GRASS TO GROWTH

Urban Aucklands ignored inhabitants

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Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Contents

Abstract

Habitats are essential for all living organisms. As human habitats increase through urbanisation, other spaces are being underutilised and/or destroyed, resulting in a lack of habitats placing local non-human species at risk. The research question “How might we develop urban spaces with the help of Football to mutually benefit multiple natural species?” was used throughout this project, following a quantitative experimental research methodology alongside the Design for Conservation Methodology. Through New Zealand's love for sport and my own personal interests, Grass to Growth uses specially designed seed-planting studs to transform under-utilised green urban spaces into habitats for local at-risk species alongside a curated casebook highlighting sustainable improvements for local football clubs.

Keywords: Habitat(s), Urban, Sport, At-risk, Species, Football.

This report is structured within 5 sections for each phase of the Design for Conservation (D4C) methodology. This report is not in linear order for how this project progressed, as the phases in the D4C methodology are supposed to intertwine with each other.

Positionality & Acknowledgements

I have to understand that I come from a position of privilege, both from where I grew up as well as the social benefits I get from being a cis-gendered white male. I have to be aware of the bias I may hold due to my upbringing and social status. I need to understand that due to my advantaged societal position, there will be stigmas held around my opinions. I also need to ensure that I'm aware of the advantages I've had throughout my life due to my privilege, and be thankful for the opportunities I've had, while also working towards ensuring that these opportunities become equitable. I want to include my passions for sport in my work whenever I can, and foster my own creativity as well as collaborate and grow alongside the creativity of others.

Tangata Whenua and upholding Te Tiriti O Waitangi - The local Iwi of Tāmaki Makaurau are the people of the land. Thus, as a proud Tangata Tiritiri, my research will consider and respect the Tangata Whenua through the three P's: Partnership, Participation, and Protection. If any disputed land or potential issues around introducing certain species arise, appropriate communication between myself and Iwi will take place to ensure that no part of my research affects Te Tiriti O Waitangi or Iwi relations. Furthermore, as mentioned in my values, I will become an environmental guardian through design approaches that ensure the preservation of our future. This will be achieved by crafting designs that facilitate enduring, positive transformations, guided by empathy, and a harmonious equilibrium between economic advancement, environmental preservation, and societal welfare.

KIA ORA TĀTOU

GREETINGS ALL

KO TARANAKI TE MAUNGA

TARANAKI IS THE MOUNTAIN

KO NGAMOTU TE AWA

NGAMOTU IS THE RIVER

NŌ NGĀMOTU AHAU

I AM FROM NEW PLYMOUTH

KO BUSHELL TŌKU WHĀNAU

BUSHELL IS MY FAMILY

KO HARRY TŌKU INGOA

MY NAME IS HARRY

Background

The Problem: Urbanisation resulting in Habitat Destruction.

Some of Auckland's most prehistoric and important inhabitants are becoming endangered due to a serious lack of habitats. Habitat loss affects all species in an area, not just one type. The loss of habitat, and subsequent loss of resources, food and shelter, is a significant threat to urban biodiversity.

Tāmaki Makaurau's green spaces could be utilized to provide mutually beneficial spaces for multiple of it's inhabitants. through the use of football, we can create new habitats, as well as improve pre-existing ones - here's how I think we could do this.

as an example, the Auckland green gecko is "Listed in the most recent threat classification as 'At Risk - Declining', due to land development/clearance of habitat" (NZ Herpetological society, 2021). These geckos are primarily arboreal (tree-dwelling), although are also found quite low to the ground in prostrate (ground-hugging) vegetation. Both of which can easily be implemented/combined in auckland's green spaces.

Background

How might we develop urban spaces with the help of Football to mutually benefit multiple natural species?

Background


Key
Private Green Space
Public Green Space
Auckland City
Green Spaces
My Local Urban
Green Spaces
Green space accounts
for 47% of
Urban Auckland
Eagle Technology, Land Information New Zealand, GEBCO
POWERED BY
esri

Design Process

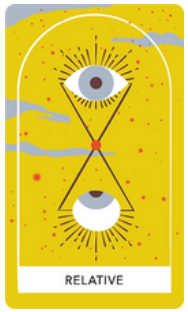
The Grass to Growth capstone project utilised the Design for Conservation (D4C) Design Methodology developed by Gabriela Baron. The D4C framework emphasises that humans are just one species in a complex ecosystem, and our success and well-being depend on maintaining balance within that ecosystem. This approach is well-suited to the sustainability stream brief, as it focuses on sustainability, environmental connection, and positionality. Additionally, the D4C process provides an open and user-friendly toolkit with templates for visually displaying thought processes throughout the project's journey. The D4C process is described as an iterative process consisting of 5 core stages that can overlap and change in order. The Grass to Growth design process began with the understand phase, followed by the propose and validate phase, plan for impact, and deploy sustainably, while revisiting the (re)connect phase multiple times as the project progressed.

(Re) Connect

Through the cultivation of Empathy, the (Re)Connect phase facilitates the development of essential perspectives for authentic, dedicated, innovative, and flexible problem-solving by re-establishing individuals' connections to themselves, their community, and their environment (D4C 2021). This phase of the D4C methodology was constantly revisited throughout this project's development to ensure that the project remained grounded and connected to its stakeholders and beneficiaries. This was achieved through the D4C Mindset cards, the Reconnection Ritual Canvas, and Lesley-Ann Noel's Positionality Wheel (Lesley-Ann Noel, 2019).

KAWA / VALUES

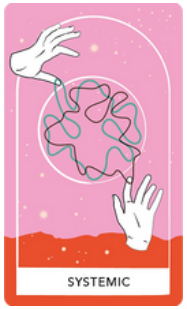
Positive - I need to stay positive with the work I create and trust the process and journey that my project is on. I should approach the inevitable challenges of this project with a growth mindset and see all of them as an opportunity to learn and improve. My project is practically a love child between myself and football, and encapsulates my passions.



Relative - I need to be open to challenging my own assumptions and stepping back from things I think I know. Being open to new perspectives from multiple species will allow me to learn and grow as a designer, and allow my work to benefit a greater audience.

Cyclic - The design process is always a cycle. There's always opportunities to innovate and iterate no mater how early or late into the process you are. However, phases of rest need to be considered also, and change for the sake of change is a risk that needs to be considered.

Humble - Positionality is crucial to ensure that my project stays humble with it's scope and approach. Focusing on the way things work already, and building from them rather than trying to create something entirely new. I need to be aware of my own self bias, and approach my work with a want to grow and learn. I need to be aware of the intended and unintended consequences of my work.



Systemic - Understanding that my project is systemic and that parts of it can easily change and shift is crucial to keeping a positive and healthy relationship with my work balance. Knowing that things will go wrong, but will eventually come right again is important, especially when following a design process.

Balanced - Ensure that my interests are balanced with the brief and that my personal values work coherently with the values of the sustainability stream. Look to create an environmental balance between multiple natural species. Ensure that a healthy life balance is maintained.

Honest - For this assignment I need to ensure that I'm both honest with myself and my expectations for what I can feasibly create and deliver. Honesty is also important between myself and my classmates, so we can openly help each other with honest feedback.

KAWA / VALUES

Meaningful

I want to craft designs that hold significance and resonate with my designer's ethos, all the while forging connections and fostering involvement with both our team and stakeholders. Through my design endeavors, I seek to enhance my comprehension of the world and establish a bond with something greater than my individual self.

Passion

I believe that embracing passion through design fuels creation that evolves projects to a higher level. I will use my passions to allow a deeper connection to the design work I do, and empower my work through my interests, desires, and drive.

Sustainable

I will become an environmental guardian through design approaches that ensure the preservation of our future. This will be achieved by crafting designs that facilitate enduring, positive transformations, guided by empathy, and a harmonious equilibrium between economic advancement, environmental preservation, and societal welfare.

Innovative

I am committed to embracing audacity and a willingness to venture beyond conventional boundaries, undeterred by obstacles or opposition. Fueled by my inquisitiveness, I will persistently seek knowledge about our surroundings and shape designs that nurture constructive evolution and advancement. My approaches to both ideation and collaboration remain adaptable, as I am receptive to novel methodologies that cultivate internal development.

Self-Awareness

In my role as a designer, it is of utmost importance for me to infuse a sense of self-awareness into my approach. Self-awareness encompasses grasping and acknowledging my personal standpoint and inclinations. I need to remain conscious of the principles of collaboration and delve into the origins of my choices. Deliberating on the potential effects of my decisions on others and striving to establish a positive precedent for those in my vicinity are indispensable components.

My personal Kawa (reworked from my des300 teams values - Stephanie Townend, Clara Schroeder, Selena Wu, Skylir Chang)

Positionality Worksheet
12 things about me that help me see the water that I swim in!

A positionality or reflexivity statement can help you understand who you are. These characteristics can be both strengths and weaknesses as they offer insights that others cannot see, or they can cause you to make assumptions that are not true.

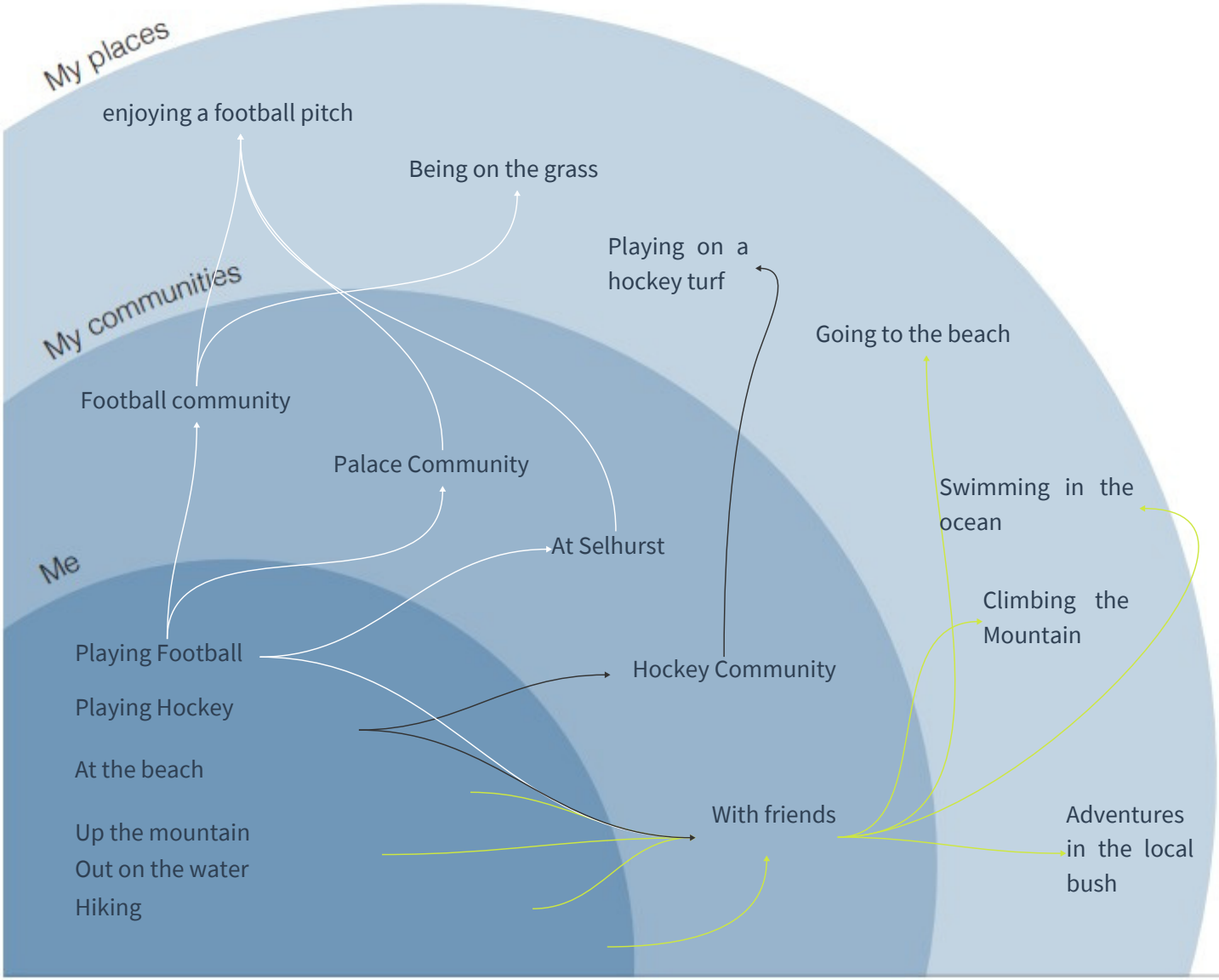
Greater self-awareness can help you to maximise strengths and minimize weaknesses.

Research is not objective, because researchers are not objective. Your background frames how you conduct research.

Lesley-Ann Noel
Carl A. Grant Lecture Series 2019
University of Wisconsin, Madison

Additional reading:
Hamby, S., PhD. (2018, May 22). Know Thyself: How to Write a Reflexivity Statement. Retrieved March 22, 2019, from https://www.psychologytoday.com/us/blog/the-web-violence/201805/know-thyself-how-write-reflexivity-statement

Reconnection Rituals Canvas



Story

The joys of football connect me to people and places all over the globe. Living for the highs and lows that the game creates, building lifetime friendships and bonds, and being a part of a community that connects me to people I've never met before, simply through a shared love for the beautiful game.

Exercise, connection through place, fun,

Insight physical, mental, and social benefits, comfort.

Story

Playing hockey has taken me all over the country and the globe since I started at the age of 5. It's brought me life long friends as well as taught me extremely valuable lessons. My school hockey team was practically a **second family**, our coach was fantastic and taught me not just how to be a good player, but how to be a good man.

Family, Love, Bonds, Learnings, Exercise, fun, comfort with my people.

Story

Exploring nature with my friends is something that brings me utmost joy. Appreciating and respecting the taiao while being able to enjoy it's many gifts is my favorite form of therapy and bonding. Sharing its gifts with my friends through the ocean, the maunga, the bush and all that's in-between is a blessing.

Insight nature, therapy, ocean, swimming, love, bonds, respect, protect.

Understand

The Understand Phase facilitates research and learning, focusing on developing a deep understanding of the problem being addressed by the groups affected and allowing said groups to primarily impact solutions. Comprehending environmental challenges necessitates adopting a system thinking approach, embracing uncertainty, and re-establishing connections with the origins. To conduct impartial research, we must shed our preconceived notions and recognise that those closest to the land, the species, and the issue can also be the experts (D4C 2021).

Brain storm

seed planting studs and by playing a match players would plant different seeds over the field, could be used for replanting over preseason or on areas not normally used for football to create individualized exhibitions?

Seed- Planting studs - could work with a similar mechanic to a ball point pen or cologne bottle?

Nutrient deposit studs - could work with a similar mechanic to a ball point pen or cologne bottle?

Recyled materials to create goalposts / nets / balls / boots? incorporates urban spaces through the pitches as well as benefiting relationships through recycling.

Create recycled insoles or laces or something that hasn't been innovated in ages? Using materials that either remove harmful items from the environment or materials that break down to improve the envrionment for wildlife

Insoles that when broken can be planted in the garden and grow something or give extra nutrition to soil? - Nike created insoles from castor beans

Exhibition field designed with tree goals, natural lines created from native flowers etc.

Look into pesticides and such used currently to maintain fields, what could be planted around fields to better benefit chosen wildife etc.

Design the 'ideal' football facility for NZ endangered species (green gecko and copper skink + others maybe)

Utilising Empty Space

Leptospermum scoparii
https://en.wikipedia.o

Auckland Council. (2020,
Wildflowers. OurAuckland.
https://ourauckland.auckl
domain-comes-alive-with-

Honey Traveler. (n.d.). Clover Honey. Honey Traveler.
https://www.honeytraveler.com/single-flower-honey/clover-honey/

List of plantlife I worked with for this project.

Manuka - When Manuka grows it creates shrub-like trees that flower beautifully. These trees offer cover and shade that benefits lizards like the Auckland Green Gecko, while also providing nectar and pollen for Auckland's bees to feed from.

Clovers - White clovers are loved by bees and extremely easy to grow, commonly grown on lawns that are left untreated. They require minimal maintenance and provide dense cover that also benefit Auckland's lizards. Furthermore, annual clovers are able to self-pollinate and reseed, allowing further growth after initial seeding. Both are relatively drought resistant, with the natural rain cycle being more than enough for them to grow.

Wildflowers & Pollen Mix - Wildflowers also grow on their own, are drought resistant, provide good diversity, and don't need any form of fertiliser, manure or compost. They again attract bees and also some moths and flies, providing food for both lizards and bees.

Biomechanics

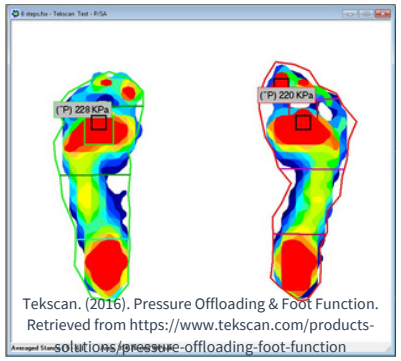
Foot mechanics with running and football

From personal playing experience, a game of football involves a lot of pivoting, quick changes of direction, rotation, planting of the feet, and running. All of these mechanics utilise the stud plate of a football boot, as well as the studs themselves to offer traction, maneuverability, bite for acceleration and deceleration, and stability.

"When you run, your foot naturally rotates inward to help absorb impact as you hit the ground." (Smiths sport shoes, 2022) Called pronation. On average, the foot rotates 15 degrees during push off while running, with the toes twisting inwards and the heel twisting outwards. Furthermore, players twist and pivot frequently in football.

"The ankle is in about 10° of dorsiflexion when the heel strikes, and then dorsiflexes rapidly to 25° of dorsiflexion." (Biomechanics of running

Novacheck TF; The Biomechanics of running; Gait and Posture 7; 1998; 77-95
Mann RA: Biomechanics of running. In D' Ambrosia, RD and Drez D: Prevention and treatment of running injuries, ed 2. Slack, New Jersey, 1989



Tekscan. (2016). Pressure Offloading & Foot Function. Retrieved from https://www.tekscan.com/products-solutions/pressure-offloading-foot-function

Heat map of common pressure points for the average foot - justifies the placement of football studs and the areas that I will be focusing on with my project. The red areas represent the areas utilised most with the highest pressure / use, and also represent where the majority of studs are placed on a pair of football boots.

The screw in stud locations that I am working with for my assignment are all located in the highest wear areas (the heel and forefoot). Meaning that these areas are guaranteed to see wear when used, providing proof of concept for creating movement based or durability based products for these select areas.

PROJECT GOALS

GRAND CHALLENGE

Which are the main wicked problem/s that frame your conservation problem?

Sustainability in football, lack of urban habitats for auckland endangered animals

SPECIFIC PROBLEM

Which conservation problem are you addressing?

Both of the above

In relation to the conservation problem, what do you want to develop/improve? For whom?

I want to improve awareness and action around environmental sustainability in football, while also utilising underused green urban spaces to create unique habitats for wildlife (starting in Auckland).

SUSTAINABLE DEVELOPMENT GOALS

Which SDGs will your project address?

Good health and wellbeing

Life on land

Sustainable cities and communities

CONTEXT

CULTURAL OBLIGATIONS

Which are local cultural values that this project should observe?

Tangata tiriti - being a good treaty partner covers most of the local cultural values I can think of.

RELATION TO PLACE

What are the particular relations between this project and it's physical location?

Key relationship between utilizing gren urban spaces in it's physical location, as well as a key relationship between local wildlife, plant life, and communities / clubs.

VOICES

What are people saying about this problem?

Not a lot is being said, the problem has gone mostly under-the-radar, and focus is being placed on other issues around Auckland.

REQUIREMENTS

Are there particular requirementsconstraints for this project?

Time constraints are probably the biggest constraint for this project, alongside the scope that I am hoping to achieve within this time.

MAIN STAKEHOLDERS

Who is most affected by this problem / your project? Who should have a say in it? Who could be your partners?

HUMAN	NON-HUMAN	INSTITUTIONS	OTHERS
Football players	Auckland wildlife (specific focus on endangered wildlife like the Auckland Green Gecko or copper skink)	Football clubs	Underutilized green urban space
Sporty Environmentalists	Native Plant-life	Environment and Conservation Organisations of Aotearoa	Football pitches
Zoologists	Soil	Wildlife Rehabilitators Network of New Zealand	Seeds

DESIGN CHALLENGES

Write your main Design Challenges in the form: HOW COULD WE stakeholders/verb/goal?

"How might we develop urban spaces with the help of sports to mutually benefit multiple natural species?"

IMPACT

What will happen if your project works? How will you define "success"? Describe different impact indicators and speculate on how these could be measured.

	SHORT TERM	MEDIUM TERM	LONG TERM
Quantitative indicators	1 Increased number of seeds planted throughout green spaces in Auckland	2 From these seeds, a larger portion of wildlife habitats are established throughout Auckland, exhibition matches are happening more frequently and Aucklands green urban spaces are being utilized for something.	3 An increase in wildlife habitats has restored numbers of endangered species within urban Auckland, and the rest of the country is following suit.
Qualitative indicators	1 Sustainability in football is more recognized and some clubs are starting to change their view on how to establish the fields moving forwards	2 Multiple Auckland clubs have deployed a new sustainable approach to their pitch development, greater care is placed on the plantlife around the pitches as well as with what materials are used for the fields.	3 NZ Football creates sustainability criteria for all pitches across New Zealand, while also organizing nationwide exhibitions that are specilized towards local wildlife and plant-life to the areas where the games are played.

Created by Gabriela Baron (2021)

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use popular and/or scientific name*
Auckland Green Gecko

MAIN DESCRIPTOR *What type of persona is it?*
Environment user

WHERE? *Where is your non-human persona located?*
Shaded floor areas and trees around urban and rural Tamaki Makaurau

Sketch this persona

WHY? *What makes you want to protect this persona (use data if you have it)*
The Auckland Green Gecko is under threat, as they approach endangerment. Any native animal that's under threat is an issue in my opinion, so protecting them is highly important in keeping the identity of our wildlife in Aotearoa.

NEEDS *What does this persona need in this specific project context*
Auckland Green Geckos need habitats to live and breed in order to repopulate

OTHER *Describe other pertinent considerations about your persona relevant to this project*
Food and water, as well as a mix of habitats as they dwell in both trees and on the floor. Surrounding wildlife so that there isn't a clash.

LEVEL OF VULNERABILITY WITHIN THIS PROJECT CONTEXT

Barely affected *Neutral /don't know* *Deeply affected*

Stakeholders

Non-Human Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use popular and/or scientific name*
NZ native bees

MAIN DESCRIPTOR *What type of persona is it?*
Environment user and worker

WHERE? *Where is your non-human persona located?*
Any areas with flowers around urban and rural Tamaki Makaurau

Sketch this persona

WHY? *What makes you want to protect this persona (use data if you have it)*
Vitally important to the environmental health of Auckland, and under threat from lack of habitat and areas to pollinate and feed.

NEEDS *What does this persona need in this specific project context*
Habitats, areas to feed and drink, flowers for pollination and nectar, areas to build beehives. Like honey bees, these native bees forage on flowers. While they collect nectar and pollen for food they pollinate the plants they visit. However, their life is very different from the domesticated honey bee.

OTHER *Describe other pertinent considerations about your persona relevant to this project*
Needs to be relatively safe from predators and human interference after certain stages

LEVEL OF VULNERABILITY WITHIN THIS PROJECT CONTEXT

Barely affected *Neutral /don't know* *Deeply affected*

DESIGN 4CONSERVATION
D4C Toolkit: UNDERSTAND www.design4conservation.com
Created by Gabriela Baron (2021)

Non-Human Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use popular and/or scientific name*
Common Auckland fly

MAIN DESCRIPTOR *What type of persona is it?*
One of the main food sources for omnivore Auckland green geckos

WHERE? *Where is your non-human persona located?*
All over Auckland and NZ. In nature as well as all around industrial areas. All over urban spaces.

Sketch this persona

WHY? *What makes you want to protect this persona (use data if you have it)*
This persona has been included due to my want to increase the population of Geckos, by increasing the population of Geckos, more flies will be eaten, thus they need to be considered as well.

NEEDS *What does this persona need in this specific project context*
Enough space to keep their population up, but through an increase in geckos it should help manage the influx of flies in urban NZ at the moment.

OTHER *Describe other pertinent considerations about your persona relevant to this project*
Need to ensure that the natural equilibrium between prey and predator isn't damaged or interrupted and is instead shifted slightly to balance better.

LEVEL OF VULNERABILITY WITHIN THIS PROJECT CONTEXT

Barely affected — *Neutral /don't know* — *Deeply affected*

Human Persona

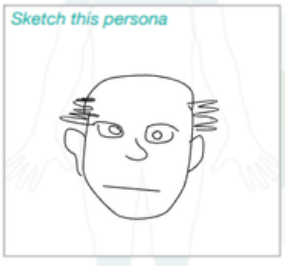
Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a realistic name*
Grant Howard

MAIN DESCRIPTOR *What type of persona is it?*
Local football club director / owner

WHO? *Personal profile segmentation: age, gender, location or any other pertinent descriptors*
Grant is a 68 year old male, he runs a business on the side, but spends most of his time looking after his football club, he get's everything set up for match days and organises everything about the club (pitches, players etc.)

Sketch this persona



QUOTE *Which is the essence of this person in a quote that they could say?*
"**Hard work beats talent when talent doesn't work hard.**"

GOALS *What is their main motivator? Which latent needs and desires?*
Grants main motivator is running a successful and sustainable football club (sustainable financially). He wants to keep the club successful on and off the field.

ATTITUDE *Describe their point of view/expectations/behaviors within the project context*
Grant is from an older generation, he would be open to improving the surrounding areas of his club and pitches if it had no impact on the facilities and didn't cost him anything.

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed — *Neutral /don't know* — *Conservation hero*

Human Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a realistic name*
Fraser Ross

MAIN DESCRIPTOR *What type of persona is it?*
Local urban events organiser

Sketch this persona

WHO? *Personal profile segmentation: age, gender, location or any other pertinent descriptors*
Fraser works for the local council organising events for the public community. He is in his early 30s and has a young son.

QUOTE *Which is the essence of this person in a quote that they could say?*
"There is no power for change greater than a community discovering what it cares about."

GOALS *What is their main motivator? Which latent needs and desires?*
Fraser wants to create a community bond around the events and work he does, he wants people to be committed to improving their local communities, and through community events he is able to improve the livelihood of his local population.

ATTITUDE *Describe their point of view/expectations/behaviors within the project context*
Fraser is all for securing a better future for his local community. He wants a safe world for his son to grow up in, and hopes to use his community events to promote a greater way of living.

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed — *Neutral /don't know* — *Conservation hero*

Human Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a realistic name*
Jacob Michael

MAIN DESCRIPTOR *What type of persona is it?*
Football enthusiast

Sketch this persona

WHO? *Personal profile segmentation: age, gender, location or any other pertinent descriptors*
Jacob is a 31 year old male, living in Denmark and working for Unisport as a football equipment reviewer. He has a high interest in football technology and innovation.

QUOTE *Which is the essence of this person in a quote that they could say?*
"a winner is just another loser who tried one more time"

GOALS *What is their main motivator? Which latent needs and desires?*
Jacobs main motivator is being at his very best, both on and off the pitch. He is aware of his own energy needs, and shares when he can while also knowing when he needs space.

ATTITUDE *Describe their point of view/expectations/behaviors within the project context*
Jacob is always excited with any innovation in football. Anything new, no matter if it's successful, unsuccessful, or just interesting, spikes his interest. He is interested to see how this project will develop, and if it could perhaps offer performance benefits as well as environmental ones in the future.

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed — *Neutral /don't know* — *Conservation hero*

DESIGN 4CONSERVATION

D4C Toolkit: UNDERSTAND www.design4conservation.com
Created by Gabriela Baron (2021)

Organisation Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a real name*

Auckland Council

TYPE *What type of organisation is it? Describe it briefly.*

Local Council

Paste their logo/brand

Te Kaunihera o Tāmaki Makaurau
Auckland Council

ROLE *What is this organisation's role within this project? Why?*

Has the rights to majority of urban green spaces in Auckland, and also inspired the idea of redeveloping urban green spaces. With their backing, my project could be implemented onto the urban green spaces that they currently run. They also have ownership to a lot of local parks and fields that football teams use.

What would this organisation provide?

- [ ] *Funding*
- [ ] *Work force*
- [ ] *Specialists/Advice/Knowledge*
- [x] *Physical space*
- [ ] *Products*
- [ ] *Access/Connections*
- [x] *Outreach/Advertising*
- [ ] *Other:*

MOTIVATIONS *What are the organisation goals (relevant to the project)? Why will this organisation be motivated to participate in your project?*

A healthier and more sustainable Auckland is the main focus of their "Auckland Plan 2050", and my project is attempting to build towards both of these aspects.

OTHER *Describe other pertinent considerations about this organisation relevant to this project*

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed — *Neutral /don't know* — *Conservation hero*

Organisation Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a real name*

Ngā ara whetū centre for climate, biodiversity and society

TYPE *What type of organisation is it? Describe it briefly.*

"Transdisciplinary innovation and collaboration in research, education, and engagement for thriving peoples and planetary wellbeing"

Paste their logo/brand

UNIVERSITY OF AUCKLAND Waipapa Taumata Rau NEW ZEALAND | NGĀ ARA WHETŪ CENTRE FOR CLIMATE, BIODIVERSITY & SOCIETY

ROLE *What is this organisation's role within this project? Why?*

Ngā ara whetū is the provided project partner for my capstone project. They will provide feedback, insight, specialized knowledge, and support throughout my capstone journey.

What would this organisation provide?

- [ ] *Funding*
- [ ] *Work force*
- [x] *Specialists/Advice/Knowledge*
- [ ] *Physical space*
- [ ] *Products*
- [x] *Access/Connections*
- [ ] *Outreach/Advertising*
- [ ] *Other:*

MOTIVATIONS *What are the organisation goals (relevant to the project)? Why will this organisation be motivated to participate in your project?*

"attaining sustainable futures and collective wellbeing through enabling and enhancing collaborative research and training. Ngā Ara Whetū is networked with local and global communities of purpose, practice and understanding, who share aspirations for accelerating actions that promote lasting protection of the planet, its natural resources, and peaceful, just and inclusive societies."

OTHER *Describe other pertinent considerations about this organisation relevant to this project*

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed — *Neutral /don't know* — *Conservation hero*

DESIGN 4CONSERVATION

D4C Toolkit: UNDERSTAND www.design4conservation.com
Created by Gabriela Baron (2021)

Organisation Persona

Define the main stakeholders involved in your project. Use as many templates as you need.

NAME *Use a real name*
Sport New Zealand

TYPE *What type of organisation is it? Describe it briefly.*
Nationwide sports organisation

Paste their logo/brand

SPORT NEW ZEALAND
IHI AOTEAROA

Active Friendly Environments Project | Sport New Zealand - Ihi Aotearoa

The Active Friendly Environments Project is a 2004-2006 pilot study coordinated by North Shore City Council supported through Sport New Zealand investment

ROLE *What is this organisation's role within this project? Why?*
Sport New Zealand would be crucial in organizing and spreading my project across the country in the future. Their support would allow my project to grow, and offer a large platform of contacts to work with.

What would this organisation provide?

- [ ] *Funding*
- [x] *Work force*
- [x] *Specialists/Advice/Knowledge*
- [x] *Physical space*
- [x] *Products*
- [x] *Access/Connections*
- [x] *Outreach/Advertising*
- [ ] *Other:*

MOTIVATIONS *What are the organisation goals (relevant to the project)? Why will this organisation be motivated to participate in your project?*
Sport NZ have been big on promoting sustainability in NZ sport since 2006, and through the use of sport in combination with sustainable practices and outcomes it allows NZ sport to promote their values through my project.

OTHER *Describe other pertinent considerations about this organisation relevant to this project*

LEVEL OF COMMITMENT WITH THE CAUSE

Not committed *Neutral /don't know* *Conservation hero*

Created by Gabriela Baron (2021)

Project Scope

Plan A: My most ambitious and hopefully successful plan is to create an event using an area of green urban space not normally used for sport. The event would focus on creating a more sustainable football world, while also showcasing a way that football could transform urban spaces into habitats for local wildlife and plantlife. This would be achieved through the creation of seed planting studs, as well as a seed dropping football and an information booklet. By utilizing this urban space I could have almost an art piece installed from the seeds planted throughout the game. This would create a 1 of 1 layout of stuff growing that showcased the exhibition game that took place there, this would be represented through a scaled pitch mock-up, as well as a pitch mock-up for how clubs could have their pitches in the future. the seed packs used in the studs could be chosen to specifically benefit the local wildlife of the urban areas used. The event could also showcase to clubs that are involved how they could have a more positive impact on the environment, i.e. through fertilizers, plantlife around fields, paints used, water used, etc. This could be done through the information booklet mentioned earlier. This plan places a heavy reliance on the availability of materials and workspace, which ideally I will be able to use and access.

Final Deliverables - Functioning Seed studs, ball, 2 pitch mock-ups, information booklet

Plan B: Plan B is less ambitious than plan A, but sticks to the same core deliverables. I would still look to create an event with functioning seed studs, as well as a pitch mock-up and information booklet. However the seed ball would be dropped to make it more easily achieved than plan A. I think that the pitch mock-up and information booklet are crucial parts of this assignment, as they allow me to demonstrate my project visually, as well as propose my projects narrative with evidence from the booklet. Plan B, while still focusing on creating an event, would place a greater importance on functional final deliverables than the event. Creating a conceptual event is another ambitious step in scope, thus being a greater part of Plan A than Plan B. This plan still relies on the availability of materials and workspace, however by removing one of the physical final deliverables, less materials will be needed.

Final Deliverables - Functioning Seed studs, urban space mock-ups, information booklet

Plan C: Plan C is the most achievable plan / scope for my capstone project. There is less focus on creating a functional product and more on presenting and validating my idea. With this, there would be a greater focus on developing the information booklet, while also creating a less ambitious stud prototype. With a focus on the booklet, research would be an even more crucial tool, as my idea would have to be conveyed without a functioning product, instead with a detailed concept. Plan C places more of a reliance on my computer work and deliverables that can be created with less reliance on materials.

Final Deliverables - Stud prototypes, information booklet

Propose & Validate

The Propose and Validate phase draws inspiration from natural systems and represents a time-tested method for addressing challenges. By blending ancient wisdom with cutting-edge technologies, there's the potential to generate remarkably inventive and durable concepts. In the Propose and Validate phase, rapid and rudimentary prototyping is crucial. It can be achieved by embracing early testing, learning from initial setbacks, iterative development, and enhancing the clarity of initial concepts. (D4C 2021)

Throughout this project, I developed 2 separate stud prototypes - one mechanical and one organic.

Idea Selection Checklist

This tool helps teams select their best ideas. Once you have finished brainstorming, group your ideas into themes. Select the ideas that seem more desirable, feasible and viable.

1. *Select your best 3 ideas and give them a clear, interesting, short name.*
2. *Discuss how each of the following attributes may apply to each one of them using the attached checklist.*
3. *Add 1 point per checked attribute.*
4. *Use the idea with the most points to move forward.*

NAME:

1 SeedSculpt

seed planting studs. By playing a match players would plant different seeds over green spaces. could be used for replanting over preseason or on areas not normally used for football to create individualized exhibitions?

ADEQUATE / SUSTAINABLE

- [x] functional
- [x] purposeful (noble and altruistic)
- [x] scalable/ replicable
- [x] context-related (local)
- [ ] sustainable (in all it's life cycle)

CREATIVE / INNOVATIVE

- [ ] simple/clear
- [ ] original/innovative
- [ ] resilient
- [ ] smart / challenging
- [ ] resonant (beautiful/fun/ unexpected/familiar)

- [x] magical (bonus point!)

This idea allows me to incorporate my biggest passions in my life (football and design) to create something that I think could begin a powerful movement and create both meaningful and unprecedented results.

TOTAL 10

NAME:

2 PlantSoles

Insoles that when broken can be planted in the garden and grow something or give extra nutrition to soil? - Nike created insoles from castor beans (precedent)

ADEQUATE / SUSTAINABLE

- [ ] functional
- [x] purposeful (noble and altruistic)
- [x] scalable/ replicable
- [ ] context-related (local)
- [x] sustainable (in all it's life cycle)

CREATIVE / INNOVATIVE

- [x] simple/clear
- [x] original/innovative
- [ ] resilient
- [x] smart / challenging
- [x] resonant (beautiful/fun/ unexpected/familiar)

- [ ] magical (bonus point!)

Why is it magical?

TOTAL 7

NAME:

3 FutureField

Exhibition field designed with tree goals, natural lines created from native flowers etc.

ADEQUATE / SUSTAINABLE

- [x] functional
- [x] purposeful (noble and altruistic)
- [ ] scalable/ replicable
- [x] context-related (local)
- [x] sustainable (in all it's life cycle)

CREATIVE / INNOVATIVE

- [x] simple/clear
- [x] original/innovative
- [x] resilient
- [x] smart / challenging
- [x] resonant (beautiful/fun/ unexpected/familiar)

- [x] magical (bonus point!)

This idea also incorporates my passions. But instead presents less of a physical product and more of an experience.

TOTAL 10

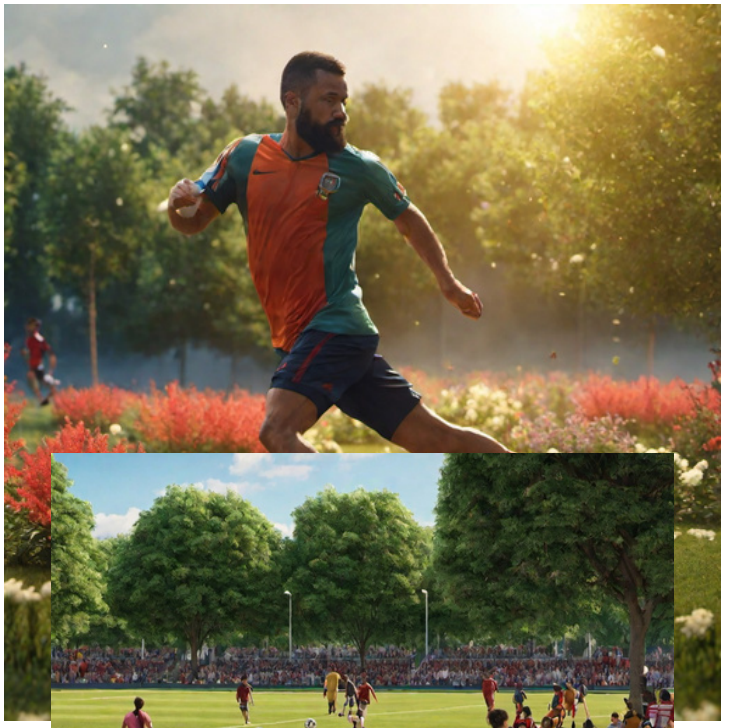
AN EVENT THAT USES FOOTBALL TO CREATE WILDLIFE HABITATS.

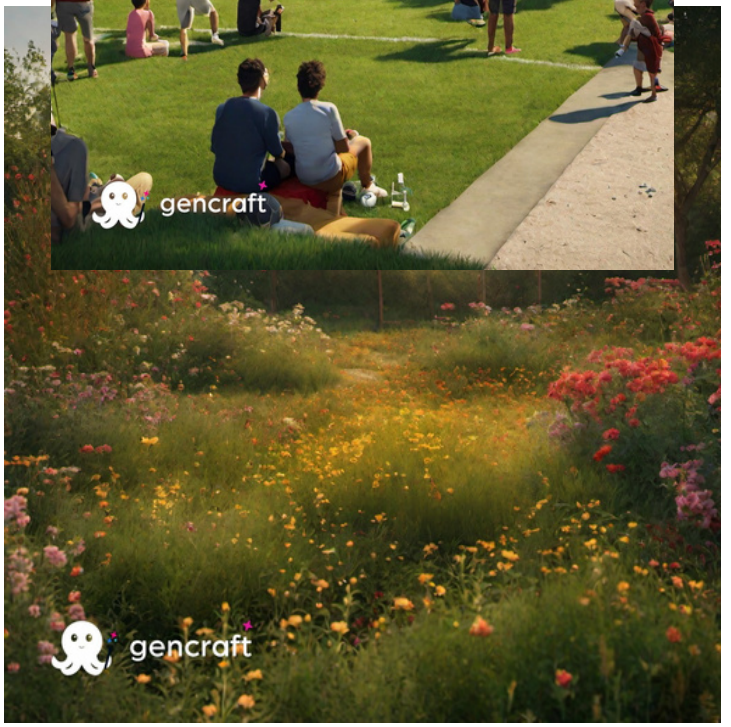
Through creating studs that can house and plant seeds, an area of green urban space not normally used for sport (i.e. local reserves and parks) could have an environmental art piece installed from the seeds planted throughout the game. This Would create a 1 of 1 ecosystem that showcased the exhibition game that took place there. The Seed packs used would be chosen to specifically benefit the wildlife of the urban areas used. the events would raise awareness for greener football by using the sport to benefit multiple natural species, and also showcasing to clubs that are involved how they could improve their set-ups, i.e. fertilizers, plantlife around fields, paints used, water used, etc through a casebook detailing how this can be achieved.

Urban space and Experience concept images

AI concept images for the use of urban space and the experience of my event created using the prompts "people watching a soccer game in an open park", "old football field now growing flowers and bushes" "soccer player running with a trail of flowers on the pitch behind him", and "soccer player playing on grass full of flowers and trees".

These were generated to both show how the event could look utilising urban green spaces for football, while also showing my metaphorical vison with the players creating these flowery habitats. (The game wouldn't actually happen with the flowers there)





Football boot and stud concept images

Ai generated concept images using prompts "soccer cleat studs planting flowers and trees for bees and lizards", "Football boot surrounded by wildflowers, bees, and lizards", "Football stud planting seeds in the ground", and "Soccer cleat planting trees and flowers for wildlife".

These images capture the mood of what I want to create well, however the AI software struggled with understanding what my idea meant with the prompts, and didn't do much with the studs on the bottom of each boot. The image in the bottom right showcases the idea in the best way, as the studs are shown well and the environment which they are planting in is the most realistic for my vision.

Utilising Surrounding Pitch Space concept images

Ai generated concept images using prompts "soccer field surrounded by plantlife and wildlife", "people watching a soccer game in a meadow of flowers", "soccer game surrounded by wildflowers and trees".

These images were created to convey how pitches could better utilise their surrounding spaces, and how the viewing experience could be. This is useful to demonstrate my vision to clubs and stakeholders.

SeedSculpt

an area of green urban space not normally used for sport could have almost an art piece installed from the seeds planted throughout the game. Would create a 1 of 1 layout of stuff growing that showcased the exhibition game that took place there. Seed packs used would be chosen to specifically benefit the wildlife of the urban areas used. Could also include the seed ball idea alongside the studs. + use the event to raise awareness for greener football. Showcase to clubs that are involved how they could improve their set-ups, i.e. fertilizers, plantlife around fields, paints used, water used, etc. This could be done through a casebook.

Service Delivery Blueprint

This Service Delivery Canvas will help your team to prototype different aspects of your project, based in the interactions between people and your offer.

1. Which Sustainable Development Goal are you supporting with this project (It maye be more than one)? Circle it/them.
2. Choose your main human persona, give it a name and write down its main descriptors in the spaces provided. If you have enough/time/resources, you can run this activity for all your human and non-human personas.
3. Start by filling out the people line following a time sequence (Before, During and After use).
4. Fill out the front stage lines, define staff activities and touchpoints, be specific.
5. Fill out the backstage lines, define support activities and support elements, be brief but specific.
6. Decide what you need to develop in order to support the delivery of your project, be brief but specific.
7. Think about the user's experience for each activity, how do they feel? You can use emojis placing them on the good, neutral or bad experience moments.

Finally, understand if you are addressing your conservation challenge goals correctly, iterate as needed.

GOALS *Which SDG goals are you addressing?*

NAME *Use a realistic name*	MAIN DESCRIPTOR *What type of persona is it?*
Jacob Michael	Late 20's male football enthusiast

TIMELINE	BEFORE Notice, understand, be triggered...	DURING Participate, attend, use, buy, donate, relate, communicate, etc.	AFTER Relationship building, communication, education, community....
EXPERIENCE USER EXPERIENCE *Try to estimate the emotions of your users for each service moment* GOOD / BAD	Excited about new football technology Excited to see more sustainability in football Unsure of how it all works	loves the hands on experience with studs interested in how clubs could improve their existing infrastructure Learns the importance of habitats for local wildlife Learns about chosen plant-life and its benefits	Connected with the local football community Shares his experience with others Educated on local wildlife issues Has something to take home
PEOPLE ACTIVITY *What does the user do?*	The user is advised of my project through social media and advertising, is excited to see it in action and get his hands on a physical copy. Books tickets and travels to the event location	Gets to play with the studs Can take some studs home (or stud mold to create their own) Has an educational conversation about environmental improvements from the project Reads about seeds used and improvements in case book watches some of the football event	Travels home, excited to see what will become of the space in a few months Speaks to his club and coach about how their facilities could be better utilised
FRONT STAGE TOUCH POINT *What do the user/staff use for this action? (folder, form, vehicle, tools card, app, etc.)*	Mobile phone Car Football Social media Football boots	Mobile phone Football Green urban space New studs Football boots Information case book Hands on with seeds Mock-ups and examples Seating / viewing area	New studs information booklet Mobile phone Car
FRONT STAGE ACTIVITY *What happens? What does the staff member do? What does the application do?*	Prepare event space Set up information areas and main pitch Ensure studs are ready Prepare players	Conversations with attendees of event Showing and talking about examples, prototypes, and mock-ups Showing process and future insights Organising the game	Quick water of the field Pack up viewing area and left over items from event
line of visibility			
BACK STAGE INTERNAL PROCESSES *What do your employees or systems do behind the scenes?*	Testing of studs Advertise collection of seeds Speak to stakeholders Set up of pitch discussions and agreements on right to use / alter space	Studs plant seeds problem-solving incase something goes wrong Urban space is sowed by game Learning from conversations with attendees	Repeat process for next event Share contact details
BACK STAGE SUPPORT ELEMENTS *Tools and systems necessary to support the staff (notebook, training, software, etc.)*	Open green urban space Volunteer education and training Space permits Event organisation Seed collection Pitch set up Manufacturing materials	Open green urban space Space permits Replacement studs and seeds Players A refereeing team Health and safety set up (physios present?)	Further permits for other spaces check ups on the space to see if it's growing establish a support system and community
WHAT TO DEVELOP? *What will you need to make in order to deliver this service moment? (apps, spaces, products, training, communication items, documents, signage, etc.)*	Functioning studs Information booklets turn an urban space into a pitch Permits Footballs Advertising Referees	Relationships with attendees and the local football and environmental community An understanding of local areas and ecosystems to know what plant-life to incorporate A successful and enjoyable atmosphere at the event	Reviews Plans for next events Permits for next events Relationships with local communities and councils

Created by Gabriela Baron (2020)

SeedSculpt Stud Prototyping




Dismantled 2 pieces of stud (Aluminum core and plastic shell). The core will be what I'll be mostly focusing on, while the shell will be hollowed out slightly to allow room for seeds and mechanics.

Size of seeds

Max area per ryegrass seed (ryegrass used as it is the most commonly used grass for football pitches, and was the only common seed with size measurements available)

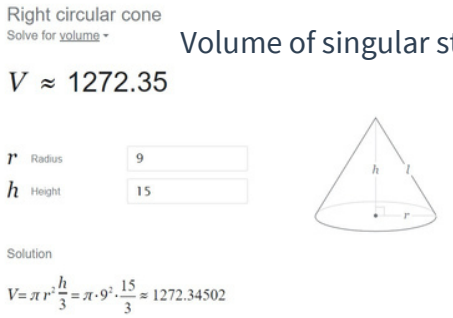
can fit around 30 seeds into the volume of the stud

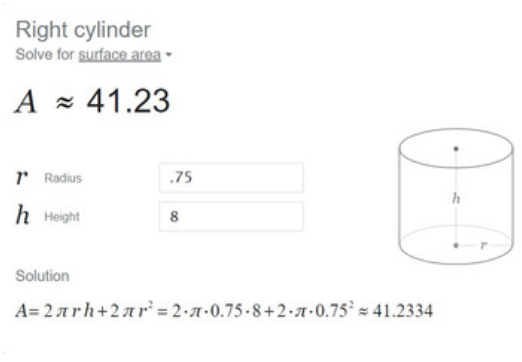
1272 / 41 =

31.0243902439

This however leaves no room for mechanics and reinforcement

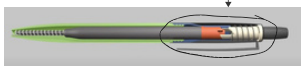
Volume of singular stud

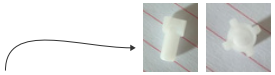




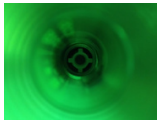
Prototype 1 (conical pen mechanics)

Angled-tooth cam





When the top of the pen is pressed, this piece rotates, locking the pen in place. When it is pressed again, it rotates again to allow the pen to slide back up.



Notches that lock and slide

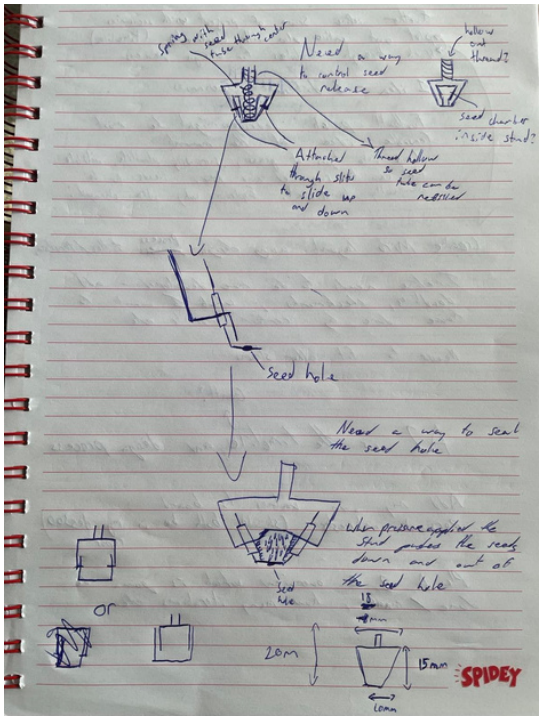
SeedSculpt Stud Prototyping

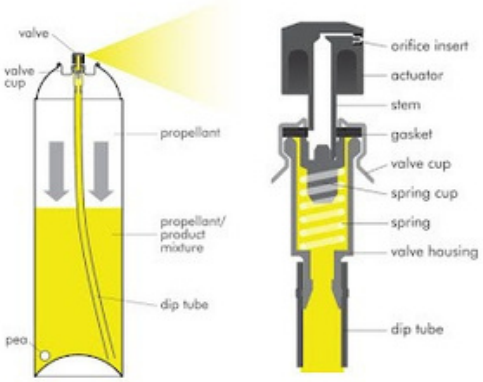
Prototype 2 (Cylinder Cologne mechanics)

If we change the shape of the stud to a cylinder then we triple the volume, thus allowing more room for mechanics and seeds.

amount of rye seeds that would fit in cylinder volume

Initial Sketches





However with a cylinder, there is a loss of direction for the seeds to exit the stud.

Could instead deposit nutrients into the soil? improved soil quality means the pitches will grow better. Plantlife around the pitches would also benefit which in-turn would improve livelihood of local wildlife.

Creating a stud like the head of a cologne bottle would allow for this cylindrical shape and increased volume for mechanics and seed storage will also presenting the possibility for pressurized release of the seeds.

"Grass needs 16 key nutrients to grow, but for fertilization purposes, the most important three are nitrogen, phosphorus, and potassium. These are the nutrients your grass probably doesn't have enough of, and these are the three that will help your grass grow thicker, faster, and stronger."

"Why are nitrogen, phosphorus, and potassium so important?
Their effects can be remembered with the phrase "up, down, and all around." Nitrogen helps grass grow up, phosphorus helps roots grow down, and potassium increases the all-around health of the grass, like disease resistance."

SeedSculpt Stud Prototyping

Prototype 3 (Twist mechanics)

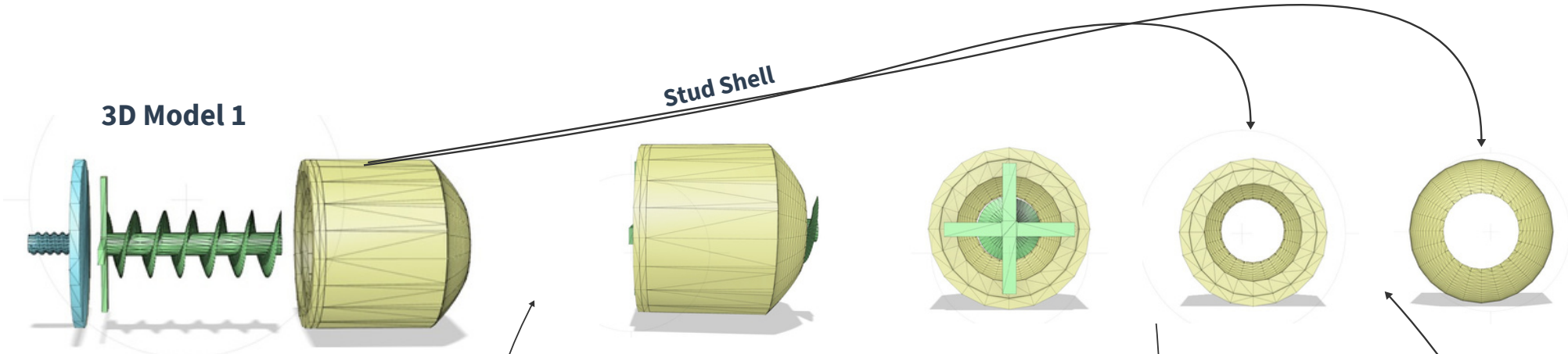
Look into twisting motion or running motion to release seeds instead of pressure? twist and release leaves more room and is a simpler system.

A funnel like system similar to a pepper mill (minus the grinding aspect) could work well. Using gravity and an angled interior, the seeds could be directed out of the stud without excessive need for springs, and could be released when the stud is twisted.

With this, it seems that making the stud slightly angled (conical) would still allow a lot of volume while also providing direction for the seeds. With a twisting motion like this, minus the grinding aspect, the seeds could be picked up by the twister in the middle and taken out of the stud and into the ground.

When you run, your foot naturally rotates inward to help absorb impact as you hit the ground, called pronation (Smiths Sports). On average, the foot rotates 10 degrees during a gait cycle while running, with the toes twisting inwards and the heel twisting outwards. Furthermore, players twist and pivot frequently in football. With this however, I need to make sure that the twisting mechanic of the studs is successful in either direction - or locks in one direction and only carries seeds down when twisted the right way.

3D Model 1



Spiral Seed carrier - Inspired by the mechanics of a pepper grinder, this spiral piece is the core of the stud, and positions itself slightly protruding from the end of the stud. This ensures that the spiral can be in contact with the ground, and thus use the ground to twist. By twisting, seeds should position themselves within the shelves of the spiral, and as the spiral twists in the ground, these seeds will move down the spiral and eventually out of the stud and into the ground.

Initially built with a circular base, I realized that the seeds wouldn't be able to be replaced after the core of the stud empties, so by changing to a cross-shaped base, it still keeps the rotational ability to spin while supported, but also offers gaps for the stud to be refilled.

Within the stud shell, there is a small lip around the edge that sits 2.5mm in from either side of the 15mm shell diameter. this lip supports the spiral and ensures that it can rotate within the stud system without falling out or moving too much.

The top of the stud and the thread are still under development, I haven't yet figured out a way in which the top of the stop will attach to the rest of the shell while being removable to refill the studs and still allowing for the spiral to rotate. At the moment I'm thinking about threading the outside of the stud shell and attaching the top that way.

Oliver (Sustainability stream)

Feedback Collection

FEEDBACK NOTES

Liked – *What did your audience like about the presentation? Or a particular aspect/part of it?*

Liked the idea that the studs will sow the seeds into the ground. and thinks the shell is designed well and will print easily. Also liked that the studs are universal (will work on most / all boots)

Learned – *What new information did you learn from the feedback provided? Is there anything that could be utilised to your advantage?*

Rotation while playing, as well as the size and measurements for studs and the difference in soleplates on different boots.

Lacked – *What seemed to be missing from the presentation? Was there something unclear that needs further development or researches?*

Mentioned how thin the spiral is, that it will break straight away if 3D printed, and will have a lot of pressure on it in future iterations. Also mentioned the potential for mud to clog the spiral.

Longed for – *What there something completely new that your audience wish to see in the presentation, and would make it more impactful?.*

A more structurally sound spiral design, and maybe use scale to create a larger 3D model to show that your idea will work.

Liked
Learned
Lacked
Longed for

ACTION POINTS

What needs change? Spiral Design

What steps are required to implement this change?

Research into other mechanics that could work. Re-working the spiral to be thicker / stronger / more supported.

Who will do it? I will

What needs change? The risk of mud clogging

What steps are required to implement this change?

Consider how this could affect the function of the stud, as well as ways this could be avoided / utilised.

Who will do it? I will

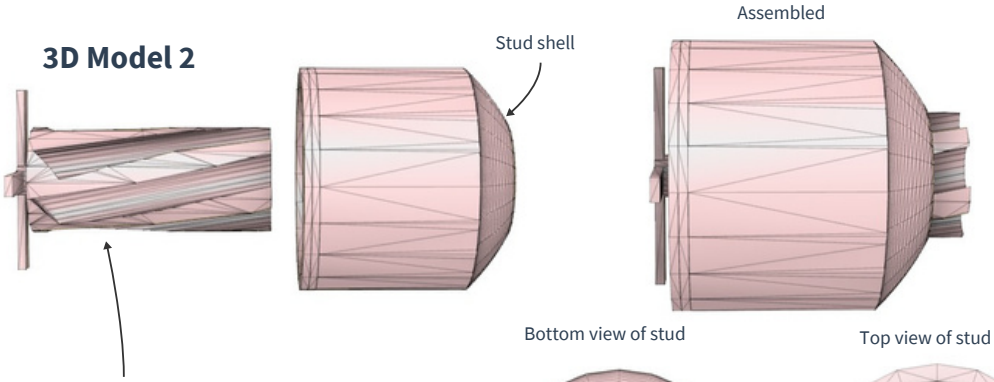
What needs change?

What steps are required to implement this change?

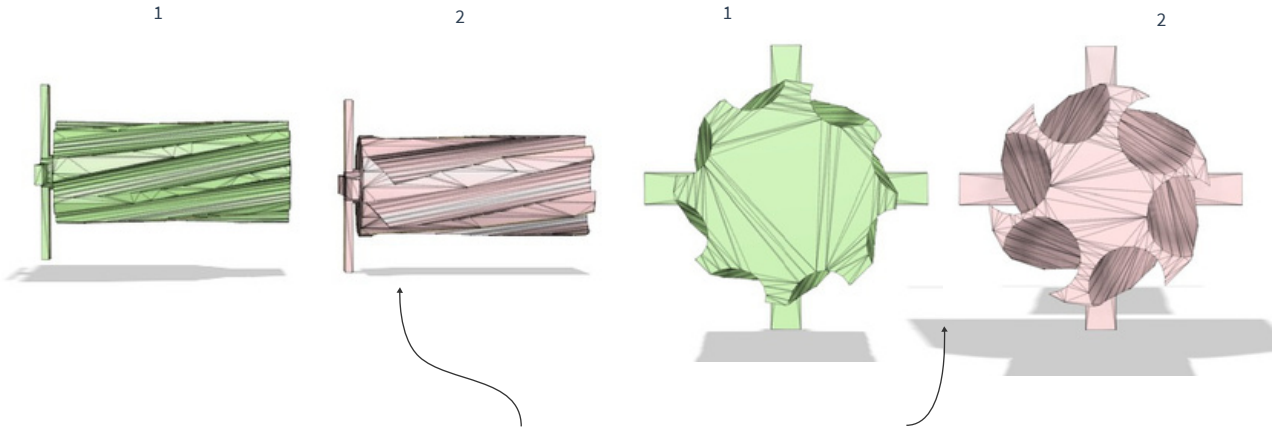
Who will do it?

Created by Gabriela Baron and Baptiste Natali (2020)

SeedSculpt Stud Prototyping



Twisted Seed carrier - Inspired by the mechanics of a salt grinder, this twisted piece is the core of the stud, and positions itself slightly protruding from the end of the stud. This ensures that the twist can be in contact with the ground, and thus use the ground to rotate. By twisting, seeds should catch within the twists, and as it rotates in the ground, these seeds will travel down the twist and eventually out of the stud and into the ground.

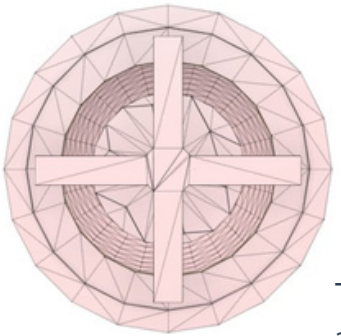


After dismantling a salt grinder, the mechanics are practically the same as the ones presented in the youtube 3D model animation. With this in mind, I'm considering changing the angle and depth of the spirals that are present on my 3D model to something more similar to this precedent, which features much more aggressively angled groves that might produce more efficient results.

I experimented with shapes and depth of the twists ridges and came to two final designs. 1 was the first final design, it has 8 ridges, but they are much shallower. This provides more surface for the seeds to be guided with, however provides a much smaller clearance at the bottom of the stud for the seeds to go through. Design 2 features 6 deeper ridges, providing a much greater clearance at the bottom of the stud for the seeds to pass through. At the moment, both have their ridges at a 22.5 degree angle, this will potentially be increased after physical testing.

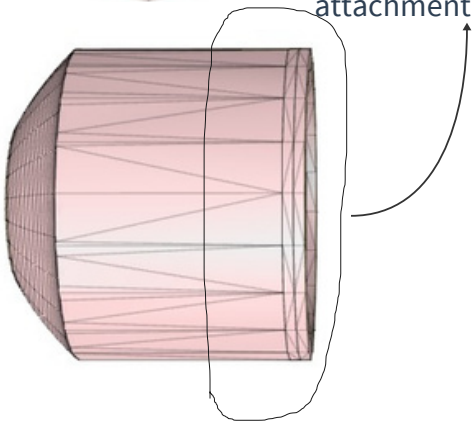
SeedSculpt Stud Prototyping

Top view of stud



Looking into how a thread could be attached to the top of the stud, I'm thinking of threading the outside of the stud shell to create an attachment point.

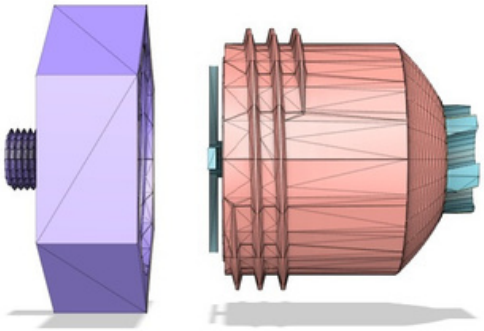
This area could be threaded to allow attachment of the upper part of the stud.

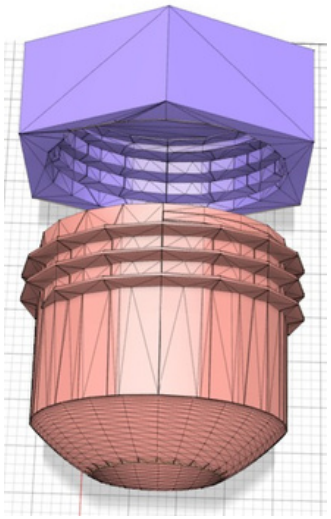


I doubled the width of the support frame of the twist mechanic so it is stronger when 3D printed.

Preparing for printing

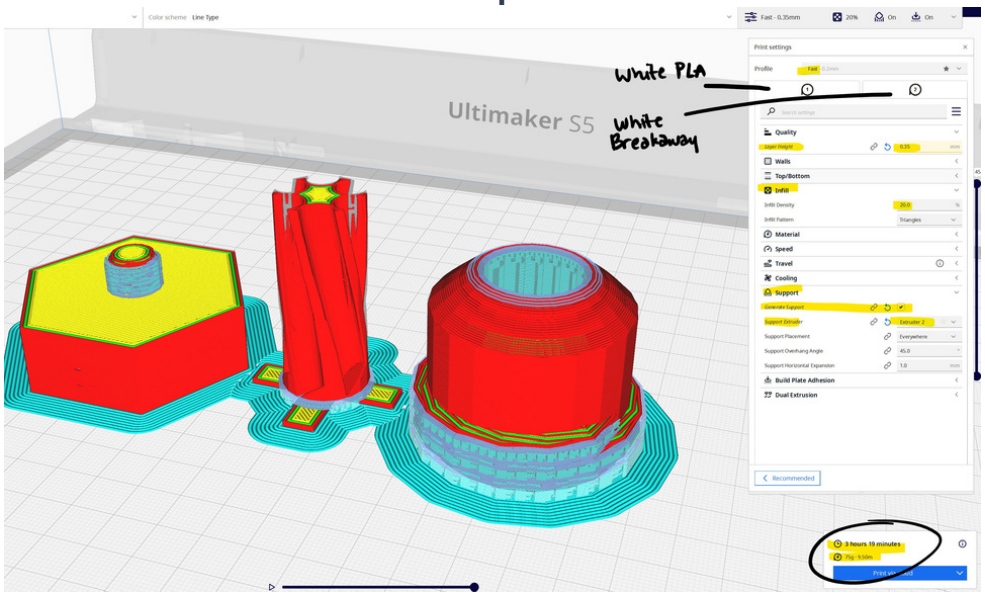
3D Model 3





Hexagonal shape used due to the nature of most stud keys

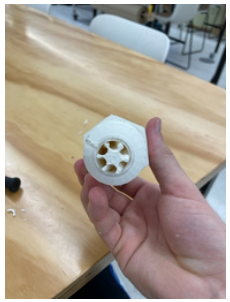
Materials used and Ultimaker set-up

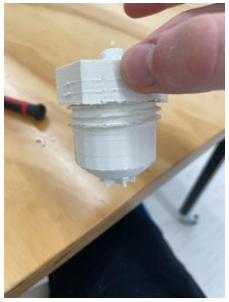


3D printed prototype photos





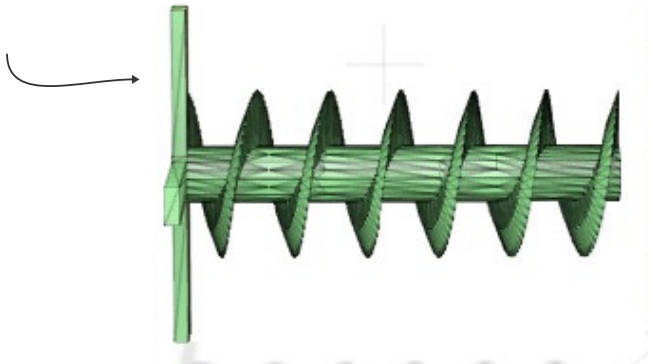





the mechanical twist-stud concept was scaled up three times and 3D printed in the FabLab. I scaled the mechanical model up because it allowed me to better see any flaws in my design, as well as reduced the risk of structural instability from 3D printing something so small. The 3D model was created using white PLA and breakaway through a .8 nozel with a triangular print pattern. These settings were chosen due to the increased printing speed and availability of material. The .8 nozel allows more material to be applied, thus decreasing the printing time, while also increasing the strength of the print. The triangular print pattern was chosen for the same reasons. These settings were then applied in a program called Cura and were transferred to the UltiMaker printers in the FabLab through a .3mf file. Cura was a fantastic tool for this, it provides a view of what your print will look like within the printer, how each layer will be printed, what materials will be used, etc.

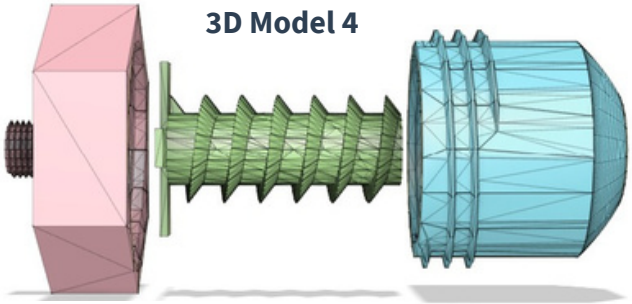
Testing

After testing, my 3D model definitely needs further iteration. Although the testing proved that my idea works, the gaps at the bottom of the stud are too big, and the angles of the groves aren't dramatic enough to restrict the flow of material through the stud. The twisting mechanic worked to carry material that was embedded into its groves, but the majority of material fell straight through the stud due to the gaps between the twist mechanic and the stud. Creating more dramatic angles for my twist mechanic, similar to the 3D model of my first prototype, could reduce the space for material to fall through.

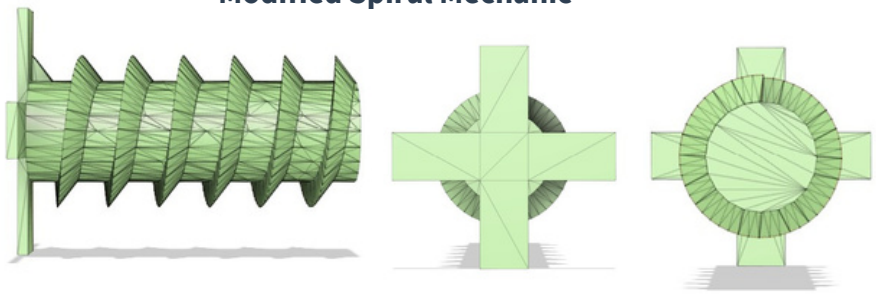


SeedSculpt Stud Prototyping

3D Model 4

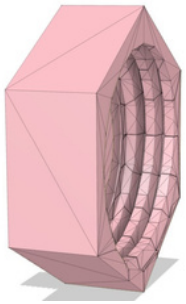


Modified Spiral Mechanic



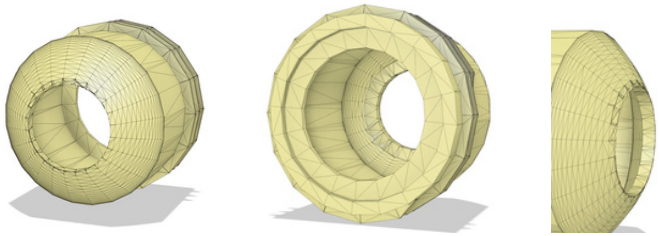
The big change from 3D model 3 to model 4 comes from the new spiral twist piece. After testing the 3D printed prototype of model 3, I found that the twist piece I had designed wasn't fitted enough for the shell, and allowed the seeds within the shell to fall out too
easily. Along with this, it didn't print especially accurately due to the complex shape of the piece, resulting in a few holes on the edges. In order to fix this, I looked back at my earlier models, and how these addressed the issues stated earlier. With this, I found that by going back to a spiral pattern the opening at the bottom of the model is closed off a lot more efficiently, allowing the seeds to better stay in the shell. In order to counter the issues I found with a spiral mechanic in model 1, I thickened the central support beam as well as the ridges for the spiral itself to ensure that the model is strong enough for printing and testing.

Edited Screw-Top

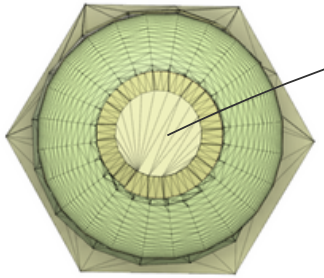


After 3D printing the previous 3D model, I found that the thread I had designed was too tight for the screw mechanics to function properly. In order to improve this, I widened the the gaps within the screw-top to accommodate the thread better, as well as expanding the space at the entrance of the screw-top to allow the thread to fit better and screw in easier.

Edited Shell



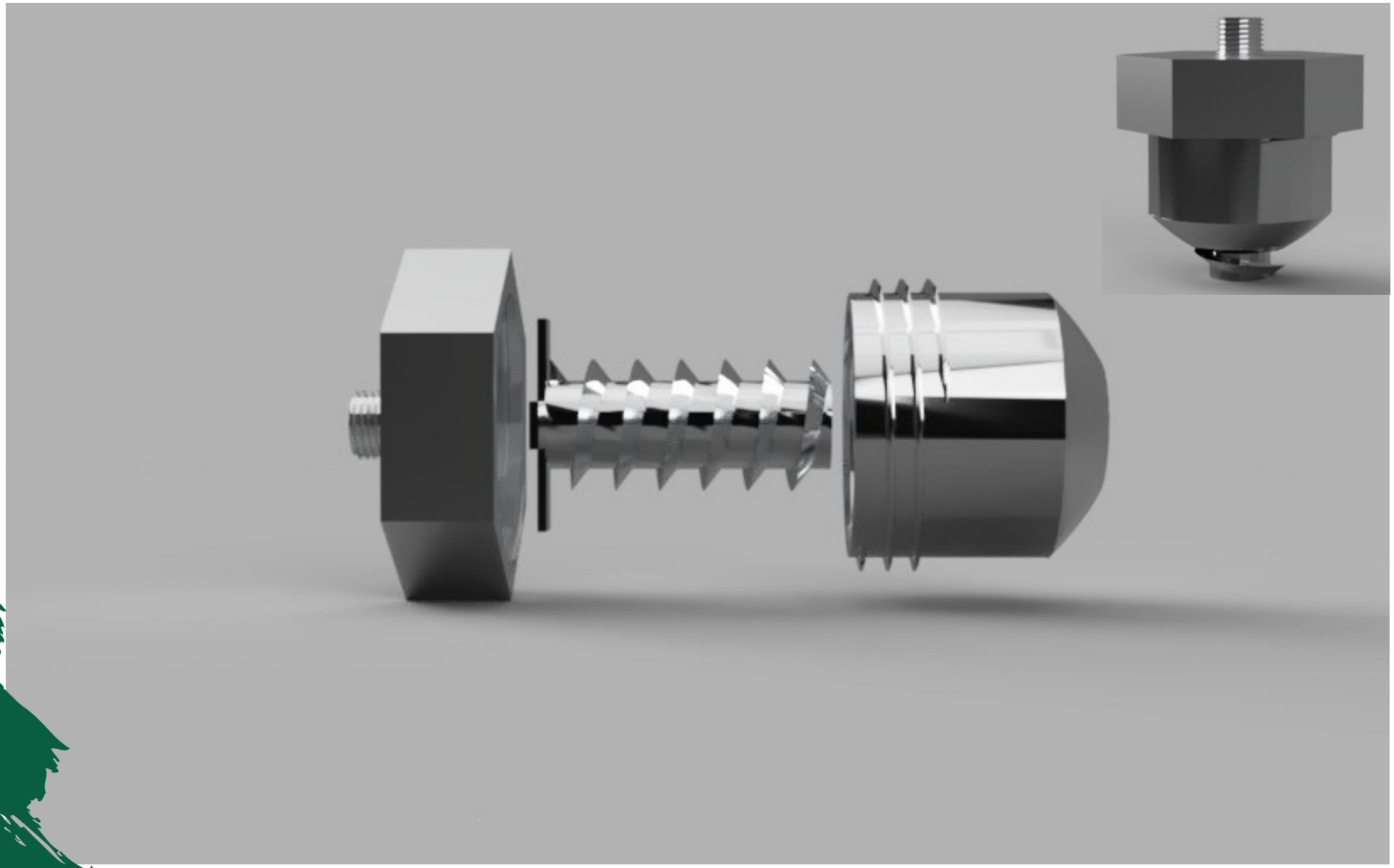
The new outer shell design for model 4 is all about little touch ups. After testing model 3, I found that the tip of the stud was quite weak, and that the threads didn't have enough tolerance to slide easily through the screw-top. With this in mind, I added reinforcement to the end point of the stud to thicken and strengthen it, and narrowed up the thread thickness as well as made them slightly shorter to hopefully allow a more smooth screw- in transition with the screw-top.



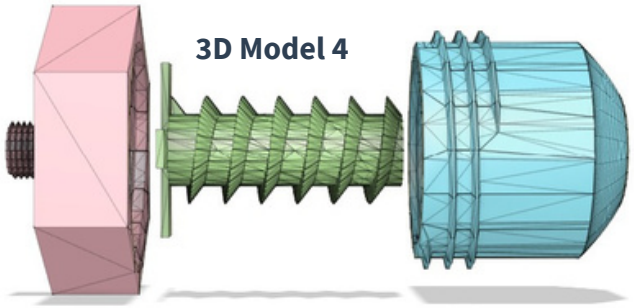
Spiral sits flush and seals off the bottom of the stud to fix the leaking seed issue of the previous model.

3D Aluminum Renders of Model 4

Aluminum used as it is a relatively cheap, light, and durable metal. Predominantly used with pre-existing football studs already.



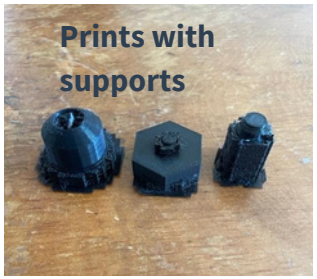
SeedSculpt Stud Prototyping

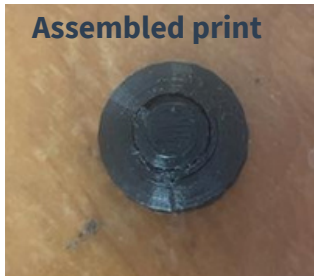


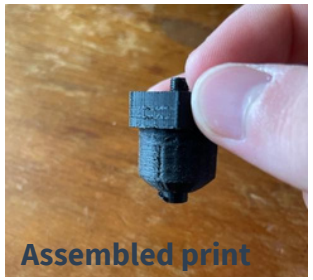
Testing of Model 4 prototype

3D model 4 was tested using a 25 seed mix to ensure that a plethora of seed sizes and shapes work with my model. Some of these seeds were a tight fit however, so may have to be excluded when the model is scaled to its normal size, rather than the 1.5x scale used for this 3D print. The videos above show the testing process of model 4, starting with a shake test to see if the seeds stay in the stud (which they do). This is then followed by two twist test from different angles to show the seeds slowly working their way out of the stud shell through the use of the spiral mechanic. Overall I'm very happy with how this came out, and the proof of concept is all there. Model 4 works as intended. Minor tweaks are needed still with the thread but other than that I think that this prototype is a functioning and feasible model.

3D print of Model 4

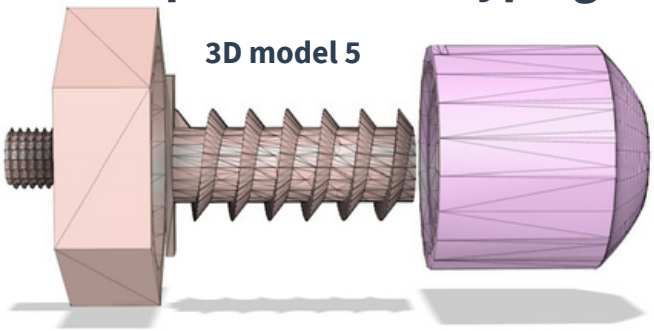


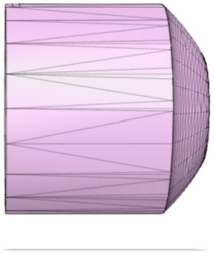




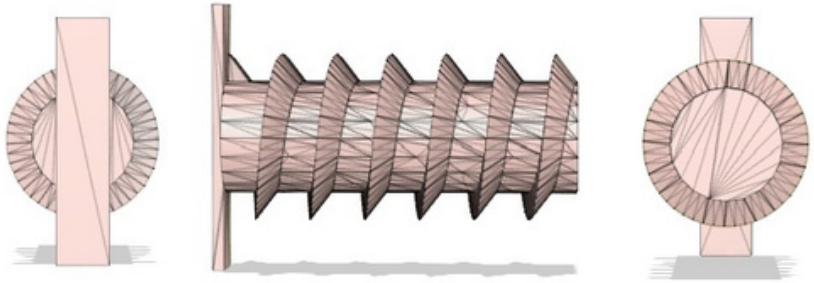
3D model 4 was printed at a 1.5x scale rather than the 3x scale used in the previous print. This was done for three reasons, firstly to test if the parts would be strong enough at a much smaller size, secondly to decrease the printing time, and thirdly to reduce the materials used. The model assembles well, although the fit is still quite tight, so the threaded part of the model will still need further refinement, the spiral piece fits much closer to the core, reducing the gap issues around the tip of the previous model.

SeedSculpt Stud Prototyping



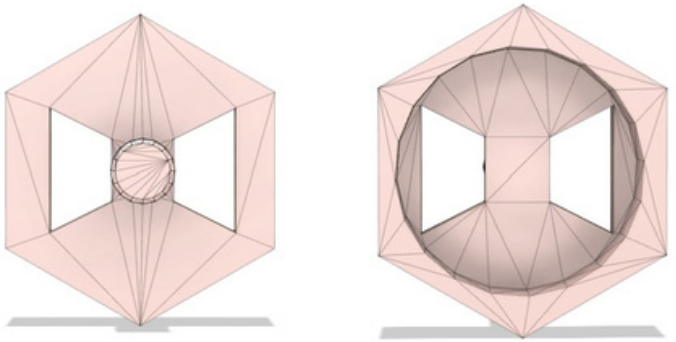


3D model 5 has been reworked due to the struggles I've been having with threading my design. Initially, threading was the only way I thought the top part of the stud shell could work, as I needed to be able to remove the top part of the stud to both assemble it as well as refill the shell with seeds. However after struggling with creating functional 3D modelled threads, I realised that by creating a tight fitting system and creating open areas on top of the shell both of these needs can be addressed without the need for threads.



The spiral mechanic remains mostly unchanged as well, as the spiral piece functioned exactly as I had hoped for model 4. With this however, I thought it would be interesting to see if the spiral would function just as well with only 2 directional support rather than 4, thus removing the cross support. This was removed for 2 reasons. Firstly, to increase the area available for refilling the stud, increasing the efficiency of the refilling process, and secondly to save on materials.

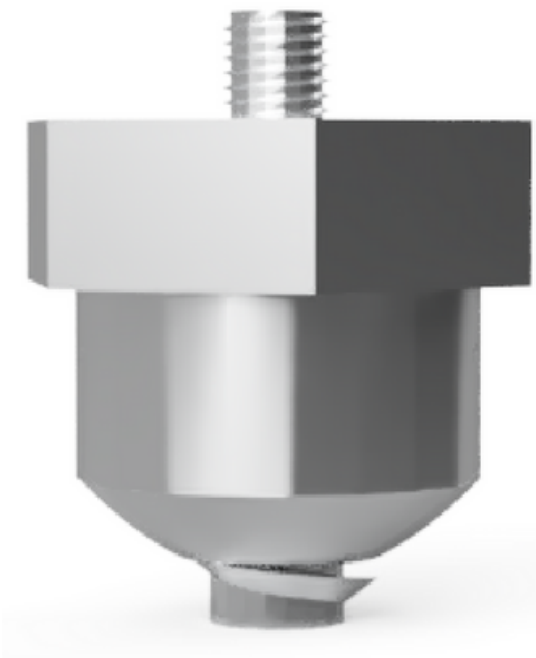
The shell for model 5 remains mostly unchanged from model 4, with the same size, shape, and internal reinforcements and features. The only difference coming with the removal of the threaded outer shell, instead using a tight push fit and potentially glue in order to put all of the models pieces together.

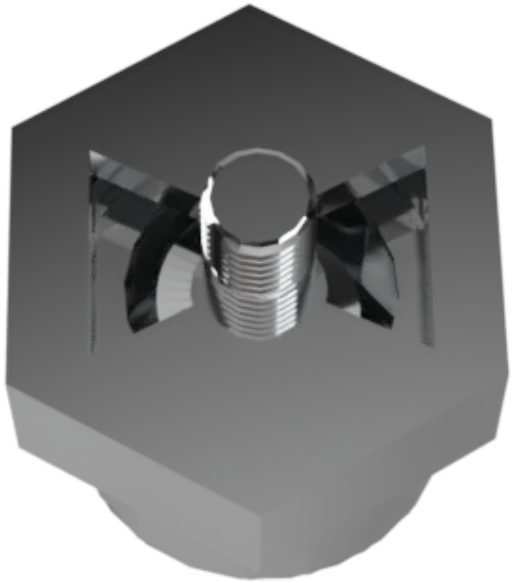


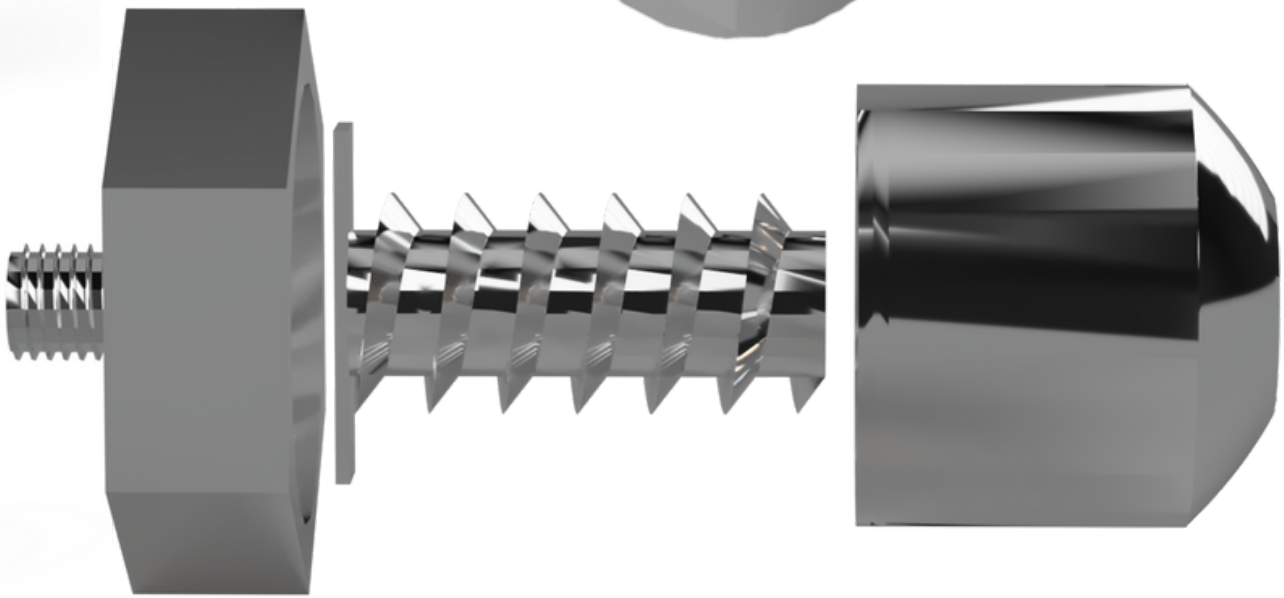
The major changes to model 5 come with the newly designed stud cap. Moving away from a screw top and instead focusing on a tightly fitting cap to close off the model. With this, there have also been cut outs incorporated to ensure that the stud can be refilled without the need of removing the lower shell, thus streamlining the refilling process further and removing the need for threads, reducing the risk of damage or accidental loss of the lower portion of the stud. Once the stud is assembled, glue can be used if needed to ensure that the cap and shell aren't separated, although from previous tests I feel that the tightness of the print should be enough.

3D Aluminum Renders of Model 5

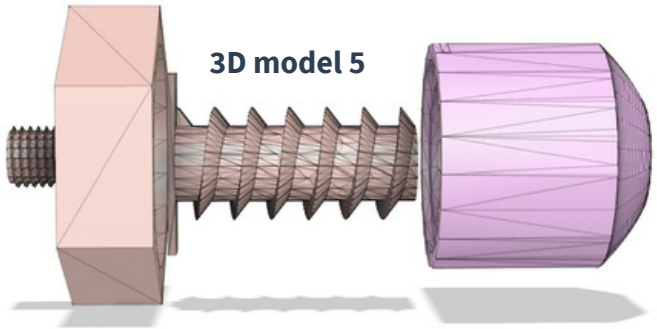
Aluminum used as it is a relatively cheap, light, and durable metal. Predominantly used with pre-existing football studs already.



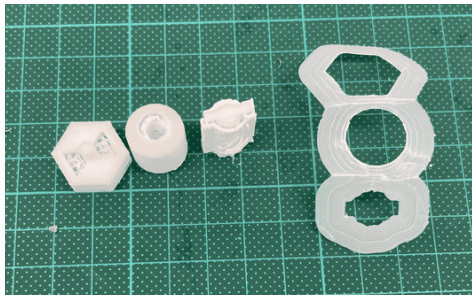




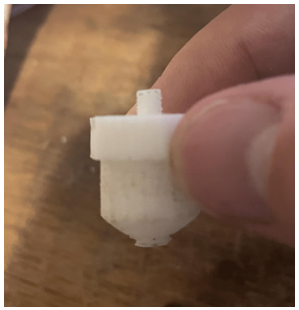
SeedSculpt Stud Prototyping



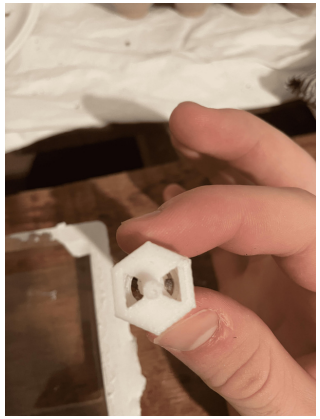
3D print of Model 5



Scale model compared to normal studs



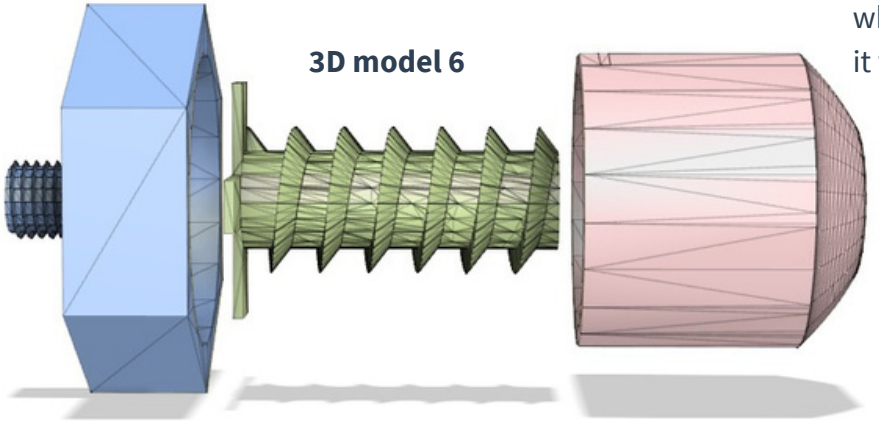
Stud filled with seeds



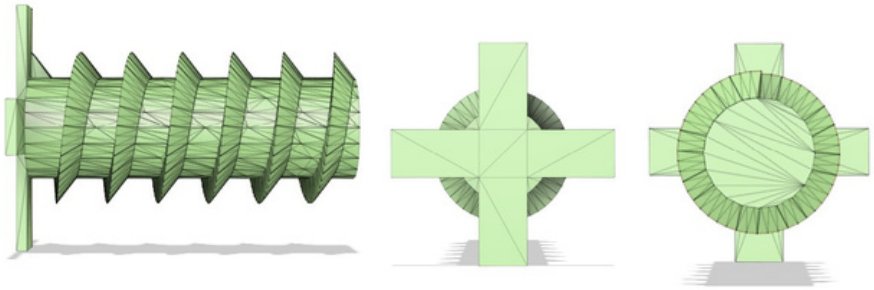
Stud attached to boot

After testing, model 5 worked very very well. The entire model could be assembled and refilled without needing to be taken apart! The spiral mechanic worked as it did with the previous model, and being printed at scale worked and had enough strength to be tested with seeds. The stud measures up the same size as a 15mm stud as shown in the above photos. The only issues arouse with the size of the top thread piece and the inaccuracies of 3D printing, as the indent inside the stud shell was too detailed to be printed accurately, resulting in the spiral model sitting slightly higher in the shell than it should've, while also wobbling around slightly when testing due to it being loose. This resulted in a final few iterations for model 6.

SeedSculpt Stud Prototyping

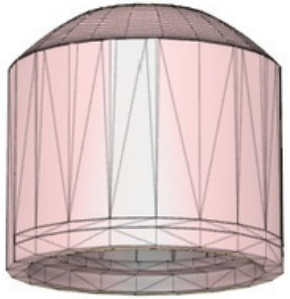


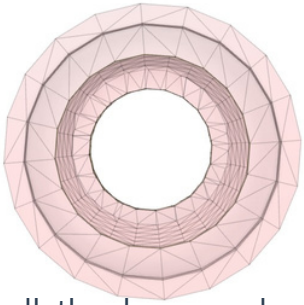
Not a lot changed with model 6, the spiral mechanic is the same as model 4, and the cap / top is the same as model 5 except the thread piece is slightly longer and wider to better fit into a boot. The only other change came with the shell itself.



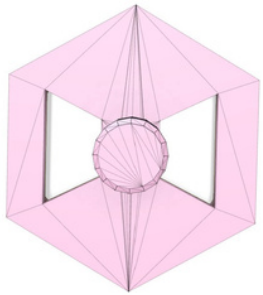
The spiral mechanic reverted back to the same as model 4. This was done as when printed to scale there is a lot of stress on the rectangle piece and I believe it would be best to revert back to a stronger, more supportive shape.

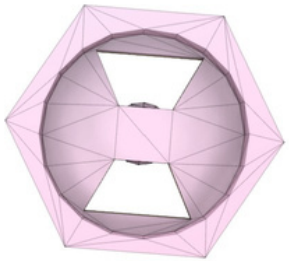
After testing model 5, the lip of the stud shell for the spiral piece isn't deep enough for the intolerance / inaccuracy of a 3D printer, so for the next model I exaggerated the depth of this inner lip slightly to ensure that the spiral model can sit within the shell and the entire model can be assembled tightly. Along with this, I reverted the support piece of the spiral mechanic back to a cross, as when printed to scale there is a lot of stress on the rectangle piece and I believe it would be best to revert back to a stronger, more supportive shape.

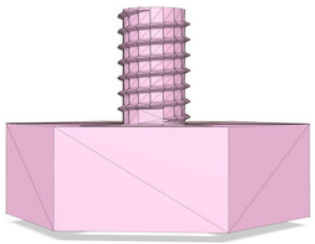




In terms of what was done with the shell, the shape was kept the same as model 5, but the inner lip support was lowered in order to combat the issues presented with the shell of model 5. This will hopefully allow the spiral mechanic to sit flusher with the shell and ensure that the entire system can close effectively.



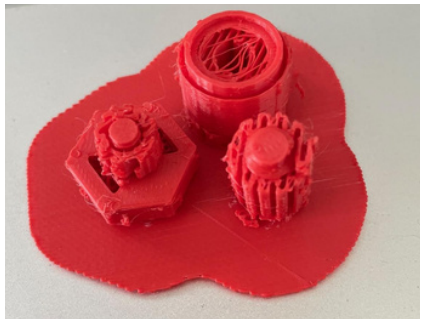


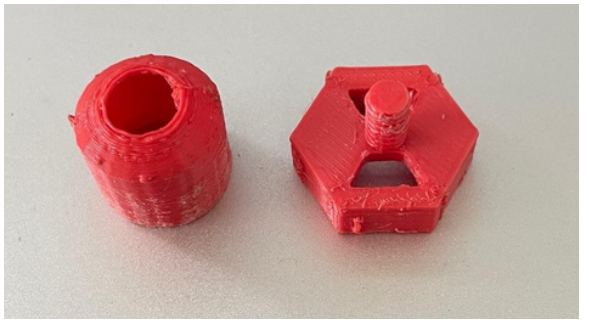


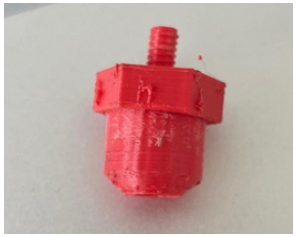
The top piece / the cap of the stud remains mostly unchanged due to its success with model 5, however a small tweak has been done to the thread on top of the cap to try and make for a tighter and more effective fit when screwed into a football boot.

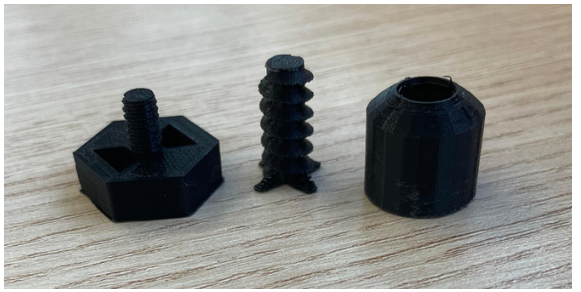
SeedSculpt Stud Prototyping

3D Print of Model 6









After printing and testing 3D model 6, the slightly deeper shelf in the shell allows the spiral piece to fit flusher and spin with less resistance. Along with this, the resized thread on top of the stud fits perfectly with a pair of football boots, and holds enough tension to be screwed in and out of the boot. Unfortunately, the spiral piece for Model 6 broke due to a printing error, so the spiral from model 5 was used for testing. A new spiral piece will be printed soon to complete model 6. Luckily, the spiral piece is relatively unchanged for model 6, and the main innovation for this model was the thread, which worked as intended.

Oliver (Sustainability stream)

Feedback Collection

FEEDBACK NOTES

Liked – *What did your audience like about the presentation? Or a particular aspect/part of it?*

Kept the core idea strong, as well as actually strengthening the core of the stud. Liked that it'll be stronger when printed, as well as will print a lot easier, as well as less risk of mud clogging.

Learned – *What new information did you learn from the feedback provided? Is there anything that could be utilised to your advantage?*

The functionality of a salt grinder, as well as more about what sort of seeds will fit within the studs.

Lacked – *What seemed to be missing from the presentation? Was there something unclear that needs further development or researches?*

there is still a risk for mud to clog, although it is much less than the first prototype.

Longed for – *What there something completely new that your audience wish to see in the presentation, and would make it more impactful?.*

Maybe to remove the stress on the small mechanics inside the stud, could look into creating something that fits over the stud, like a degrading cap from a sugar-water solution? Or something that uses the studs to hold something onto the soleplate? Similar to the plantsoles idea you presented but on the outside of the shoe rather than the inside?

Liked
Learned
Lacked
Longed for

ACTION POINTS

What needs change? Look into other prototypes for stud - like the cap idea?

What steps are required to implement this change?
Research into a separate field - mold making? Also how these caps would stay together but also slowly break down over a game? Still using the stud concept but changing the focus.

Who will do it? I will

What needs change?

What steps are required to implement this change?

Who will do it?

What needs change?

What steps are required to implement this change?

Who will do it?

Created by Gabriela Baron and Baptiste Natali (2020)

SeedShell Stud Prototyping

After discussion with Oliver and the FabLab tecs, there is the potential to go away from creating a mechanical model, and instead create a degrading shell to cap over pre-existing studs. Using similar concepts to the seed bombs, these shells could be created to break down over the game, removing the stress on the mechanics of the stud while also reducing potential waste.

Dismantled 2 pieces of stud (Aluminum core and plastic shell). The core piece could be used to attach the shell? or leave space for an attachment piece? Or the shell could be replaced and just have the core left at the end?

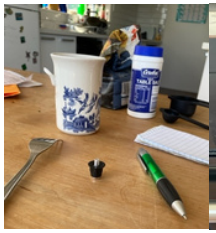
AI Mock-up

In order to create the seed mixture for the shell, Ill be researching into seed bombs and other precedents where natural materials are used to create semi-solid objects.

Attempting to create molds without silicone

Mixing 2 parts flour with 1 part salt and water (for my first attempt I mixed 15mg of flour with 7.5mg of salt and 7.5ml of water) creates a dough substance that once kneaded for a few minutes becomes fairly solid. I then imprinted the stud shell and core into the dough, before baking it for 30 minutes to solidify the mold. Once baked, the mold was solid and will hopefully be functional with my seed mix. Avoiding silicone is important for my assignment, "as **Silicone isn't the most environmentally friendly material on the market**. Producing silicone uses hydrocarbons derived from petroleum, which isn't sustainable. It's difficult to recycle, and most facilities won't accept it." Whereas creating a mold from flour water and salt is something that could be eaten by birds or wildlife when the molds durability goes.

Ingredients and mixing

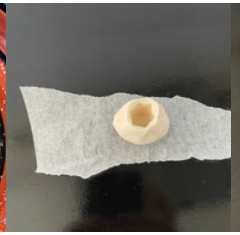


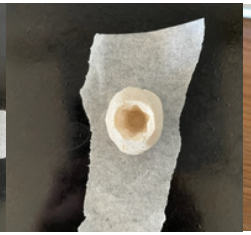
Oven settings

Kneading

Setting the shape

Baking mold



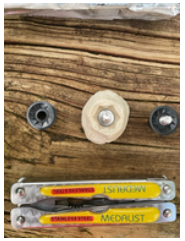


Finished mold

SeedShell Stud Prototyping

Creating seed-bomb stud shells

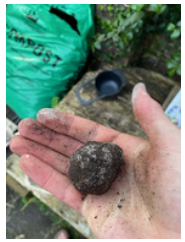
Materials


Using 100% organic green waste compost, Jovi air-dry white clay, Manuka Tea Tree Mcgregor seeds, Yates Bee Pasture Pollen & Nectar seed mix, my salt dough mold, aluminum cores, and a multitool.

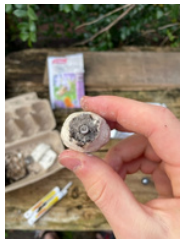
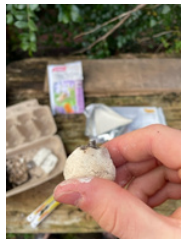
Mixing materials



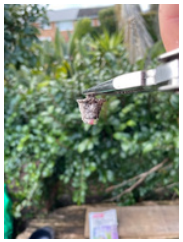
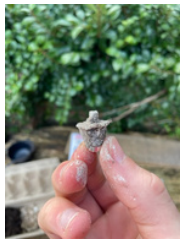
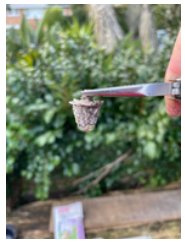
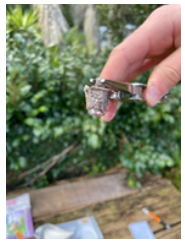



Using an old egg carton as a mixing bowl, I combined 5 parts compost to 2 parts clay. For my first batch, I combined 1 cup of compost (250g) with .2 cup of clay (50g). Before I mixed in the clay, I removed any solid bits from the compost (twigs, bark, sticks, pebbles etc.), I then sprinkled a bunch of Bee Pasture seeds into the compost. Once my compost mix was completed, I sliced up the 100g of clay into small sections and mixed it through the compost seed mix in my hands until it formed a solid ball.

Filling the mold

I then used a flat small tool from the multitool to compact parts of the mixture into the mold. My mold had a solid hold on the aluminum cores at the bottom, allowing me to stuff in the mixture around the core and ensure that the mix is nice and compact in order for the clay to do its thing and hold solid. Once I was satisfied that no more mixture could fit in the mold, I flattened down the top of the mold as much as possible and removed any excess mixture for later use.

Once I was confident that the mixture was packed in and solid, I used pliers to remove the aluminum core and seedshell from the mold. The results are shown above! I then removed the aluminum core with my fingers so that it could be reused for the next seedshell. I repeated this process until I created 8 shells, and then waited 48 hours for the clay to set before testing.

SeedShell Stud Testing

First Prototypes (dry)

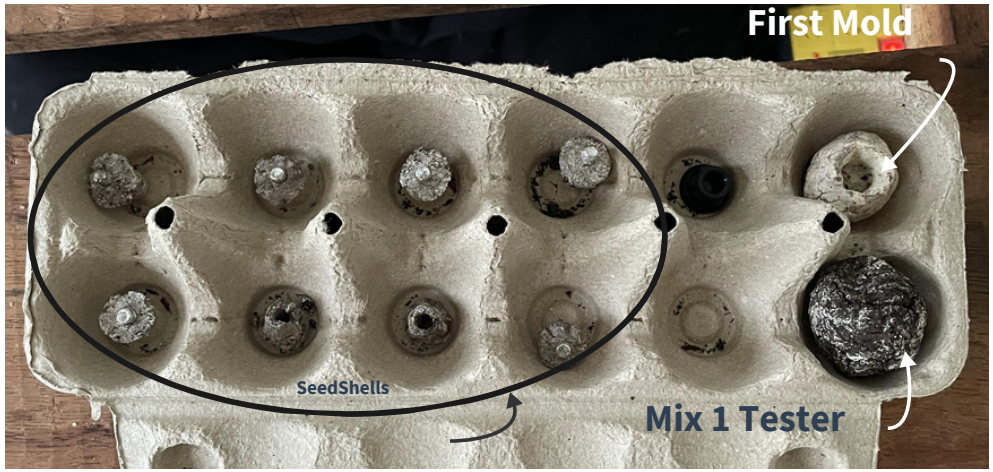












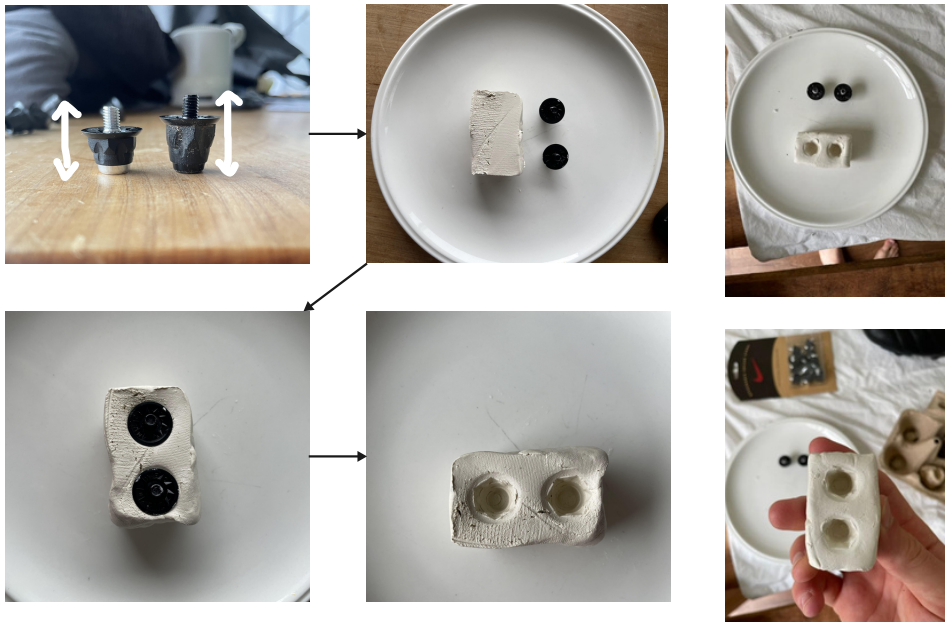
Implementing the first few models onto a pair of boots for display and testing was fairly straightforward. The mold did a good job in ensuring that the studs were solid enough to withstand twisting with a stud-key when being screwed into the boots, as well as leaving enough room at the top of the thread for the studs to be secured tightly (although some were shorter than others). For the initial testing and images, I replaced four screw in studs on the left boot (2 at the front and 2 at the back). Each stud was replaced with a 15mm SeedShell prototype. The first model I made crumbled pretty quickly, but I luckily made 2 extra shells that slid over the aluminum core and allowed for easy replacement (something that I want to implement further for when the studs are actually used).

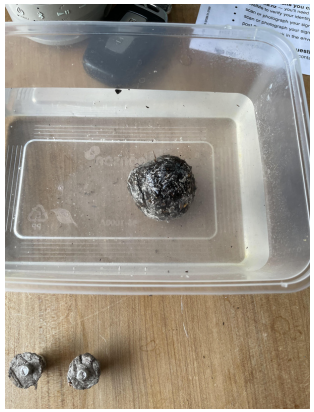
SeedShell Stud Testing

First Prototypes (dry)

Clay Mold - Mold prototype 2

After looking at my SeedShell prototypes closer, I realised that some of the recycled aluminium cores were shorter, resulting in some of the molds having a lot less thread showing at the top. This is due to studs commonly coming in 3 different lengths, 11mm, 13mm, and 15mm. I had created a mold for a 15mm stud, as this allowed for the most seed mixture. What I didn't account for was my array of recycled cores, which is a mix of 13mm and 15mm. Therefore I thought it smart to create a new mold, this time out of spare clay, to accommodate for both sizes of cores I have, while still avoiding the use of silicone due to it's environmental harm. Once these clay molds begin to break down, they can either be re-molded or re-used to create further seed-shell studs or seed bombs.



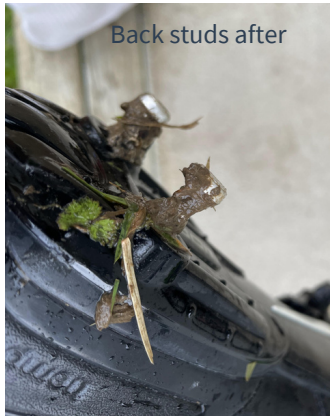


Solubility test for Prototype Mix 1

Mix one was decently soluble, although it took some contact while wet in order to break up the mixture. This is good, as for the stud shells to be successful they need to be weakened by water, but not completely solvent in it. Therefore mix 1 successfully pasted the water solubility test.

Mix one was also fairly durable when not wet, although some of the first few crumbled as they weren't packed together in the molding process strong enough, the later shells were decently durable, could withstand enough force to be screwed tightly into the boots, as well as be dropped from over a meter and not break on impact with the ground.

SeedShell Stud Physical Testing



The physical tests for my first SeedShell mix prototypes went very well. The proof of concept, feasibility and validation of my idea were all proven (apart from the growing part but due to time restraints that part is assumed). The studs hold up well enough to attach and function with the boots, but also breakdown once used on a slightly wet grassy surface. Along with this, the aluminum cores are left behind and new shells can easily be replaced by sliding them onto the unscrewed core.

Besides the proof of concept, mix 1 definitely had its flaws. The first came from a few of the original models crumbling due to not being compressed enough in the molding process (an easy enough fix). A more potent flaw was the fact that the majority of the SeedShells only held up for about a minute before breaking down. This is positive in terms of showing that the breaking down part works, and also would allow for more shells to be used during a game, however a minute is well short of what is feasible for any form of football game - even if for an exhibition. Players having to replace the shells every minute or so would result in a slow and boring process.

In order to combat this, my next prototype mix will incorporate a greater part clay (starting with a 3/1 ratio of compost to clay rather than a 5/1 ratio) to ensure greater structural integrity for the shells, hopefully expanding their lifespan to a more reasonable amount of time. I will continue to test my future mixes until a structural balance and reasonable ratio is acquired to move forward with.

SeedShell Stud Prototyping

Mix 2 for SeedShells

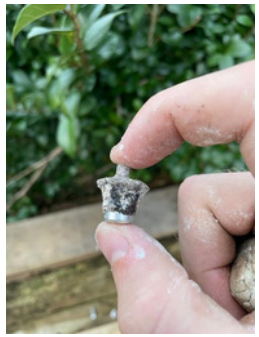
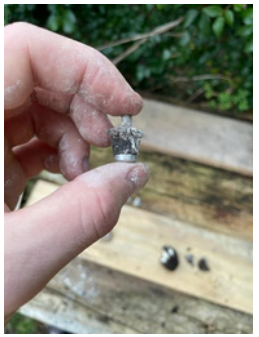
Mixing Materials

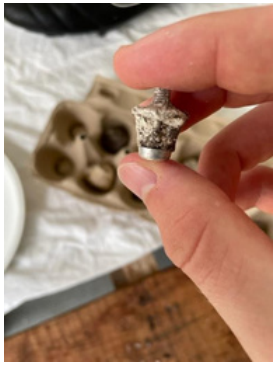
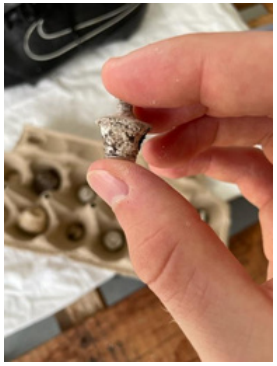



Using the same base materials as the previous mix, I increased the compost clay ratio from 5:1 to 3:1, hopefully increasing the durability of the mix when in contact with soil and moisture. I then followed the same method as mix one, by slicing up the clay into smaller pieces and mixing it in with the seeds and compost by hand. This process was repeated until I had a solid ball of materials that could be used with my stud mold.

Filling the mold

I then followed the same process as before, using a flat small tool from the multitool to compact parts of the mixture into the mold. My mold had a solid hold on the aluminum cores at the bottom, allowing me to stuff in the mixture around the core and ensure that the mix is nice and compact in order for the clay to do its thing and hold solid. Once I was satisfied that no more mixture could fit in the mold, I flattened down the top of the mold as much as possible and removed any excess mixture for later use.


The finished prototypes look much the same as the first batch, however I'm hoping that by increasing the compost-clay ratio that they will last longer when tested. I will also allow for a longer drying period to see if that accommodates greater results. One thing I have noticed is on some of the prototypes the clay compost split is visible, and this could be a contributing factor to the low durability. If this is the case after testing, the next batch will have to use finer pieces of clay, meaning I'll probably end up cutting them into much smaller pieces in order to negate the obvious separation between the materials and create what is hopefully a stronger mixture.

SeedShell Stud Mix 2 Testing

Pre Testing




Before beginning physical testing, I screwed my studs into the soleplate of my boot. For mix 2 I chose to skip the solubility water test as this concept was already proven with the testing for mix 1. This proved that the clay, compost, and seed mix was soluble in water, thus removing the need to test solubility with further mixes as despite ratios changing, the core materials are the same and their chemical makeup and ability to be soluble is also the same, however it may increase / decrease in time depending on the ratio of materials in the mix.

During Testing



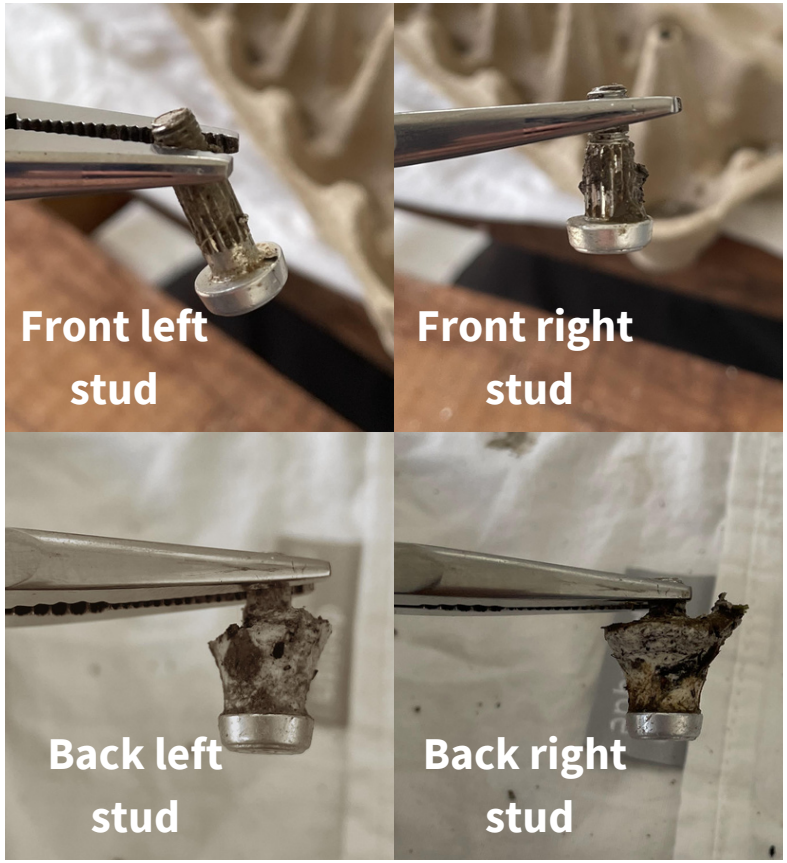





SeedShell Stud Mix 2 Testing

Post Testing

4 Studs post testing



After testing mix 2, the results were extremely promising. I spent 15 minutes running on slightly damp grass with the boots on, doing directional cuts and other movements common with a game of football, and as seen above, the studs more or less degraded, but not until around the 15 minute mark. This is exactly what I wanted after mix 1s durability being too low. a 15-20 minute lifespan is perfect for allowing enough time for a game to flow, while also ensuring that the studs break down enough to plant a meaningful amount of mix throughout the game. A 15 - 20 minute life span allows roughly 5-6 breaks within a game to replace the studs, which for an exhibition / event game is perfectly reasonable.

With this, I think the mixture ratio for mix 2 is exactly what I wanted, and will be closely followed for the next mix (presentation mix).

Making a complete stud set

New mold

Unfortunately, the clay mold I created previously cracked during use. With this, I decided to go back to using the same method as the first mold I created, except for both stud sizes. So, following the same method as before (mixing 2 parts flour with 1 part water and 1 part salt) I created 2 new molds for the 2 different stud sizes.

Reproducing mix 2 for a full stud set

Mixing the seed mix

Kneading it all together

Getting the molds ready

Molding the studs

Finished 6 stud set

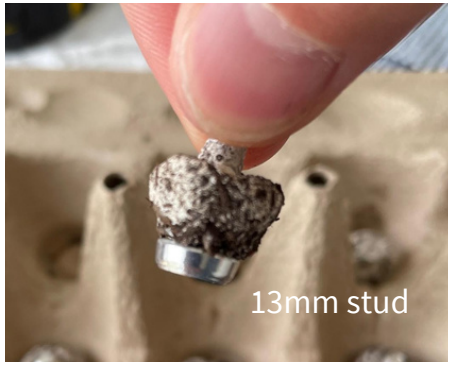
Finished stud set

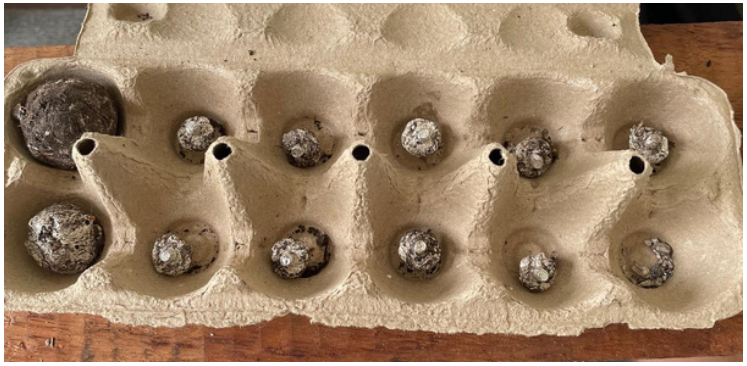
Full 6 stud set up on boot - 2x 15mm heel, 4x 13mm forefoot.

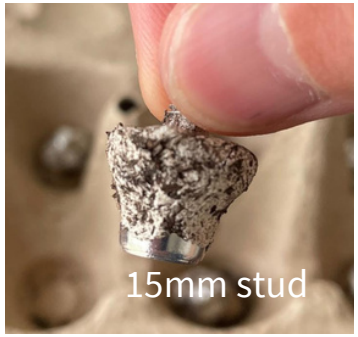





12 Studs for packaging - 4x 15mm, 8x 13mm.







Plan for Impact

Assessing impact holds paramount significance within environmental projects. The Plan for Impact phase offers a practical route, enabling the implementation of agile variations of impact assessment methods that demand fewer resources for execution. This is crucial for creating a cyclic sustainable model - ensuring that everything is ready and utilised efficiently to allow sustainable deployment in the next phase. (D4C 2021)

Along with this, there is my casebook prototype which provides information for clubs to plan for more sustainable systems and facilities.

a) SYSTEM LIFESPAN: Does your project use products/infrastructure with a short lifespan?

Priority: oL oM oH ✓N

Durability: This strategy is aimed towards making products/services that last longer and therefore have less environmental impact throughout their whole life cycle.
- Complement the product with services for maintenance or repair.
- Complement the product with services for technological updating (software).
- Complement the product with services that allow aesthetic modification (appearance).
- Complement the product with services that allow re-configuration (adaptation to a new space/context).
- Offer a platform that enables reuse/buy/sell already used products.

Servicisation: This strategy is oriented towards satisfying needs through shared use and therefore using less materials/energies.
- Satisfy the user's needs through a service instead of selling a product (e.g. rental/leasing).
- Promote a collective/group use of the products.
- Outsource complementary activities to the product/service.
- Create alliances to use/integrate existing infrastructure (space/machinery/institutions).

b) MATERIALS AND ENERGY: Does your project use non-renewable materials and energies?

Priority: oL oM ✓oH oN

Use of renewable materials and energy: This strategy is aimed towards ensuring that your product/service uses materials and energy sources that conserve the planet's resources.
- Use local materials that are renewable/recycled/biodegradable (circular approach).
- Reduce the material quantity of packaging materials or plan for their reuse.
- Create alliances in order to use renewable energies during production.
- Use human energy to fulfil the product/service function.
- Create alliances to offset carbon emissions.

Transport and packaging reduction: This strategy is aimed towards reducing transport and packaging needed for production, assembly, retail, and consumption.
- Use digital channels for information sharing (marketing, meetings, communications, information).
- Create alliances that reduce/avoid transport and packaging of finalised products.
- Design in order to reduce the volume of the products to be transported.
- Encourage and educate for local assembly/finishing of the product (in situ).
- Produce locally following a distributed model (e.g. 3D printing).

c) WASTE: Does your project generate waste that ends up in urban spaces/landfill/water?

Priority: oL oM ✓oH oN

Waste minimisation and valorisation: This strategy is aimed towards minimizing waste and reusing/recycling/-composting the unavoidable waste using a circular model.
- Complement the product with retrieval services if no longer in use in order to offer them to someone else (reuse).
- Promote/enable users to reuse/recycle the product/service packaging.
- Complement the product/service offer with systems that enable composting of their waste.
- Make alliances for waste retrieval in order for it to be used as raw material for a different industry.
- Make alliances for effluents treatment in the production phase.

d) EMPLOYEES: Does your project promote a diverse, healthy, safe and motivated working environment?

Priority: ✓oL oM oH oN

Improve working conditions: This strategy is aimed for promoting and ensuring justice, equity and wellbeing for the people that work within the organisation that offers the products/services.
- Provide legal working conditions that include medical health, just retribution and work stability.
- Promote a healthy workload, provide resting spaces and provide recreational opportunities for employees.
- Include job positions that integrate the vulnerable, weak and marginalised sectors.
- Ensure a zero-tolerance policy towards discrimination of any kind in your workplace.
- Supply communication mechanisms for the creative participation of employees in the offer definition.

e) USERS/CLIENTS: Does your project promote critical and responsible consumption?

Priority: oL ✓oM oH oN

Enable responsible consumption: This strategy is aimed towards assuring that your project promotes sustainable lifestyles, facilitating informed decision making for the users/clients.

- Establish clear and honest communication channels aimed for transparency and traceability of the social and environmental aspects of your offer.
- Complement your product/service with relevant information in order to educate the user in responsible and sustainable practices.
- Enable communication channels for the participation of users/clients in the definition of the product/service.

f) CONTEXT: Does your project help to regenerate the social cohesion, the economy and the environmental health of the context of the offer?

Priority: oL oM ✓oH oN

Valorise local environmental and social resources: This strategy is aimed at the improvement of social cohesion, respecting local cultures, promoting diversity and regenerating the environment.

- Ensure that your offer acknowledges particularities of local cultures promoting tolerance, justice and equity.
- Promote activities/products/services that enable integration between gender/age/culture/religions.
- Favor/support local economies whenever possible.
- Develop mechanisms that make your offer accessible to all socio-economic levels (e.g. public and shared use, grants)
- Promote just relationships with all stakeholders throughout the supply chain (suppliers, contractors, community members, etc.)
- Promote activities that regenerate the local natural and public spaces where the offer takes place.

Discuss how these strategies can apply to your project, fill out the Sustainability Radar with your refinement ideas, measure the level of improvement (in relation to existing cases) and finally trace the polygon.

Created by Gabriela Baron (2021). Canvas based on the SDO toolkit - LeNS project (2007-2011).

ENVIRONMENTAL IMPACT

IMPROVEMENT IDEAS:

a) SYSTEM LIFESPAN

Parts of my product may specifically have short lifespans while others have long lifespans - for example, the seedshell idea has the shells breaking down quickly - i.e within 20 minutes of use so that they can effectively sow seeds during the game. Whereas the mechanical stud has a focus on a much longer life-cycle, hence the use of durable material like aluminum.

b) MATERIALS AND ENERGY

I want my project to be as renewable as possible - majority if not all of the materials used will hopefully be renewable and reusable. This is shown through the materials used in my molds - choosing to create molds from environmentally friendly materials rather than something like silicon or plaster.

c) WASTE

Reducing waste generation is a big part of my project, and I'm working on developing something that produces no waste at all (including it's packaging through something like seedpaper). The mechanical model would be made from aluminum which is infinitely recyclable, and the seedshell model (degradable one) also uses aluminum cores which are recyclable.

SOCIAL IMPACT

IMPROVEMENT IDEAS:

d) EMPLOYEES

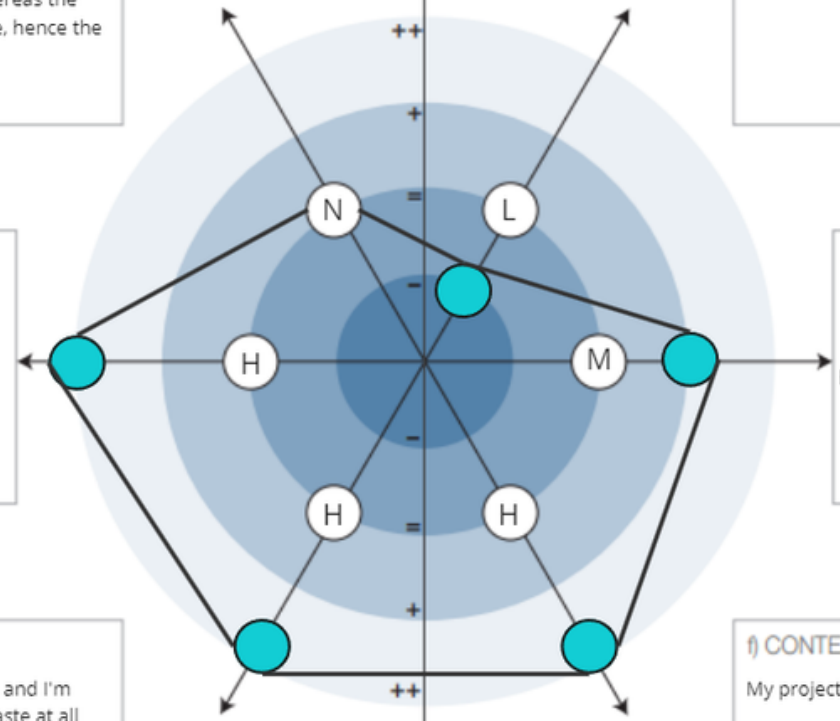
Not really a focus on employees for this project. For the event side of my project, I would rely on volunteers and people interested in the event rather than employees. Further down the line, employees could be used for mass production of studs?

e) USERS/CLIENTS

My project is promoting habitat construction for local wildlife through the consumption of my product, so in that regard I think it promotes critical consumption. The users / clients are crucial for my product to have a meaningful effect on the environment as their consumption will allow my product to have an impact.

f) CONTEXT

My projects utmost priority is environmental regeneration to create habitats for local endangered species.



PRIORITY

- HIGH
- M MEDIUM
- L LOW
- N NOT APPLICABLE

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INTENDED IMPACTS

Goal/s of the project: Create new habitats and promote greener, more sustainable sport

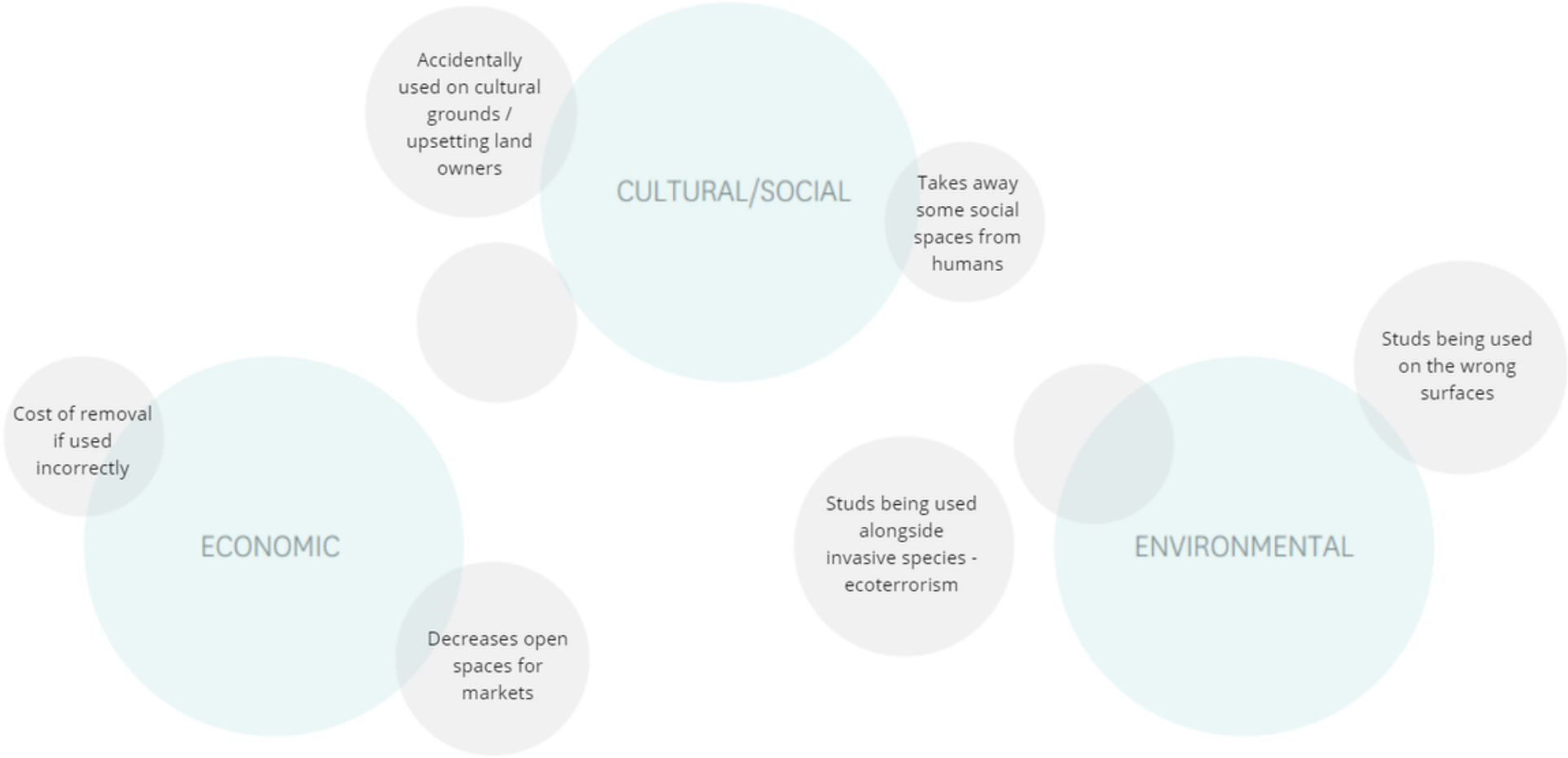
IMPACT	QUESTIONS *What do you want to find out?*	QUANTITATIVE INDICATORS	TOOLS *How will you measure this?*	QUALITATIVE INDICATORS	TOOLS *How will you gauge this?*
BREADTH *How many people/places /species/etc will your project reach?*	How great an impact my project has, it's potential for habitat regeneration, and how well it recovered endangered species?	People talking about it, Habitat regrowth in green urban areas, increase in population of natural species	Social media interactions number of new habitats, increase in population		
DEPTH *How deep has your project's influence been?*	Will my project have a positive influence on wildlife? How about urban space? The footballing community? Will football clubs be on board?			Footballing partnerships, increased habitats, increased population numbers, being talked about within footballing communities.	Number of potential partnerships, amount of posts about the project online. Increase in number of habitats.
TARGET *How focused is this impact in relation to your main GOAL?*	"New football technology in the market" "**Increase in wildlife habitats**" "**Increase in population of local species**" "**Better utilised urban spaces**" "People playing football"	Positive change to the football boot world More attractive urban spaces Less open urban spaces **Primary goals - increased habitats, population numbers, and better utilised urban spaces** Good for the football community		Measure impact and discussion about project in football boot communities Survey locals about new look of urban spaces and if less open space was an issue for them Measure new habitats and local wildlife populations Measure amount of people playing football in local communities	

Created by Gabriela Baron (2020)

UNINTENDED IMPACTS

Focus on the systemic nature of the environment that surrounds us. Your project will most likely affect other systems in ways that you have not forecasted. It is alright to not know much about these other possible impacts, but you must remember that these will exist.

Which could be the UNINTENDED impacts of our project? What should you keep an eye on?
Brainstorm of what these may be using the following template.



Deploy Sustainably

Deployment involves refining concepts to facilitate their practical implementation. This process encompasses a set of tools that aid in finalising projects. Regardless of whether it pertains to a for-profit or non-profit endeavor, most of these initiatives typically commence at a local and modest scale before expanding and duplicating, allowing conceptual deployment at both a local and global scale. (D4C 2021)

This phase focused on finalising Grass to Growth, through presentation and marketing research, as well as polishing all of my prototypes.

Stakeholder Motivation Matrix

Creating influence groups is key to deploying a successfull project.

This is a visualization tool that represents the solution from the point of view of the individual motivations/benefits of each stakeholder of the system. Ask yourself: Why would they be interested in participating in this project?

1. *Write down the name of each stakeholder on the gray boxes on both sides of the double-entry table (write each name twice, once on the horizontal row and once on the vertical column).*
2. *Write down the main motivations of each stakeholder in the green boxes.*
3. *Write down the specific partnership benefits at the intersection of each pair of stakeholders.*

STAKEHOLDERS	Project Partners	Native Bee Species	Native lizard Species	Local Football clubs	NZ Football
Project Partners	Assisting the next generation in creating meaningful solutions	One of our project partners specialises in NZ native bee species, so benefitting them, especially the endangered species, is something he is passionate about.	One of our project partners specialises in NZ native lizard species as well, so benefitting them, especially the endangered species, is something he is passionate about.	Project Partners are on board with increasing utilising green spaces in Auckland, and through partnering with local football clubs there is a greater area of potential land to transform into habitats.	Project Partners are on board with increasing utilising green spaces in Auckland, and through partnering with NZ football there is a greater potential of moving the project nationally.
Native Bee Species	One of our project partners specialises in NZ native bee species, so benefitting them is something he is passionate about.	Recovering habitats, and increase in population	The types of habitats that I'm hoping to create are beneficial to both these species, and offer space for them to live alongside each other.	Increase in bee numbers means an increase in pollination, hopefully benefiting the quality of plantlife and soil for pitches in the off-season	Bees are seen as an extremely important part of our global ecosystem, and through improving their livelihood it would improve NZ footballs global image
Native lizard Species	One of our project partners specialises in NZ native lizard species as well, so benefitting them, especially the endangered species, is something he is passionate about.	The types of habitats that I'm hoping to create are beneficial to both these species, and offer space for them to live alongside each other.	Recovering habitats, and increase in population	An increase in local lizard species will create a decrease in invasive species like house flies and sandflies, something that may cause annoyance for football communities.	An increase in local lizard species will create a decrease in invasive species like house flies and sandflies, something that may cause annoyance for football communities.
Local Football clubs	Project Partners are on board with increasing utilising green spaces in Auckland, and through partnering with local football clubs there is a greater area of potential land to transform into habitats.	Increase in bee numbers means an increase in pollination, hopefully benefiting the quality of plantlife and soil for pitches in the off-season	An increase in local lizard species will create a decrease in invasive species like house flies and sandflies, something that may cause annoyance for football communities.	Better green image	NZ football is always looking to improve community football, and through this partnership they could improve the livelihood of areas around football and thus improve the image of community football in NZ.
NZ Football	Project Partners are on board with increasing utilising green spaces in Auckland, and through partnering with NZ football there is a greater potential of moving the project nationally.	Bees are seen as an extremely important part of our global ecosystem, and through improving their livelihood it would improve NZ footballs global image	An increase in local lizard species will create a decrease in invasive species like house flies and sandflies, something that may cause annoyance for football communities.	NZ football is always looking to improve community football, and through this partnership they could improve the livelihood of areas around football and thus improve the image of community football in NZ.	Potential for world recognition and a more sustainable footballing culture in Aotearoa

Growing a purposeful project means that you will be able to extend the breadth of your impact by reaching more people and ecosystems.

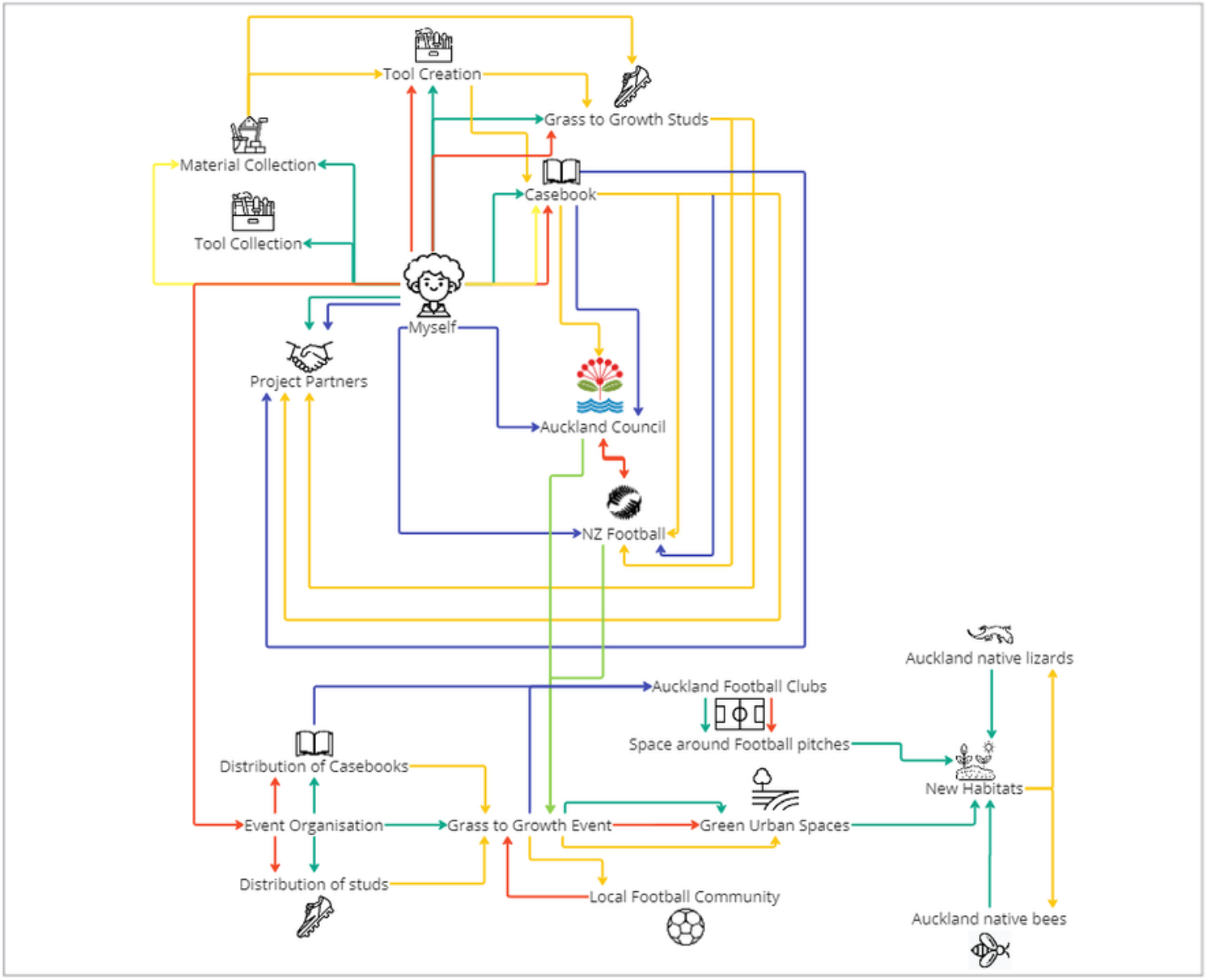
In order to ensure the depth and target of your impact, this growth should follow a distibuted model, highly related to your context, providing long term financial autonomy and environmental sustainability. This model is based on the Small, Local, Open, Connected scenario.

"The SLOC Scenario gives a clear direction of where to look for sustainable solutions, in which sustainable solutions necessarily refer to the local (and the community of which this local is a vital part) and to the small (with all the possibilities of relationships, participation and democracy that the human scale makes possible). At the same time, it tells us that to implement solutions, we have to consider these small entities and their localities in the framework of the global network society in which the local and the small are both open and connected." (Manzini, 2011)

	GROWTH PLAN	WHO?	WHERE?	HOW? *Main revenue streams*	WHEN? *Timeline*
PROJECT	**PILOT** *Describe pilot project / test / validation stage*	Myself Project Partners (UoA)	East Auckland - St Heliers Glen Innes Point England	Self Funded Self made to begin with	June - November 2023
SMALL	**STARTUP** *Describe the startup stage*	Myself Project Partners (UoA)	Auckland city	Funding from Auckland Council and stud sales	December 2023 - March 2024
LOCAL	**AUTONOMY** *Describe how the startup becomes an autonomous enterprise*	Myself Project Partners Employees Auckland Council Local Football Clubs	Northern region areas	As funding from Auckland Council begins to yield results, sales from studs would increase and local football clubs could start assisting in revenue	April - October 2024
OPEN	**REPLICATION** *Describe your plans for contextual replication*	Myself Project Partners Auckland Council NZ Football Nation-wide Football Clubs	New Zealand	As results begin to show and support grows, funding from NZ football allows the project to move nation-wide, positively impacting green urban spaces and football communities around NZ	November 2024 - May 2026
CONNECTED	**SCALE** *Describe your plans for resilient scaling*	Myself Project Partners NZ Football FIFA UEFA Global Councils	Global	If NZ expansion brings in enough revenue and support, as well as successful results, then Grass to Growth will look into global expansion and partnerships with FIFA and global councils.	May 2026+

Created by Gabriela Baron (2021). Model based on the SLOC scenario coined by Ezio Manzini (2011).

SYSTEM MAP



This is a tool for visualizing the system that supports your project, making it contextually feasible and outlining key relationships.

This system will involve stakeholders (human and non-human, institutions, etc.) relationships between these (information flows, labour flows, material flows, life-energy flows, monetary flows, etc) and locations.

You can use logos, icons and words, add more types of flows and anything else you want!

1. In a spare paper draw your offer in the centre and all the stakeholders involved around it, then draw arrows to represent flows. You might need to add locations, other stakeholders, or new flows.

2. Once you have a good system map, copy it in this template in a more organised/readable way. Make sure that you have all the relevant info needed to explain your project comprehensively.

REFERENCES

- *Energy flow*
- *Information flow*
- *Material flow*
- *Labour flow*
- *Monetary flow*

Brand Identity Mood Board

Brand Identity Fonts

Potential names
SeedSculpt Studs (mechanical model)
SeedShell Studs (Organic Model)
4S (Seed shell soccer studs)
HABITat
Grass to Growth initiative

This is probably my weakest point in design, I've never really had a knack for art or making things look pretty, so while I understand marketing, I'm not great at creating attractive graphics. I think it's good that I'm aware of my difficulties with this, and that I don't get to hard on myself when I struggle to create aesthetic work like some of my peers. Regardless of this, I still enjoy it, and hope that my logo generation is up to standard for this assignment.

Grass to Growth - event name
Seedsculpt studs
Seedshell studs

Look into softer fonts like this?

League Gothic

Genty Sans

Glacial Indifference

League Spartan

HORIZON

Archivo Black

Blueberry

Grass to Growth

Grass to Growth

Grass to Growth

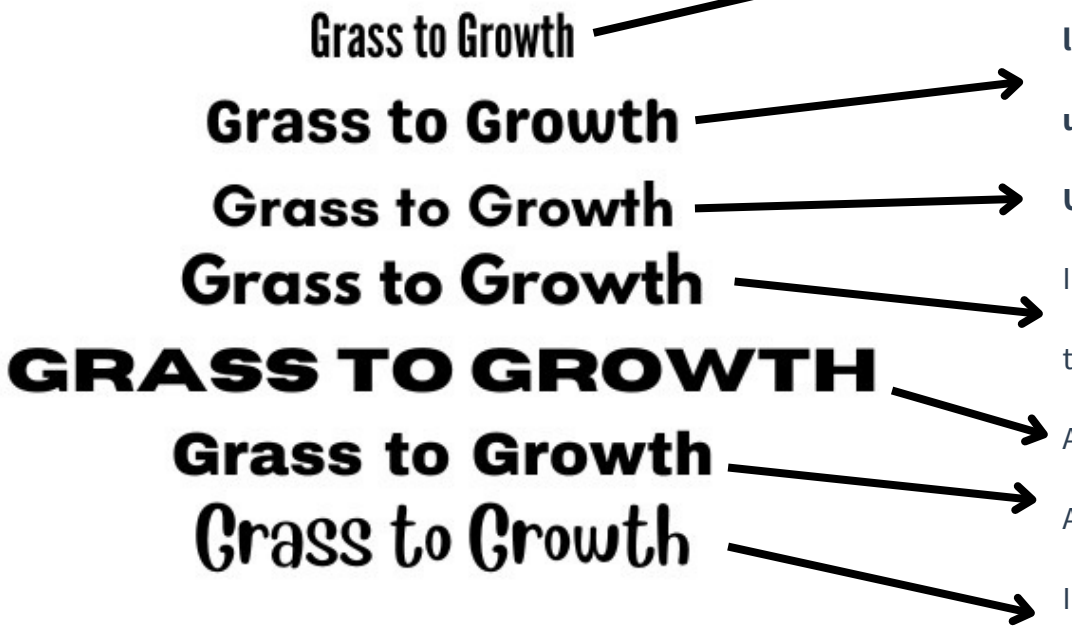
Grass to Growth

GRASS TO GROWTH

Grass to Growth

Grass to Growth

Brand Identity Fonts



I like the classy and simplistic look of this, it's spaced a lot tighter so more can be written.

l like how the font is soft, however might be a bit unprofessional?

Used with DES300 Research proposal

I like the classy and simplistic look of this, it's spaced a lot tighter so more can be written.

A bit aggressive

A sharper and thicker version of Glacial Indifference.

I like the growing aesthetic of the font but also is a bit too childish in my opinion.

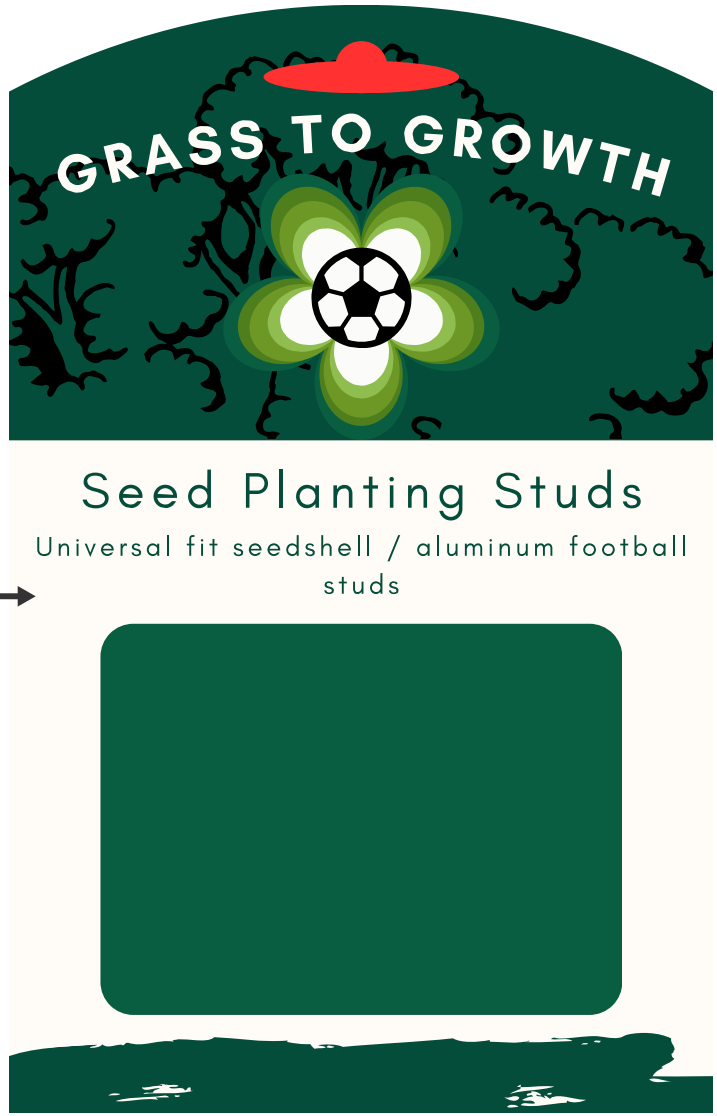
Best to stick with glacial indifference for this style since it was used for previous work.

Brand Identity Colours

From this, I think green is the obvious colour choice for my logo and branding - as my project is based on growth and healthy environments, the peaceful emotional nature of green colours fits my brand identity perfectly.

Draft Logos

Packaging and Marketing



Packaging and Marketing

Seed Planting Studs

Universal fit seedshell / aluminum football studs

Detachable Seed Planting Studs

Universal fit seedshell / aluminum football studs

ユニバーサルフィットシードシェル/アルミニウムサッカースタッド

Tacos de fútbol de aluminio / cáscara de semilla de ajuste universal

Semiconchiglia universale/tacchetti da calcio in alluminio

Universell passende Samenschalen-/Aluminium-Fußballstollen

通用型种子壳/铝制足球鞋钉

Ko nga anga kakano / konumohe e tika ana mo te katoa

Harry Bushell DES301

Made in New Zealand

Final Results Hero Shots

GRASS TO GROWTH

GENCRAFT. (N.D.). GENCRAFT. HTTPS://WWW.GENCRAFT.COM

By Harry Bushell

Final Results
Urban Space Mock-ups


Merton Reserve


Merton Reserve

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