



Annie Lumby
3D Design & Craft BA (Hons)
Creative Enquiry PDF
2019

There's a
Hullabaloo
in the
Deep Blue

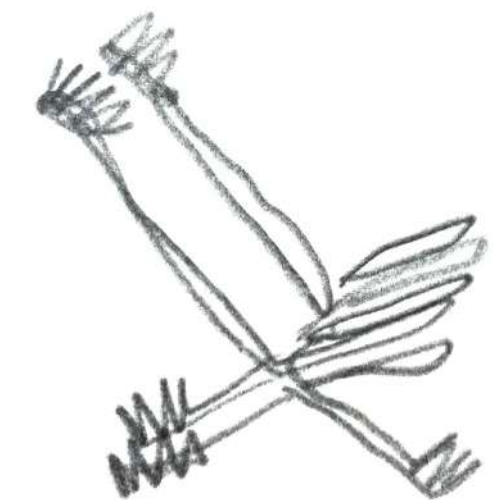
This project has been an exploration into plastic pollution in the sea, and how puppetry and film can be used to convey messages about the increasing threat sea creatures are facing from micro- plastics. Using a variety of materials and techniques, I have created a series of characters, each who depicts the issue towards their kind, and aim to enlighten the audience through humour and an underlying message.

-Annie Lumby



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C h a p t e r O n e

R o n a l d
T h e
R a t

EVALUATION OF STAVROS THE SEAGULL

I began the year following on from my 2nd Year Self Directed Project 'The Name and Shame Seagull on Plastic Patrol', where I created Stavros the Seagull, a character who patrols the beach, attacking litterers, 'eradicating tossers overnight'.

He worked well, as he was directed at all audiences, and was a funny campaign, with a serious underlying meaning.

This method of non-aggressive campaigns is something I planned to continue with this year – showing the plastic pollution issue from the point of view of the animals, using humor to get the message across, but always with a serious message behind them.

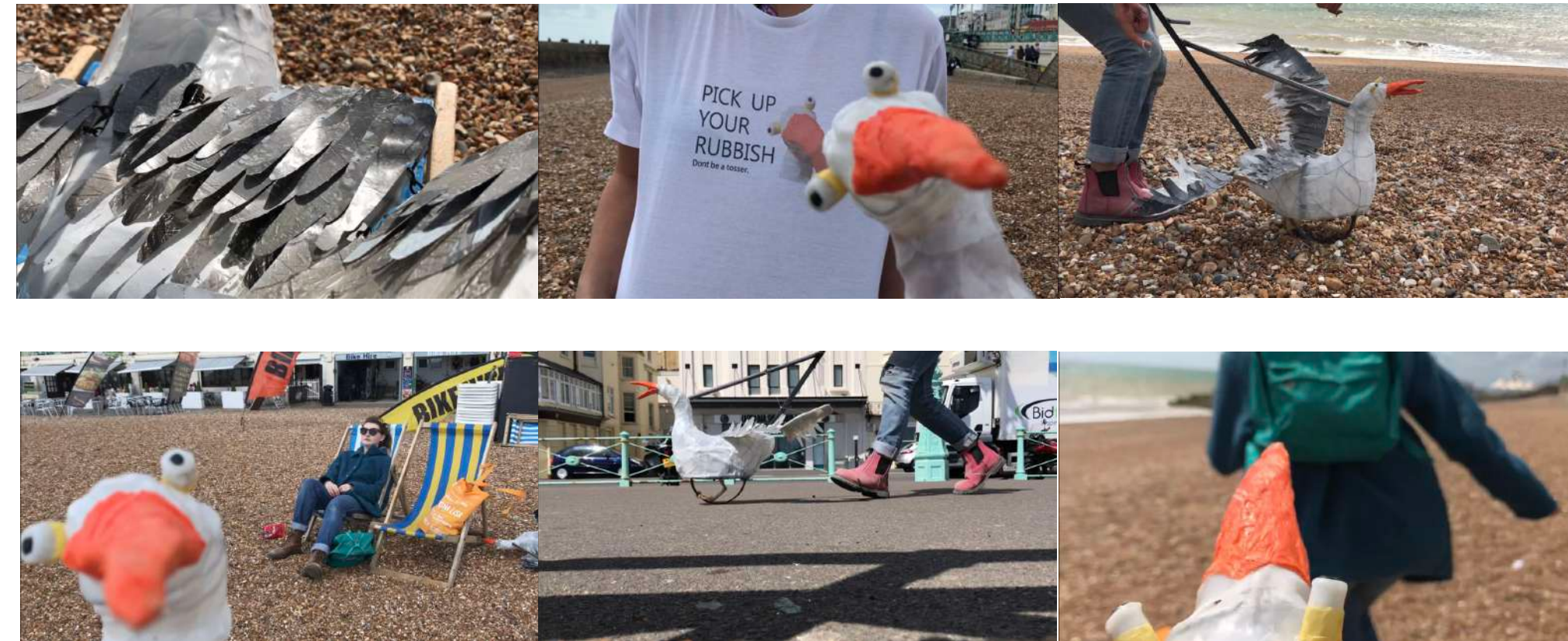
Stavros the Seagull was featured in a few local newspapers, and his video received many views, therefore hopefully spreading the message to pick up your litter on the beach!



Litterbugs warned to watch out for 'Seagull Police'



Annie Lumby with her 'name-and-shame' seagull



Stavros was successful because of his humorous approach to the plastic waste problem. He was also unashamedly handmade, and was made from waste plastic, but not in obvious was as seen before. It was also a success due to the recognisable use of Brighton Beach, and the timing of bank holiday weekend leaving it under so much rubbish.

I planned to create a herd of characters, with Stavros the Seagull at the centre as their ring leader.

The characters would all be linked, and relevant to the plastic waste issues around Brighton Beach.

I planned to use the narrative of the characters to construct a humorous film, showing the animals fighting back against plastic pollution.

The animals would all be fighting against their arch nemesis; Trashy Tracey, the woman who constantly is caught littering in the beach.

Sadly, as my project developed, Trashy Tracey never came to life. Oh what could have been...



TRASHY
TRACEY

HOTEL WASTE STREAMS

Pretty soon into my research, I decided to broaden my site to 'Brighton Waste Streams' – those linked to the beach. I was able to identify, research and highlight other problems that all have knock on effects to plastic pollution in the sea. Through animation and props, I planned to draw attention to these issues, and aim to shame residents into new thought and actions of waste and material disposal.

As Brighton plays host to many tourists, it is full of hotels. Their waste output is significant in Brighton's overall percentage of waste. This is due to the many disposable miniature versions of shampoo, conditioner, and toothbrushes.

As Stavros the Seagull was essentially a parasitic animal, I used this to narrow my decision on what animal to make first. Therefore, as I was looking at hotel waste streams, who generally have their rubbish bins in alleyways, it seemed only fitting to begin with a rat.



FIG - 1
© Simon Annand

PUPPET RESEARCH

Looking at puppets, and how the move and interact with the body and their surroundings is something that I'm really interested in. I also love the humble way they're created, with unashamed craftsmanship. They have incredible power to convey messages, and are able to portray even the most avoided subjects through non-aggressive campaigns, humour, and narratives.



FIG - 2



FIG - 3

RONALD THE RAT

He needed to have the same comical effect as Stavros the Seagull; engaging through humour, but still conveying his message.

'Ronald the Reusing Rat' focused on hotel waste, searching for toothbrushes in bins, to take back to the rat parlour to flock into new funky hairstyles.

Looking at classic stop motion animation, and well known children's characters, I planned to make Ronald very unashamedly hand crafted, and put him into context through film like Stavros.



FIG - 4

WALLACE AND GROMIT



FIG - 5

WOMBLES OF WIMBLEDON



FIG - 6

FLUSHED AWAY

RONALD THE RAT'S SKELETON

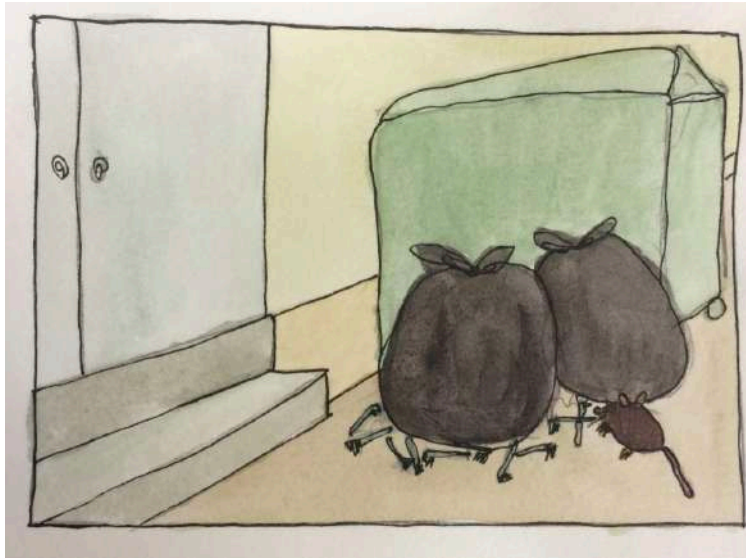


Made the same way as Stavros the Seagull, I spot welded the steel wire frame, and then coated it in milk bottles, using a heat gun.

FLOCKING THE BODY



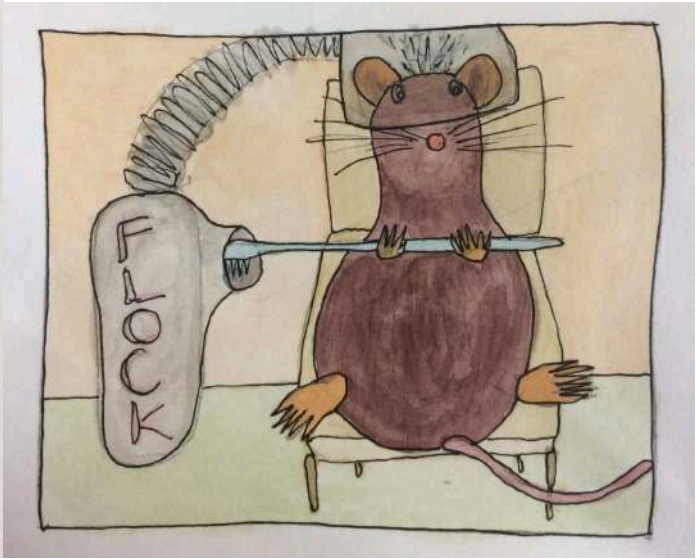
Using a mixture of many shades and lengths of flock, I created a convincing rat fur for Ronald, attaching his latex ears before, so they appeared to grow out from under the fur.



Ronald the Rat finds a toothbrush amongst the hotel waste

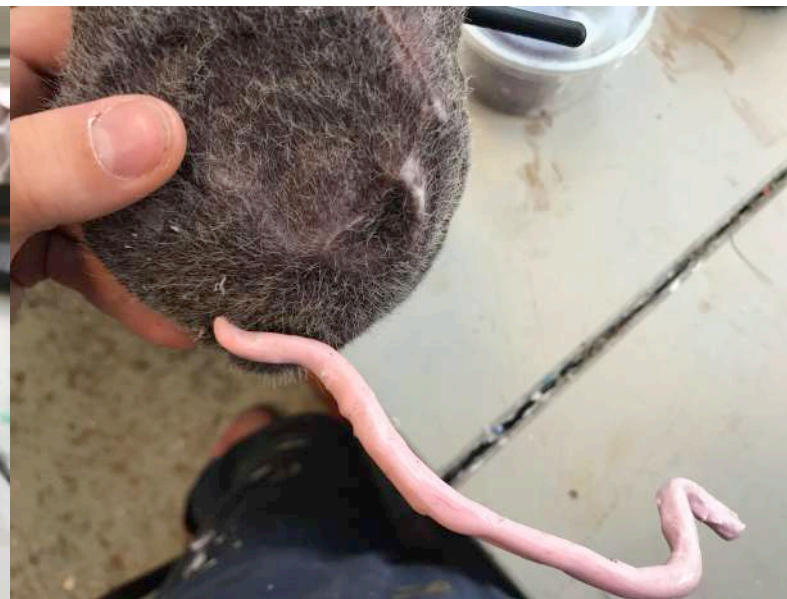


He runs through Brighton, carrying it back to the rat run



Ronald enjoys a new hairstyle of toothbrush bristles at the Rat Parlour.

RONALD THE RAT STORY BOARD



THE MAKING OF RONALD THE RAT

To make the details, I used super-sculpy, latex, old rope dipped in silicone, and broom and toothbrush bristles.



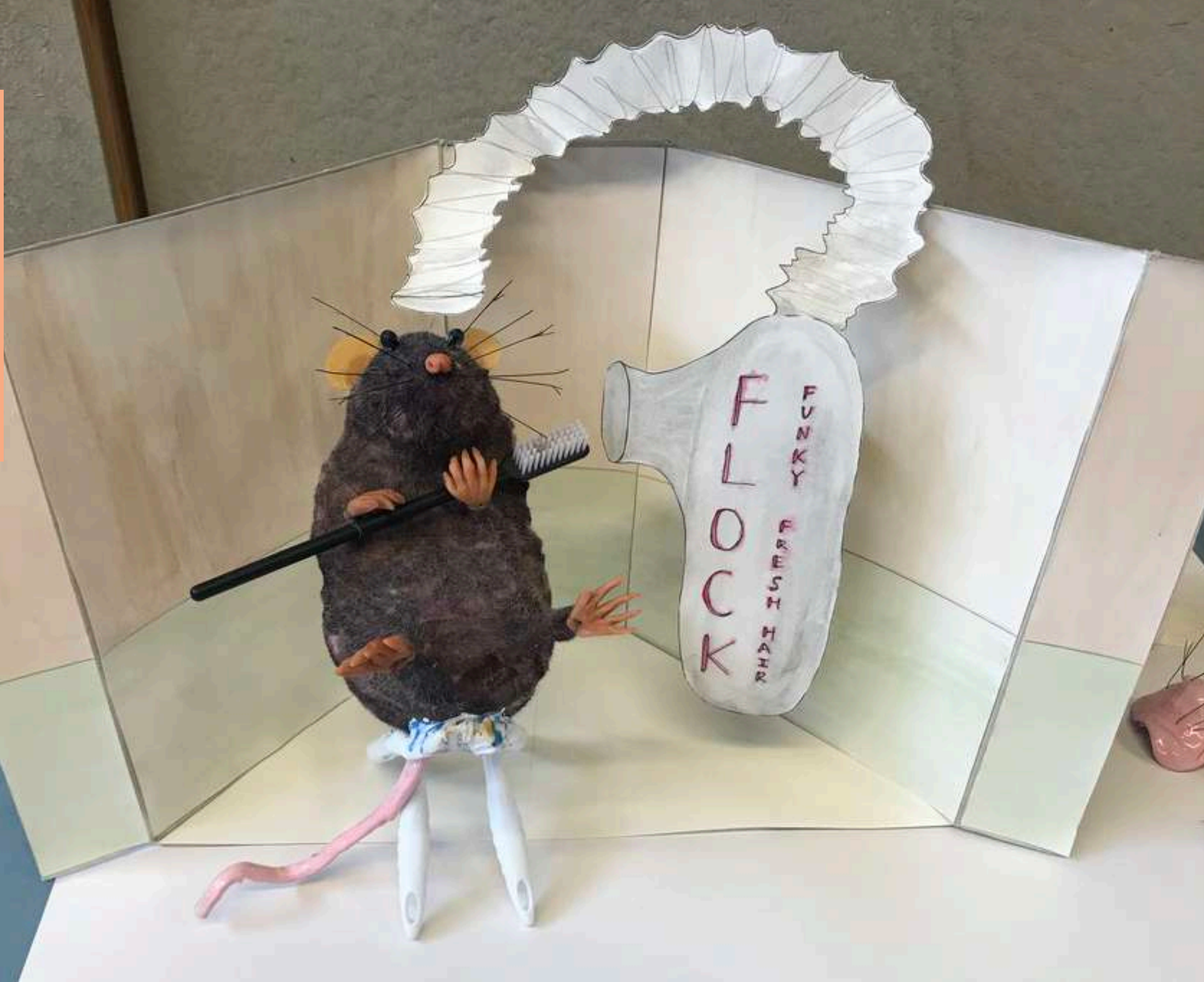
There once was a chap
named Ronald the Rat,
Who found his hair
looked incredibly flat.

Alas, thought Ronald,
I know what do;
I'll search for rubbish
that's commonly strewn.

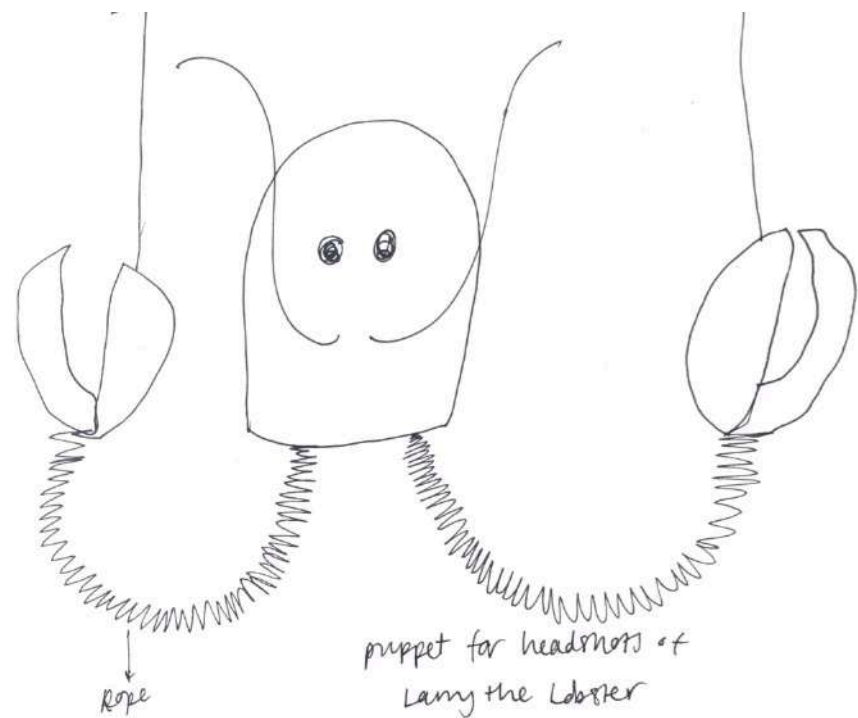
He wandered the streets,
That seemed to bare.
And found a toothbrush,
To flock into hair.

And now, sweet Ronald,
Asleep for the night.
Can rest in peace,
As his hair looks alright.

RONALD
IN
THE
RAT
PARLOUR -
FLOCKING
FUNKY
FRESH
HAIR



RONALD
MEETS
THE
PEST
CONTROL
FALCON



Chapter Two

Larry The Lobster

For my next character, I moved my research back towards the sea directly, as I found it much more interesting, and a lot more accessible for research and filming. I'm fascinated by the way sea creatures move, and found the idea of perusing research into this very alluring.

Plastic pollution in the sea has many incredibly harmful effects on marine life, and I wanted to research into this further. The impacts of plastic upon them is something many people find easy to ignore, as it's not an issue you directly see in your day to day life. I wanted to bring these issue to the surface, and speak for the creatures that are paying for the unsustainable habits of our culture.

With 230000 forms of marine life, and five oceans, the task of where to begin seemed overwhelming.

INCREDIBLE OCEANS



Incredible Oceans are an organisation that aim to change the public's disassociation with the sea. Using "the combined power of culture, science and charismatic marine life to grab hearts and minds and bring about a sea change in the way we relate to our oceans."¹ The oceans faces threats from all angles, and it's health directly impacts the future of the human race.



INSIDE THE BEAST - AN IMMERSIVE INSTALLATION BY AMANDA STAFFORD

Created for WhaleFest 2012 in Brighton, Amanda Stafford of the *Whale and Dolphin Connection* constructed the belly of a Sperm Whale; an immersive experience for visitors where they where able to see the organs, and its quarry, an illuminated squid, along with plastic debris. Marine creature sounds were produced by sonic footpads.



WHALE WORKSHOP - INCREDIBLE OCEANS' PUBLIC PERFORMANCE WITH ANDY PETERS

Prop-maker Andy Peters tours the world with The Marine Wildlife Roadshow, a collection of "life-size and life-like models of sea creatures, to raise awareness and focus attention, at public events, exhibitions, festivals, and in schools. I have also developed the skill and the confidence to deliver important conservation messages wherever I give a presentation, to all ages and status of audiences"²

1- "Inside The Beast". *Incredible Oceans*, 2019, <https://www.incredibleoceans.org/inside-the-beast>. Accessed 2 Apr 2019.

2- "Whale Workshop". *Incredible Oceans*, 2019, <https://www.incredibleoceans.org/whale-workshop>. Accessed 2 Apr 2019.

3- "Whale Fest". *Whale-Fest.Com*, 2019, <http://www.whale-fest.com>. Accessed 2 Apr 2019.

WHALE FEST - THE WORLDS BIGGEST CELEBRATION OF MARINE LIFE



"Our mission continues to be to reach the biggest audiences, in the most diverse ways and to instill in them a love of our blue planet, so that we can all take action to save our incredible oceans."³

Through researching Incredible Oceans, I realised that many campaigns to save the oceans are spearheaded by installations/events/performances about plastics' effect on whales. As the largest mammal, it seems obvious that they should use it as a way of getting through to people who dismiss ideas of sustainability. Through highlighting our effect as humans on this enormous creature, people may start to take notice.

BBC'S DROWNING IN PLASTIC DOCUMENTARY

"After the release of David Attenborough's Blue Planet II, the plastic crisis became impossible to ignore.

-Over 200 marine species have been found to have ingested plastic

-An algae that grows in plastic gives off a beacon that attracts animals, but they also mistake it for fish eggs and jellyfish.

-1 million plastic bottles bought every minute globally

-1 million disposable cups

-2 million plastic bags

EVERY MINUTE AN ENTIRE TRUCK LOAD OF PLASTIC ENDS UP IN THE SEA.

-1/2 enters from rivers- they've been turned into the world's plastic arteries.

-Plastic has now replaced many organic materials

-Mechanisms such as the SeaBin and Mr.TrashWheel are available to try and clean up local areas.

-It can cope with the phenomenal power of the sea.

The Fishing Industry

-Puts more plastic in the sea than any other industry

-Nearly every net/rope/line is made of plastic

-1 MILLION TONNES OF FISHING GEAR IS LOST AT SEA EACH YEAR

(-Could I make a mascot for an animal rescue team?)

-Plastic entanglements kill over 300 thousand marine mammals a year, and 400 thousand sea birds

-Whales are badly affected because they migrate through some of the busiest fishing grounds

-Authorities have imposed bans on fishing during the whales migrating seasons, however there are backlashes from fisherman due to the regulations being imposed

(-What about dressing as a fisherman and pretending to identify different plastic things as fish?)

Lobster Fishing

-Rope used is twice as long as traditional hemp rope

-3 million miles of unbreakable plastic rope is used on the East US coast alone. These ropes hang vertically in the water, creating deadly obstacle course for migrating whales.

-2/3 of whales in that area have been entangled at least once

-Whales obviously can't receive medical attention, even after topes have been removed.

-There are lobster pot systems being trialed that use a recalling GPS instead of a rope, but fisherman don't like them as they are expensive and time consuming to set up.

-340million lobsters caught globally each year."⁴

4- Bonnin, Liz. "BBC One - Drowning In Plastic". *BBC Iplayer*, 2018, <https://www.bbc.co.uk/iplayer/episode/b0bmbn47/drowning-in-plastic>. Accessed 23 Oct 2018.

THE YOUNG MAN AND THE GHOST NET

Artists Karen Hethey and Ilka White created a community puppet performance on Moa Island Torres Strait (near Australia), telling the stories of peoples experience with ghost nets, and the damage it causes to turtles, dugongs, coral reefs, mangroves, and many other sea creatures, as well as fisherman.

The story depicts a young man who discovers a shark caught in a ghost net, and his plight of trying to rescue it. "The net is from very far away, where the fisherman catch fish to sell in the cities using big nets, but a storm is coming, and the net is lost in the crashing waves". The current washes the net into the seas od the the Torres Strait.

"THE NET DRIFTS FOR WEEKS, STILL FISHING BY ITSELF"⁵

The puppets created are so raw and beautifully made. The lights inside them make the plastic debris used stand out vividly.

5- "The Young Man And The Ghost Net" Moa Island Torres Strait. Ghostnets Australia". *Youtube*, 2019, <https://www.youtube.com/watch?v=GnN3t-5nf3g>. Accessed 5 Apr 2019.

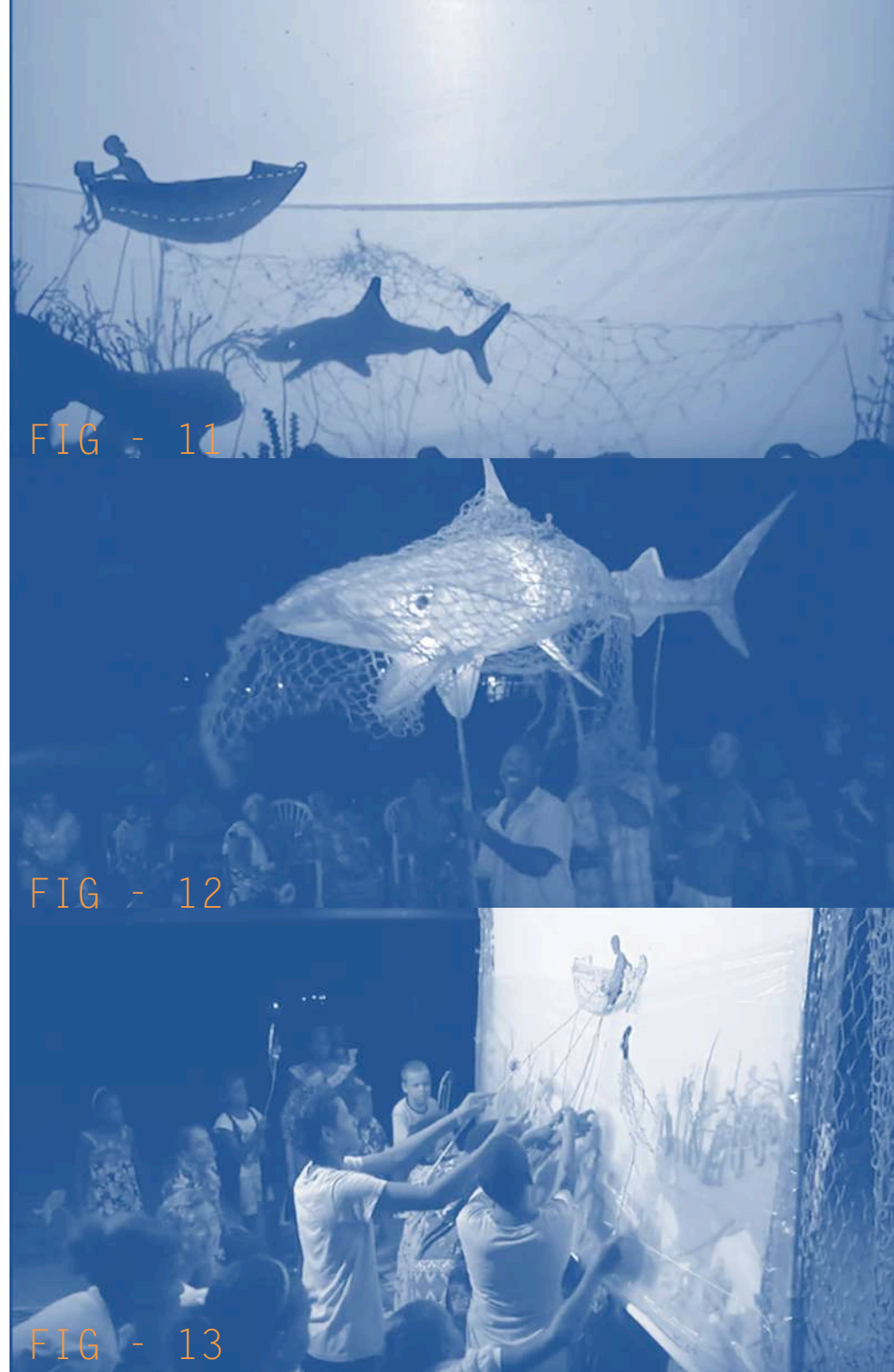
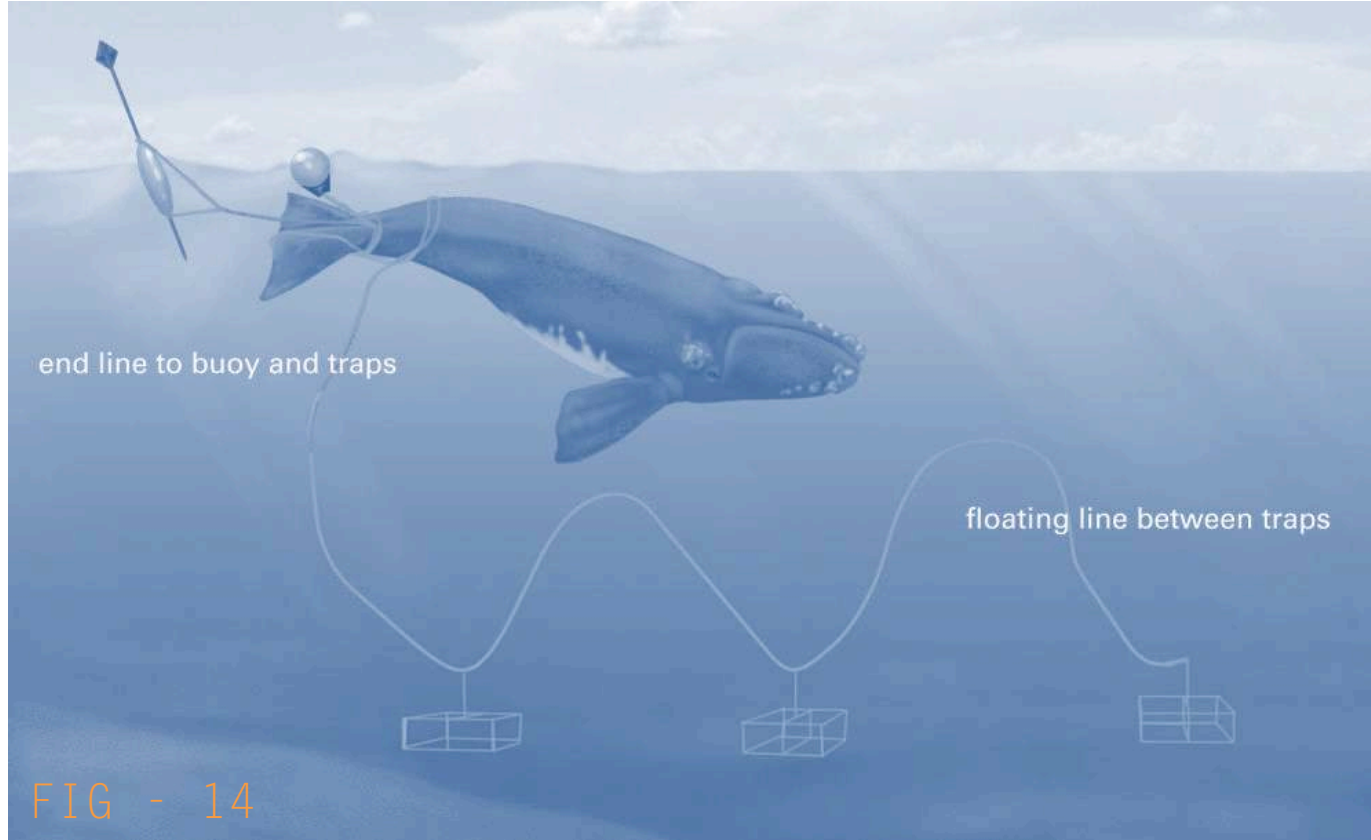


FIG - 11

FIG - 12

FIG - 13



WHALE ENTANGLEMENTS IN FISHING ROPE

When the whales migrate, they are caught in the vertical ropes of the lobster pots, which they drag around, as it slices into their flesh and bone, causing infections, injuries, and partial amputations. A lobster pot carries three times the natural drag of a whale, so it makes them incredible tires too.

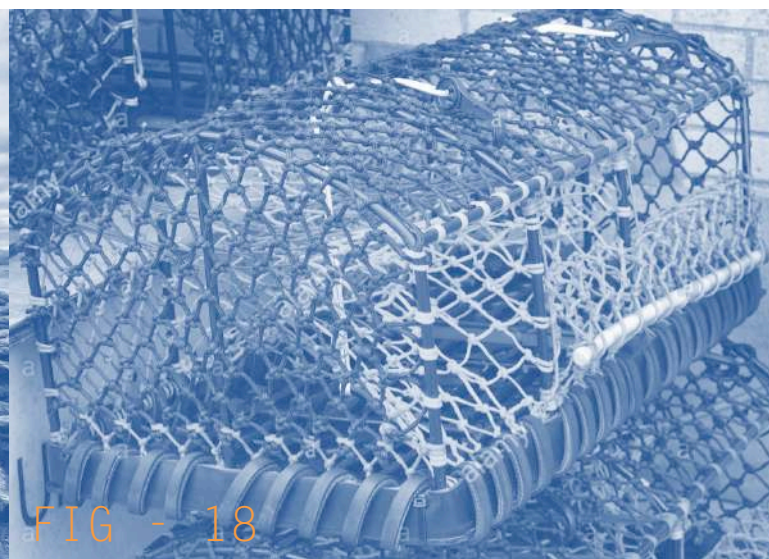
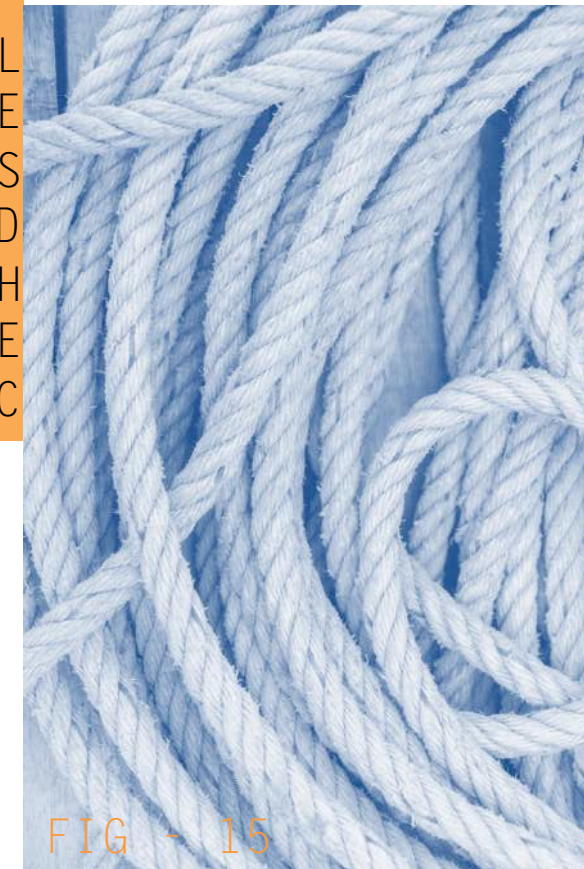
Fishing equipment used to be made from hemp and other natural materials, but it has been replaced with non-biodegradable plastic. Although twice as strong as hemp rope, it means that if broken, they remain floating in the sea, waiting to entangle a sea creature.

“Few people will protect the natural world if they don’t love and understand it”⁶

-David Attenborough

6- "Our Planet | Netflix Official Site". *Netflix.Com*, 2019, https://www.netflix.com/watch/80094032?trackId=14170289&tctx=0%2C3%2C1e2956ae-b601-4531-9b70-ff09ea1997d2-394144384%2Cbab8b8b7-5603-438f-b2da-ae2100e15a61_13727821X3XX1557095053504%2Cbab8b8b7-5603-438f-b2da-ae2100e15a61_ROOT. Accessed 20 Apr 2019.

TRADITIONAL
MARINE
MATERIALS
REPLACED
WITH
UNBREAKABLE
PLASTIC



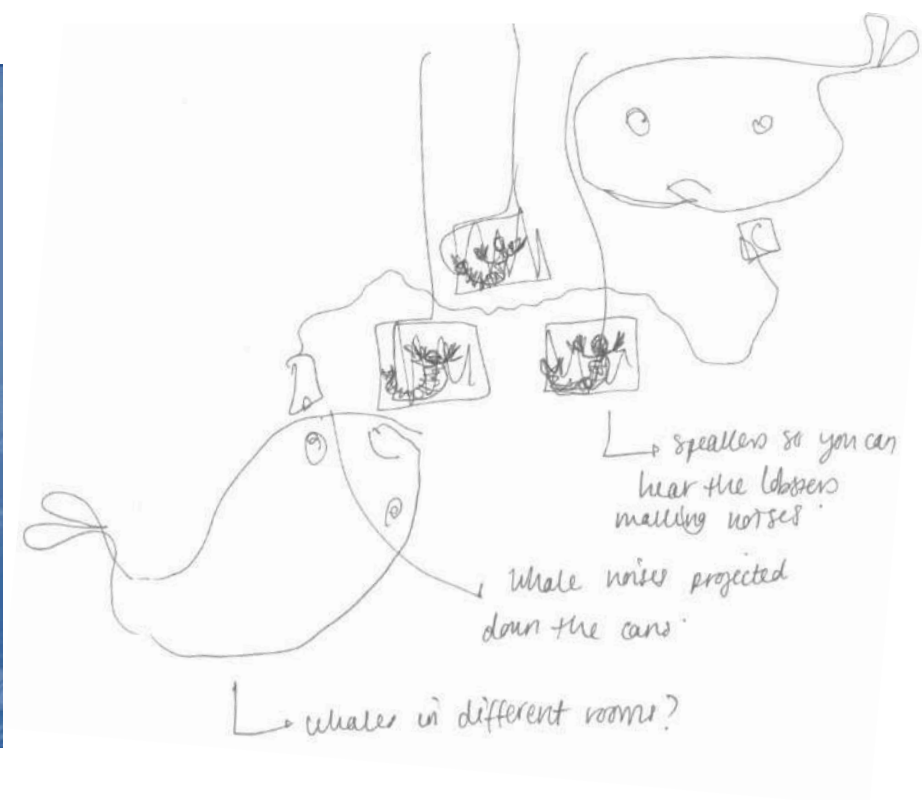
WHALE
ENTANGLEMENTS
FROM
THE
LOBSTERS
POINT
OF
VIEW
OF
THE
LOBSTER

After watching BBC's Drowning in Plastic, I was made aware of the danger of lobster fishing to whales, as they become tangled in the ropes floating up from lobster pots. I decided to pursue this information further, researching lobsters in depth. I planned to make lobster puppets that talked about the lobster potting issue, from the lobsters point of view. However, after thorough research into lobsters, I came across a series of facts that took my project in a slightly new direction – to the micro plastic pollution issues on lobsters themselves.



FIG - 19

46% of all plastic in the sea is fishing gear.



LOBSTER ARE CONSTANTLY INGESTING MICROPLASTICS, WHICH BECOME EMBEDDED IN THEIR SHELL.

AFTER SHEDDING THEIR SHELL LIKE SNAKES, THE EAT THE SHELL IN ORDER TO ABSORB THE PROTEIN FOR THEIR NEW SHELL.

THEREFORE THE PLASTIC NEVER LEAVES THEIR SYSTEM.

THIS INFERS THAT LOBSTERS IN THE FUTURE MAY BECOME PLASTIC.

IMAGINE THAT.

THE
ONE
THAT
GOT
AWAY
-
UNDERWATER
SHORT
PUPPET
FILM



FIG - 20

This method of creating scenes that appear underwater, yet unashamedly crafted, is an option I was prepared to try, if my underwater filming wasn't successful.

The recent film, 'The Shape of Water' used many clever techniques to create under water illusions without actually filming underwater.



THE
SHAPE
OF
WATER

FIG - 22



FIG - 21

"The underwater dream sequence was all shot dry-for-wet at 50fps for a watery slow motion. Using Magic Lantern I dialed in a cool white balance of around 2500K, and pumped in smoke to add diffusion and suggest currents. (I wished I'd use a lot more smoke, but we would have all choked to death.)

I used just two light sources: the 1K backlight, now gelled blue, and the other 1K, bounced off sheets of silver wrapping paper tacked loosely to the ceiling. Flapping a piece of card at the wrapping paper makes the light ripple in a very watery way.

Shallow depth of field working nicely in the romantic underwater dream sequence

The underwater lighting scheme was a lot darker than the daylight one, so I opened up to around f2, giving a crazily shallow depth of field that worked nicely for this dream sequence. The mermaid's close-ups were all shot through a CD case for an old-school soft-focus look.

I would have liked to have shot this sequence handheld, but a lack of crew meant I had to lock the camera off so I could operate the smoke machine, fan the wrapping paper and move little fish through frame."

7 -NEIL OSEMAN

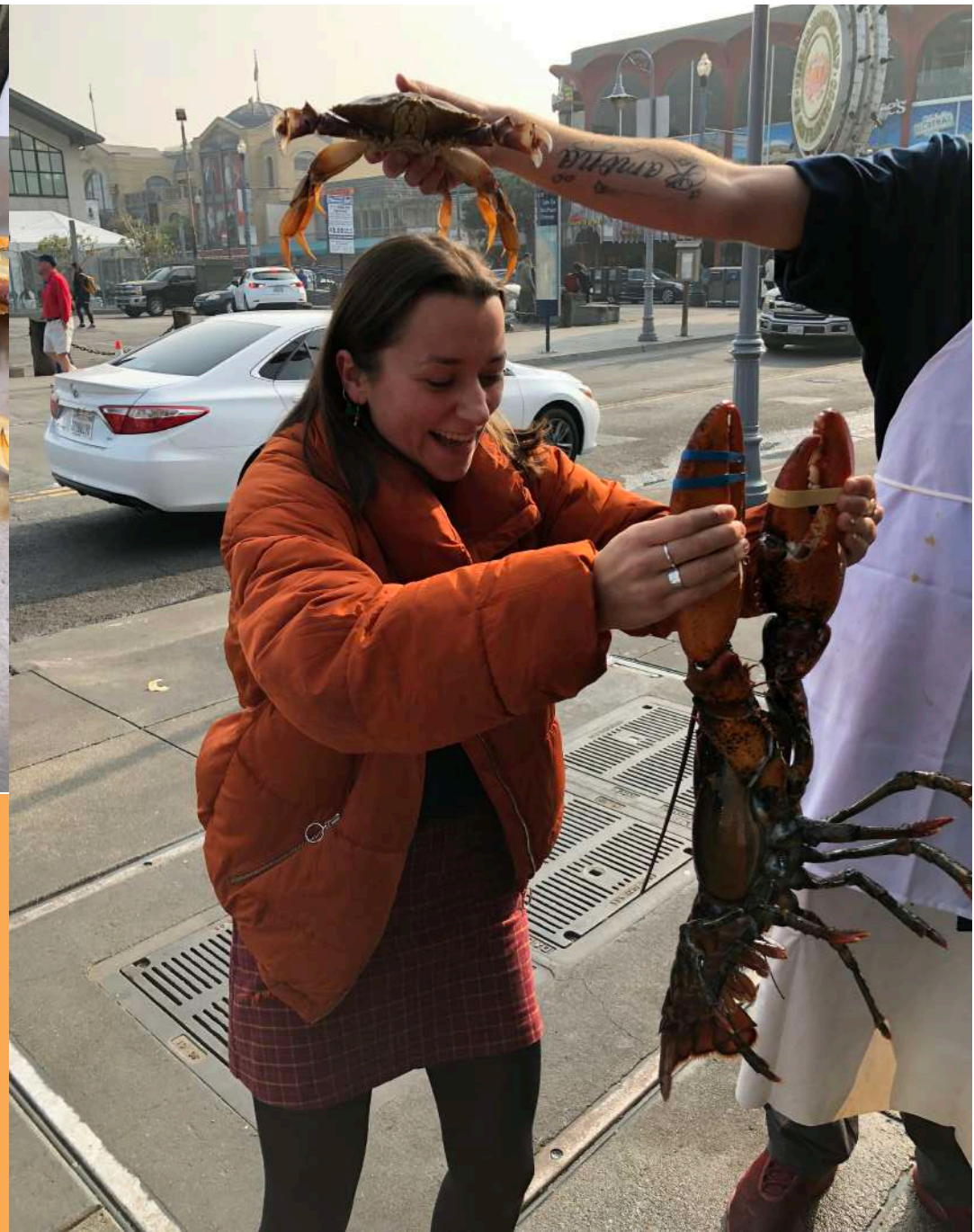


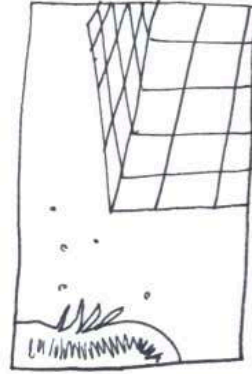
FISHERMANS
WHARF
-
SAN
FRANSISCO



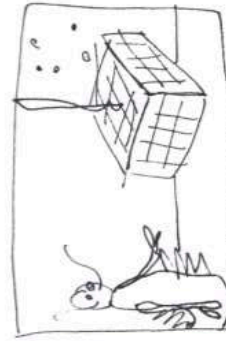
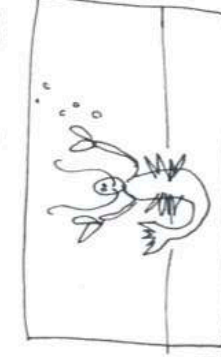
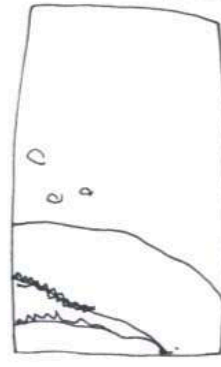
A Lobster I met in Fisherman's Wharf, with it's claws tied up as it had been in a tank. Lobsters are not naturally cannibals, they only become so when kept in confined spaces with other lobsters (such as in tanks in fish shops).

MY
NOT
SO
FRIENDLY
FRIEND
LEONARD
THE
LOBSTER

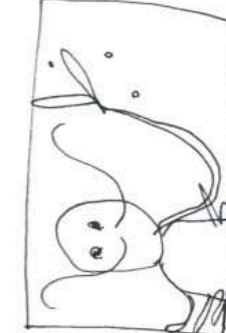




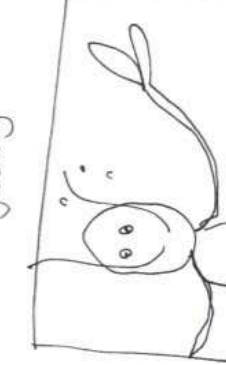
Different shots of Larry the Lobster (not whole body yet).



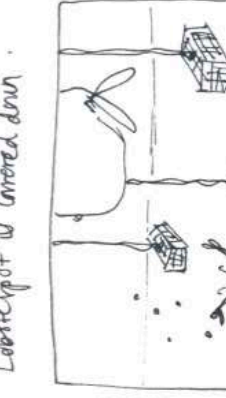
Larry looking at lobster pot.



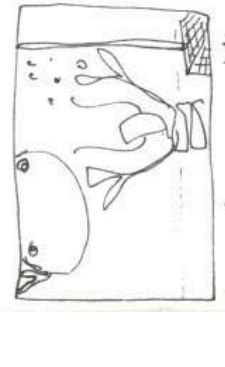
Pen off to Larry's face, shades red.



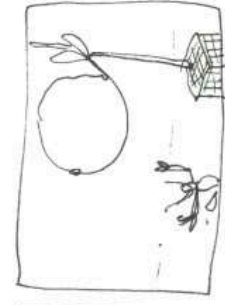
Larry mimes still up (noise of whales approaching).



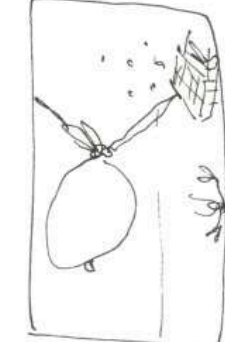
Larry mimes still up (noise of whales approaching).



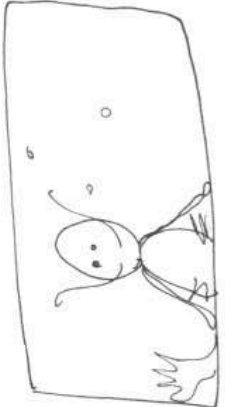
Larry tries to move whale.



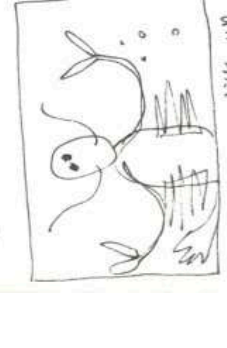
Whale's tail gets tangled and pulls a lobster pot away.



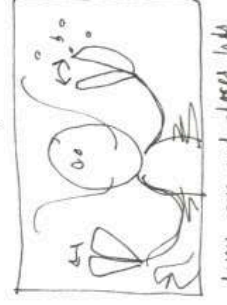
Whale's tail gets tangled and pulls a lobster pot away.



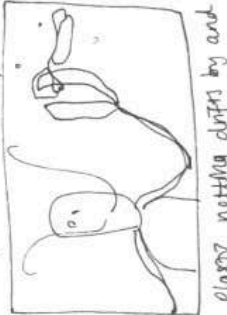
Larry pumps out of the pot before the fishermen get him.



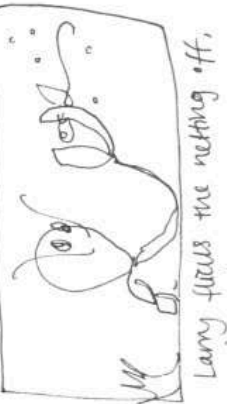
Larry stumps + lifts up arms defeated.



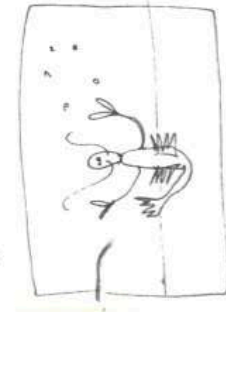
Larry open and closes his claws.



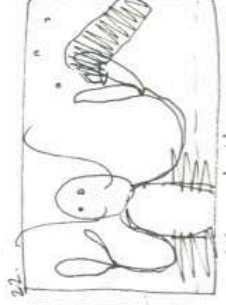
Larry pumps out of the pot before the fishermen get him.



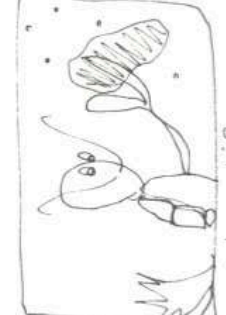
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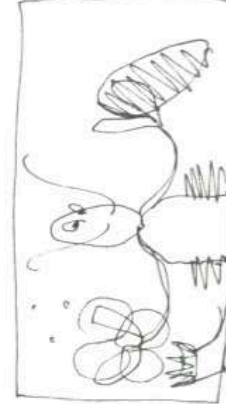
Larry minding his own business again.



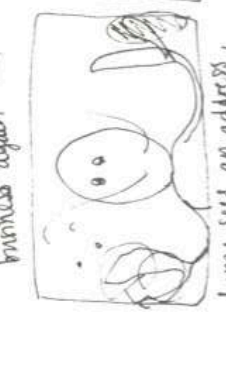
Larry minding his own business again.



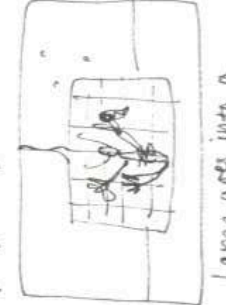
Larry minding his own business again.



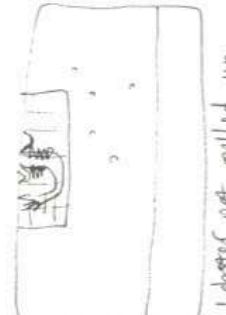
Larry minding his own business again.



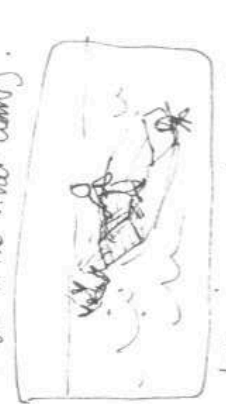
Larry sees an address, and decides to take action.



Larry goes into a lobster pot.



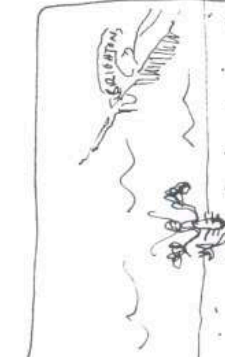
Larry goes into a lobster pot.



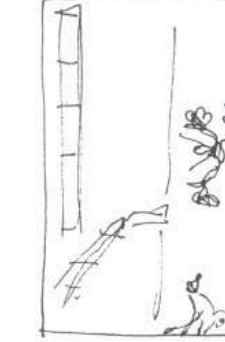
Larry goes into a lobster pot.



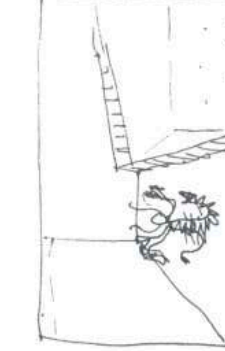
Larry swims to shore.



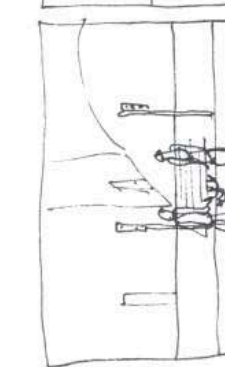
Larry walks up to lobster beach, still holding the rubbish.



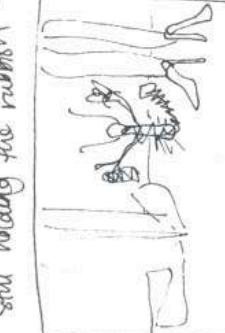
Larry walks up the ramp to the road.



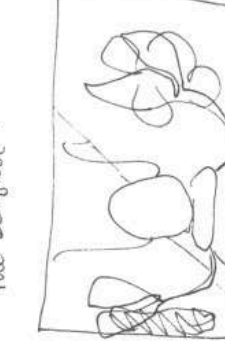
Larry walks up the ramp to the road.



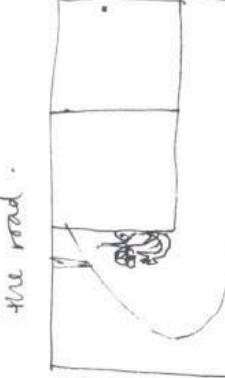
Larry waits to cross the road.



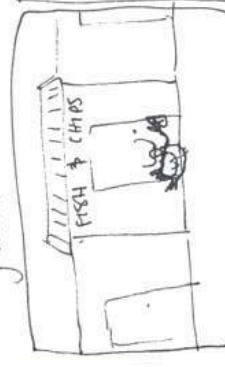
Larry waits to cross the road.



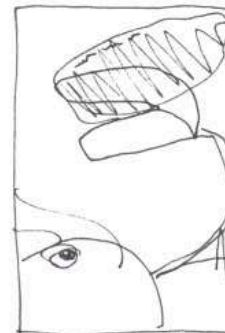
Larry waits to cross the road.



Larry waits to cross the road.



Larry outside the F&C shop.



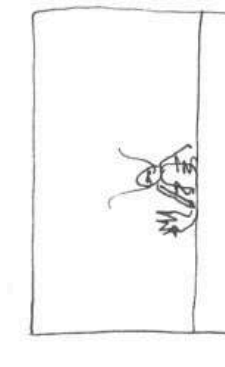
Larry outside the F&C shop.



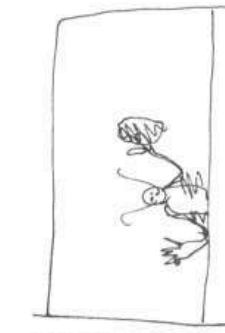
Larry outside the F&C shop.



Larry outside the F&C shop.



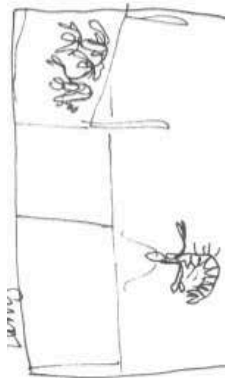
Larry looks up at him.



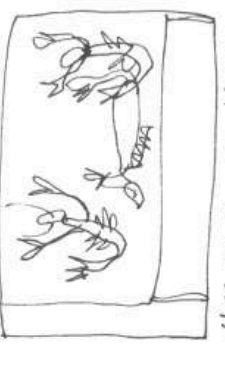
Larry looks up at him.



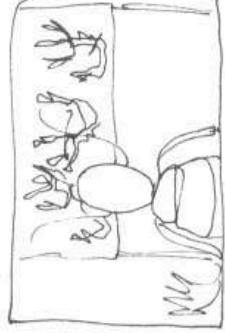
Larry looks up at him.



Larry looks up at him.



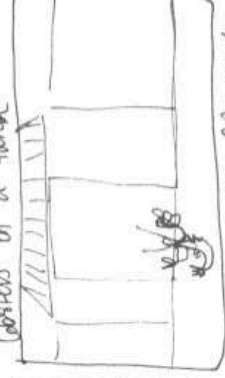
Close up of real lobster in a tank.



Close up of real lobster in a tank.



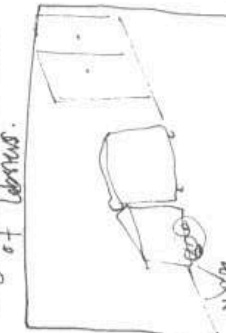
Close up of real lobster in a tank.



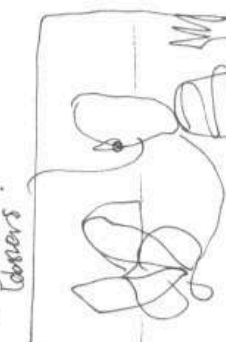
Close up of real lobster in a tank.



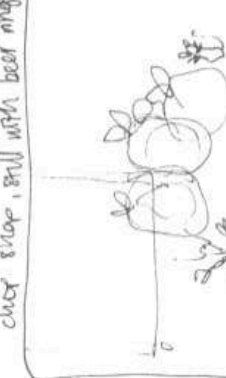
Larry walking down the street again.



Larry walking down the street again.



Larry walking down the street again.



Larry walking down the street again.



Ronald looks at Larry.



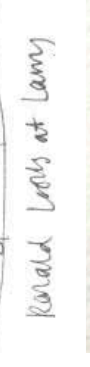
Ronald looks at Larry.



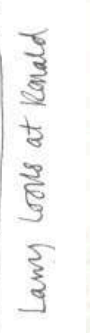
Ronald looks at Larry.



Ronald looks at Larry.



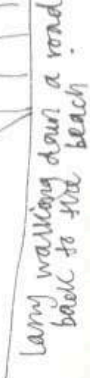
Ronald looks at Larry.



Ronald looks at Larry.

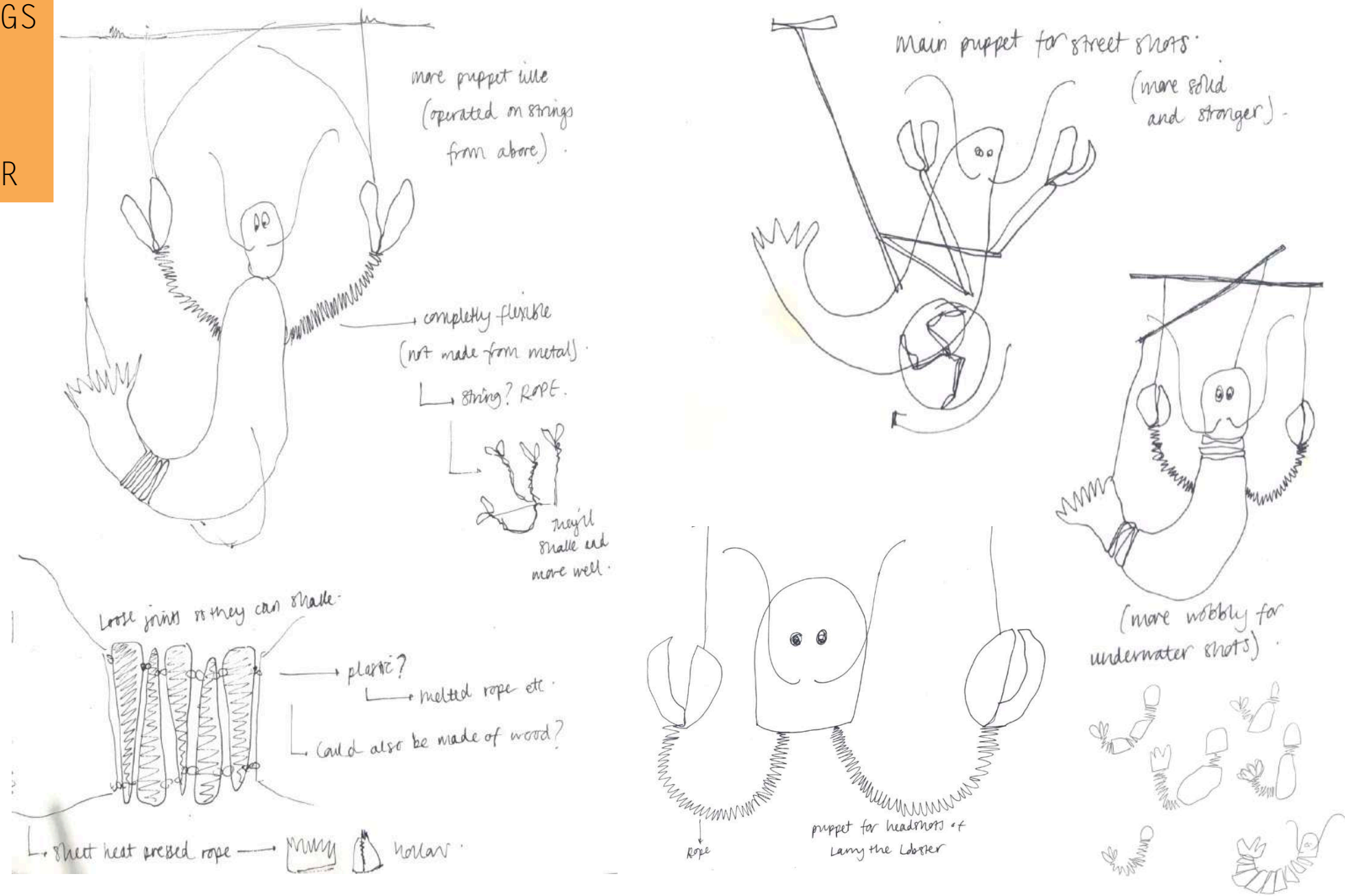


Ronald looks at Larry.



Ronald looks at Larry.

INITIAL
DRAWINGS
OF
LARRY
THE
LOBSTER



COOKED
LOBSTER
SHELL



LIVE
LOBSTER
SHELL

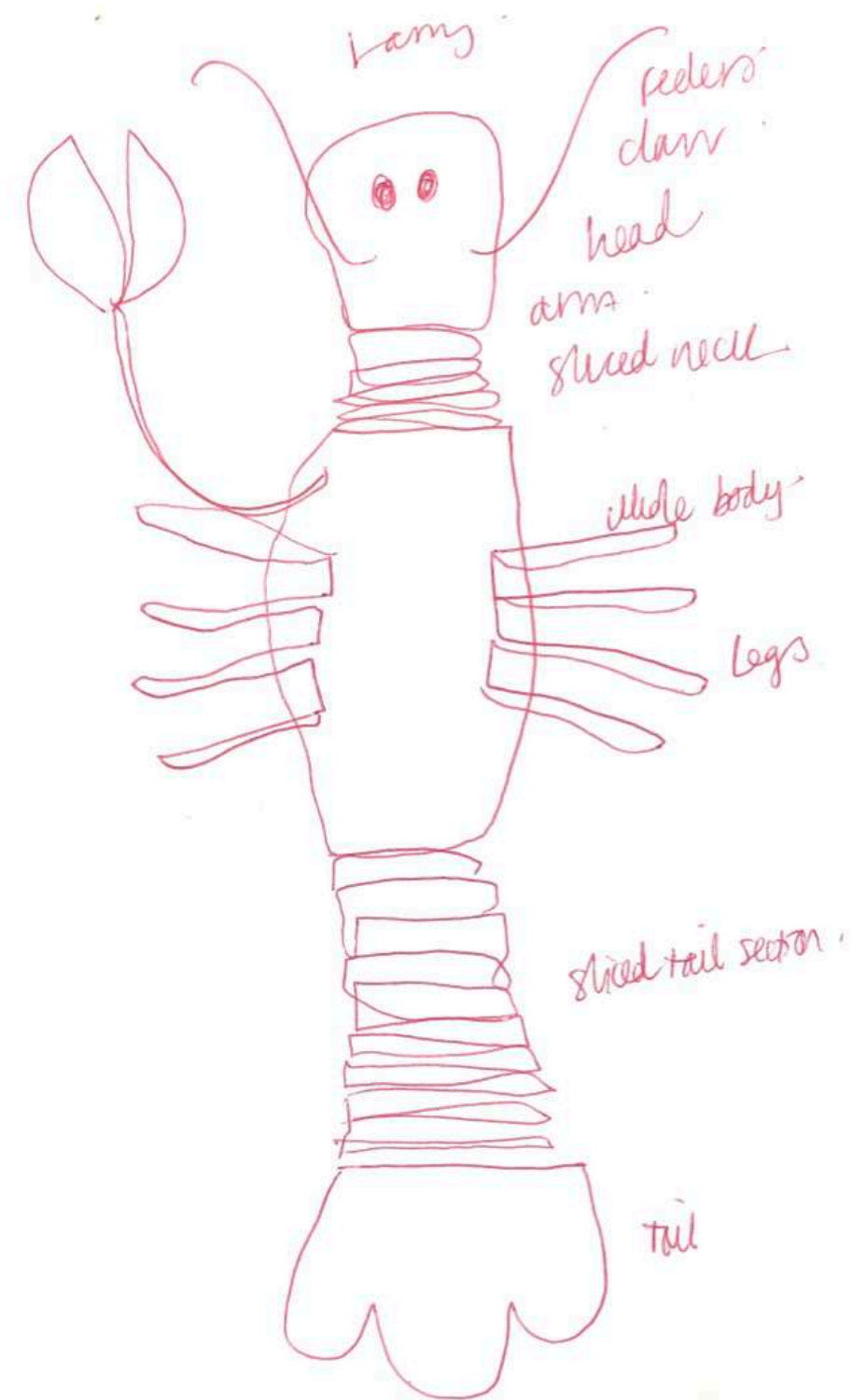
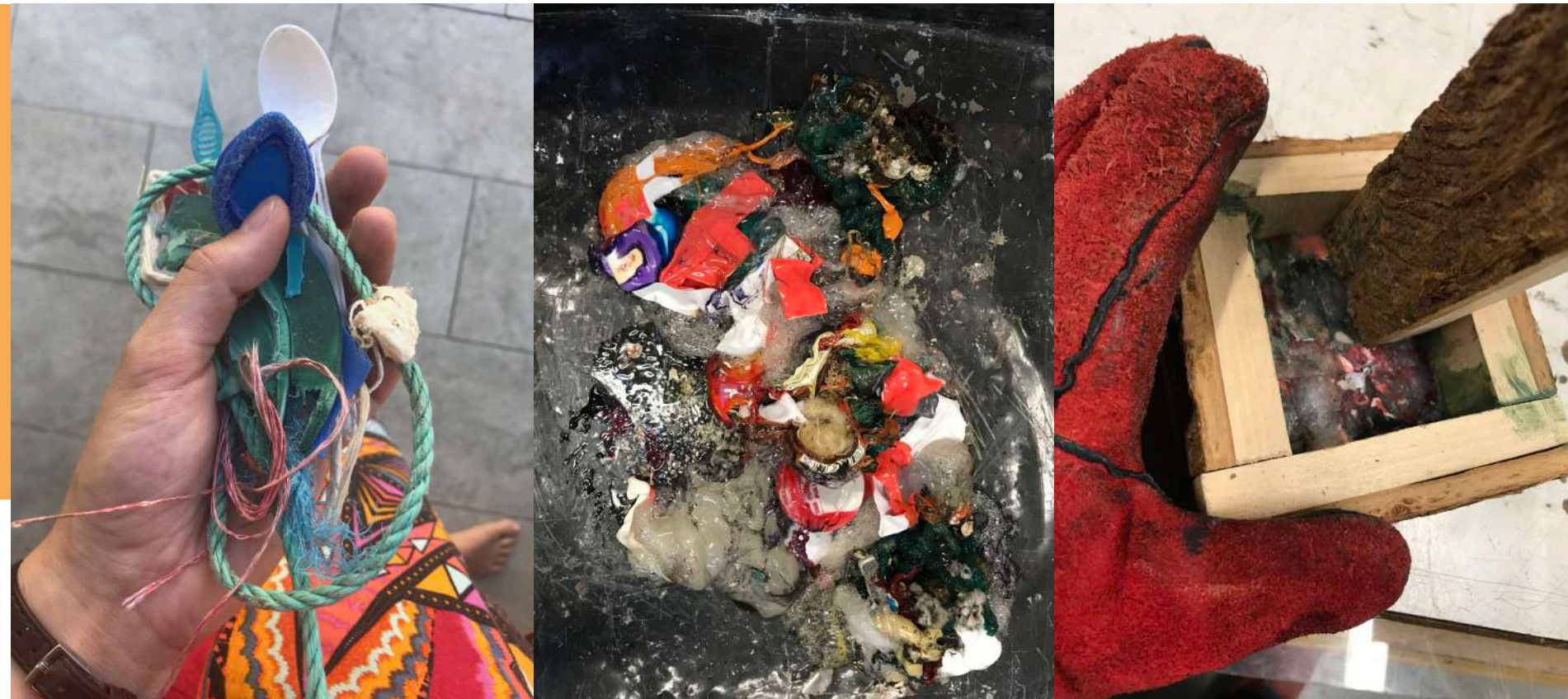


Lobsters are not naturally orange. They are camouflaged blue-grey with the underwater colors, to hide from prey. They suppress the orange pigmented protein, but it is released when they are cooked, as they obviously no longer have control

LOBSTER
SHELL
MATERIAL
TESTS

I melted acrylic chippings, leaving them in the oven all day, so that they properly melted. This created interesting shell material, but I did not continue testing with this because I wanted to use waste plastic found on the beach instead.

BEGINNING
TO
MELT
AND
MOLD
PLASTIC
WASTE
FROM
THE
BEACH



CREATING
THE
TAIL



First tail from my melted block. It was hard to get the shape I wanted with the bandsaw, so I made one out of plasticine and made a plaster mold to cast the melted plastic into.





COMPRESSING
MELTED
PLASTIC
WITH
THE
HYDRAULIC
PRESS



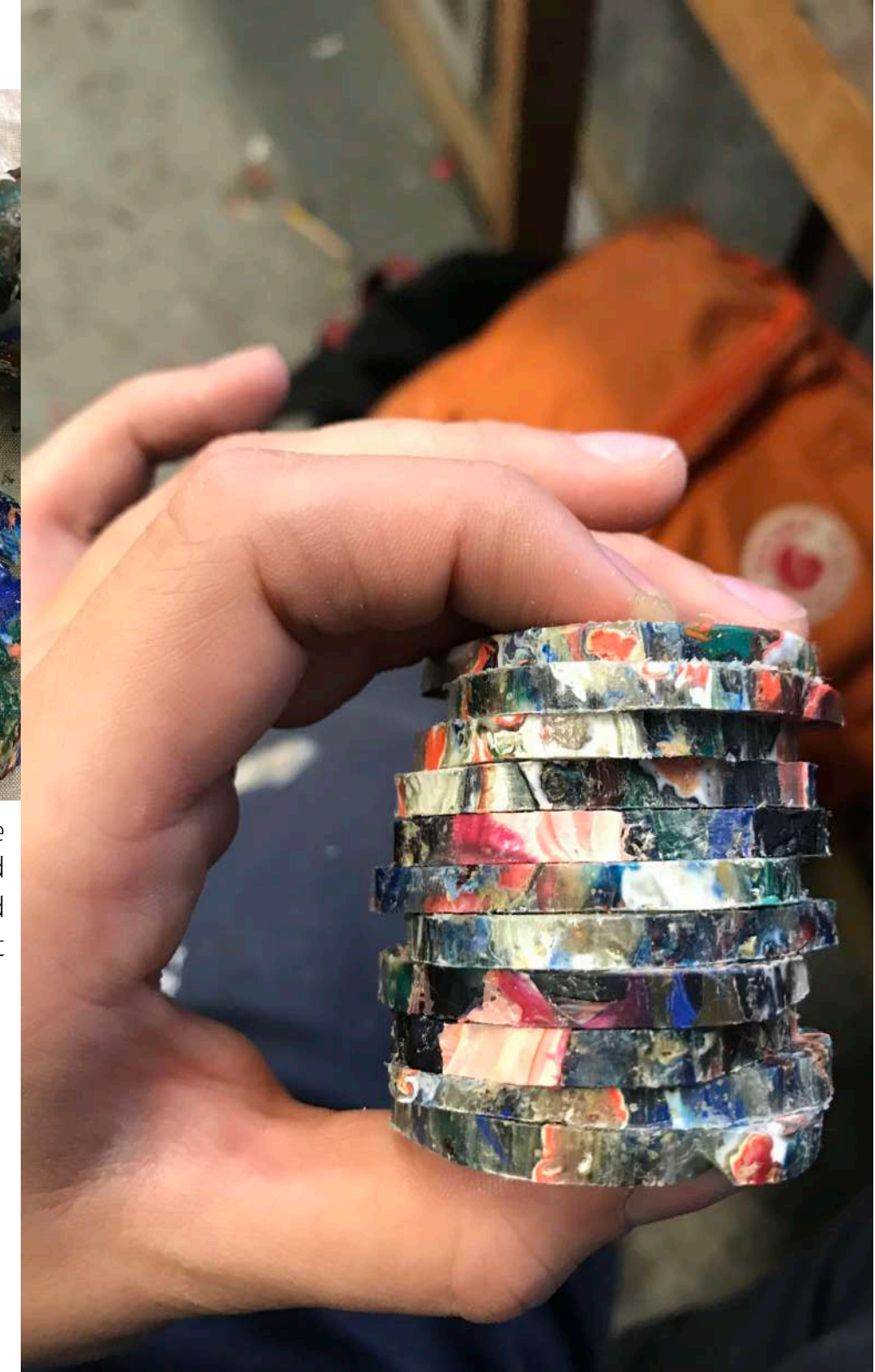
I also tested compressing the melted plastic into a mold using the hydraulic press to create a good shape for lathing. However the block created wasn't strong enough for the force of lathing, so I had to consider other options.

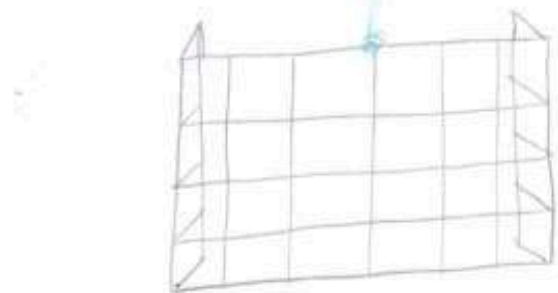
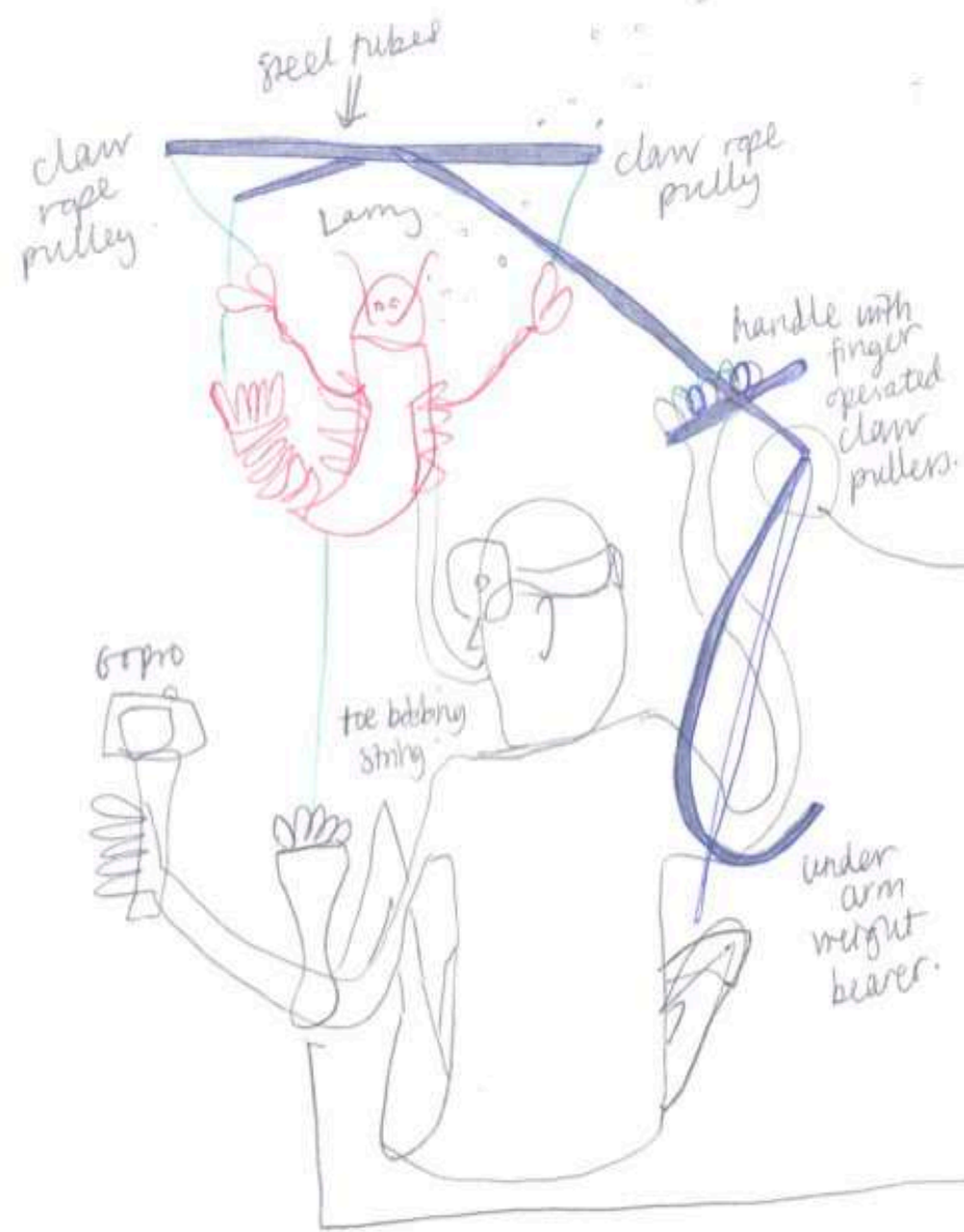


MOVING
TAIL
SECTION



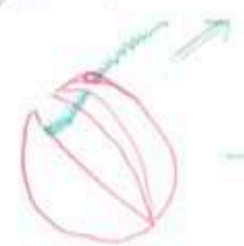
Moving section of the tail made from the hydraulic pressed cylinder of melted plastic, sliced up and heat pressed to make it smooth.





small sides for support

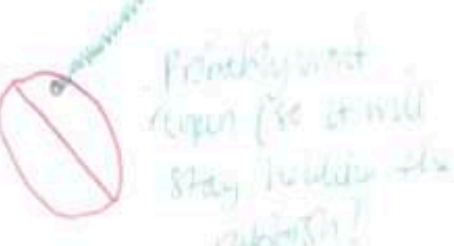
Needs to fit in my suitcase, so this may have to be hinged (so it can fold in).



one sided lobster pot
↳ steel, but maybe this should be made from plastic or old wooden materials?

↳ could I use a real lobster pot?

↳ although it's just a representation of me?



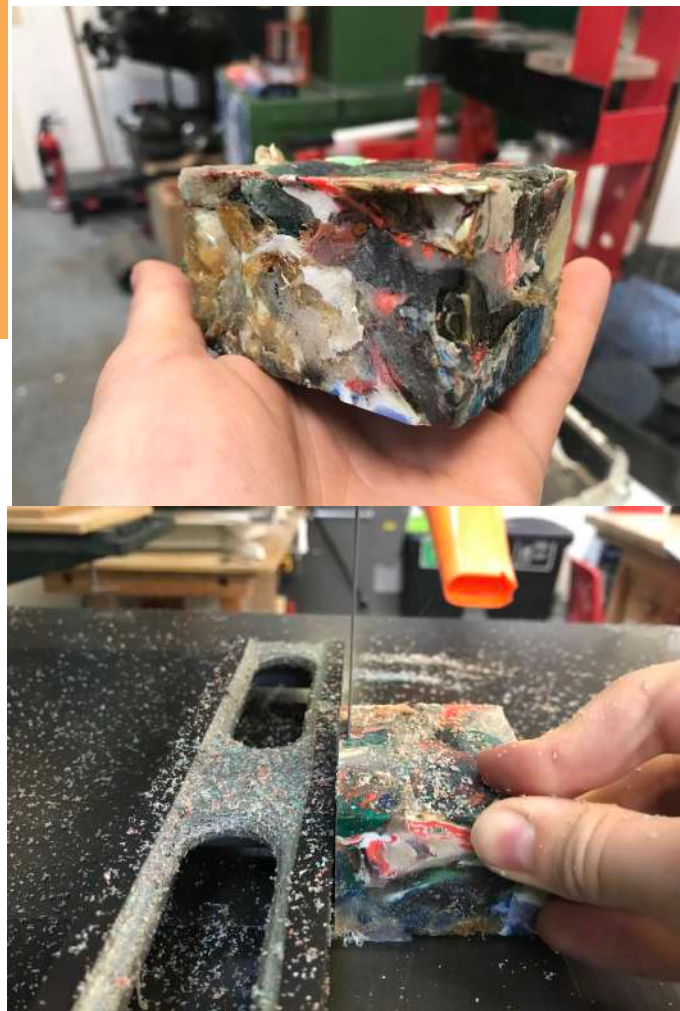
Probably not (so it will stay holding the puppet).

This will pull the puppet down as it may float. (will bob like it's under waves).

ONE
MAN
BAND
PUPPET
-
UNDERWATER
LARRY



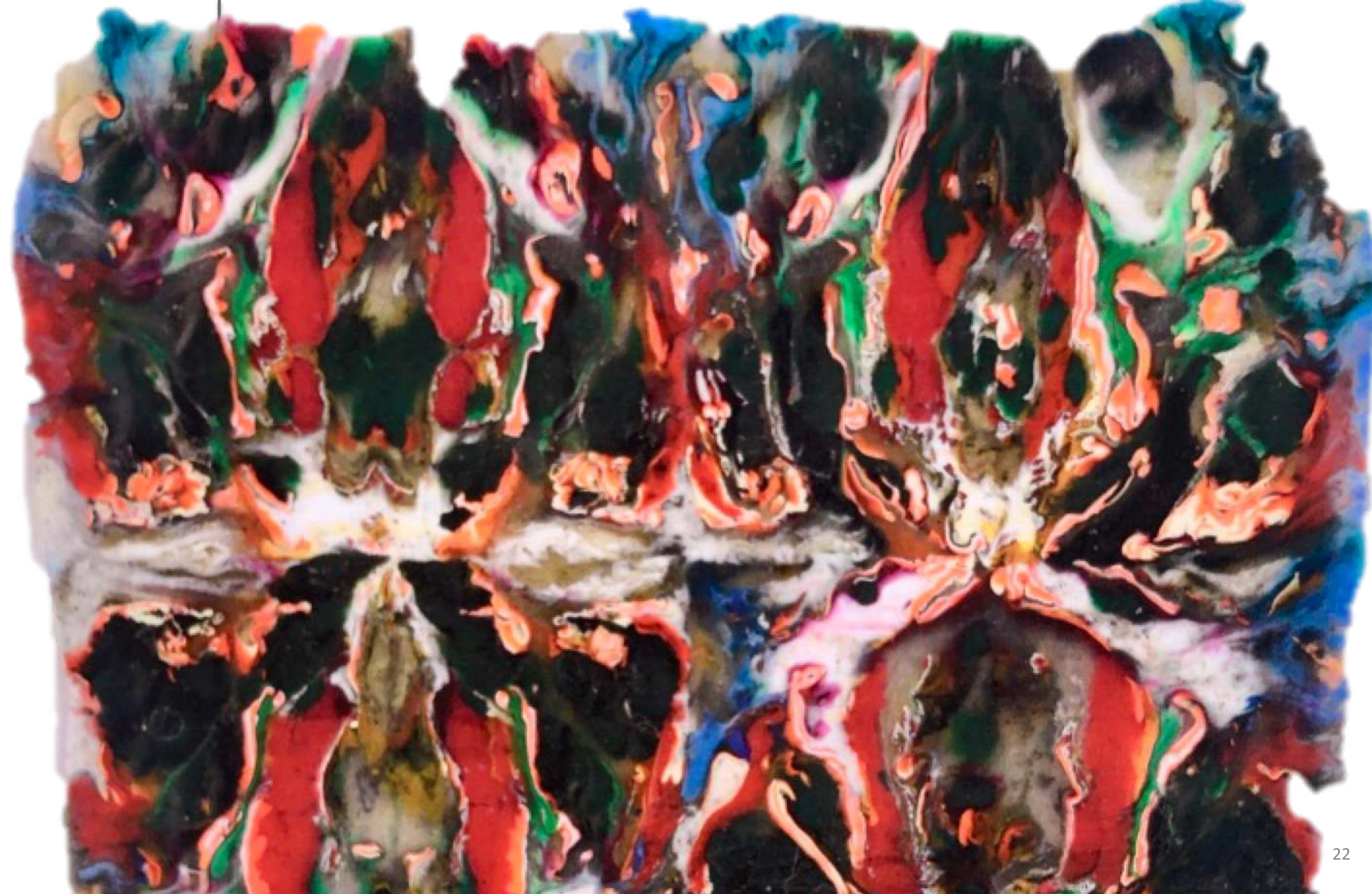
FIRST
PLASTIC
LOBSTER
SHELL
SHEET



Through much testing, I created a way of turning discarded domestic plastics, and plastics found on the beach into sheet material, that I could manipulate into shape to create the lobster puppets.

After sorting the collected plastics into appropriate colours, I heated them, then shoved the melted ball into a wooden mold. After cooling, I used a band saw to slice up the plastic block into pieces. I then arranged these pieces into a pattern, and heat press them into a sheet.

After creating the intended creature in paper, I used these pieces to draw out the net needed in plastic. These sections were then cut out on the band saw, and using a heat gun, I formed them into the lobster shape.





PAPER LOBSTER MODEL



I used these shapes as templates for the plastic lobster

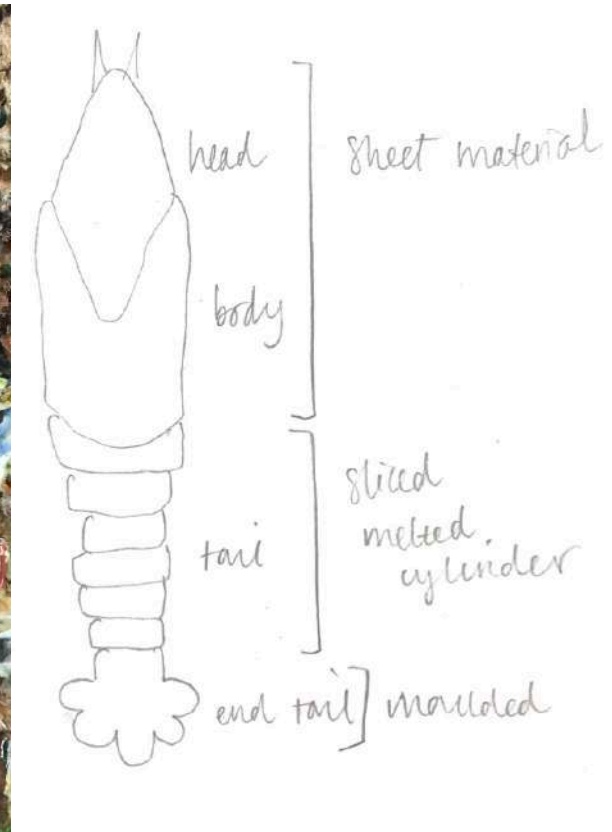


Sections of lobster shell, made from the paper model templates



SECOND LOBSTER SHEET

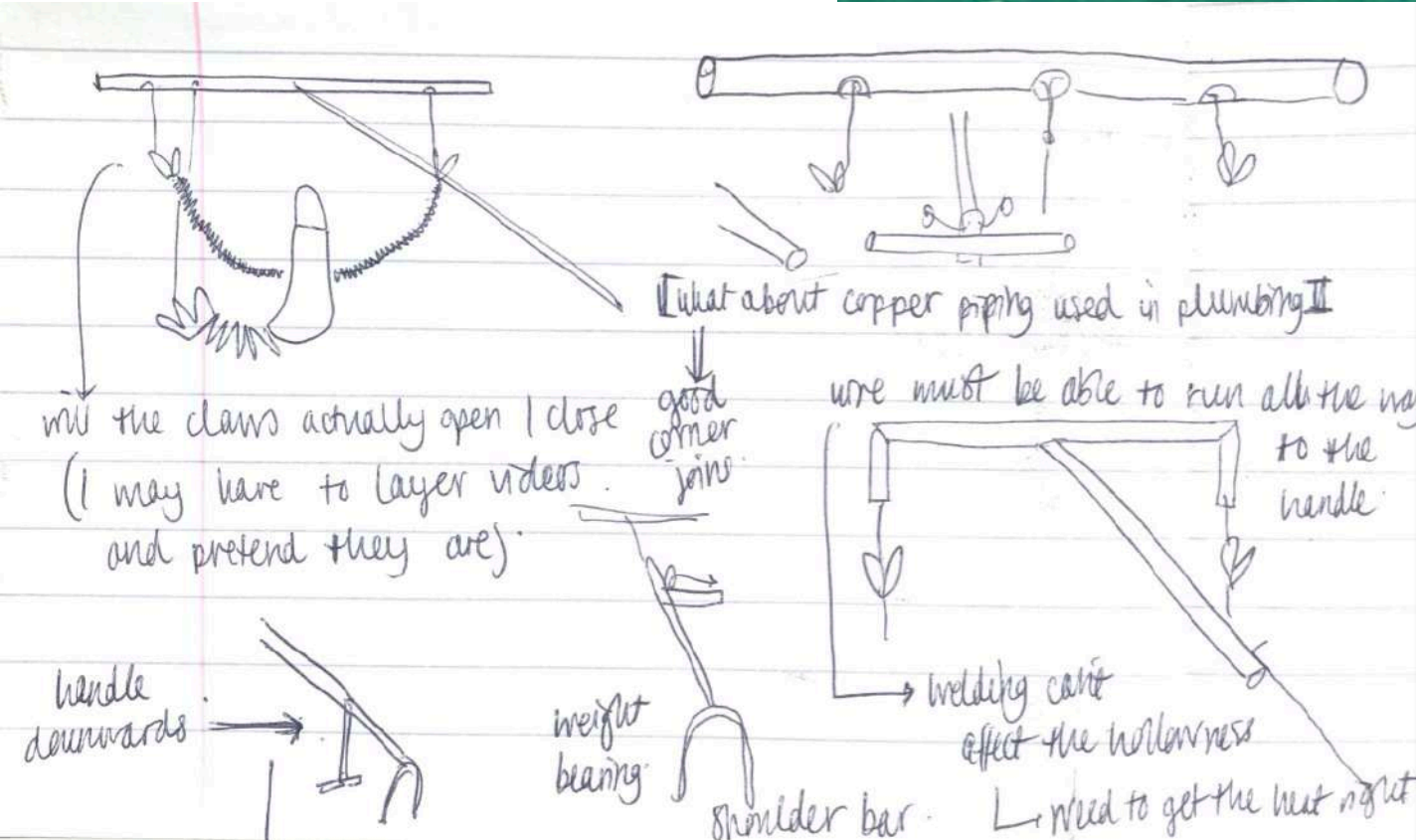
This was made from all the offcuts of my previous tests, hence why the colours are duller, and it appears more burnt.



LARRY THE LOBSTERS STEEL TUBE FRAME



I made a steel tube frame to hang the puppet from, that I could rig up. This meant that the MIG welding had to be done in small bursts, as any long duration would melt through the tube, and this would obstruct the wires controlling the lobster. I made a knee rest to take the weight of the lobster and frame.



LOBSTER POT PUPPET





MAKING THE SHELL

I used a heat gun to create the shell shapes, then used the heat gun to heat the edges to fuse them together.



LOBSTER LEGS

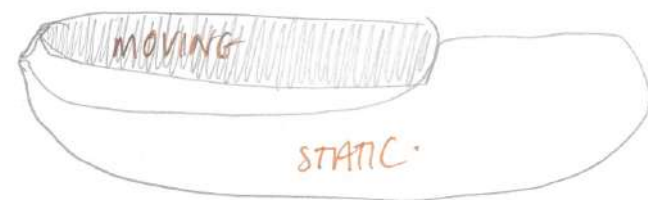


I made the legs using discarded rope from the beach. They are sandwiched between two layers of shell, and attached to the underside with a heat gun.

LOBSTER CLAWS



The claws have a moveable pincer, to hold the plastic that Larry is returning in my story.

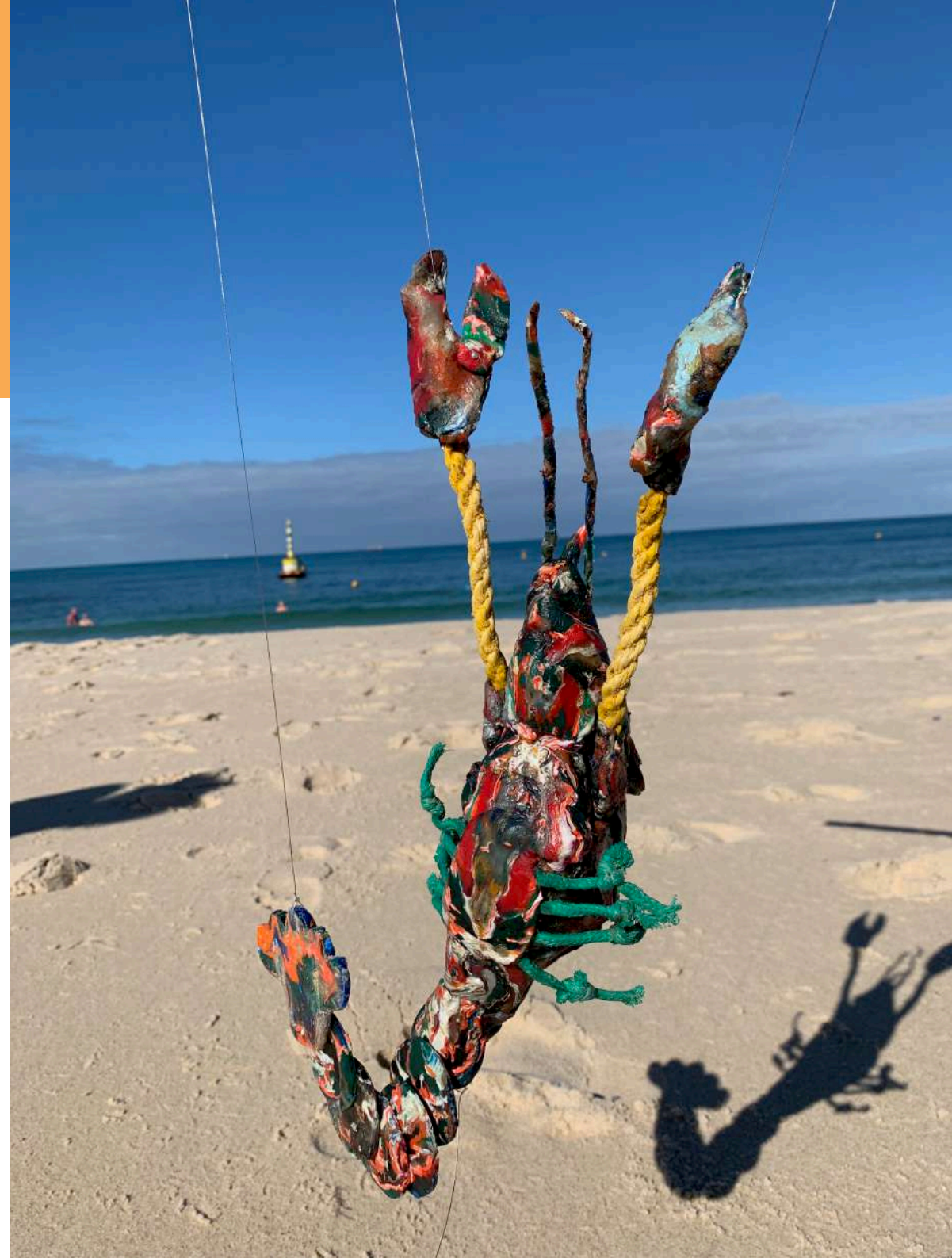


MICRO PLASTIC COLLECTION BEGINS



I was horrified by the amount of micro plastic dust I created during my making process, so decided to collect it all, and include it in my display in the degree show.

LARRY
AT
COTTESLOE
BEACH
-
PERTH
AUSTRALIA



FILMING
LARRY
THE
LOBSTER
IN
A
SWIMMING
POOL



FILMING
UNDERWATER
IS
MUCH
HARDER
THAN
YOU'D
THINK



FILMING
LARRY
IN
THE
RIVER



STILLS
FROM
UNDERWATER
FOOTAGE





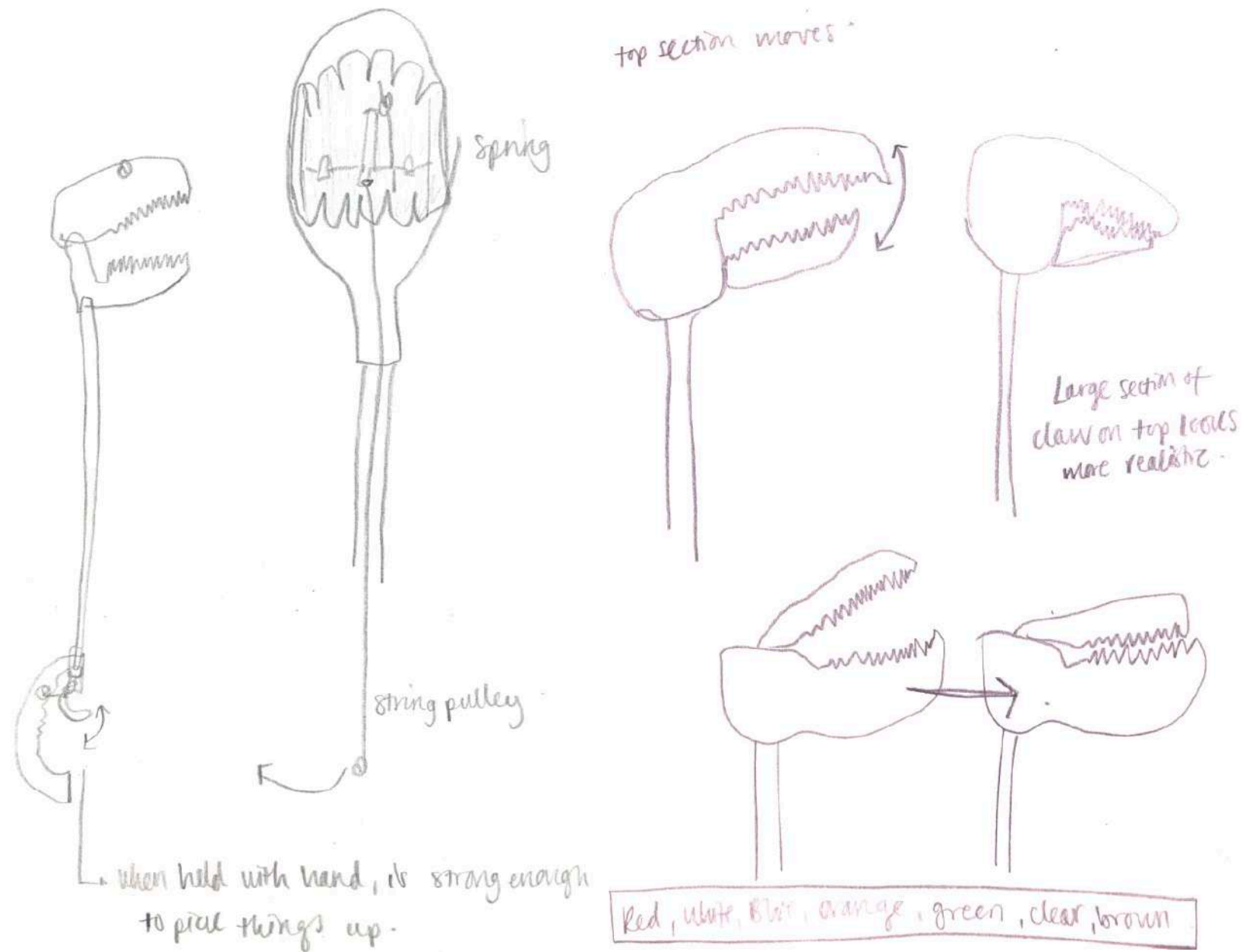
COMING
SOON

CLAWS



TOY GRABBER CLAW MECHANISM

I looked at 'toy grabbers' as a mechanism to make Larry's claw more articulated.

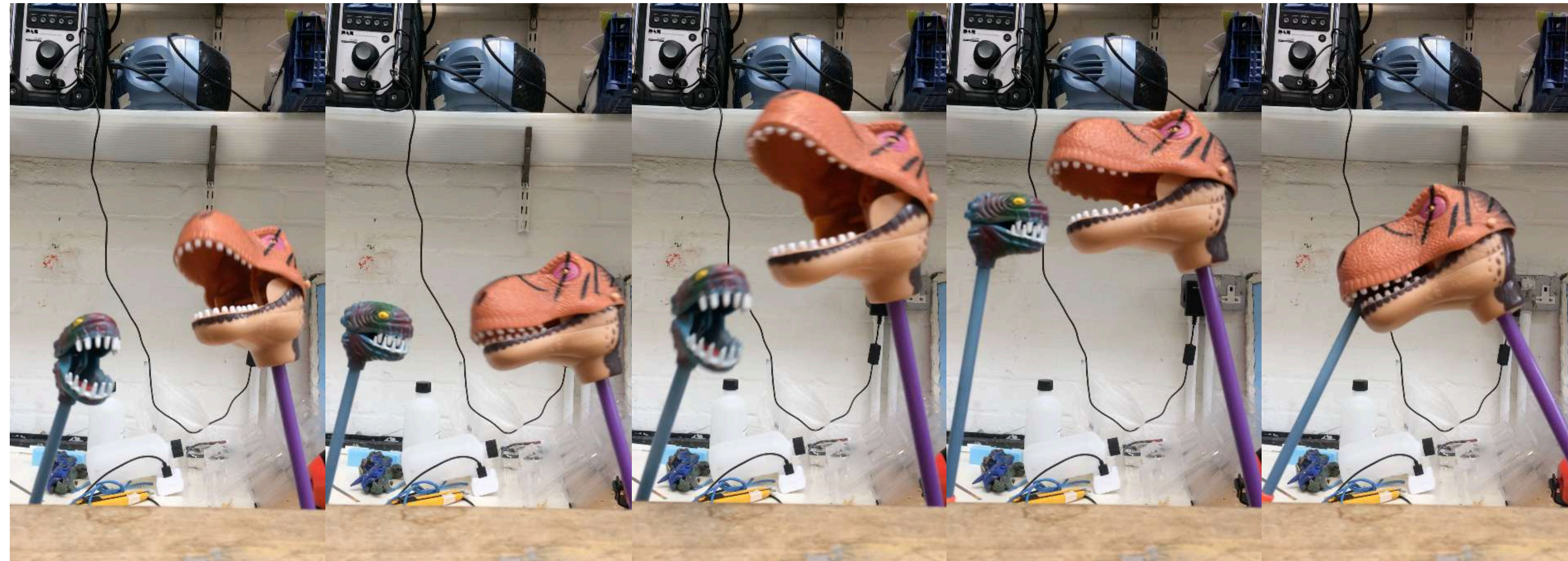


FIRST MECHANICAL CLAW MODEL

I've explored 'cannibalisation' of existing mechanisms. This was built around a toy grabber, using the heat gun and template method I had used done with Larry the Lobster. The toy grabber meant the claw was able to pick up and grab things, such as plastic packaging.

VITALLY
IMPORTANT
TESTING
OF
TOY
GRABBER
MECHANISMS

They are singing
along to “Time to
Say Goodbye”,
by Andrea Bocelli
and
Sara Brightman.





BEHOLD ... THE MIGHTY LOBSTER

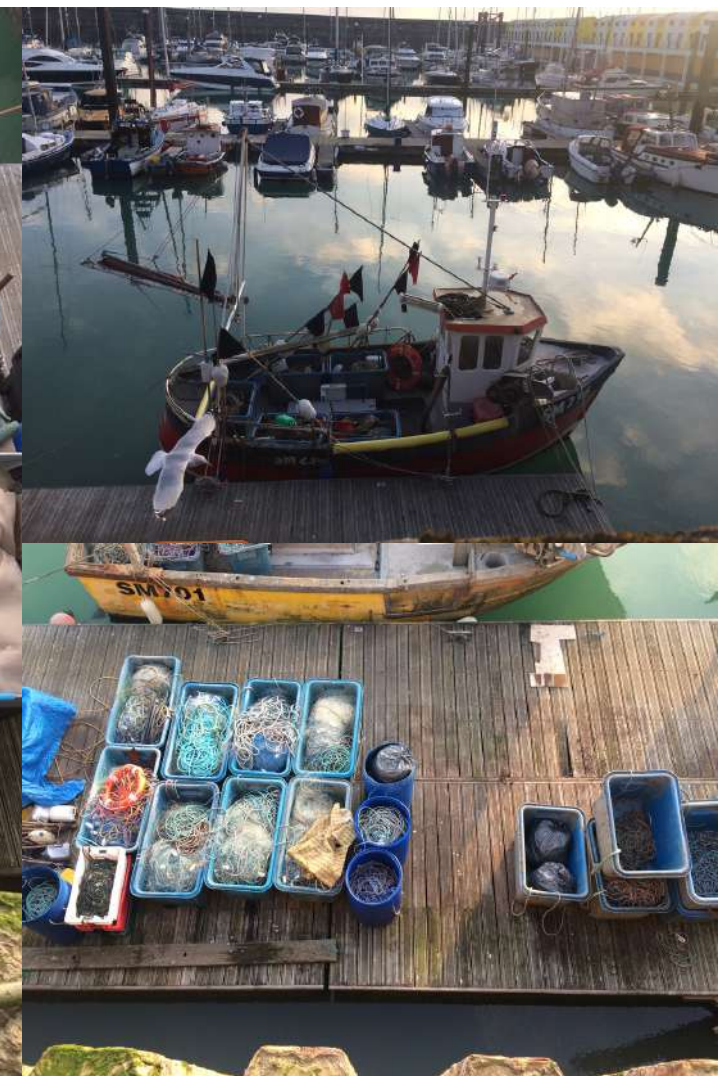


FILMING THE CLAW ON A FISHING BOAT

For filming the claw in action, I looked into going out on a fishing boat with a local fisherman called Neil, to film the claw coming up from the sea holding some plastic. This would be the section of the film where Larry emerges from the water in a lobster pot and swims back to shore. However, it would have been six hours out on the boat, and did not end up happening.



BRIGHTON MARINA



Instead I went down to the marina, to look at the fishing boats and watch them bringing in their catch (although it's not lobster season until June).

MAKING
LIONEL
THE
LOBSTER
-
COUSIN
OF
LARRY



I experimented with dye sublimation, using photos I had taken of lobsters in San Francisco as a net.

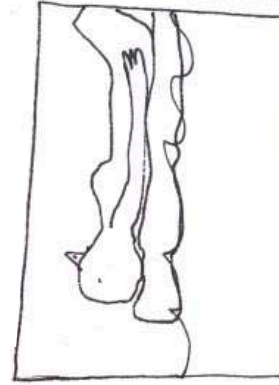




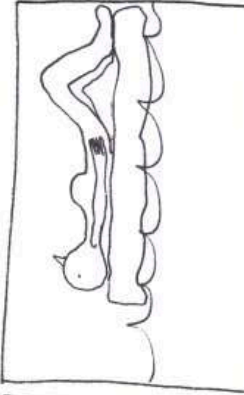
With the second claw, I wanted it to pince more, and look less like a dinosaur head! When making the template, I made sure I had plenty of excess plastic to go across the open seams in the middle of the mouth.

SECOND MECHANICAL CLAW

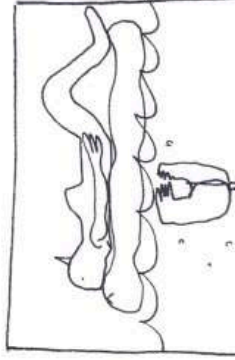




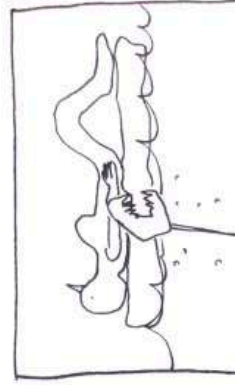
woman on lilo at beach



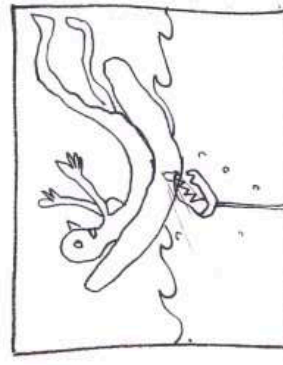
Lilo floats into the frame



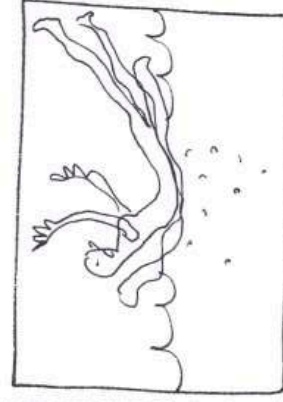
claw appears from below



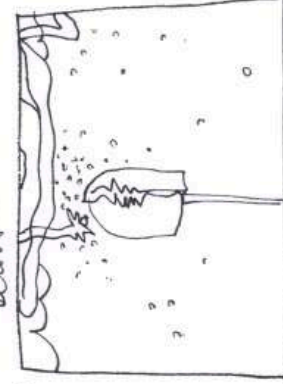
claw moves towards lilo



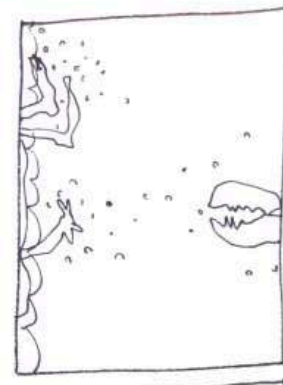
Lilo pops, noise of air coming out



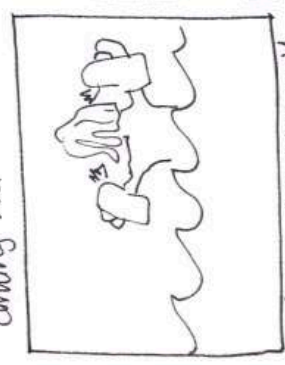
Lilo deflates, woman sinks into the water



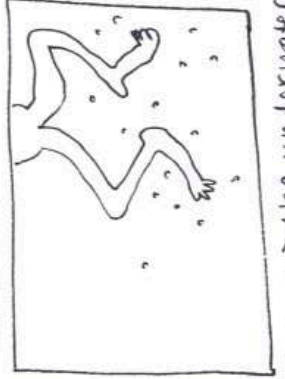
claw sinks back down



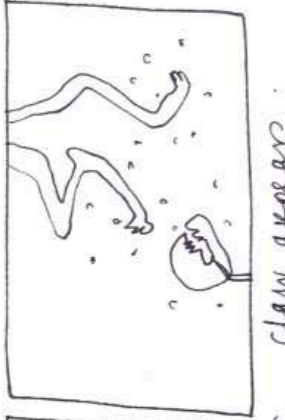
woman still sitting, claw disappears from surf



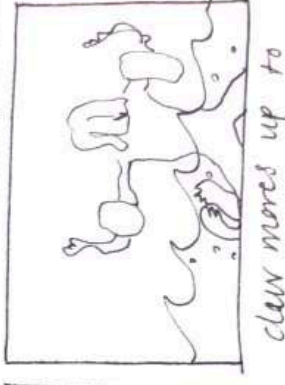
child swimming with arm bands



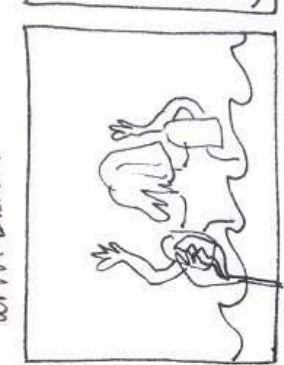
legs visible underwater



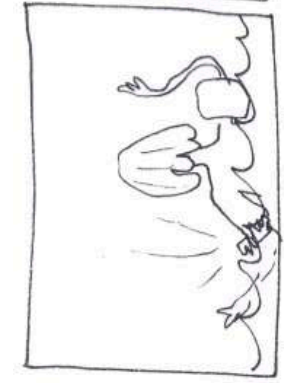
claw appears



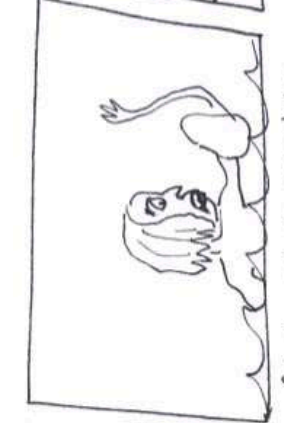
claw moves up to the surface



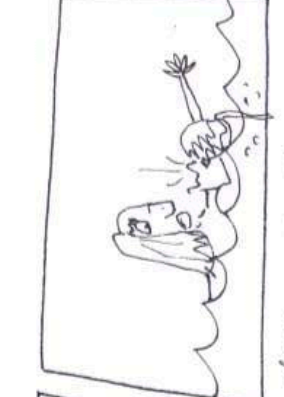
claw pops an



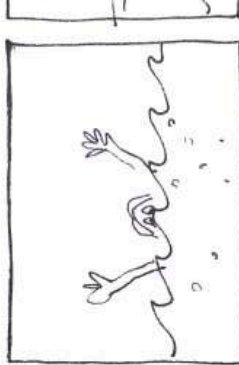
arm falls into the water (girl on outside)



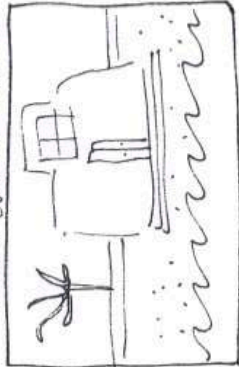
girl turns to remaining arm band side



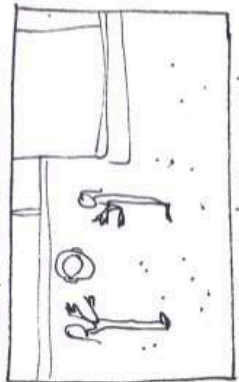
claw pops other arm band (air noise)



camera turns to face the beach



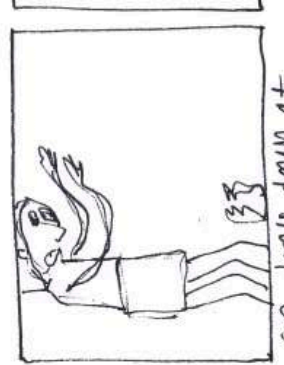
girl looks down at claw



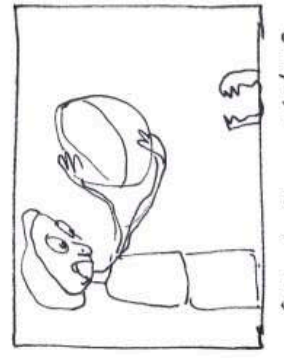
claw pops ball



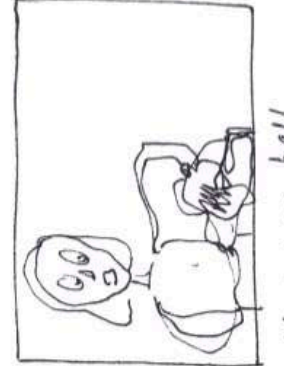
girl comes out of ball



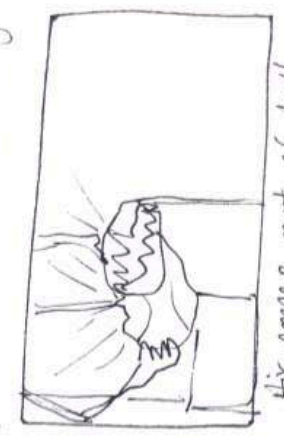
woman eating water bottle out of disposable cup



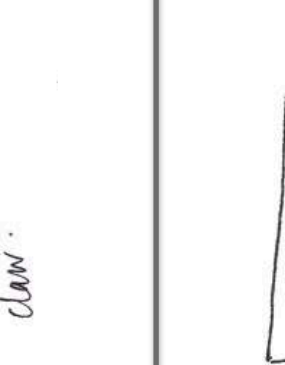
woman pulls up plastic water bottle



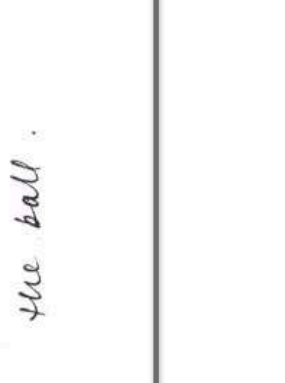
man arrives on beach with a balloon



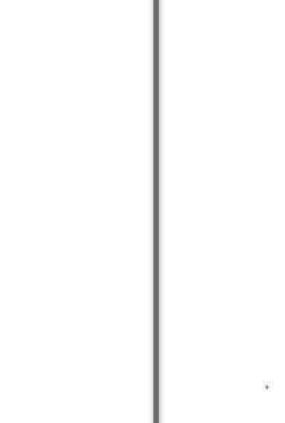
different angle of claw popping bear



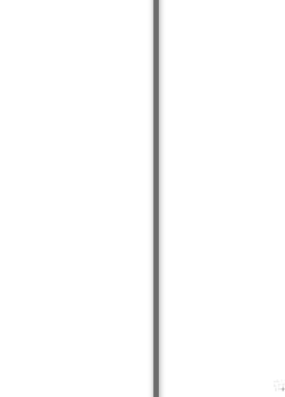
different angle of claw popping bear



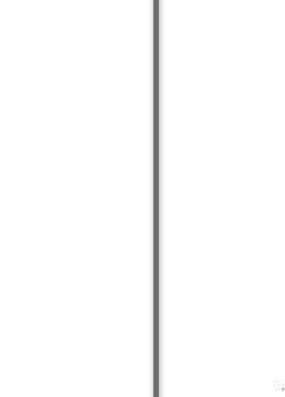
different angle of claw popping bear



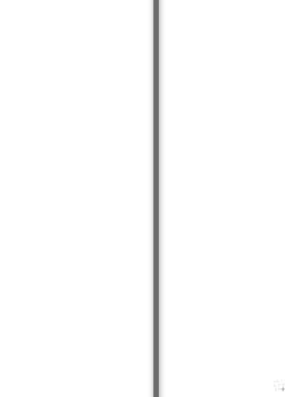
different angle of claw popping bear



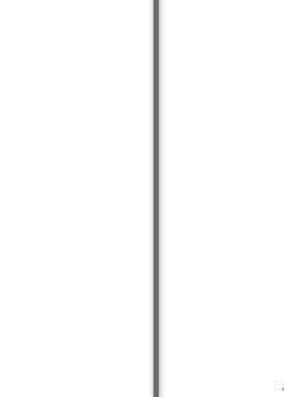
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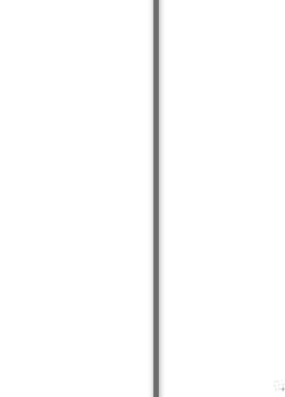
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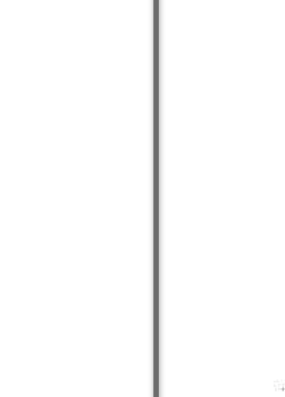
different angle of claw popping bear



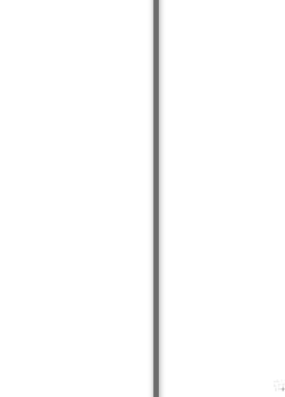
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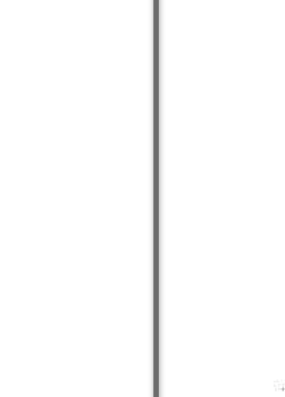
different angle of claw popping bear



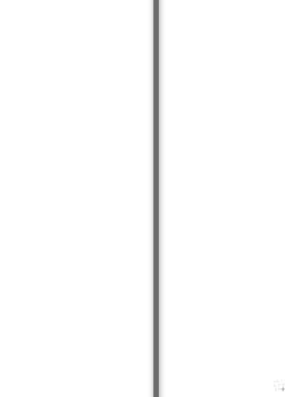
different angle of claw popping bear



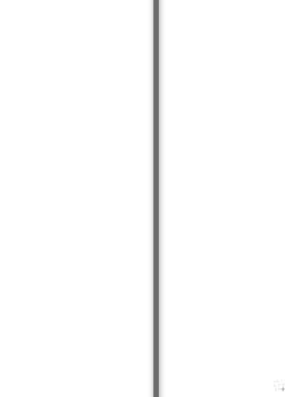
different angle of claw popping bear



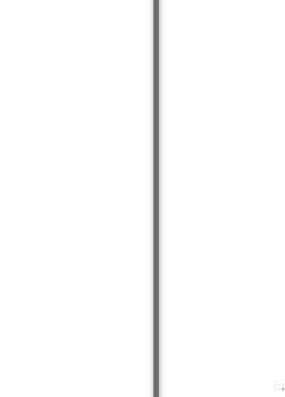
different angle of claw popping bear



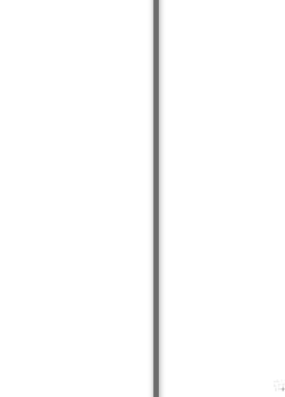
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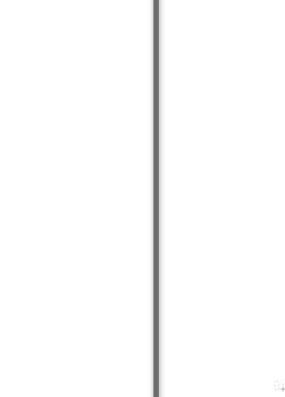
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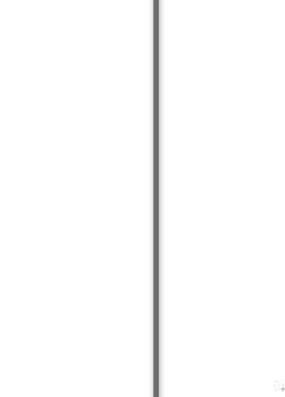
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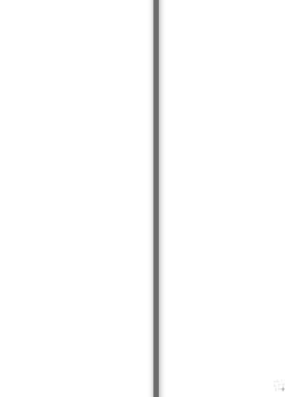
different angle of claw popping bear



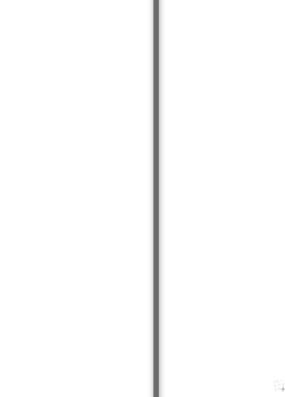
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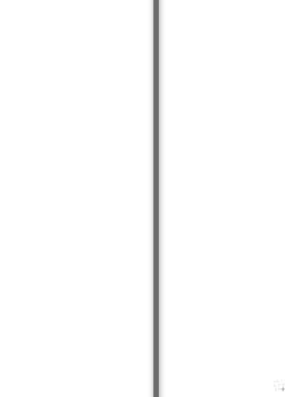
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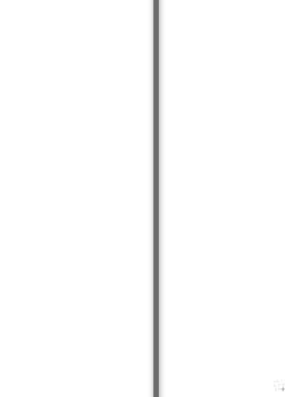
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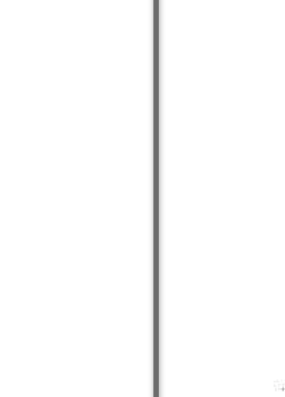
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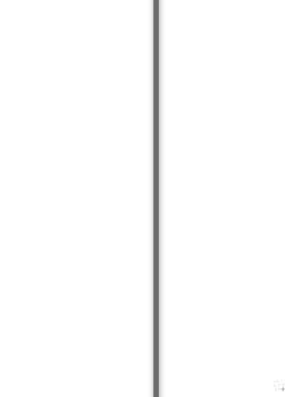
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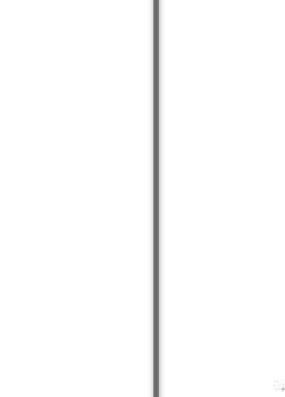
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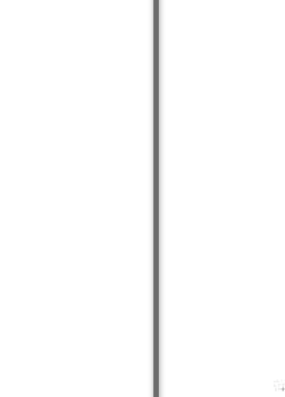
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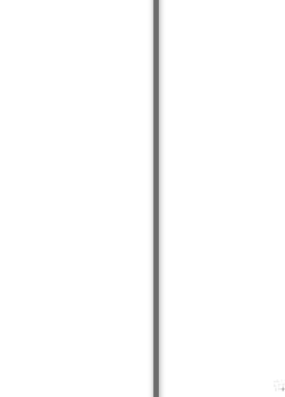
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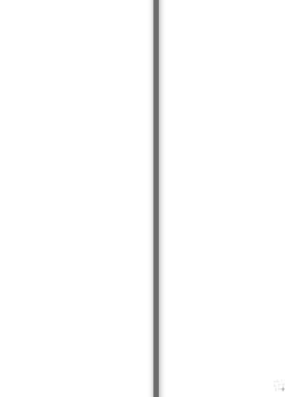
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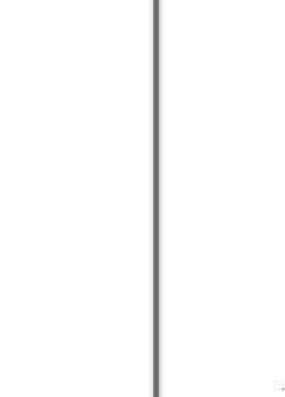
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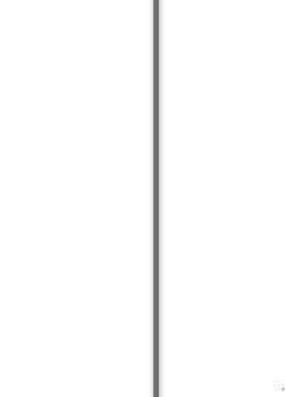
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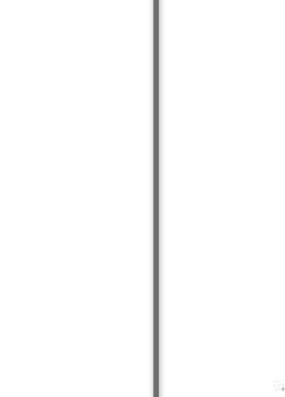
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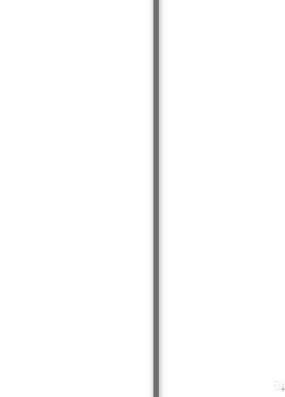
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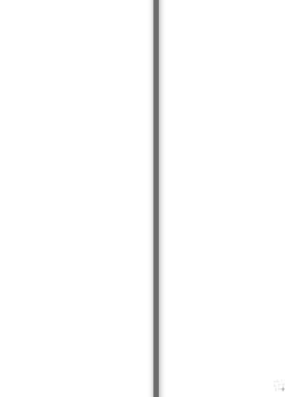
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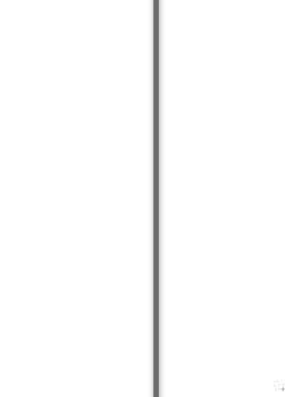
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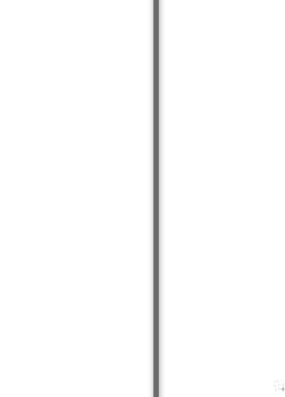
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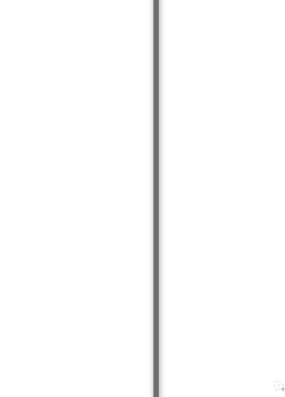
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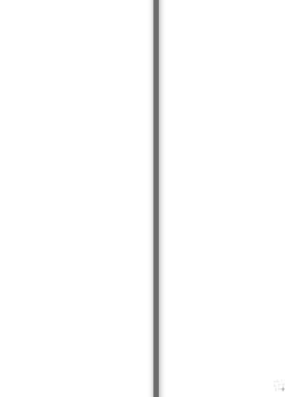
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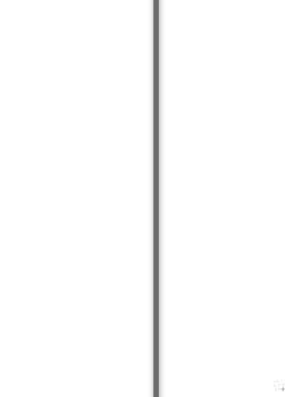
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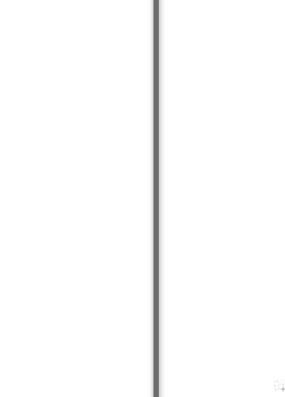
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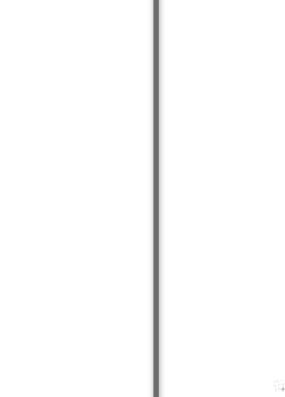
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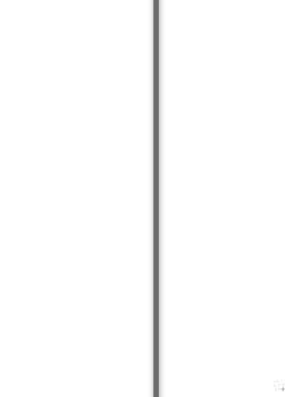
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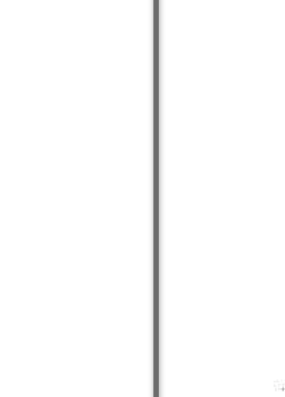
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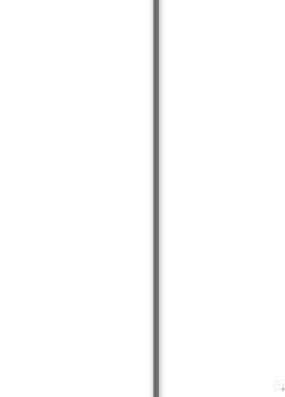
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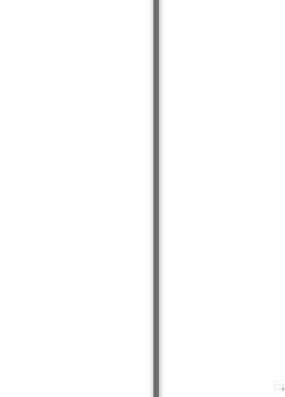
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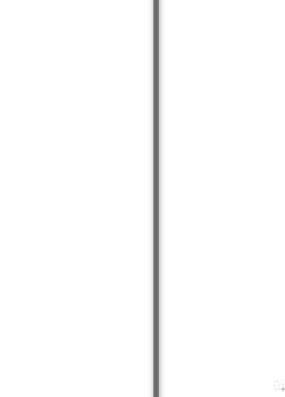
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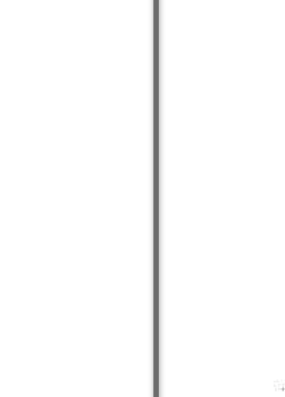
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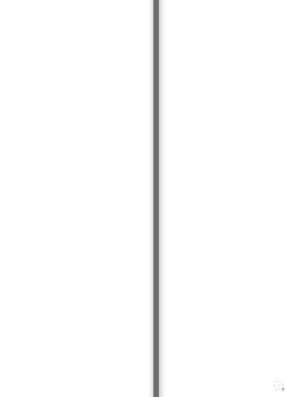
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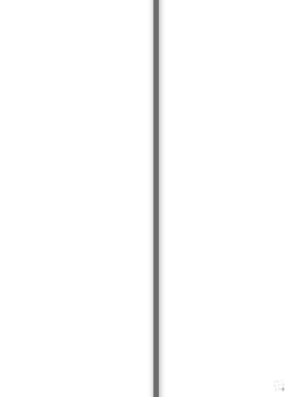
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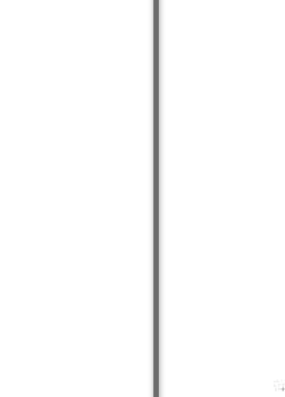
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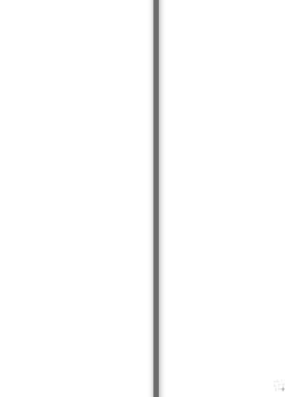
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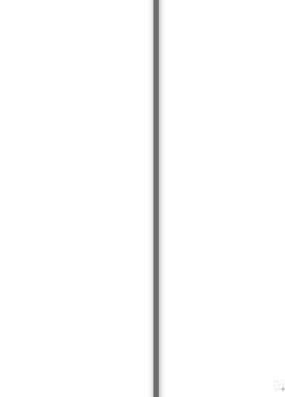
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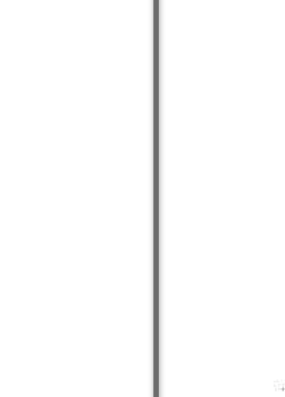
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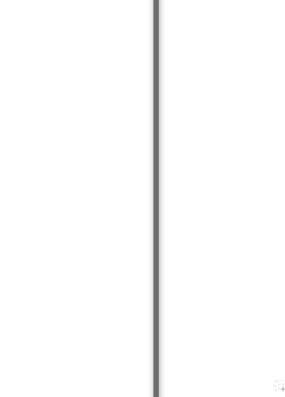
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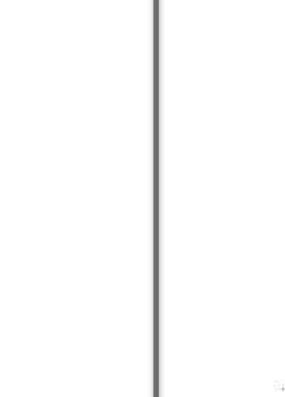
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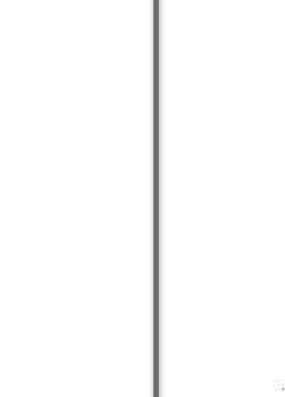
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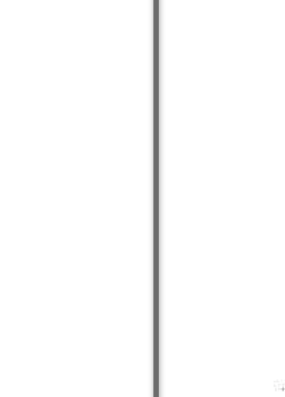
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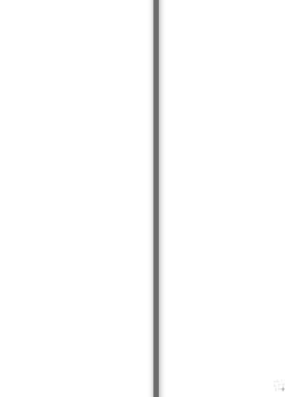
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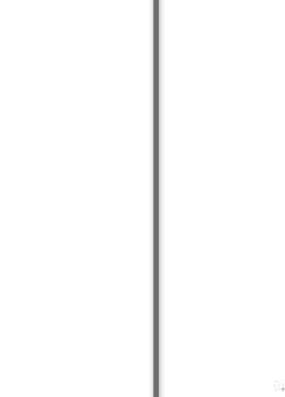
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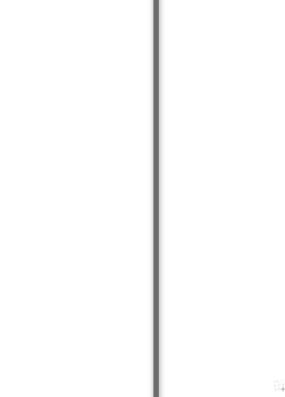
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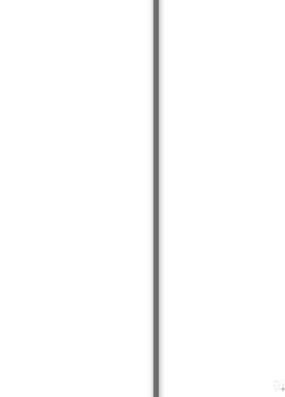
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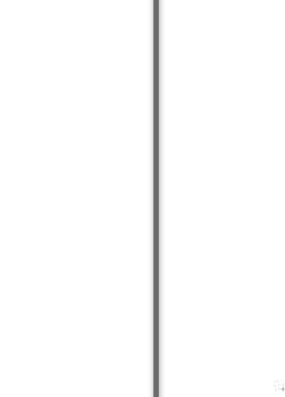
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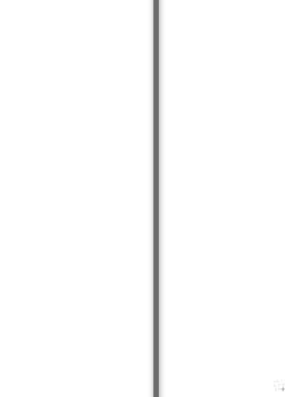
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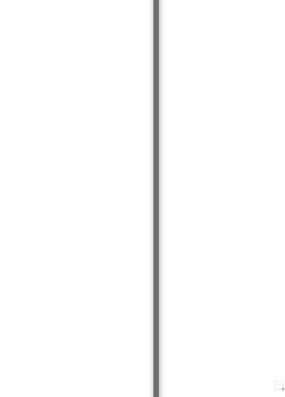
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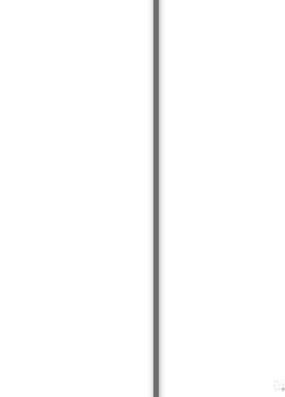
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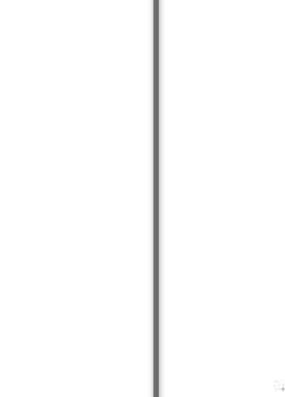
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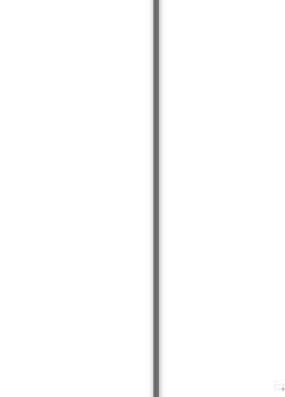
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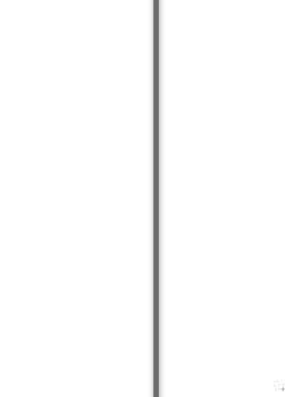
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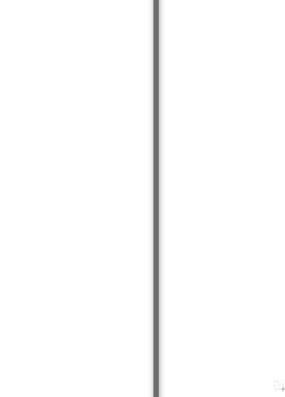
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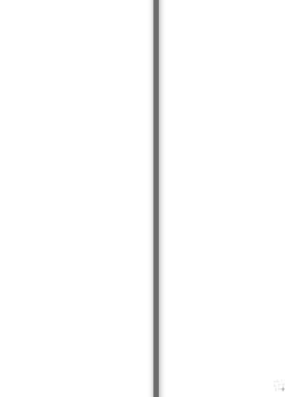
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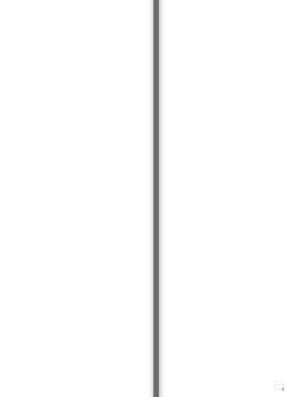
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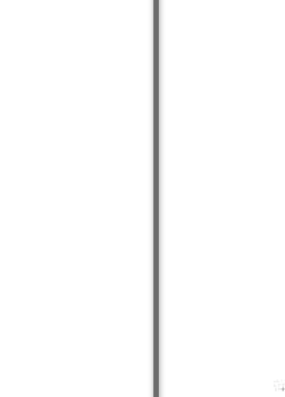
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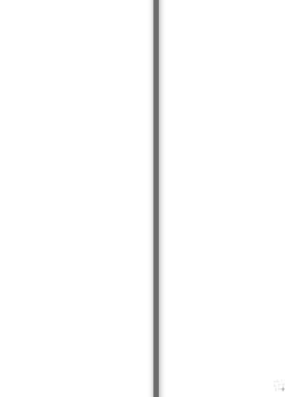
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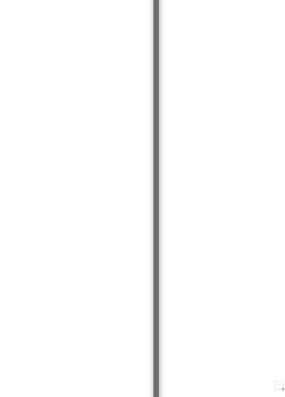
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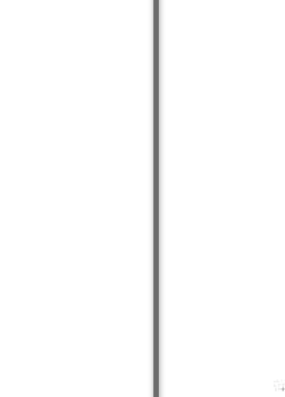
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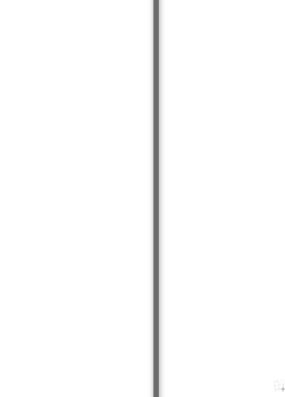
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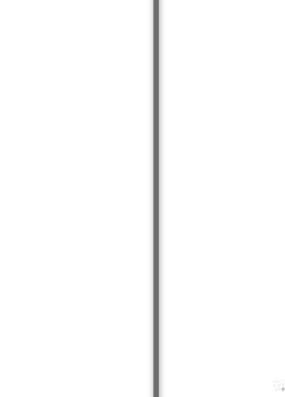
different angle of claw popping bear



different angle of claw popping bear



different angle of claw popping bear



different angle of claw popping bear



I was really happy with how this claw turned out! It looks menacing enough to portray the role of Claws in the upcoming film! Although it was useful being able to 'cannibalise' a toy grabber, I felt I needed to move on to creating my own mechanisms from scratch for my next creatures, to enhance my puppets and my own skills.

FILMING
OF
CLAWS
VIDEOS



REPAIRING
AN
OLD
LILO

I didn't want to pop and waste a new one, so I found an old broken lilo and repaired it.



In order to make the lilo pop exaggerated, my mother who is seen floating on it, slit it with a knife as I went to pop it with the claw

FILMED
AT
COTTESLOE
BEACH
-
PERTH
AUSTRALIA



I wanted the clips to be short and to the point (like gifs) so that viewers could easily understand the message without needing to know the whole narrative when watching.

When filming, I tried to make the camera angle from the point of view of the claw, as if it is a predator scanning for it's prey.

The claw was quite hard to control under water, as the stick it sits on is so long!



CLAW
GRABS
SWIMMING
CAP



CLAW
POPS
BALLON



CLAW
CRUNCHES
PLASTIC
BOTTLE



CLAW
SLAPS
ICECREAM



CLAW
POPS
LILO



CLAW
GOES
FOR
INFLATABLE
GIRL



CLAW
LUNGES
AT
DOUGHNUT
GIRL

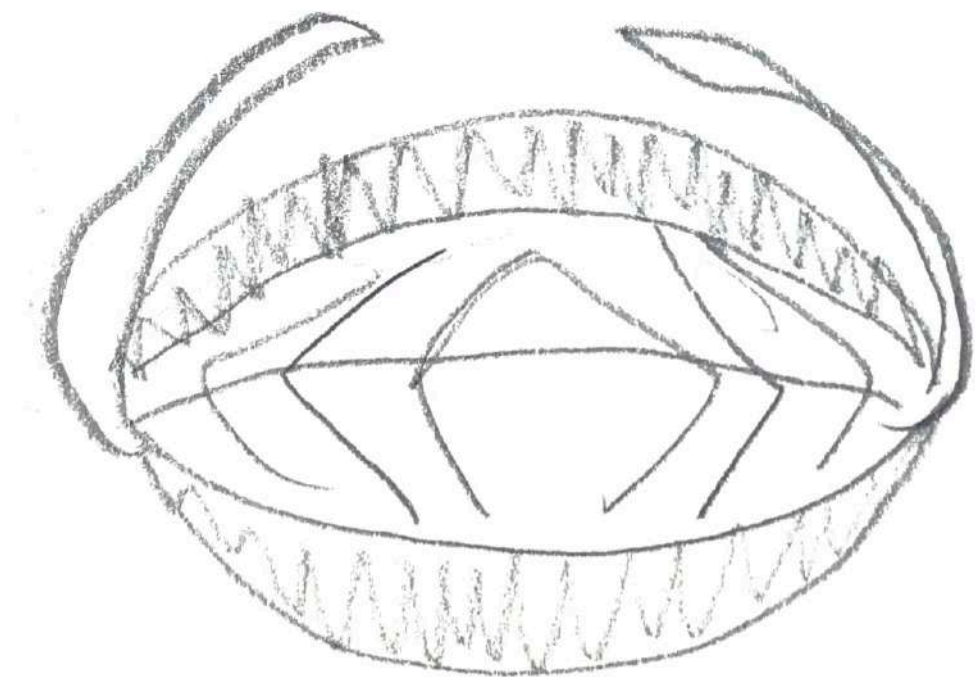


CLAW
SEARCHES
FOR
PREY





The CLAWS film is very quick, and has a really straight forward narrative, but is very easy to follow without formally understanding the plot. This means that people can catch a quick glance and understand, rather than needing to stand and watch the entire film.



Chapter Three

Manuel
The
Manta Ray

NEXT CREATURE

Moving on to my next creature, I wanted to create something that showed more refined skills, and a more detailed and laborous making process. I planned to stick with making my character life-sized, meaning I needed choose a larger creature to create.

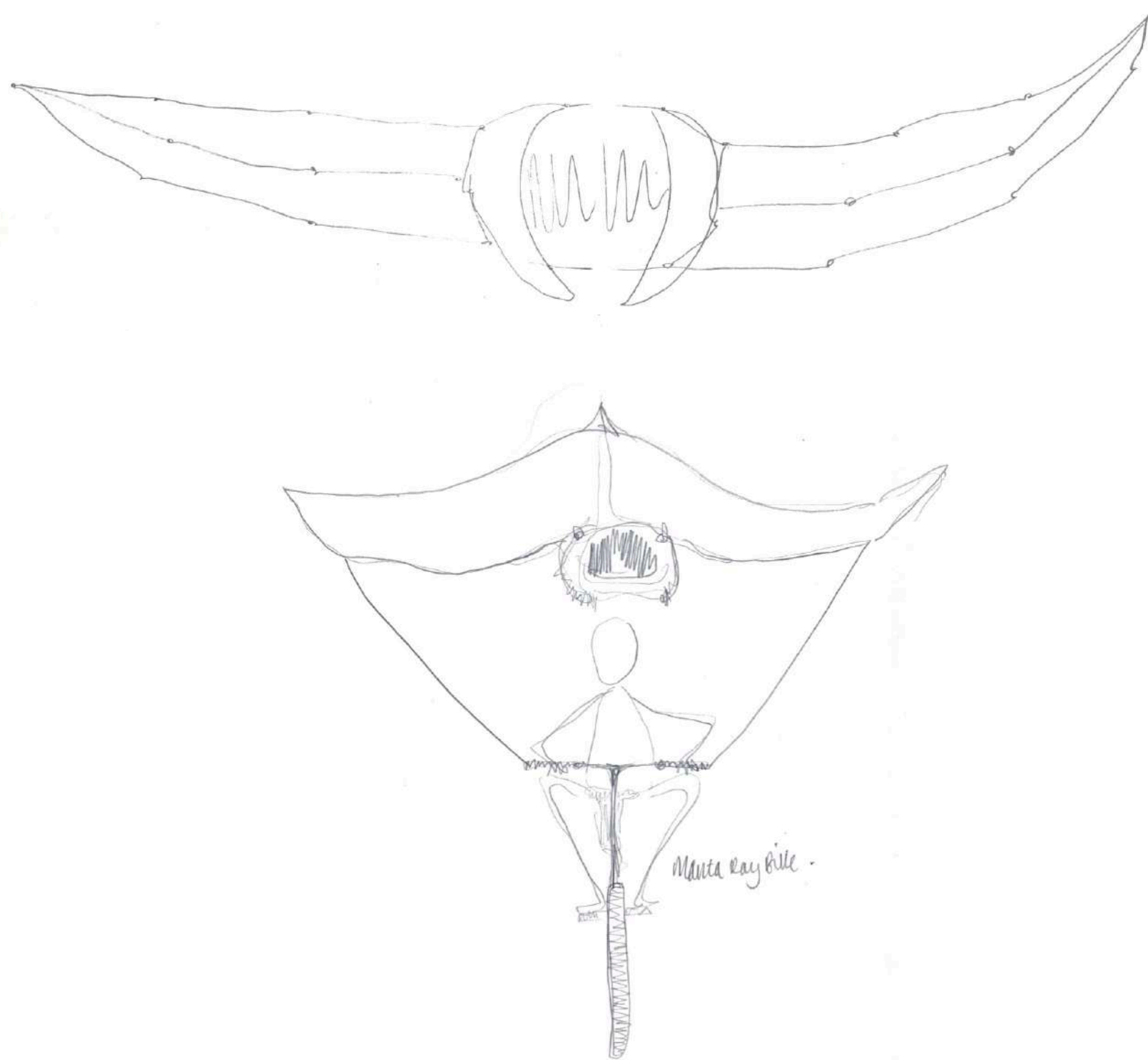


FIG - 23

I returned to my initial research, looking at large scale puppets that incorporate the puppeteer inside them, such as War Horse. I also wanted to develop how my puppets we rearticulated, so that they could move more successfully

LARGE
SCALE
PUPPETRY
RESEARCH

SCUBADIVING WITH MANTARAYS

I scuba dived with Manta Rays in Manta-Bay in Bali in August 2018. I collected footage and sound recordings of the manta rays swimming past. Their graceful wing movement is incredible.



“The manta ray is effectively a living, swimming, car-sized colander that continuously strains the oceans for food.”⁸

⁸- Yong, Ed. "Why Your Vacuum Clogs But A Manta Ray Doesn'T". *The Atlantic*, 2019, <https://www.theatlantic.com/science/archive/2018/09/how-manta-rays-gill-rakers-filter-water-without-clogging/571324/>. Accessed 5 May 2019.



BROOKE
PYKE
MARINE
PHOTOGRAPHER

Manta Rays swimming
through plastic in Manta-
Bay, Bali.

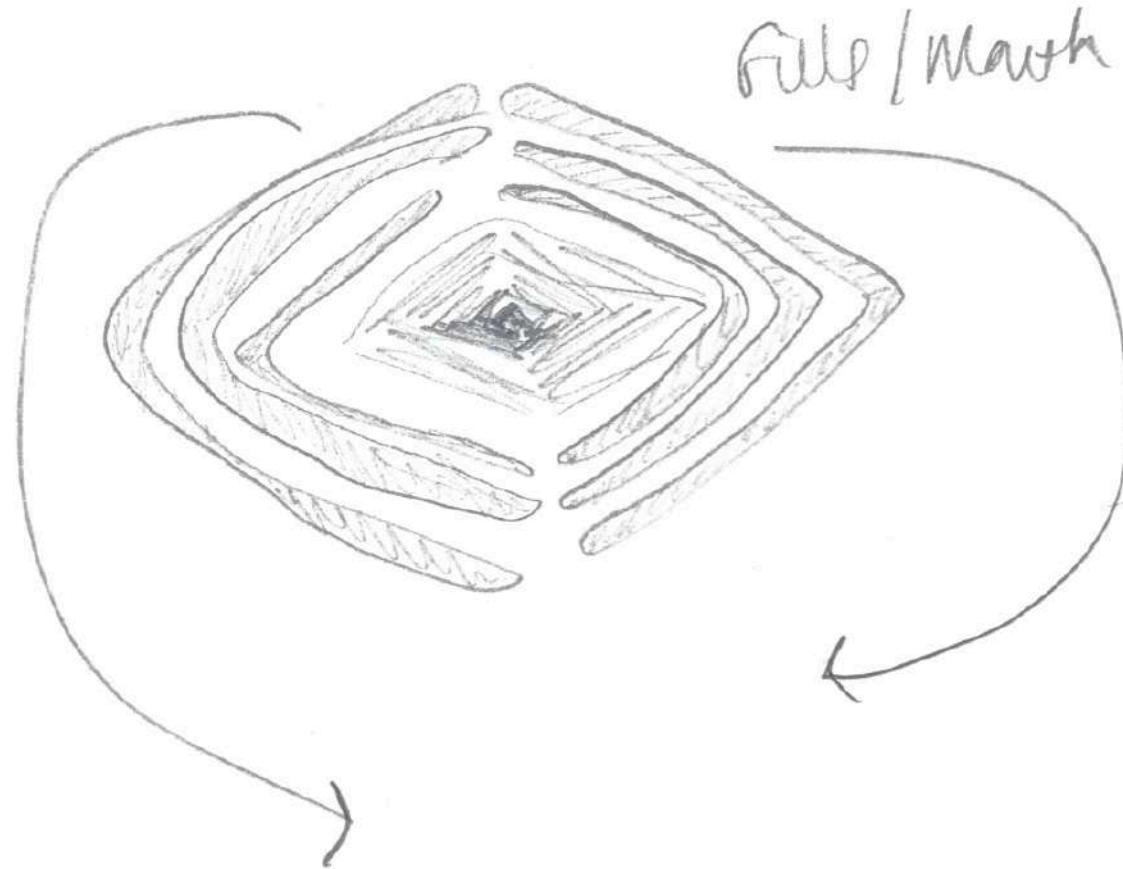
I allowed my point of focus
to expand larger then
Brighton Beach, as with
rising sea levels, climate
change, and plastic
pollution, our marine life
will change, meaning that
MantaRays may live in our
waters in the future.



SCIENTIST GILL RESEARCH

The way MantaRay's gills filter their food is ingenious; constantly sieving particles, but never blocking.

Their gills are currently being looked at by scientists as a way to clean the ocean of plastic. Although by the time this design becomes a reality, MantaRays will have been wiped out from micro plastic pollution.



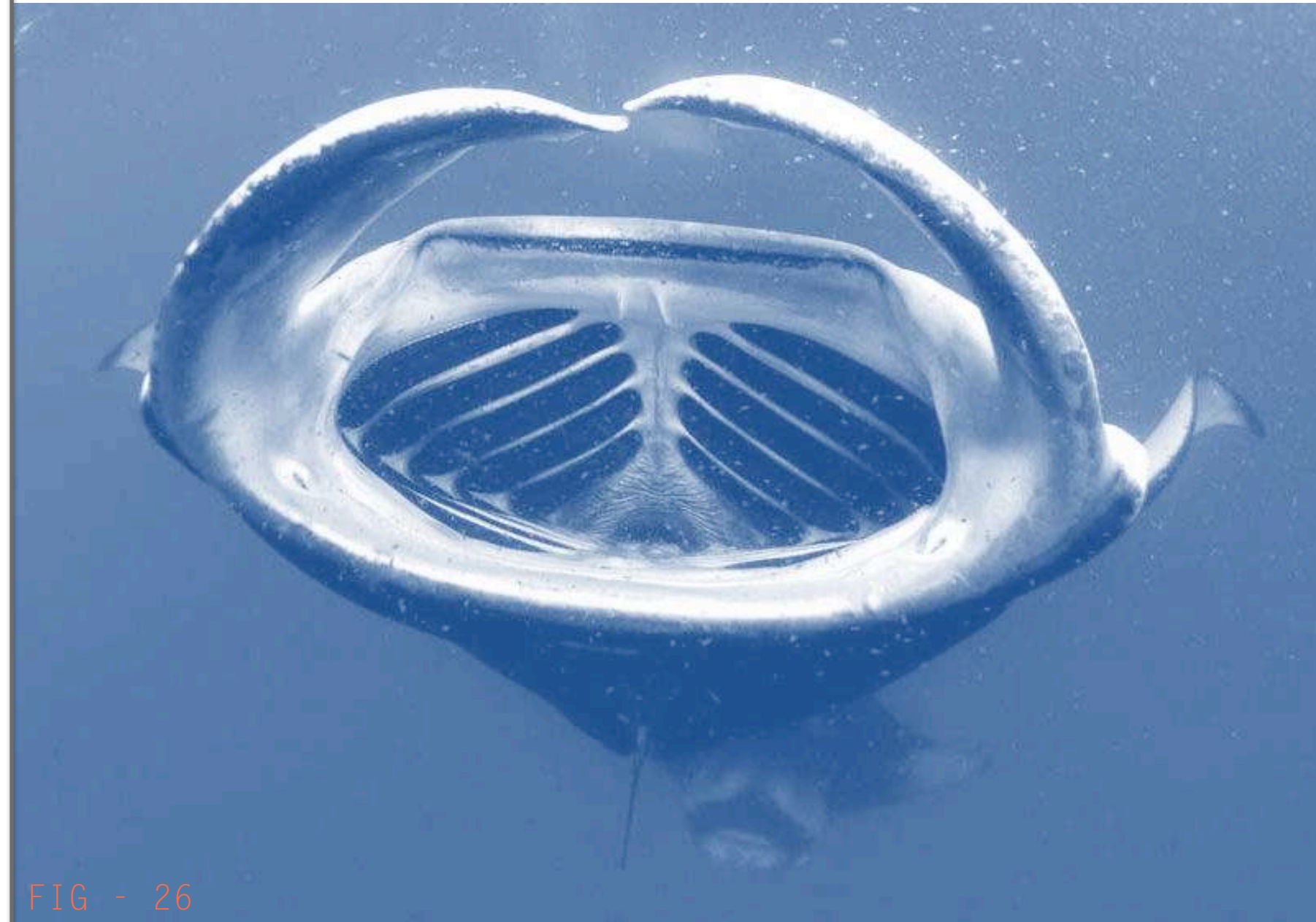
“Stare headlong into a manta's mouth, and you'll see five successive pairs of white, V-shaped rods. These are called gill arches. Now think of each arch as a double-sided comb, with teeth protruding both forward and backward. These are called gill rakers. As water enters the animal's mouth, it flows over the gill rakers before exiting the gills. Some of the water is diverted into the narrow gaps between the rows, and plankton gets trapped in those gaps. But thanks to the angle of the rakers, the same incoming currents also dislodge the trapped plankton, sweeping them into the manta's throat.

“Understanding these mechanisms can one day lead to bio-inspired technologies and novel devices for filtration,” adds Kakani Katija from the Monterey Bay Aquarium Research Institute, who studies how marine creatures manipulate fluid dynamics to feed and move.

Paig-Tran has now filed a provisional patent to develop filters that are based on manta gills. Together with colleagues in Toledo, she is hoping to build a system that can sieve microscopic bits of plastic from water.”⁹

—Journalist Ed Young, writing for The Atlantic about the work of scientist Misty Paig-Tran

9- Yong, Ed. "Why Your Vacuum Clogs But A Manta Ray Doesn'T". *The Atlantic*, 2019, <https://www.theatlantic.com/science/archive/2018/09/how-manta-rays-gill-rakers-filter-water-without-clogging/571324/>. Accessed 5 May 2019.



It was therefore very important that I reference their gill sin some way when making. MantaRays are also well recognised for being able to see their skeletal system through their open mouth, so this was important to capture too.

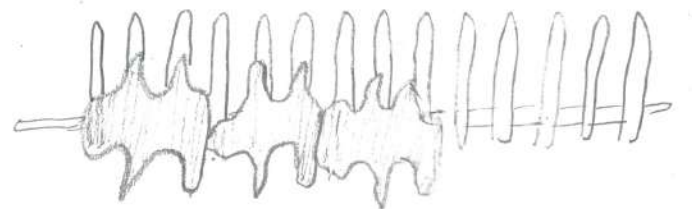
The main threat to manta rays is man. With plastic pollution being closely followed poachers who sell their gills for Asian medicinal purposes, who crush the gills and eat them, with no evidence of the benefits.



COPPER GILL TESTS



Copper wire was
hammered out,
and soldered
onto a main rod.
Gill rakers will
then be sewn
onto these



LASER CUT GILL RAKERS

As previously mentioned, the Gill Rakers are essential to the MantaRay's gill filtration system, that is being looks at to help clean micro plastics out of the sea. It was essential that these be featured on my mantaray, so I had them laser cut out of my sheet material.

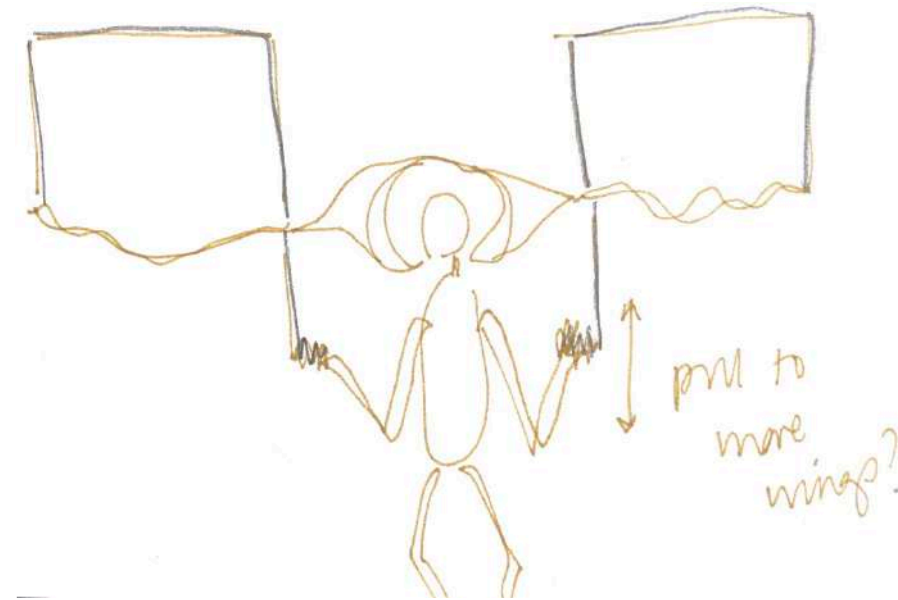


MOVEMENT
OF
WINGS
IS
IMPORTANT



FIG - 26.5

CREATING
THE
WING
FLICK



To create a convincing, and powerful creature, I really needed to achieve the graceful flick at the end of the wings. However, this is really hard to do with simple mechanisms! I thought I would have to suspend the wings from the ceiling. Or a large frame, in order to get the power and the angle to ripple them.

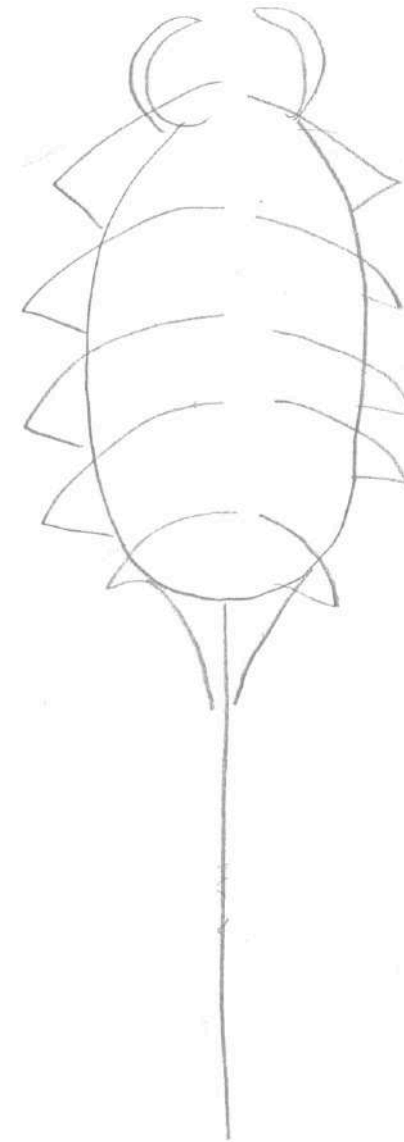


The wing flick was eventually achieved by having a floaty piece of material on the end of the plastic wing, which follows the wing movement with graceful ripples.

REOPENING OF BRIGHTON SEALIFE CENTRE

"The Sea Life Centre in Brighton, the oldest operating aquarium in the world, with Grade II listed heritage, will soon undertake the last phase of the on-going refurbishment started in 2011 and costing so far over £4m."¹⁰

I had an idea to contact the General Manager of the aquarium Max Leviston, and see if he wanted to have Manuel the MantaRay in the aquarium. However, I then decided that I actually wanted to keep Manuel, rather than sell him, as then I could tour round with him and spread the anti-plastic pollution message to more people.



MANTARAY ANATOMY

In order to create a functioning and convincing frame for the MantaRay, I looked at images of their skeletal structure, and worked from the basic forms in that, as if it works for them, then surely it's the right frame for mine!

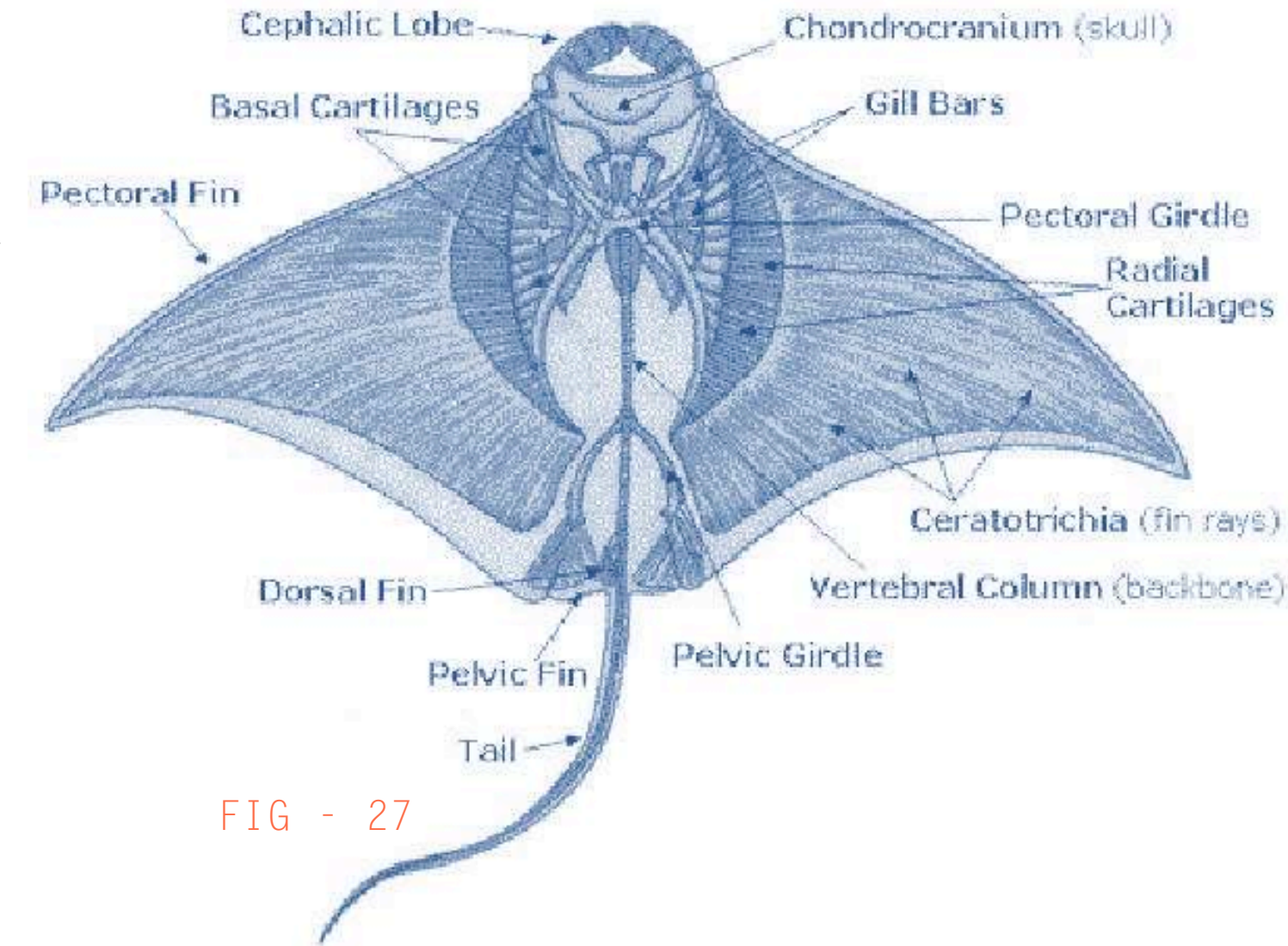
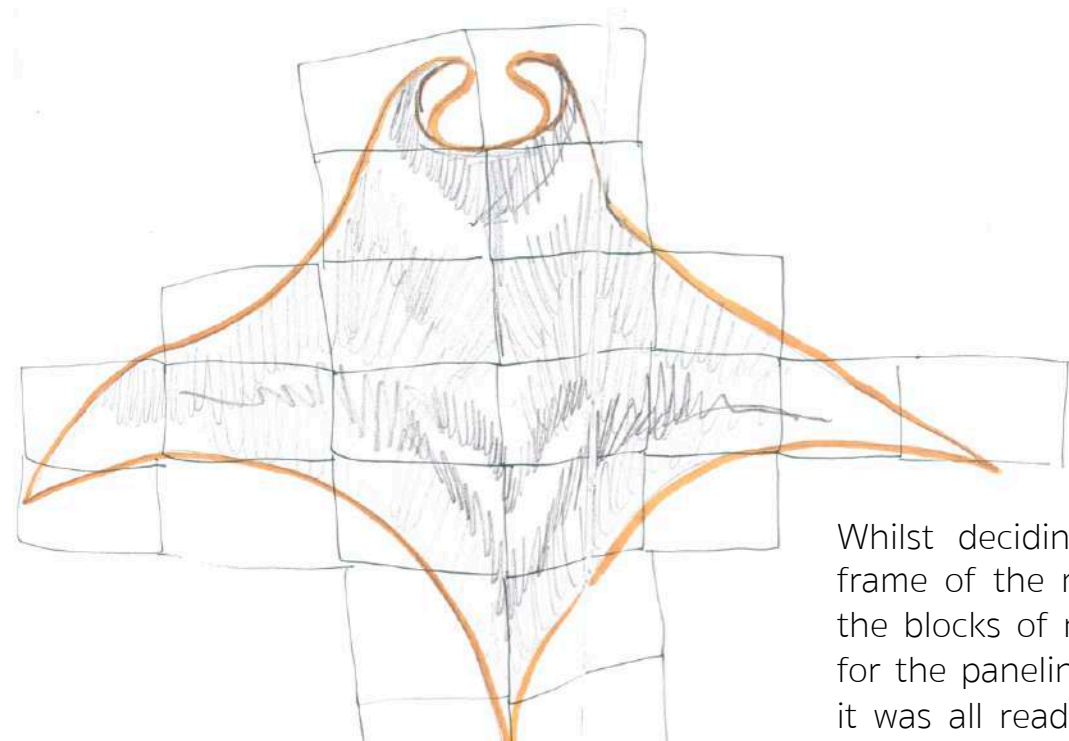


FIG - 27

¹⁰- Latest TV channel from Brighton. Watch on Virgin Media channel 159, channel 7 on Freeview or online. "The Sea Life Brighton In New Refurbishment For Ocean Display". *Latest Brighton Ltd*, 2019, <https://thelatest.co.uk/brighton/2018/08/16/the-sea-life-centre-send-its-sharks-for-a-short-vacation/>. Accessed 9 Mar 2019.

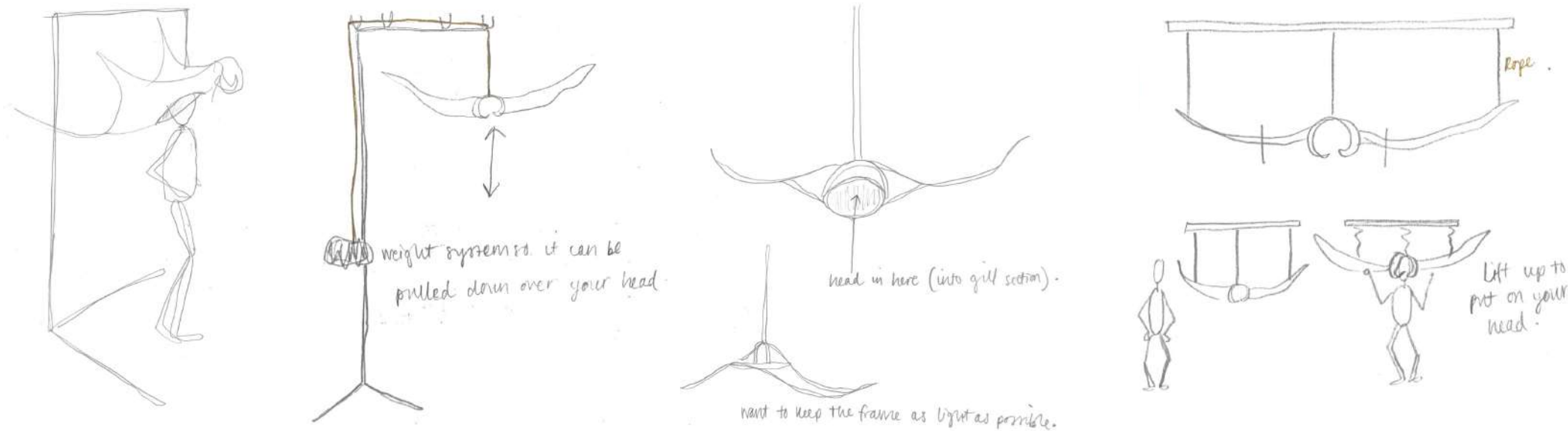


Whilst deciding how to make the frame of the manta ray, I made all the blocks of melted plastic needed for the paneling, and sliced it up so it was all ready to be heat pressed into the correct shapes once the frame was made.

BLOCKS
READY
FOR
MANUEL'S
PLASTIC
PANELS



MANUEL'S FRAME



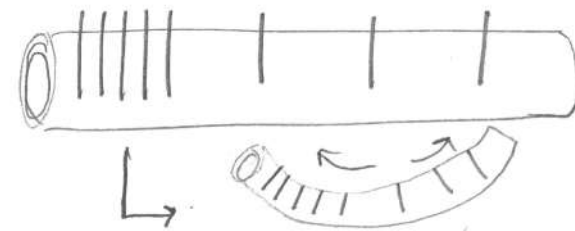
MODEL OF MANUEL THE MANTARAY HANGING FROM A FRAME



BENDING THE TUBE BY SLITTING WITH A HACKSAW



The tube can't be bent in a roller, as it squashes it into an oval. Therefore to create my desired curves and shapes, I had to the metal with a hacksaw, and bend it by hand.



SILVER SOLDERING THE STEEL TUBE



I originally believed that welding the tube would not work due to its thin walls, so explored other options such as silver soldering, however this was hard to do all the way around, and when I reheated the back to solder it, it remelted the front and fell apart.

MIG WELDING THE STEEL TUBE



As the tube has 1mm walls, it can't be MIG welded for long or it burns through, therefore it has to be small tacks, repeated in different areas to give the tube time to cool down. This isn't that neat, but is much stronger than soldering, so I decided to pursue it.

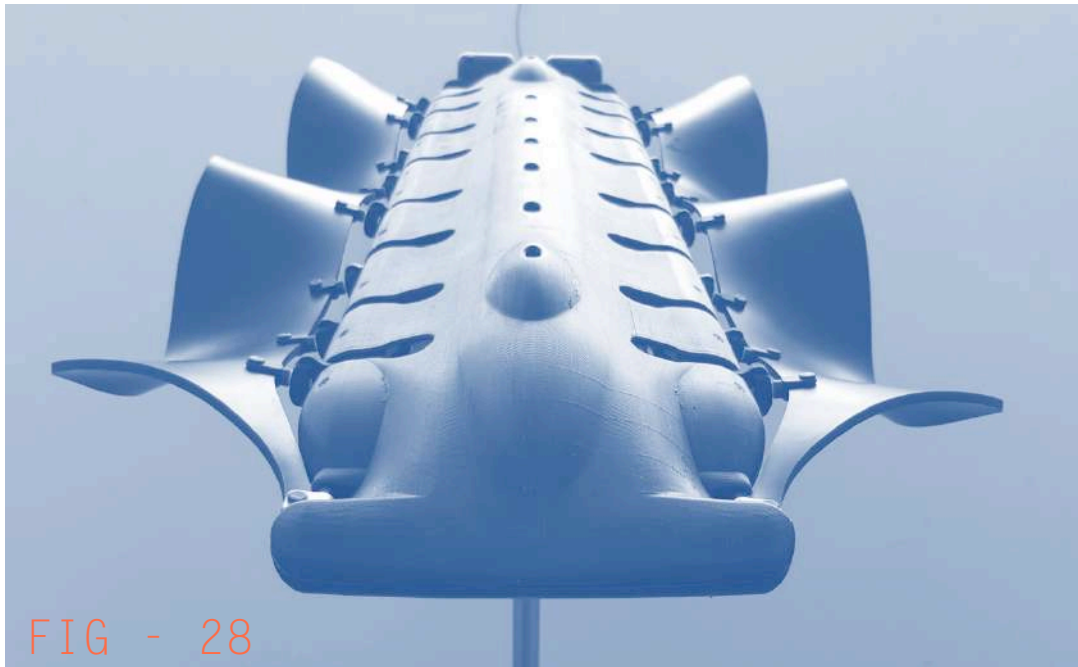


FIG - 28

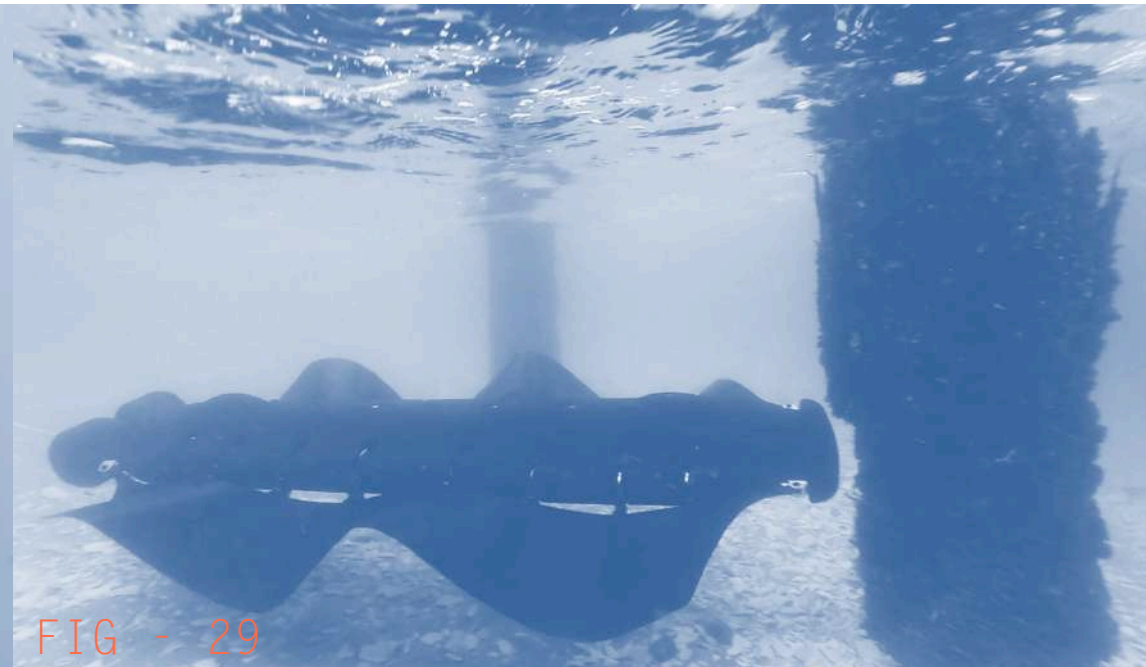


FIG - 29

THIS
UNDULATING
MOVEMENT
WOULD
WORK
REALLY
WELL
FOR
MANUEL
THE
MANTARAY'S
WINGS

AMPHIBIOUS VELOX ROBOT USES UNDULATING FINS TO SWIM AND CRAWL
“Created by US company Pliant Energy Systems, The Velox robot can move through water as well as over sand, pebbles, snow, ice and other solid ground, completing tasks that robots designed purely for either land or sea would be unsuited to. Velox's versatility is due to its undulating soft fins, which sit on either side of Velox and move in a hyperbolic pattern reminiscent of a stingray or a millipede. The fins make Velox efficient and ultra-maneuverable. The robot can instantly reverse direction or do a quick turn. Its amphibious abilities make Velox potentially the most effective machine for studying and mapping the surf-zone, where waves meet the shore — an area that is off-limits for typical undersea drones.”¹¹

The Pop Rivet Hypothesis is an analogy for understanding the importance of Biodiversity and need for conservation of species, explained by scientist Paul Ehrlich.

AEROPLANE = ECOSYSTEM
RIVETS = SPECIES

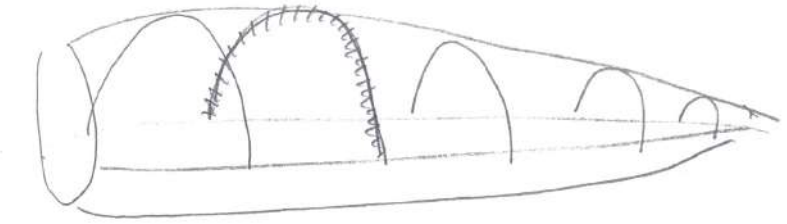
“Aeroplanes are made up of millions of rivets.

If the plane loses one rivet among the million, it may not significantly affect the aircraft as a whole. But if it starts losing rivets successively, it may weaken the aircraft and affect flight. Similar is the case of an ecosystem.

If every passenger travelling in the airplane starts taking rivets home (causing a species to become extinct), initially it may not affect flight safety (proper functioning of ecosystem), but over a period of time the plane becomes weak and dangerous (species become endangered and then extinct) or the ecosystem loses its balance. Also loss of rivets on critical parts like wings causes more serious threats than losing rivets on lesser importance like seats. This is compared to ecosystem and critical species.”¹²

11- Aouf, Rima. "Amphibious Velox Robot Uses Undulating Fins To Swim And Crawl". *Dezeen*, 2019, <https://www.dezeen.com/2019/02/07/amphibious-velox-robot-technology/>. Accessed 5 Apr 2019.

12- Ehrlich, Paul. *What Is The Pop Rivet Hypothesis*. 2019, <https://www.quora.com/What-is-rivet-popper-hypothesis>. Accessed 5 May 2019.



POP
RIVET
HYPOTHESIS
-
AERODYNAMICS



FIG - 30

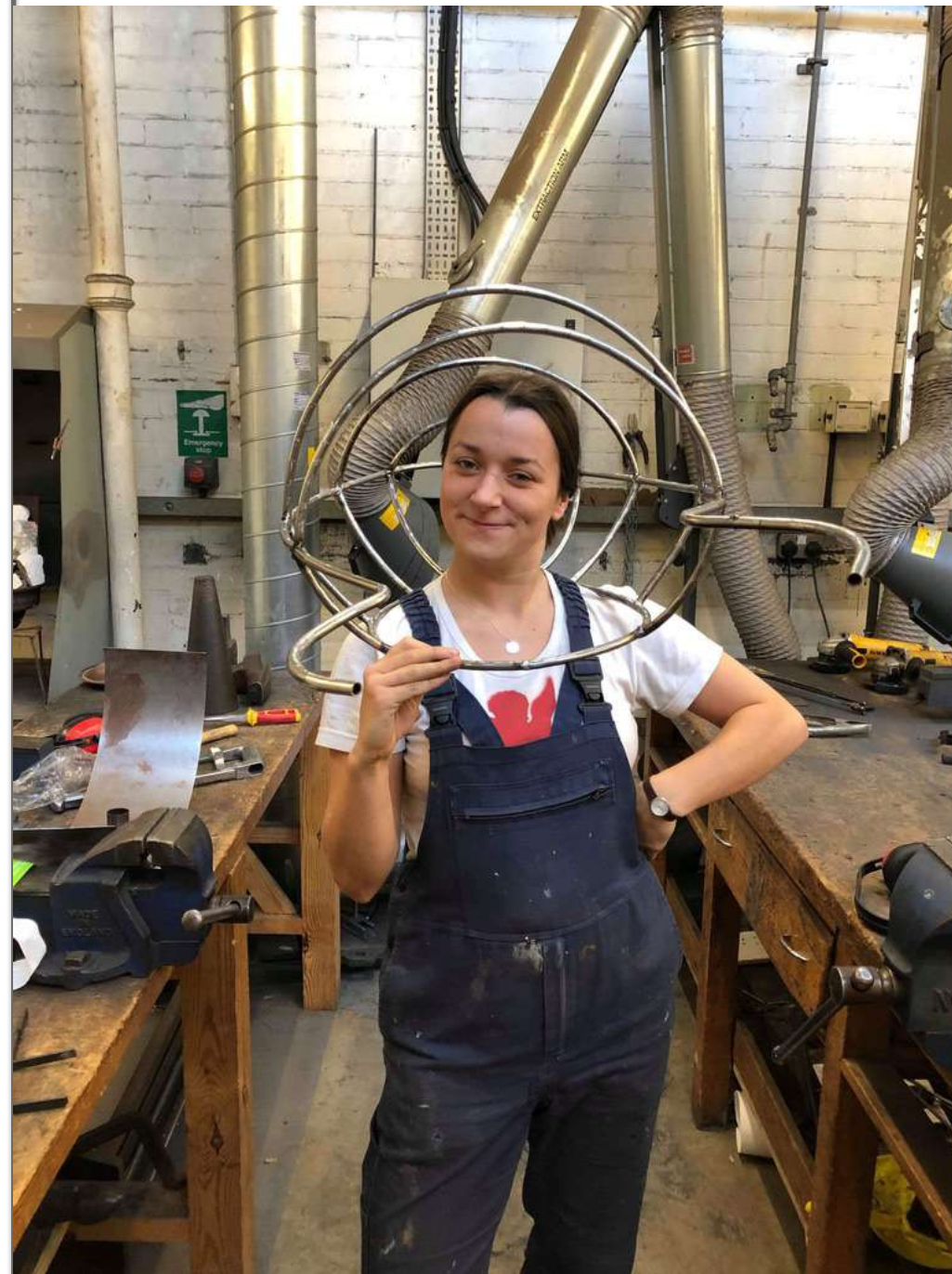
MIG
WELDS
WERE
FILED
DOWN
AFTER



THE
HEAT
STAYED
LOCALLY
WITHIN
THE
SLITS



TRYING
ON
THE
FRAME
TO
DECIDE
HOW
BIG
TO
MAKE
THE
MOUTH
OPENING



CREATING
WING
ATTACHMENT
SECTIONS

In order for the wing movement to be smooth, there needed to be a flat section from them to pivot off. These was welded onto the sides of the frame.

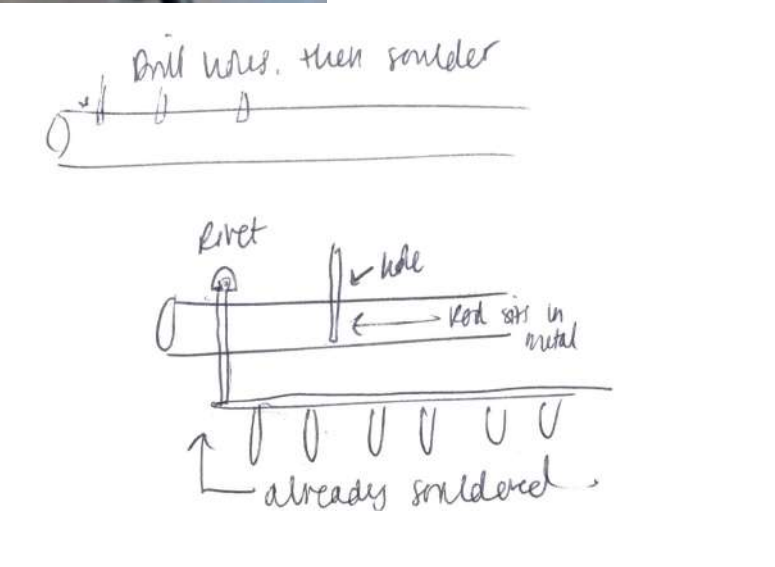


RIVET TESTS FOR THE PLASTIC PANELS

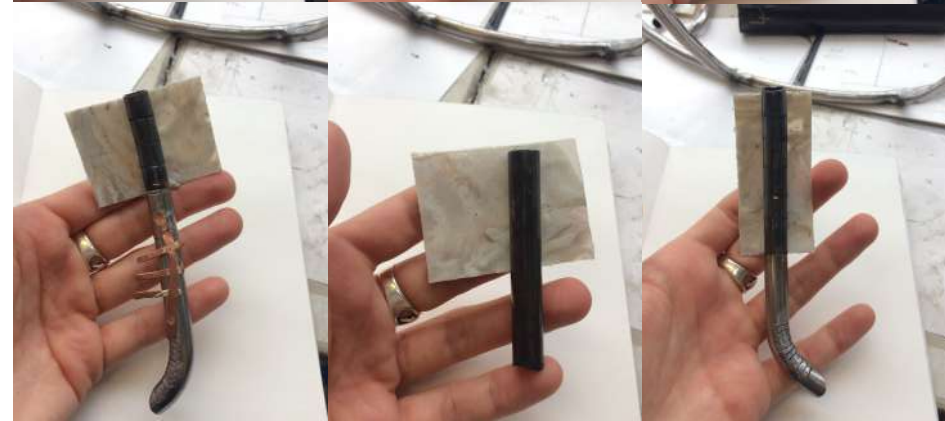
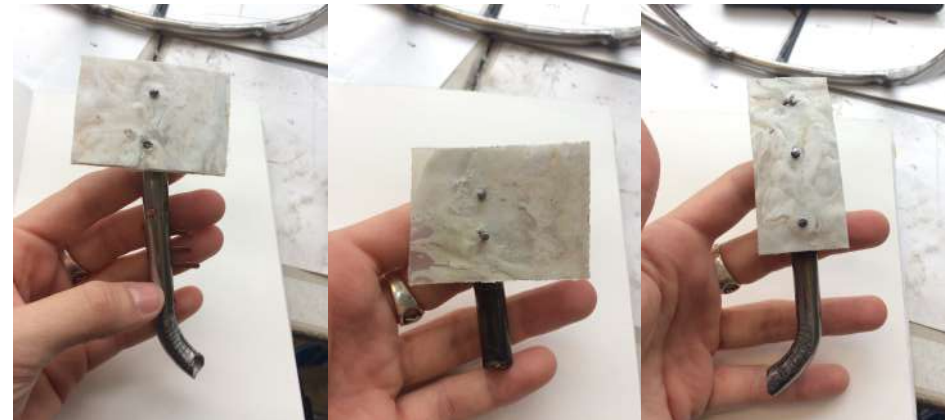
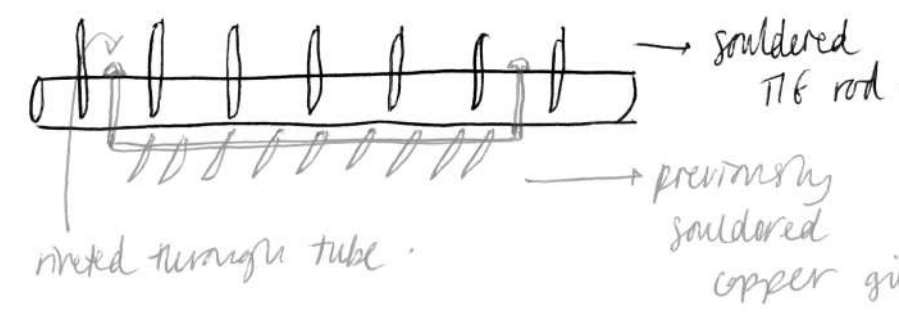
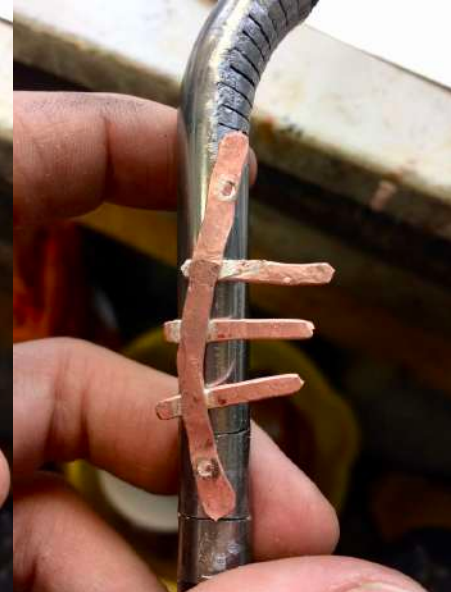


Initially I tried soldering on the spikes, but they were hard to position, so would have taken an extremely long time overall. I was also not confident that they would be strong enough as rivets.

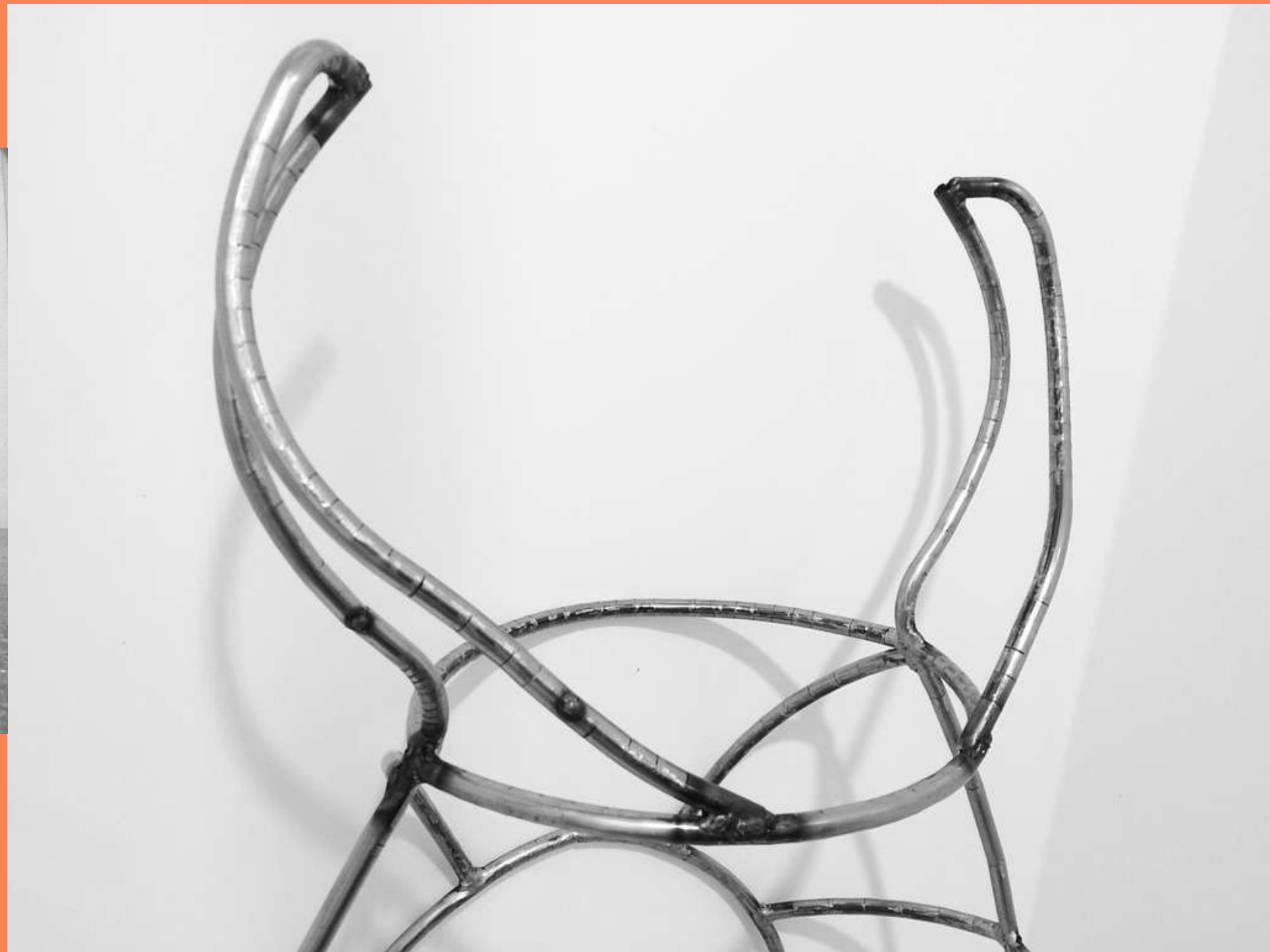
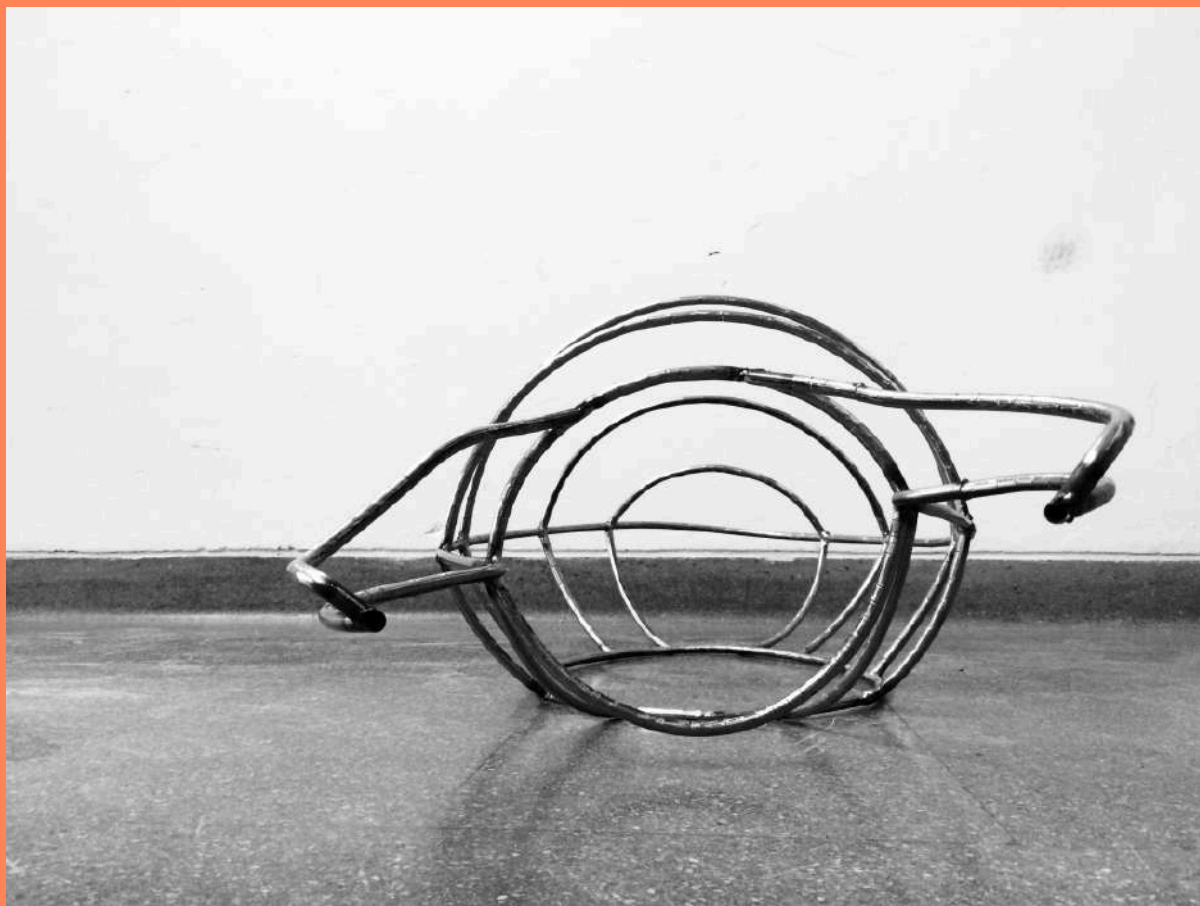
Instead, I drilled into the tube and hammered in a piece of TIG filler rod. I then used the TIG welder to silver solder it on, as it kept the heat local to the point of contact, meaning I did not have to heat the entire frame. This meant I could prepare many spikes with solder in a row, and move from one to the next without worrying about existing solder re-melting. I had to keep the TIG heat at the base of the spike near the tube, or it would melt the spike.

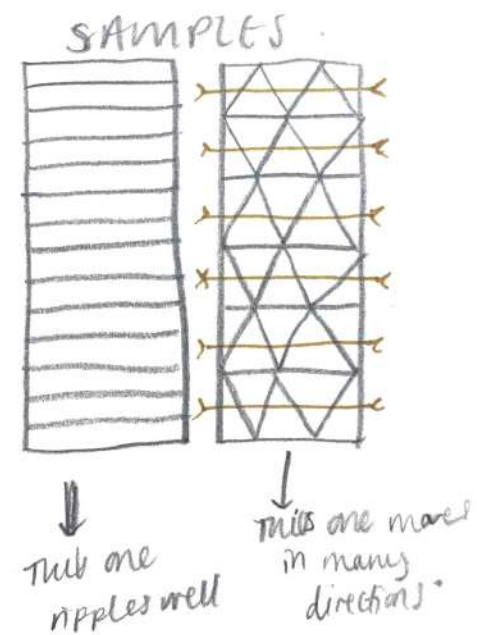
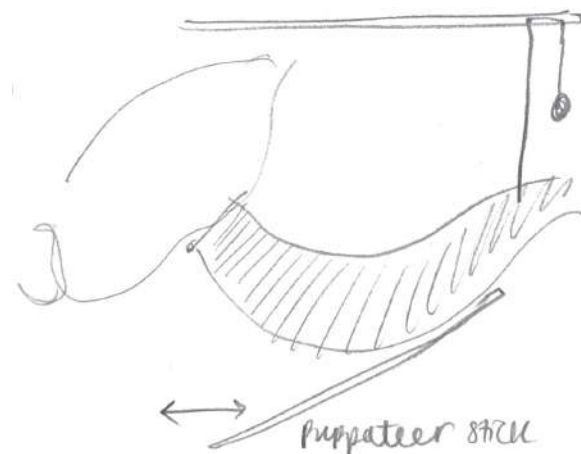
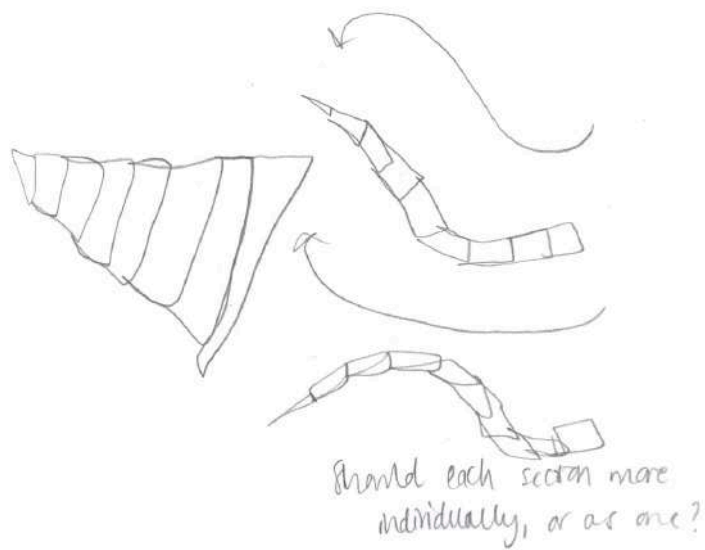


ATTACHING THE COPPER GILLS TO THE TUBE



To attach the copper gills, I drilled a hole through the tube and pushed the soldered copper arms up through the hole, out the other side and riveted it. This meant I only had to introduce heat to the frame once (for the rivet spikes), and not for the gills, as more heat may have warped the frame.





WING RIPPLE MOVEMENT TESTS

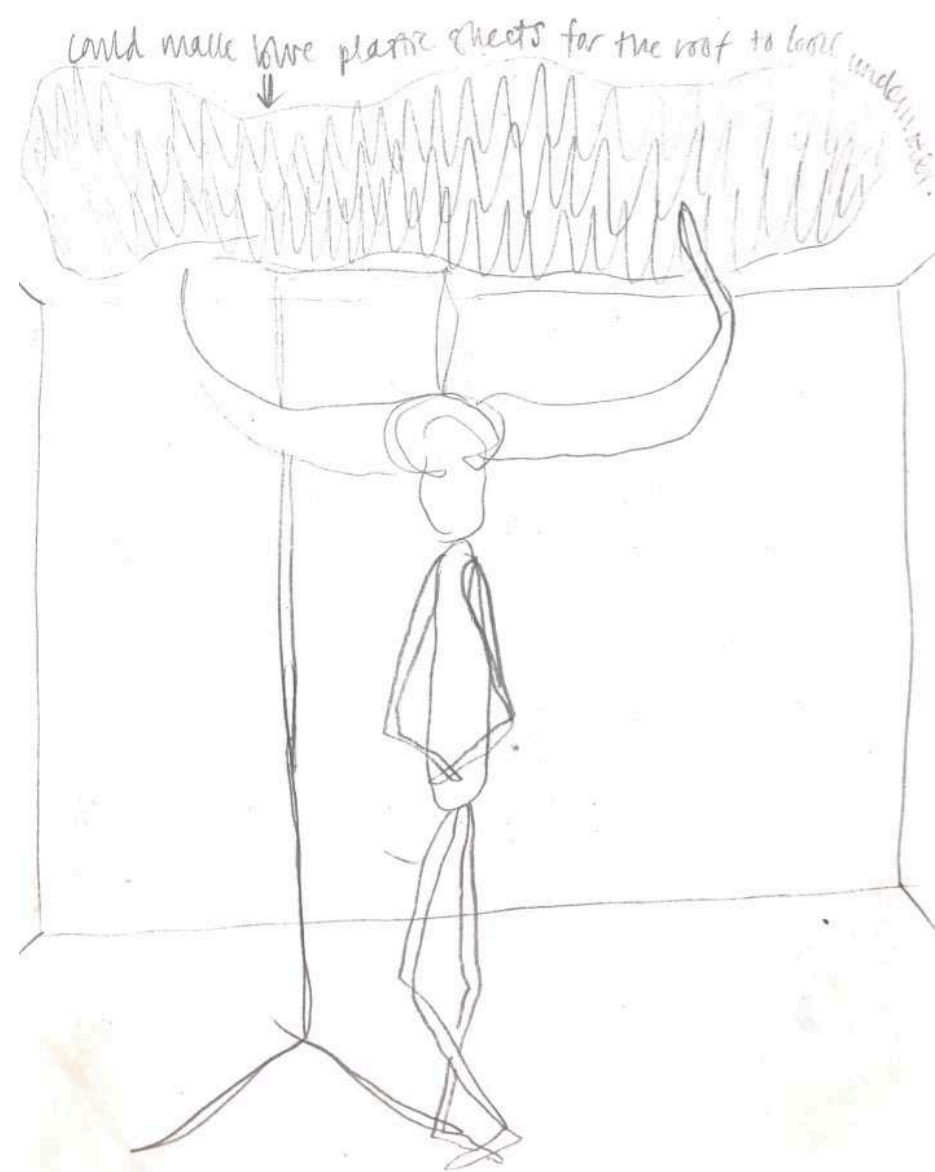


The wings only need to ripple in one direction, so the horizontally cut sections worked well. The tessellating triangles allowed movement in all directions, which worked well, but wasn't needed. I revisited them later for the puffer fish.





If it's going to be a static model, it
needs to be frozen in motion →



WATER ABOVE THE MANTARAY

I wanted to have these 'water' sheets suspended above my work, with lights shining through to make my space look like it was underwater. They also look like plastic floating on the surface of the sea from underneath. However this would have been over-kill in my space, so I did not continue with it.

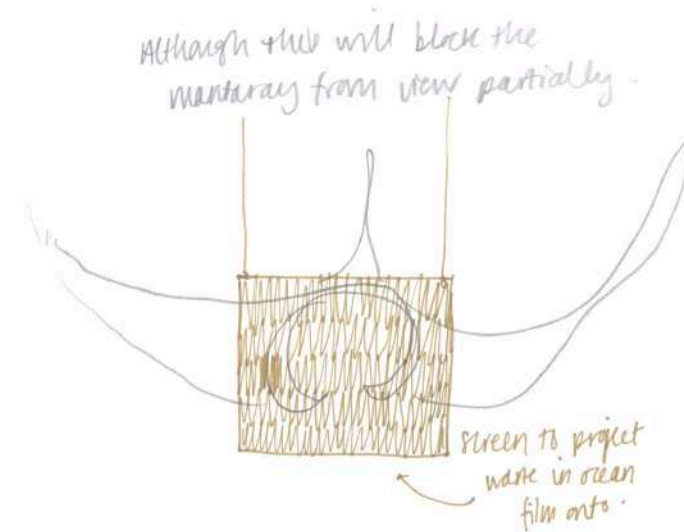
One large sheet of 'water' hung
↑ above the mantaray.



IMMERSIVE PROJECTION EXHIBITIONS



FIG - 31



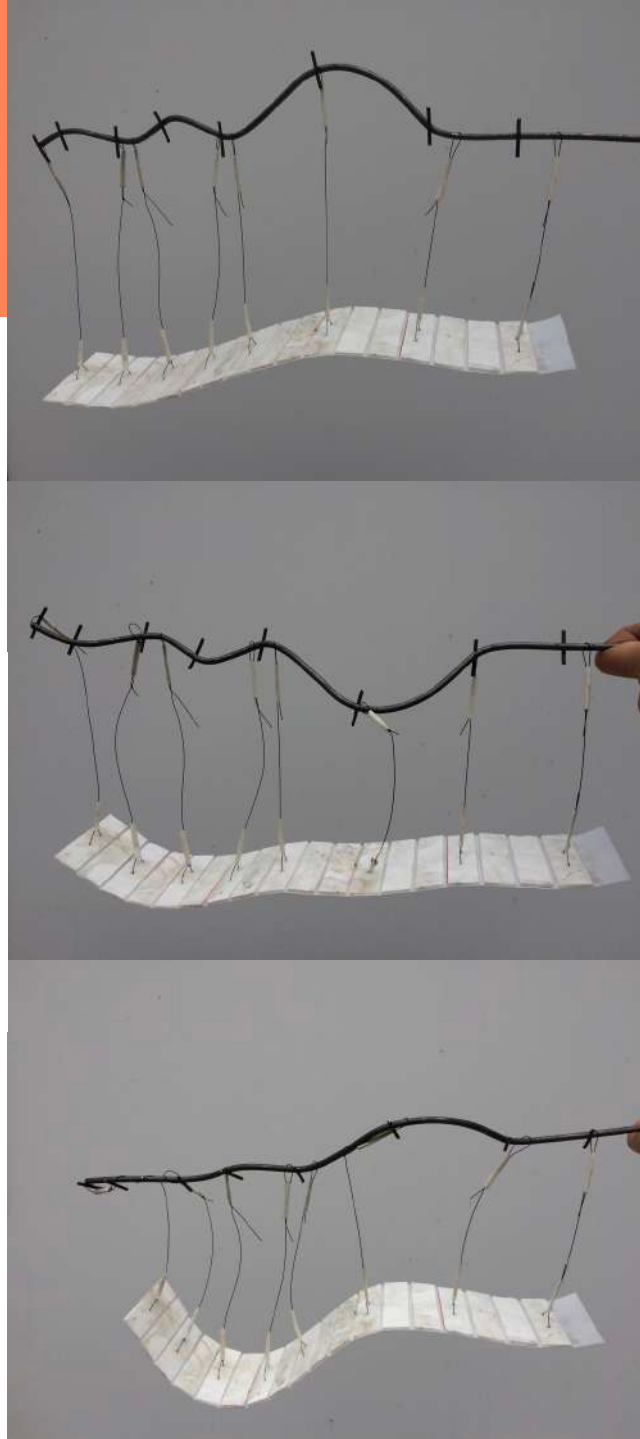
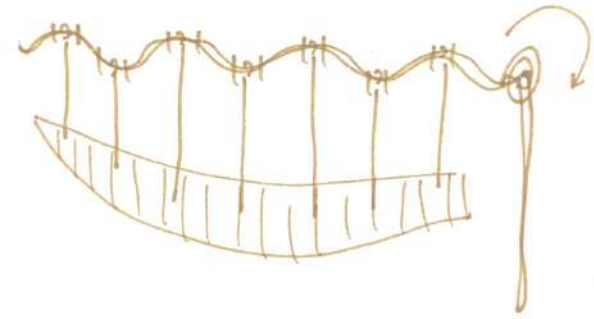
I researched 'immersive' exhibitions, as I had an idea to project films of mantarays swimming through plastic in front of the mantaray, so when you put your head inside and looked out the mouth, that's what you would see. I was also going to have the noises I recorded of the mantarays swimming past me, playing inside the body of my mantaray. However, with the timescale left and not wanting to overdo my degree show space, I did not pursue this idea any further.



IMMERSIVE EXPERIENCE

CAMS WING MODEL

I did not end up using this method of making the wings ripple, as on a larger scale it would have been messy, and become even more tangled. I may have worked had it been weighted better, but I decided to move on to alternative methods.

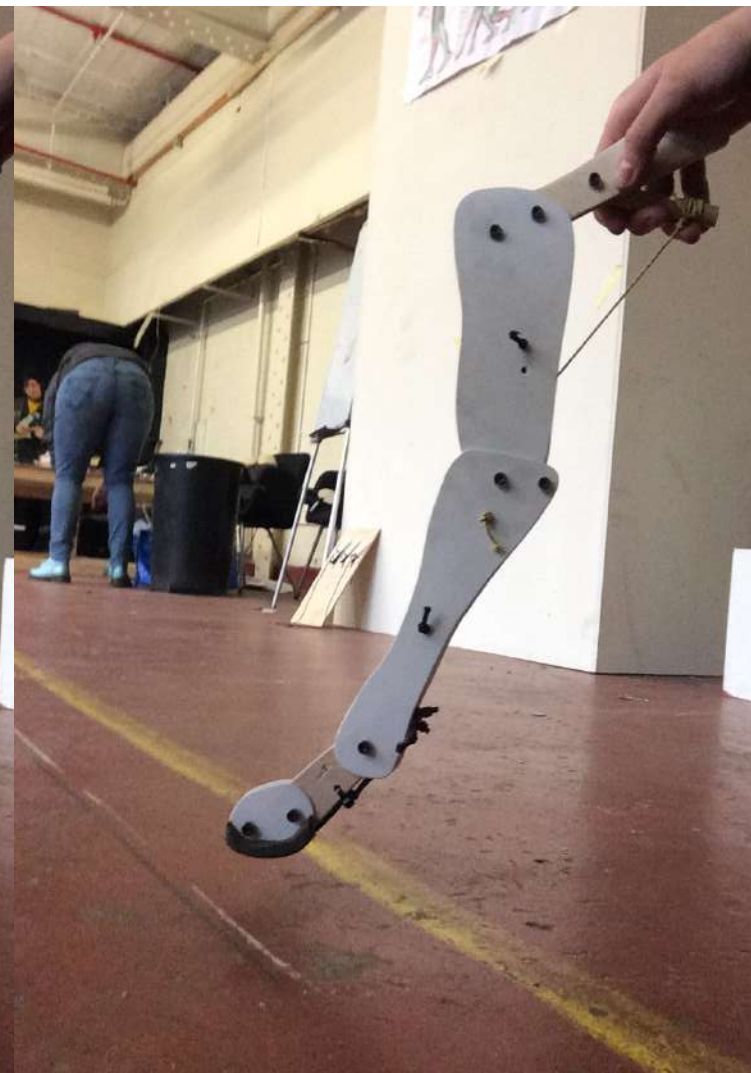


SILVER
SOLDERING
THE
RIVET
SPIKES
WITH
THE
TIG
WELDER



It took four days in the workshop to solder on all the rivet spikes, as hammering the spikes in to the holes was much harder on the frame, than on the tests I did originally.





BRUNSKILL AND GRIMES PUPPETRY WORKSHOP

I did a two day workshop with puppetry duo, Brunskill and Grimes, who worked on War Horse and Dr.Doolittle.

We each made a dogs leg, learning the skills needed to make expressive anatomical puppets with convincing joints.

These skills were really vital for giving the Manta Ray the extra mechanical spark that it needed. It was also fantastic as I met many puppeteers and prop makers.

SOLDERING ON THE GILL SPIKES



I decided not to pickle these, as I really liked the natural colours from the heat, similar to those on the main from the welding.



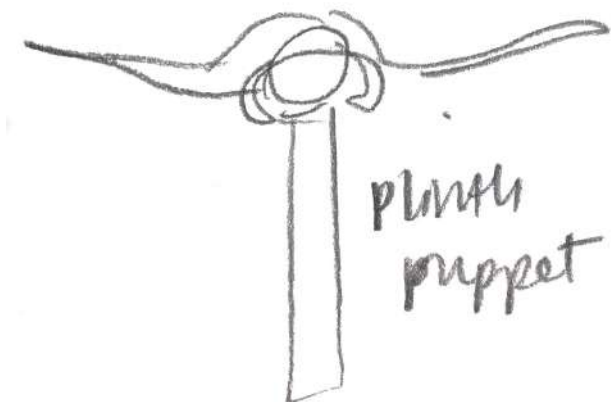
SEWING ON THE GILL RAKERS

I used binding wire to attach the laser cut pieces, as it was much more secure than thread.

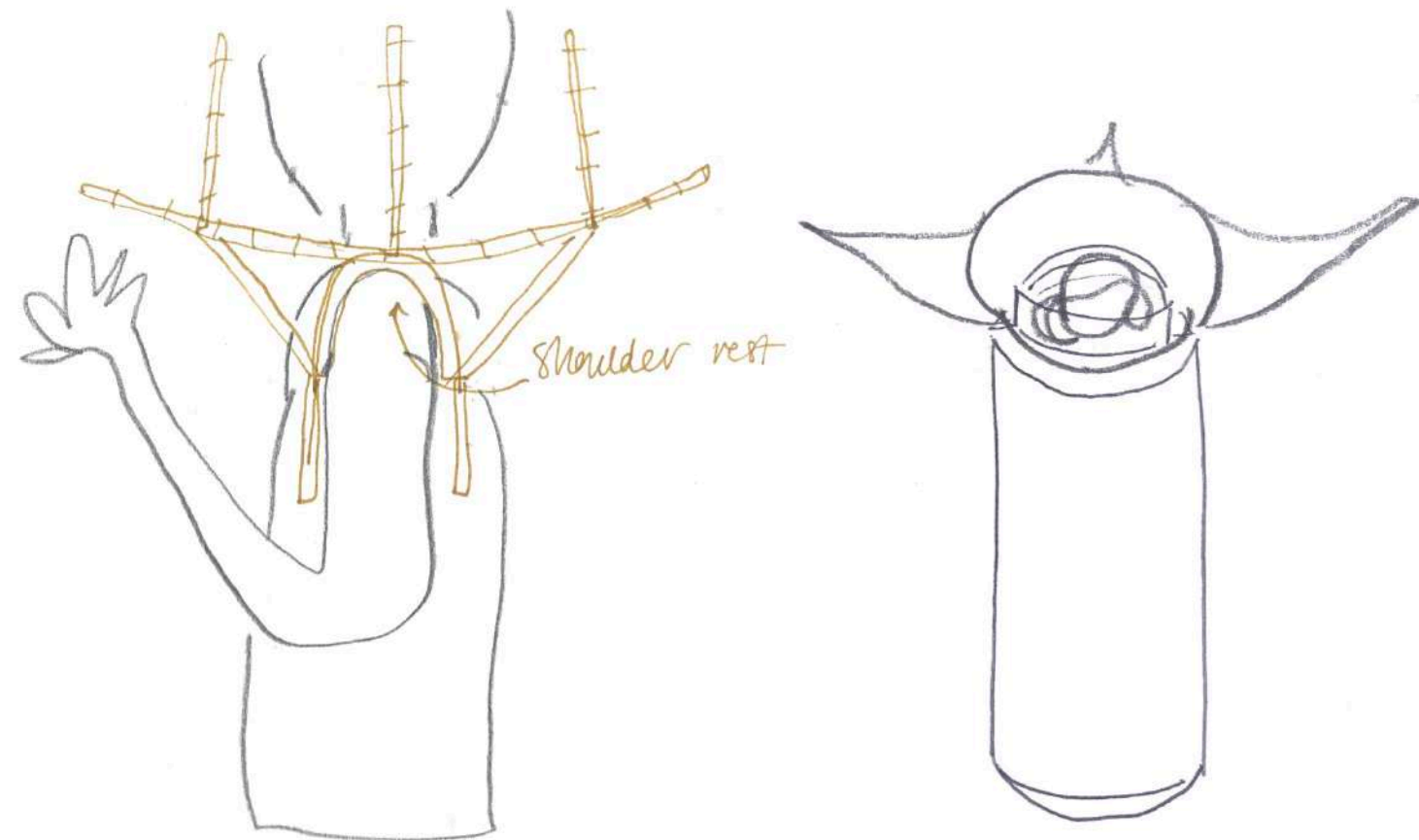
PHOTOGRAPHY
STUDIO
SESSION



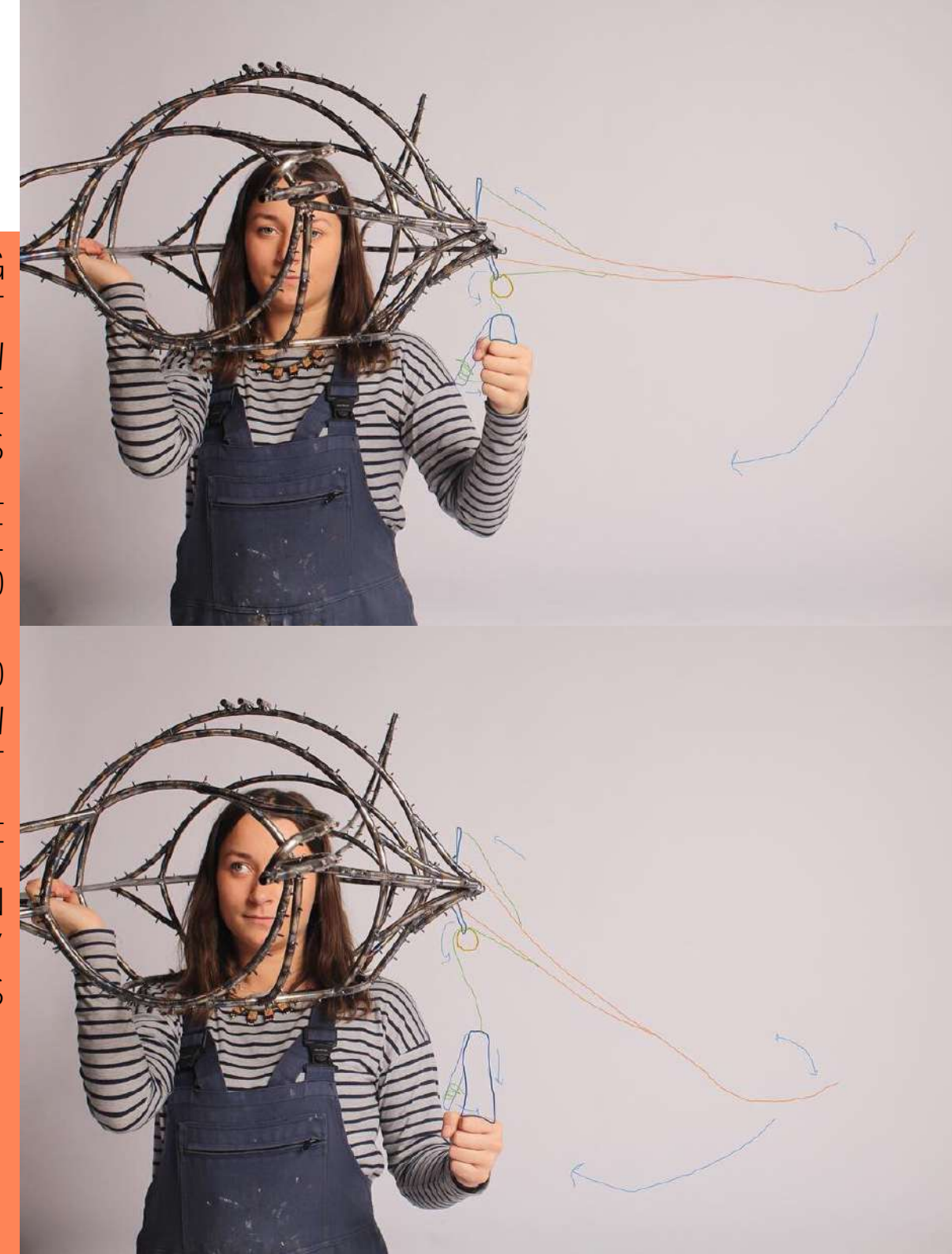
Taking photos of my work in a white room confirmed to me that I want my final images to be in context, on the beach, as otherwise the MantaRay would just appear as an object, with no reference to its meaning.



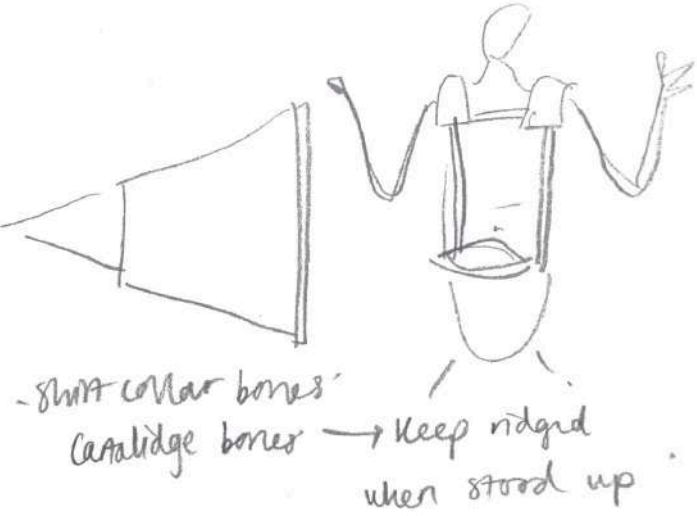
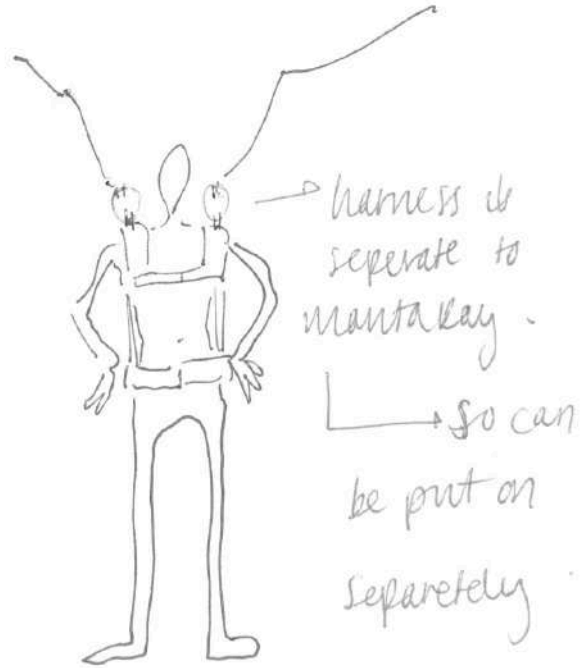
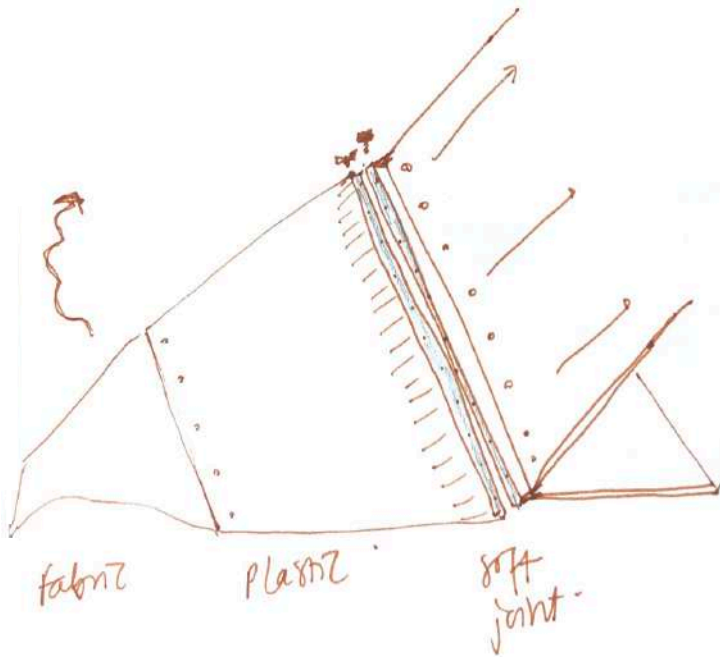
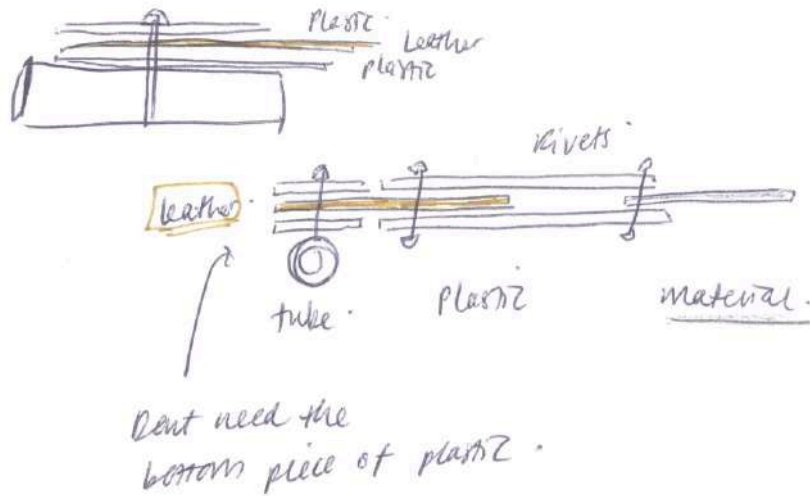
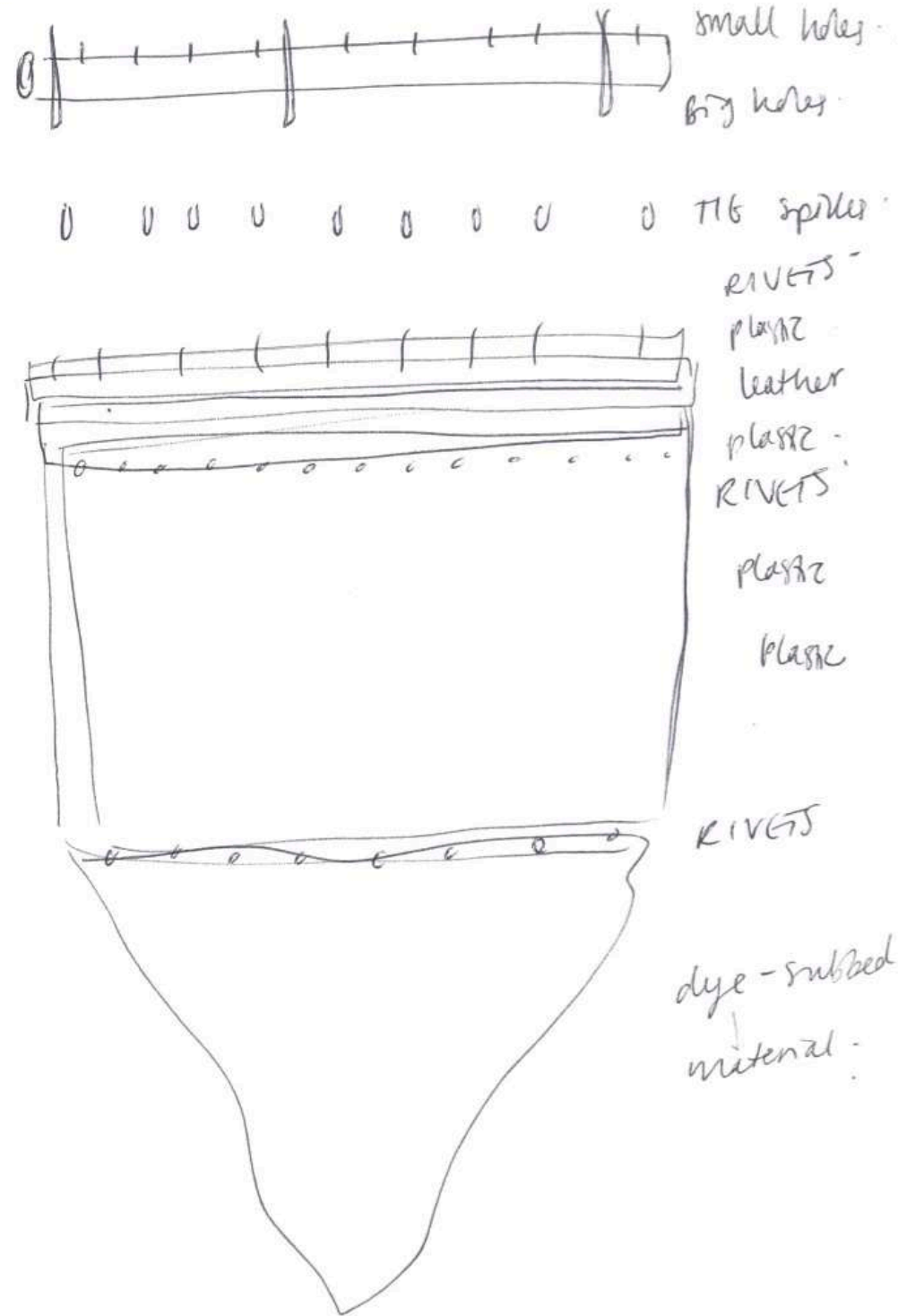
NO
LONGER
HANGING
THE
MANTARAY
ON
A
FRAME
-
NOW
A
FUNCTIONING
TRANSPORTABLE
PUPPET



WORKING
OUT
HOW
THE
WINGS
WILL
BE
PUPPATEERED
-
AND
HOW
IT
WILL
SIT
ON
MY
SHOULDERS



HOW WILL THE WINGS ATTATCH TO THE FRAME?



THE SHOULDER ATTATCHMENTS ON MANUEL SO HE CAN BE WORN ON THE BODY

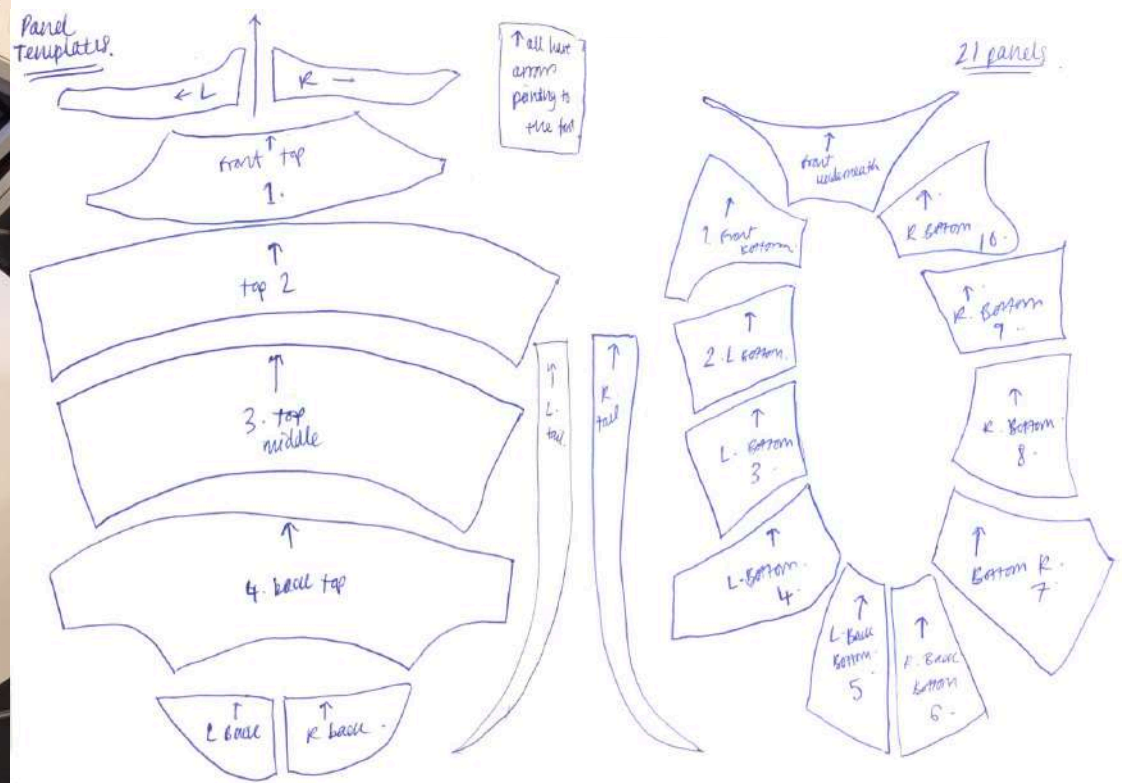


The shoulder rests are snug, meaning that the puppet doesn't wobble about or need any more harnessing to your body. This leaves your hand free for puppeteering the wings.



FINISHED STEEL FRAME

I'm was really happy with how the frame turned out, and would love to pursue more creatures using this steel tubing methods in the future. But for now, on to the panels!



To work out the shapes of the templates, I skewered the paper onto the rivet spikes, to ensure I had the right shapes whilst allowing the material to curve. When doing this with the plastic sheets, the heat gun will allow them to easily follow the curves of the steel.

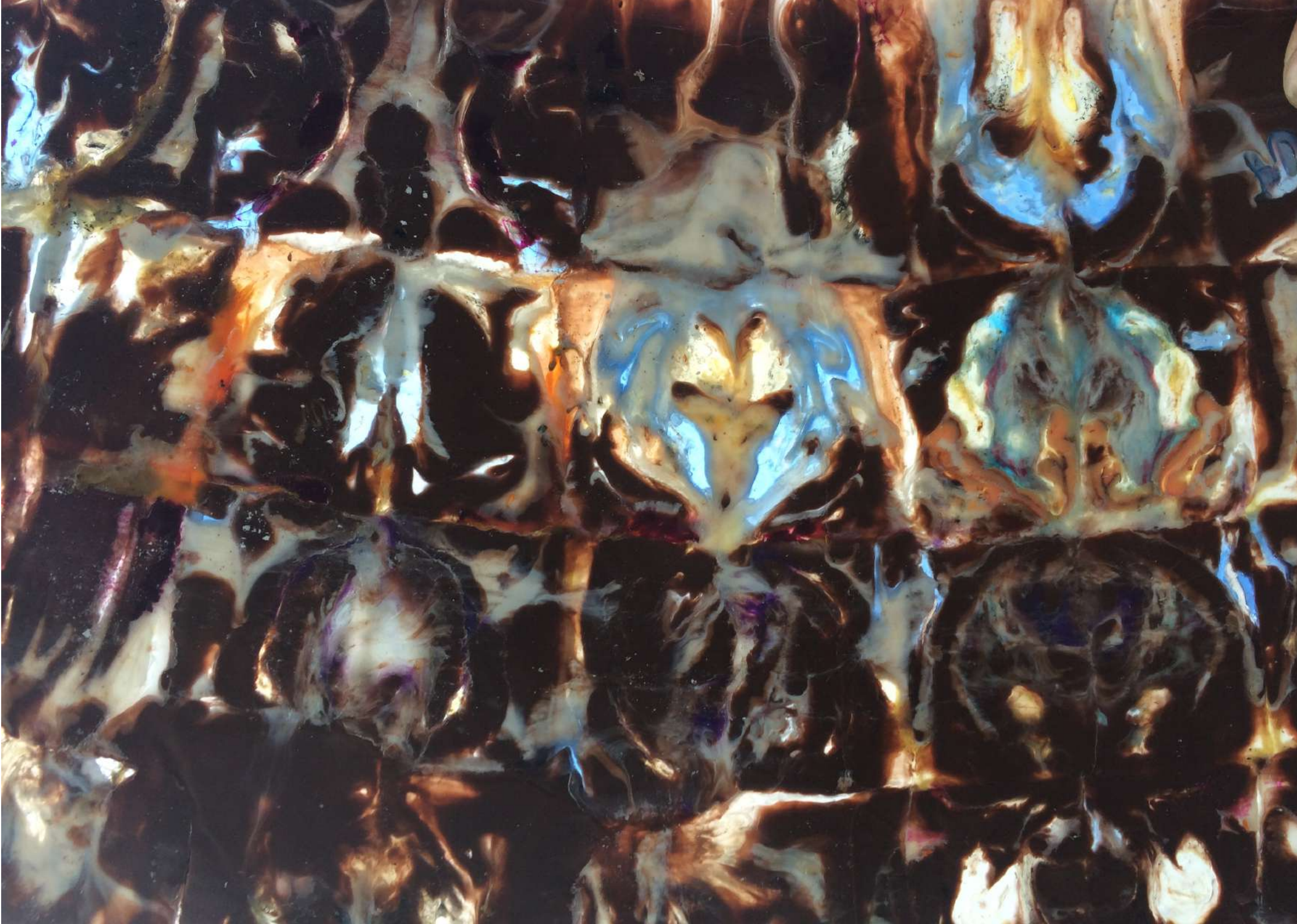
PAPER PANEL TEMPLATES

PIECEING TOGETHER THE PANELS



Using my sliced up blocks of melted plastic, I created symmetrical patterns for all the panels. I then broke these into sections big enough to fit in the heat press, then heat pressed those sections together to make the correct panel shapes.





LIGHT
THROUGH
HEAT
PRESSED
PANELS



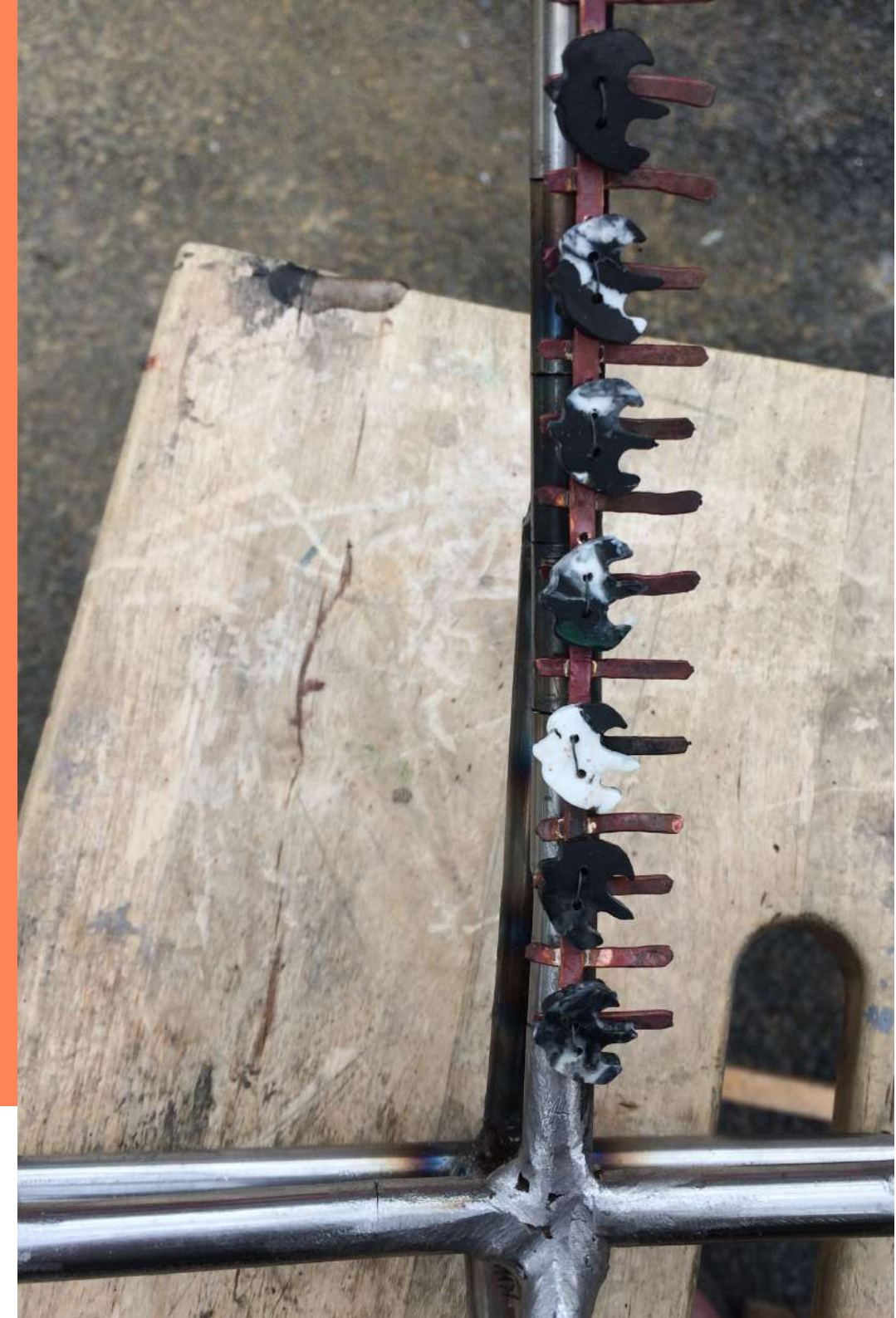
The translucent plastic I used in the melted blocks meant that light comes through the heat pressed sheet in natural filtered patterns, reminiscent of shapes that light makes on surfaces underwater.

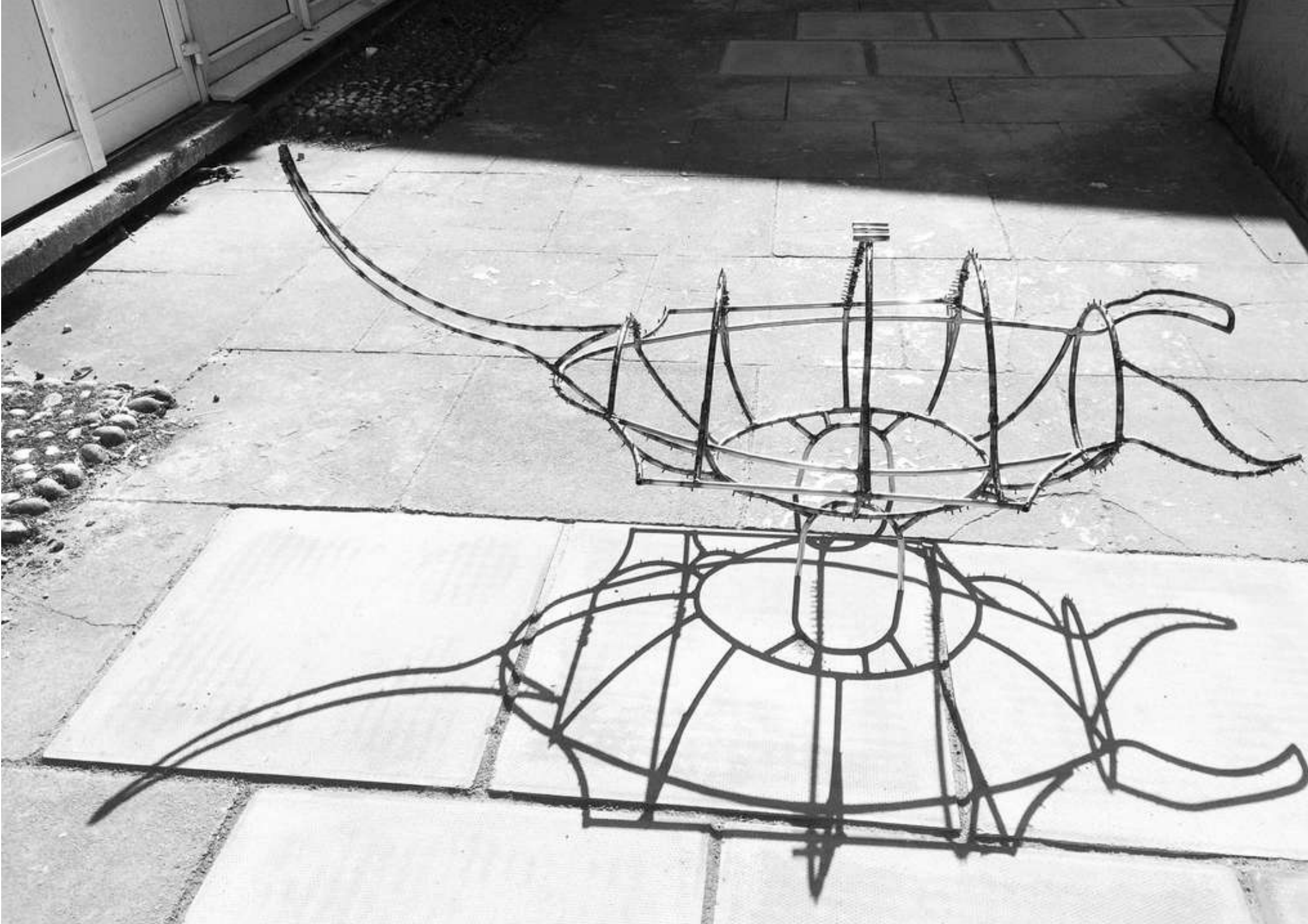


RIVETING THE GILLS TO THE STEEL FRAME



These rivets needed to be strong rather than neat, as they had to hold the gills in place. The actual rivets would be hidden by the plastic paneling.

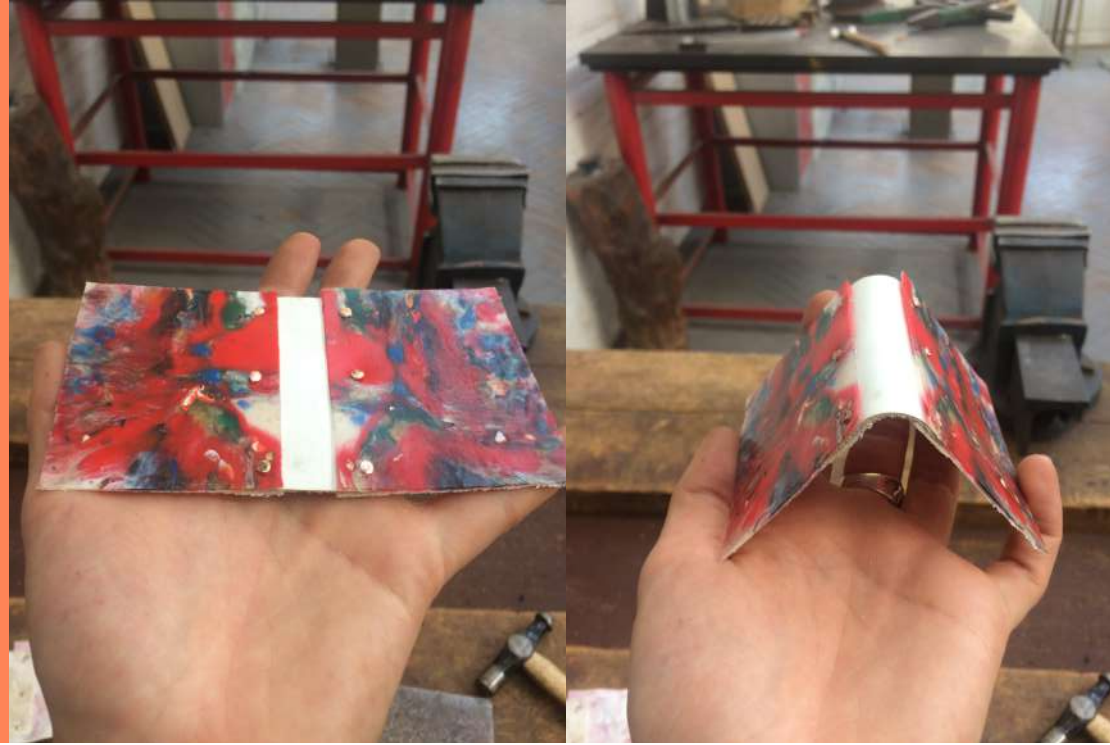




Both Mantaray species were classed as VULNERABLE in 2011. They have since gained protection under the Endangered Species Act, but they will take time to recover, as they are slow to reproduce, by which time it may be too late, is micro plastic pollution continues. ¹³

13- Yong, Ed. "Why Your Vacuum Clogs But A Manta Ray Doesn'T". *The Atlantic*, 2019, <https://www.theatlantic.com/science/archive/2018/09/how-manta-rays-gill-rakers-filter-water-without-clogging/571324/>. Accessed 5 May 2019.

LEATHER WING JOINT TESTS



I tested many ways of joining the plastic wing panels together, and to the leather hinges. The most successful test was heat pressing the two sheets together (that would be the top and bottom of the wing), and using a tefflon sheet to keep a space where I could slot in the leather after, and rivet it into place.

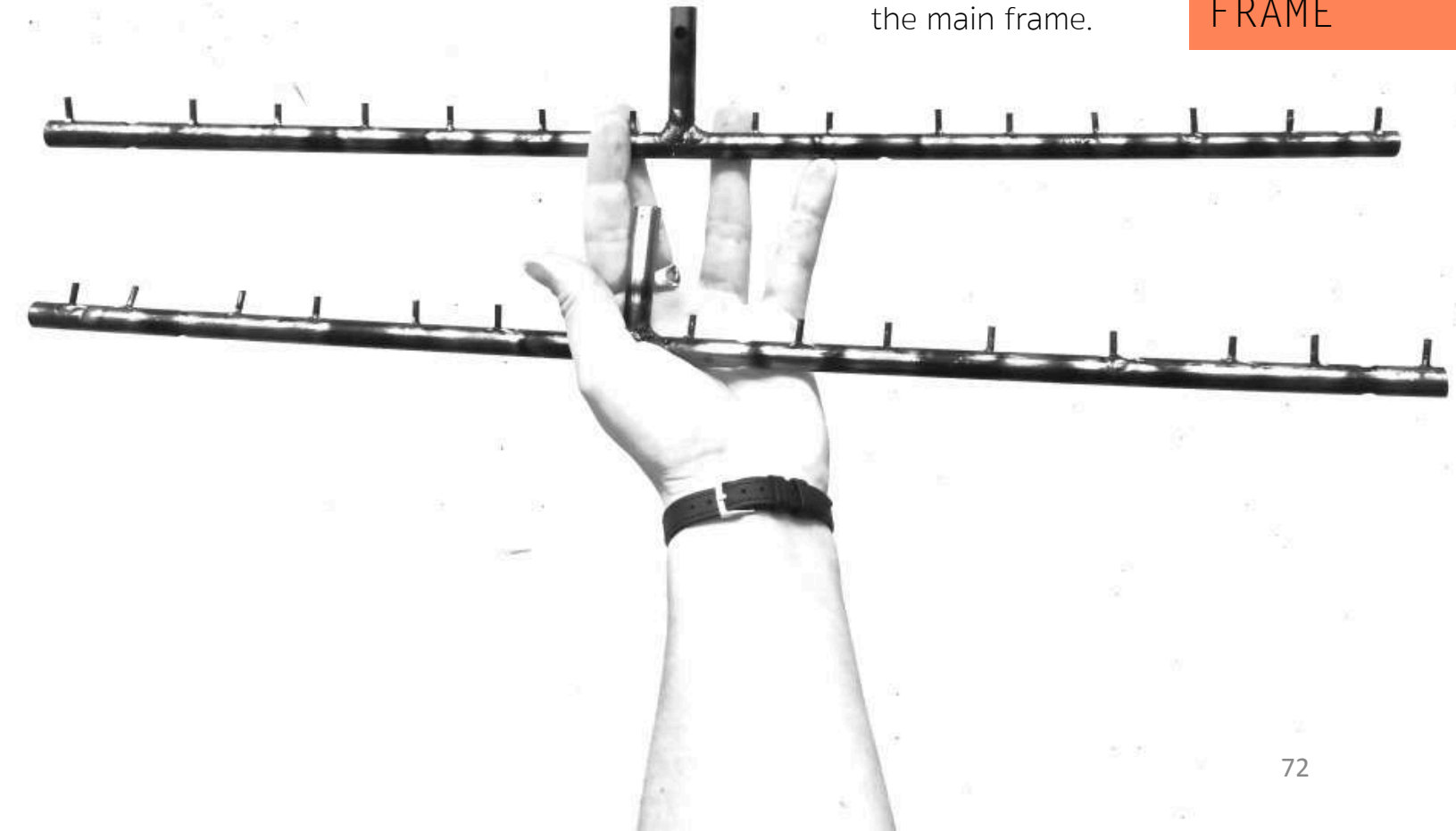
PADDING FOR SHOULDERS



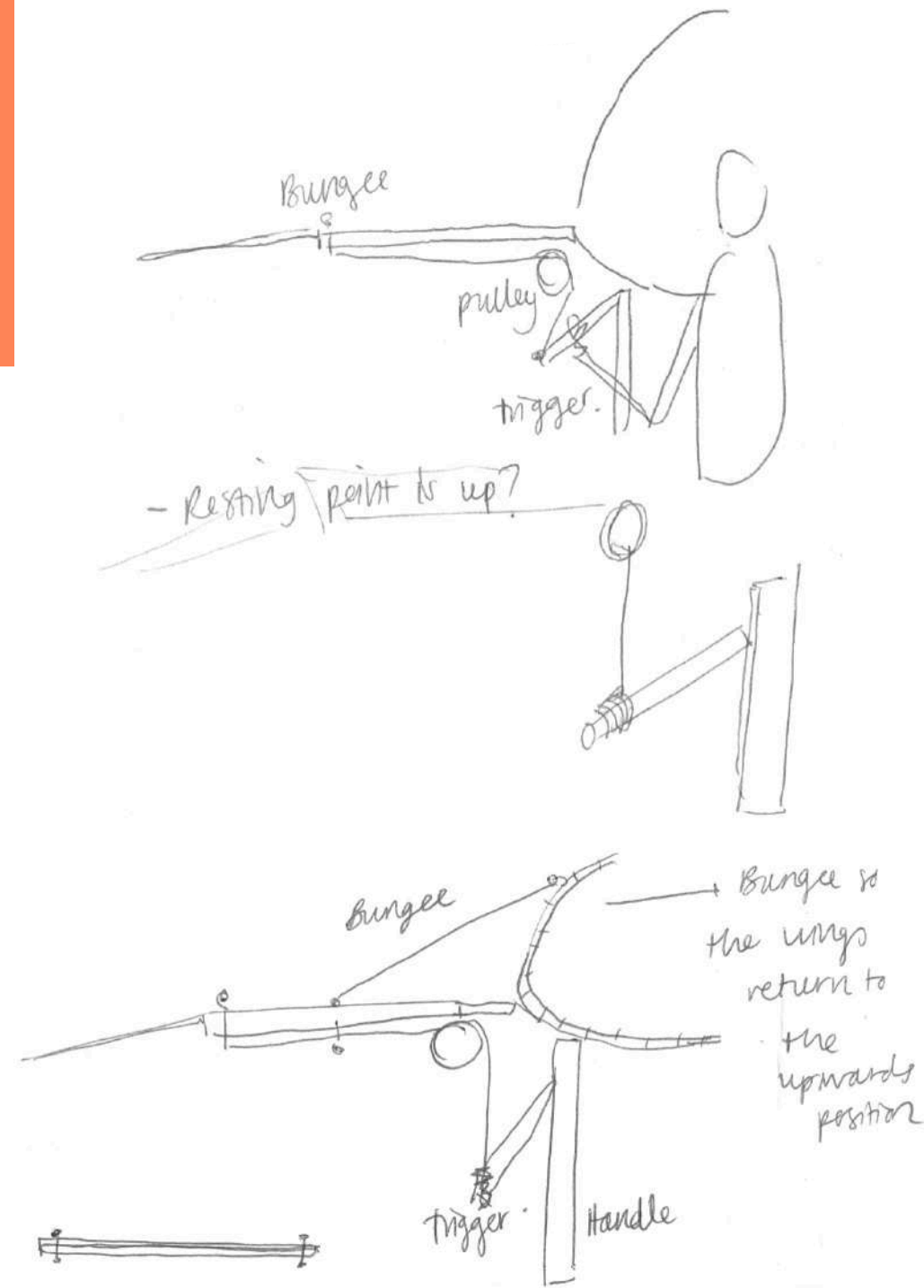
The padding was made out of a children's foam mat I found. I milled out a section which the steel slots in to, and then sewed it on with thin ribbon (as thread or wire would have ripped through the material).

ATTACHING THE WINGS TO THE FRAME

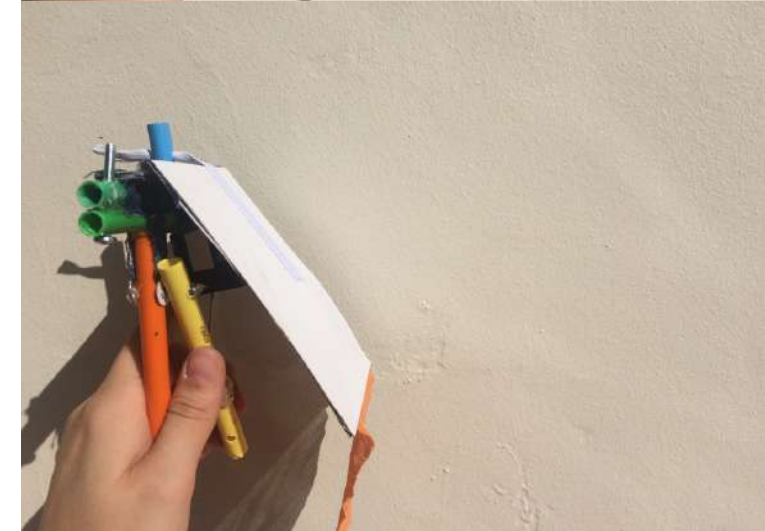
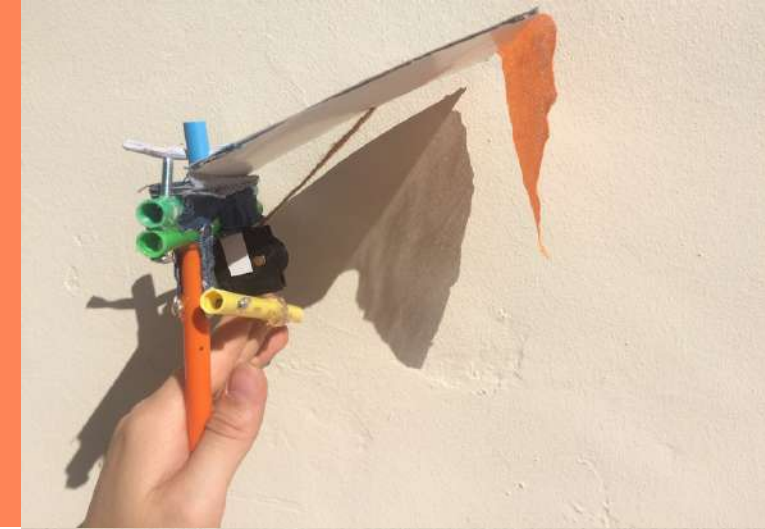
To attach the wings to the main frame, I made steel tube pieces with more rivet spikes, that would slot onto the straight sections of the main frame.



TRIGGER MECHANISM FOR THE WINGS



MODEL OF WING MECHANISM



The pulley wheel has to be directly under the bungee on top, in order to make the trigger movement smooth.
I made this model using crayon cartridges, as they're the same size as the steel tubing I'm using for the real thing.



RIVETING
ON
THE
PLASTIC
PANELS



As the panels all overlapped on the rows of rivet spikes, I had to wait until I had attached the neighboring one before riveting the spikes. I used a heat gun to persuade the plastic sheets into the right curves, and then skewered them onto the spikes using pliers, then riveted.



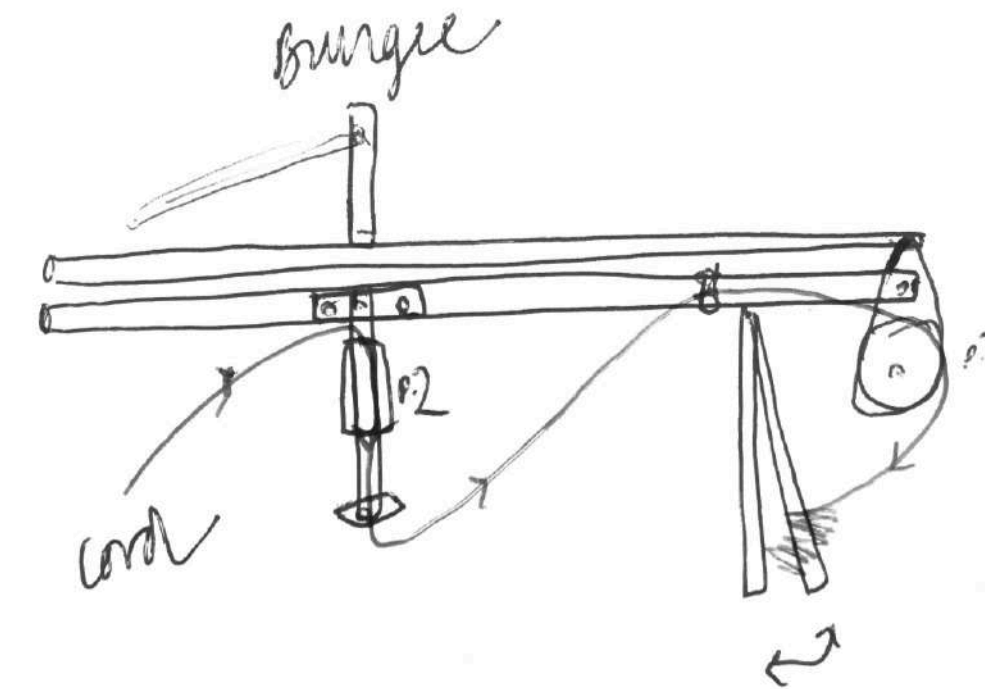


THE CONSTRUCTED WING

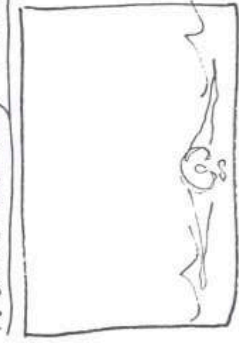
The wings had to be detachable, so that the MantaRay could be transported easily. The wings are the most complex part of the piece, with so many elements to consider. The main plastic section is brown on top and white underneath, in keeping with the main body. This is riveted to leather on one side, which is the joint, and the leather is riveted to a steel tube with bolted to the main frame. The plastic is also riveted to floaty material on the other side, which is dye-sublimated with the same pattern. This material achieves the natural flick of the wings that MantaRays have when they swim.

RIGGING UP THE WINGS

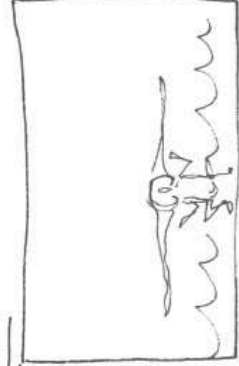
This proved to be much harder than in thought, as the placement of the handle/trigger in relation to the pulley was different to the model I made. This meant that I had to feed the chord up and around the trigger, in order to get the same pull movement. I also had to attach a steel tube arm above each wing to hold the elastic, as without it the wings did not bounce back up with the correct motion as the elastic was not anchored in the right place.



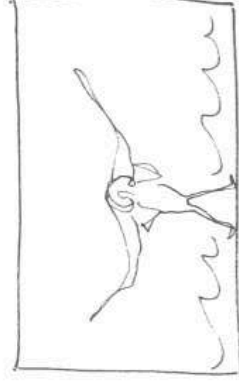
Mantaray film.



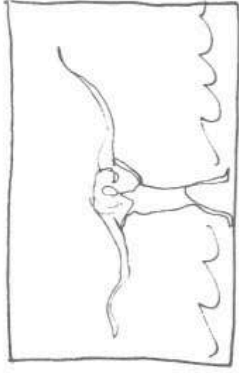
Just mantaray in water



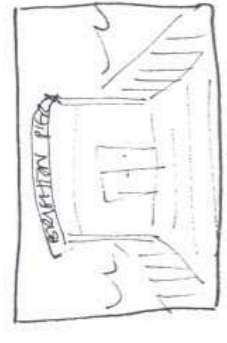
suddenly he jumps up



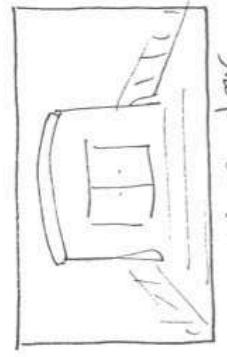
Starts flapping above water



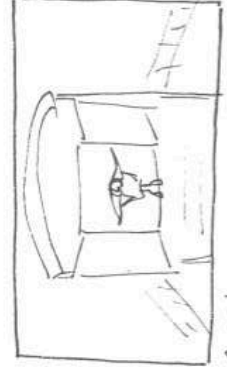
more flapping.



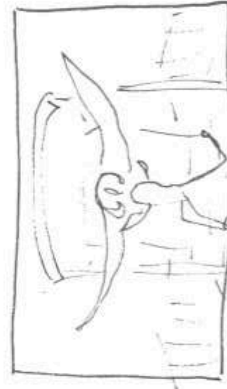
shot of pier



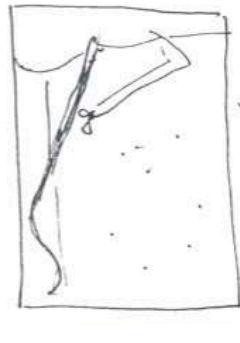
zooms in close



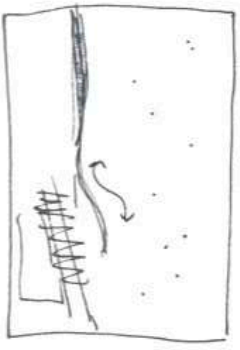
arms burst open an mantle appears!



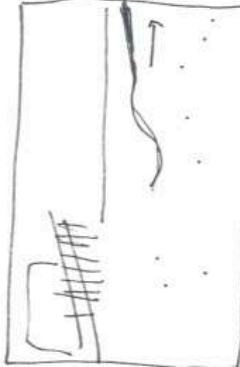
Runs / flaps towards camera.



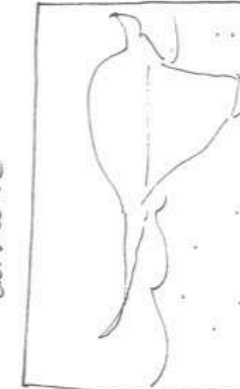
close up of under wings.



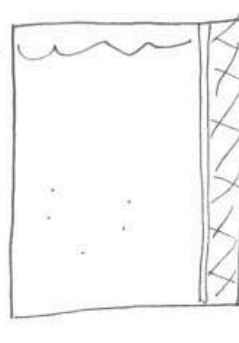
Camera pans to the pier (still on wing)



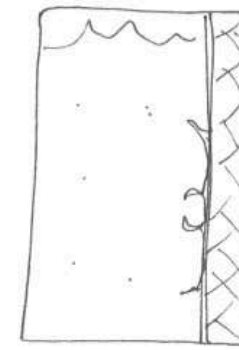
wing flaps out of the shot



Camera pans back to mantaray flapping away.



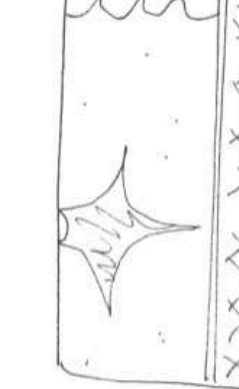
Beach from on the pier.



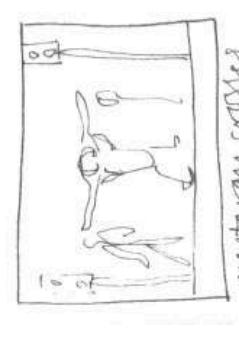
Mantaray appears



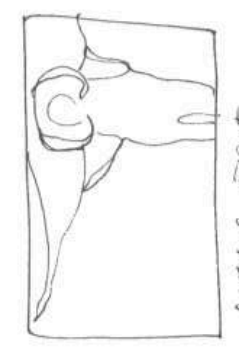
full view



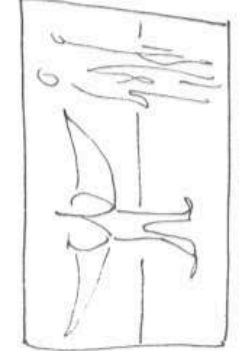
Runs out of shot.



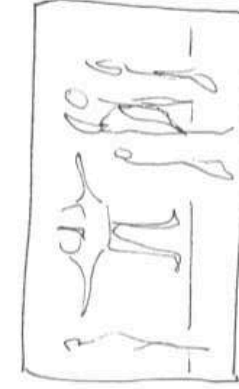
Mantaray crosses the road.



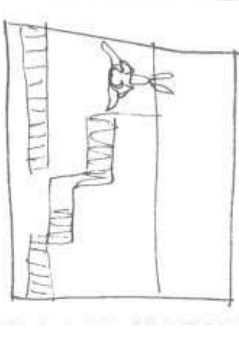
Crosses right past camera



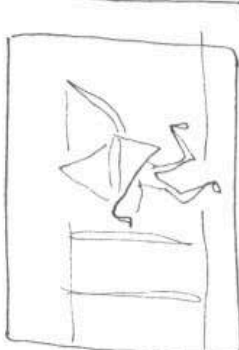
crosses, shot from behind.



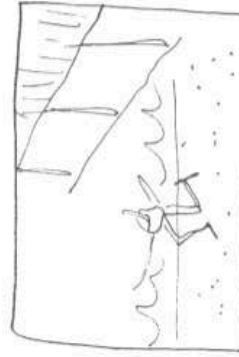
further away arms road.



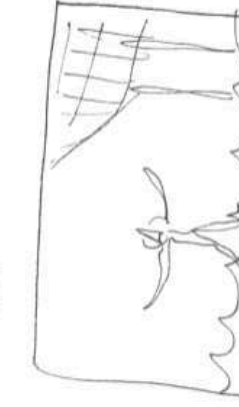
Mantaray wings down



Runs past pier



Runs towards sea.



lets to sea, pier in foreground.



FILMING
MANUEL
THE
MANTARAY
ON
BRIGHTON
BEACH



The MantaRay actually blended in with the stones, which I had not foreseen! This meant I could not get clear overhead shots of it on the beach. This means that when I have photos of him taken with a drone, It will have to be in the water or on the road.



Getting Manuel to and from the beach was the hardest part. As I could only see out the front, I had no idea where people were around me/ how close I was to hitting lampposts! My team of four 'crew' had to spot each wing, the tail, and one had to guide me! I got many looks, most really positive, some confused, and some people even thought I would move out of their way even in a small lane! However, I had a fantastic time and it was great to see the positive response people had to him.

ON
BOARD
VIEW
FROM
MANUEL



MANUEL
CROSS
ROAD



MANUEL
RUNS
AT
CAMERA



MANUEL
RUNS
ARUOND
BEACH



MANUEL
FROM
UNDER-
NEATH

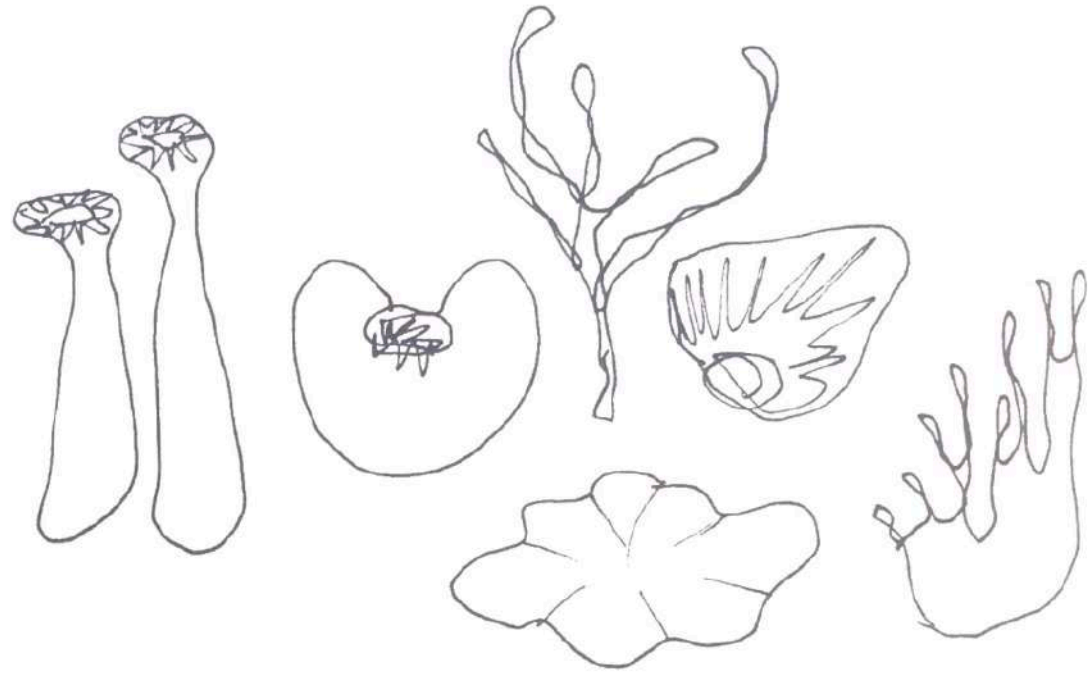




MANUEL GOES FOR A DIP

I wanted shots of the mantaray leaping out of the water, like the do in real life. I didn't want to actually put him under water as it would make him rust faster, so I just squatted down in the water, and jumped out!





Chapter Four

Christof The Coral



FIG - 32

CORAL BLEACHING

Coral Bleaching does not kill coral. They can recover, however with rising sea temperatures recovery time is reducing as it occurs more often. As well as increased sea temperature, it is triggered by stress, forcing them to expel the algae living inside them, which they feed off.

How a coral becomes bleached



Source: NOAA

Credit: Sarah Frostenson

FIG - 33

Vox

MICROPLASTICS AFFECT ON CORAL

Microplastics can easily become lodged in the pores of coral. However during coral bleaching, the corals expel the algae living in them,. This 'expelling' of algae also flushes out the microplastics, however once bleached, the coral needs time to recover. As their defenses are down, they have no way of preventing microplastics from becoming trapped in their pores again, and this time there is no recovery, with the chemicals from the microplastics damaging their chemical make-up.

I decided to research coral, due to it's really tactile nature. It as also very different from the mantaray, so I was interested to research into the similar issues they may face from micro-plastic pollution.



FIG - 34

DAVID
ATTENBOROUGH
-
OUR
PLANET
DOCUMENTARIES
ON
NETFLIX
-
EPISODE
FOUR

- Small fish in turn sustain bigger ones.
- The rich costal seas are the feeding ground of our planet, and can provide abundant food for wildlife and humanity.
- Coral reefs cover 1% of the sea floor, yet are home to ¼ of all marine species.
- Coral provides food and shelter, on which the entire community depends.
- Healthy coral reefs are facing huge threats. Climate change means our seas are warming, causing coral bleaching. If the temperatures reamin 1 degree higher than usual for a few weeks, the coral will starve and die.
- Without living corals, many of the reef's residents will also perish.
- Worldwide, ½ of the shallow coral reefs have ALREADY DIED.”¹⁴

14, 15 "Our Planet | Netflix Official Site". *Netflix.Com*, 2019, https://www.netflix.com/watch/80094032?trackId=14170289&tctx=0%2C3%2C1e2956ae-b601-4531-9b70-ff09ea1997d2-394144384%2Cbab8b8b7-5603-438f-b2da-ae2100e15a61_13727821X3XX1557095053504%2Cbab8b8b7-5603-438f-b2da-ae2100e15a61_ROOT. Accessed 20 Apr 2019.

“Right now we are in the midst of the Earth’s sixth mass extinction.”¹⁵



FIG - 35

PHOTOGRAPHER
PETER
MUMBY

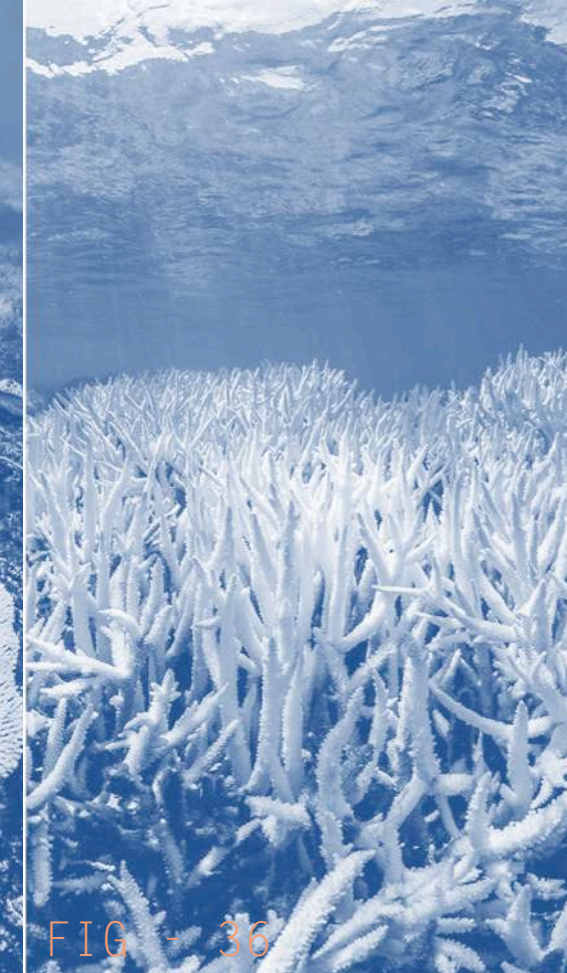


FIG - 36

Captures the continuing effects of coral bleaching on the Great Barrier Reef.



CORAL BLEACHING PLASTIC SHEET TESTS

By using progressively more white plastic in the melted blocks, the sheets appear to become more bleached as the coral models go along.



CORAL GLOVES IN A FISH TANK

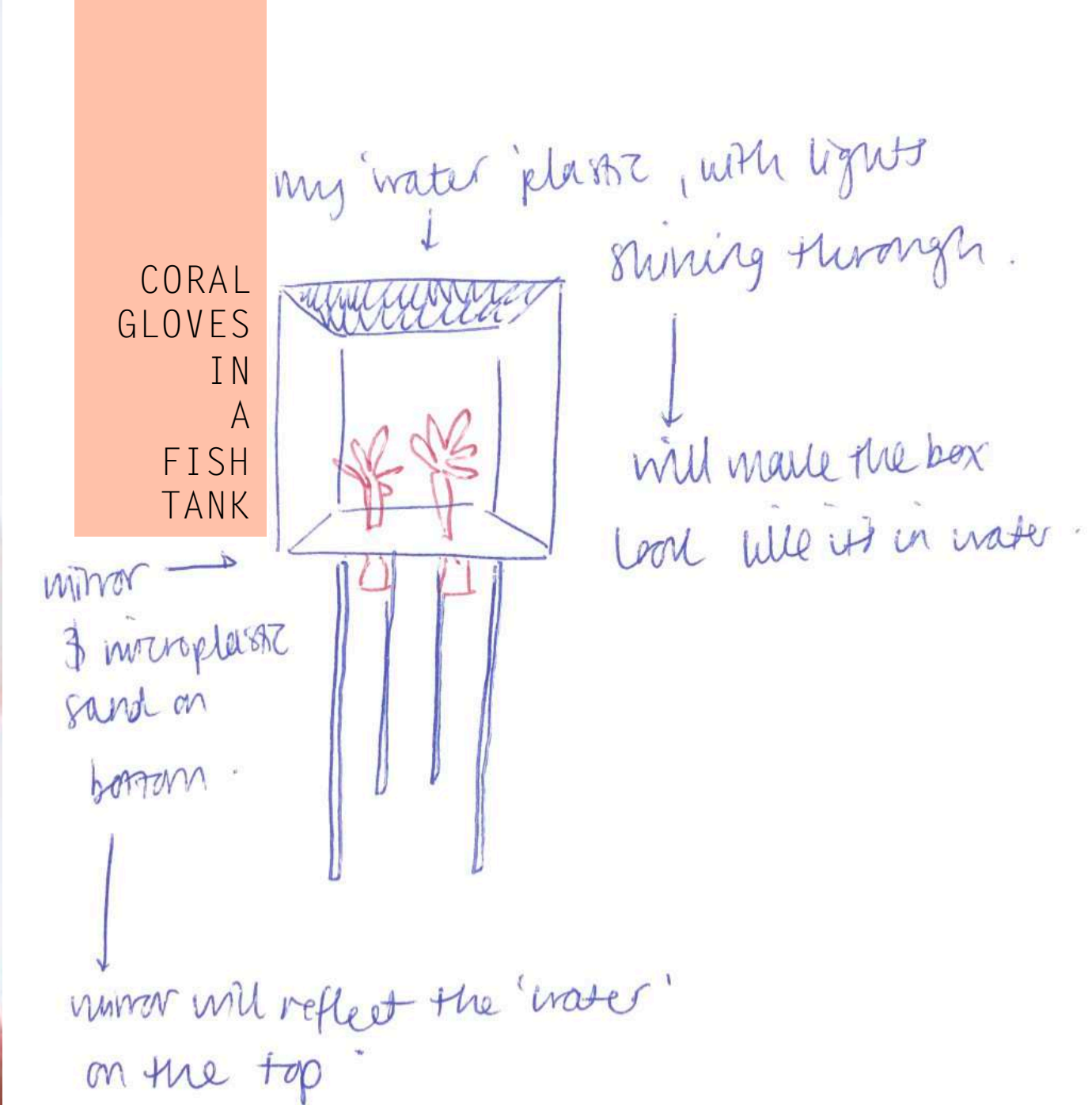




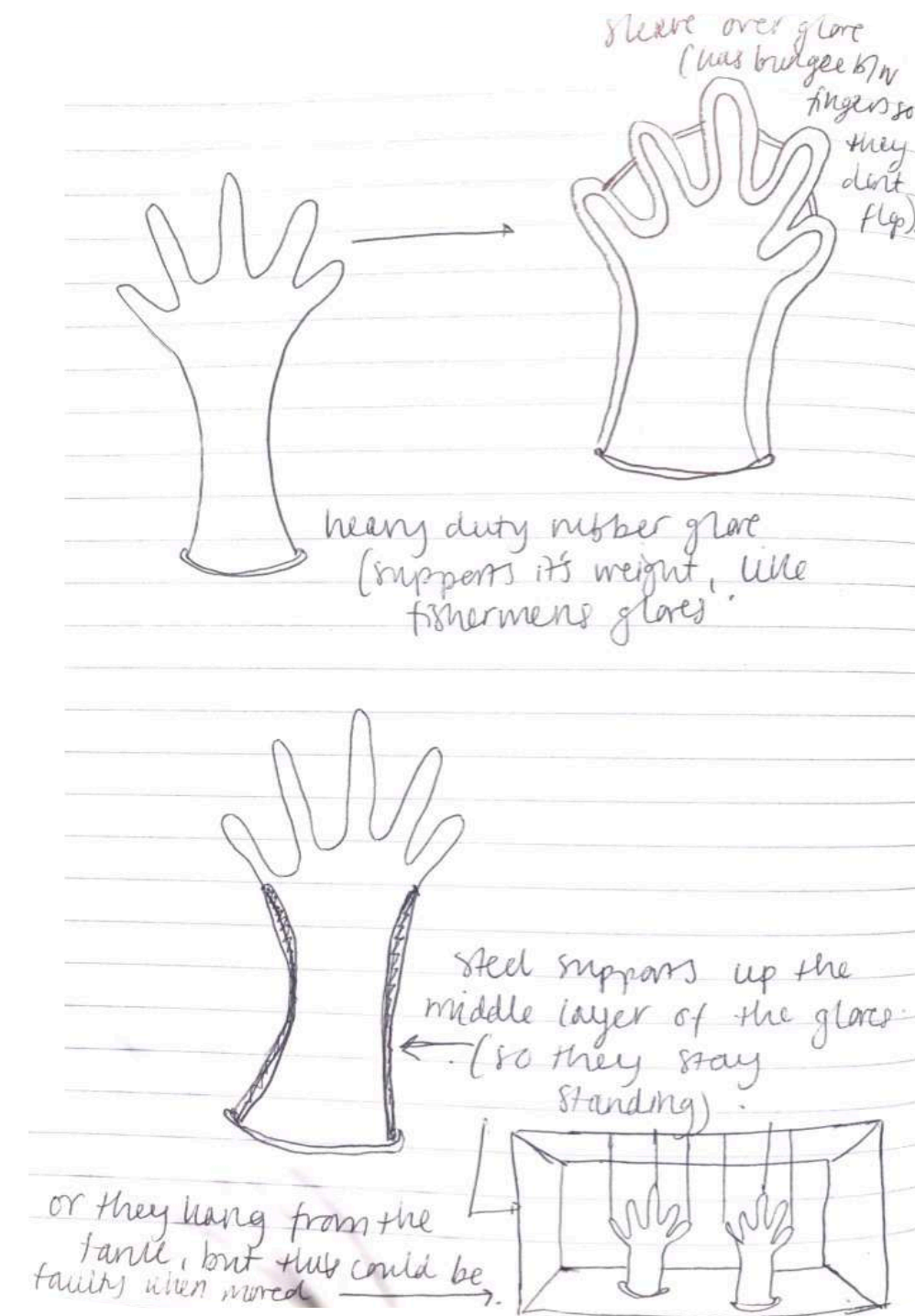
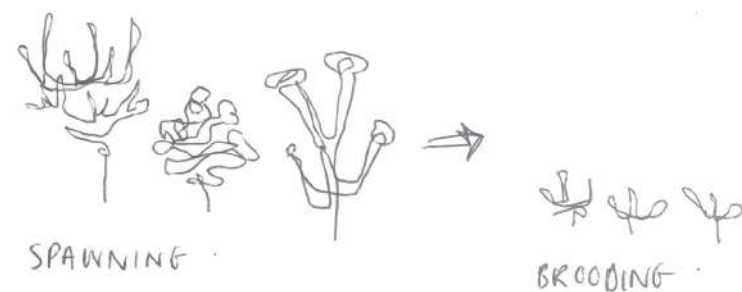
FIG - 37



FIG - 38

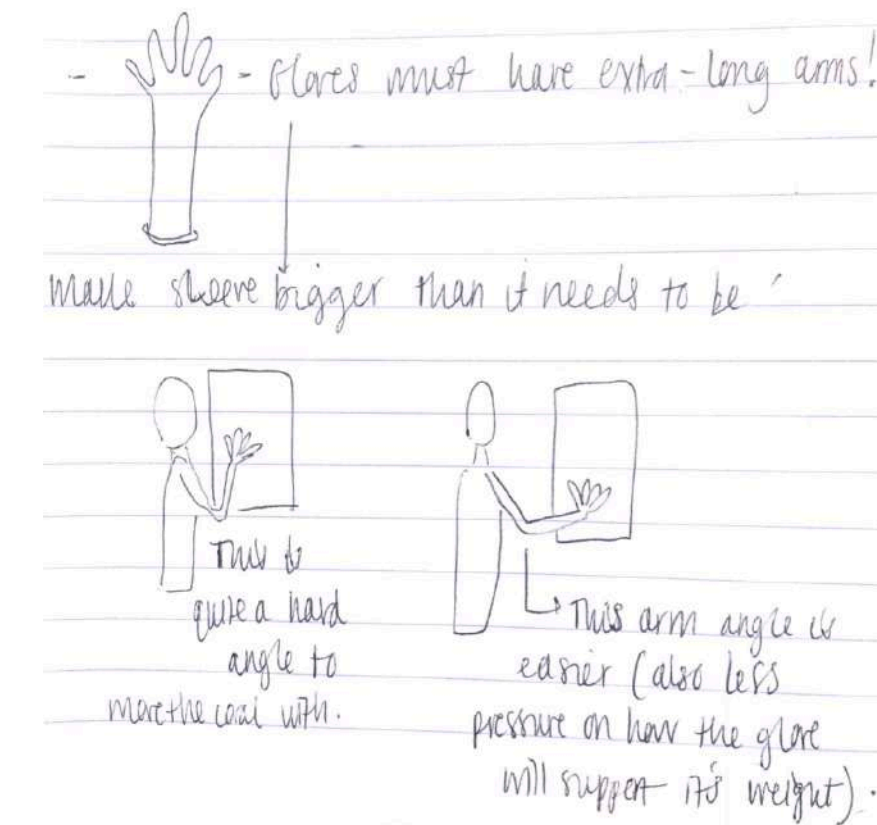
VARIETY OF SHAPES

I planned to achieve these shapes by manipulating my sheet material with a heat gun, and using various tools to bend them into the right shapes.



CORAL SLEEVE TO GO OVER HEAVY DUTY GLOVES

My coral glove was originally intended to be displayed in a tank of water, where you could put your hand inside and move the coral, with varying degrees of stiffness depending on their amount of bleaching.



COURTNEY MATTISON

After completing a masters at Browns University for Environmental Studies, with coursework at Rhode Island School of Design, Courtney has found that to inspire coral reef stewardship and policy change, a creative outreach is most successful in reaching the widest audience.

By bringing both the beauty and the threats to coral reefs above the surface, Courtney hopes that people take notice.

“I want to help people to appreciate the beauty and fragility of coral, and feel a connection to this ecosystem, which to so many of us is out of sight, out of mind.

Corals are so sensitive that the slightest change to the temperature or chemistry of the seawater that surrounds them can cause total devastation through coral bleaching, death and reef erosion. Without our help to eliminate greenhouse gas emissions, pollution and over-fishing, scientists agree that reefs may cease to function as ecological cradles for marine life by the end of this century. Are coral reefs doomed to fade into oblivion or will we allow them to recover and regain their vibrancy?”¹⁶

¹⁶ -Mattison, Courtney. "Our Changing Seas III — Courtney Mattison". *Courtney Mattison*, 2019, <http://courtneymattison.com/ourchangingseas-iii/hpxqmb2oxvlxq4yau2znehv00624s>. Accessed 15 Apr 2019.

FIG - 39

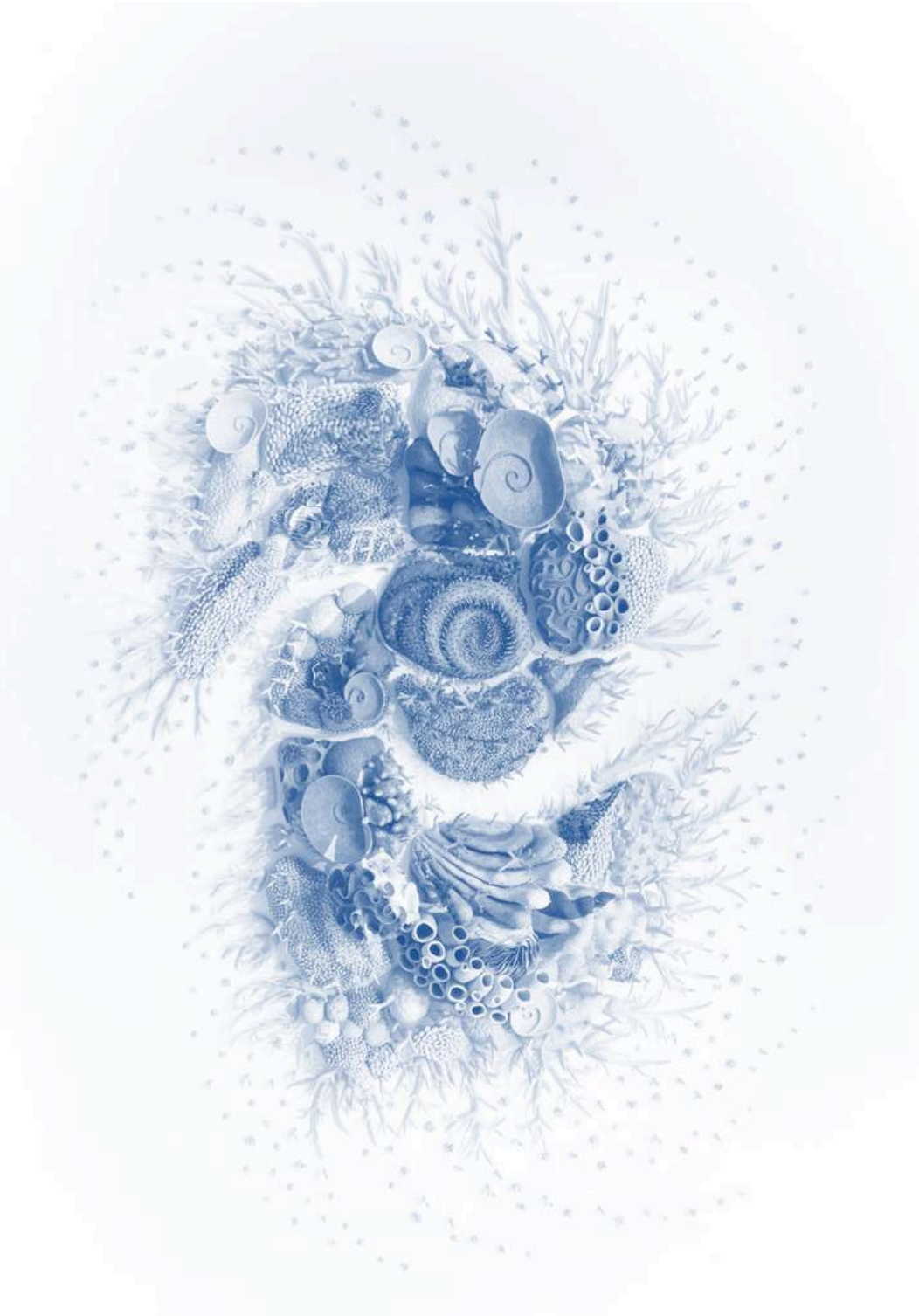


FIG - 40



FIG - 41





PAPER
MODELS
OF
CORAL
PIECES

The shapes are
repeated in clusters,
in varying sizes





TEXTURING THE SURFACE OF THE CORAL



Most coral has large sections underneath, that fan out and support the new growths on top. These sections are quite simple shapes, so to make them look more intricate, I've used a stencil heat skewer to melt lines/holes into the surface. These also make the plastic sheets look much more natural, and the way the skewer blends the plastic when I draw lines, makes the plastic look like it's rippling under water.



HEAVY
DUTY
CRABBING
GLOVE
AS
BASE

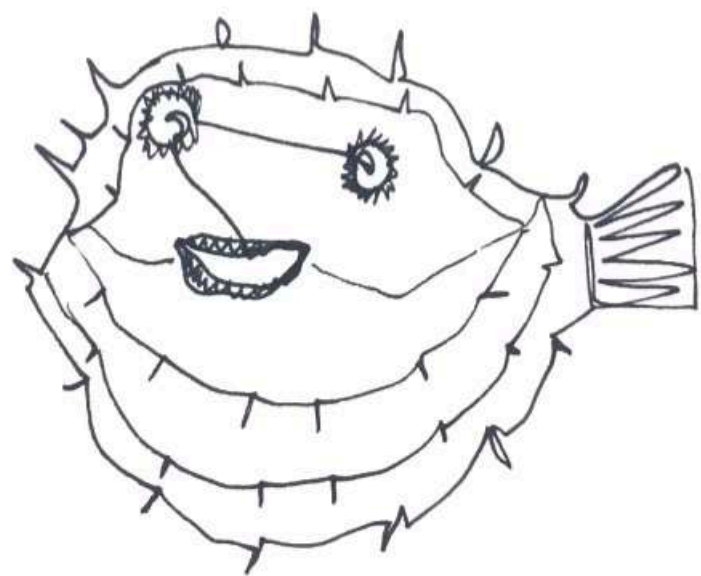
As the glove will no longer actually be in a tank filled with water, it doesn't have to be water-tight. Therefore I can sew the coral pieces straight onto the glove, without worrying about water leaking through the needle holes.

The gloves I'm using are heavy duty crabbing gloves, which have a red dip coated layer. I turned them inside out, to see how they're made on the inside, and the inside material actually looks like quite a natural coral colour, so I plan to use them this way!

With the rubber now on the inside, the gloves feel slightly slimey when you put your hands in, which adds to the whole idea that you're putting your hand actually inside coral, underwater.



COMING SOON...



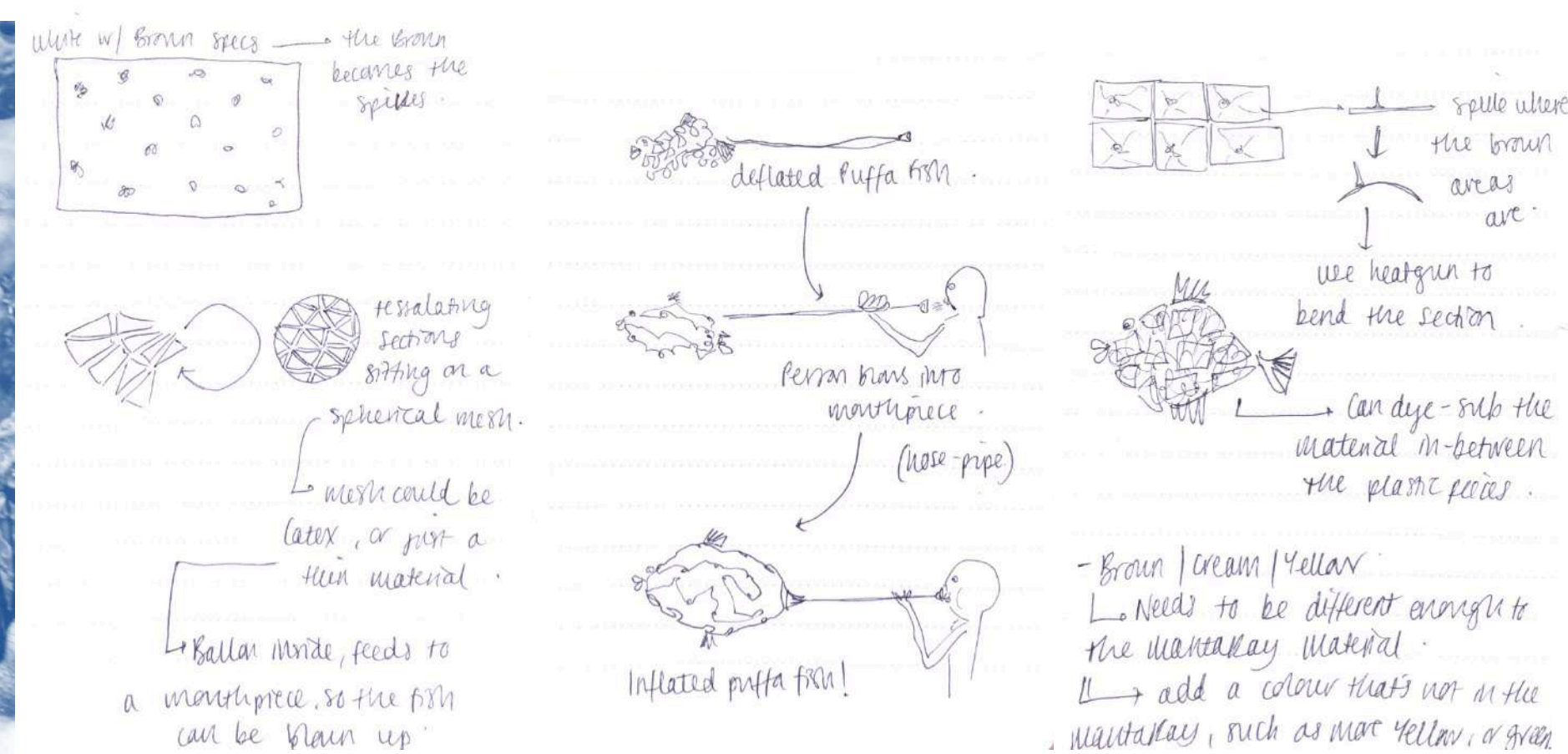
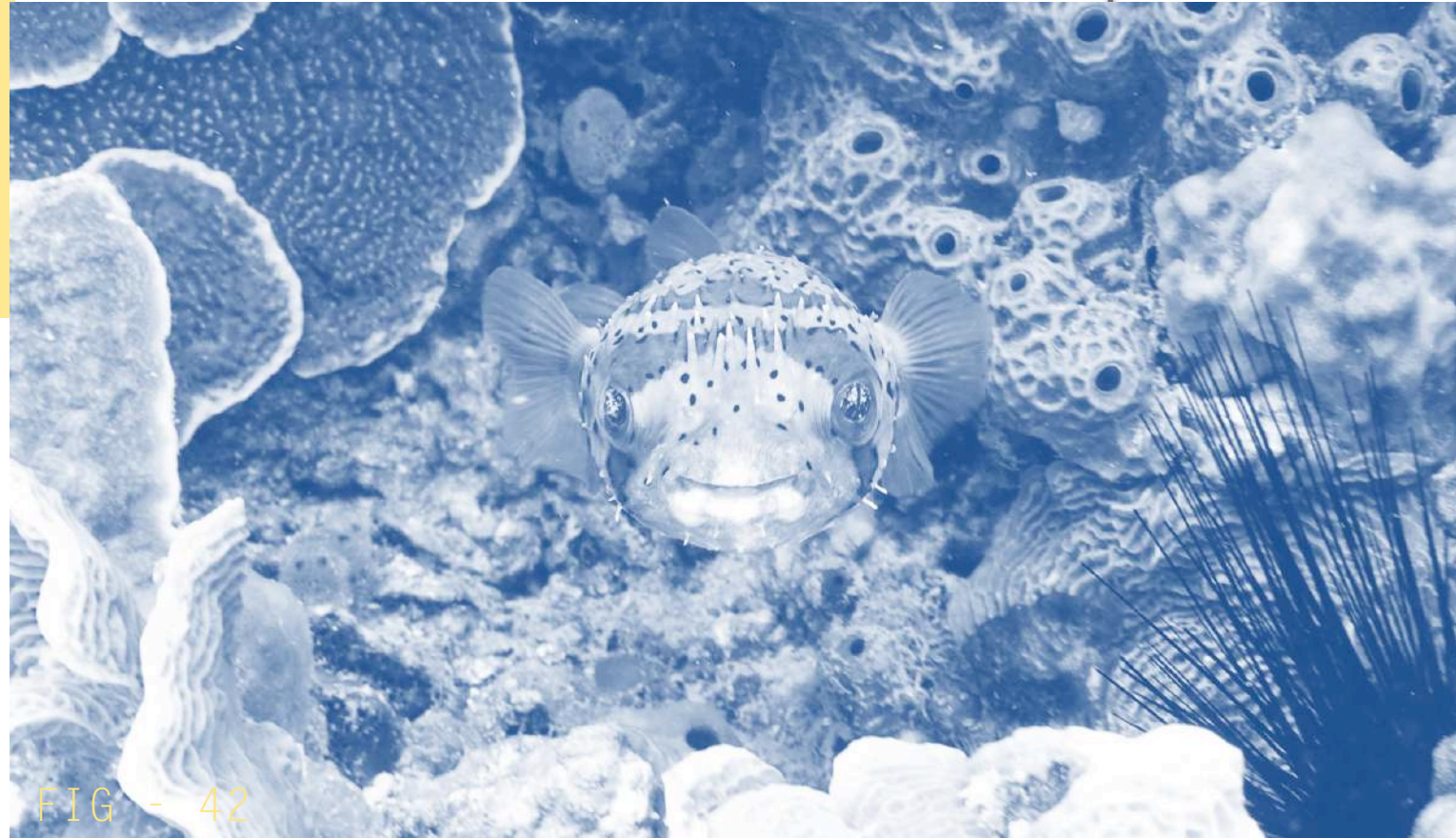
C h a p t e r F i v e

P e r k i n s T h e P u f f e r F i s h

THE EFFECTS OF MICROPLASTICS ON PUFFERFISH

Puffer fish live close to coral reefs, and feed off the algae. When micro plastics become lodged in coral, they chemically effect the algae living inside, and also cause coral bleaching. During coral beaching, the algae is expelled from the coral into the surrounding water, which is then eaten by other species, including the puffer fish. This means the puffer fish suffer chemical harm, due to their consumption of contaminated algae.

As well as eating the algae, the puffer fish also accidentally directly ingest contaminated algae and micro plastics. When puffer fish inflate, they ingest huge amounts of water very quickly into their stomach. This means that during coral bleaching, the water is filled with chemically imbalanced algae and micro plastics, which the puffer fish will ingest in order to expand. These then remain in their stomach, chemically affecting them in turn, giving them loss of energy, which directly effects reproduction, and their ability to 'inflate'.



I was excited to create a puffer fish, due to it's humorous inflating. It was a mechanism I wanted to try and create with my plastic paneling. I was also interested to discover how it was affected by the micropalstic pollution, as it shares a habitat with mantarays and coral.

Hello to you Sir,
I'm Perkins the PufferFish.
It's quite alright
To make friends with another fish.

For although I look friendly,
I've many a spike,
That pop out all over,
Whenever I like.

So go on, swim off,
Straight back to the land.
And take back that plastic,
That floats near the sand.

For although you don't know it,
We blame unto you;
The death of the fish
A few million or two.

Who chocked in the the plastic
They passed in the sea,
That lingered before them,
Like you are to me.

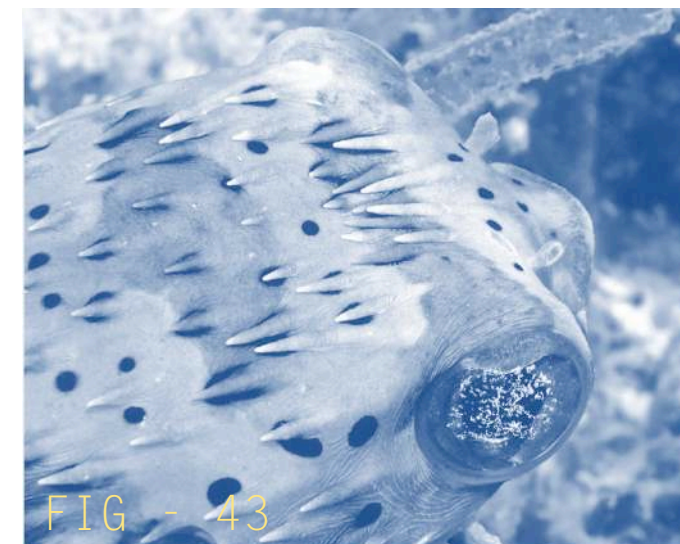
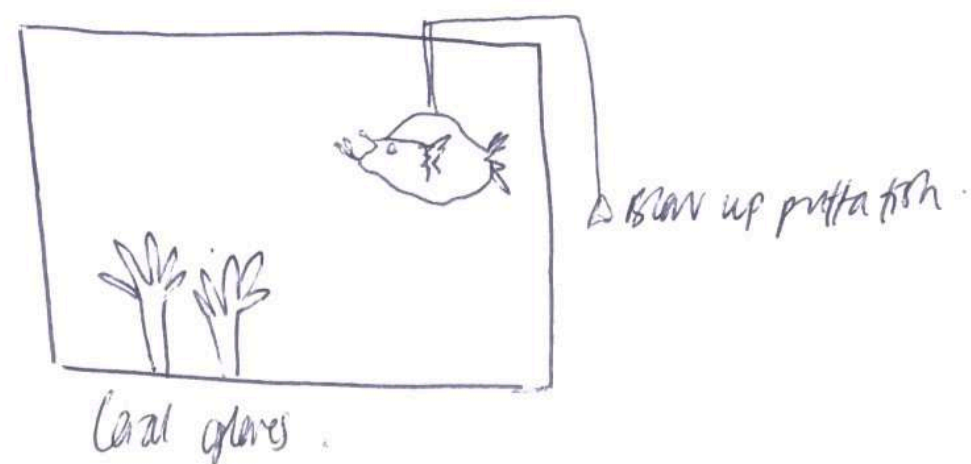
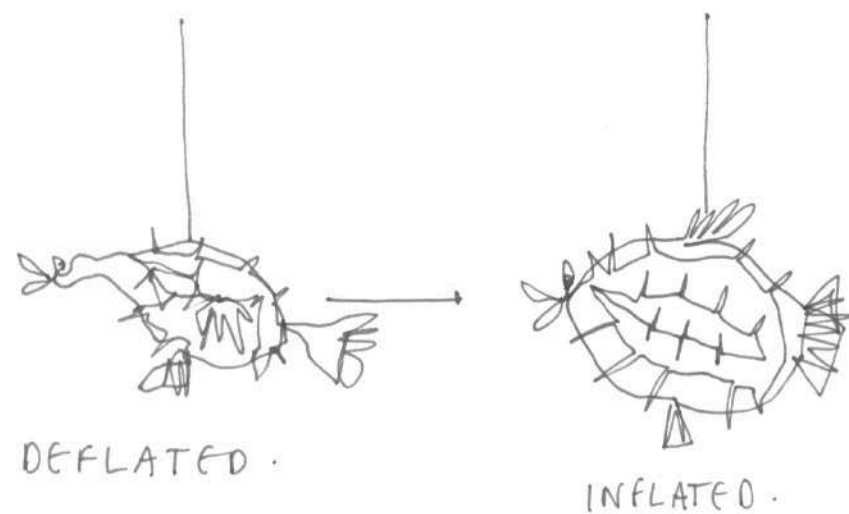


FIG - 43



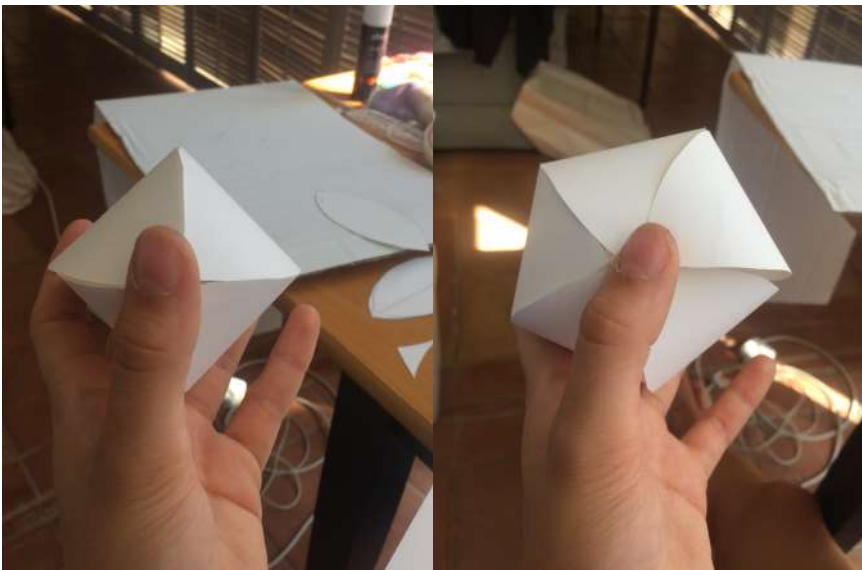
FIG - 44



FIG - 45

NATIONAL
GEORGAPHIC
PHOTOGRAPHER
JOEL
SARTORE

A reduction in coral
diversity from bleaching,
will also result in a loss of
habitat and food sources
for many species, including
the Puffer Fish.



INFLATABLE PUFFER FISH MODELS

Five sections make an oval shape, which worked well for the puffer shape, whereas four segments was too square, and six too round.

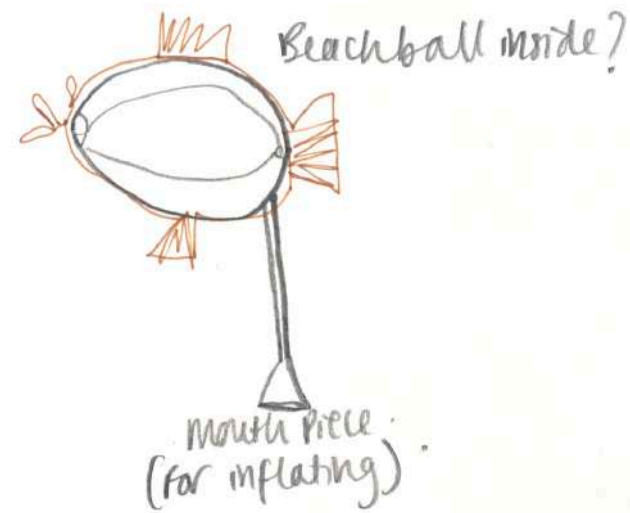


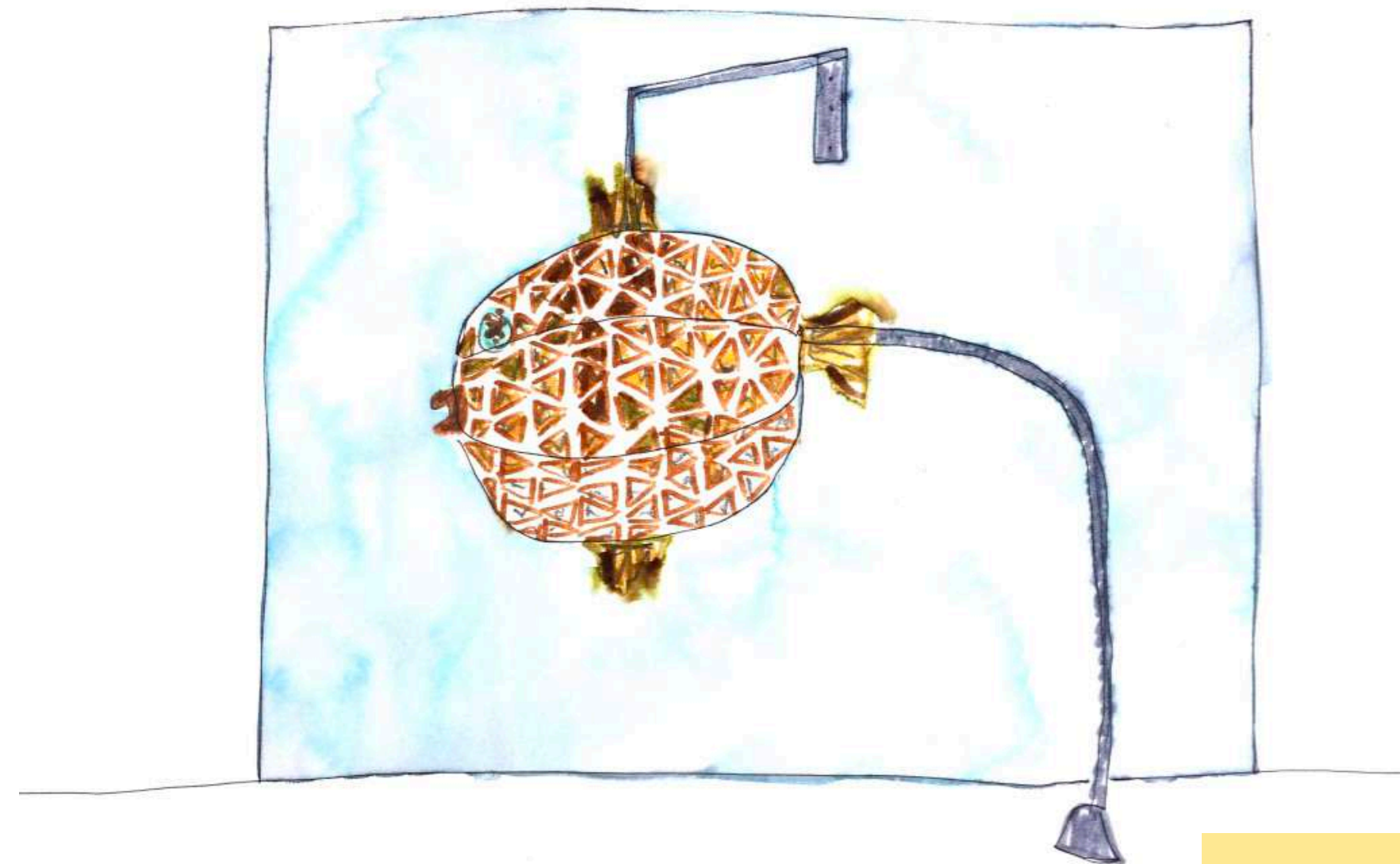
However, when I made five sections out of material and inflated it with a balloon, one section was always wrinkled, meaning that they were too wide. For the actual puffer fish, I needed it to be a more natural shape when inflated.



Looking back at a model I made for Manuel the Manta ray's wings, the method of having many tessellating triangles works well as it has an interesting shape when deflated, and curves well when inflated. It also reflects the puffer fishes natural scale structure.

INFLATES WITH A BALLOON





COMING SOON...

REFLECTION OF MY PROJECT AND YEAR

I initially found this year really challenging, as being a maker at heart, the design process threw me, and I found it hard to step back and research, not constantly making. Once I fully got my teeth into my sea creature: microplastic pollution direction, and the creation of my plastic sheet material, I was able to explore puppetry in many ways, and dig deep into research to find some pretty shocking facts about the affects of microplastics on certain marine creatures.

There have been many times when I felt lost, but through material and mechanism exploration, I was able to develop as a maker, and allow my projects to carry more meaning than previously. Through these developments, I am more prepared for struggles in my future career, and feel I will be able to push through them with more confidence now, as I have learnt to look at the problem at hand from a different direction.

Overall, my time in the workshop this year has been fantastic, and I have loved brining my characters to life. My collection of creatures all shed light on the underlying issues of microplastic pollution, and I hope through my films and my project, that I will have made more people aware of the arising problems.

-Annie Lumby



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