

Garnishing Light

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LUND
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ENGINEERING

Garnishing Light

**Designed for the Nordic indoor kitchen garden,
allowing fresh herbs year around.**

By Ida Ahlström 2026

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Ai has in this documentation been used for synonyms, spell and grammar check

Abstract

The result of this project is a grow light designed for use in a kitchen environment. The project investigates how seasonal variations affect behaviour and daily activities in Nordic countries where weather conditions and daylight hours change drastically throughout the year.

Access to sunlight plays a significant role in people's ability to spend time outdoors, socialize and engage in activities beyond work and school. During the winter months, lack of daylight makes it challenging for many to maintain these routines. Surveys and interviews conducted as part of this project identified gardening and cooking with freshly grown ingredients as activities that were often missed during this period.

To support plant growth in conditions where sunlight is lacking, artificial lighting becomes essential. This project explores how light, modularity and aesthetics can be combined to create a grow light that not only supports plant growth but also encourages user engagement and hand on interactions.

Sammanfattning

Resultatet av detta projekt är en växtlampa designad för användning i köksmiljöer. Projektet undersöker hur säsongsvariationer påverkar beteenden och vardagliga aktiviteter i nordiska länder där väderförhållanden och dagsljus varierar drastiskt under året.

Tillgång till solljus spelar en viktig roll för människors möjlighet att vistas utomhus, umgås och ägna sig åt aktiviteter utanför arbete och skola. Under vintermånaderna gör bristen på dagsljus det svårt för många att upprätthålla dessa rutiner. Enkäter och intervjuer som genomförts tidigt i projektet visade att trädgårdsarbete och matlagning med färskodlade ingredienser var aktiviteter som många saknade under denna period.

För att växter ska kunna växa i miljöer där solljus saknas är artificiell belysning avgörande. Projektet undersöker hur ljus, modularitet och estetik kan kombineras för att skapa en växtlampa som inte bara främjar växters tillväxt utan också uppmuntar engagemang och interaktion kring odling och matlagning.

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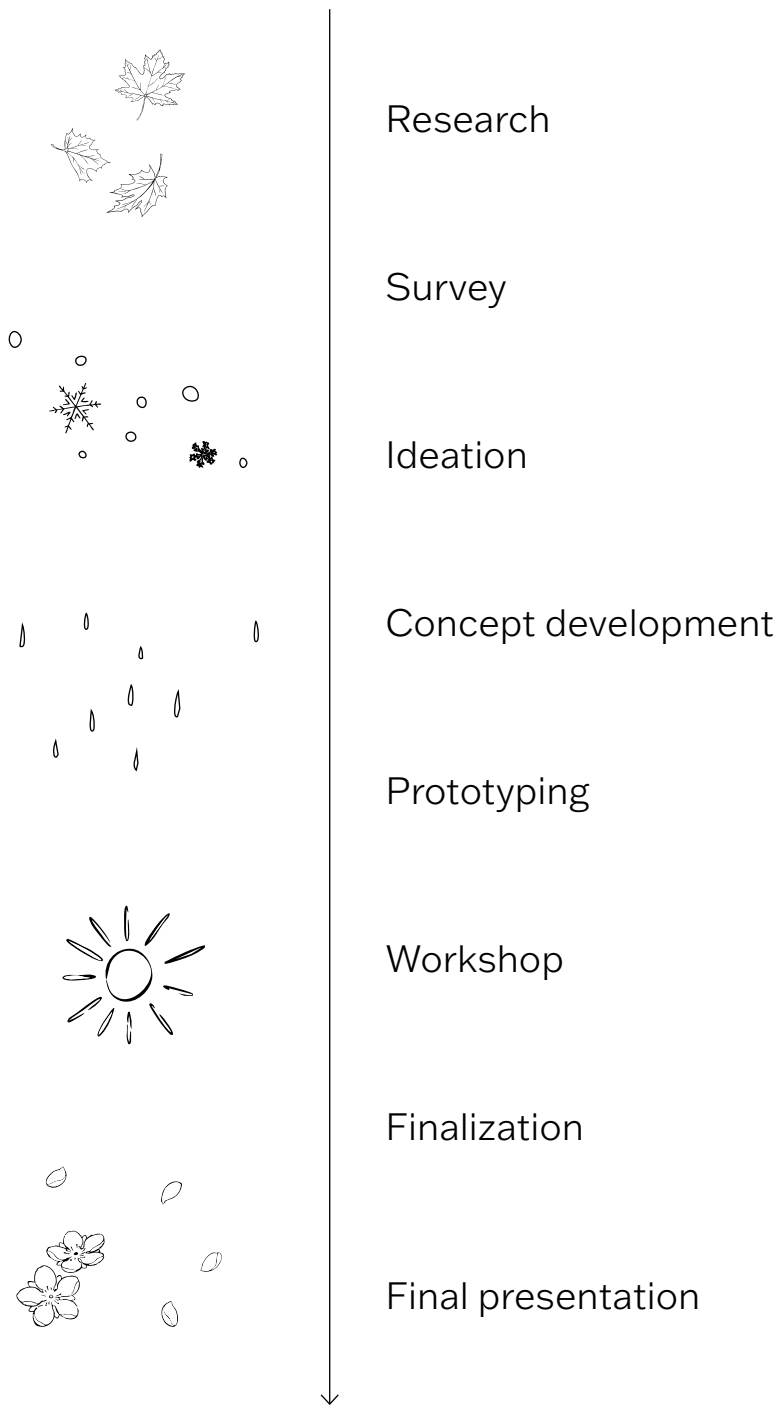
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PROJECT TIMELINE



1 RESEARCH



INITIAL THOUGHTS

In the Nordic countries, weather is a common topic of conversation in everyday social interactions. It is often seen as superficial or trivial and serves merely as a transition into more meaningful discussions. However, its frequency may reflect a deeper meaning. Weather conditions have a noticeable impact on human mood and mental state and conversations about the weather offer indirect expressions of how individuals feel.

Seasonal variations are closely related to changes in mental well-being. Periods of sunlight are associated with increased energy and happiness while extended periods of darkness and cloud cover often contribute to fatigue and reduced motivation. This connection is further reflected in the market of lighting solutions designed to mimic natural lighting such as sunrises and sunsets, where the goal is to support a more stable sleep and wake cycle.

Beyond these effects on mental state, it is also relevant to consider how human behavior in everyday life and activities changes with the seasons.

"There is no such thing as bad weather, only bad clothing"



"After rain comes sunshine"



"T-shirt weather"



"It's stuffy outside, rain is probably in the air"



SUNLIGHT

Light plays a crucial role in human health and well being, influencing mood, emotions and overall mental state. In the Nordic countries localized at higher latitudes far from the equator, the availability of daylight varies dramatically throughout the year. Seasonal changes result in significant differences in the time span and intensity of natural light

Weather conditions further affect how much sunlight reaches individuals. During winter, dense clouds often form a thick layer that limits direct sunlight. Even on clearer days, daylight hours remain short with the sunlight visible for only a short period of time (Dubois, Et al. 2019, page 27-30). For instance, in Lund 2025, the sun was only visible for no more than two hours during the first two weeks of December (SVT, 2025).

Sunlight plays a fundamental role in regulating the human circadian rhythm which control the sleep and wake cycle. In the early morning, natural light is characterized by a cooler, blue-toned spectrum that has a biologically stimulating effect, boosting alertness and wakefulness. In the evening the light shifts toward warmer, red-toned hues which support relaxation and prepare the body for sleep (Dubois, Et al. 2019, page 29-35).

In the present day, this natural rhythm is increasingly at risk of disruption due to the use of digital technology. Devices such as televisions, smartphones and laptops emit blue-toned light similar or even brighter than early daylight. Exposure to this type of light in the evening can signal to the brain that it is still daytime making it difficult to unwind and fall asleep.

Although circadian rhythms vary with age and lifestyle, maintaining a consistent cycle is important for overall health and well-being. Disruptions to this rhythm, combined with reduced exposure to natural daylight plays a big part into the fatigue and decreased motivation often experienced during the winter months (Dubois, Et al. 2019, page 29-35).

Introducing natural elements into indoor environments can have a positive impact on individual well-being. Studies have shown that patients recovering in hospitals after surgery experience faster and more effective recovery when they have access to a window overlooking moving greenery, compared to patients whose views were limited to brick walls (Dubois, Et al. 2019, page 117).

All of us experience stress at times, it is a natural response in the body. However, long term stress can have negative effects on the body. When we feel stressed, our heartbeat increases. Feeling high stress for longer periods of time can weaken the immune system which raises the risk of illness. Stress can be caused by work, school but also isolation. Living an active life with close relationships can reduce stress.

Robert J. Waldinger, a professor at Harvard, has spoken about the impact of living an active and balanced life. He describes how he was “forced” to take breaks from work when he attended his son’s football practices and other outdoor activities. When his children moved out, he realized how easy it was to work all the time without stopping. Because of this, he chose to continue living an active lifestyle with social activities and meaningful free time. Science supports well being and balanced life (SVT 2025).

How can a solution using natural elements be designed to support human well-being?

The initial brief emerged from findings that seasonal changes influence mental well-being and that contact with nature can have restorative effects. This led to an exploration of how natural elements could be incorporated into a design solution that supports human well-being.

SURVEY

The purpose of the survey sent out was to gain a better understanding of how daily routines and behavior change throughout the seasons for people living in regions with significant variations in daylight. An already well-known fact was that well-being is often affected by darkness and colder temperatures resulting in changes in energy levels, mood and motivations. However, the survey aimed to explore how these seasonal changes influence everyday life and whether there are activities, routines or experiences that people feel are missing during the winter months.

While some of the responses confirmed patterns already described in already known knowledge, others provided valuable insights into activities and experiences that participants felt absent from daily lives during winter.

SURVEY

Seventeen participants, all living in southern Sweden were asked via a survey about their sleep and wake cycles and daily routines throughout the seasonal changes. The majority were feeling more tired, less productive and generally unmotivated during the winter months which they explained that the lack of sunlight caused. Many participants noted spending significantly more time at home during winter, with some leaving their homes only for work or school.

The participants were then asked about how their behavior and levels of activity changes with the seasons and whether there were any activities or projects they missed during winter or summer. While winter activities such as watching movies or reading could be carried out during other seasons one recurring activity that participants missed during the winter was gardening. They expressed their passion to engage with plants, grow their own food and observe the cycle of plants around them. Experiences that were largely absent during the darker months.

SURVEY

Do you feel more active during the spring / summer than in the winter/autumn?

YES



NO



SURVEY

Participants' comments regarding their active lifestyles during seasonal changes



"Tired due to the darkness"



"Activities and being social is easier when my surroundings are full of colours and the nature is full of life"



"All seasons has their charm"



"I barely get to see sunlight during the winter, even if I go outside on my lunch breaks"



"I sleep more during the winter, still I am more tired than in the summer"

SURVEY

Participants' comments regarding their active lifestyles during seasonal changes



"I need **sunlight** and to be outdoors in order to feel well"



"Summer is very social and creates a sense of community"



"Because **gardening** is my main interest, winter feels a bit boring and empty"



"Because I am very inspired by **nature** and my surroundings, it becomes difficult to stay motivated to do anything in the winter"



"All **outdoor** activities disappear. The world becomes grey. The outdoor light is so cold, and I always look so tired"

How can nature be integrated into indoor environments to support well-being ?

The research showed that people spend more time indoors during winter while their interaction with nature decreases. This identified a potential area of exploration focused on bringing elements of nature into everyday indoor environments.

THE BENEFIT OF NATURE

Nature has a great impact on human well being. In Finland during the 1920s, crowded housing conditions and poor hygiene contributed to the spread of diseases with tuberculosis claiming the lives of one million Europeans. One of the primary treatments at the time was exposure to fresh air.

The Finnish architect Alvar Aalto designed the Paimio Sanatorium with a strong focus on the needs of the human being. Located in a pine forest, the building was designed so the patios could see at least one tree from any seat or bed. The ceilings were painted green and the windows were asymmetrically placed to optimize light and views.

Aino Aalto contributed by designing staircases and wave shaped furniture in bright yellow. Creating a non-traditional and human centered environment.

While fresh air alone did not cure tuberculosis, presence to nature has been shown to support overall well being, benefiting both physical and psychological health. (SVT 2025, kap. 2, 4:35).



HOW TO BRING NATURE INSIDE

During winter, outdoors temperatures drop and sunlight is available for only a few hours per day at best. These conditions make it impossible to grow plants outside. To continue gardening indoors during this season, some form of equipment is required. In particular, artificial lighting is necessary to compensate for the lack of natural sunlight.



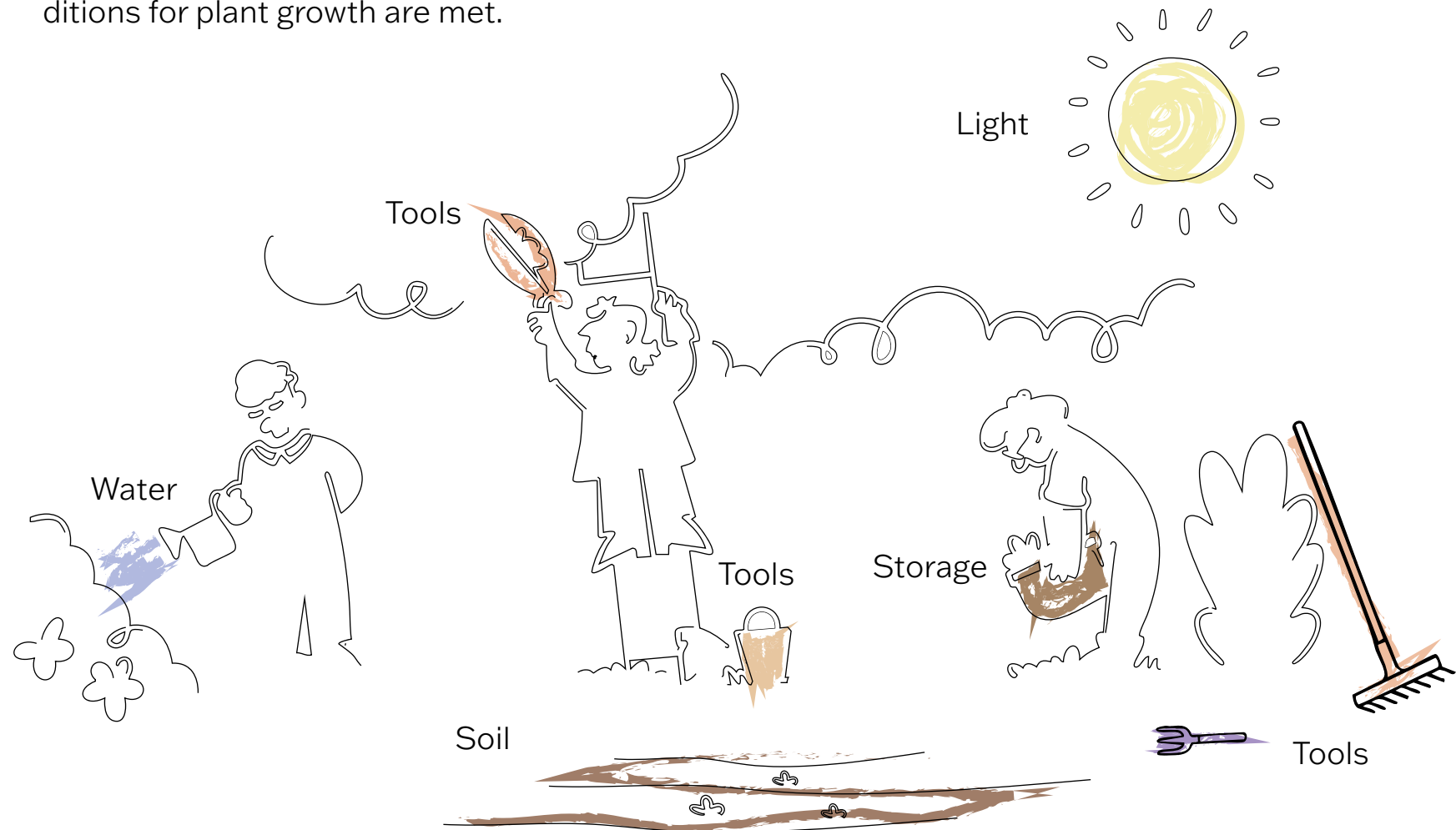
HOW TO BRING NATURE INSIDE

The survey shows that gardening is about more than simply keeping plants alive. Several participants described gardening as an activity they missed during the darker months of the year. They enjoyed caring for growing vegetables, herbs and following the development of plants over time. Gardening allowed them to spend time outdoors and engage with nature in a way that was not possible during winter.

Unlike many indoor activities, gardening requires continuous interaction and care. Plants need water, light and attention in order to grow. This creates routines and gives people something to look after and follow over time. Several participants expressed that they enjoyed seeing plants develop from seed to mature plant and that this process was an important part of the experience. The activity itself therefore appears to be just as important as the final result.

HOW TO BRING NATURE INSIDE

To understand how gardening could be brought indoors during the winter months, the tools and product used for the scenario were researched. The investigation showed that gardening can be successfully transferred from outdoor to indoor environments, provided that the necessary conditions for plant growth are met.



EARLY CONCEPTS

One concept explored during the early stage of this project was a planting box system for indoor gardening. The intention was to create a solution that could hold larger amounts of soil than traditional pots, giving plants more space to grow while keeping the indoor environment clean and organised. The system was envisioned as a movable unit on wheels, allowing it to be relocated depending on where light was available or where the plants were wanted within the home. When not in use, the system could be easily stored away. The planting box could be used for decorative flowers as well as herbs and edible goods. Making indoor planting more accessible and adaptable to different needs.

EARLY CONCEPTS

Another concept explored during the project was a drying and storage system for herbs and other edible plants. The intention was to create a solution that would allow home grown produce to be preserved and used throughout the year. The system was envisioned as a compact unit on wheels, making it easy to move, store and integrate into different areas of the home. The concept focused on extending the use of plants beyond the growing season by providing a dedicated place for drying and storing harvested herbs. However, the system relied on plants having already been grown and harvested. As the project progressed, it became clear that the larger challenge was maintaining plant growth during the darker months of the year. With limited natural daylight during autumn and winter, the concept addressed a later stage of the gardening process rather than the conditions required for plants to grow in the first place.

Another concept lightly explored during the project was a watering system for indoor gardening. The intention was to simplify plant care by providing a more controlled and convenient way of watering plants. The system could reduce the risk of overwatering or under watering while making indoor gardening easier to maintain over longer periods of time.

However, a review of existing indoor gardening products revealed that none of these solutions could function effectively without one essential component; **Artificial light.** During the winter months, the lack of natural sunlight becomes a major limitation for indoor gardening. Regardless of the container, storage solution or watering method used, plants still require sufficient light to grow and survive. This identified artificial lighting as the most fundamental requirement for indoor gardening and led to a focus on the design of a grow light. (Blomsterlandet. 2025) (Elmberg, K. 2018)

ENVIRONMENT

The survey also showed that participants spent significantly more time at home during winter. This raised the question of how indoor gardening could become a natural part of everyday life, rather than a seasonal activity. Since the activity relies on regular care and interaction, it became important to identify a location within the home where plants would be seen frequently throughout the day.

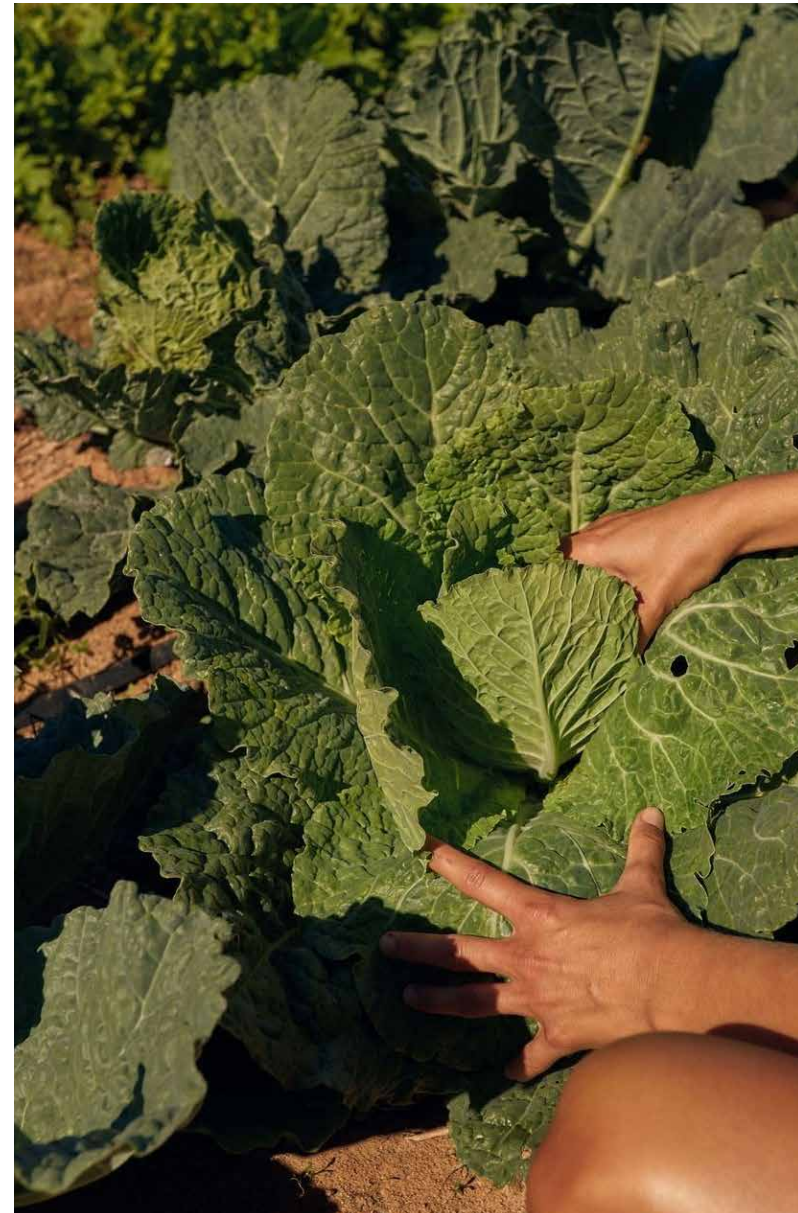
The kitchen was identified as a suitable location because it is one of the most commonly used spaces in the home. It is visible multiple times a day and already has a natural connection to herbs, vegetables and food preparation. By placing plants in the kitchen, users are more likely to notice them, care for them and follow their development over time. This makes indoor gardening easier to maintain while also allowing plants to become a visible part of everyday routines.

For many people, the kitchen also functions as a social space where family and visitors gather. Integrating a growing station into this environment creates opportunities for interaction with plants throughout the day rather than limiting the activity to a dedicated hobby room or temporary growing setup. As a result, the kitchen was selected as the primary context for the design.

TARGET GROUP

This project is aimed at individuals who enjoy having personal side projects alongside work or school. Motivation increases in spring when vegetation begins to bloom outside their windows and they can actively participate in the process of growing plants, observing, smelling and harvesting fresh produce. The primary target group has access to a kitchen that has room for an indoor planting station.

From spring to late summer, the targeted users typically spend a significant amount of time outdoors looking after their kitchen gardens. During the winter months however, this activity is lost, leaving them longing for the return of warmer seasons and the opportunity to take up the activity again.





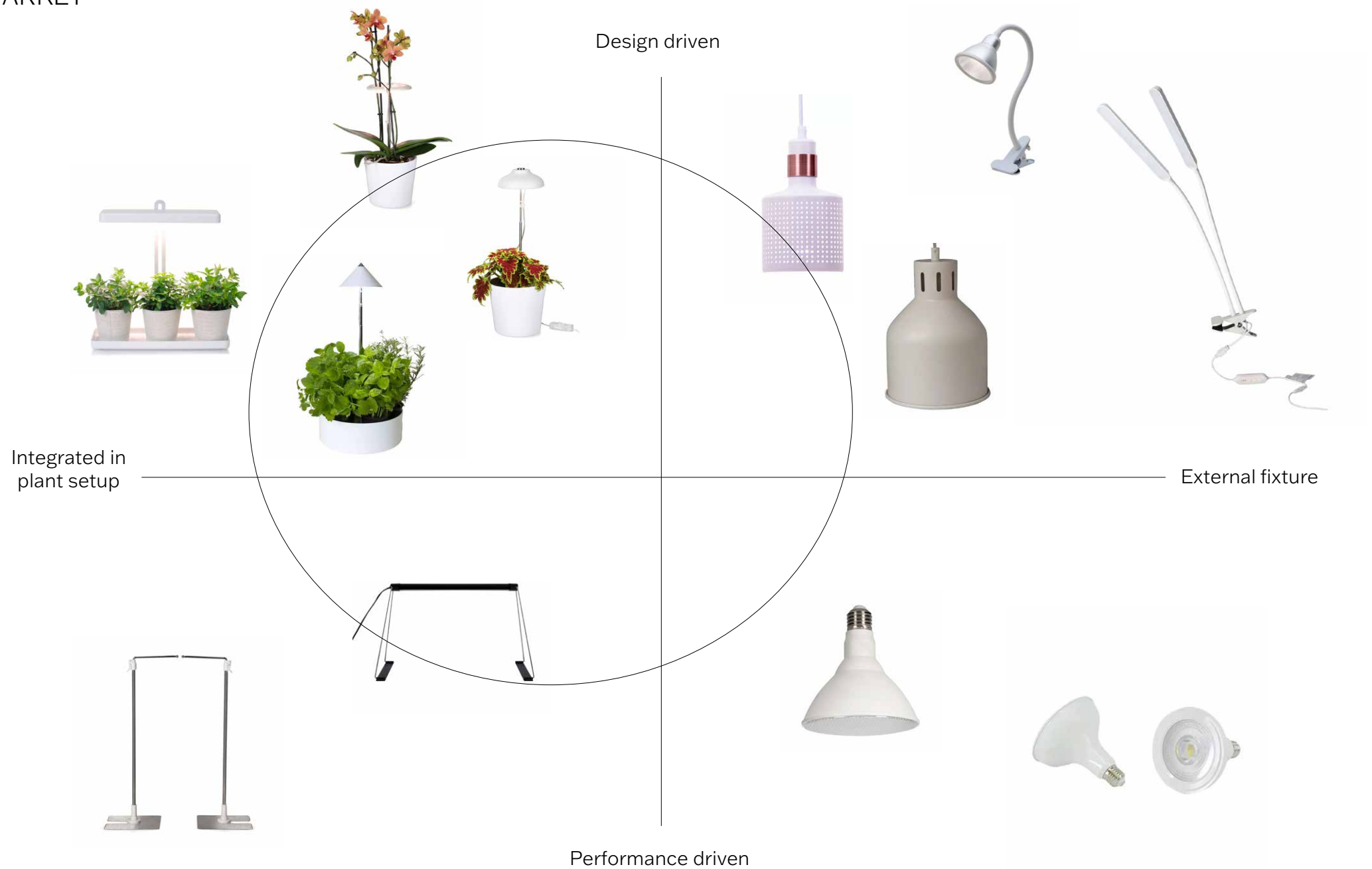
MARKET

There is a wide variety of grow lights available on the market, although most are designed primarily for function rather than visual appearance. While the light sources must be strong enough to provide sufficient energy for plant growth, this often results in noticeable glare.

Grow light also varies in shape and type of light source, with the choice typically determined by the specific needs of the plant. Different plants require different light intensities and range of colour which is of course the reason for the design of the lighting system (Elmberg, K. 2018).



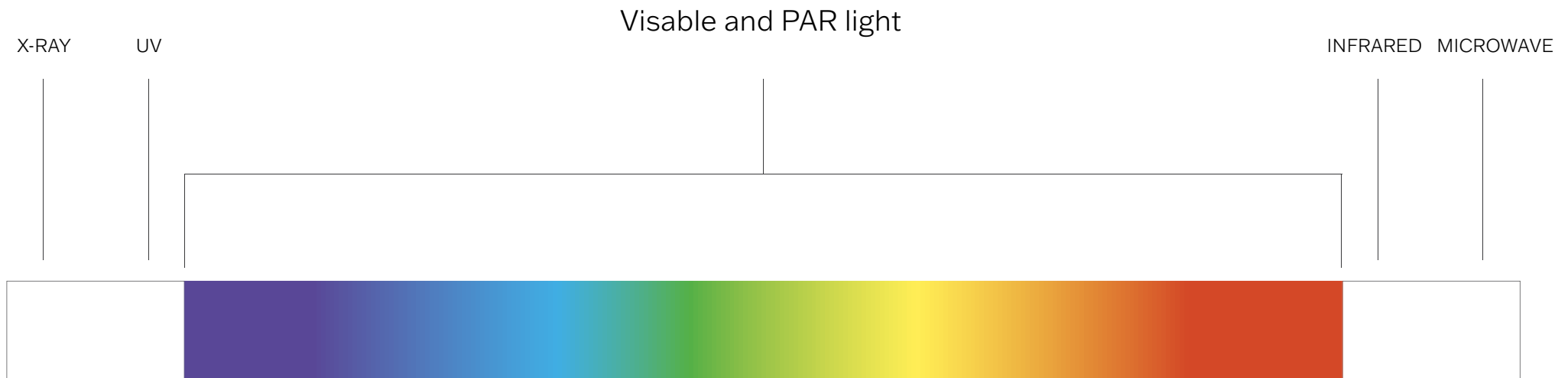
MARKET



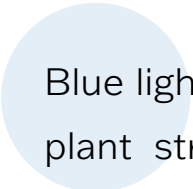
LIGHT

Just as humans rely on sunlight for survival, plants are also dependent on it. Sunlight forms the foundation of all life on earth, providing the energy necessary for growth and development. Plants absorb light through their leaves and convert it into energy via *photosynthesis*.

Humans and plants perceive and respond to light differently. The Photosynthetically Active Radiation (PAR) Spectrum defines the wavelengths of light that are most beneficial for plant growth. While the human eye is most sensitive to green and yellow light, these wavelengths are largely reflected by plants, which is why leaves appear green to us. In contrast, red and blue wavelengths are most efficient for photosynthesis. (Elmberg, K. 2018).



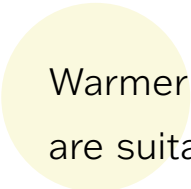
LIGHT



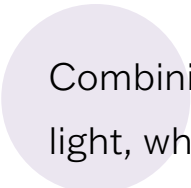
Blue light or cool white light, promotes strong plant structure, supports root development and helps leaves retain moisture. It is typically used for plants that naturally grow in warmer climates and require intense light such as mediterranean plants.



Red light primarily supports lateral growth, root developments and elongation in taller plants.



Warmer tones such as warm white or pink light are suitable for potted plants, decorative plants and cuttings. This type of light encourages the plants to grow thicker and stronger before they are replanted into larger pots.

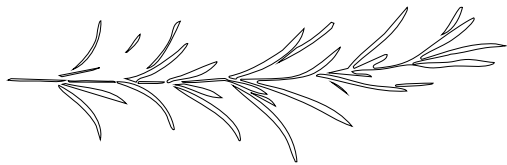


Combining all of these colours produces a purple light, which is particularly beneficial for *vigorous* growth in larger plants (Elmberg, K. 2018)

WHAT TYPE OF PLANT

The target group consists of individuals who enjoy cooking with fresh ingredients and typically maintain a kitchen garden during the summer months. Based on these preferences, herbs emerge as a suitable category of plants for indoor growing within this context.

The lighting for herbs also meets the requirements suitable for a home environment, giving a pleasant warm toned light.



As the project developed, the focus shifted from nature in general to activities that could strengthen the connection between people and pasture during the winter months. User research revealed that several participants missed gardening and growing plants during this period as outdoor gardening became impossible. Gardening was found to offer more than practical benefits, providing opportunities for routine, care and interaction with living plants.

To understand how gardening could be maintained throughout the winter, existing products for indoor gardening were studied. The research showed that sufficient lighting is essential for plant growth during the darker months of the year, making artificial lighting a necessary component of indoor gardening. At the same time, many existing grow lights were found to prioritise technical performance over their integration into the home environment.

Design a grow light for indoor kitchen gardening



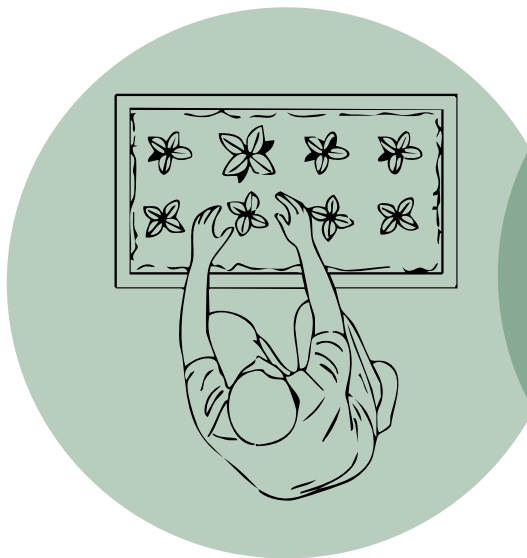
2 FUNCTION



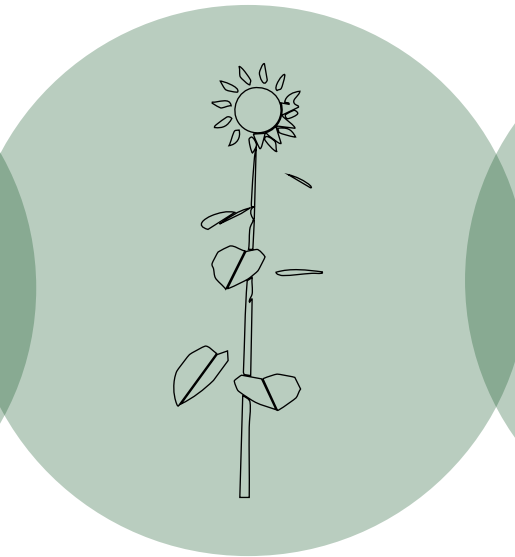
REQUIREMENTS

In the winter when there is a lack of sunlight, where plants won't grow, this lamp is working as a growing lamp for indoor use. The light sources should be modular and be able to be changed in height when the plant grows. The lamp should be vertical, inspired by vertical planting which has become popular. This saves space in the kitchen. In the spring to late summer when the gardening is happening outside, the lamp should be working as a pleasant light with no glare visible apart from the direct angle towards the light source. The lamp should be incorporated in the interior not only be used as a tool, also as a decorative piece used all year around.

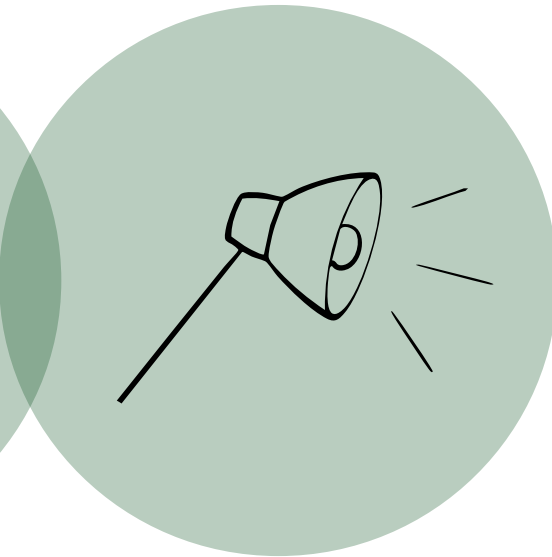
Modularity



Vertical structure



Reduced glare

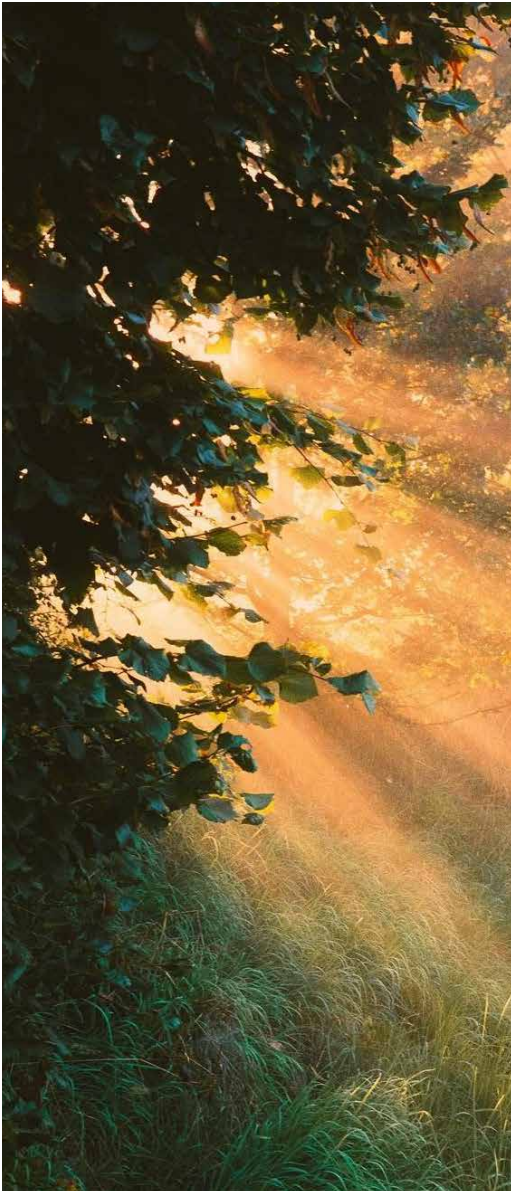


MODULARITY

In the survey that was sent out in the early stages of this project. The activities that were missed during the wintertime usually done in the winter was a project where something was made out of hand movement. Some examples besides gardening; cooking, grilling, carpentry etcetera. For this lamp to help with an activity where you are present and working with your hands, modularity felt like an important feature allowing the person to be an active part of the growing plants.



REDUCED GLARE



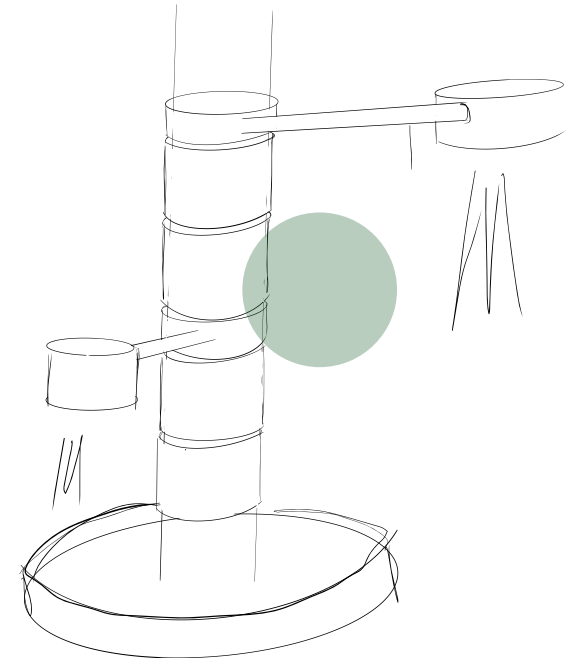
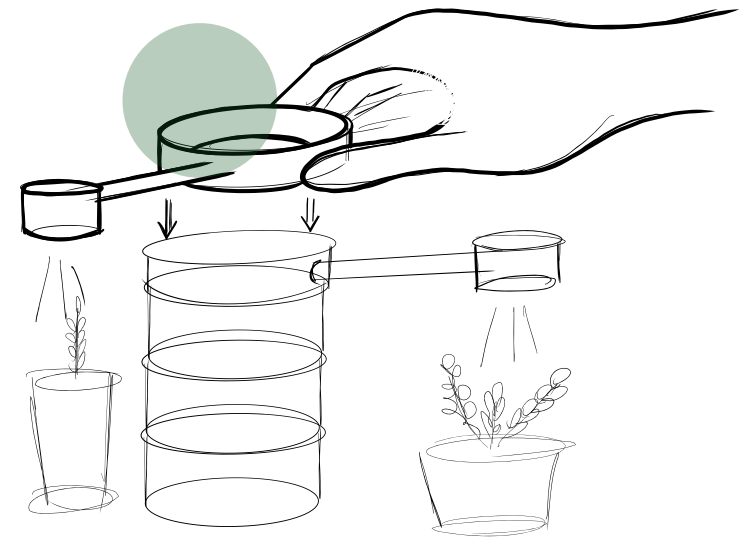
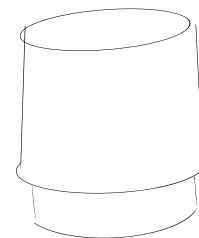
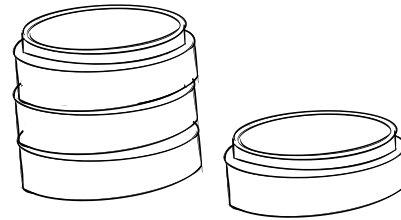
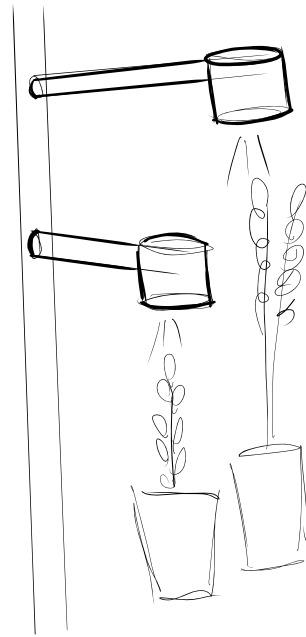
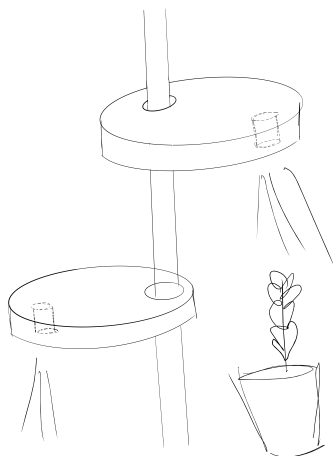
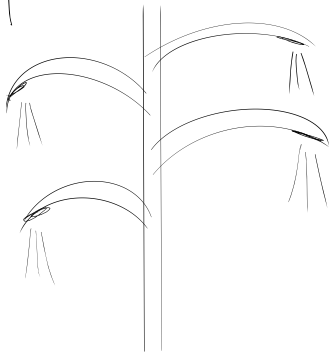
For the lamp to effectively support indoor plant growth in the absence of direct sunlight, while also integrating with the interior environment, the emitted light should be both pleasant and designed to minimize glare.

VERTICAL STRUCTURE

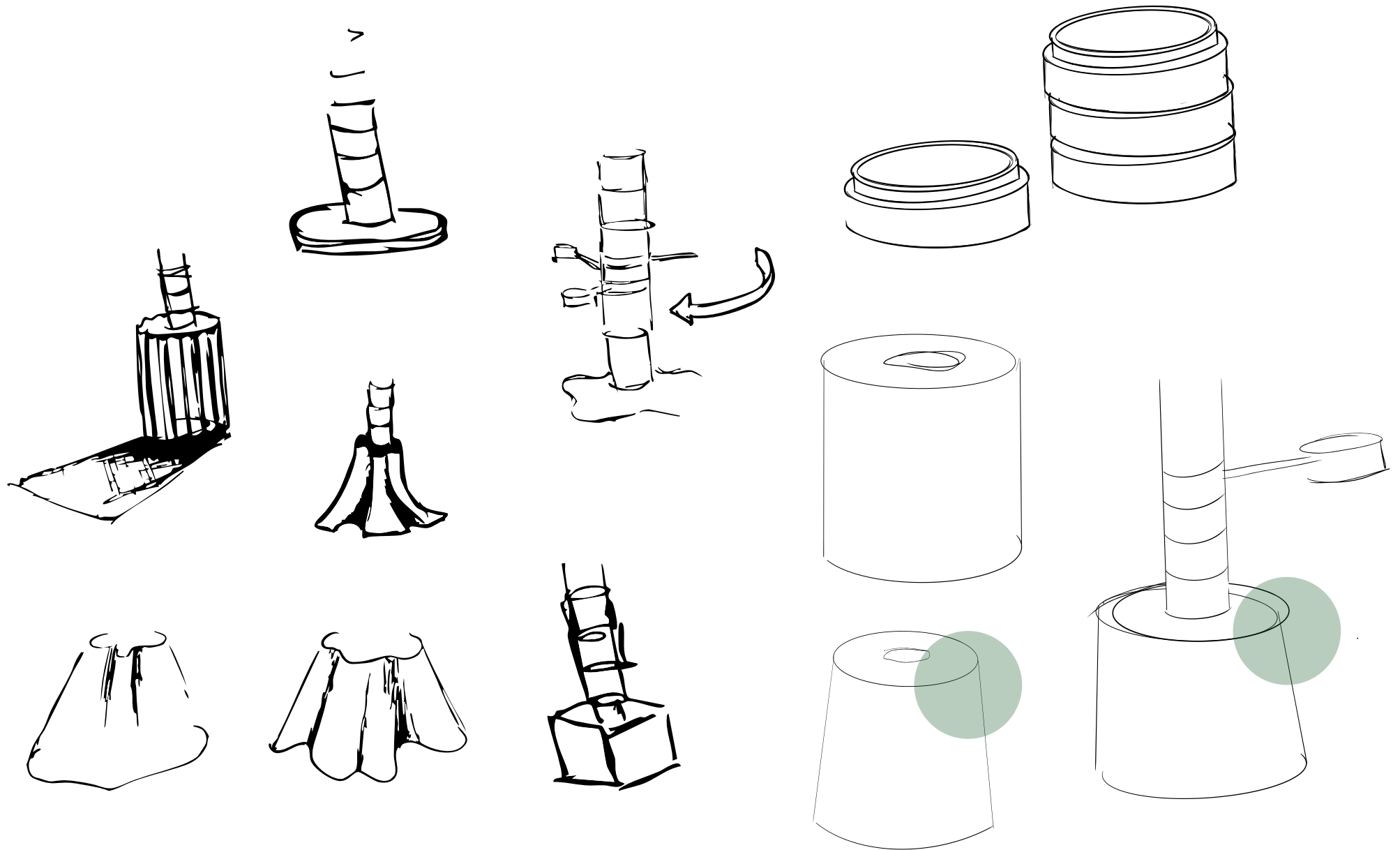


Making the lamp vertical allows it to take up less space on the surface it stands on. By combining verticality with modularity, the height of the source can be easily adjusted to follow the plant's growth. The vertical designs are inspired from plants, with the internal structure representing the stem and the light sources resembling leaves.

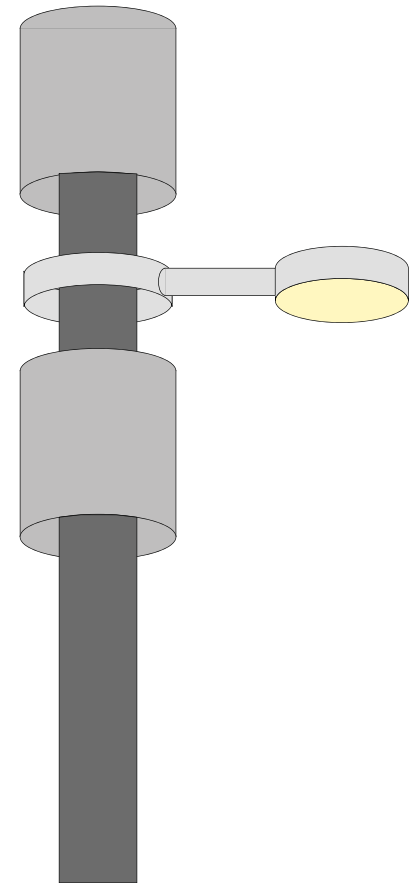
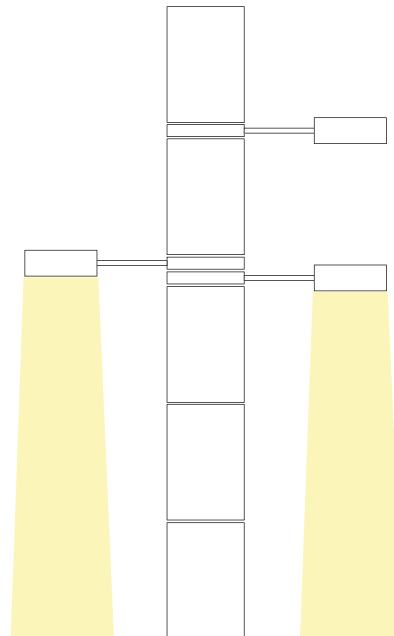
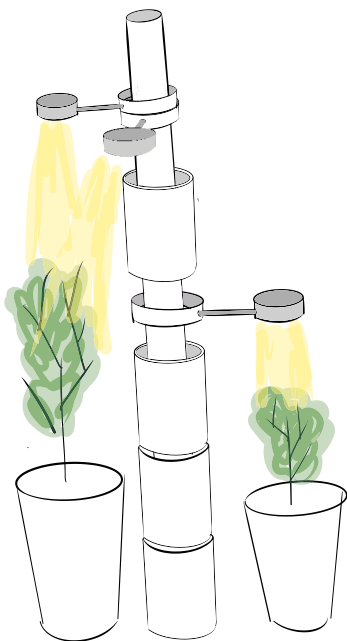
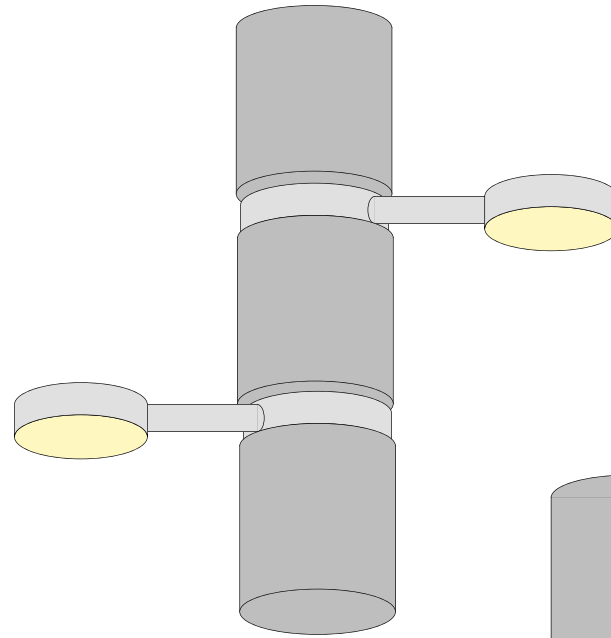
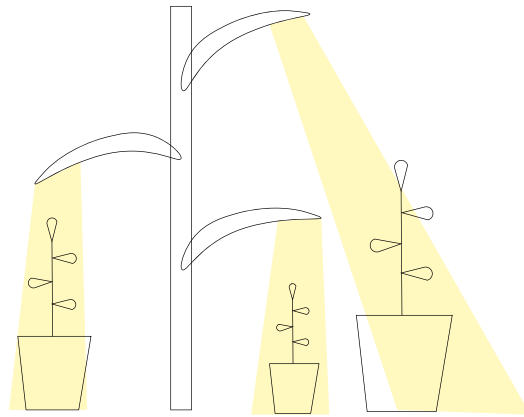
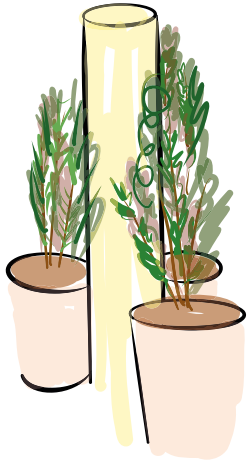
IDEATION



IDEATION



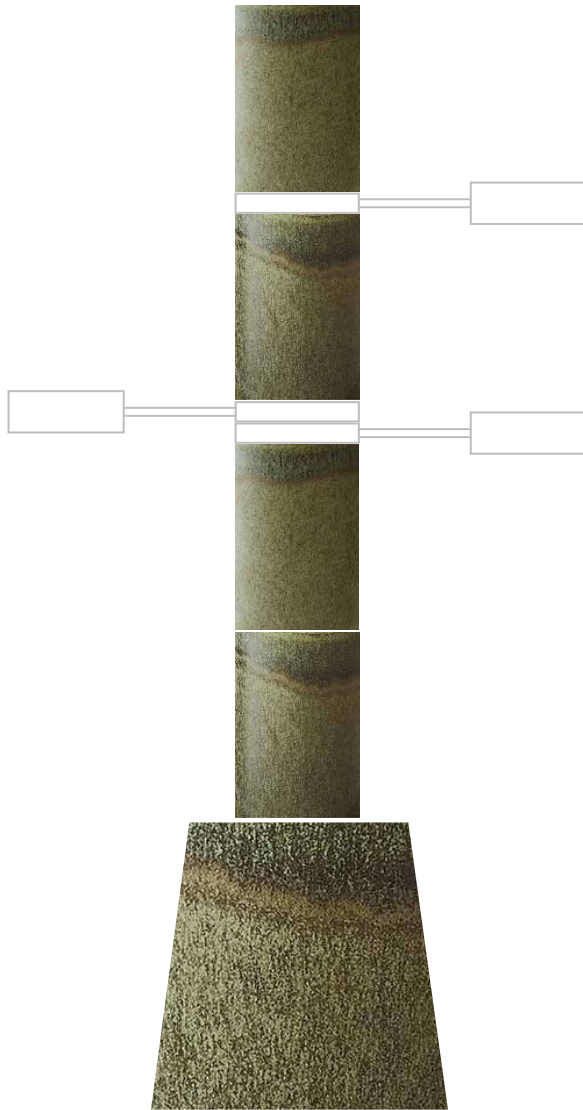
IDEATION



3 MATERIAL



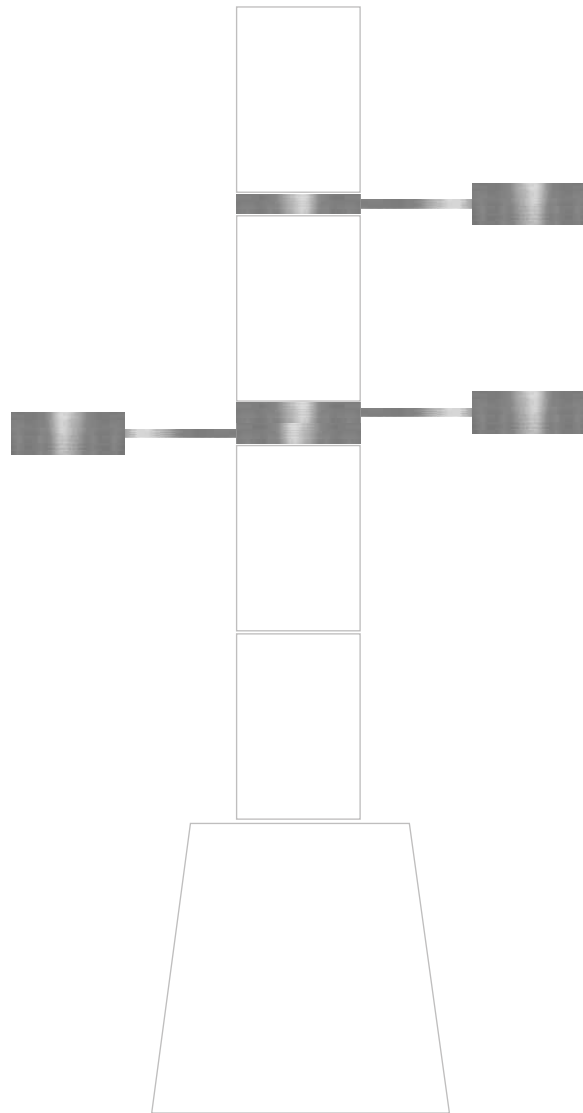
STONEWARE



Stoneware is a water-based ceramic material known for its durability and sustainability compared to other ceramics such as porcelain. It is commonly used for everyday items such as plates, cups and bowls and is well suited for use in dishwashers, microwaves and ovens.

This material is suitable for the lamp due to both its qualities but also its aesthetics. The lamp is intended for a setting where cooking takes place and plants are growing right beside and underneath. The ceramic components are designed to be easily removable and can be cleaned either by hand or in a dishwasher. The use of ceramics is inspired by indoor plant pots as well as traditional kitchenware, supporting its natural fit within a kitchen environment.

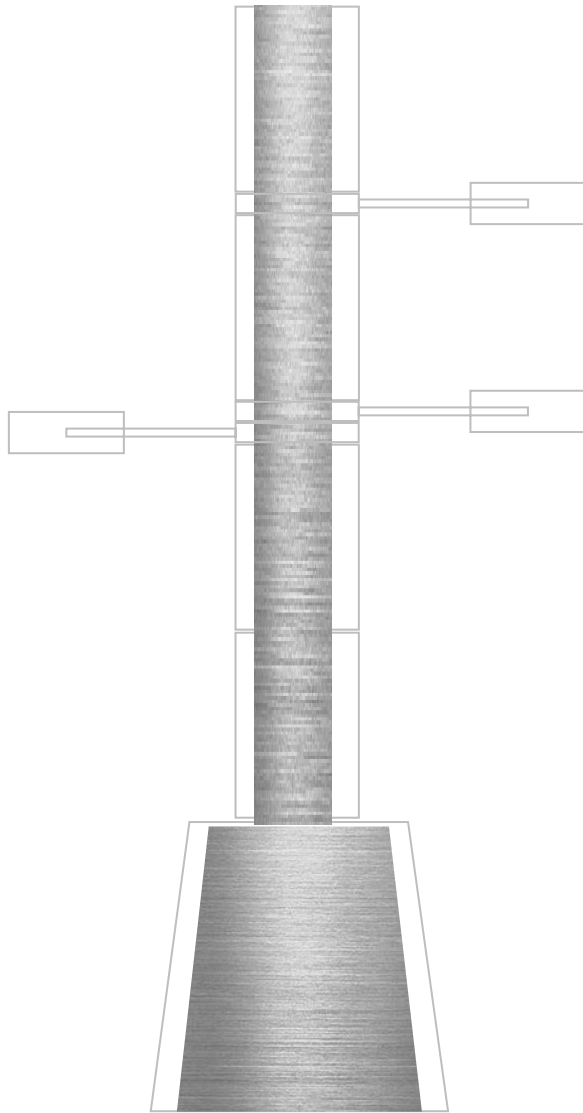
ALUMINUM



Aluminum is lightweight compared to many other metals and offers corrosion resistance. Although the aluminum components will be in direct contact with water, they will be exposed to a humid environment. This resistance helps the material maintain both its surface and rigid structure over time.

In contrast to the stoneware, the aluminum has a sleek and durable finish that creates a visually appealing contrast while complementing common kitchen elements such as utensils, sinks, pots, and pans.

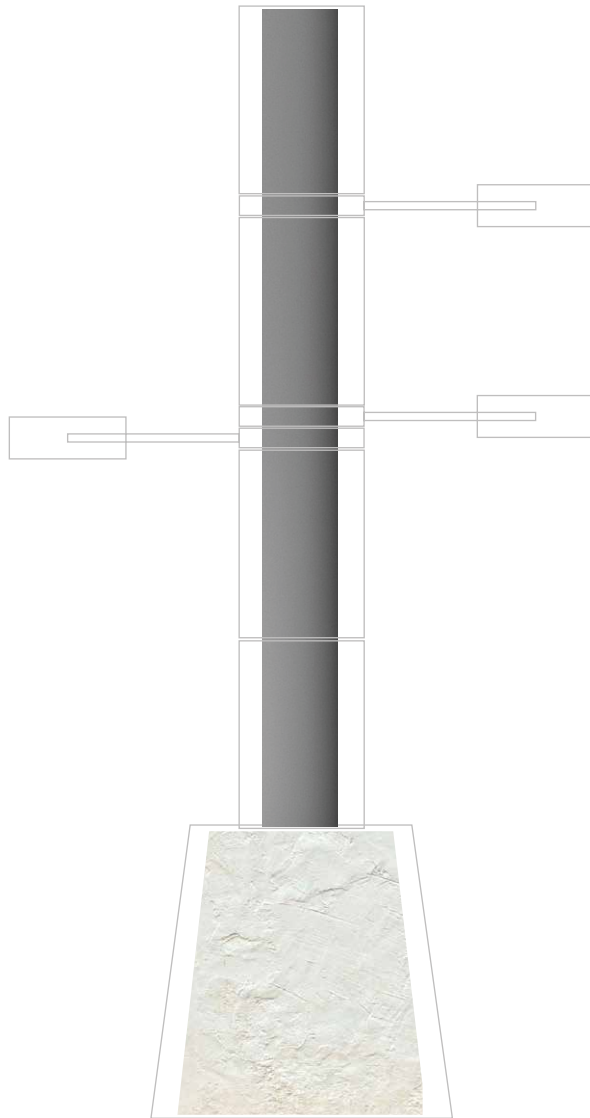
ALUMINUM



The initial plan was to use aluminum for the base and pipe structure to match the lamp holders. However, this was not possible due to time constraints. Instead, a more rigid available material that provided sufficient stability was used for the final prototype. In future processes, earlier material testing could help achieve a visually pleasing result while also avoiding unnecessary use of metal for this component that will not be visible once assembled. The most important factor is that the base weighs more than all the other components combined to ensure stability.

A rigid polymer could be used for both the base and the pipe. The base would be solid while the pipe would be hollow to help balance the weight distribution. Friction between the polymer and the other components would also aid assembly and help keep the structure securely together. Choosing a polymer material would also help keep production costs down.

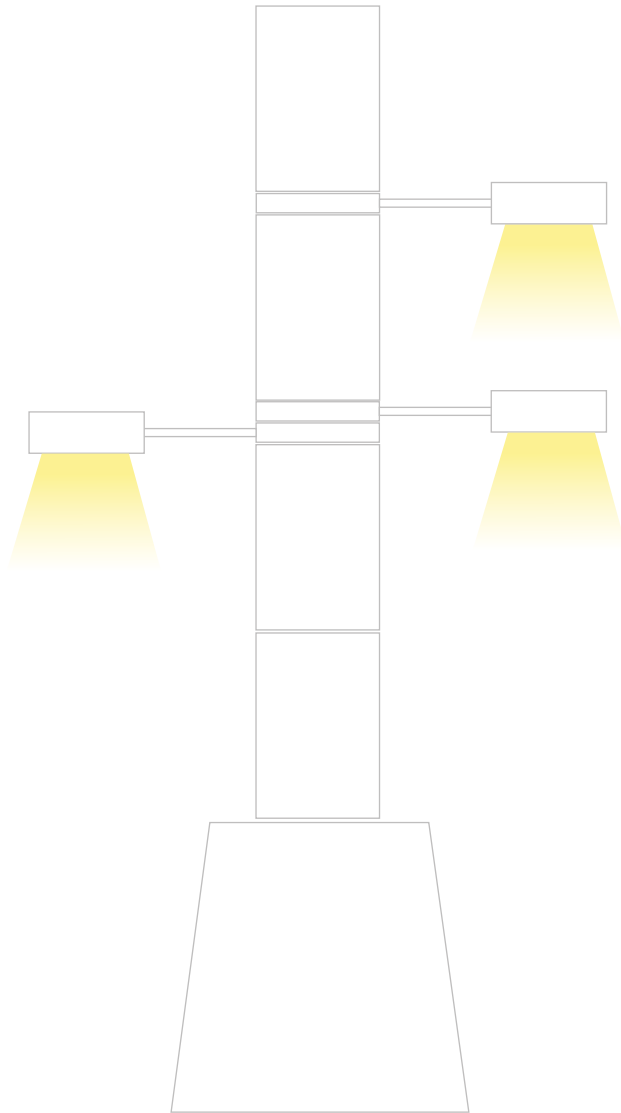
POLYMER AND PLASTER



In the final prototype the pipe that is the vertical structure is made out of polypropylene. This polymer is lightweight, sustainable and provides good isolation for water. It was chosen both to reduce the overall weight of the structure and to create friction between the pipe and the surrounding components, which creates stability.

The base in the final prototype is made of plaster. This is not an ideal material for the final product, as it cannot withstand water and may dissolve over time when exposed to moisture and humidity. However, the plaster base is stable and keeps the lamp rigid and demonstrates its intended function.

LIGHT SOURCE



The light source is secured with a magnet and can be easily removed for charging.

The light source is not visible from the sides. The aluminum cylinder hides the brightest glare while directing the light toward the plant below.

4 PROCESS



PROTOTYPING

During the prototyping phase, stackable 3D-printed parts and lamp holders of varying lengths and sizes were assembled together to evaluate the stability of the structure. The stackable cylindrical parts provide good structural support and integrate well with the lamp holders.

One issue discovered during prototyping was that the tolerances between the lamp holders and the pipe structure need to be kept as small as possible. Since the light source adds weight to the sides of the lamp holder, the stackability alone was not sufficient to ensure stability.



PROTOTYPING



Another important aspect of the testing process was ensuring that plants could fit comfortably underneath the structure and that the light distribution would effectively reach them.



The ceramic stackable cylinders are produced in stoneware using a slip casting process. The geometries were developed as solid parts through 3D-printing which were used to create plaster molds in two stages. A two-piece mold construction was made for the hollow components to make removal from the mold easier.

The mold design resembles a mug-shaped form where the bottom is removed and is left with the hollow, intended form. Liquid stoneware slip was poured into the plaster mold and left for approximately 35 minutes to build up the wall thickness through the plaster absorbing the water in from the slip. The excess slip was then drained and the cast was left to dry until it released from the plaster mold. Compressed air was used to get the cast out.

The taken out casts were dried overnight before the bisque firing. After firing the pieces were glazed and then fired in a glaze firing. Both firing took about 15 hours each.

CERMICS WORKSHOP



CERMICS WORKSHOP



METAL WORKSHOP

The lampholders are made from solid aluminum cylinders, milled down to the required dimensions. Each lampholder consists of three parts, a stackable cylinder, a rod and a holder for the light source. A critical aspect of the design was achieving precise measurements as the lamp holders function as stops for the other components.

The dimensions from the ceramic parts were required to produce the aluminum components. The ceramic pieces shrank more than expected during firing. Fortunately the aluminum parts, which act as stops, could be adjusted since their dimensions would be precise and not constrained in the same way.

The tolerances between the pipe and the holder were kept as tight as possible to ensure overall structural stability. The processes, milling and slip casting were carried out in parallel to ensure that all components aligned correctly in the final assembly.

The aluminum parts were joined using epoxy glue. This decision was made to simplify the final prototype. In production the parts would be threaded and screwed together, resulting in a more seamless finish with easy assembling.

METAL WORKSHOP



COLOUR AND FINISH

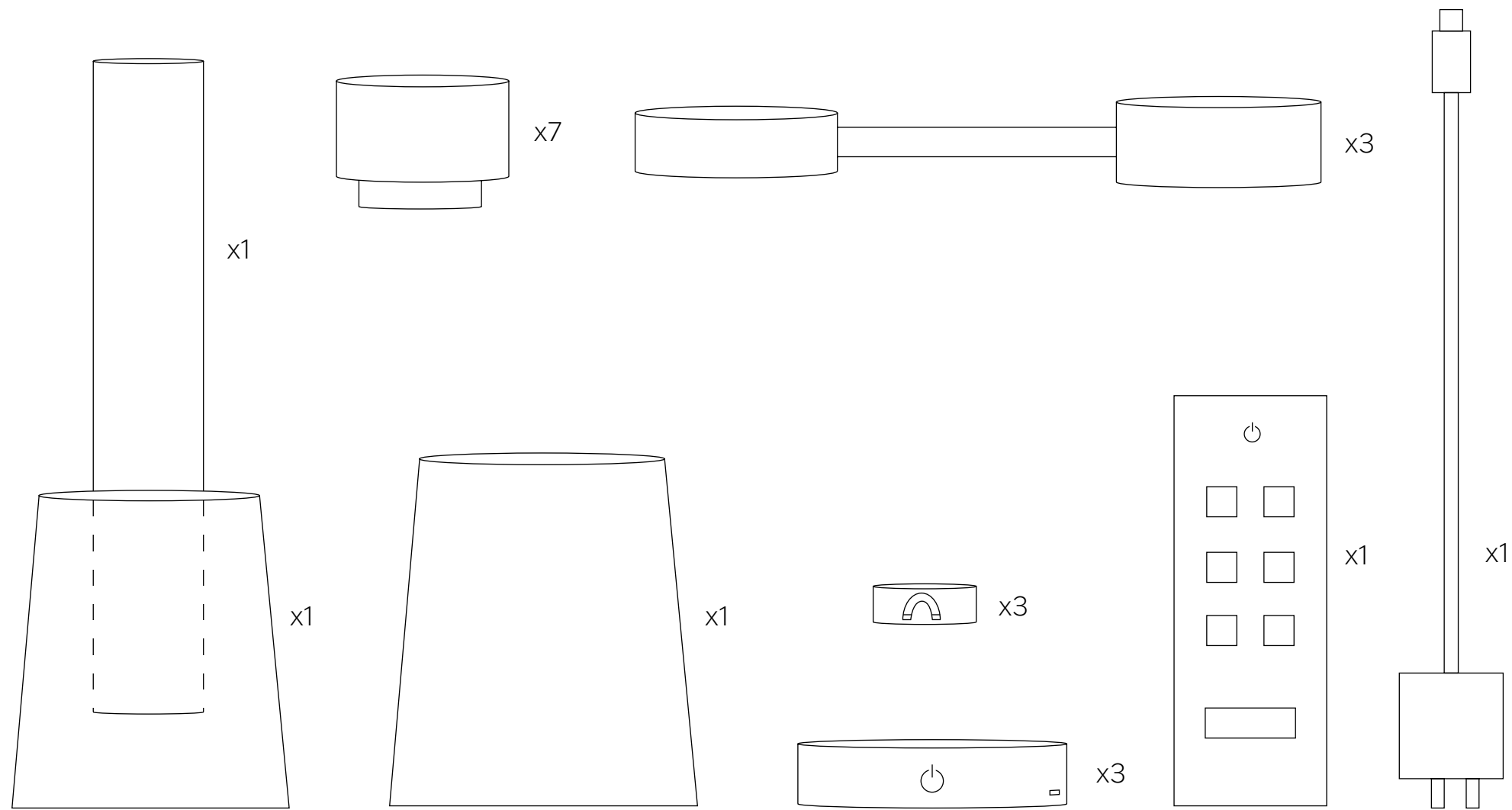


The stoneware parts were glazed using two different glazes as part of an experiment, where the appearance changed before and after glaze firing. One glaze is speckled with different shades of warm brown and has a glossy finish. The other glaze blends green and blue tones with a subtle metallic effect and a matte finish.

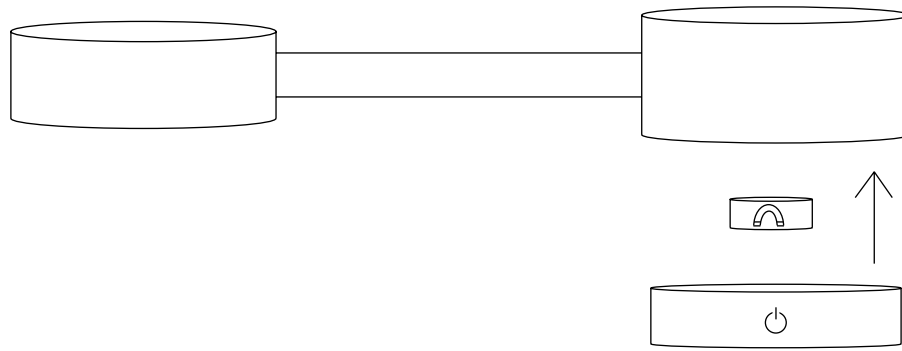


The aluminum pieces creating the lampholders were carefully milled to achieve an even and precise finish. The aluminum has a natural gloss and no additional surface treatment was applied to get a contrast to the organic and hand made looking stone ware parts.

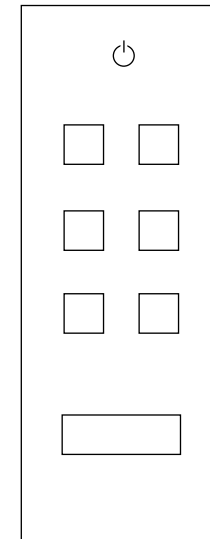
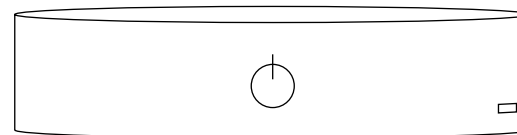
COMPONENTS



COMPONENTS



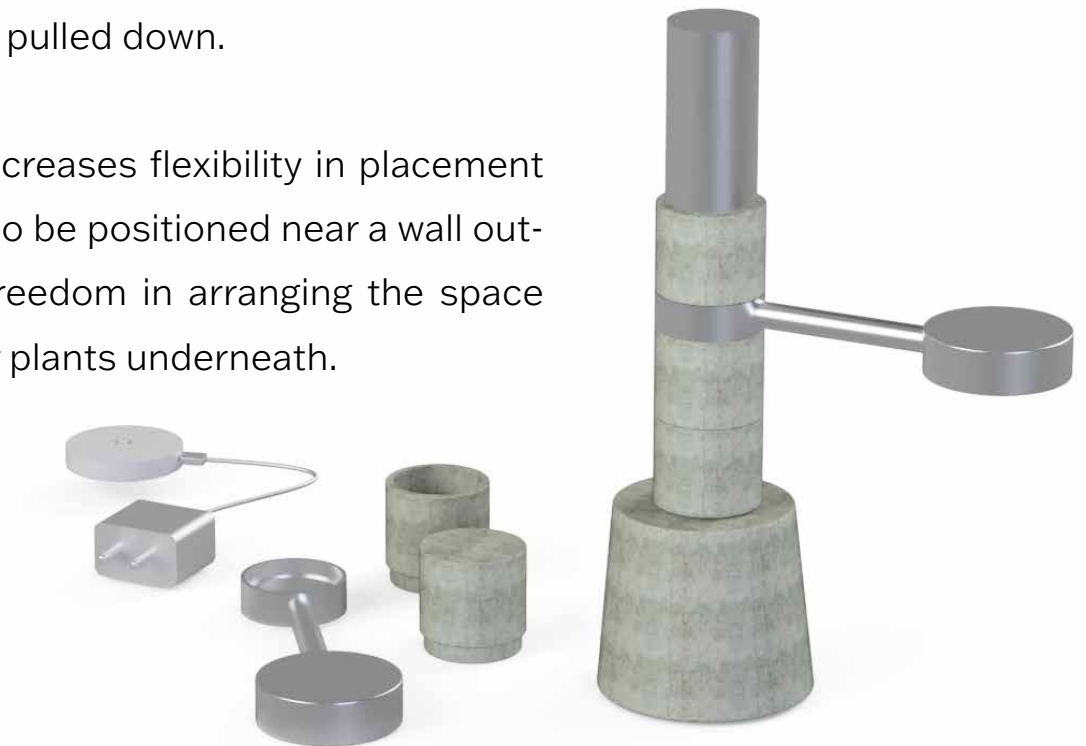
The light turns on by using the touch function on the surface. The brightness is adjusted with a remote control.

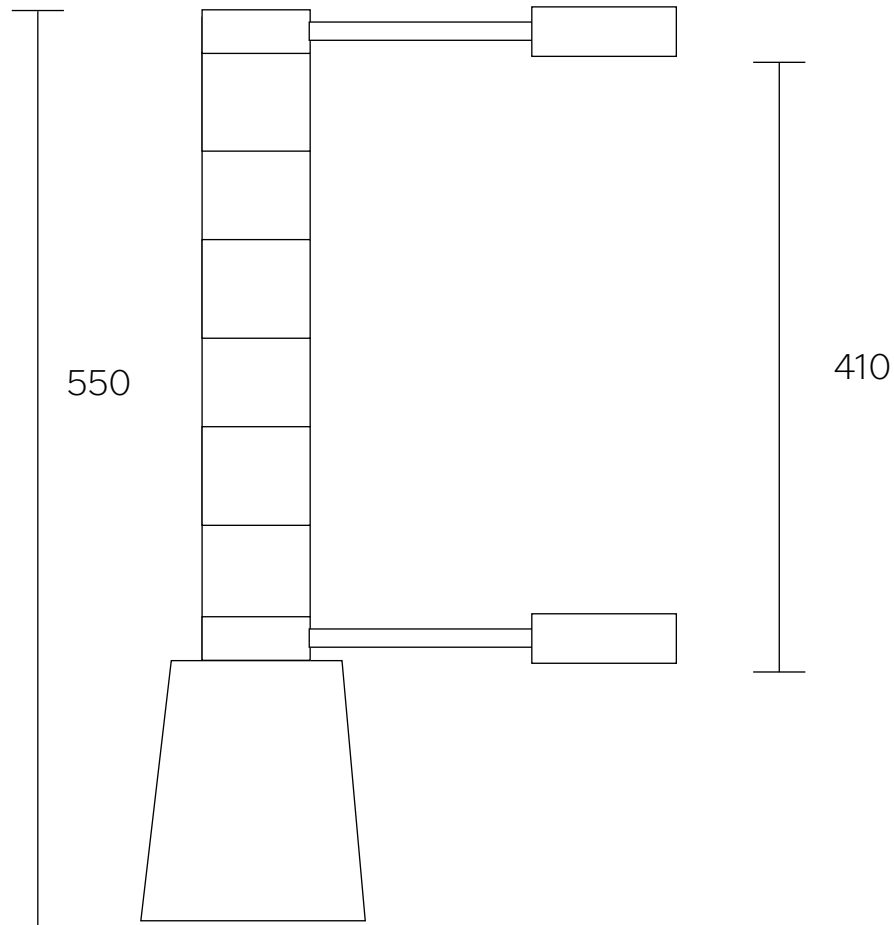


COARDLESS

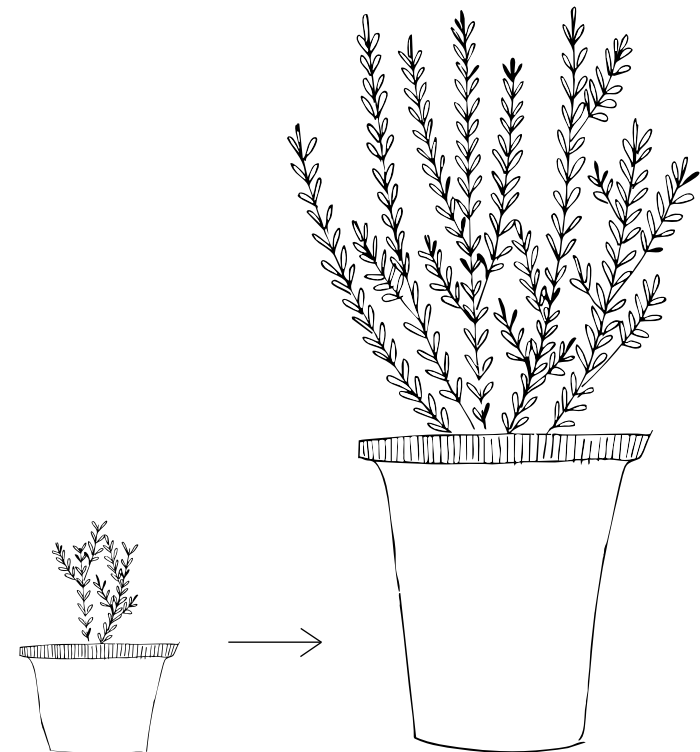
The lamp is cord-less, except when charging. This decision was made because the lamp is intended for use in a kitchen environment when there is frequent movement, water, food and general activity. A cord could both be in the way and create a risk for the lamp being pulled down.

The cordless design also increases flexibility in placement as the lamp does not need to be positioned near a wall outlet. This allows for bigger freedom in arranging the space and provides more room for plants underneath.

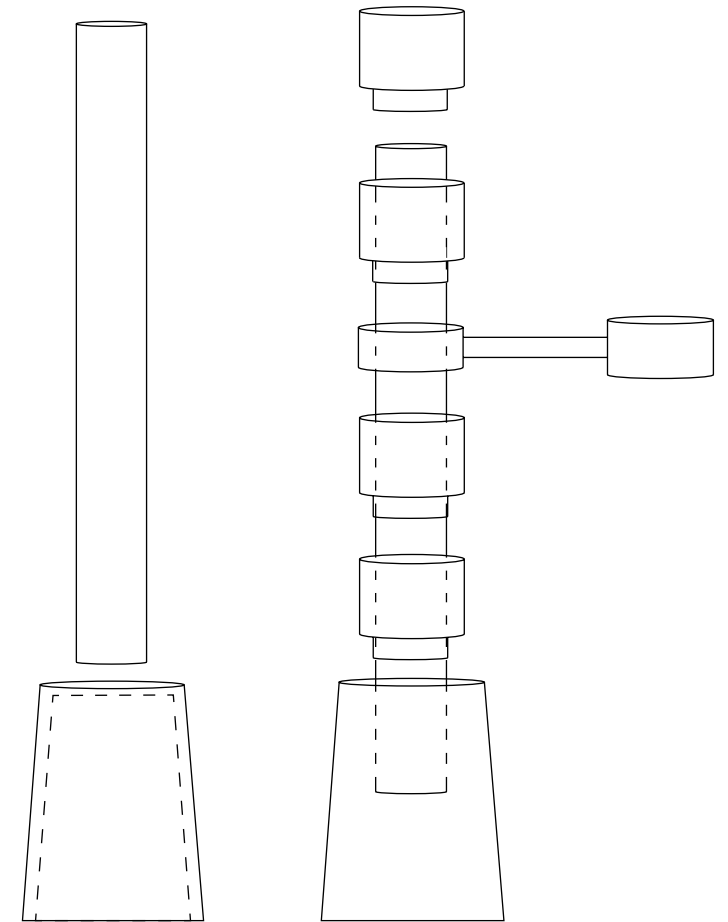


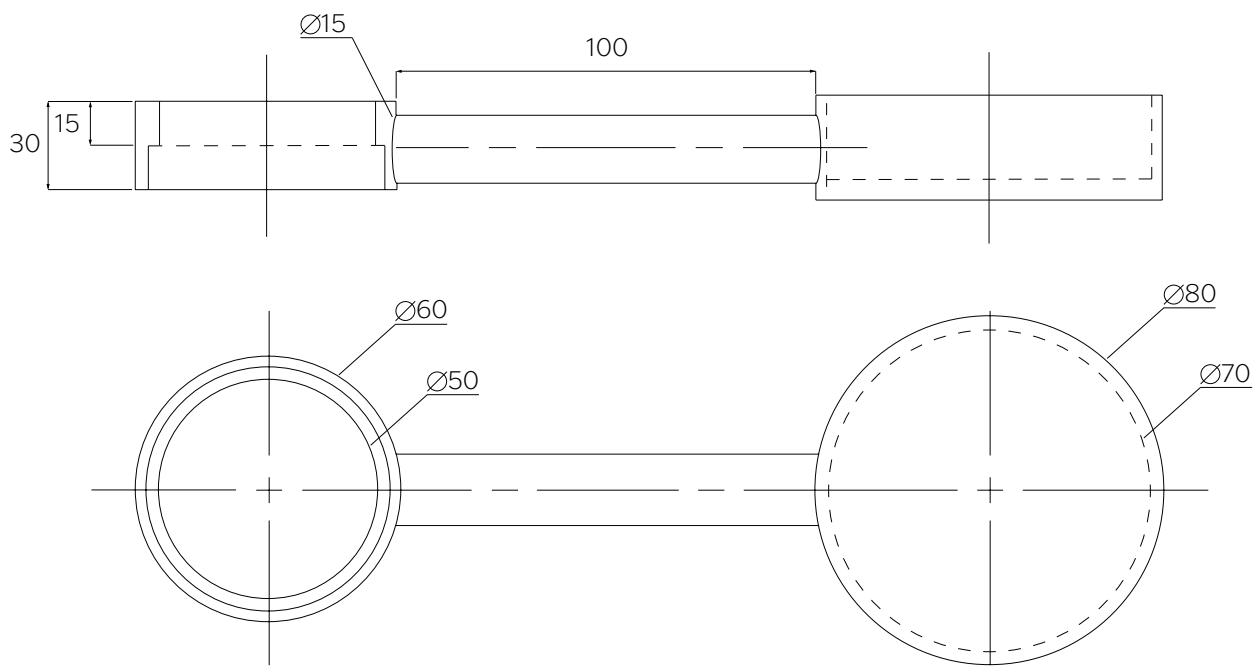
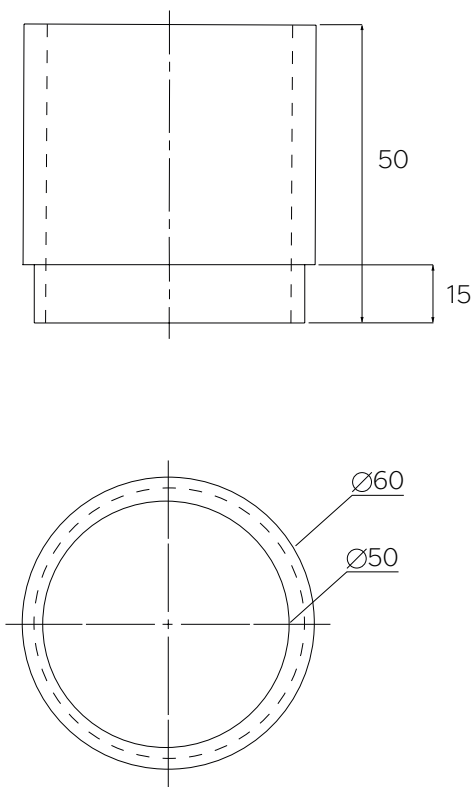


The light sources can be adjusted in height within a range of 410 millimeters, from 140 mm to 550 mm.

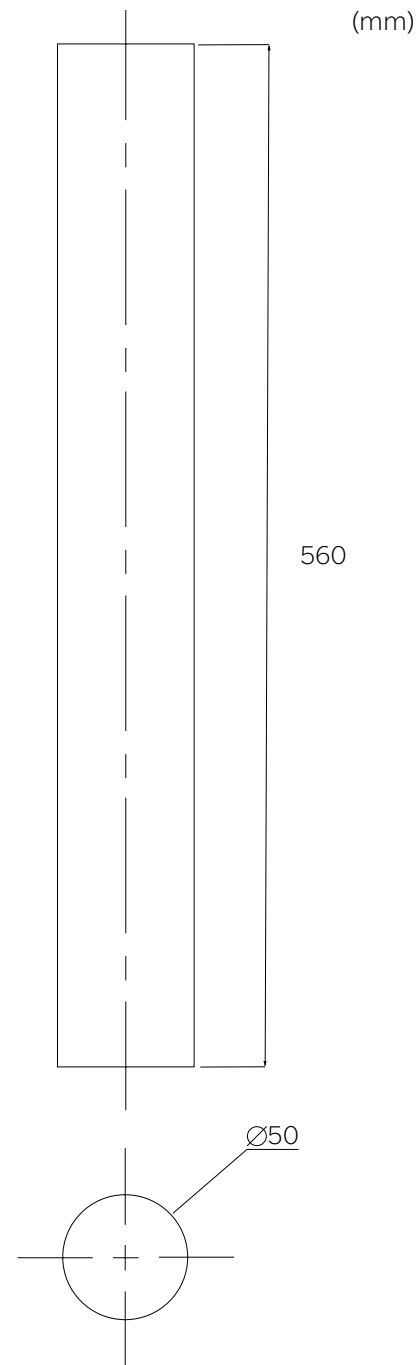
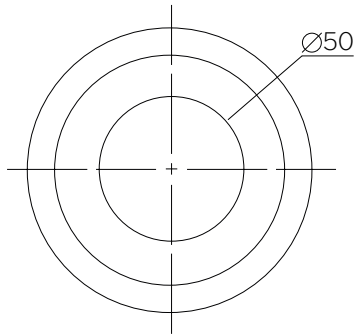
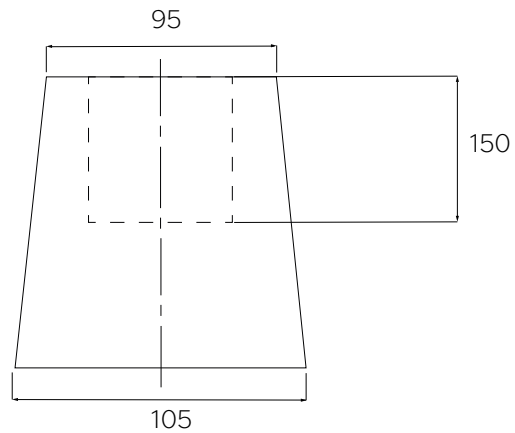
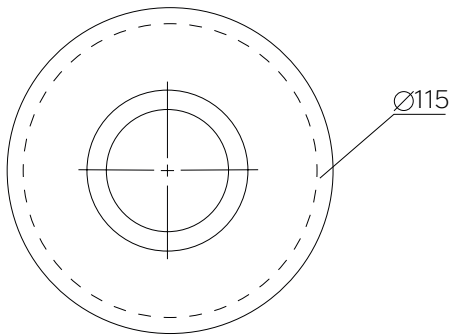
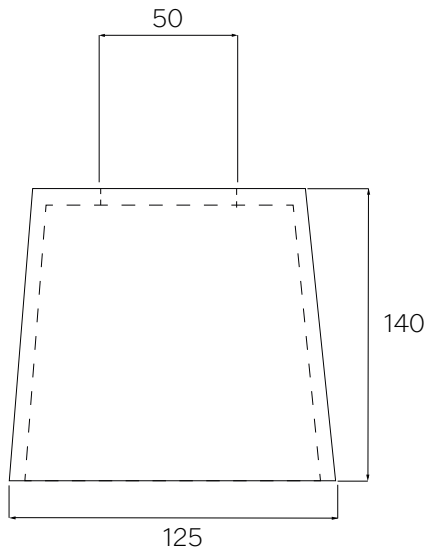


TECHNICAL SKETCH

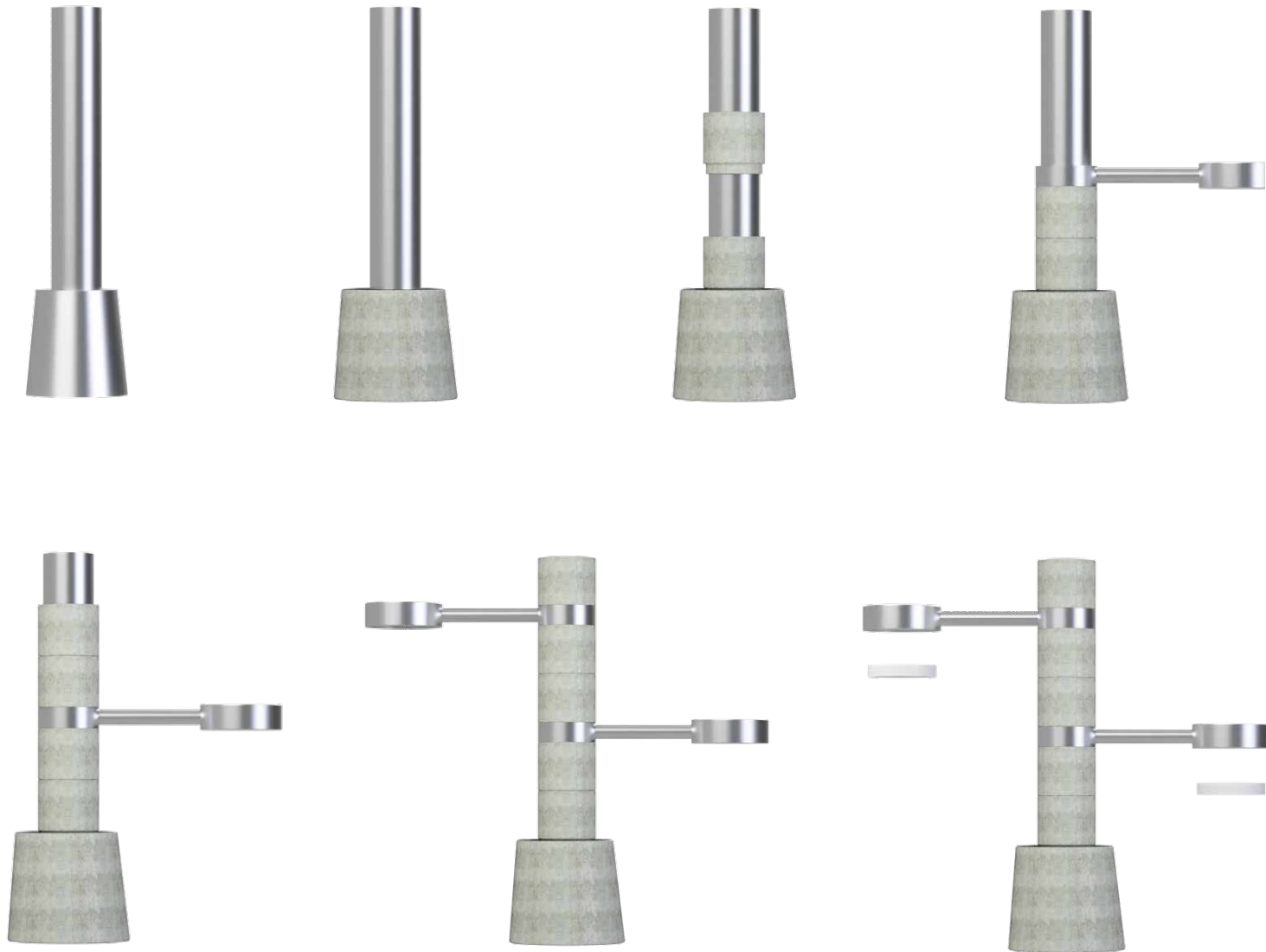




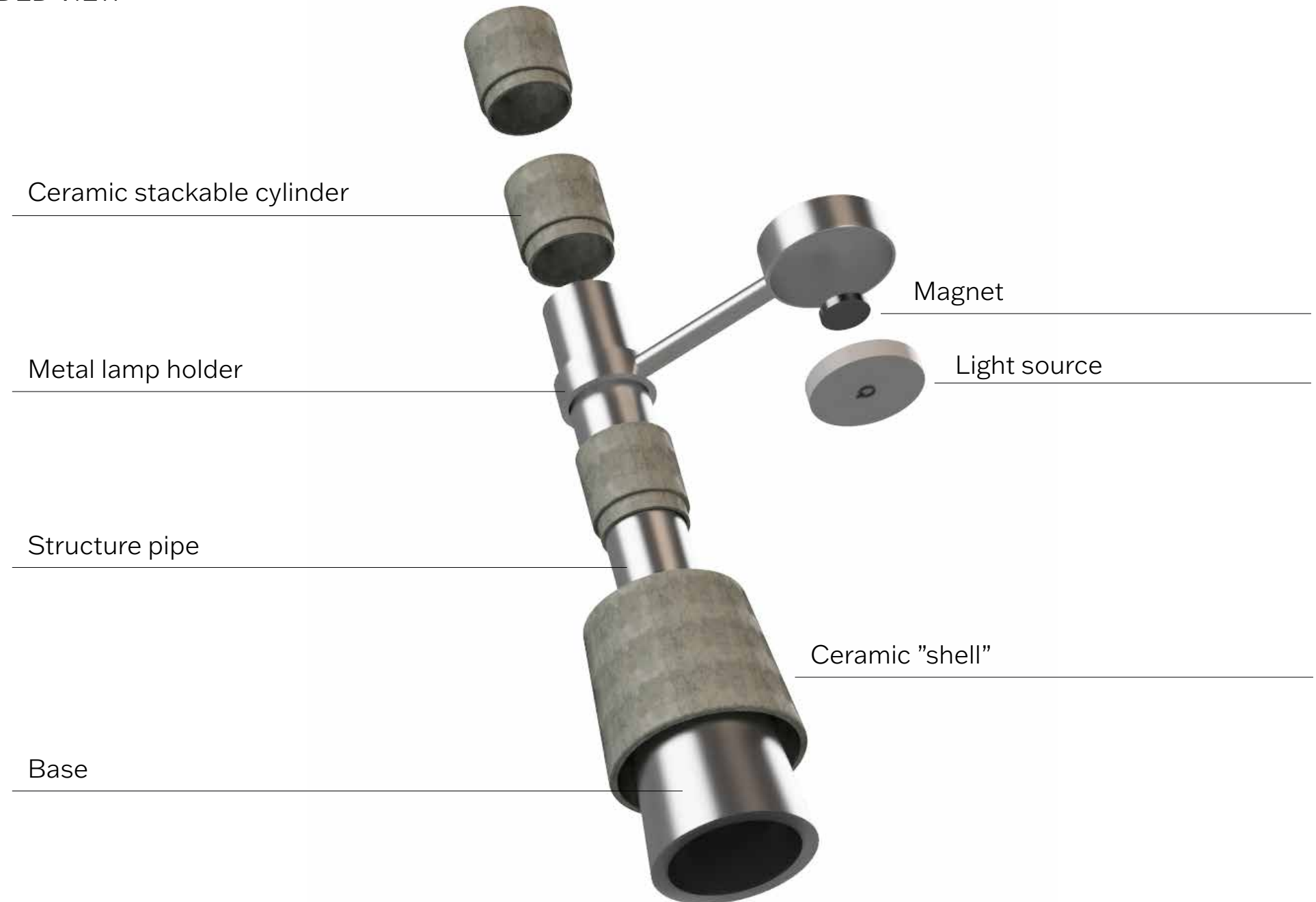
TECHNICAL SKETCH



ASSEMBLE



EXPLODED VIEW



5 RESULT













6 CONCLUSION



DISCUSSION

This project allowed me to develop a deeper understanding of materials and processes. It began with the intention of designing a grow light where I initially planned to focus on lighting. However this project evolved into a material driven exploration. I had no prior experience working with ceramics, the process took longer than expected. Some stages of working with ceramics were more challenging than anticipated while others were surprisingly straightforward.

One of the most important lessons I will take with me from my bachelor's degree project is the importance of asking for help when needed. Throughout the project there were moments when I felt unsure of how to proceed but many challenges were quickly resolved simply by asking for help. Both students and teachers were supportive and it is always inspiring following others' projects, which is possible when starting conversations.

FUTURE DEVELOPMENTS

The initial goal was to construct the underlying structure in aluminum to achieve a cohesive visual expression. However, due to time, material and budget constraints this was not fulfilled. In the final prototype the base is made of plaster and the pipe of polymer.

Despite this, the structure proved to be rigid and stable. This outcome suggests that aluminum may not be necessary as the underlying components are not even visible when the lamp is assembled. Instead, the primary functional requirements are stability and weight. Both of which can be achieved with alternative materials which could be looked into more in detail. The polymer pipe also provides friction allowing the components to fit securely together.

FUTURE DEVELOPMENTS

Working in the ceramics lab expanded my knowledge of the different steps required to achieve a successful result. The firing process in the kiln caused some parts to warp, and shrinkage, while considered beforehand, still involved uncertainty and post process work for all parts to fit together. With this insight, material testing is a must for stackable parts to fit well together.

While the contrast between the stoneware and the aluminum was the central idea, it would be interesting to further explore surface treatments for the aluminum. This could help achieve a softer visual expression while still keeping the contrast between the two materials.

A key requirement for this grow light was modularity which felt relevant with the project's goals from the beginning. This aspect could be developed further. Currently all modular and stackable components are the same size but in the future, making variations in size could enhance both functionality and flexibility.

FUTURE DEVELOPMENTS

If this projects were to be further developed, the light sources would need to be reconsidered. The light sources used in the final prototype are not designed for plant growth, which means the lamp does not function effectively as grow light. While some light is better than none, the prototype primarily serves to demonstrate the overall concept rather than functionality.

It would be, in the future, valuable to develop the lamp into a fully functional product. The cordless design suits the intended environment but it also means that the light must be rechargeable. For the grow light to be practical, the battery life would need to be sufficiently long. Therefore, further research into appropriate light sources and energy solutions would be necessary.

This project was made possible thanks to,

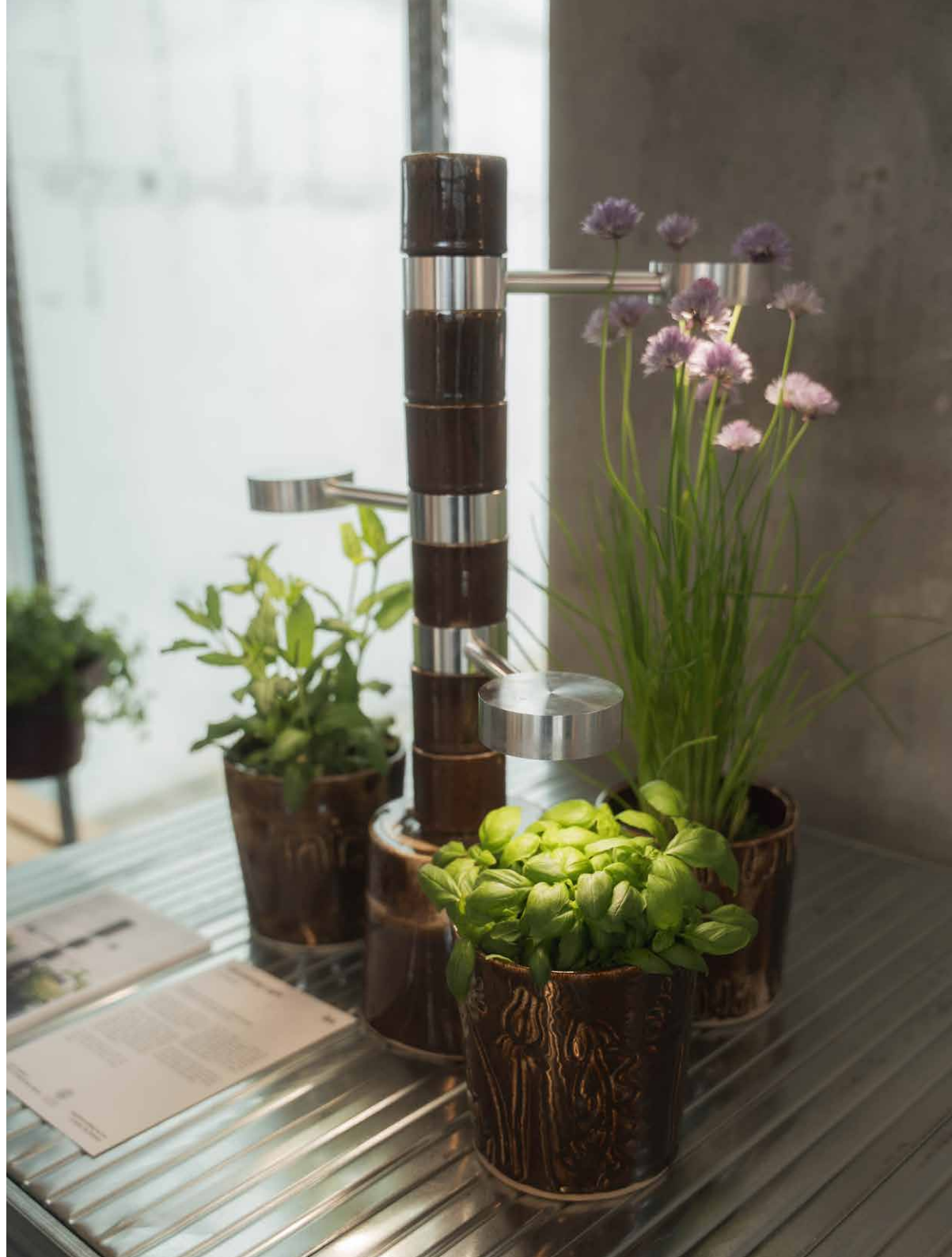
Therese Eklund my main supervisor,

Anna Persson, Jasjit Singh, Charlotte Sjödel,
Claus-Christian Eckhardt the course supervisors,

Emil, John and **Bert** in the metal workshop,

Students in the ceramics lab,

My classmates for the support and friendships.



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A vertical hydroponic system is shown, featuring a metal frame with several tiers. Green plants are growing in the tiers, which appear to be filled with a nutrient solution. The plants have small, rounded leaves and some are beginning to flower. The background is a blurred outdoor scene with a blue sky and some greenery.

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