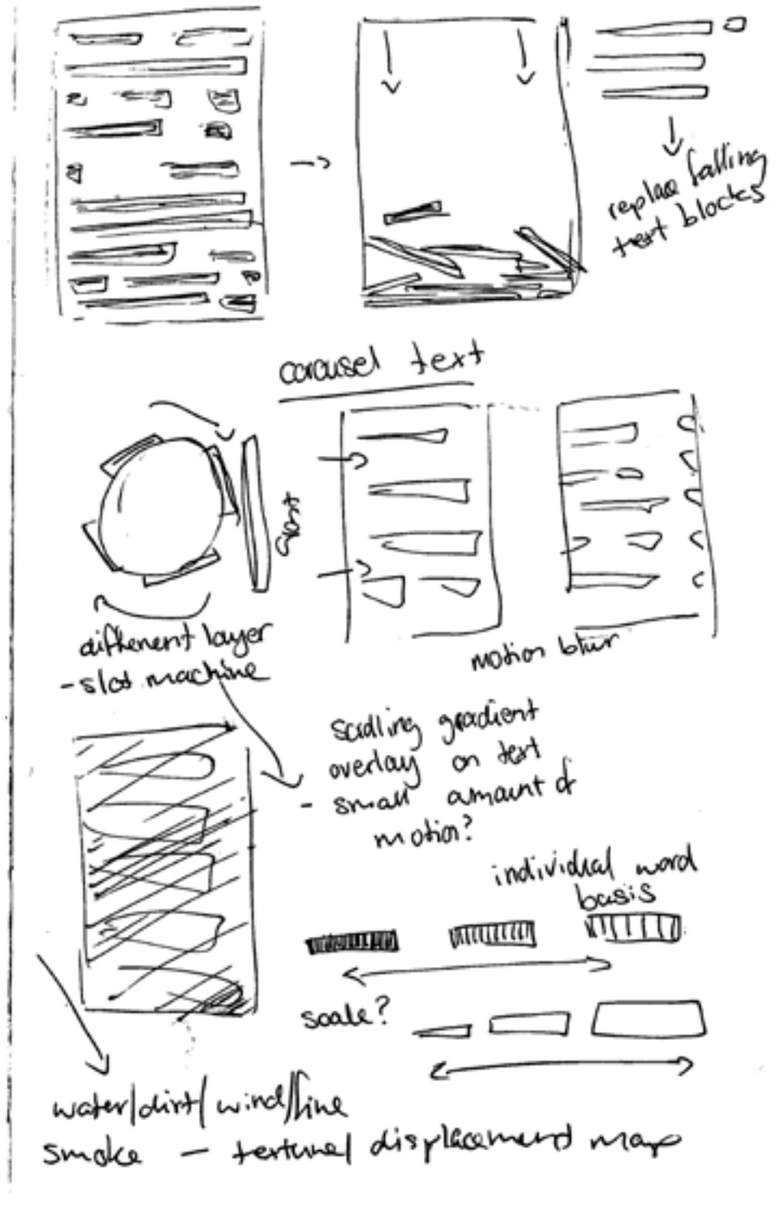
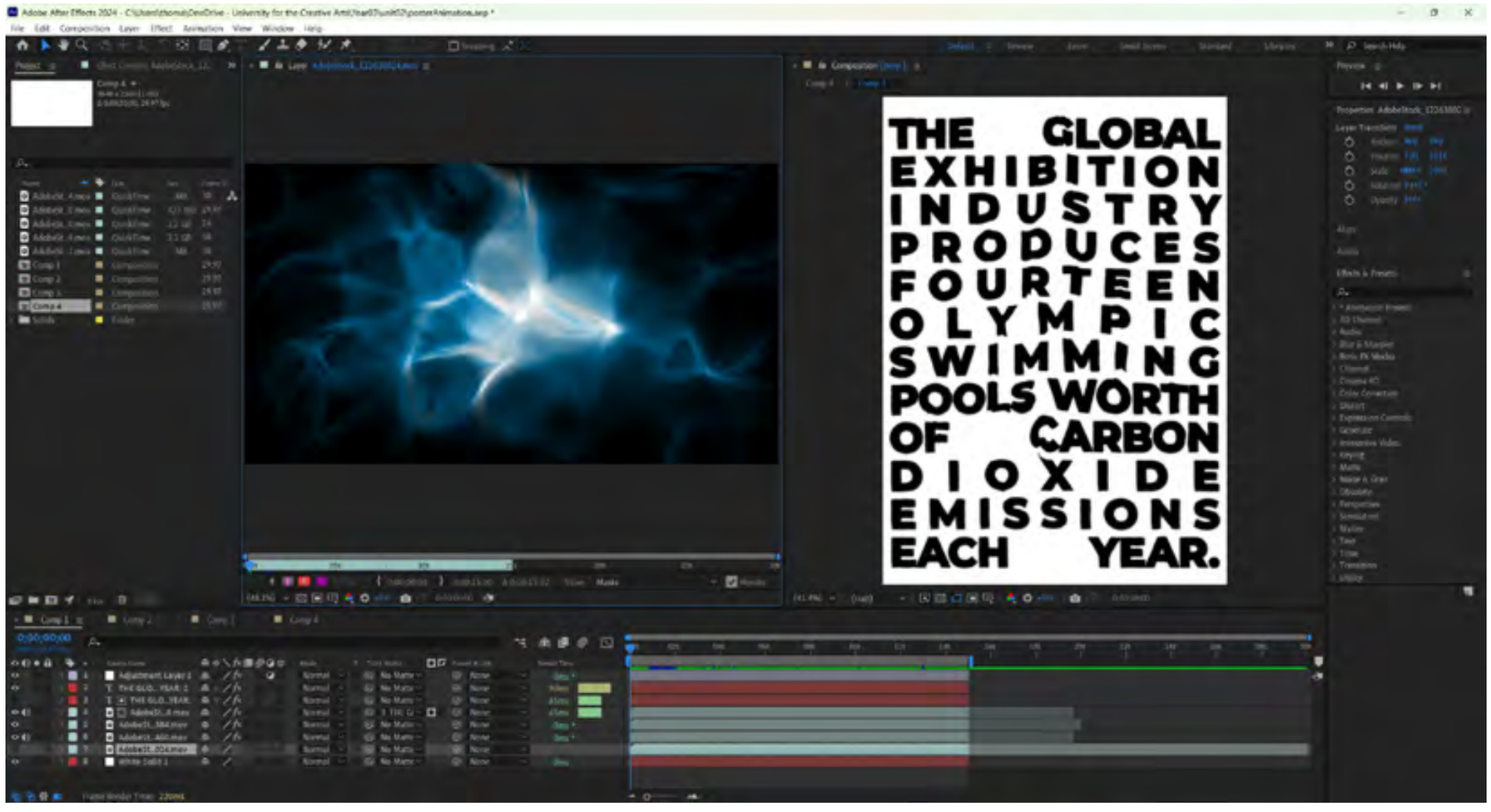


Fig. 189 and Fig. 190 - Initial sketches and text ideas for my poster animations

Fig. 191 - A screenshot showing my process creating the animation

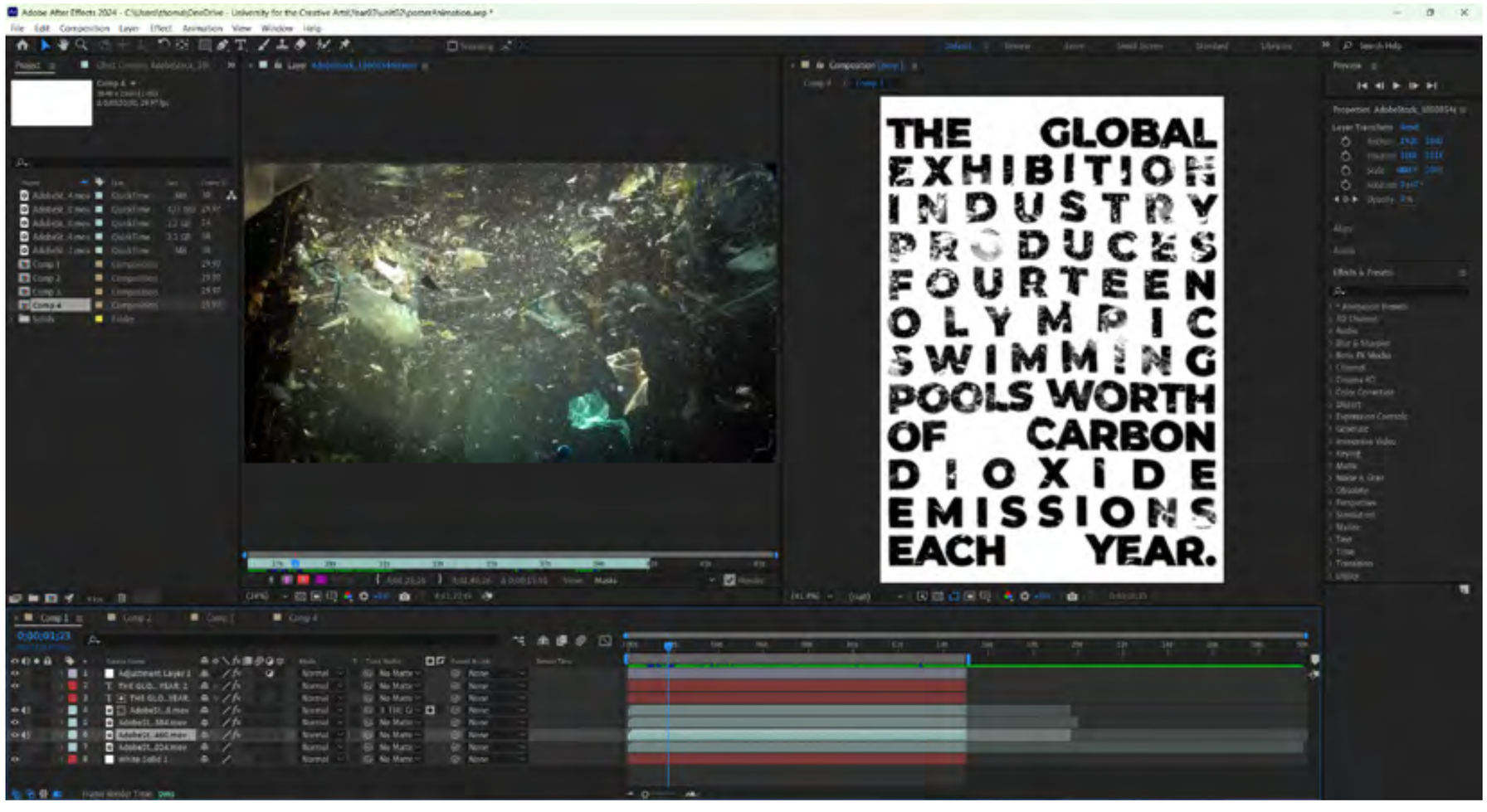


I began my animation in After Effects by writing out the slogans using the layout styles I had chosen previously.

For the first piece of motion I found a looping video of simulated water from Adobe, and placed that in the scene. I used a displacement map effect on the text that referenced the water video, meaning the motion from the video now applied to the text layer.

I also added a slight box blur to the text, which helped to soften some of the harsh edges that appeared from the high contrast areas of the video. The blur also added some simulated bloom to the text which helped add a grungy aesthetic to it, something I had experimented with previous outcome iterations.

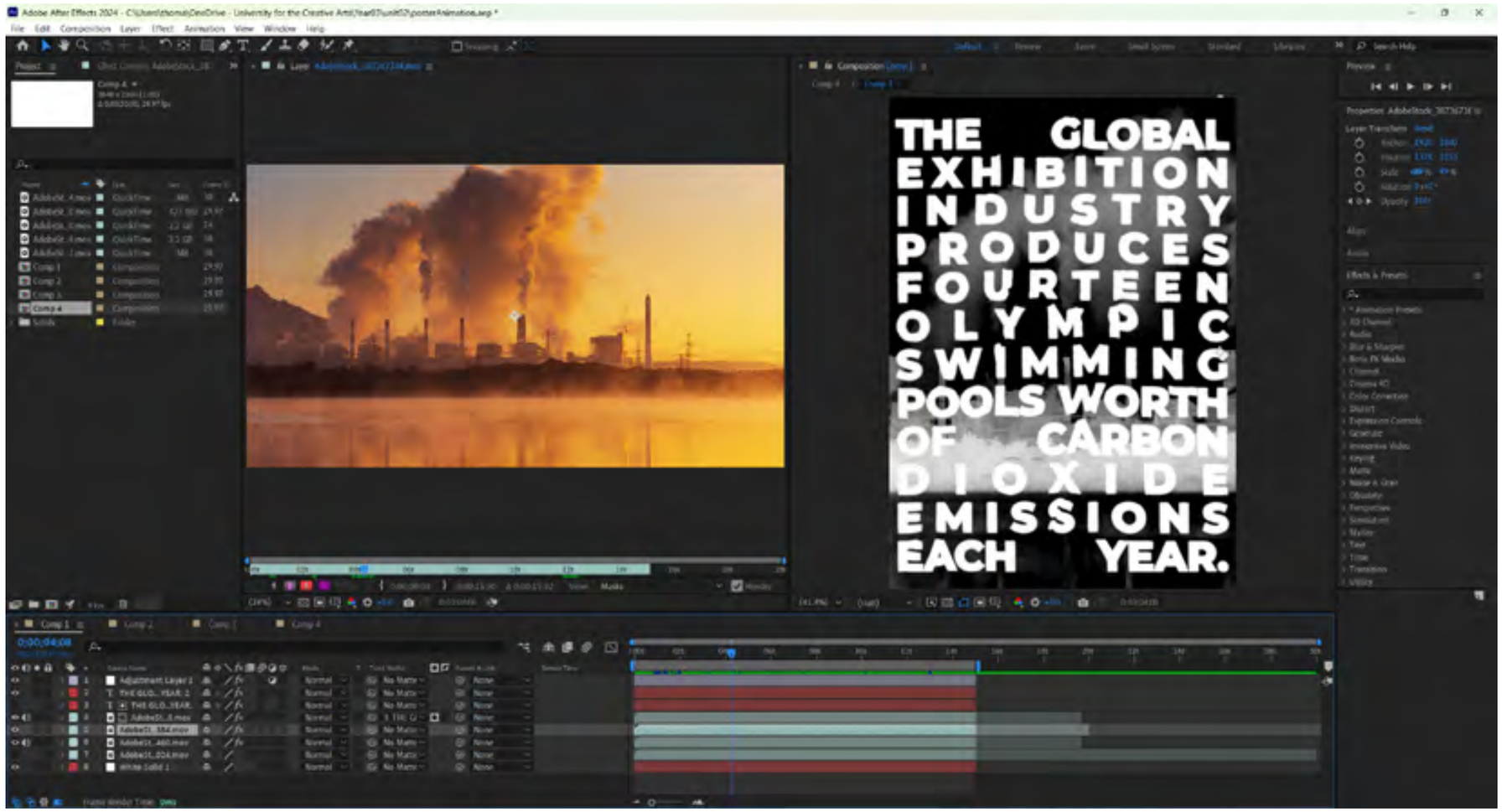
Fig. 192 - A screenshot showing my process creating the animation



I then used Adobe Stock again to find a video of plastic waste in the ocean. I wanted to turn the video into a texture that I could mask into the text, so I added a black and white filter to the video, and then used the curves effect to adjust the contrast. As the video would be within the text, I increased the black point of the video to make it darker.

I also decided to use this video as a background design throughout the animation. I added an adjustment layer with the invert effect on it so that I could invert the footage at any point.

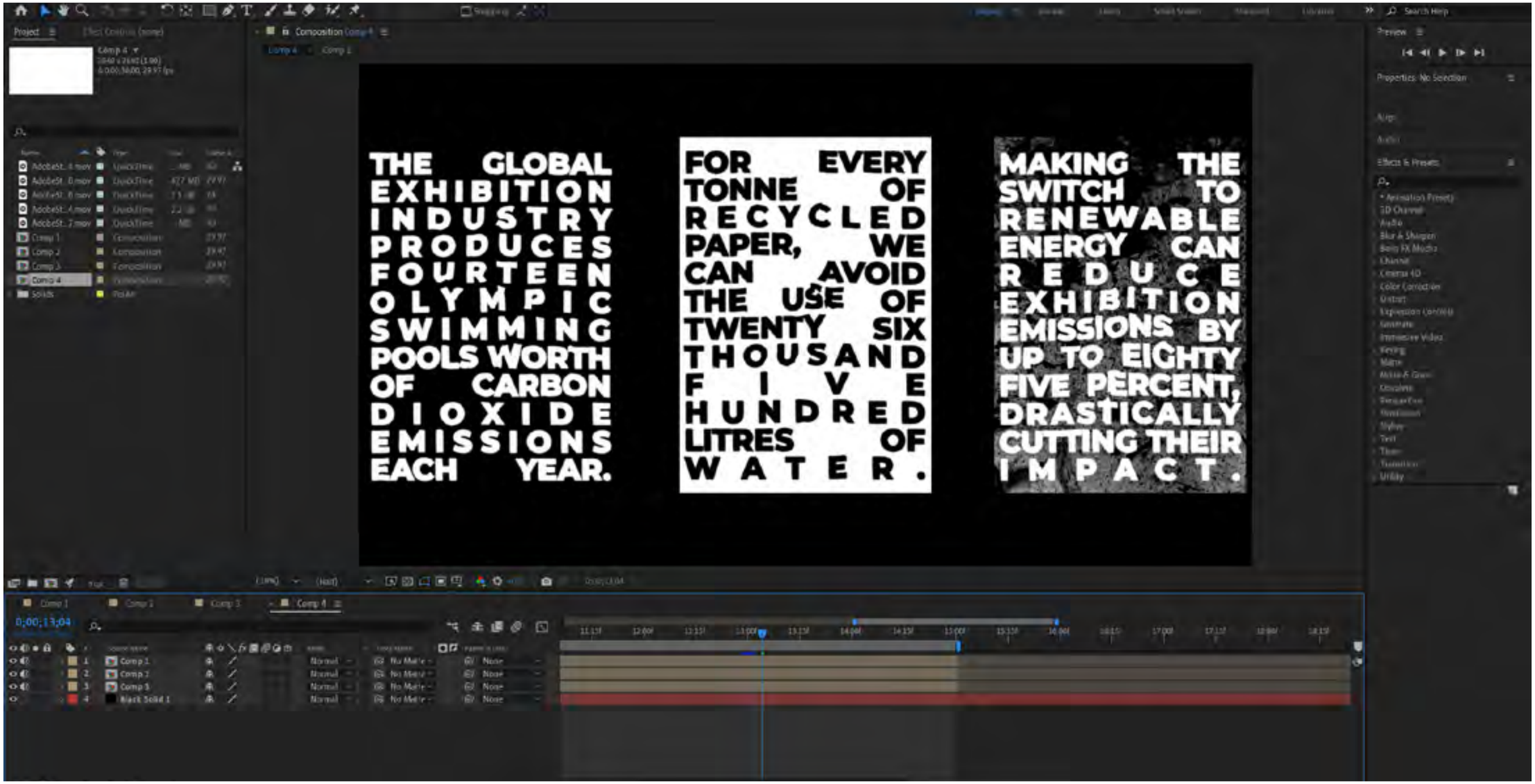
Fig. 193 - A screenshot showing my process creating the animation



I liked the effect that placing the plastic waste video into the background created, so I found another video from Adobe Stock. This footage is of pollution from a factory, but was recorded as a time-lapse so it was quite fast.

I first slowed down the footage slightly so the motion of the smoke was a bit more subtle, then I used the same combination of a black and white filter and curves to make the video monochrome. I then used the invert adjustment layer in some areas to add some contrast to the rest of the footage.

Fig. 194 - A screenshot showing the three posters at different stages of the animation



Once I had finished one animation, I duplicated the composition, and changed the text for the other two poster designs. Then I staggered the animations so they wouldn't all play at the exact same time.

https://youtube.com/playlist?list=PLntkHi1tWnNeSbCZjjqFJj5y4qLcmUEq&si=AsWsOlsLPsWoFuWL

BOOK BINDING TEST 02

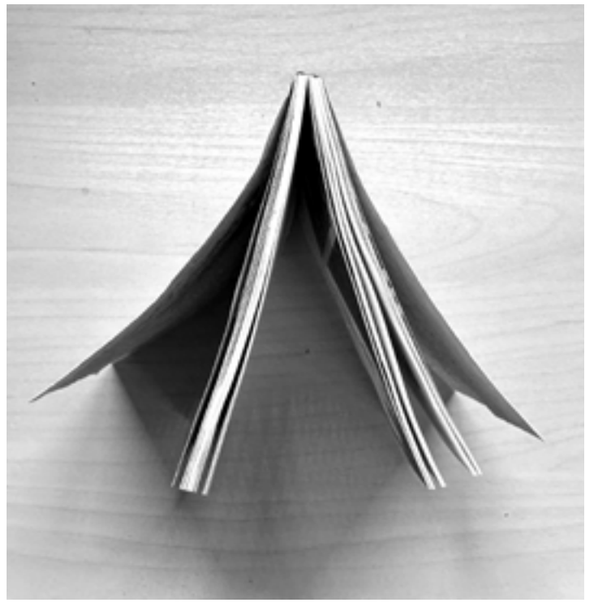
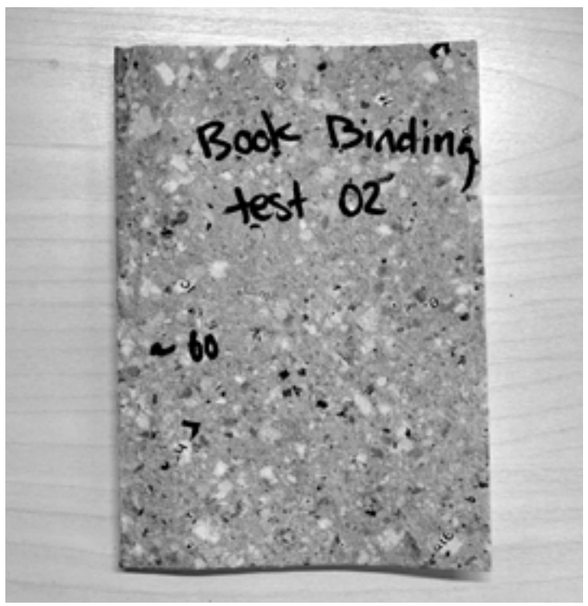


Fig. 195 - Fig. 198 - Photos from my second book binding test



As I will be printing and producing my own outcome book for this project, I needed to perform another book binding test in preparation. I am hoping to use some of my handmade paper to bind the book, so this test was focused on implementing that, and ensuring it will be a viable option for the final version.

For the paper, I didn't want to create a whole new sheet, resulting in more waste, so I chose to use on the pieces of paper I made earlier in the project. I chose the one I made from home, as it was thinner than the ones from the workshop, and I felt this would allow it to fold to the form of the book properly.

Due to the size of the paper (slightly larger than A5) the book would have to be quite small for this test. I prepared some A6 paper using left over waste paper from the last book binding test, and placed both this and thee paper into the perfect binding machine. I learned from the last test that I needed to be careful to make sure the pages were properly aligned.

Once the machine was finished, I took the book and trimmed down the edges with the electric guillotine. As I was doing this I noticed that due to the angle the guillotine cuts at, the hand-made paper sometimes tore slightly. In the future I just need to ensure the spine of the book is on the edge that cuts first to mitigate this.

Overall I'm happy with this experiment, the cover and pages all stuck together well, and I haven't had any issues with paper falling out. The final version will be A4, so I will need to ensure the paper for the cover is slightly thicker so it properly protects the rest of the book.

WASTE AGE BOOK RESEARCH

Fig. 199 - Fig. 201 - Photos of 'WASTE AGE: WHAT CAN DESIGN DO?'

Previously in this project when I was researching the Waste Age exhibition, I noted that a catalogue was published alongside it for visitors to purchase. The catalogue, much like the exhibition itself, was designed to minimise waste, and reuse materials where possible, and therefore I wanted a chance to look through the catalogue to get inspiration for my own project.

I was able to access a copy of 'WASTE AGE: WHAT CAN DESIGN DO?' from the library on campus. Being able to see a physical copy of the book meant I could explore factors of the publication such as the weight of the paper, print size, and how the materials used have impacted the print and colour quality.

PAPER AND PRINT TEST

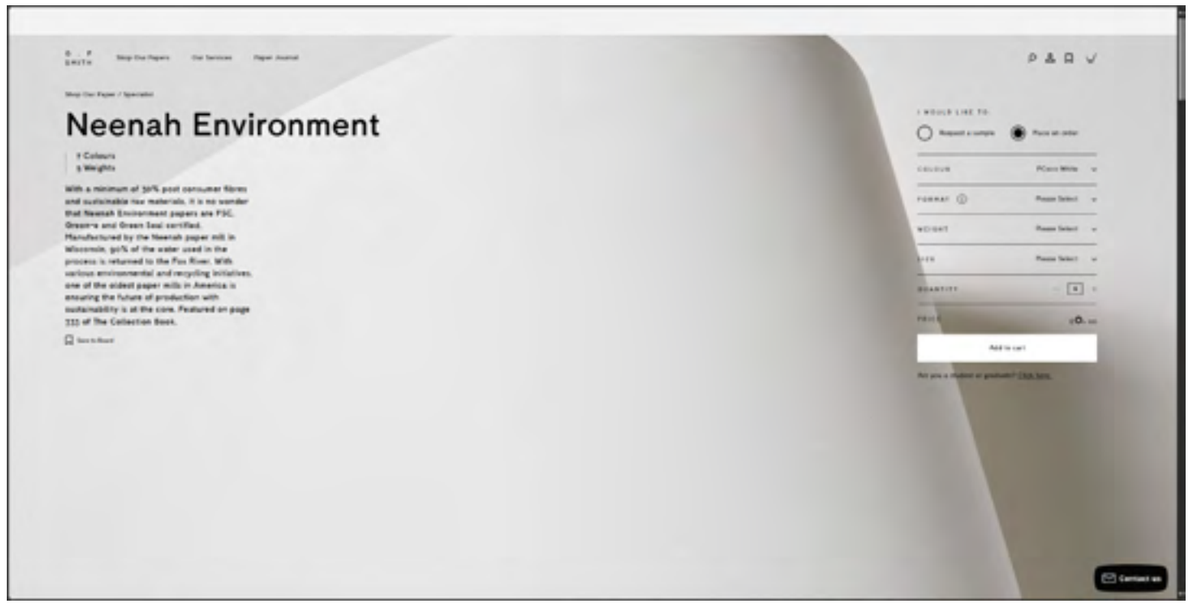


Fig. 202 - A screenshot of the GF Smith website showing the Neenah Environment paper

Fig. 203 and Fig. 204 - Scans of the prints I did to test my paper

As I will be producing my own book outcome for this project, I needed to source or make all the materials. I had already settled on using some of the hand-made paper I had created, however I didn't have the time or printing capabilities to produce paper for the entire book. Instead I needed to find somewhere to purchase the paper from.

I decided to use GF Smith for the majority of the paper, as I know they make some environmentally friendly paper stocks. Looking on their website I found a paper called 'Neenah Environment'. According to GF Smith this paper is made "with a minimum of 30% post consumer fibres and sustainable raw materials... 90% of the water used is returned to the [local] river" (GF Smith, n.d.). I made an order of this paper in PC100 White, 90gsm.

When the paper arrived, I needed to do a print test to ensure the paper both worked with the duplex printer on campus, and that the details would come out properly on the paper. The print tests were successful, so I am confident in being able to use this paper for my final book outcome.

BOOK BINDING PAPER

Fig. 205 and Fig. 206 - The process of me making paper for the book cover

In preparation for getting the pages of my book printed, I began to construct the paper that I would be using for the outside cover. My final process book will be A4, meaning this sheet of paper needs to be bigger than A3. This ensures there is room for the edges to be trimmed, and for the extra material that will be used for the spine.

I made this paper using the same methods as the posters, however I added a couple more layers to give the final sheet a bit more weight.

Once the paper was dry, I left it pressed beneath some weight so it was flat for when it came to putting in the binding machine.

BOOK COVER DESIGN

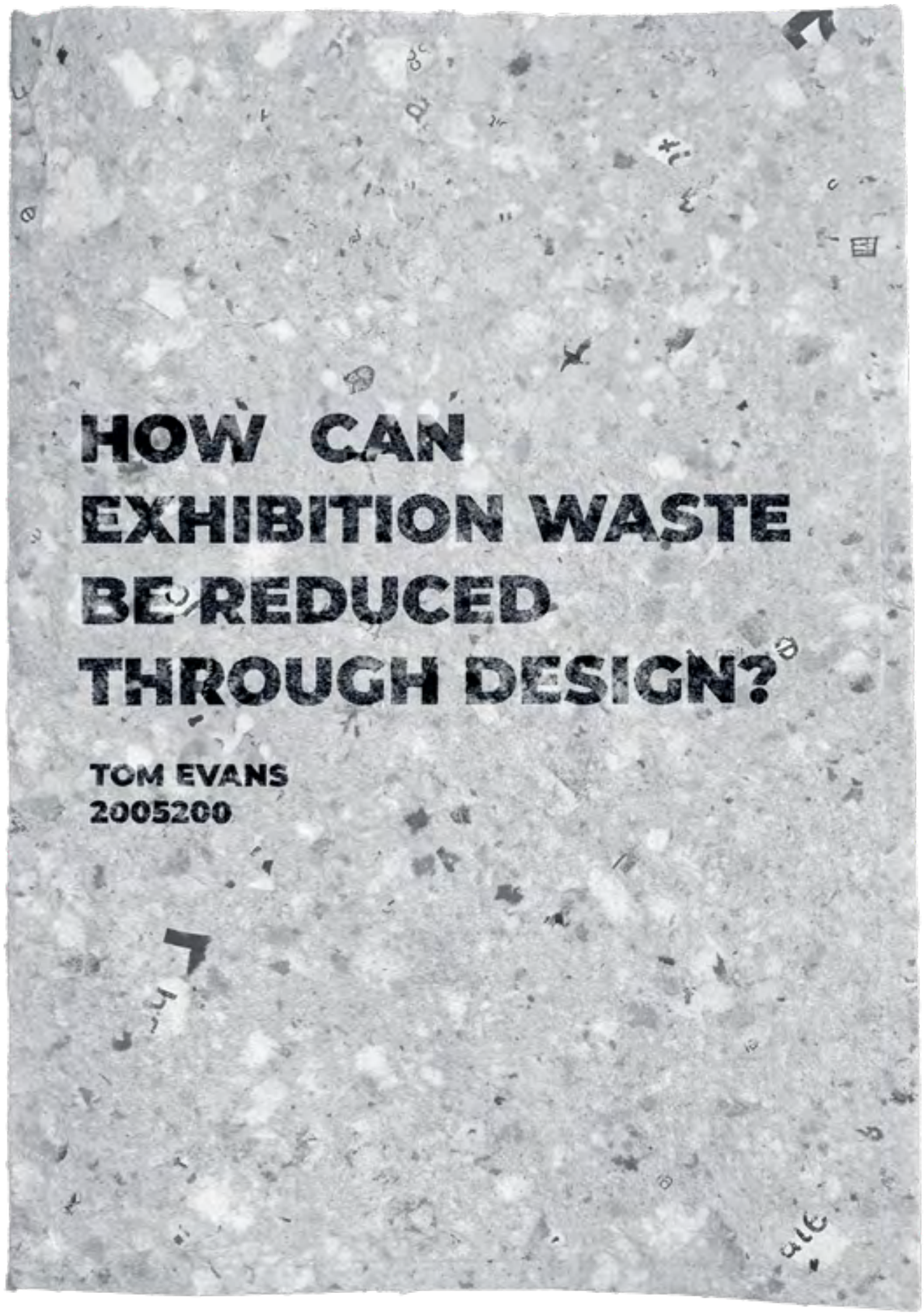


Fig. 207 - A mockup of a potential cover for my process book

I wanted to keep the cover design for my book simple for several reasons. Firstly, I wanted the focus of the book to be the hand-made paper, and therefore didn't want any big images on the cover. Secondly, as the paper needed to be trimmed and shaped after being bound around the book, the printing of the cover would have to be done after the book was constructed and bound. Due to this, I was limited on what printing methods I could use, and my first idea was lino printing. Lino printing requires the design to be hand carved, which was another reason for me to keep the design simple, so I didn't have to carve anything too difficult and there was less chance of there being a mistake.

Alternatively, I could create a stencil of what I wanted on the cover, and print ink over the top of it. This approach is closer to screen printing, but doesn't require the whole process of of coating, and curing a screen. Compared to lino printing, this technique would most likely be easier to set up, however I would possibly have to lose details in any typography I print on the cover.

The final idea I had was to not print anything on the cover at all, and let the hand-made paper be the cover for the book. This would allow people to focus more on the texture of the material than any designs, and then I could include a title page within the book with the important information that would usually be on the cover. The main issue with this is that no one would know what the book was until they picked it up and started reading it, and also there would be no external indicators of orientation for the book.

I made the decision to prepare some simple lino print options that I could apply to the cover, but to wait until the book was bound completely before deciding where to print on the cover, or leave it blank and rely on the title page.

EVALUATION AND REFLECTION

As this was a self directed project, research played an integral role throughout, and particularly at the start of the project where I was iterating on my brief to come up with a final proposal. Having to write my own brief meant I first needed to look into the problem that I have been attempting to combat: reducing waste from exhibitions and museums, and explore current research around the topic.

I feel the opportunity to write and complete my own brief from start to finish has been invaluable in preparing me for a career in the design world. By writing and rewriting my brief at the start of the project, I have learned how to create an effective brief for a designer, a skill that will carry over into various aspects of the design world.

My aim with this project was to use my outcomes to both raise awareness for the issue of waste in the design world, whilst also proposing solutions and alternatives to traditional exhibition standards. As this was the focus of my FMP, I attempted to be as conscious of my own waste, and as sustainable as possible throughout the project. At every stage I was comparing my practice and outcomes to those of similar projects from my research, such as the Waste Age exhibition, and Ice Watch London.

Throughout this project I was able to undertake a number of workshops to help further my technical abilities, such as a paper making workshop, screen-printing, and a heat press workshop. I utilised the skills I learned in these sessions to help with the production of my outcomes, particularly paper making and screen printing.

I really enjoyed being able to experiment with new techniques, especially the paper making, as I feel my knowledge in this area will make me stand out against other designers when it comes to job applications. Making my own paper also helped to increase the sustainability of my project.

I really enjoyed working on this brief, and feel very proud of my outcomes. Due to the hand-made nature of my posters and project book, I feel a strong connection to this project.

An aspect that I feel I could have worked more on is keeping better track of the impact of my project. If I were to repeat this project, or work on one similar I would ensure I was keeping a record of the emissions and waste I produced over the length of the project. Unfortunately, due to the changes in direction I undertook at the start of this brief, I didn't consider recording my own waste until several weeks into the unit, at which point it would have been tool late to keep an accurate record. I would have liked to keep track of this data and then present it as a comment on my own work within this evaluation and reflection.

I hope the outcomes of my FMP can inspire both designers, and non-designers to be more environmentally conscious, and consider their impact on the Earth.

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