Changing Our Perception of Waste: The Hidden Value on Brighton Beach

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INTRODUCTION

At the beginning of summer 2018, was when the littering problem really caught my attention. I was sat on Brighton beach in the late afternoon, and as people got up to leave, they carlessly and knowingly abandoned their rubbish on the beach. Even as they looked over their shoulder to see if they had left anything behind, they continued walking away from the litter. It shocked me how irresponsible people were regarding the environment.

Almost immediately, a group of us got some binbags from a nearby pub and we began to collect litter left by other on a small portion of the beach, filling 4 large binbags.

I had done previous projects surrounding the theme of sustainability, but this got me even more interested in the wellbeing of the oceanic wildlife, so this project will allow me to research the topic in depth.

RESEARCH

WHY ARE THE OCEANS IMPORTANT?

The Oceans produce over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere. (1)

Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns. (1)

It is home to the greatest abundance of life on our planet, with experts predicting that there are more than 300.000 different species underwater. All the creatures that live in the Ocean play an essential role in the trophic chain of the ecosystems. (2)

As David Attenborough quotes in the series 'Our Planet', "90% of the life in the oceans is found in the shallow seas close to the coast." (3)
The map to the right, which is featured in a TED talk by Jackie Savitz, also shows that marine life is mostly located in costal zones. (shown in blue)
Therefore a large number of marine life is under threat from the debris and chemicals that end up in the oceans, polluting the costal areas first, via streams and rivers but also directly from seaside cities and towns.

(1) NOAA, "Why should we care about the ocean?", *National Ocean Service*, www.oceanservice.noaa.gov/facts/why-care-about-ocean.html (Accessed 07.04.19)
(2) "Why is the Ocean so important?", *Oceanpreneur*, www.theoceanpreneur.com/sail-green/seven-reasons-ocean-important/ (Accessed 07.04.19)
(3) *Our Planet (Season 1 Episode 1)*, Alastair Fothergill (Netflix, 2019)
(4) *Save the oceans, feed the world!*, June Cohen (TED, 2013)

It is estimated that 1.15 to 2.41 million tonnes of plastic are entering the ocean each year from rivers.
More than half of this plastic is less dense than the water, meaning that it will not sink once it encounters the sea, allowing them to be transported over extended distances.
They persist at the sea surface as they make their way offshore, transported by converging currents and finally accumulating in the patch. Since plastic cannot biodegrade, it breaks down into smaller pieces, known as microplastics.

Due to its size and color, animals confuse the plastic for food, causing malnutrition; it poses entanglement risks and threatens their overall behavior, health and existence.
Through a process called bioaccumulation, chemicals in plastics will enter the body of the animal feeding on the plastic, and as the feeder becomes prey, the chemicals will pass to the predator - making their way up the food web. (5)

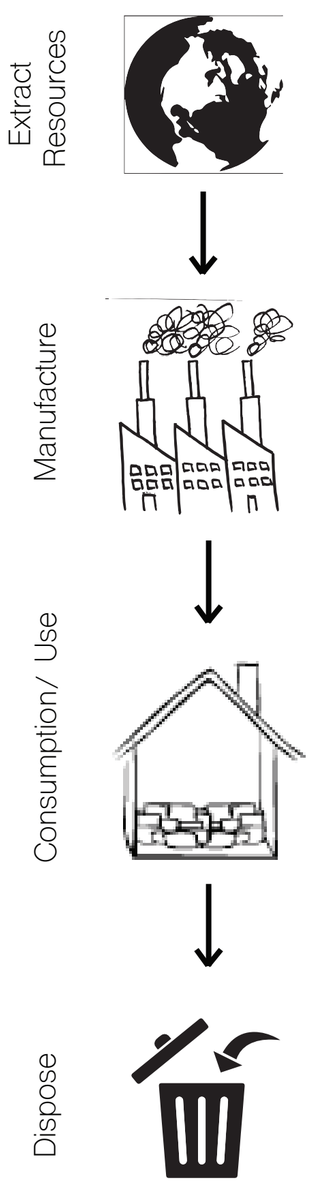
(5) "The Great Pacific Garbage Patch", *The Ocean Cleanup*, https://www.theoceancleanup.com/great-pacific-garbage-patch/ (Accessed 08.04.19)

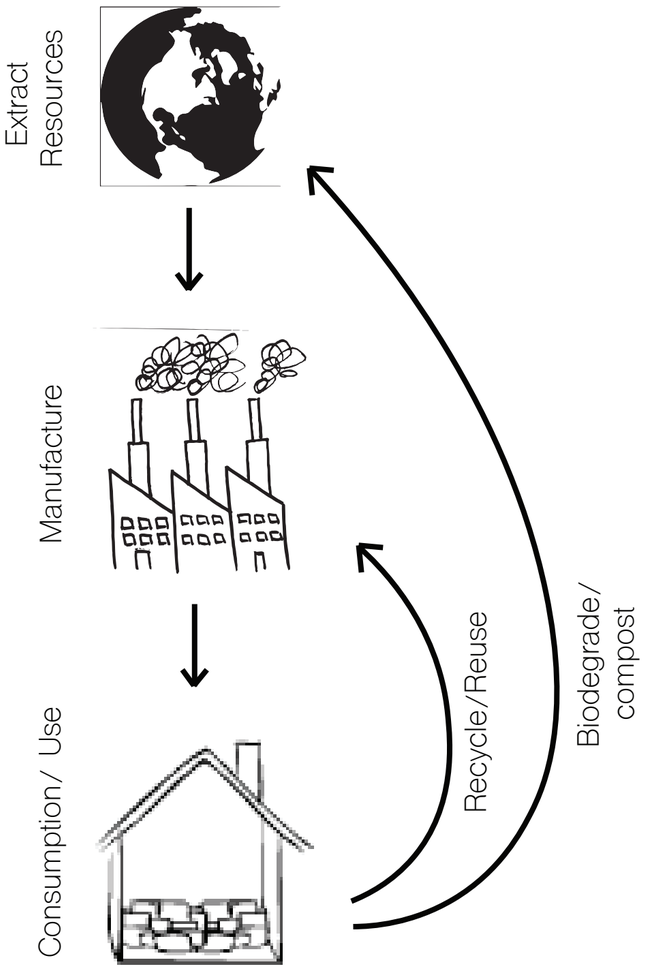
Focussing on Plastic Ocean Pollution, my project looks into the problem and the threats that this opposes onto marine wildlife and ecosystems.

Throughout the project I also explore various concepts found within the circular economy, which is the topic I wrote my dissertation on, where I examined how design contributes towards the circular economy, specifically looking into the initial design process.

The project aims to show that what people see as ‘rubbish’ or ‘waste’ is a valuable resource. Therefore we should be making stuff in a way that can be easily and quickly repaired, recycled or upcycled. As well as being made from resources that already exist, especially when it comes to plastic.

LINEAR ECONOMY vs CIRCULAR ECONOMY





To start off my primary research, before doing anything else, I had to find out what kind of rubbish was being littered. I did this by going to Brighton Beach and collecting the rubbish that people had littered.
The result was a lot of drinks cans, plastic food packaging and driftwood.

After spending time on Brighton beach, where I would make observations and collect any rubbish that I came aross, I became very interested in the relationship between the city, the beach and the people; the liminal space. The place of transition, where the city meets the beach and where the beach meets the city.

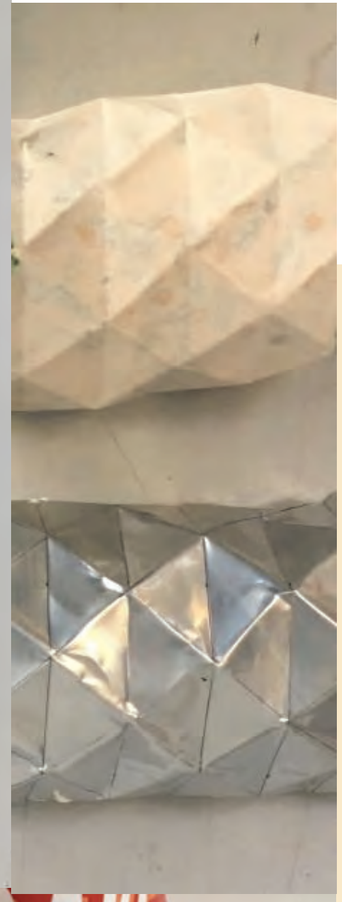
This location, where the beach meets the city soon became the site of my project. I identified the site as the shops and restaurants on the seafront, right infront of the beach.

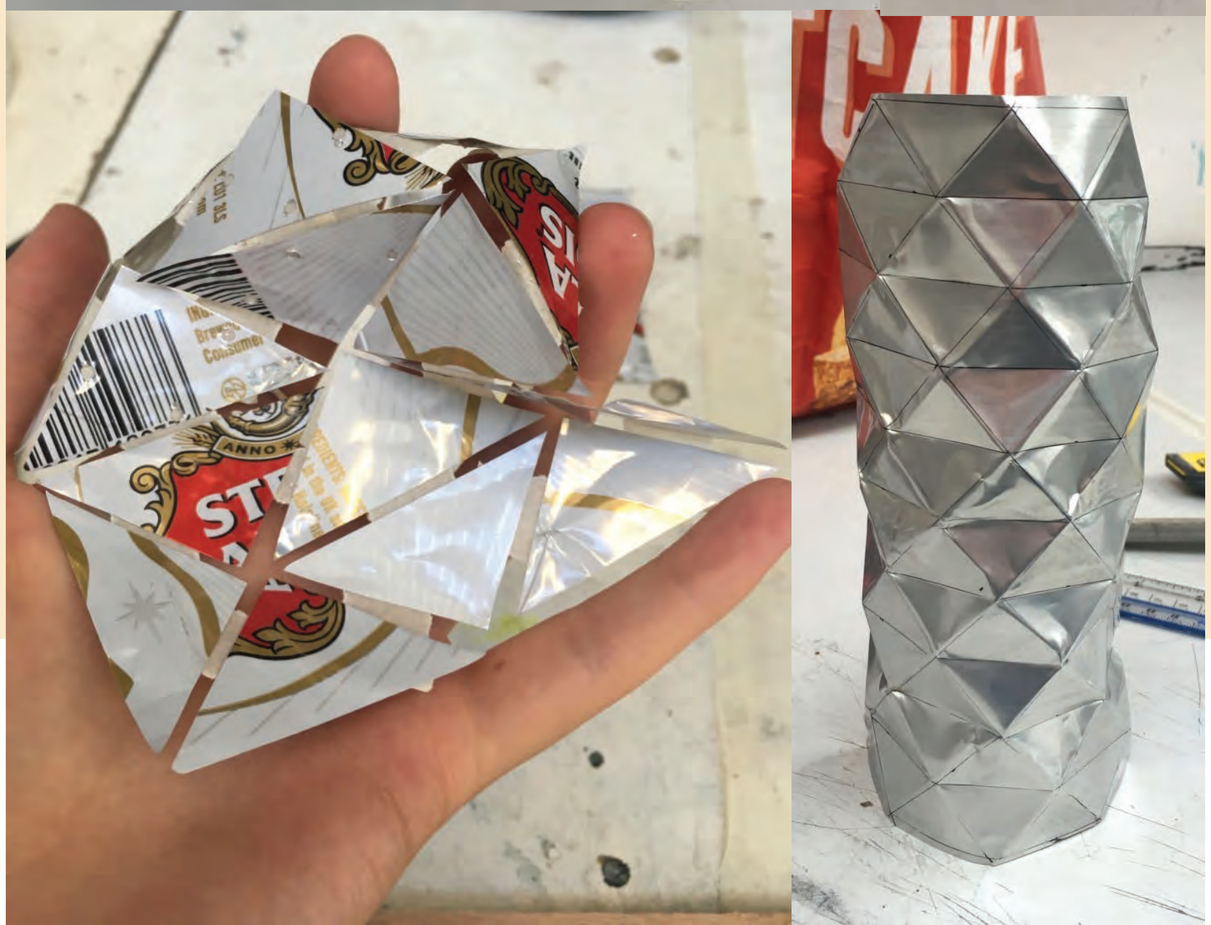
Once my project site was identified, I began the research on the seafront shops/restaurants which included:
- What they sell
- Their waste streams (i.e. What type of rubbish are they producing?)
- Their target market

During my research I found that most restaurants along the beach don't compost their food waste and this is their main waste stream. Therefore, this was something that I want to take into account during my project and have aspects of my project which raise awareness to this problem, by using the food waste to create products.

DEVELOPMENT

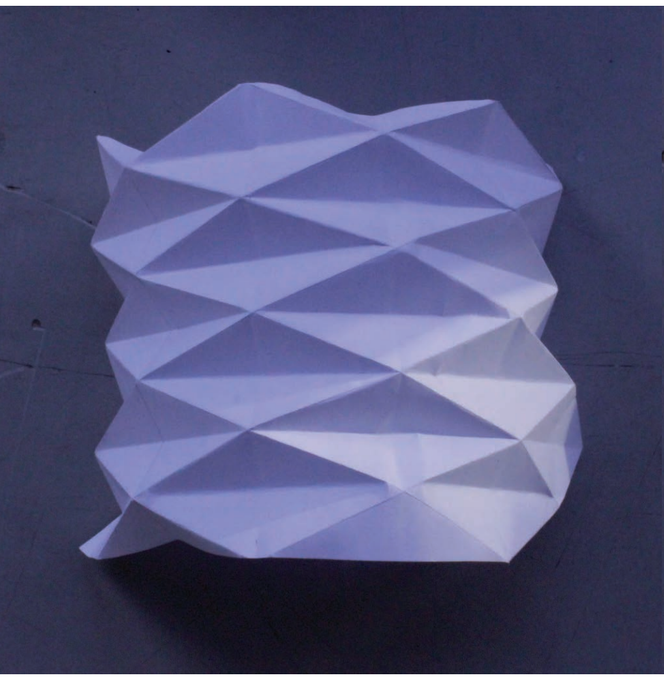
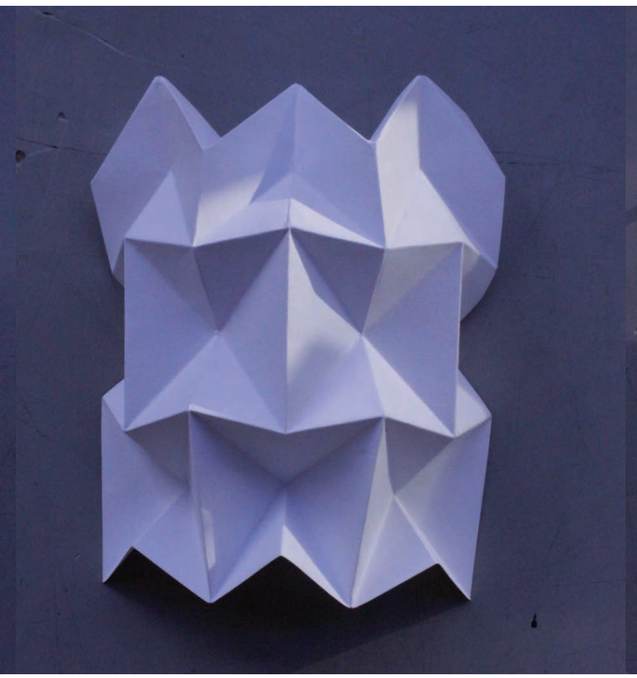
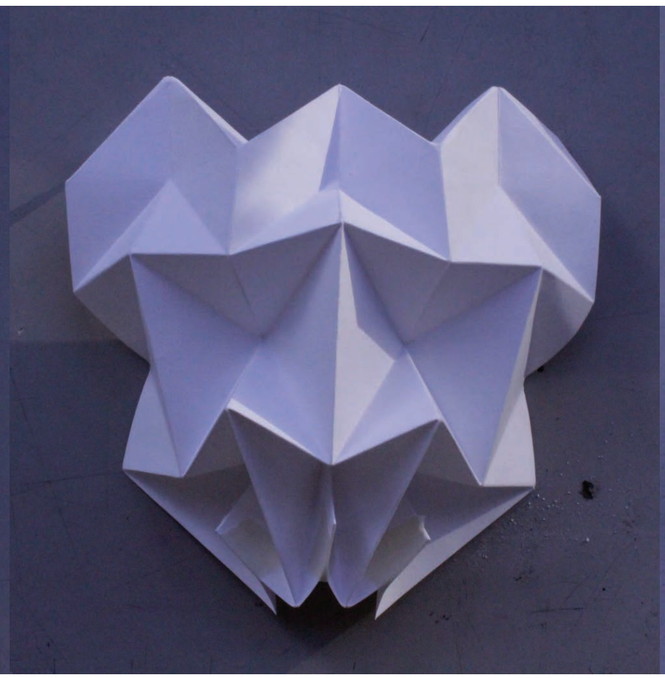
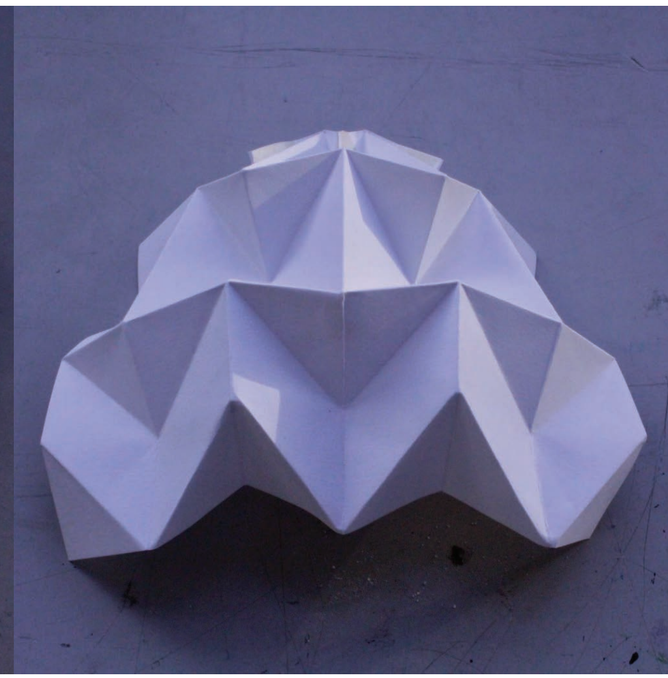
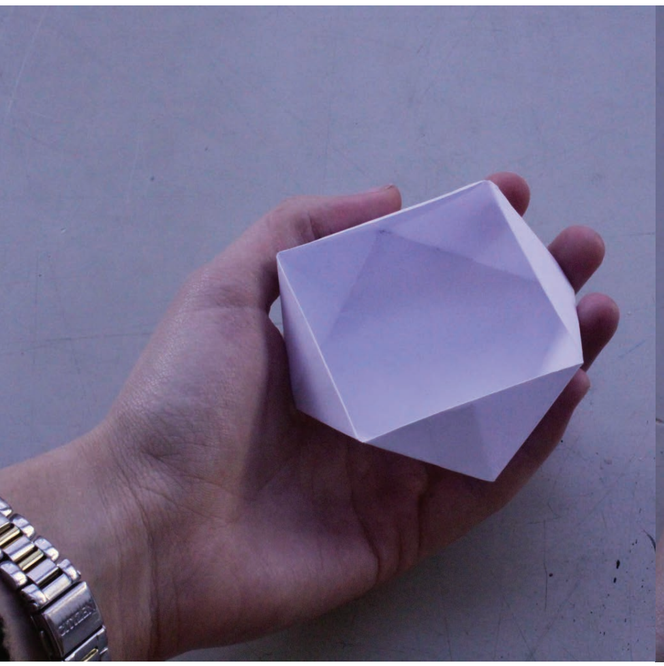
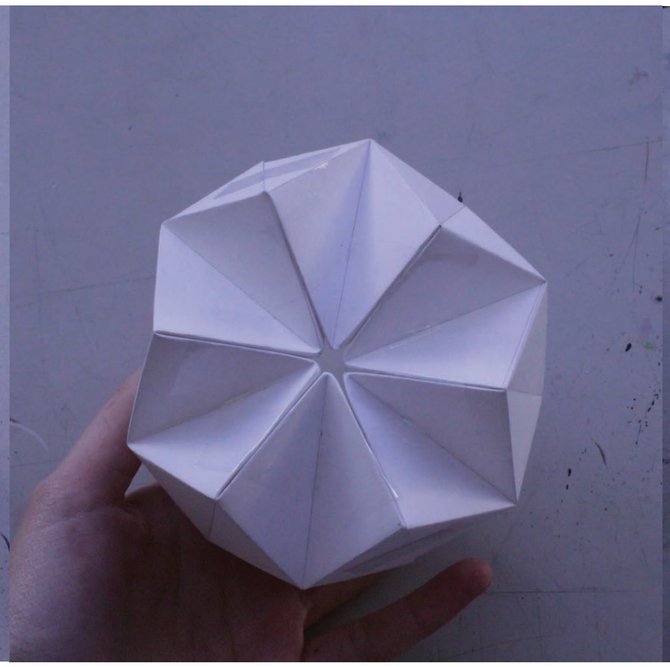
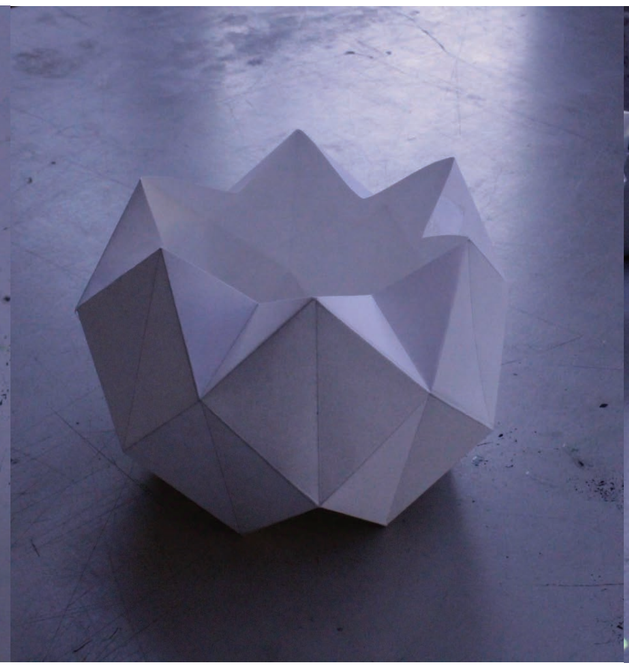
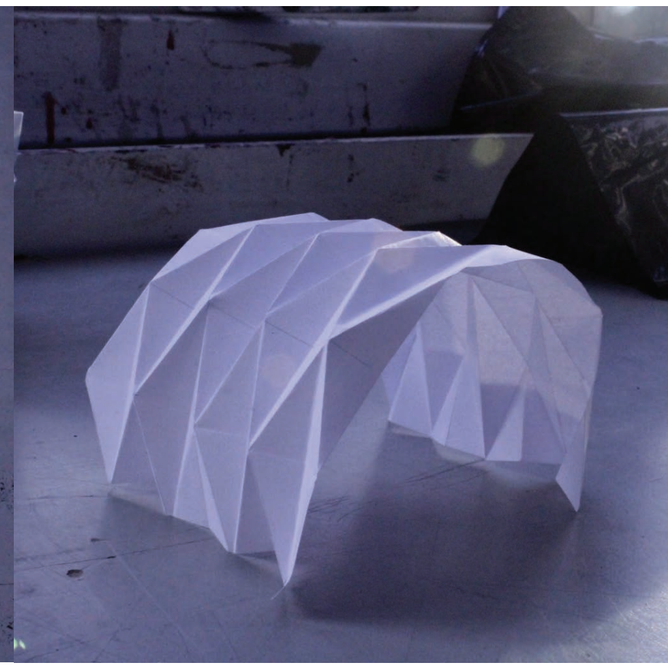
Material and form experimentation

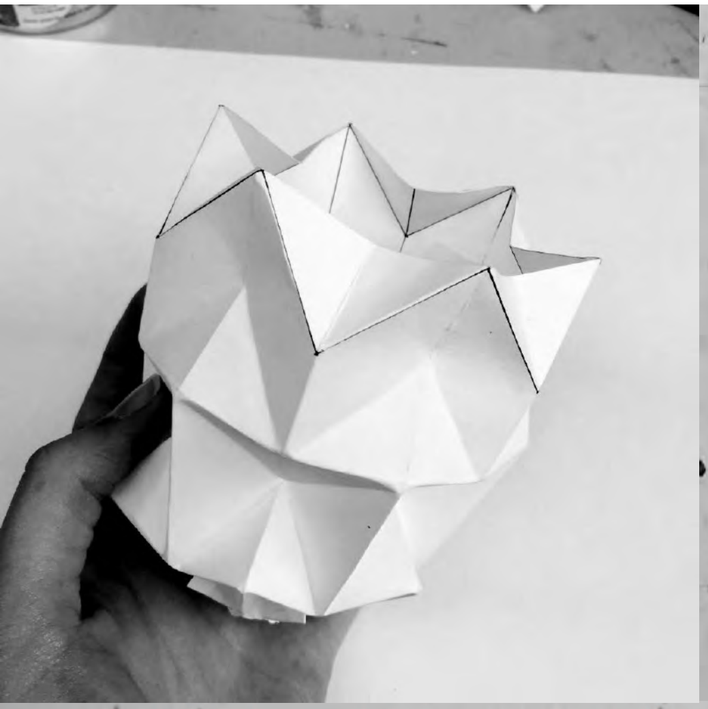


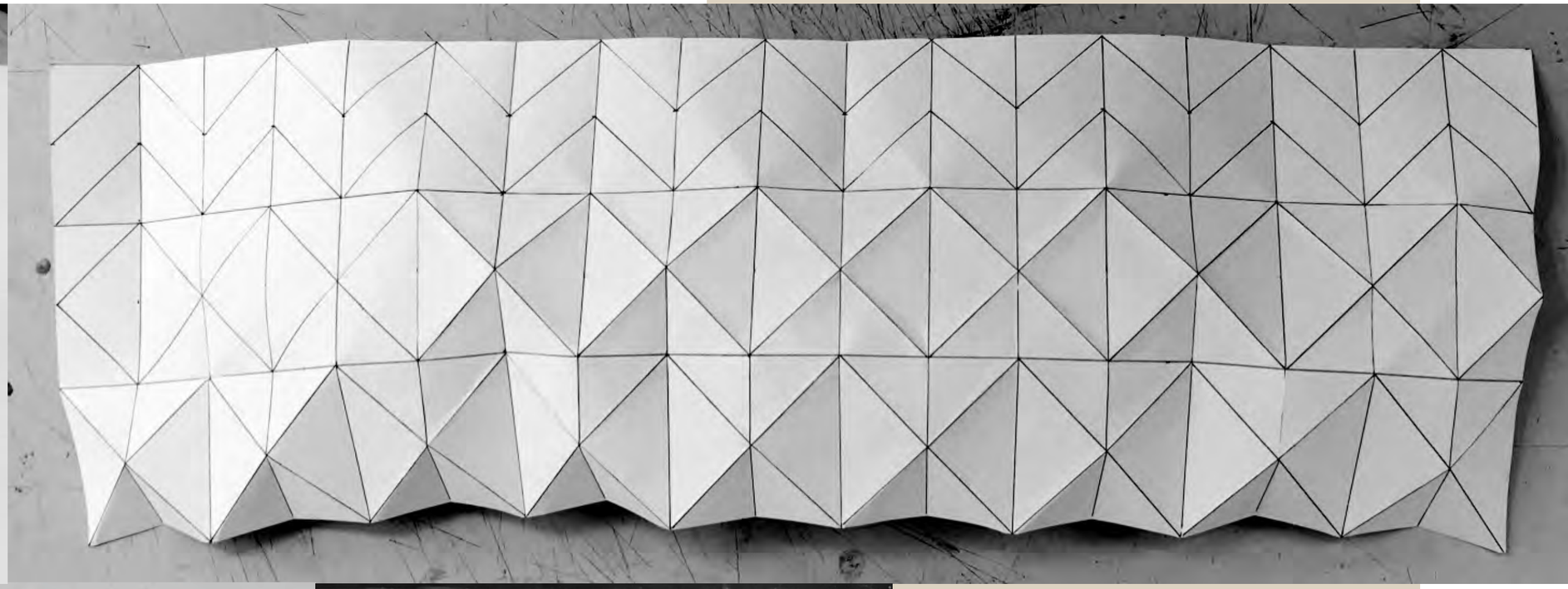


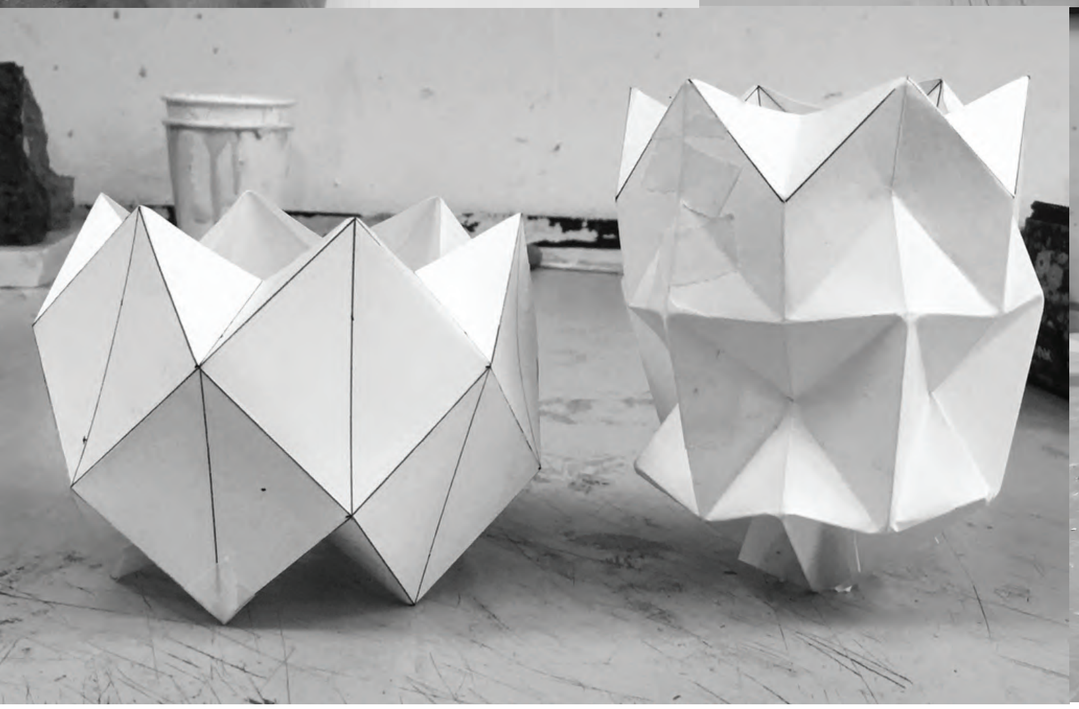
Starting with the drink cans that were collected on the beach, I began experimenting and brainstorming ideas of what I could make with them. These experimentations included:

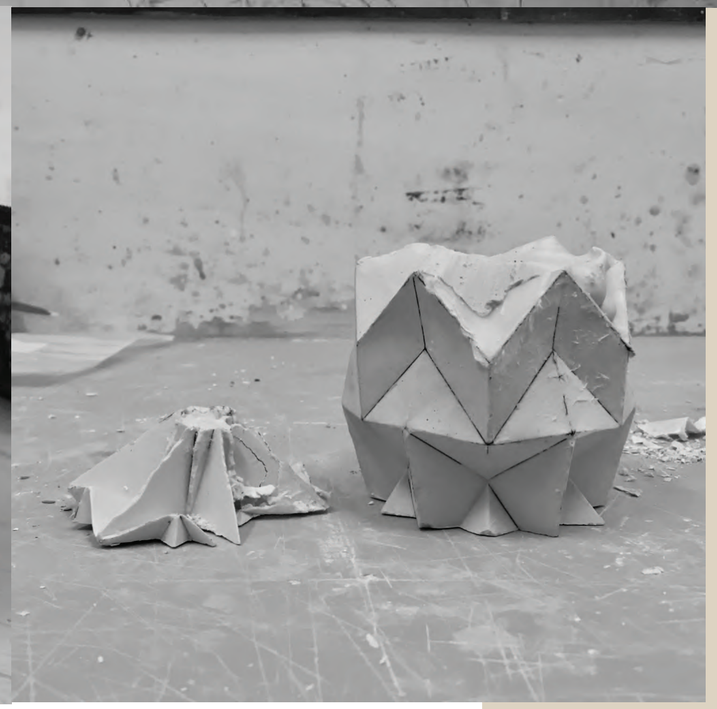
- Cutting up the cans and connecting them to create a material that had movement.
- Folding the metal using Origami methods.
- Casting into the metal with jesmonite to record the form.



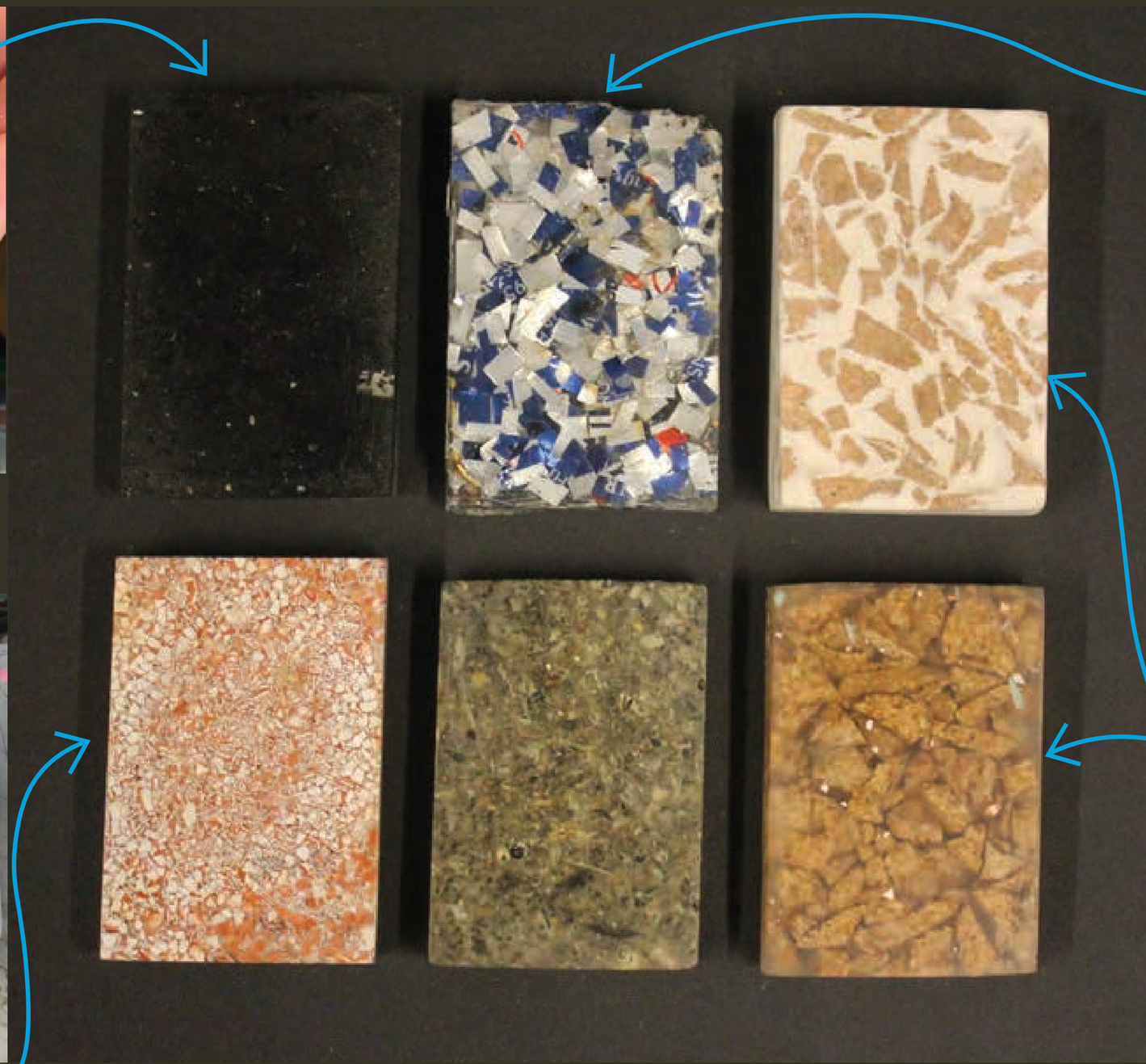


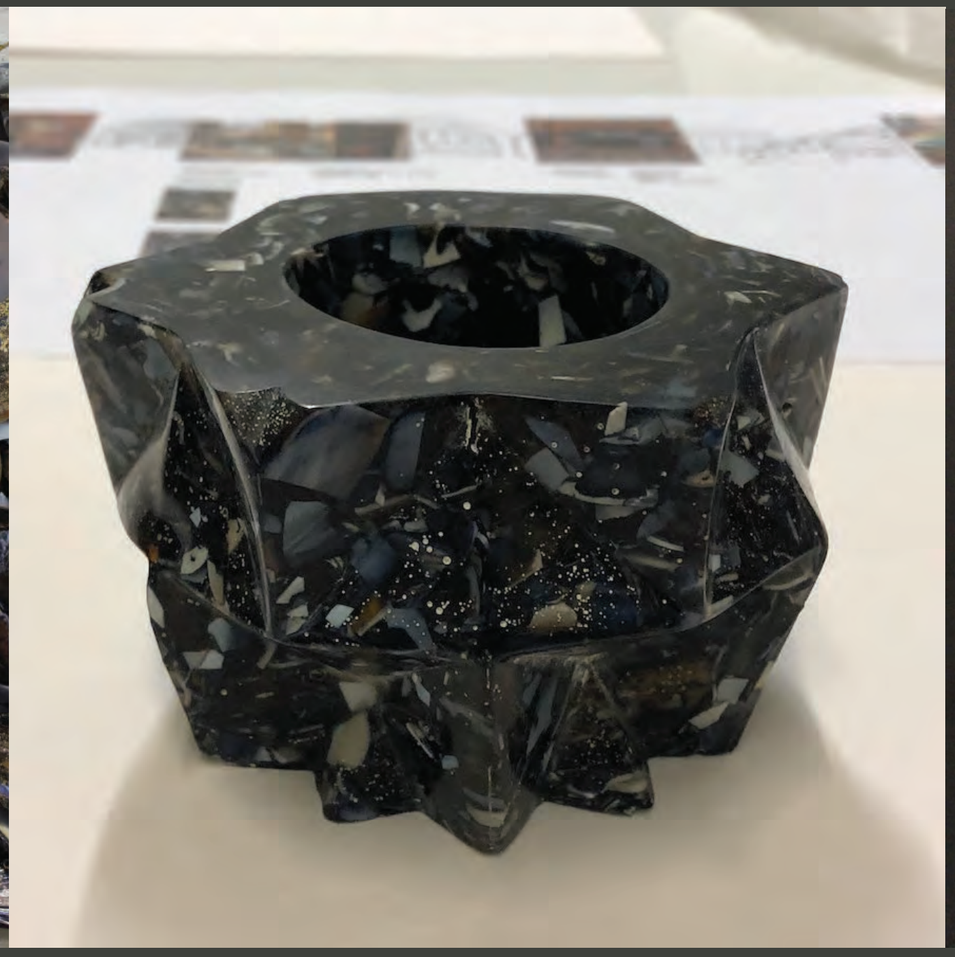


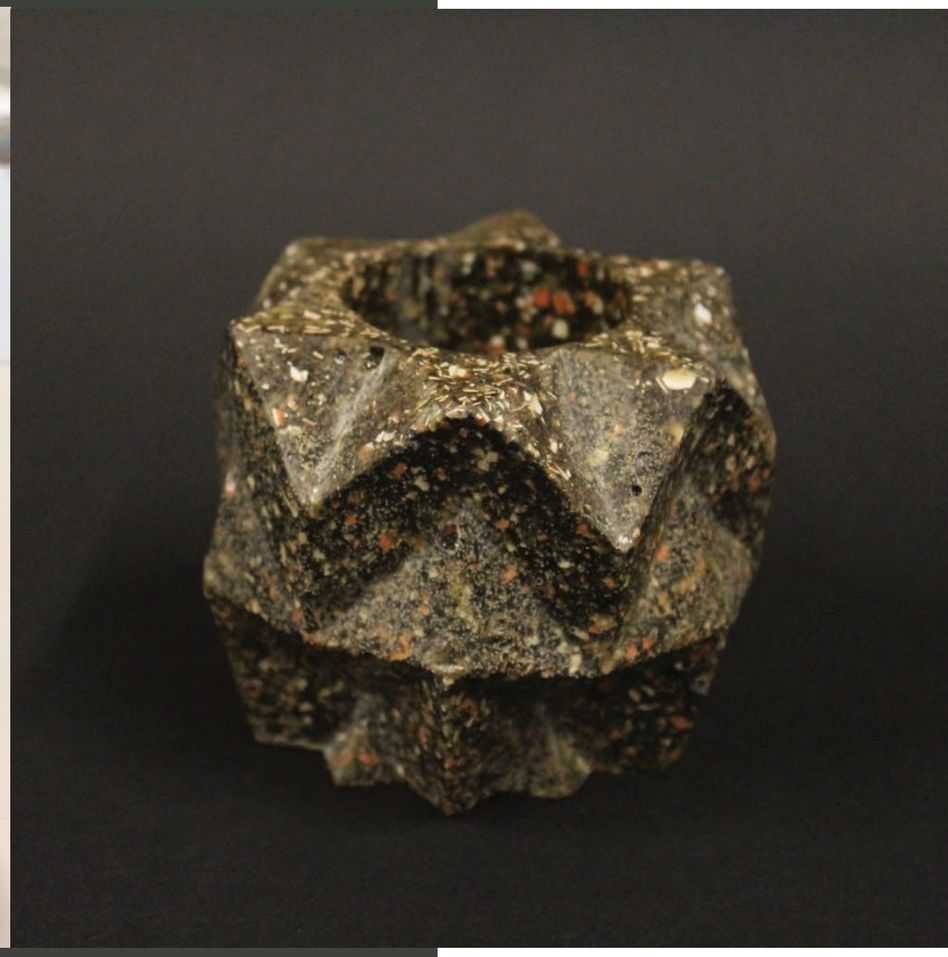


In continuation from my experimentations with the metal cans, I wanted to make more forms using Origami methods but this proved difficult to do since the metal was quite hard to fold in multiple directions, and the sheets of metal were not large enough. Therefore, I started making the forms out of paper, which I then made a plaster model from. This was then used to make a silicone mould that I could cast into.

Material test tiles: experimenting with how I could use the beach waste that I collected. The materials were mixed together with bio resin, which I would then use to cast into my mould.







After making the mould from my origami plaster model, to address the food waste problem in restaurants, I casted into it using food waste from restaurants using bio resin as a binder.
The first cast included tealeaves and eggshells from cafe's, whereas the second one included mussel shells from seafood restaurants.

The iridescence of the mussel shells created a beautiful colour in the material, but due to the complexity of the form, the material almost became secondary.
In response to this observation I decided to change the form because it was taking away from the aesthetic beauty of the mussel shells, so I wanted to create a form that allowed you to see the beauty of the shells.
In addition, the form was very difficult to sand and polish, meaning it didn't look like a finished product.

(6)

(7)

PIÑATEX

“Piñatex is a natural material made of the fibre from the leaves of the pineapple plant.
Inspired by the abundance of natural resources, including the use of plant fibres in traditional weaving such as the delicate Barong Tagalog garments, Carmen sought to create a new, non-woven textile that could be commercially produced, provide positive social and economic impact and maintain a low environmental footprint throughout its life cycle.
The leaves are the byproduct of the pineapple harvest, and their use creates an additional income stream for farming communities.
The raw material requires no additional environmental resources to produce.” (8)

This example of a natural material interested me because it shows how food waste/byproducts of food, which is viewed at waste to some, can be used as a resource and successfully used to make products, as well as creating a positive social impact

(6) www.materialshow.com/portfolio/pinatex-vegan-leather-made-from-pineapples/ (Accessed 10.04.19)
(7) Alicia Carrasco Rozas, “Sustainable Textile Innovations: Piñatex, the vegan alternative to leather”, *FashionUnited*, https://fashionunited.uk/news/fashion/sustainable-textile-innovations-pinatex-the-vegan-alternative-to-leather/2017062925005 (Accessed 10.04.19)
(8) “About us”, *Piñatex*, https://www.ananas-anam.com/about-us/ (Accessed 10.04.19)

(9)

(10)

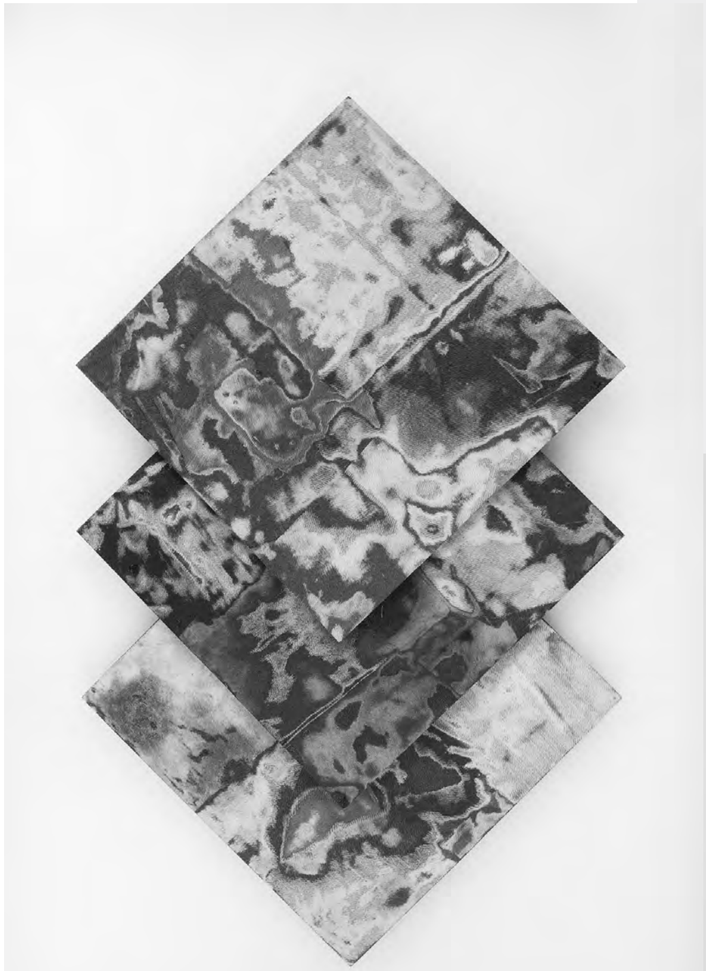
ECOVATIVE DESIGN

"Ecovative Design LLC is a biomaterials company that provides sustainable alternatives to plastics and polystyrene foams by using mushroom technology." (11)

"We use mycelium, the root structure of mushrooms, to grow materials that replace plastics and reduce animal slaughter. Our mission is to grow better materials that are compatible with Earth.
MycoComposite is our biomaterial utilizing mycelium as a biological binder for agricultural waste." (9)

Similarly to Piñatex, Ecovative caught my attention and interested me as an example of a material because they use what is viewed as 'waste' and use a natural material to bind it, making it biodegradable.

(9) *Ecovative*, https://ecovativedesign.com, (Accessed 10.04.19)
(10) Maudie Manton, "Mushroom-based modelling kit allows users to grow their own designs", *Dezeen*, https://www.dezeen.com/2015/03/25/mushroom-materials-ecovative-modelling-kit-mycelium-designs-of-the-year-2015/ (Accessed 10.04.19)
(11) "Ecovative Design", *Wikipedia*, https://en.wikipedia.org/wiki/Ecovative_Design (Accessed 10.04.19)



(13)

(13)

SOPHIE ROWLEY

“Bahia Denim is designed using production waste from the fashion industry. The textile offcuts are layered, adhered and carved. The variation in size, shade, colour and texture make the designs unique.

Being light weight yet durable allows for a diverse application of the material in furniture, wall paneling or surfaces for interiors.” (12)

In contrast to the last two examples of natural materials, this one looks into using discarded materials in combination with a binder, such as resin in this case to transform something that people see as worthless and making it into something aesthetic and beautiful.

(12) “Innovative Designs Made from Repurposed Denim”, *Sophie Rowley*, http://sophierowley.com/projects-draft/2017/10/11/bahia, (Accessed 10.04.19)
(13) *Sophie Rowley*, http://sophierowley.com/work (Accessed 10.04.19)

Having looked into peoples behaviours and the psychology of littering, I wanted to experiment with addressing the problem of plastic ocean pollution from the source, looking at how we are making packaging and products.
It is very hard to change peoples behaviours and habits, but you can change how things are made so I started to experiment with making fruit leathers by using food scraps which are compostable and wouldn't be a threat to the environment.

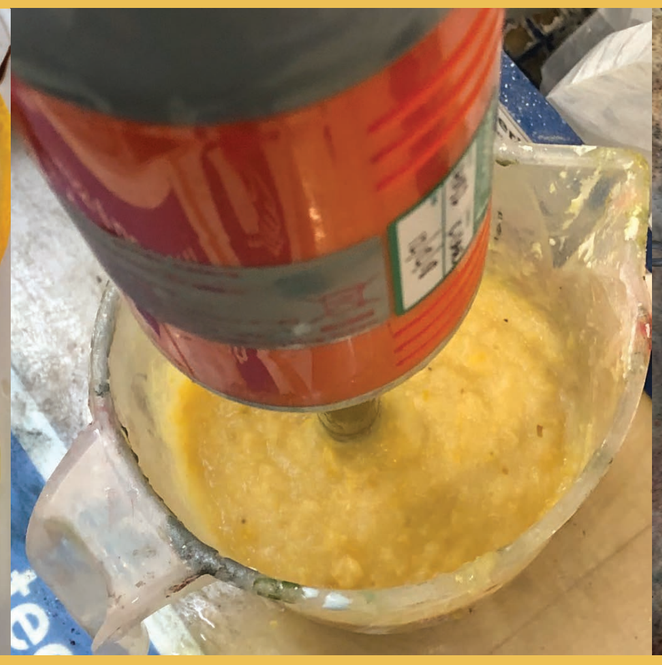
I researched what food gets thrown away the most by the restaurants and cafes on Brighton Beach, in my site, and experimented making materials out of the food waste.

My first experiment was using orange peel, where I boiled the peel to get it soft, then blended it together to get a paste, followed by dehydrating it in the oven at a very low temperature.

Since this was partially successful, it lead me onto experimenting with various different fruits and vegetable offcuts and waste such as lemon, carrot and orange peel.

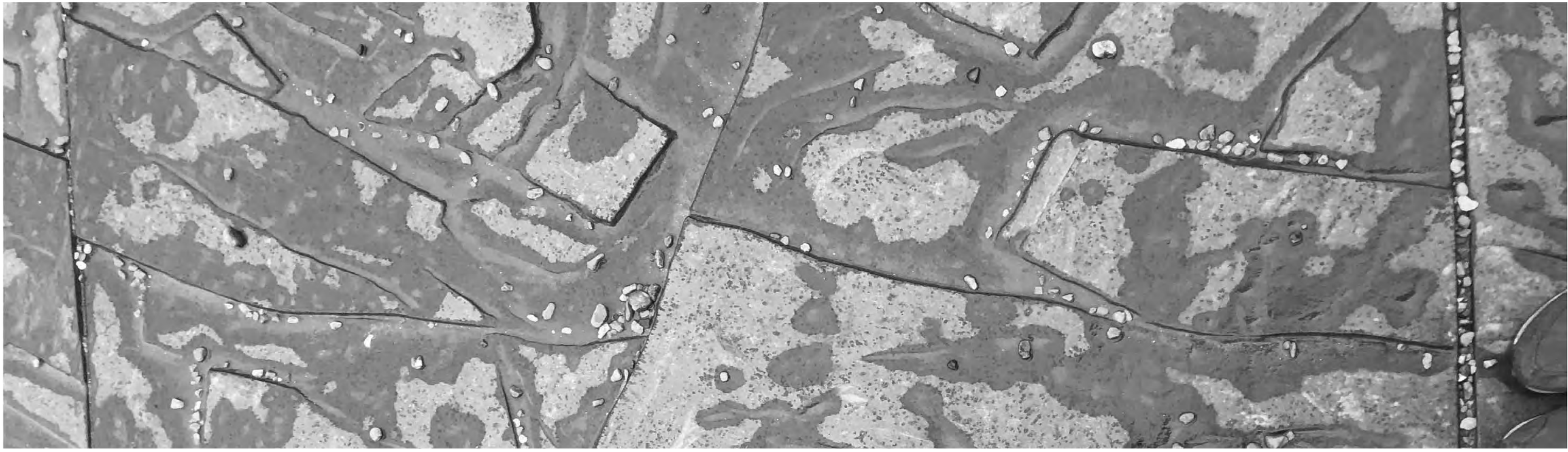
After doing many experiments, I found that using lemon peel was the most effective.

Making of the compostable lemon peel material.



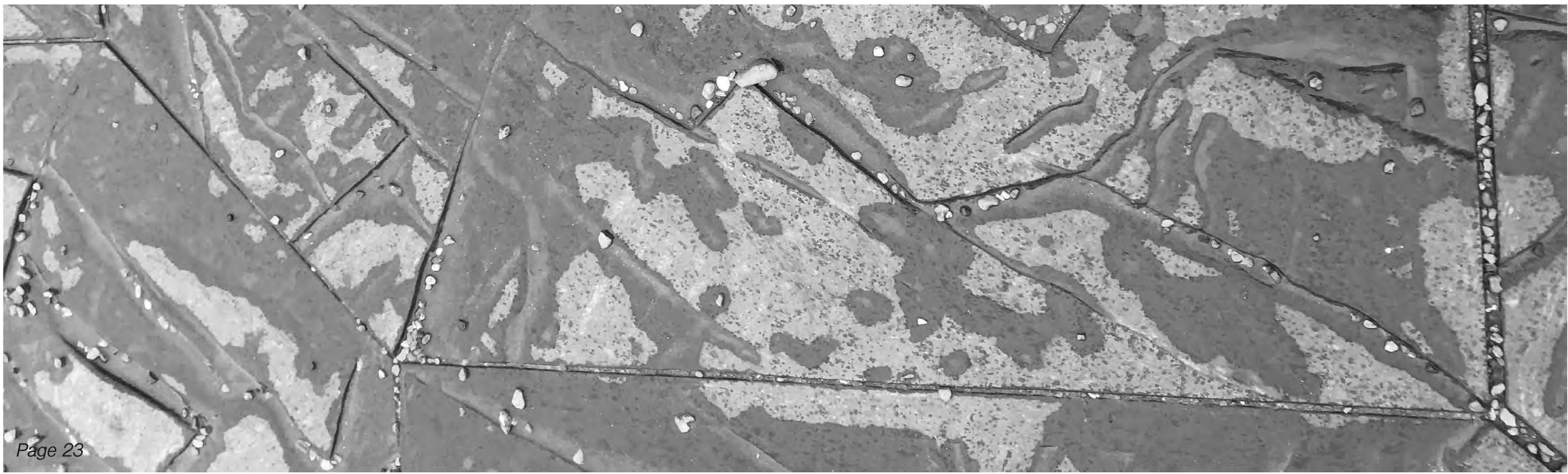
As well as being the most successful fruit to make into a sheet material, lemons are widely used in restaurants along the seafront, especially in the ones selling seafood dishes.

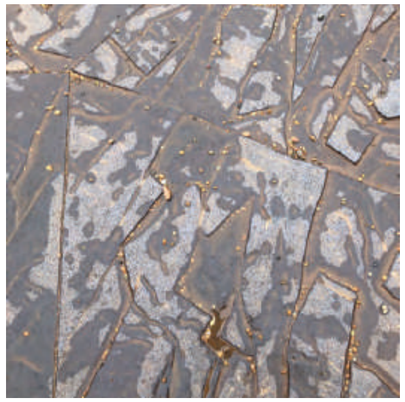
The process of making the compostable material out of lemons:
- Cut lemons into smaller pieces
- Boil until they are soft.
- Blend until smooth (It is very important to make sure that there is not too much water. If there is too much water before you start blending it, the mixture will be too liquid-y and will be hard to work with.)
- Sieve out any lumps so that you have a consistent texture.
- Using a spatula, spread the mixture evenly either into a sheet, or onto a mould.
- Dehydrate it in an oven at a very low temperature.



DESIGN DEVELOPMENT

Designing my products in response to my research and research site.



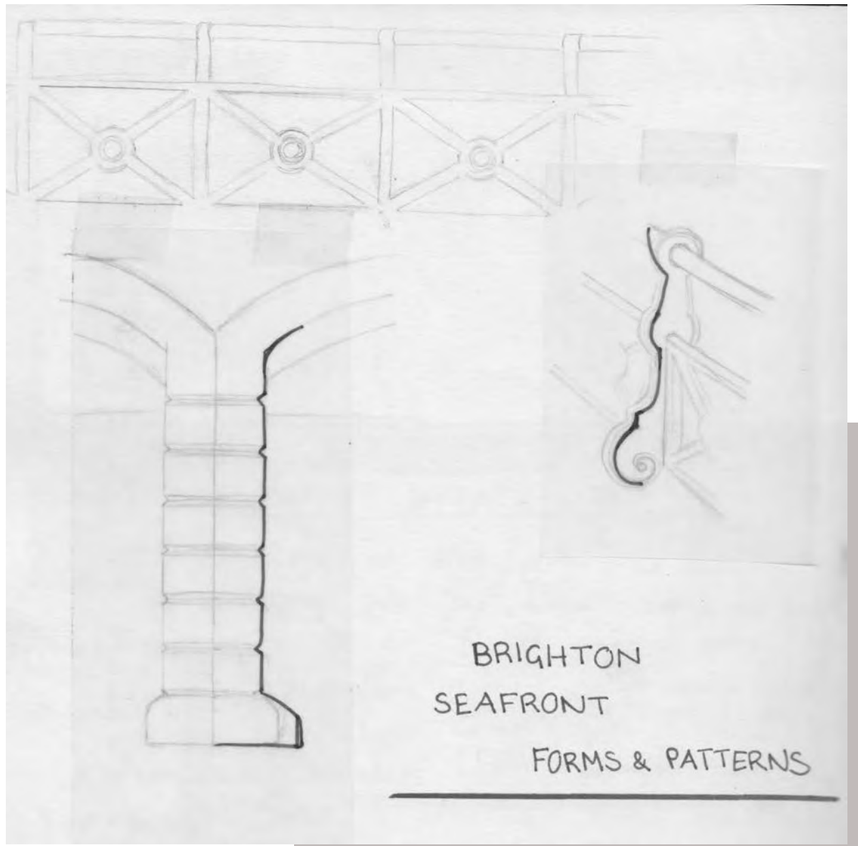


For the designs of my products, I wanted them to be based on my research site.

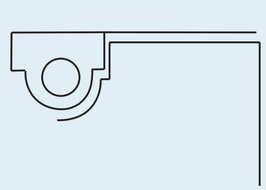
With this in mind, the start of the designing process involved going to Brighton Beach and taking a bunch of photos within my site of patterns and forms.

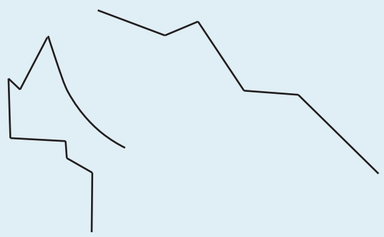
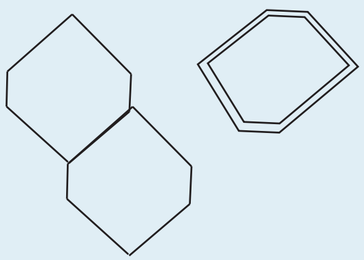
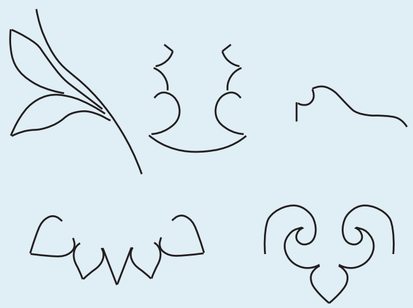
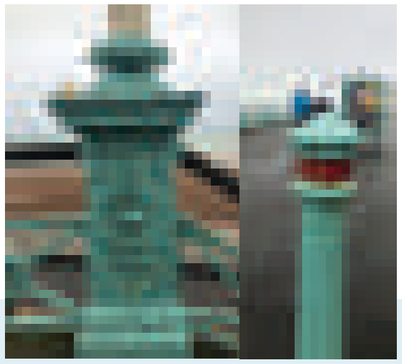
beach-music.com
EON

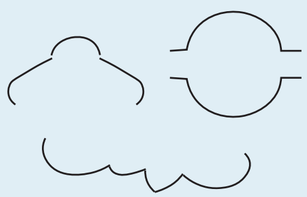
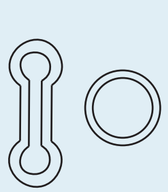
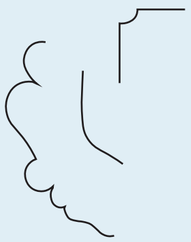
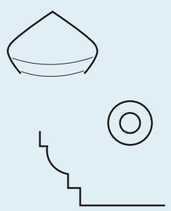
EON
Brighton & Hove Lifeguards
Champagne RIDDLE & FINNS and Oysters
Seafront Office
Award Winning Ice

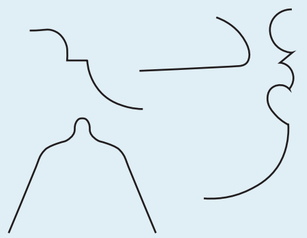

BRIGHTON
SEAFRONT
FORMS & PATTERNS

THE BRIGHTON SHELLFISH & OY





Object Study

After visiting my site and extracting patterns and forms from it to work with, I proceeded by doing an object study. The object study involved going back to my site and observing what kind of objects were in the space, specifically in the shops and restaurants.

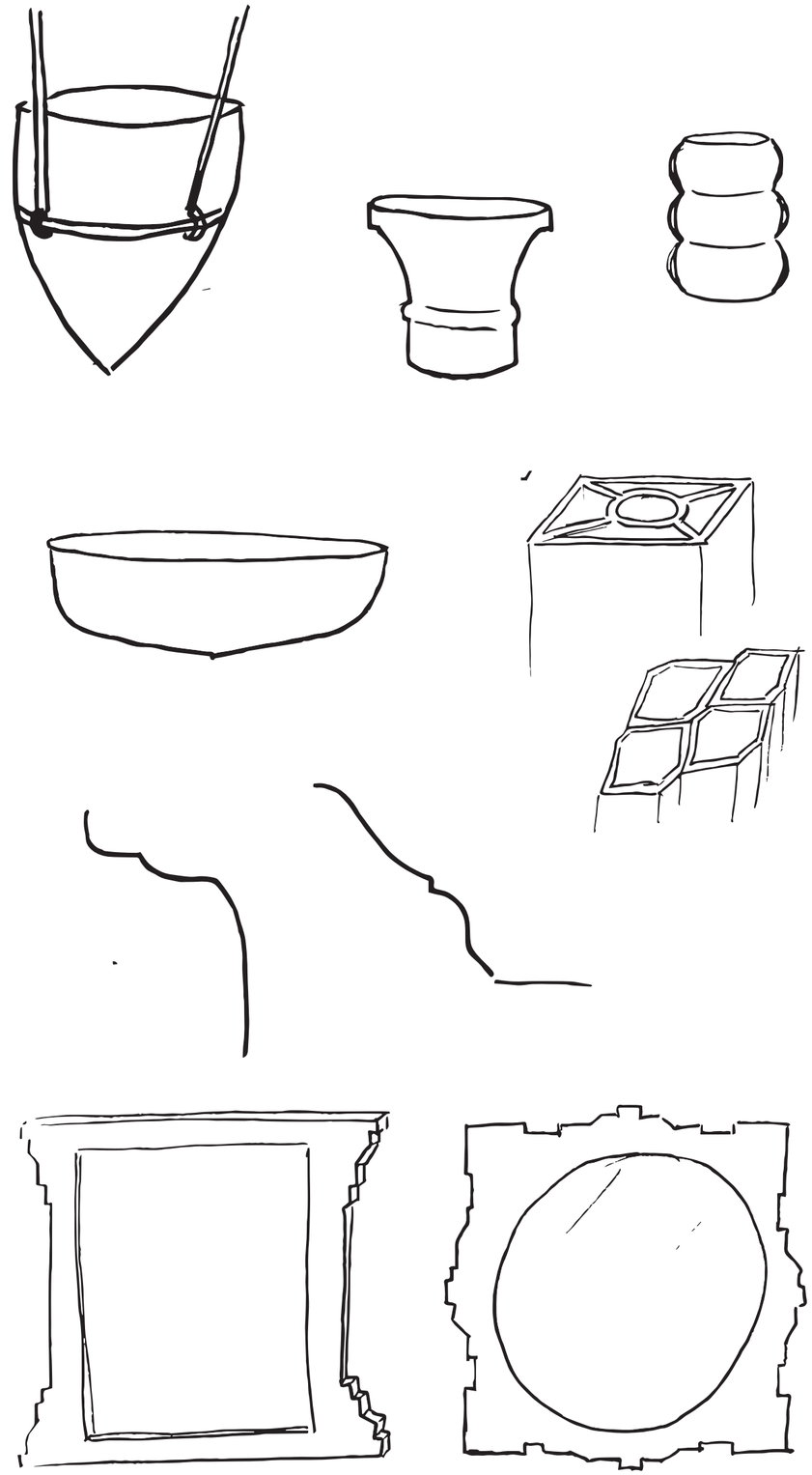
During this research trip, I documented my findings through photographs and by taking notes of the types of objects that were found for as many of the shops that I could.

Furthermore, for each place that I observed, I sketched my own product ideas based on my object study and the patterns found at my site

KEYRING
GREAT BRITAIN
BRIGHTON
BRIGHTON
BRIGHTON

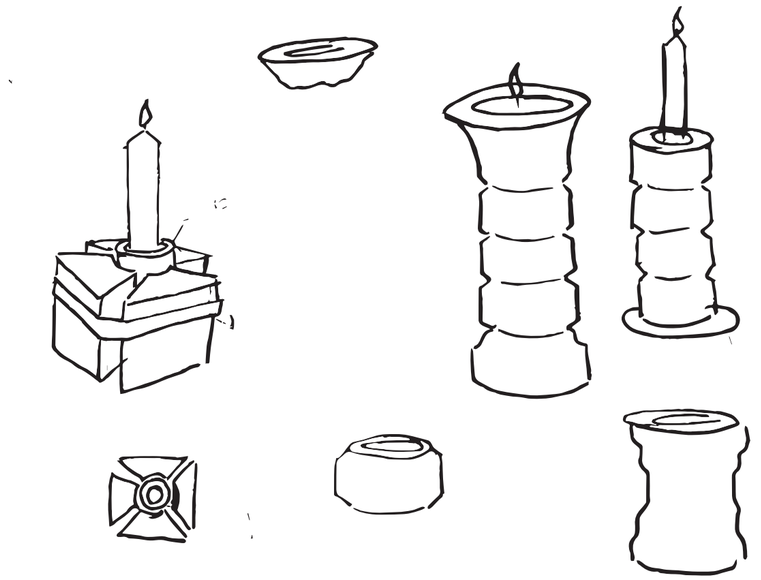
LUCKY BEACH CAFE

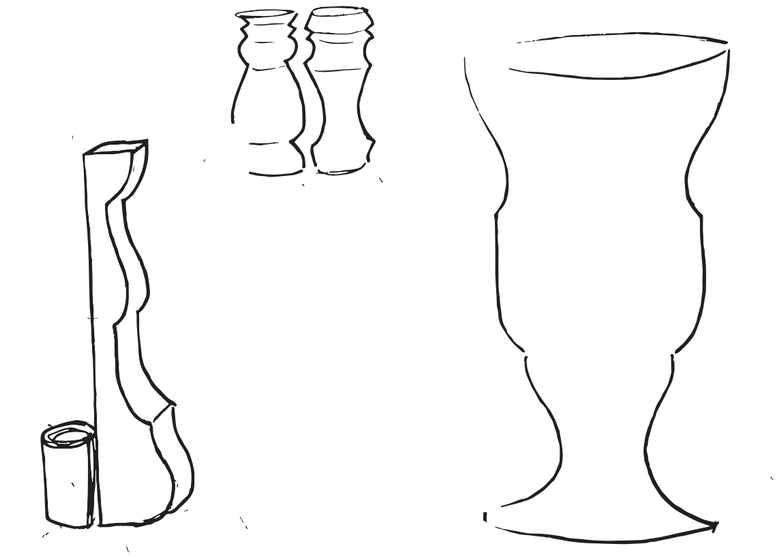
- Large Mirrors
- Candle Holder
  (large candle)
- Soap dispensor
- Plant pots
- Cutlery holder
- Sugar pot
- Stools



THE COPPER CLAM RESTAURANT

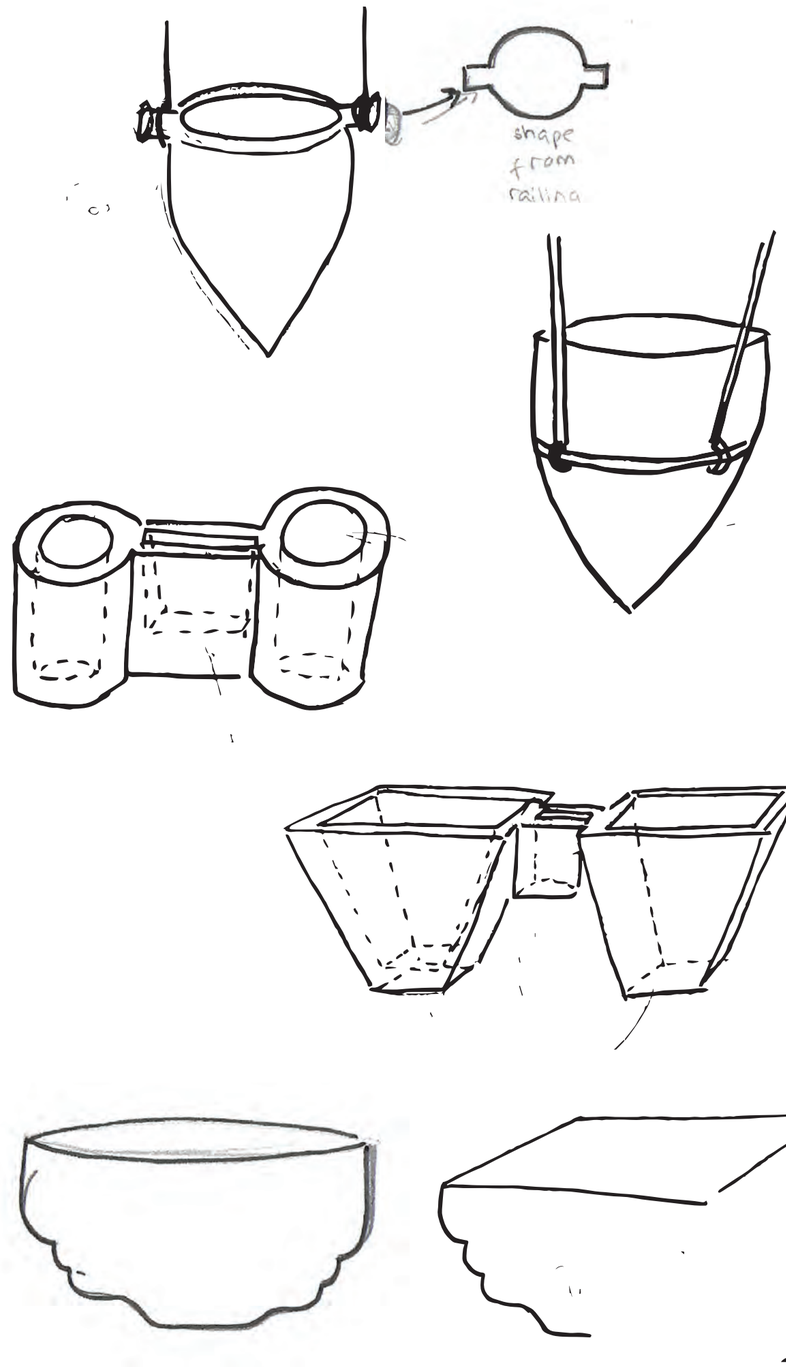
- Candle Holder
- Vases for flowers
- Lighting (ceiling hung)
- Tableware





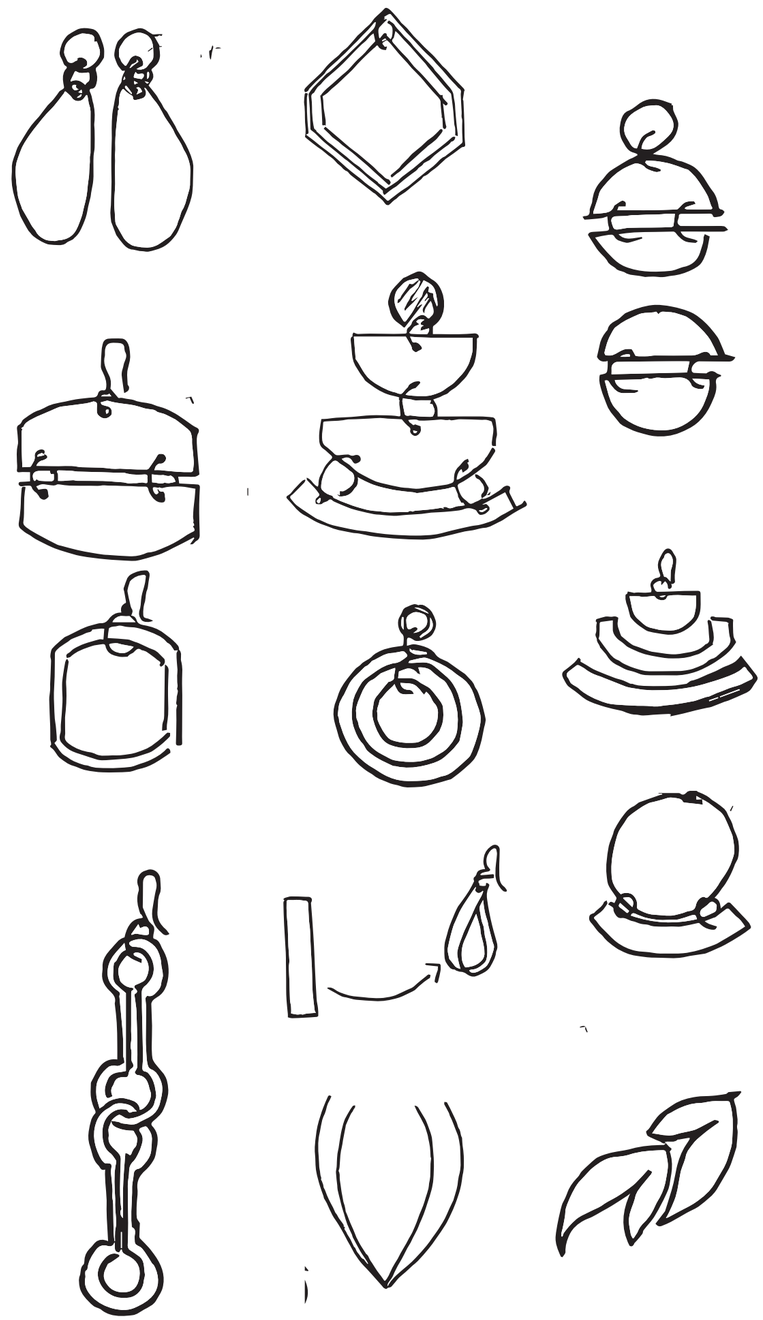
DANIEL LAURENCE

- Plant pots
- Ceramics (Beach huts)
- Mirrors
- Sculpural garden decor



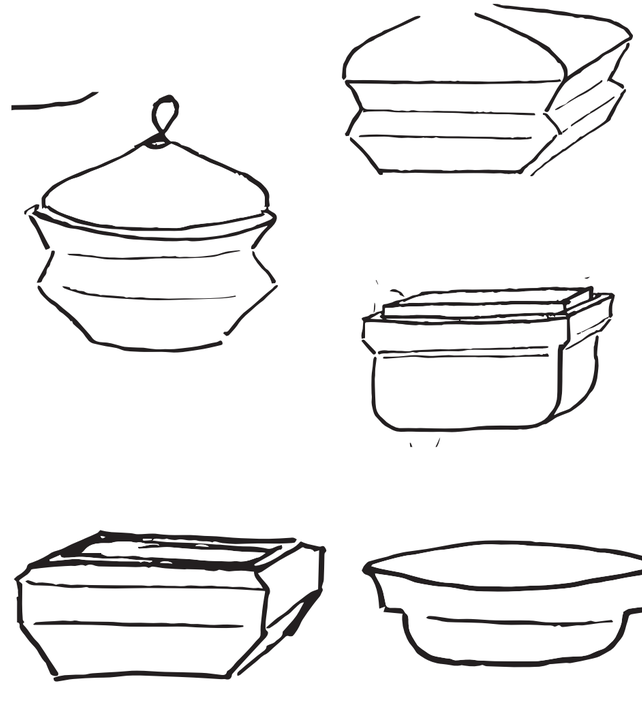
ALL AT SEASHELLS

- Keyrings
- Frames
- Jewellery
- Candle holders
- Wooden sculpture

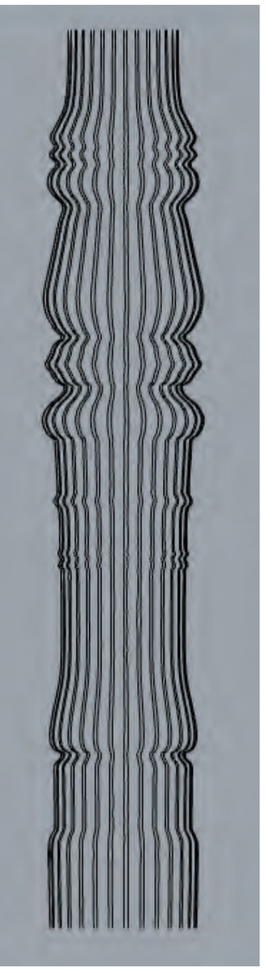


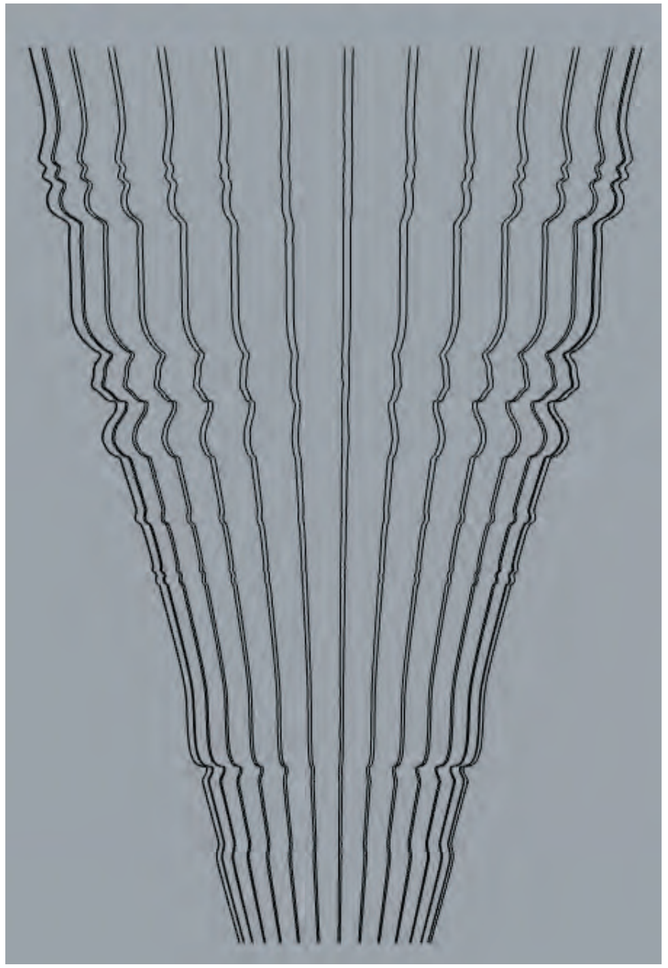
FISHING MUSEUM COFFEE SHOP

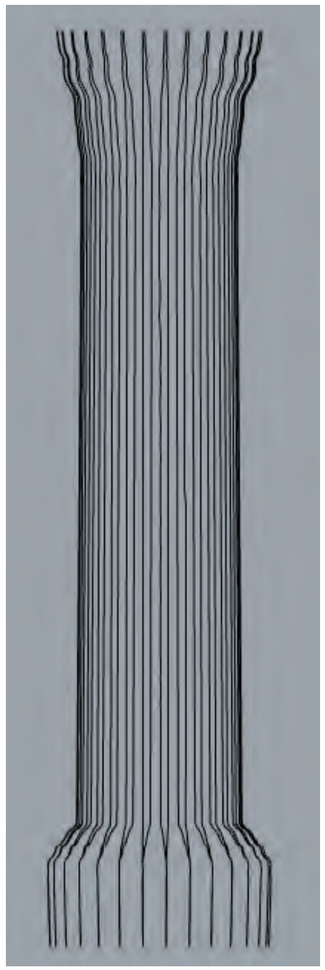
- Sugar pot
- Cup for used teabags
- Pot for paper straws

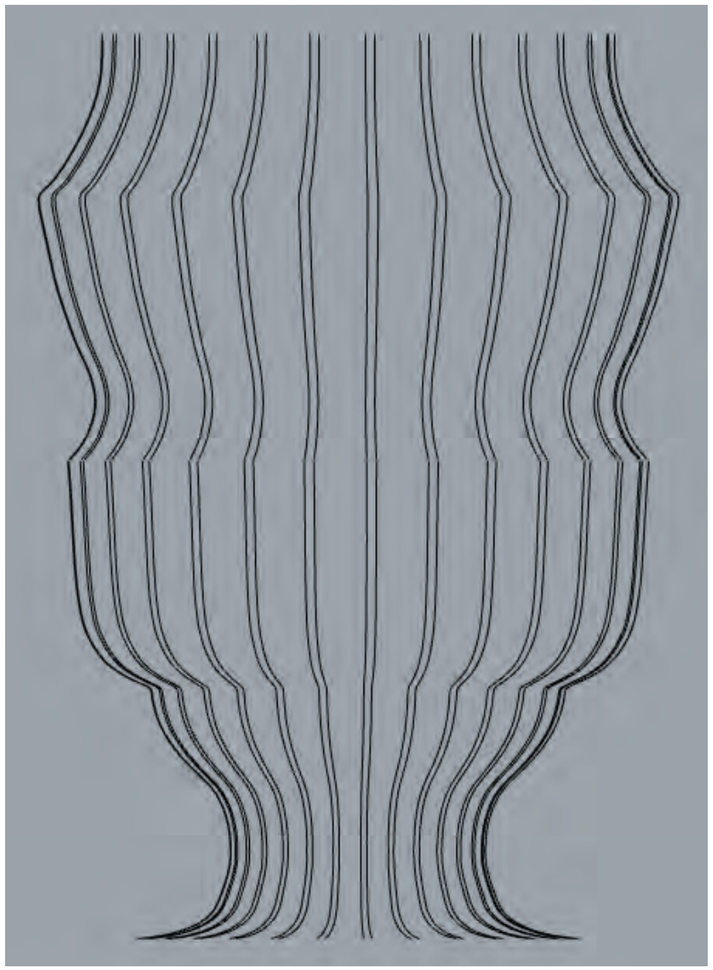


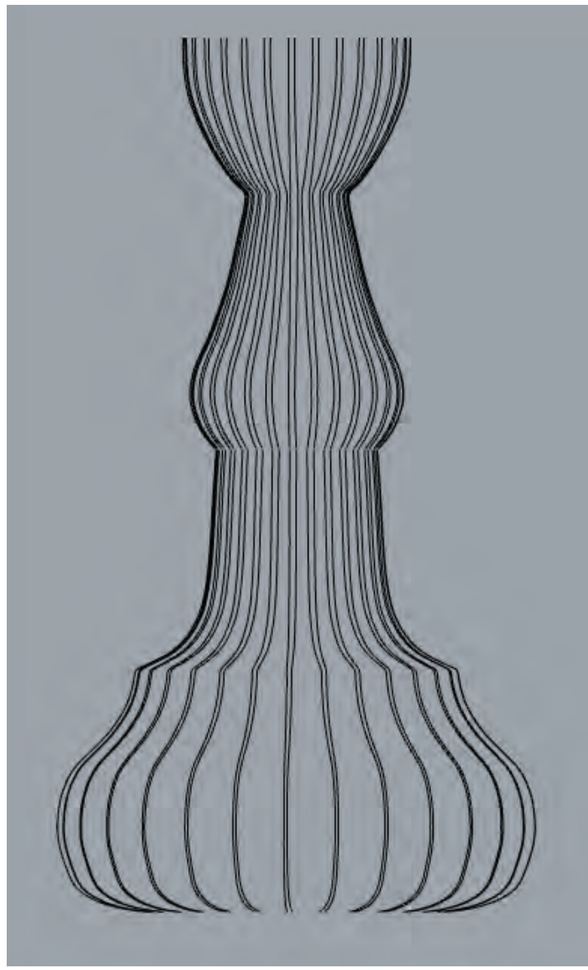
Developing my sketched ideas into digital models, to get a better idea of what they would look like and be able to easily manipulate the forms of the proposed objects.

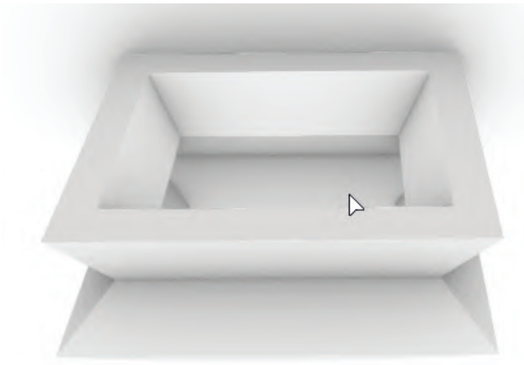
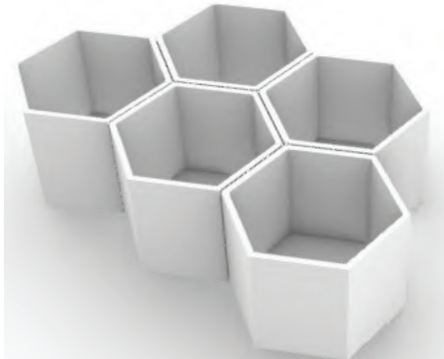


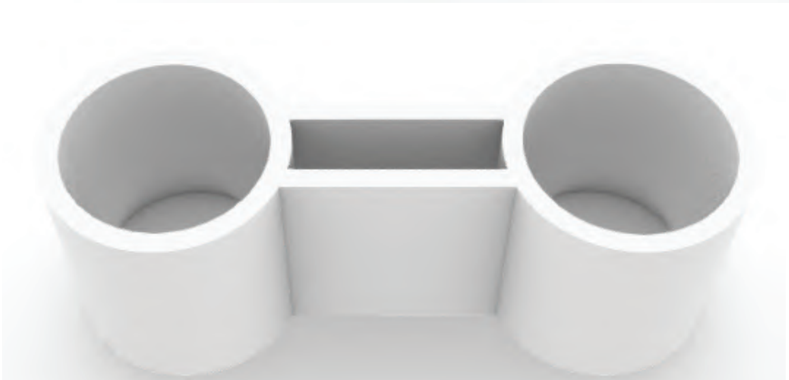








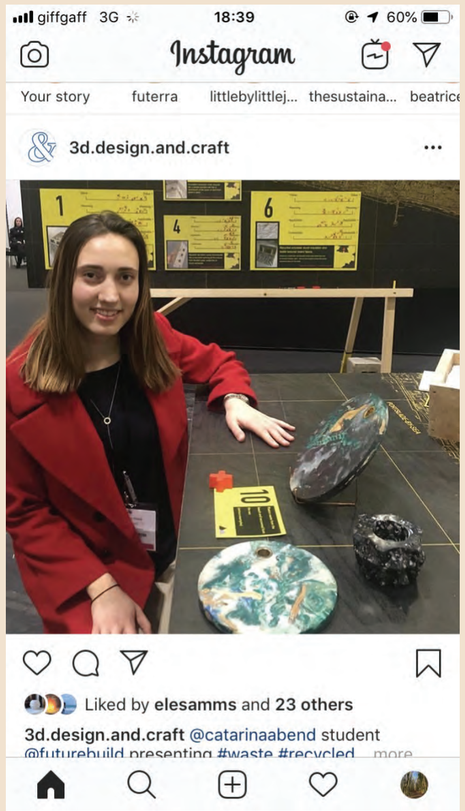





The findings from one of the beach cleans that I did, and melting the plastic beach waste into sheet material to then make into products.

futurebuild

05-07 March 2019 / ExCeL, London

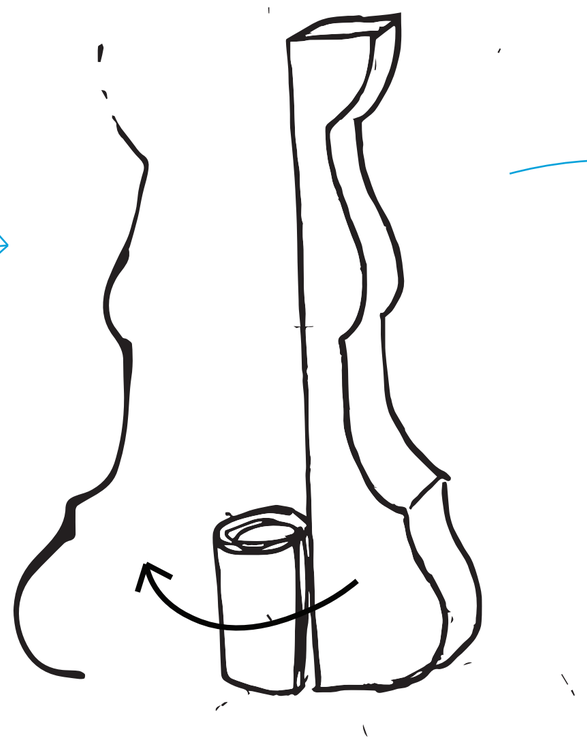


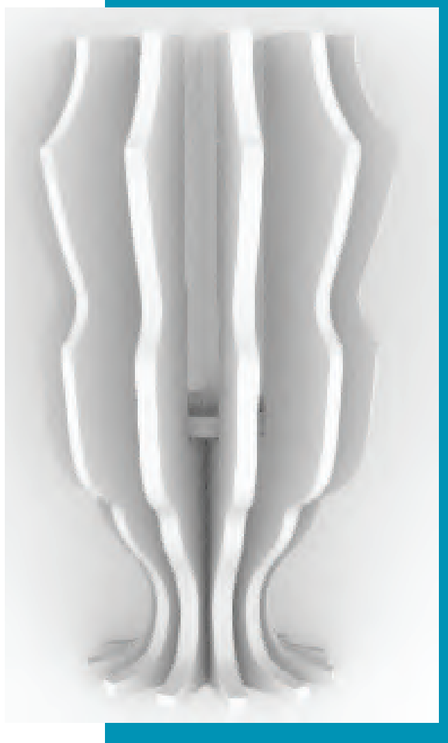
On the 5th of March, I got the opportunity to exhibit one of my pieces of work at FutureBuild in London, alongside the work of Nick Gant, Local Works Studio and Antonia Packham.
This was a great experience, because it allowed me to practice talking to people about my work which is something that I found difficult earlier in the year. In addition, I got valuable feedback and it was brought to my attention that people were very interested in the object and the material.

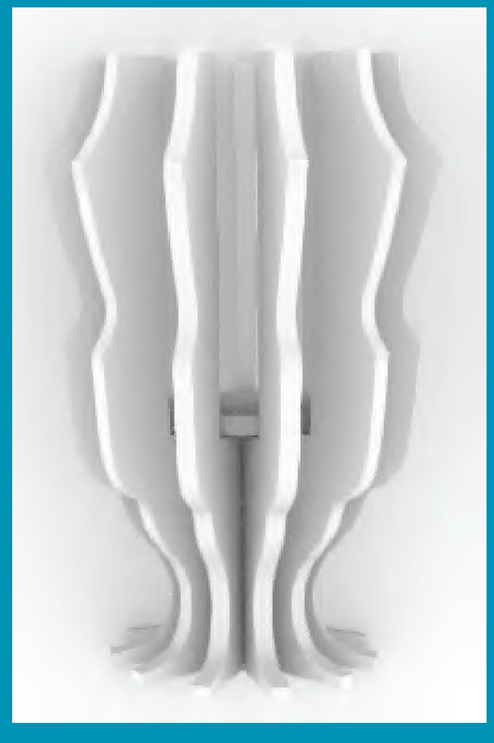
FINAL PRODUCTS

Sketches, Rhino models, The Process and The Finished Products.

Blue Mussel Shell Candle Holder





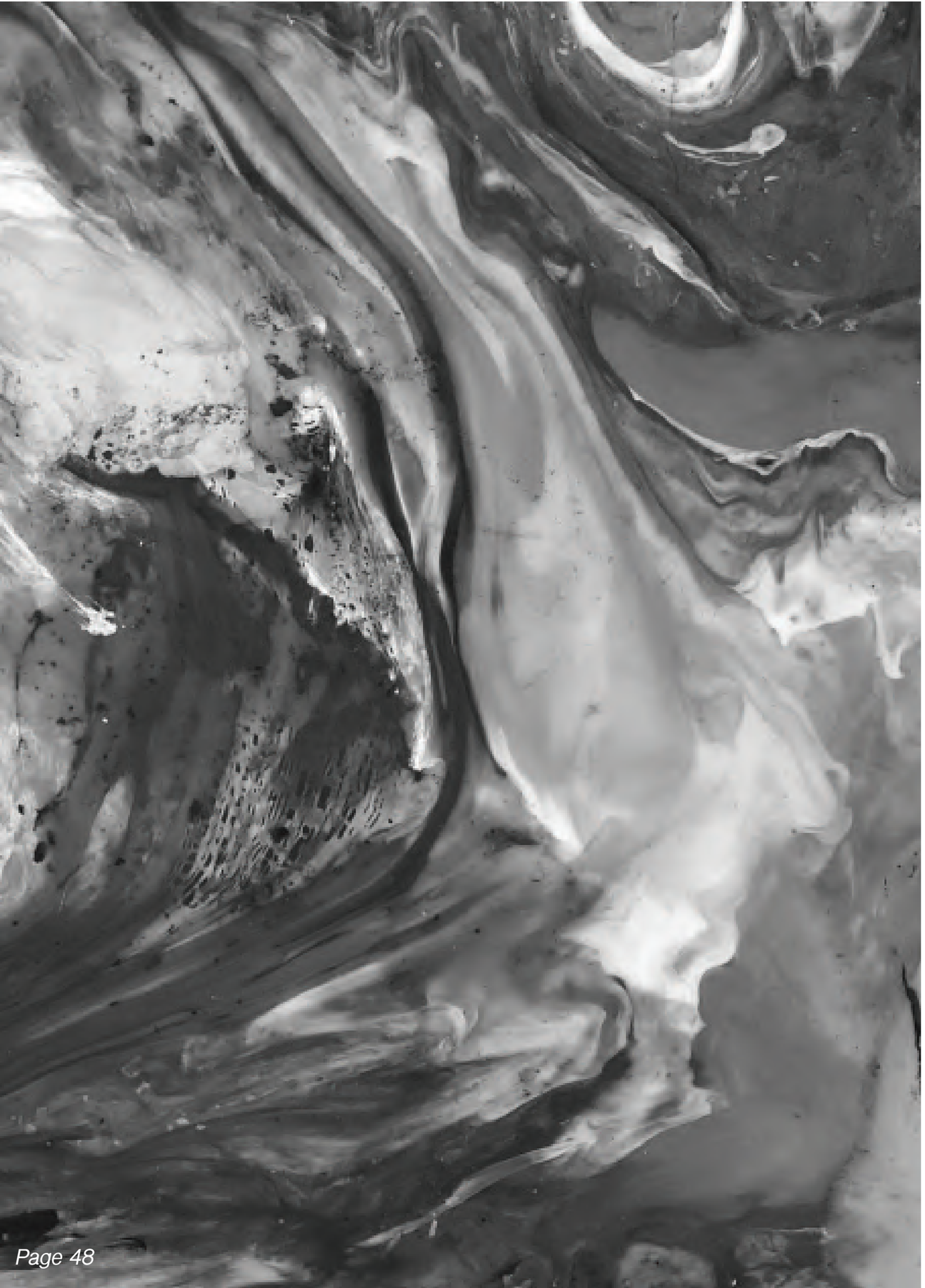


My sketched ideas, which derived from the patterns and forms that I documented from Brighton Beach, I then developed using digital CAD models where I could quickly manipulate the designs and the ideas that I had.

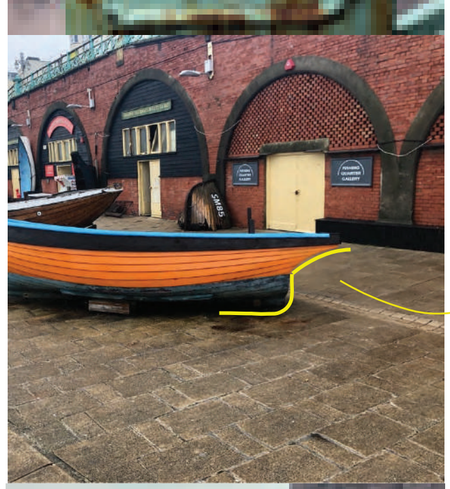
The process of making the candle holder.

Object: Candle Holder

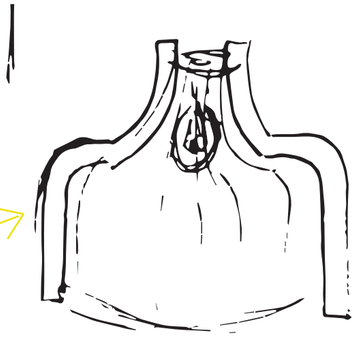
This object was designed and made in response to the seafood restaurants along the seafront, where they produce a large quantity of food waste but often don't compost it, therefore sending it to landfill.
During my observations and research into these restaurants I discovered the beauty of mussel shells, among other shellfish, and I wanted to allow other people see this aesthetic beauty too which is often overlooked due to the nature of them.
To do this, I took them out of their known context as food and created this candle holder, where I mixed the mussel shells into bio resin.

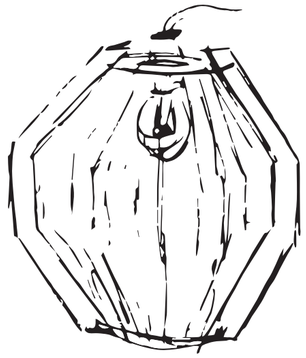


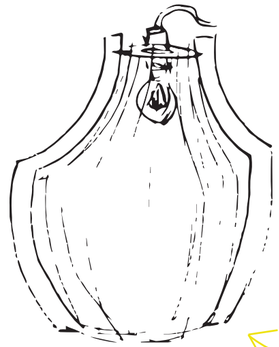
Flotsam and Jetsam Light

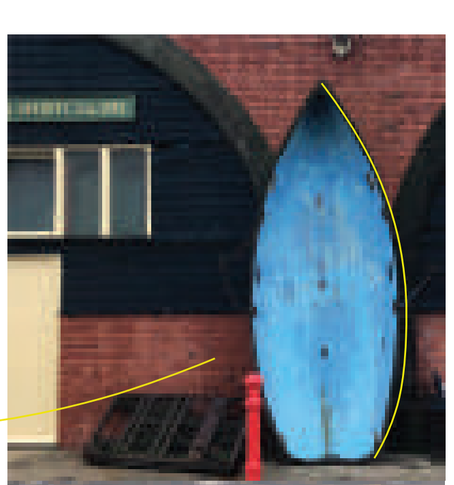


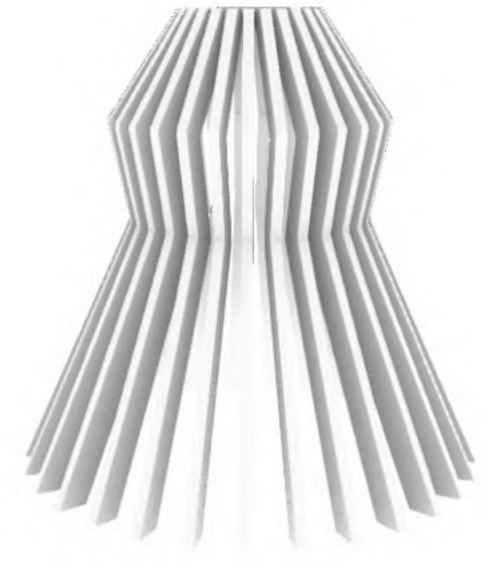
slices around, held together with metal, slotted into beachwaste plastic slices.

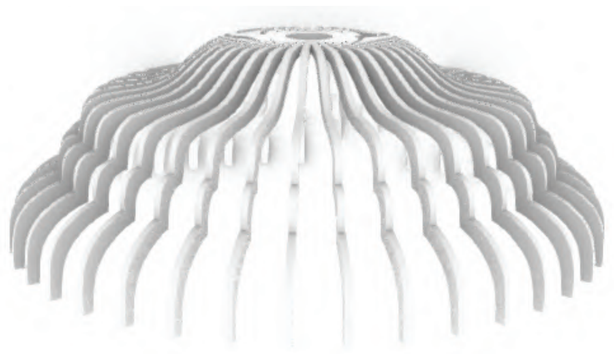




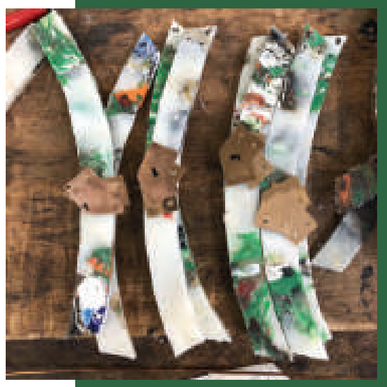
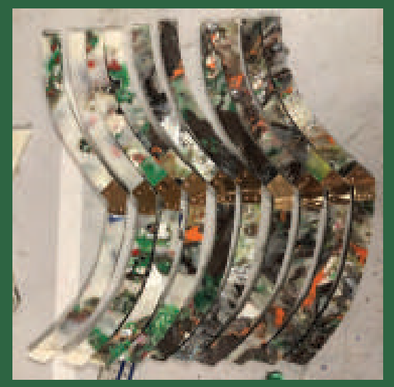






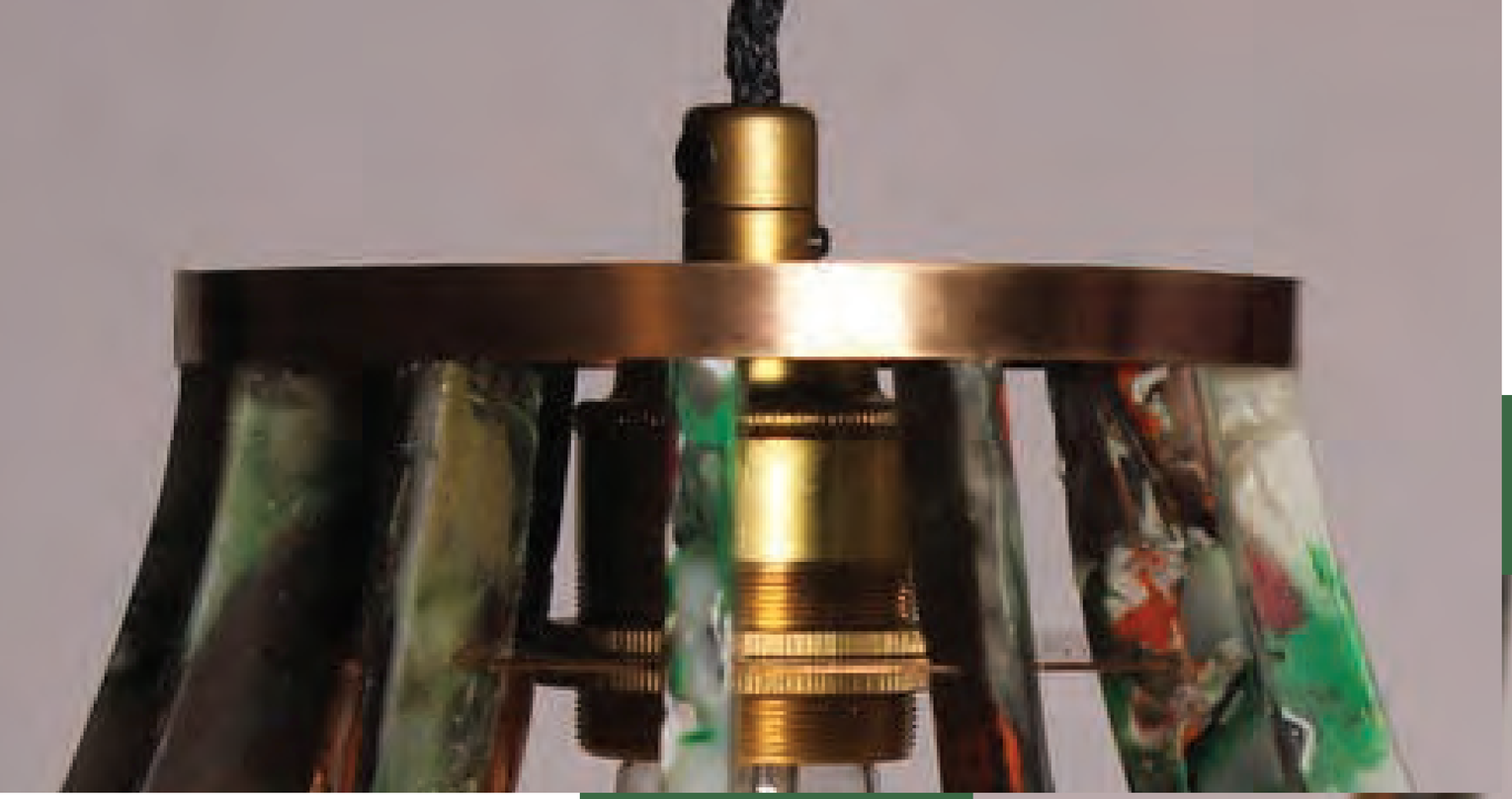


The process of making the light.

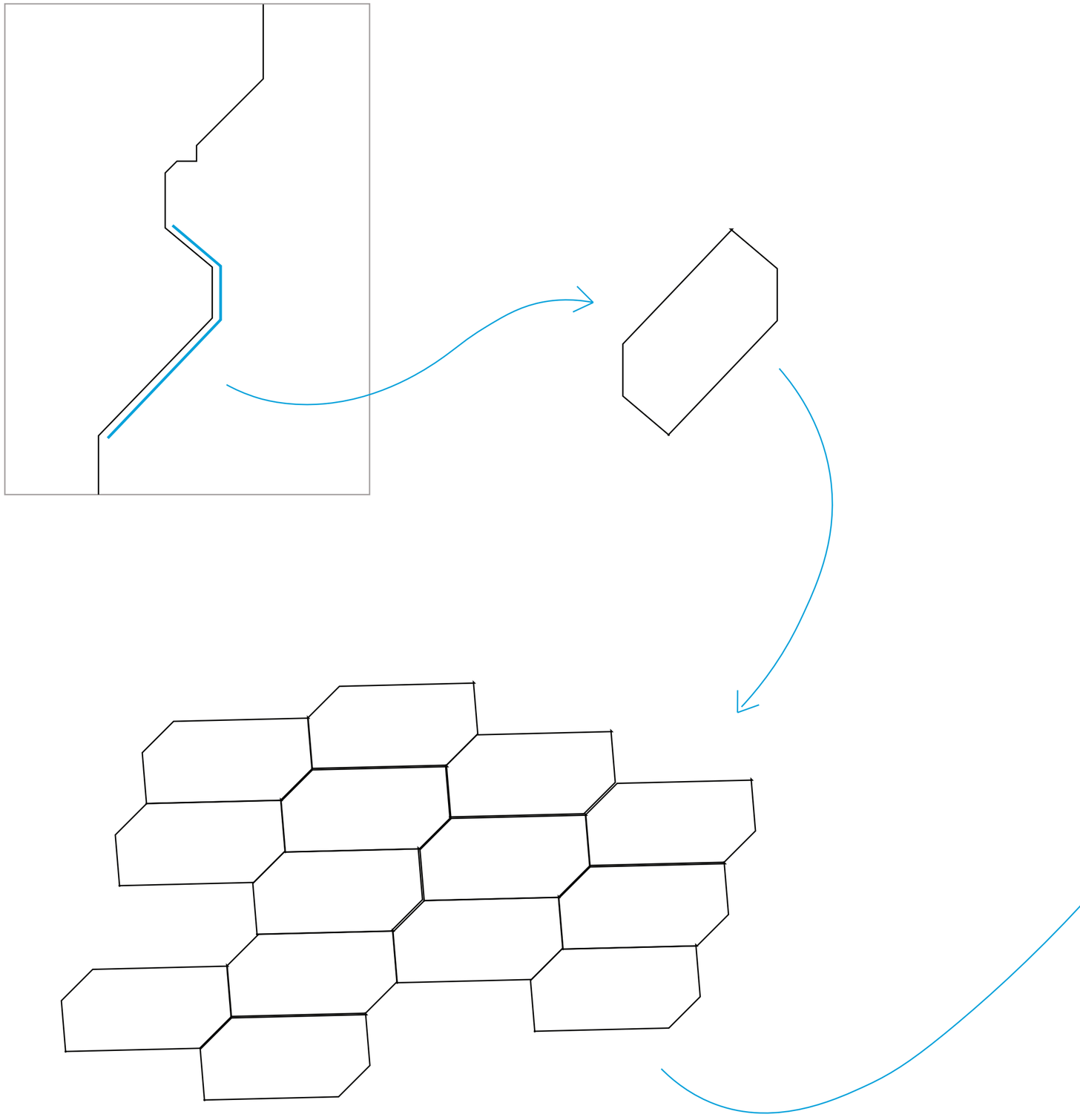



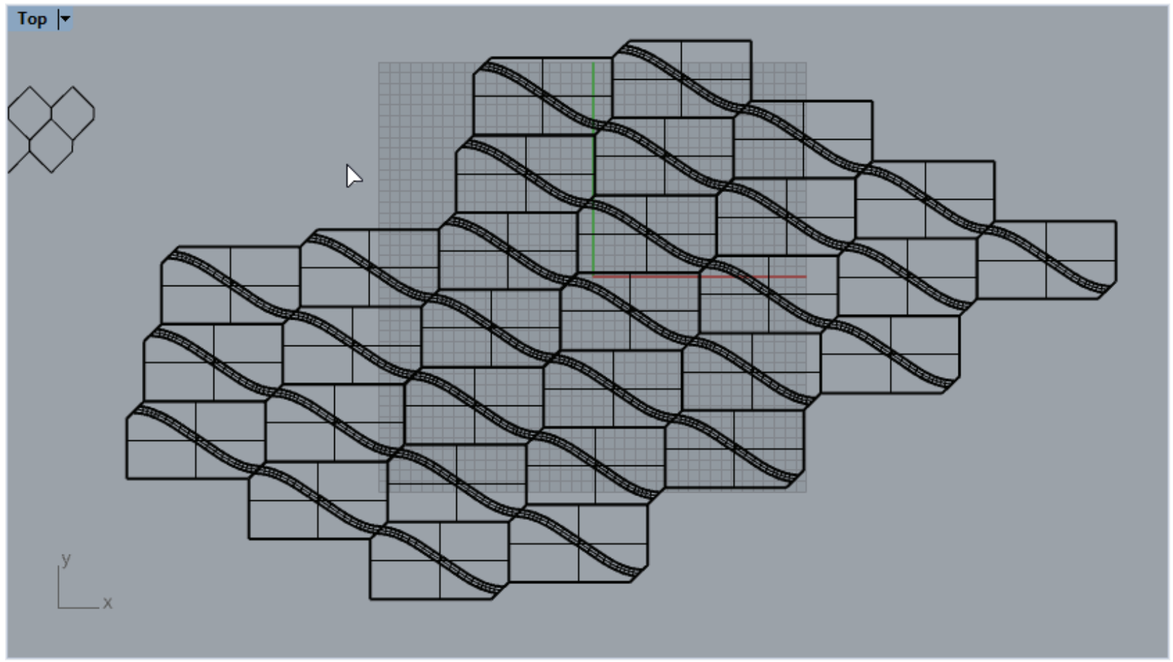
Object: Lighting

After making the Candle holder, I really liked the repetition of flat sheets of material to create a three dimentional object. Similarly to the candle holder, I also wanted my next object to be able to be taken appart easily, for both transportation and repair purposes.
Taking the previous two points into account, this light is made from plastic beach waste which was melted into sheets of about 7mm thick. The plastic sheets were then cut into my chosen shape, which was inspired by the outline of a boat, and rivetted together.
The structure of the light is made of guilding metal which keeps it all in place, but allows it to be easily disassembled, meaning it can be easily recycled and made into either another light, or something completely different.
The aim with this object is to allow people to see the value and beauty in what people consider as ‘waste’.



Blue Mussel Shell Tiles

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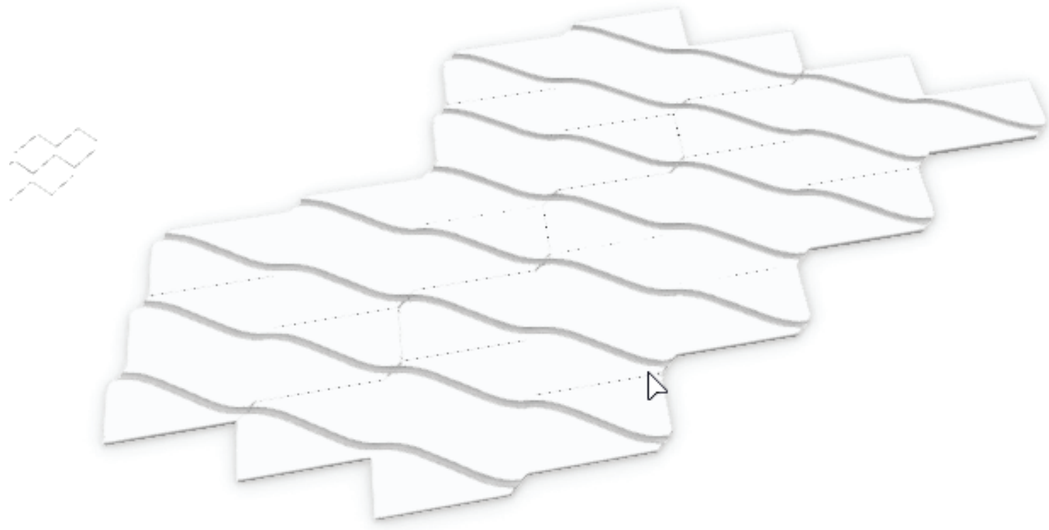
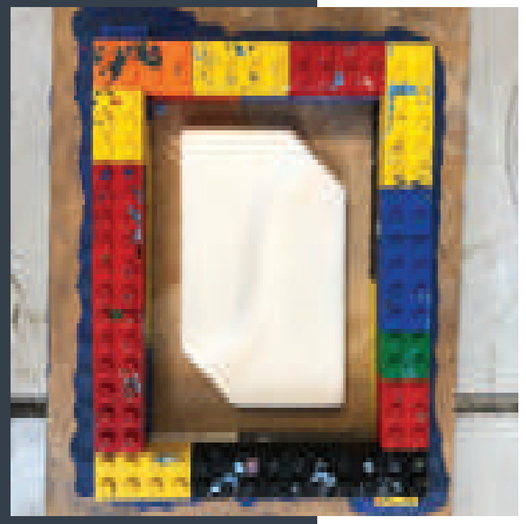
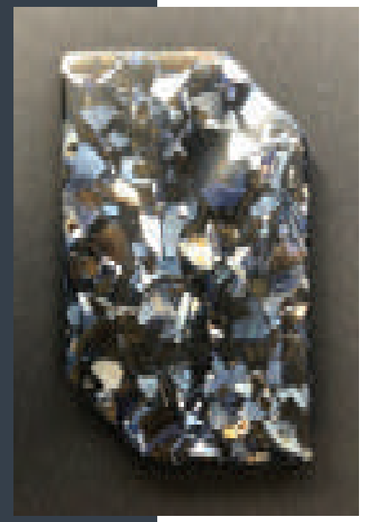


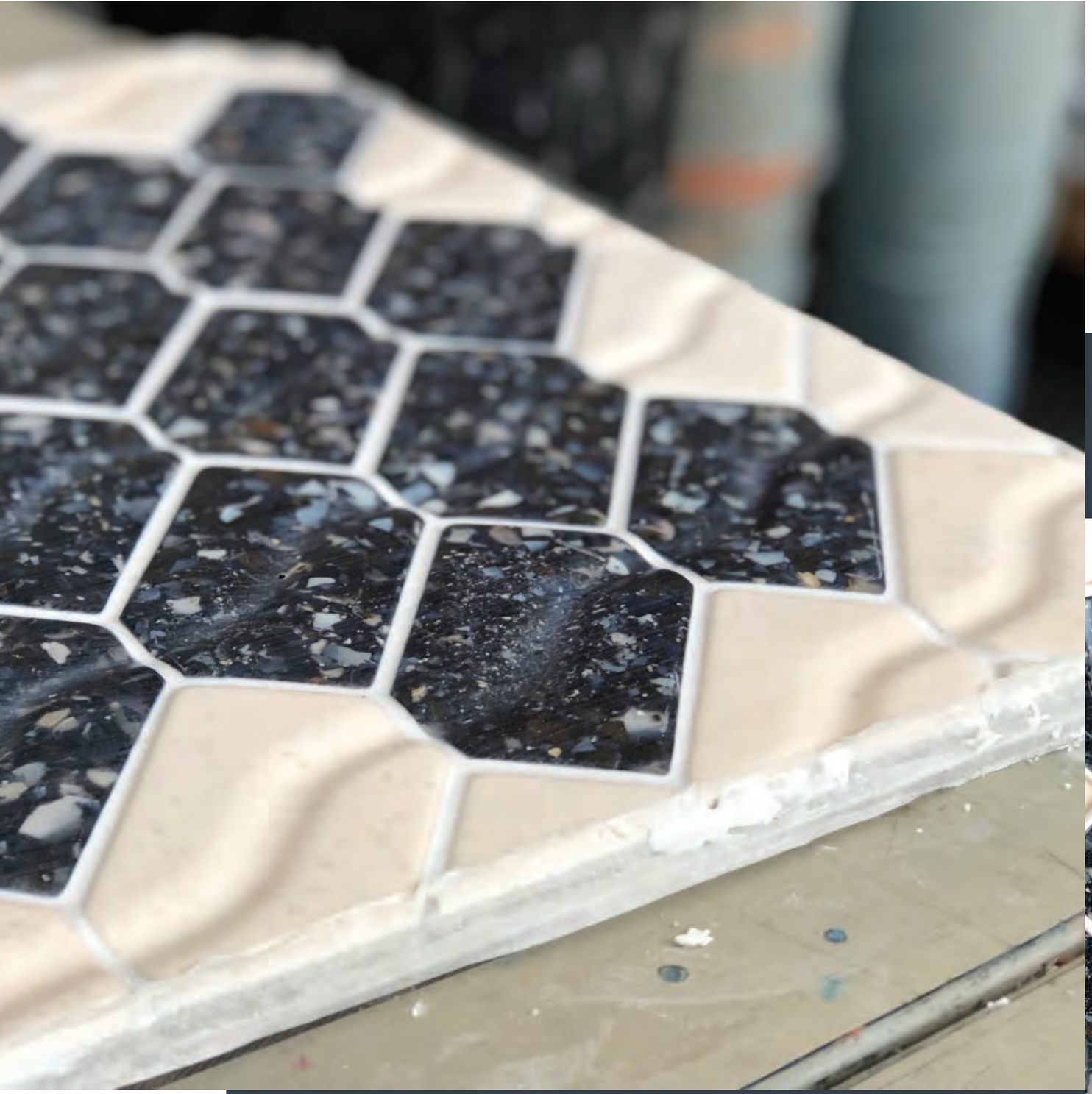
The process of making the tiles.

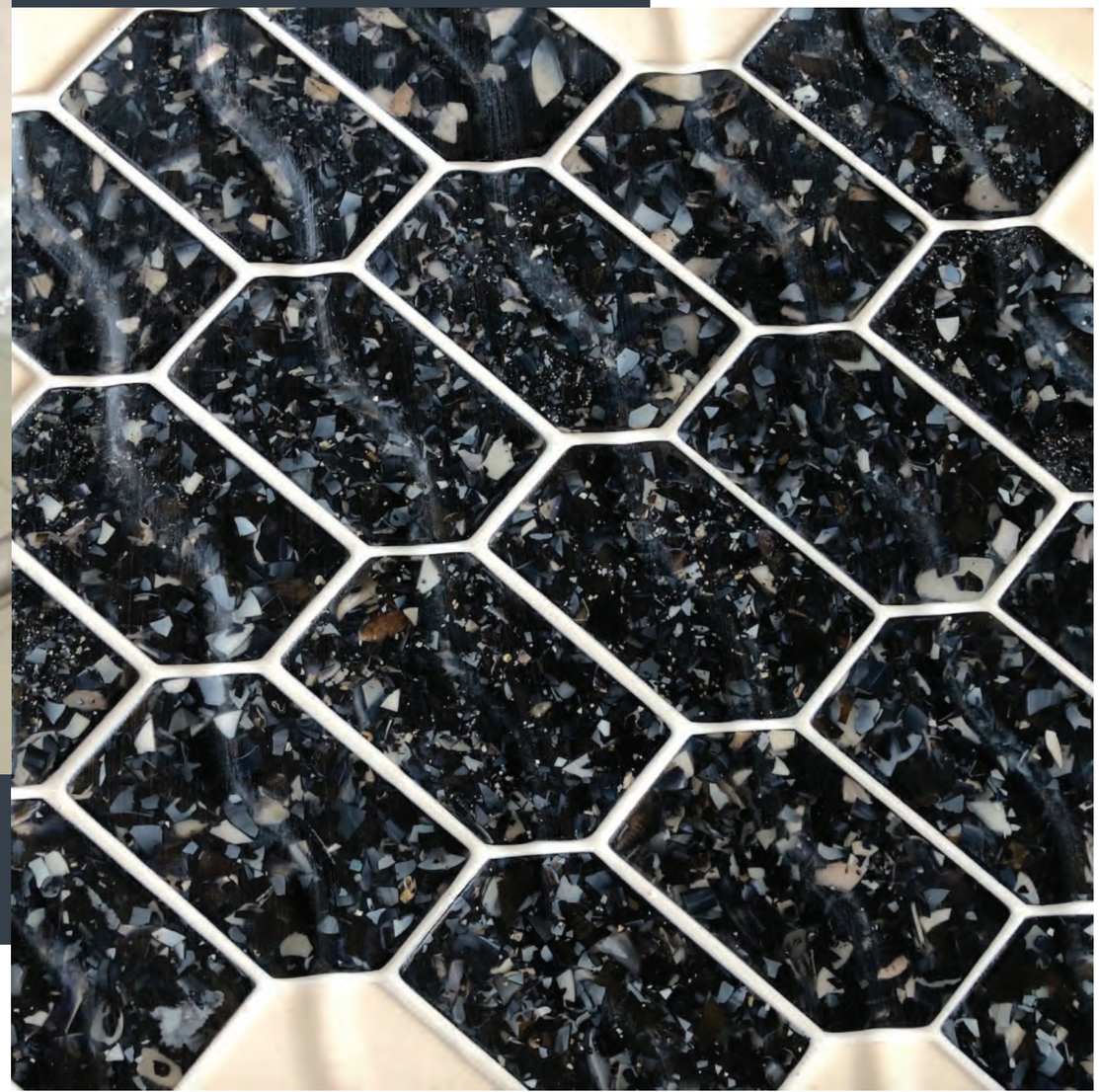


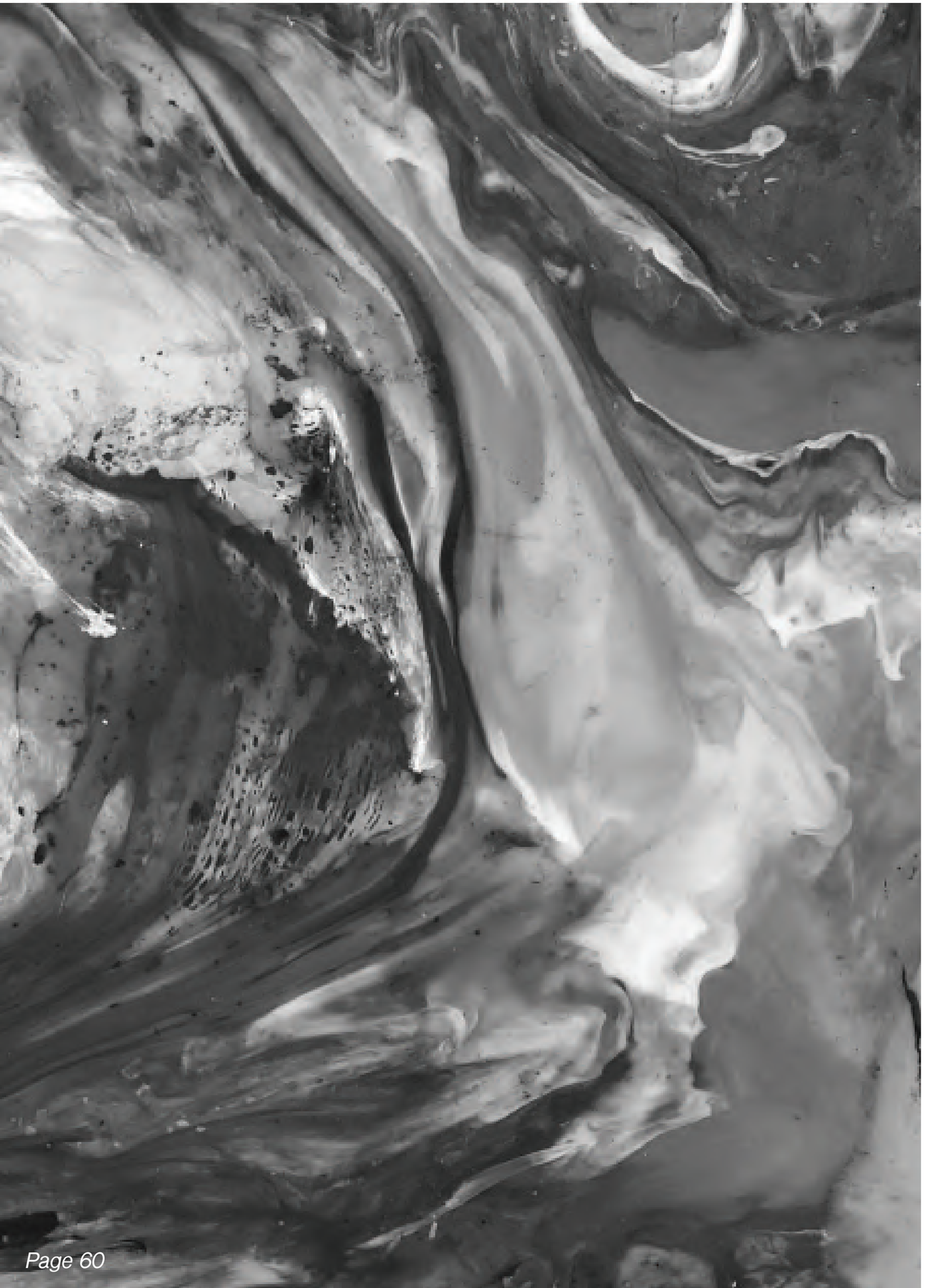


Object: Tiles

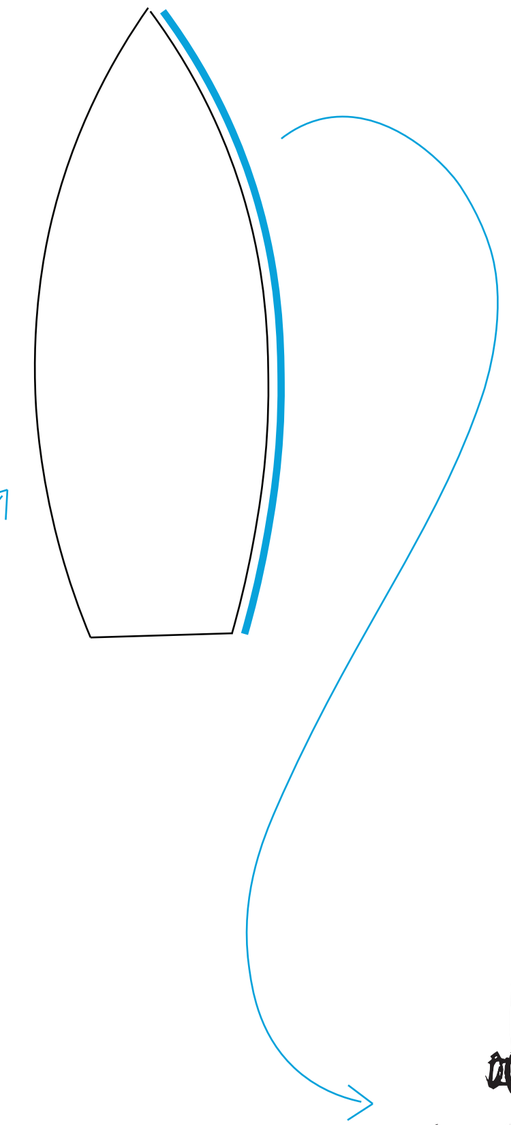
Likewise to the candle holder, these tiles were designed in response to the seafood restaurants along the seafront, where they produce a large quantity of food waste but often don’t compost it, therefore sending it to landfill.
During my observations and research into these restaurants I discovered the beauty of mussel shells, among other shellfish, and I wanted to allow other people see this aesthetic beauty too which is often overlooked due to the nature of them.
To do this, I took them out of their known context as food and created these tiles, where I mixed the mussel shells with bio resin.
These tiles could be used in a number of various scenarios, but when I designed them I saw them as wall tiles.

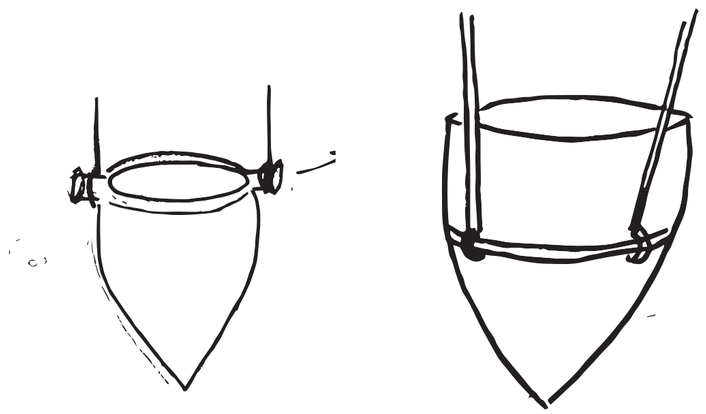


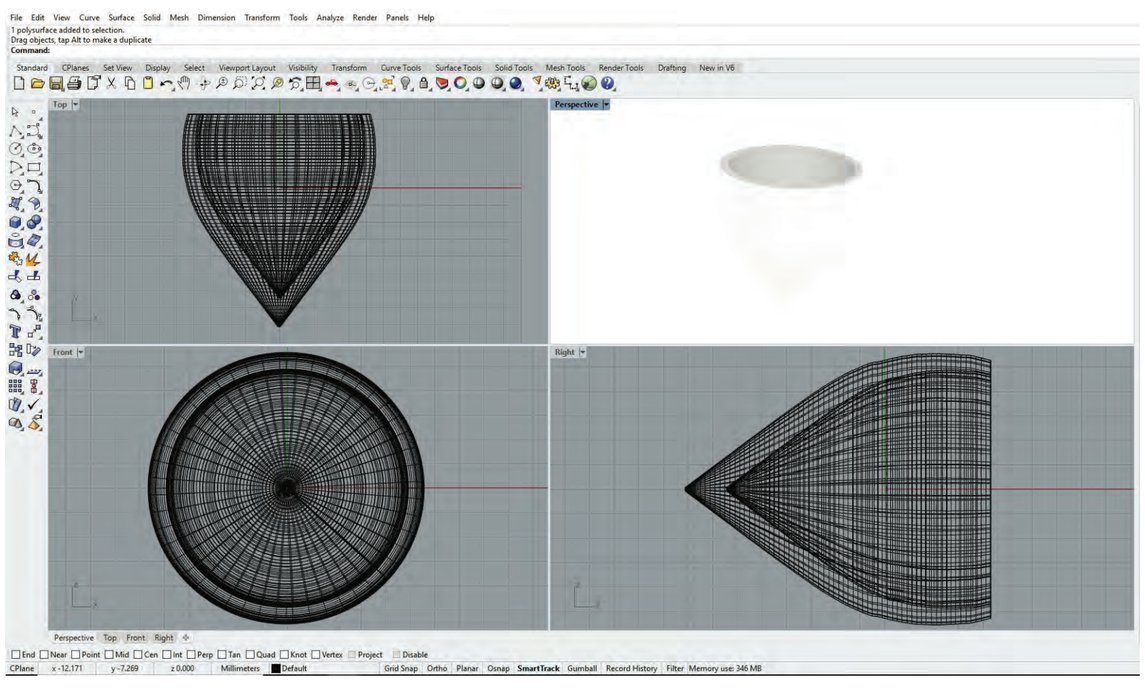




Flotsam and Jetsam Food Serving Dish



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Drag objects, tap Alt to make a duplicate
Command:
Standard CPlanes Set View Display Select Viewport Layout Visibility Transform Curve Tools Surface Tools Solid Tools Mesh Tools Render Tools Drafting New in V6
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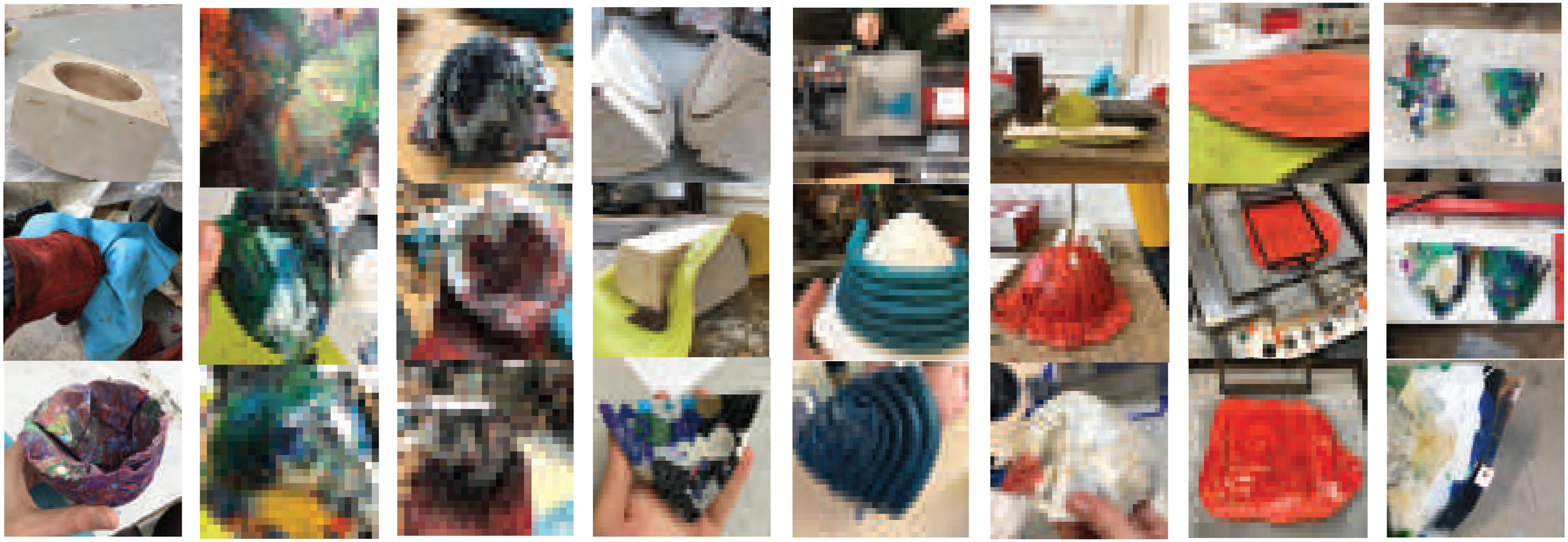
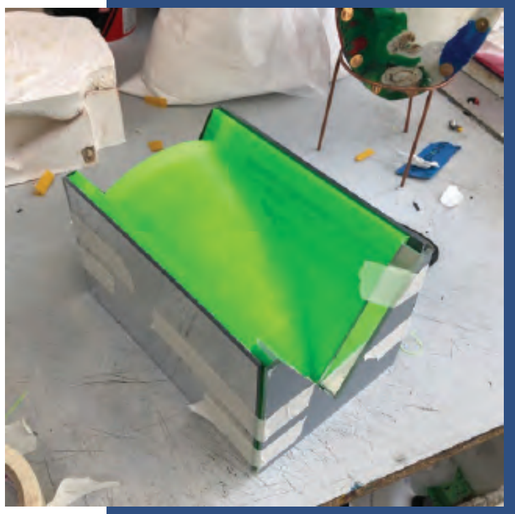
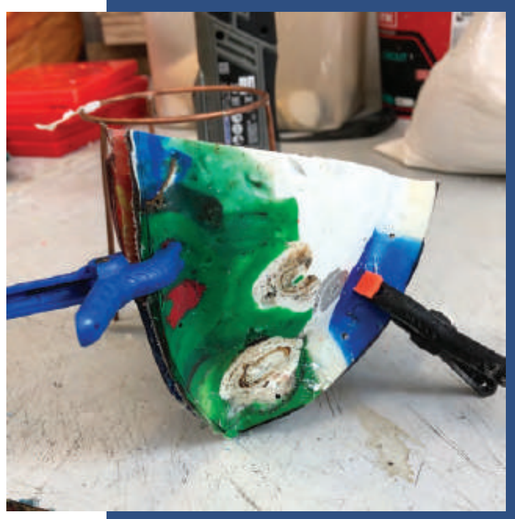


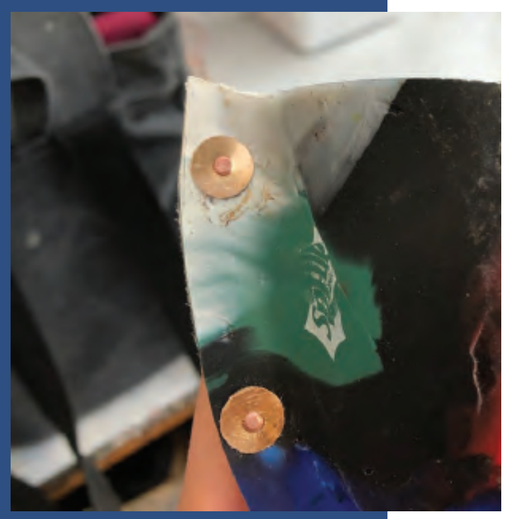
When I started making the plant pot, I initially thought that I could make the mould out of plaster and press the melted plastic into it. I soon realised that my chosen form was too deep to do this without getting a lot of fold in the material. For this point on, it took a lot of trial and error to find the best way to make my desired form. In total I tried 8 different methods:

1. Pressing the melted plastic into a mould, using my hands.
2. Pressing the melted plastic into the mould and then remelting it before pressing it again.
3. Using a heatgun to melt the plastic while pressing into the mould.
4. Cutting the mould in half and making 2 halves to them join together.
5. Extruding the plastic onto a mould.
6. Pressing the melted plastic into a mould which was a more open shape, in the hope of not getting that many folds.
7. Vaccum forming a thin sheet of plastic.
8. I went back to making it in 2 halves, but this time I left a flange around the edges so that I could easily join the two parts, which was successful.

The process of making the serving dish.







Object: Serving Dish

This product was originally going to be a plant pot, with the form designed from the shape of a boat. When it came to making it I realised that it was quite ambitious to make a form that was that deep out of one sheet of plastic, with no folds it in. So after testing many alternative ways of constucting this forms, I came to the conclusion that I would have to make it out of at least two components which I then had to attach together. Once I knew that this was the method I was going to use, I decided to make two sizes of the products: the small one which was going to be a serving dish for food and would be made of three sections, and a large one which was going to be a hanging plant pot and would be made of six sections.

To make it, I had a mould that I would form the plastic over which included flanges at the correct angles so that I could attach the sections to each other. To achieve the correct angles, I made the form of the mould digitally and then 3D printed it, which I could then make a plaster mould from. Once all the sections were made, I rivetted them together and made a metal stand for the serving dish.

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BIBLIOGRAPHY

Carrasco Rozas, Alicia. “Sustainable Textile Innovations: Piñatex, the vegan alternative to leather”. *FashionUnited*, https://fashionunited.uk/news/fashion/sustainable-textile-innovations-pinatex-the-vegan-alternative-to-leather/2017062925005 (Accessed 10.04.19)

Manton, Maudie. “Mushroom-based modelling kit allows users to grow their own designs”. *Dezeen*. https://www.dezeen.com/2015/03/25/mushroom-materials-ecovative-modelling-kit-mycelium-designs-of-the-year-2015/ (Accessed 10.04.19)

NOAA. “Why should we care about the ocean?”. *National Ocean Service*. www.oceanservice.noaa.gov/facts/why-care-about-ocean.html (Accessed 07.04.19)

“About us”. *Piñatex*. https://www.ananas-anam.com/about-us/ (Accessed 10.04.19)

“Ecovative Design”. *Wikipedia*. https://en.wikipedia.org/wiki/Ecovative_Design (Accessed 10.04.19)

“Innovative Designs Made from Repurposed Denim”. *Sophie Rowley*. http://sophierowley.com/projects-draft/2017/10/11/bahia, (Accessed 10.04.19)

“The Great Pacific Garbage Patch”. *The Ocean Cleanup*. https://www.theoceancleanup.com/great-pacific-garbage-patch/ (Accessed 08.04.19)

“Why is the Ocean so important?”. *Oceanpreneur*. www.theoceanpreneur.com/sail-green/seven-reasons-ocean-important/ (Accessed 07.04.19)

Ecovative. https://ecovativedesign.com. (Accessed 10.04.19)

Sophie Rowley. http://sophierowley.com/work (Accessed 10.04.19)

Our Planet (Season 1 Episode 1). Alastair Fothergill. Netflix, 2019. TV Series.

Save the oceans, feed the world!. June Cohen. TED, 2013. Video

www.materialshow.com/portfolio/pinatex-vegan-leather-made-from-pineapples/ (Accessed 10.04.19)