BACHELOR OF DESIGN 2024

FUTURE FLUX

UNIVERSITY of TASMANIA

Bachelor of Design
Second Semester, 2024.

STUDIO LEAD:
Vanessa Ward

TUTORS:
Kok Kiong Ong
Luke Pendergast

COVER ARTWORK:
Ximena Sotelo

DESIGN & LAYOUT:
Keith Carroll
Rebekah Ramsay

future flux

BACHELOR OF DESIGN 2024

SPONSORS

We gratefully acknowledge the support of our sponsors and support and thank them for contributing to our growing community that values design as a powerful tool for shaping our world.

amity C·M·R

flora gondwana

INTENCITY

With gratitude to Ken Carroll, and in memory of Regina Carroll.

FORWARD

The future is not a distant point on the horizon; it's a living, evolving entity shaped by our choices today. This semester, in the Design Futures course, students embarked on a journey into the possibilities of a sustainable tomorrow, focusing on circular design as a path forward. By challenging traditional approaches, they've uncovered the potential for regenerative systems—a concept crucial in addressing today's urgent issues.

Future Flux, captures projects that push the boundaries of conventional design to envision a resilient, adaptable future. Each work here takes on the pressing challenges of climate change, waste, and resource scarcity, illustrating the transformative power of design. These projects are not about finding single solutions but embracing an adaptable approach to complex, "wicked" problems.

They reflect a belief that design is a dynamic force, always evolving.

Future Flux reveals the essential role of emerging designers in building a regenerative future. Through their creativity and determination, these students demonstrate that change is not only possible but essential for a sustainable tomorrow for all.

CONTENTS

Harry Boast

Exploring the use of waste fibres such as hair and wool to reduce pollution for local application.

With locally sourced waste materials I look to reshape a current practice within marine industries.

To service a vessel in the ocean currently, there is a device containing toxic materials like polypropylene to absorb oil that is deployed into the ocean surrounding the boat in aid of collecting the unused oil. Polypropylene slowly releases these toxins into the ocean.

With my device, I will be able to mimic the same process with a device made out of 100% recycled hair and wool to stop the need for these pellets.

After my device has served its purpose of collecting oil. The operators will dispose of the contents into a collection drum that allows the hair and wool to decompose into the oil. From here the oil is transferred to the South Australian OIl Recycling Centre where the donations are re-purposed into mechanical lubrication oils, biofuels, machinery fuel etc.

The chosen materials for this project have been kept limited to hair and wool. Hair holds up to seven times its weight in oil. It also has the ability to extract select heavy metals and organic compounds from the water. Lanolin in wool is water-repellent but oil-absorbent. Sheep's wool is also biodegradable; which will allow for a natural and clean way to absorb and dispose of oil from our oceans.

Australian Fishing Enterprises (AFE Slipway)

Machinary oil water contaiminants.

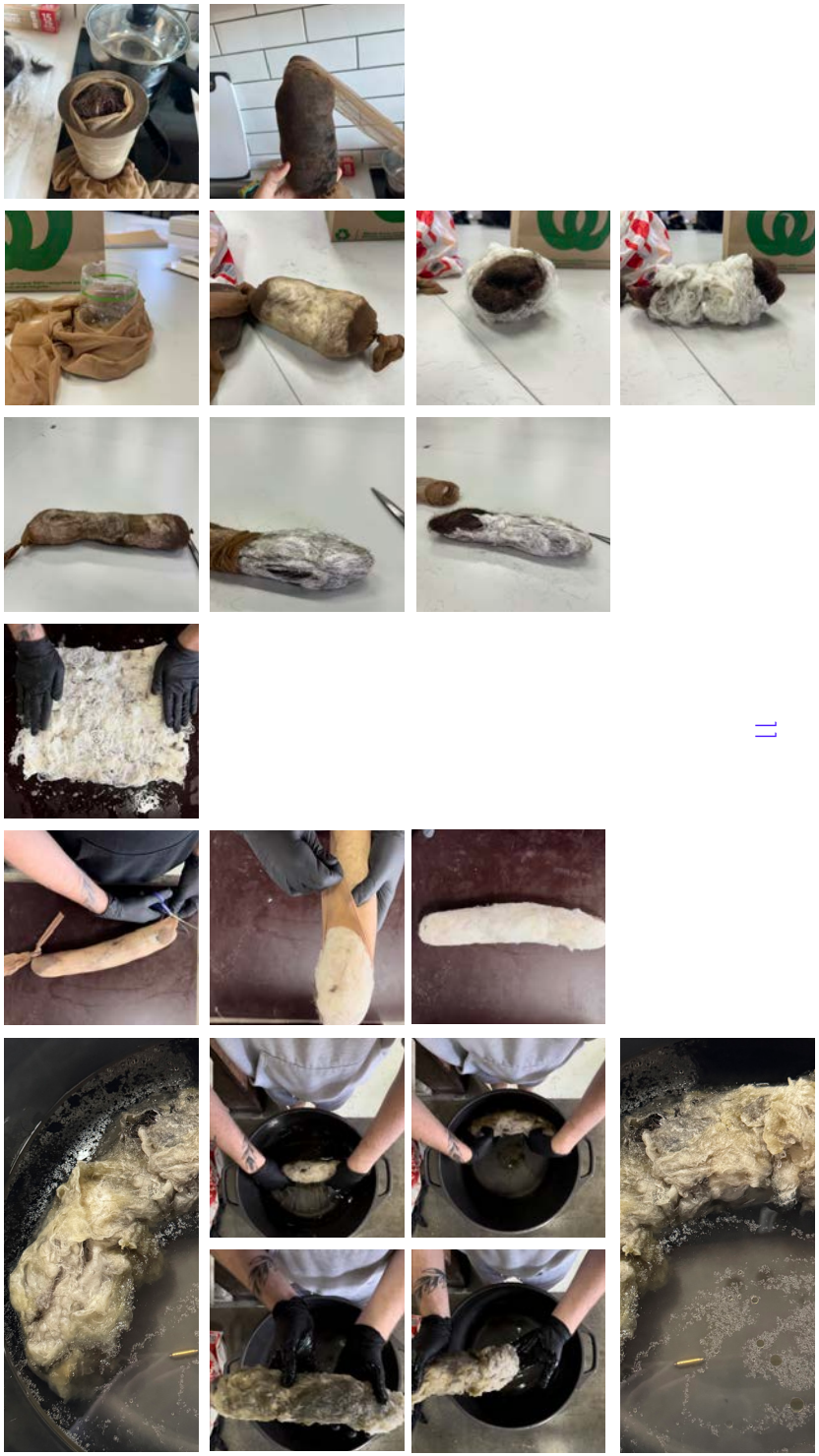
Prototyping, Testing and Iteration.

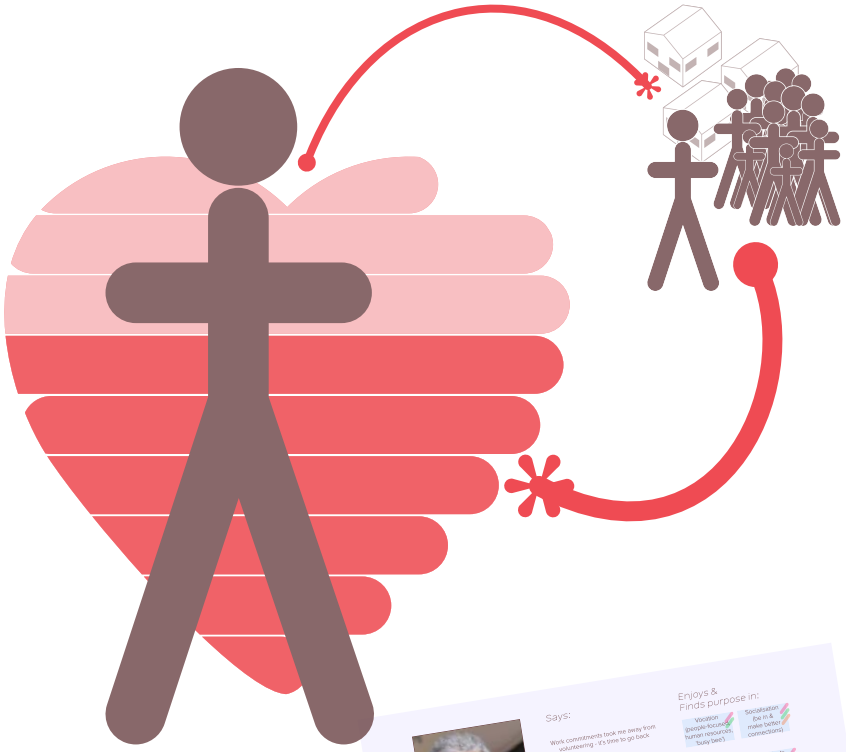
A selection of images throughout each prototyping and testing phase from top to bottom visualises the progress from the concept to the tangibility of *AquaLoop*.

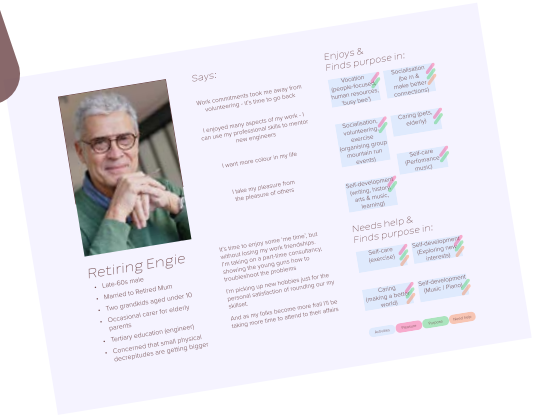
AQUALOOP INC.
DESIGNED WITH THE OCEAN IN MIND

Progression throughout the prototyping and testing phase.

Harry Boast







Keith Carroll

What do you do when you have 40 hours a week to pursue your happiness?

Can you be happier by doing it with other people?

Can we take society closer to Fry's sustainment by (say) encouraging a yachtie to take a disadvantaged youth on board to collaborate on a fun day out?

My friends helped me question my assumptions: that time-rich people only pursue their own pleasure, and that opportunities to benefit others are limited.

Across three participative design workshops we explored our perceptions of how we would use 40 hours a week to pursue happiness. We also looked at the activities they'd enjoy, and how these might be turned to benefit other people.

My research cohort was demographically limited – I'd like to broaden it in future.

The workshops delivered personae to facilitate future enquiries, and a clear Research Question to take forward.

The workshops confirmed people are willing to provide services to others where they can follow their own interests and by doing so gain pleasure and purpose.

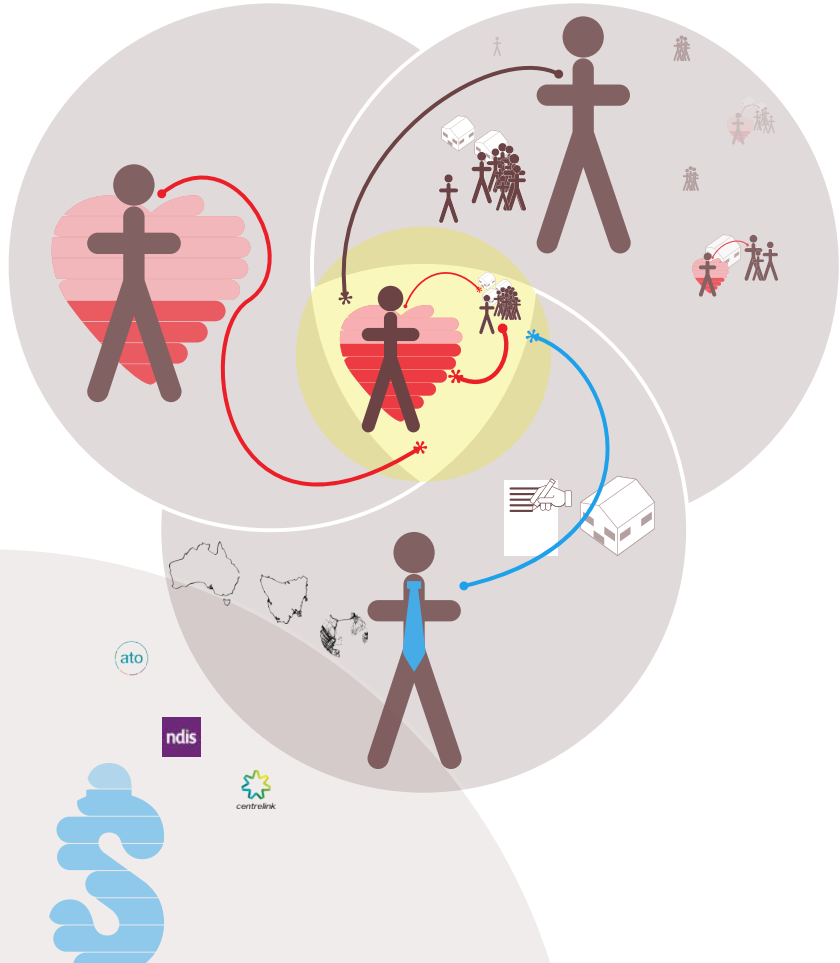
Can people work together, focusing on sharing their skills and passions with each other, to the benefit of all?

... a new kind of social services that, involving active and collaborative citizens, generate values for them and, at the same time, for the whole of society.

(Manzini, 2014)

There is an opportunity to provide coordination of collaborative services within the community.

To bring three groups together in collaborative interactions – those providing skills and expertise in pursuit of their own happiness, those receiving the benefit of those activities (in return for non-financial reward), whilst Government provides support through light-touch governance and some financial and infrastructural support.



Keith Carroll

Collaborative Services

In Tasmania, each person contributes around one tonne of waste to landfills. Waste going into Tasmanian landfill has increased 6% from 2021 to 2023.

Australia is not the worst when it comes to recycling, but it is not where it could be. With climate targets coming fast and more people buying online, waste is an issue that needs to be dealt with.

Countries such as Germany and South Korea have shown how effective simple solutions are, and Slovenia has shown how a country can change massively in as little as 10 years.

Currently, the waste collection system is not circular, with many stages of the system being diverted back to landfill. In Tasmania, kerb-side waste is collected weekly and recycling in collected fortnightly. Otherwise waste can be taken to collection centres at a cost to the individual.

There were three success criteria for this design:

Material

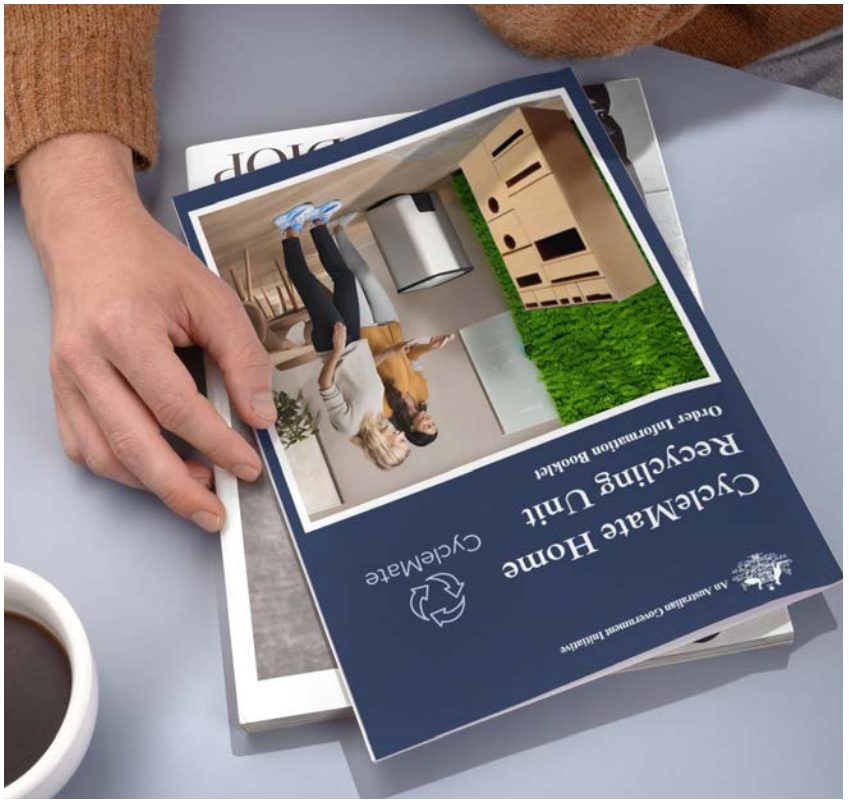
Must be repairable, sustainably sourced, strong and waterproof, and able to be recycled/re-purposed.

Education

User-friendly design, accessible to all, generational, long term and teachable.

Change

Sustainable systems, circular systems, a new way of living, positive interaction and Influential design



3D Mockups of a complete unit in four different materials.

The Mission: Change how we recycle at home, and in our community, while educating and improving the waste system in the Greater Hobart Region.

CycleMate is a sustainable and circular way to improve our waste system, while making recycling easier for everyone.

By starting the sorting process at home, we are able to combat unnecessary landfill and reuse more of our materials in new products. *CycleMate* is a fully subsidised initiative with the aim for every home to have a personalised unit.

The *CycleMate* unit is modular, meaning it can be configured any space and the user's household needs. The unit can be produced out of recycled wood or recycled plastics, letting the user choose colours and finishes.

Inspired by the effectiveness of multiple recycling bins in Germany and South Korea, but more accessible.

This recycling unit is aimed towards households, small businesses, and care homes. Later designs would evolve to service larger businesses, offices, medical centres and grocers.

Customisable Design

Modular units that are user controlled and designed. Freedom of choice and seamless integration into surrounds.

User–Guided Learning

Integrated education in schools and communities, as well as direct support for those that require it.

Sustainable solutions for a cleaner tomorrow

Australia's healthcare sector generates over 250,000 tonnes of waste each year, with large quantities stemming from hospitals, clinics, and medical facilities. This includes a mix of general, clinical, and hazardous waste.

BioSpeckle offers an alternative to non-sterile single use plastic, being durable enough to handle medical waste yet gentle on the environment. Every bag is crafted using biodegradable materials while focusing on safety and hygiene. It can help facilities reduce their carbon footprint while maintaining essential sanitary standards.

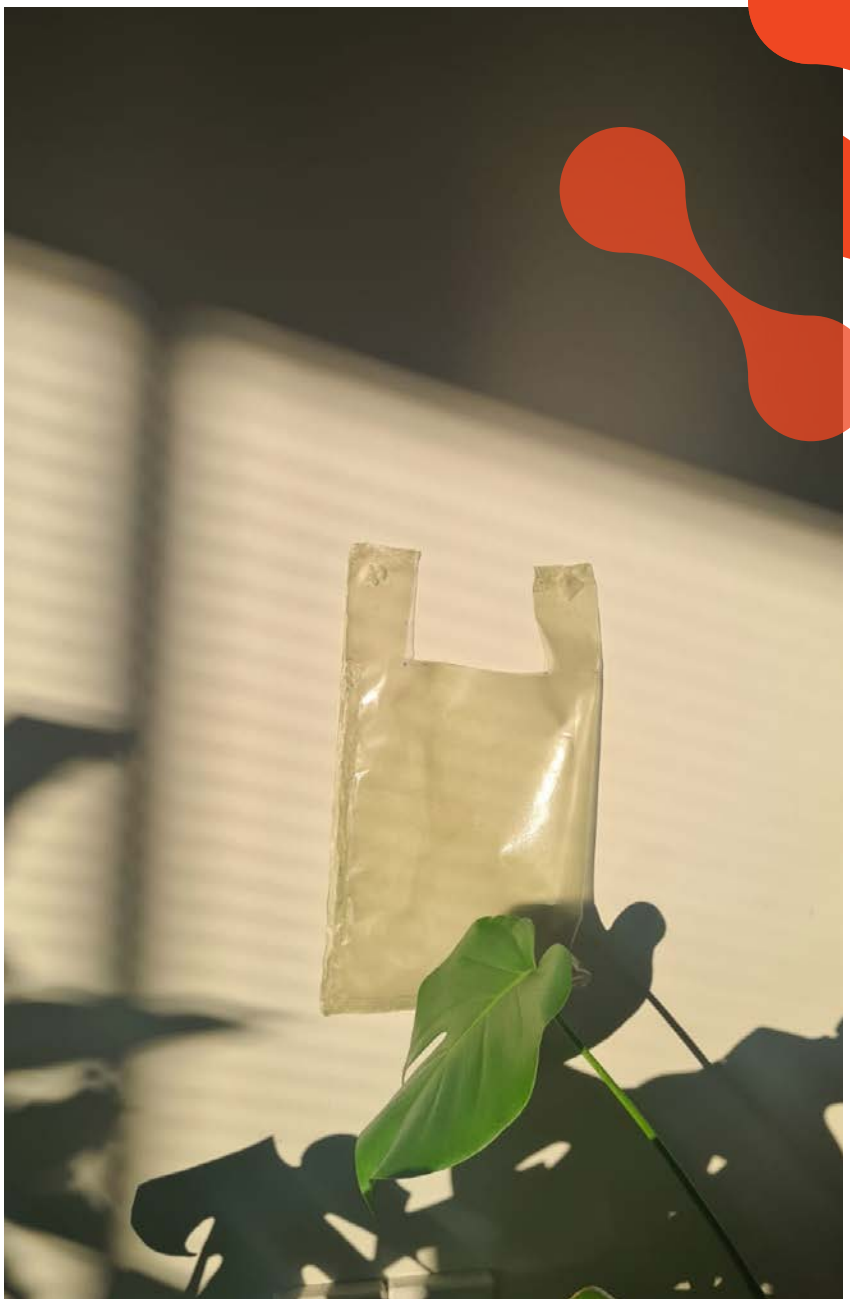
BioSpeckle is a versatile material for a diverse range of industries that need efficient eco-friendly packaging. Choose BioSpeckle and make a commitment to sustainability without compromising on quality, reliability, and safety.

Prototypes: Testing durability

Bioplastic

liquid solution

Bioplastic sample



Sylvie Manandhar

The healthcare industry contributes significantly to plastic waste, primarily through single-use plastics

BioSpeckle's mission goes beyond product innovation—it's about driving a shift towards sustainability within the healthcare sector and beyond. By choosing *BioSpeckle*, organisations can actively reduce their carbon footprint, support a cleaner future, and contribute to a circular economy. For healthcare providers, *BioSpeckle* offers a practical, responsible choice that aligns with both environmental stewardship and industry standards.

Final Bio-Plastic Bag Prototype

Dead bodies are a by-product of human life.

—Dr John Troyer

3D printed bone ash biomaterial with mock up moss and lichen

Nothing's Certain but Death and Carbon Emissions is a speculative project that re-imagines the funeral industry through the lens of circular design, envisioning a carbon-positive future where human death contributes to landscape regeneration and environmental sustainability. Inspired by John Troyer's notion on treating human remains as by-products, this project utilises alkaline hydrolysis, an emerging technology in Tasmania, to transform post-mortem care into a resource-driven practice. Here, the deceased become agents of ecological restoration: nutrient-rich effluent serves as fertiliser, bone ash forms biodegradable artefacts, and materials like implants are recycled, turning waste into purposeful outputs.

Drawing from BCL's *Biopresence* project, the concept envisions a forest of human-DNA-imbued trees, living memorials that sequester carbon and embody loved ones, fostering a commitment to conservation. Families would interact with this living legacy through a bone artefact that grows moss and lichen, visually representing the trees' carbon sequestration. This growth would be linked to a speculative App, allowing families to access tree-specific carbon data stored within the plant DNA.

Rebekah Ramsay

AI Generated
World Building

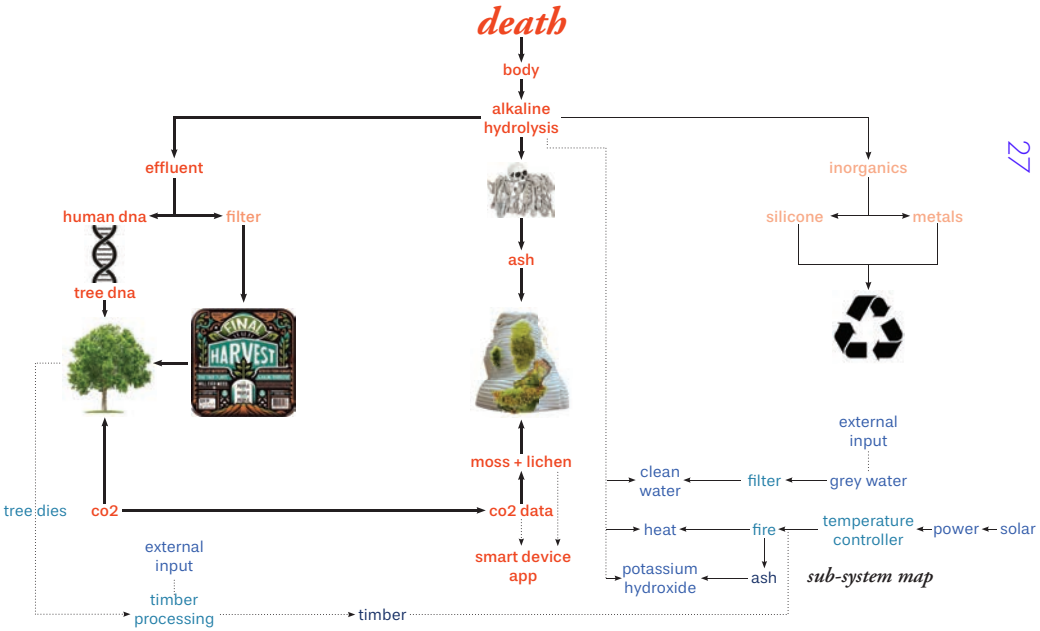
Human remains become resources... redefining waste as valuable outputs.

Rebekah Ramsay

Grounded in existing technologies, this project incorporates world-building to explore how societal values might evolve over the next fifty years in response to the climate crisis. A comprehensive system map captures the circular flow of all inputs and outputs, ensuring a fully regenerative approach.

Through a fusion of sustainable materials, biotechnologies, and life-centred design, *Nothing's Certain but Death and Carbon Emissions* presents an ecologically harmonious vision for the future of funerary practices. The project sparks a dialogue on innovative, regenerative ways to honour life and the legacies we leave on the land.

System Map for the speculative process



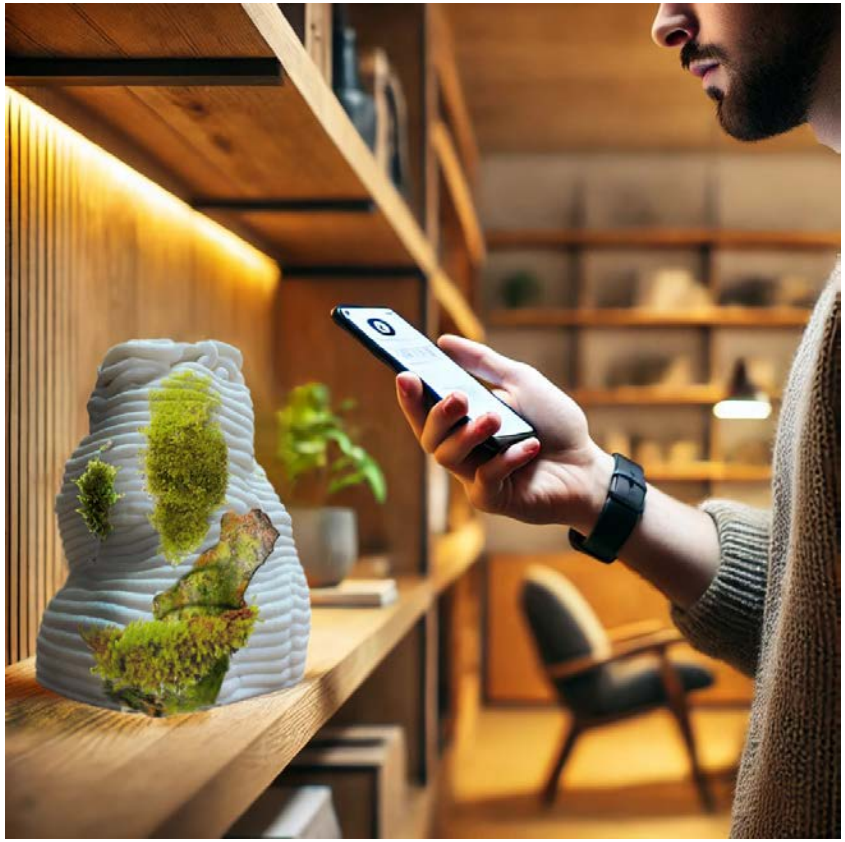
Nothing's Certain but Death and Carbon Emissions

Left: Speculative fertiliser label

Below: Altered AI generated mock up of fertiliser in store

Opposite top: 3D printed bone ash bio-material tests

Opposite below: Altered AI generated mock up of bone artefact in-situ



Rebekah Ramsay

Chloe Richman

Earthy Kneads: A Fresh Approach to Sustainable Bread

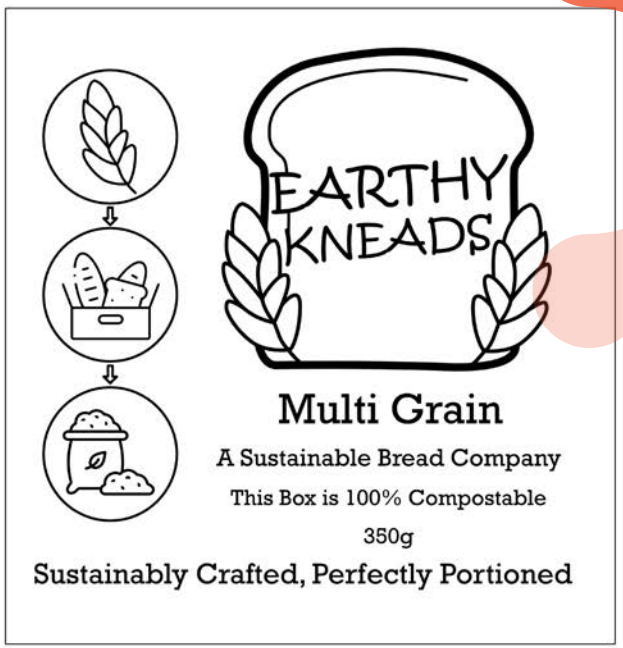
For this project I created a sustainable bread company called *Earthy Kneads*. The brief I set for myself was to 'create a sustainable supermarket product that could be re-purposed after its use'. So, from that I came up with re-purposing paper bread boxes that were sustainable.

I needed to come up with the right shape for the packaging, so I chose paper for its compost-able qualities and versatility. Through testing, I discovered that paper can be folded into various forms, but the bellow box design stood out. This design is sturdy, preventing the bread from being squished. Its accordion like structure allows the box to shrink as the bread is consumed, reducing the amount of air inside.

One challenge I had was how to make the paper water resistant, not rip easily and sealable, as plastic is very good at all of these things. After researching I discovered that if you coat the paper in bees wax and linseed oil it created a water resistant barrier and it made the paper more rigid.

I wanted this bread company to cater to people who eat smaller portions of bread, who want to be environmentally friendly when purchasing bread from the supermarket and consumers who like to re-purpose packaging after use.

Earthy Kneads Sustainable bread packaging



Chloe Richman

Opposite:

Earthy Kneads product information and packaging label

Mia Secondis

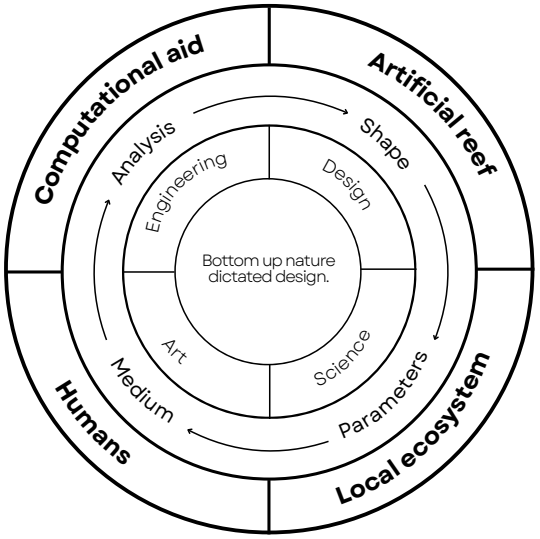
Making sustainable cocktails possible in Greater Hobart.

Food waste is an increasingly distinctive problem faced globally. As Tasmanians, we pride ourselves on sustainability, and circular design initiatives. And yet, food waste still remains a prominent challenge within our island. How can we tackle this as a community?

Project Peel looks towards a sustainable future through implementing a circular design with the collaboration of bars within the Greater Hobart region. With the collection of otherwise wasted citrus husks and other fresh produce discards from local bars, *Project Peel* aims to re-imagine this "waste" into the potential they hold. By using "waste" to create typically imported and purchased bar products, Hobart bars can reduce waste, carbon footprint, and work towards the opportunity of sustainable cocktails.

45% of Tasmanias landfill is made up of edible food waste.

Redesigning artificial reefs through circular principles



This project explores the development of biodegradable, marine-compatible materials inspired by natural marine structures like kelp forests, coral reefs, and oyster shells. The aim is to create sustainable substrates that can be used for marine habitat restoration, climate resilience, and sustainable underwater construction.

Layered composition of oyster shell's calcite exterior seen through dissecting microscope.

Ximena Sotelo

Bio-based materials for marine bio-remediation

Raw materials and what was extracted from them.

brown seaweed

polysaccharides

fucans and fucoidans

alginate

powder, gel substances

red seaweed

polysaccharides

agarans and carrageenans

extracted

green seaweed

polysaccharides

ulvans and photosynthetic microorganisms

extracted

crustaceans exoskeletons

chitosan

powder

oyster shells

calcium carbonate ($CaCO_3$)

calcium chloride (CaCl2)

powder, lilquid

diatom shells

silica

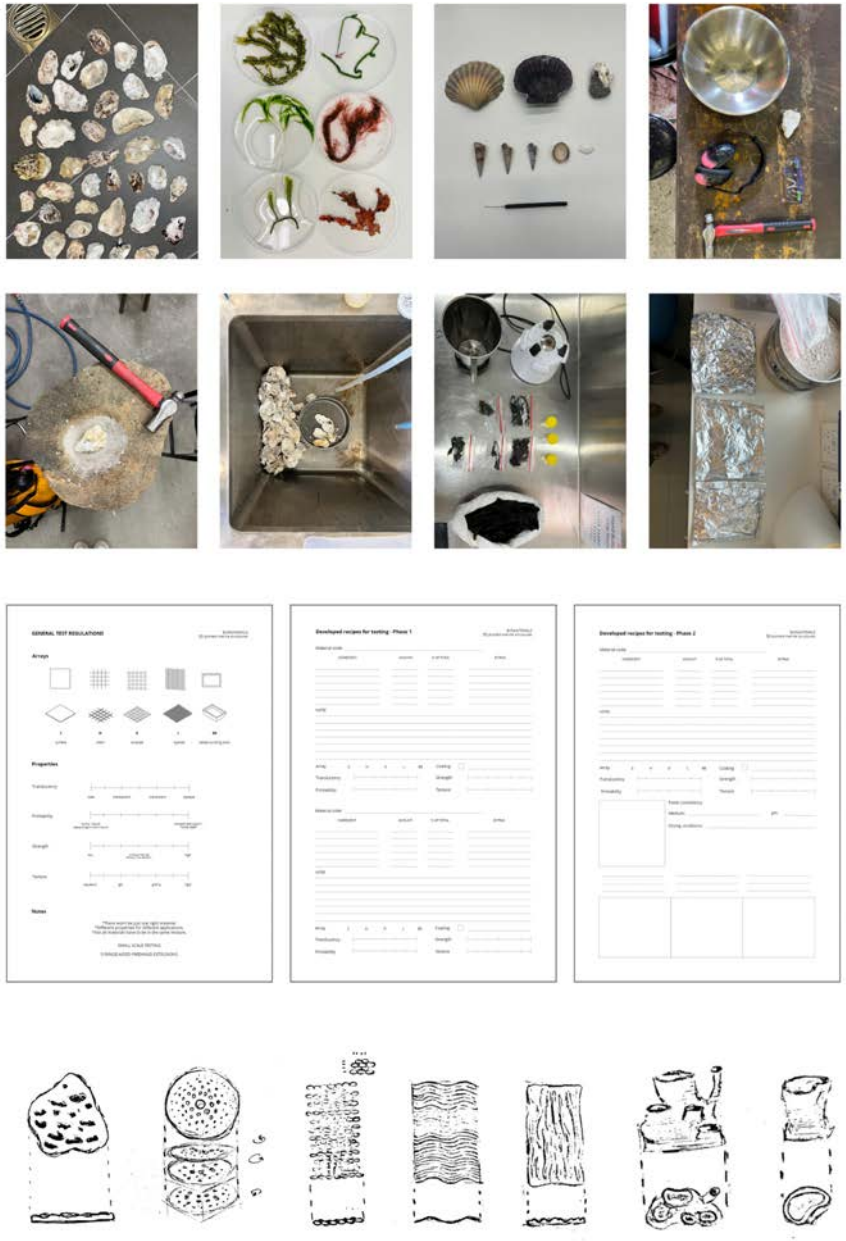
powder

A range of natural materials were selected, including alginate from seaweed, chitosan from crustacean shells, and calcium carbonate derived from crushed oyster shells. These materials were chosen for their natural abundance, proposing a shift from current materials like concrete, which has one of the highest carbon footprints.

Seaweed was collected from coastal areas, dried and ground in order to extract alginate. Locally found oyster shells were sourced to crush into fine calcium carbonate powder. This sustainable approach allows for a low-impact, resource-efficient process.

After preparing each material, I developed different formulations to create 3D-printable pastes and biocement mixtures suitable for marine use. Harnessing each material's characteristics, like strength from chitosan, and flexibility from alginate.

Testing involved assessing each formulation's adhesion to rocky surfaces, durability underwater, and biocompatibility with marine organisms.



Prototyping and ideation

First and second row: pictures documenting the different materials involved in the project, depicting some of the methods that were employed to process them.

Third row: lab manual designed to keep track of material formulations and standardize testing process.

Fourth row: ideas for testing 3D printed patterns and structures that resemble textures found in marine environments.

Pictures and sketches from design process.

Marine Biology X Material Science Design

The ultimate goal of this project is to produce a versatile, biodegradable substrate that can support marine ecosystem restoration by providing stable, long-lasting surfaces for kelp planting, coral growth, and habitat building.

By using natural, locally sourced materials, this project also addresses sustainability concerns, ensuring that future marine construction and restoration practices minimize ecological impact.

Different biocement samples, testing their self-binding properties and analysing how different conditions affect them.

Ximena Sotelo

James Streat

How could the Tasmanian prosthetic industry reduce harmful waste?

The average lifespan of a prosthetic is roughly 3 years, defined by component degradation and changes to a user's needs and proportions. Modern prosthetics are predominately produced utilising materials that cannot be regeneratively, nor sustainably, primarily: fibre-glass and carbon fibre laminates, un-recyclable thermoplastics, and silicone. Furthermore, the Therapeutic Goods Act of 2001 strictly defines and denies the possibility to re-prescribe viable prosthetic components.

ReRun acts as a proof of the capabilities of regenerative and post consumer materials within the prosthetic industry. The socket features post consumer cardboard, and hemp hessian; that would be bound by a biodegradable resin. The wooden laminate foot features relevant toe and heel spring and is capable of supporting 80kg as per industry standards. Lastly the cover is printed in biodegradable PLA and ensures that users can utilise a single prosthetic in both naked, and cosmetic layouts; circumventing the requirement for a second cosmetic prosthetic.

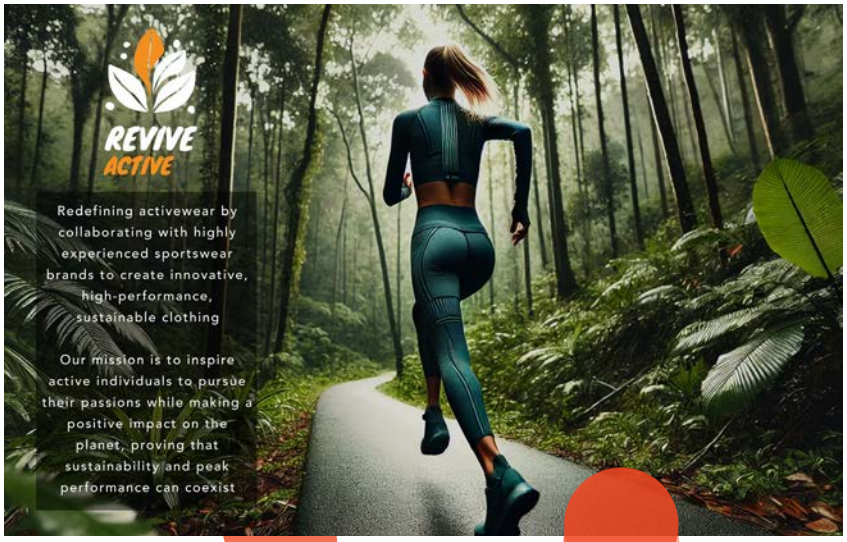
ReRun Finalised Prototype

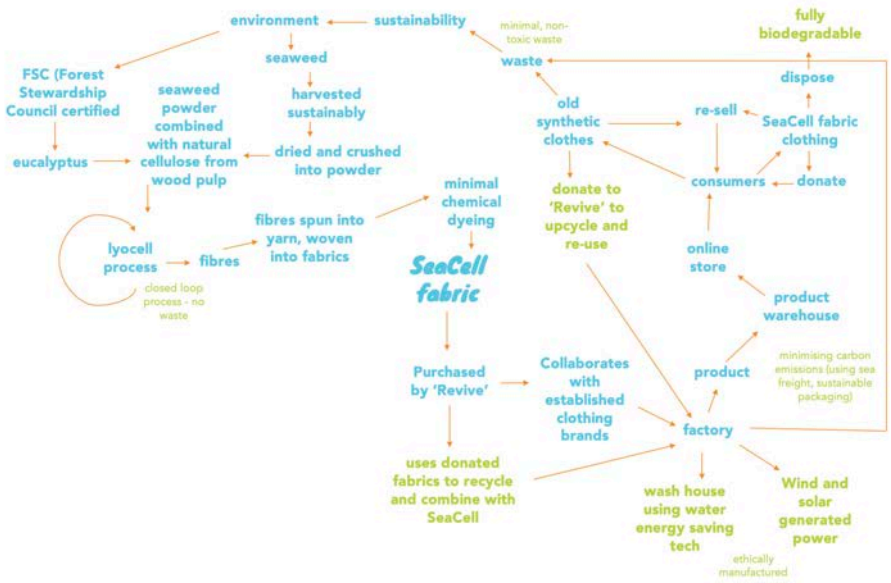
Accommodates portrait images or a range of smaller images

Clothing by nature, for our future

Danielle Thomson

This semester I have been researching how we can make the fast fashion process more circular using sustainable materials. The fast fashion industry is destroying our earth rapidly and we desperately need better alternatives. To make 1 polyester t-shirt uses up to 600 litres of water and will take 20-200 years to break down. By aiming to replace synthetic materials with sustainable alternatives, we are not only saving water waste but also producing fewer landfills that emit methane gas into our atmosphere. I have created a sustainable clothing brand system with a low environmental footprint. The brand 'Revive' uses a seaweed and wood fibre called 'SeaCell' that uses the Lyocell process, a closed-loop method that does not produce waste. The result is a soft, breathable, and biodegradable fibre. 'Revive' uses wind and solar-generated power and energy saving wash houses, and collaborates with established clothing companies to produce innovative, stylish clothing while respecting the planet. A marketing box is sent to potential collaborators, welcoming them to the brand. The box contains SeaCell yarn and uses Lyocell linen (biodegradable) as hinges.





We pride ourselves on being a brand that uses a circular system, consisting of the Lyocell production process and a donation program.

Danielle Thomson

REVIVE
SUSTAINABLE
CLOTHING

Creating in-store merchandising and product displays from fashion waste and found materials

Mannequin prototype 2

Final shopping bag prototype

Fabric sandwiching technique

Objectives

Create in-store merchandising displays using found and donated textile materials

Champion sustainable consumer behaviour.

Create a circular merchandising system

Research Goals

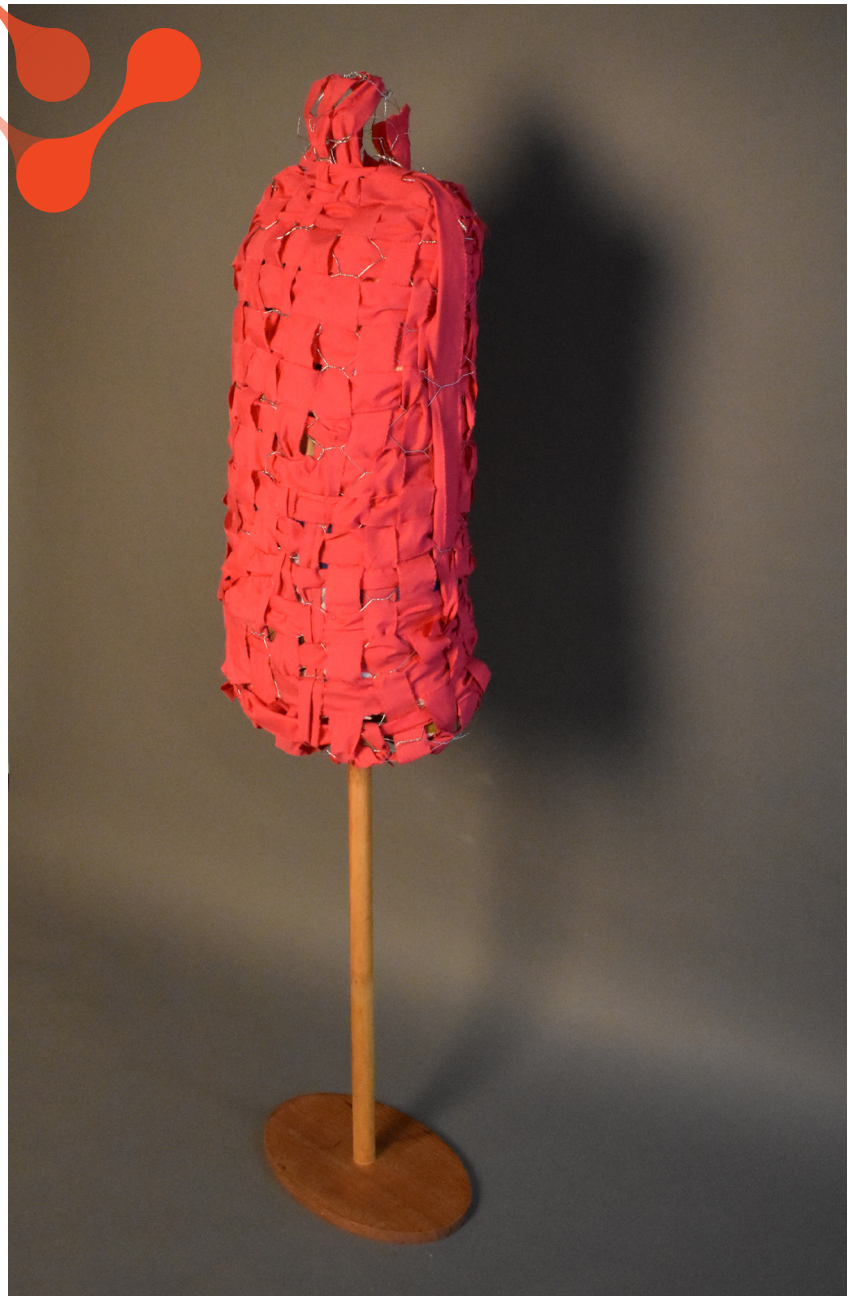
Create an understanding of the current merchandising display market

Gather precedents of both displays and touch points

Prototype Goals

Explore physical prototyping to test form, colouring, materials and accessibility

Sarah Whitaker



Sarah Whitaker

The fashion industry is the 6th largest contributor to green house gasses in the world

Project Scope

Investigating how local fashion industry waste materials can be used to create sustainable packaging solutions.

Using personal and university resources available over a ten week project time-line.

Testing physical properties, user engagement and sustainable practices incorporating circular design practices.

How can sustainable shopping practices be improved within customer behaviours through the influence of in store merchandising?

Exploring sewing and structural techniques to create a usable and aesthetically appealing mannequin for in-store displays, and reusable sustainable shopping bags for customer usage.

Final Mannequin Prototype

Weaved fabric, chickenwire, timber

How the act of making can form emotional connection and increase product longevity.

Prototyping from start to finish, exploring material, form and construction

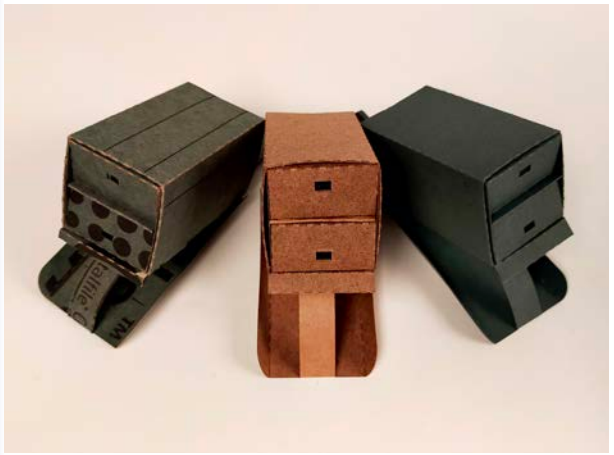
This project has focused on the concept of changing habits, in a number of ways.

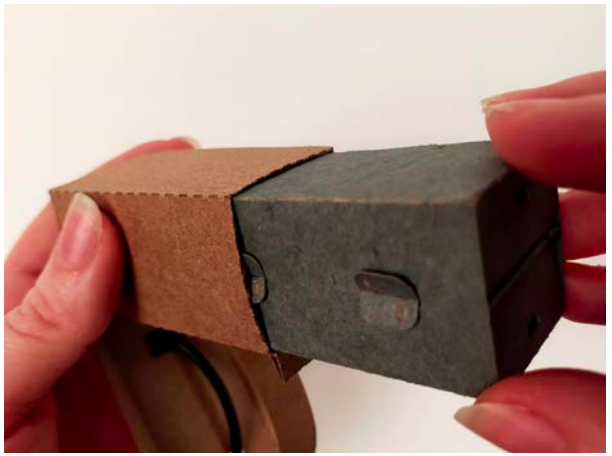
Through a collaboration with the Active Work Lab (AWL), this product has been designed to house a motion sensor that prompts office workers to take movement breaks throughout the work day, and help build healthy habits around exercise.

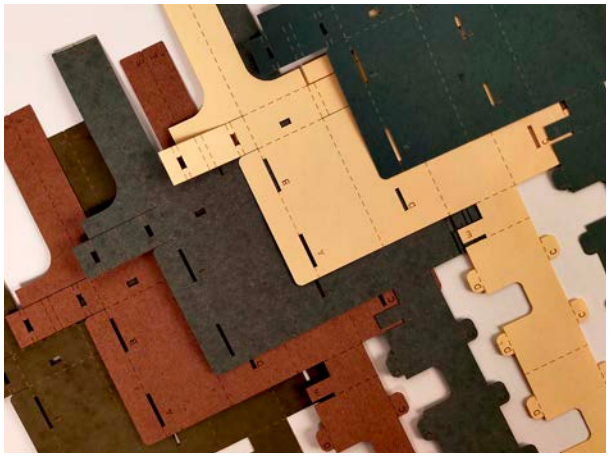
Throughout the design process circular design principles have been utilised to help form an emotional connection between user and product, which in turn will increase acceptance and product longevity.

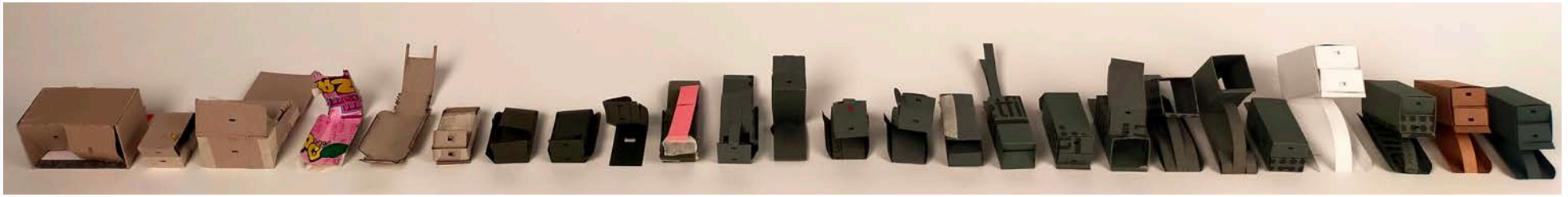
The product has been designed as a flat-pack, to be assembled by the user. Made from recycled and reclaimed materials, the user can repair and reassemble the product with ease, and when it comes time to part with it, all of the materials can be easily recycled and the internal materials can be returned to the AWL.

Circular design practices help to close the loop in product design, and making electronics repairable empowers the user, creates an emotional connection, which in turn will keep products in use for longer.



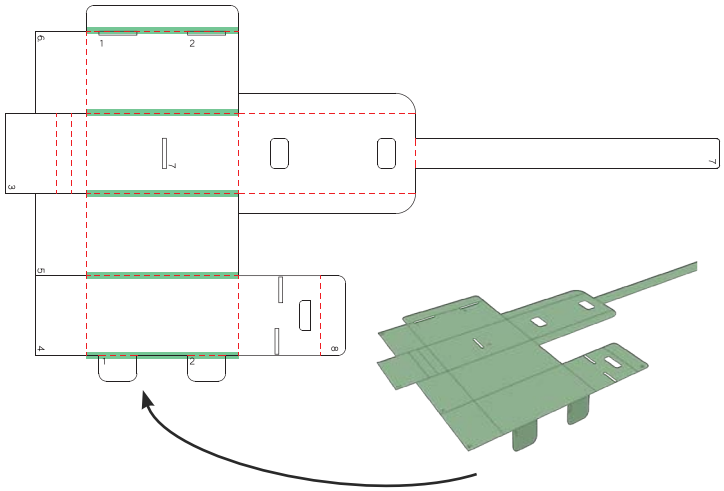




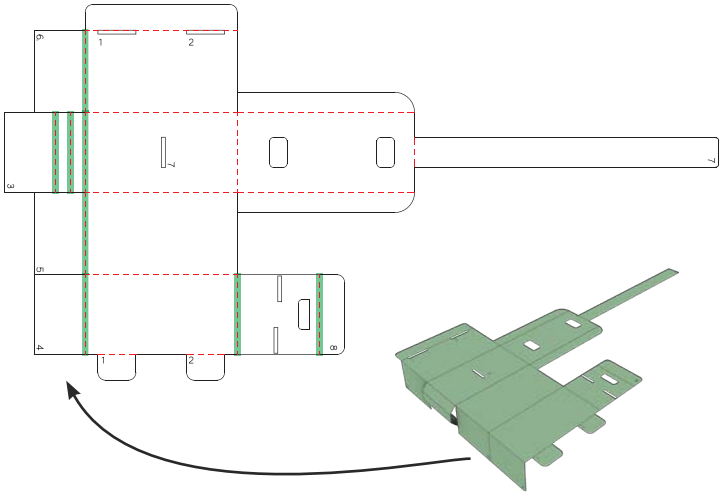


Amy Hilliard

Changing Habits

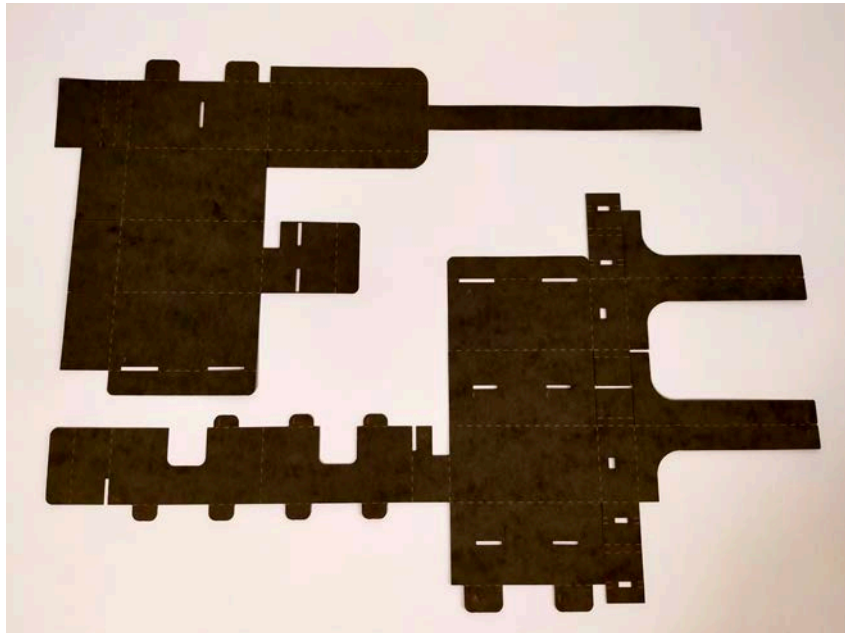


1. Fold the highlighted lines, starting at the top of the piece.



2. Fold the highlighted lines, starting at the top left. Take care folding the lines close together.

Amy Hilliard



Above: Late stage prototype

Left: Excerpt from assembly instructions

STUDENT COHORT 2024

Harry Boast
Keith Carroll
Kaitlyn Geltner
Sylvie Manandhar
Lucy Mulvany-Tennant
Rebekah Ramsay
Chloe Richman
Mia Seconds
Ximena Sotelo
James Streat
Danielle Thomson
Sarah Whitaker

HONOURS

Amy Hilliard

SCHOOL AWARDS 2024

3rd Year Award
Ximena Sotelo

Excellence in Engagement
Rebekah Ramsay

As a reflection of this institution's recognition of the deep history and culture of this island, the University of Tasmania wishes to acknowledge the Palawa people, the traditional owners of the land upon which the work in this catalogue was created and exhibited; and pay respect to elders past, and present.

Publication Details

ISBN: 978-1-922708-83-0

School of Architecture and Design
University of Tasmania

futureFLUX

Bachelor of Design 2024
Graduation catalogue

futureFLUX captures the efforts, energy, and elucidation of our graduates, showcasing their drive to address pressing global challenges. Their projects are more than academic exercises—they are bold, actionable visions that tackle complex issues from climate change to social justice, reflecting the urgent concerns of their generation.

Each proposal represents a call to reshape our world, a spark in the ongoing dialogue about what the future should look like. Together, these ideas form a transformative movement, a flux that seeks to break old patterns and construct a resilient, equitable future. This is not just a collection of projects; it is the genesis of change. The future is in flux—and they are leading the way.

Vanessa Ward
Course Coordinator

REGEN DESIGN LAB

9 781922 708847