



SKÖRDA

— A CONCEPT FOR INDOOR GROWING

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ABSTRACT

In my project I have been focusing on facilitating and shorten the step for people who don't have the knowledge, or have a small interest in cultivation, to dare to take the step to start growing vegetables. With the concept I want to simplify and in a joyful way show the possibilities to be able to grow a small yield of vegetables in a home environment. Growing is something people have done for thousands of years, but the last 50 years, a rapid change has occurred in how people live. More and more people are moving to the cities where cultivation is limited and in some cases impossible. To have a garden or allotment is a rare luxury in an increasing crowded urban environment. What has been the natural way of providing food for humans have been replaced with the supermarkets convenience, but the there is a longing to once again reconnect with our food's origin.

Product and system design, individual's role in the community, simplicity, home growing and joyful.

THANKS TO

Tack till IKEA of Swedens designavdelning för ett roligt och mycket lärorikt samarbete. Tack till alla designers som har hjälpt och stöttat mig och för alla roliga fikastunder vi har haft tillsammans. Speciellt tack till Wiebke som var min handledare på IKEA, till Henrik som alltid ställde upp och hjälpte mig med mina Solid Works-frågor och till Jonas som har skjutsat både mig och mitt exjobb runt i Älmhult. Ett stort tack till mina fina klasskamrater som jag har druckit kaffe med via länk. Och slutligen ett extra stort tack till Jesper som hela tiden har varit ett samtal bort för att stötta och ställa upp för mig. Som fick mig på rätt spår när det kändes tungt, som peppade och trodde på mig och mitt projekt gångerna när jag själv inte gjorde det. Tack!

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BACKGROUND

LACK OF RESOURCES

According to WWF's Living planet report 2010, we are today using one and a half planets. In the report they are talking about the impact of the ecological footprint that humans have on earth. It is calculated like this:

“Human activities and livelihood requires productive land and water surfaces. The ecological footprint is the sum of all the surfaces that man claims, no matter where on earth they are.”
(WWF's Living planet report 2010, s.10)

In the richest part of the world we are using three planets or even more. This is possible for a short period of time where the renewable resources are used faster than they are recovered. The resources are decreasing and at the same time is the population growing. This means that resources will be even less per person than what they are today unless we manage to increase the ecosystem's biological productivity. According to UN, year 2050 we are going to be 9 billion people in the world and 6, 5 billion of them will be living in cities. That is 70% of the world population compared to the 50% how lives in cities today. (WWF's Living Planet Report 2010, s.23) This information shows us that we are facing some great challenges, and we need to do something about it. When planning new cities and living situations we need to build them so that they facilitates the sustainable lifestyle. Education and information plays an important role for how the new way of living should be implemented.

FOODS VALUE

The food we are eating is going to play a big role for the future. But how do we treat the food today? In Sweden, it is estimated that the household alone are wasting 905 000 tons of food every year. That represents 100 kilos per person and is not even including food that we pour down the sink. Swedish studies has shown that 57% of the waste is “unnecessary” and could have been used instead of thrown away. (Naturvårdsverket, 2010) Fruit and vegetables are thrown away the most, but also bread and dairy product to a large extend. Other animal products, i.e. meat, fish and eggs; are not disposed to the same extent. Why we throw away so much food depends on many different reasons including, inaccurate and prolonged storage, expired sell-by date, that left-over are not eaten and that food are forgotten in the fridge or in the cabinet. (Livsmedelsverket, 2011, s.3)

ATTITUDES TOWARD FOOD

In Sweden only, one cookbook per day is published. On TV we can watch a numerous of cooking shows or follow bitter debates on what kind of food is the best for us. That food is a subject that involves and engages people we might all agree on. Lately more and more people are concerned about what we put into our bodies through the food we eat. The reaction can be seen on how much impact the books “*Den hemlige kocken*” (“The secret chef”) and “*Äkta vara*” (“The real product”) had. In these books Mats-Eric Nilsson describes the not very flattering food industry

with all the additives and colorants that are in put in our food and still claims to be the real thing. Jamie Oliver made a TV-show to enlighten the school kitchen in the US to feed the children better food. P1 (Sweden's public radio, channel 1) made a radio documentation called "*Matens pris*" ("The price of the food") where they put different food industries under a highly scrutinizing microscope. The show was so popular that is now to be published as a book.

So there is a change going on what we want to eat. From "*KRAV Marknadsrapport 2011*" confirms that 1 million Swedes buy ecologic food today and that even more will do so in the future. People are concerned about the foods safety and nutrition and are looking for food that doesn't contain additives and colorants. As a response to this, the customers are more interested in locally produced food in a time when they feel that the distance between the ground and the table is too far. This trend can especially be seen in the big cities. But at the same time the customer requests that the food should be fast and convenient. This will be a big part of the future challenges for the food industry, to combine convenient and climate friendly food. ("*KRAV Marknadsrapport 2011*", s. 6)

ORGANISATIONS AND MOVEMENTS

Many people are engaged in the issues concerning our food and natures "right" in our urban society. Over the last couple of years a lot of movement and organisations has started to enlighten and communicate these issues to society. One of the most famous is Guerrilla Gardening, an organization that calls people to go out in the cities and grow flowers. They do this to inform, make a political statement and in their opinion, make the cities more beautiful.

As a reaction to wanting to eat locally produced food and to reconnect with it a lot of people have started to grow vegetables in the cities. These community gardens or urban farms goal is to gather people to grow vegetables together in public places. Community gardens has been around in the US for a while and started as a social project to reduce vandalism and make people connect to one and another. The proponents mean that, besides the connection among people and the beautiful aesthetic, it also creates awareness and better attitudes for ecological systems. (<http://www.stockholmskyline.se/2011/05/urban-odling-miljo-mat-och-rekreation/>) But to grow corps in the urban modern cities are not anything new. During the first and second world war people were encourage to start so called, victory gardens. Because of the war it became lack of resources and food, to grow was one way to get food on the plates but also, strengthen the people to be more patriotic and more united. (<http://communitygarden.org/index.php>)

PLANTS INDOOR FOR A BETTER WAY OF LIVING

Although it is proven that nature has a positive impact on us outdoor, it can also affect us positively indoors. Norwegian Tove Fjed, biologist, and professor has done research on how indoor plants affect us. In her seminar report "*The effect of plants and artificial day-light on well-being and health of office workers, school children and health care personnel*"

Plants represent a part of the original ecological system in which the human species evolved. The human evolution had closed contacted with nature and vegetation over millions of years. But the last 50-100 years a radical change has hap-

pened. Due to the modern urbanization we now instead live with a closed contact with artificial elements and buildings. Even though humans have a great ability to adapt to changes there are limits to our flexibility to adjust. Asthma, allergy, diabetes and cardio-vascular illness increases but as Fjed, says:

“It should on the other hand, not be too difficult to foresee that the body would respond this way, since we know that it was developed to cope with the challenges from nature and natural occurring components. In addition no significant genetic changes have occurred the last 100 years to adjust the human body to the new, manmade, more or less artificial environment.”

(Fjed, 2002, s.7)

PROJECT DESCRIPTION

BACKGROUND

Even though food can be something social and joyful it is also influencing a big part of the environmental problems that we see today and plays a big role for how the future will look. We are facing great challenges on how we should provide food and resources for the 9 billion that will live on earth 2050. At the same time have we lost the connection to the food we eat and there is a longing and a need to be more self-sufficient.

ISSUE

How can people be convinced to start growing eatable crops and reflect over our food consumption we have today?

PURPOSE

Inform the positive impact growing can have on:

- Feeling of personal accomplishment have being able to cultivate a seed to plant.
- See the individual's role in the community.
- Enlightened about ecological systems.
- Physical advantages, like lower stress levels, better air quality and wellbeing.

GOAL

- Through products that make it easier for people to take the first step to grow no matter what type of accommodations.
- Meet the need and wish to be able to grow and cultivate at home.
- Show the possibilities to grow indoors with the space available within the home.
- Adding an aesthetic value to the home, not something that “destroys” the interior.
- Easy accessible information on how to grow at home.
- Easy understand on how to use products for growing.

DELIMITATIONS

I have delimited my work to look at the possibilities people can do for them self in their own home and as individuals. I hope to create products that will help and inspire to a more climate friendly way of living and where people feel that they can do something good for themselves and the environment.

KEY WORDS

- Product and system design
- Individual's role in the community
- Simplicity
- Space adapted products
- New aesthetics
- Eatable crops

EMOTIONAL KEY WORDS

- Joyful
- Informative
- Accomplishment
- Commitment

PROCESS

PERSONAL BACKGROUND

During my time as a design student I have done projects connected to sustainability in one way or another. Many of my projects has had the goal make people change their behavior in a positively way and reflect on how we live today. After my internship that I did during fall at IKEA of Sweden I asked Marcus Engman, head of design department at IKEA, if we could work together with my final exam project. I explained how I have worked with sustainability issues before and that I wanted to do so now as well and we agreed on collaboration. I saw my project as the bridge from the studies and into the reality where I got to meet and consider new challenges and limitations in my design process.

THE CONTEXT OF IKEA

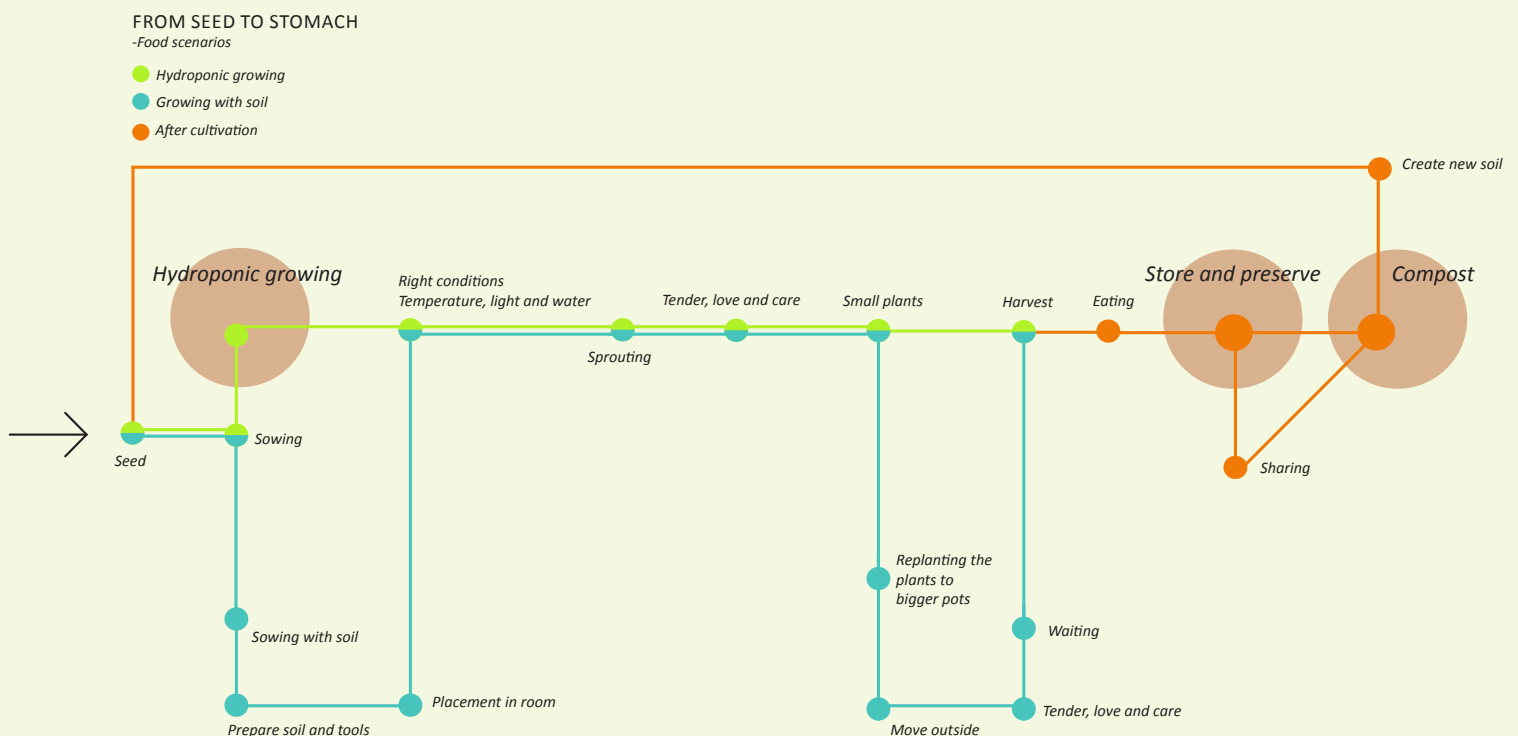
I have worked with IKEA and it has become my context. I see some great possibilities and opportunities to have IKEA as a platform for the project. Partly because of how widely IKEA is spread and represented all over the world. This way one can reach a large target group, and perhaps most importantly, reach people how normally did not have an interest in growing, in that IKEA is primarily a company that sells home furnishing. But the most exciting opportunity as I see is that IKEA can represent a lifestyle. That they are available for people's longings and new needs raised by our changing society.

HOW THE PROCESS BEGAN

In my project I have been focusing on facilitating and shorten the step for people who don't have the knowledge, or have a small interest in cultivation, to dare to take the step to start growing vegetables. With the concept I want to simplify and in a joyful way show the possibilities to be able to grow a small yield of vegetables in a home environment.

Growing is something people have done for thousands of years, but the last 50 years, a rapid change has occurred in how people live. More and more people are moving to the cities where cultivation is limited and in some cases impossible. To have a garden or allotment is a rare luxury in an increasing crowded urban environment. What has been the natural way of providing food for humans have been replaced with the supermarkets convenience, but the there is a longing for what has been, that still remains.

The concept began looking on food and how we, especially in the western world, relates to it. At a time when we have come further and further away from the food's origin there is a desire to once again approach food and be able to do the right thing for them. My project is therefore also a tool for the individual to take responsibility for their food and simultaneously being able affect the environment positively. To keep things until they are fully used is the first step towards a more sustainable society and that includes also food which is often overlooked. The food we do not have any relations to is more likely to be thrown away, even when it is still eatable. If we can reconnect people with the food we would not be as inclined to discard as much as we do today.



The different areas I researched.

THE EXPERIENCE PROCESS AND JOYFUL WORK

To be able to get to know the cultivation process I started growing in my own apartment. This way I got a better understanding on all the different steps that were connected to the cultivation process. I could also see how much space the growing demanded.



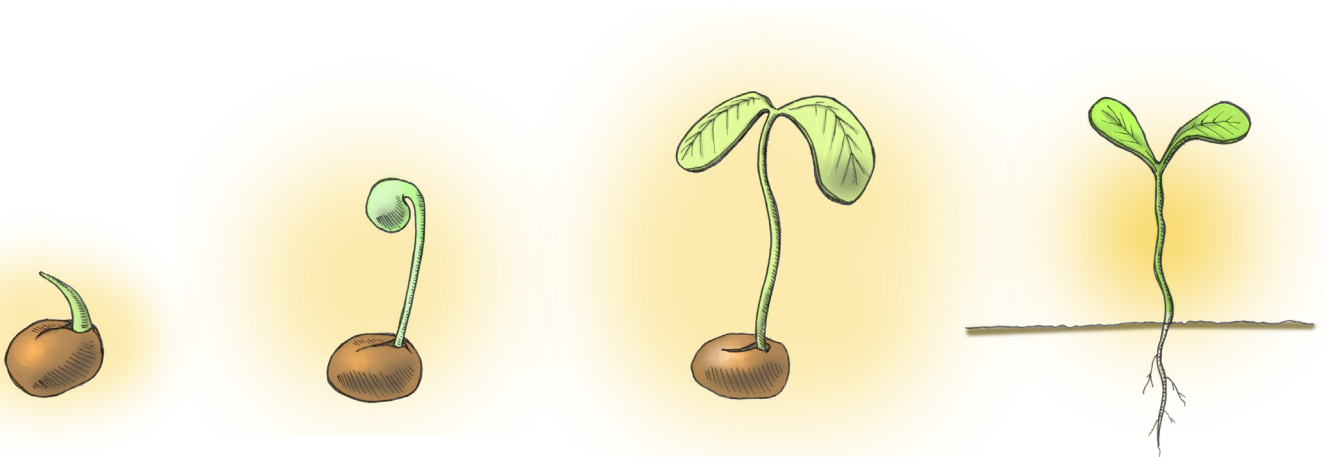
The growing process in my apartment. My own images.

THE GREMINATION PROCESS

To watch a seed grow and develop is a fantastic experience. The tiny seed can wait for infinity for the right conditions before it starts to germinate. Often it is not a difficult process. The right temperature, water and sunlight are the magic ingredients for the seed to develop. Once it has started it goes quickly. Here, there is no risk that the grower will lose interest since you can quickly see a change in the seed and later a thin stem with small leaves. The small plants will then need a bigger pot in order to develop its root system and be able to grow even larger. At this step of the process the grower should ensure that the plant gets water, light and possibly some extra nutrition and after completing this, the grower should be able to harvest. Here the grower gets the fine reward of tasty vegetables and pride in having succeeded in its cultivation. Because it is really simple, the more work and joy one has invested in the growing process, the more proud one will feel over the result.



Sunlight, water and right temperature start the process

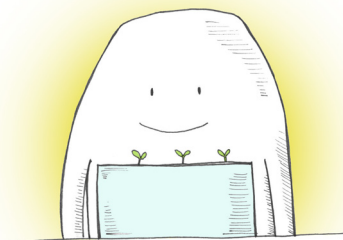
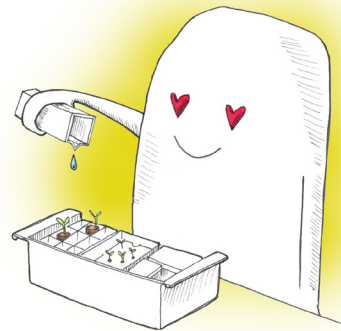
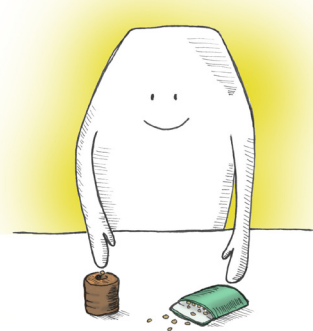


Germinations process

TO SIMPLIFY AND FACILITATE

A lot of my research of cultivation and growing methods consisted of looking at different types of systems which have facilitated the production steps for the user. For example, I thought for a long time that my project would include hydroponic cultivation, a closed system in which a pump circulates water and nutrition solutions that allow the plant to grow in a substrate instead of soil. Despite my thorough research, I decided to not to continue with this method of growing. I felt that much of the understanding of cultivating process and the responsibility disappeared with the closed system. Although there are many benefits with hydroponic cultivation I did not think it communicated the simplicity as was after. I feared this would seem a tad too complicated when you having to use an electric pump to operate the farm. I was afraid that this would scare of first time growers before they even tried it. In addition, I did not think that the desire and longing lies within an electrical pump, but rather in the tactile feeling when you press down your fingers in the soil, put in a seed, cover it, watering and waiting for it to grow.

I have chosen some operations that will remain as it is an important part of the cultivation ritual and instead has lightened the load of the individual by creating a kit of products that made it possible to start growing right away.





Coconut plugs

GROWING MEDIUM

In the kit I included the growing medium. Instead of using regular soil I decided to use coconut fiber. I did this to delimitate the step where the user have to go to another store to by the soil. Coconut fiber has the advantage that it is pressed into briquettes and when the fibers mix with water they swell up to eight times its own size. This is not only a smart way of packaging; it is also a lot easier to carry it home. Compared to soil it is a lot easier to store it in a small space home environment since it so compacted.



Coconut fibers

THE NEED FOR LIGHT

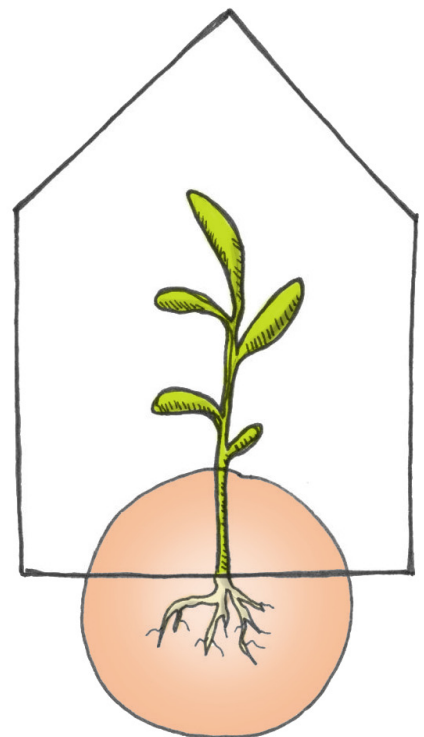
When researching indoor cultivation the main problem seemed to be the lack of light for the plants. To be able to get a better understanding for how plants and light interact I have talked to two professionals, Lars Nilsson, senior engineer at IKEA of Sweden, specialized in LED lightning and Karl-Johan Bergstrand, Assistant researcher at SLU, Alnarp.

Humans and plant see light differently. We measure light in lumens and lux but that is totally irrelevant for plants. Instead they care about micromole per m³, which is the amount of photons within the light that can be transformed into energy. Today many indoor growing industries use HPS, High pressure sodium, lamps. The problem with them is that they are very warm and there must be a distance between the light source and the plant, otherwise the plants will get burned. With the distance the efficiency of the lamp decreases and up to 75% of the energy is lost as heat. LED technology is there for researched a lot to use in the growing industries since they are not as warm as HPS. This means that the light source can be closer to the plants and are more energy efficient.

Today it is possible with LED technology to speed up, but also slow down the growing process for the plants so it is possible the harvest as much yield as needed at the time and could delimitate food waste.



HPS lamps burns the plant.



Plants prefer to have the light close to the root system.

Within the light spectrum humans prefer a more green and yellow light and plants like the red and blue wave lengths. With LED it is possible to create a light that is adapted to plants. But this pink light might not be suitable to live with for humans. But with the help of phosphorus that covers the LED, it possible to create a spectrum that covers up both the preferred wave length for plants and at the same time creates a light that human perceives as a white.

The LED for home growing that exists on the market today is very expensive and is not adapted to live with when it comes to both aesthetics and light color. IKEA has had a great impact on the LED market as we see it today and I believe that they could developed the LED technology to the growing market and adapt it to their range of affordable products for using in a home environment.

SPACE

To be able to reach out to as many people as possible I delimited my project to be adapted to small space living, without the possibility to use a balcony or outdoor space. After trying to cultivate in my own home a decided to work with the window sill as a measurement for how much space that one could spare and use for growing. The extra light that is given from the window also helps the growing process and was a strong argument for the placement.



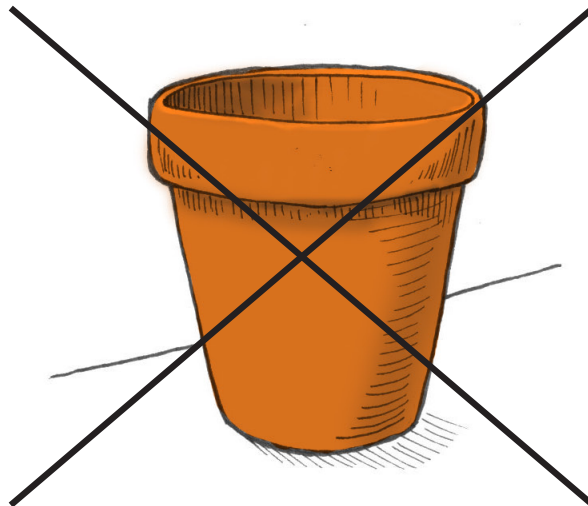
The window sill determined the amount of space to use

TARGET GROUP

My project aimed to reach the generation that are used to get their food only from the supermarkets and do not have any earlier experience of growing. The target group is concerned about what and how we treat food today and wants to reconnect with the food origin. They have a small interest in growing but they are lacking the general knowledge of how the cultivation process works.

FORM

As a goal I wanted to use a different aesthetics to stand out from the regular range of growing products. With the new expression I wanted to attract the new target group. I wanted the colors and materials to be an alternative to what you can find on the market today.



I did not want to work with the traditional shapes for growing.

RESULTAT

The concept's goal has been to develop products and tools that will facilitate the cultivation in a small space home environment. The result contains of products that help the user in two different phases of the cultivation process. The sizes of the object were all adapted to the window sill that represent the users own allotment.



PHASE ONE OF CULTIVATING, GERMINATION AND SEEDLINGS.

The tray is used in the first phase of the cultivation. The objects are tools to for starting the germination process, to grow seedlings and small plants. Here follows a description on how to use them.



-A growing tray that is easy to move around. The dimensions, 163 x 500 mm are suited to the window sill and represent the cultivation area and the user's own allotment.



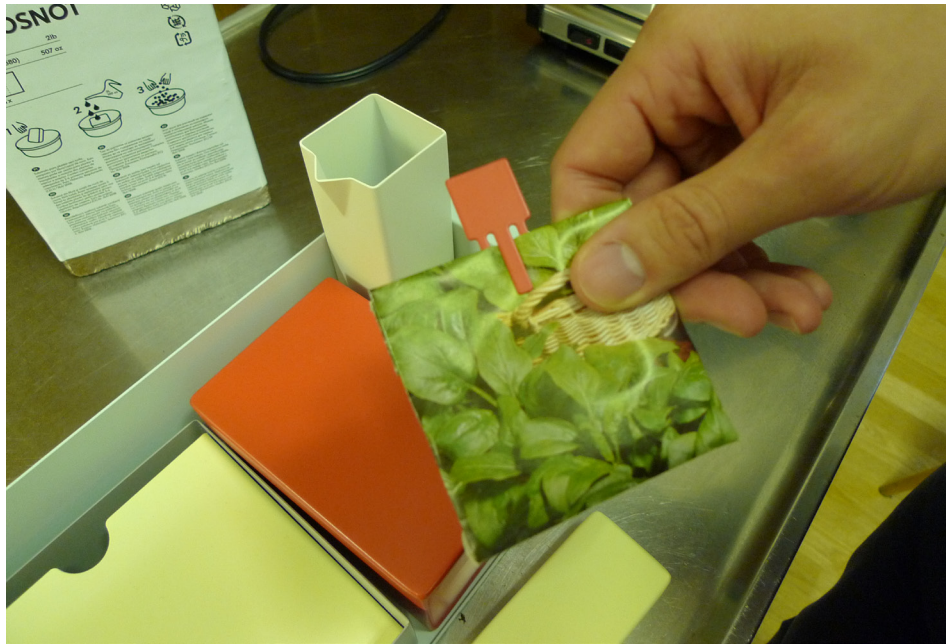
-A box with a metal grid which is intended to be used together with coconut plugs, where you germinate your seeds. The plastic lid helps to create high humidity.



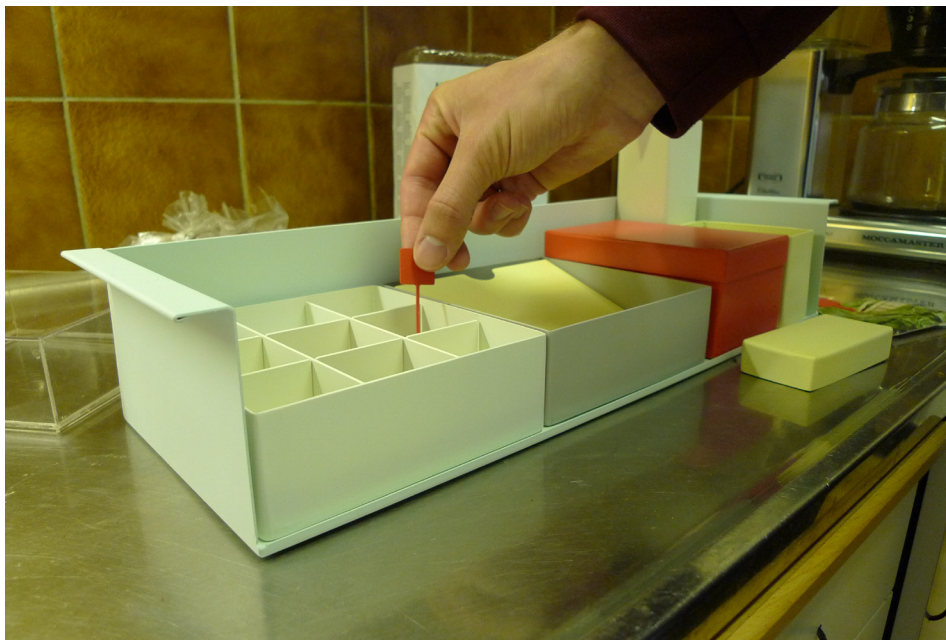
-With help of water from vessel the coconut plug expand. When the plants are small and fragile it is important not to break them when watering. The water vessel take this in consideration and it is used for precision watering.



-The red box is for storing seed bags. The lid is used for protect the seed from sunlight and water.



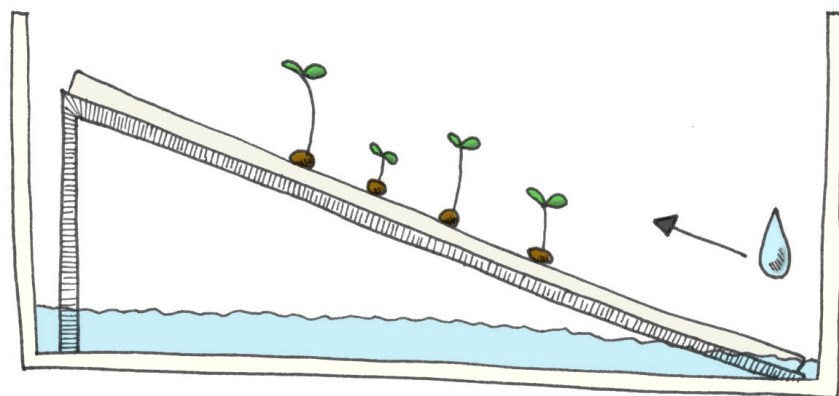
-The yellow box is used for storage of the colour coded clips and tags. The clip closes the seed bags.



-To remember what the user have started to grow they can use a clip to close the seed bag and press down a tag with the same colour in plug with the seed in it.



-One of the box has a yellow sloping plane where the user place a growing felt and pour water into the box. The felt uses the capillary power to keep the seeds moist and is excellent for germination or growing living greens.



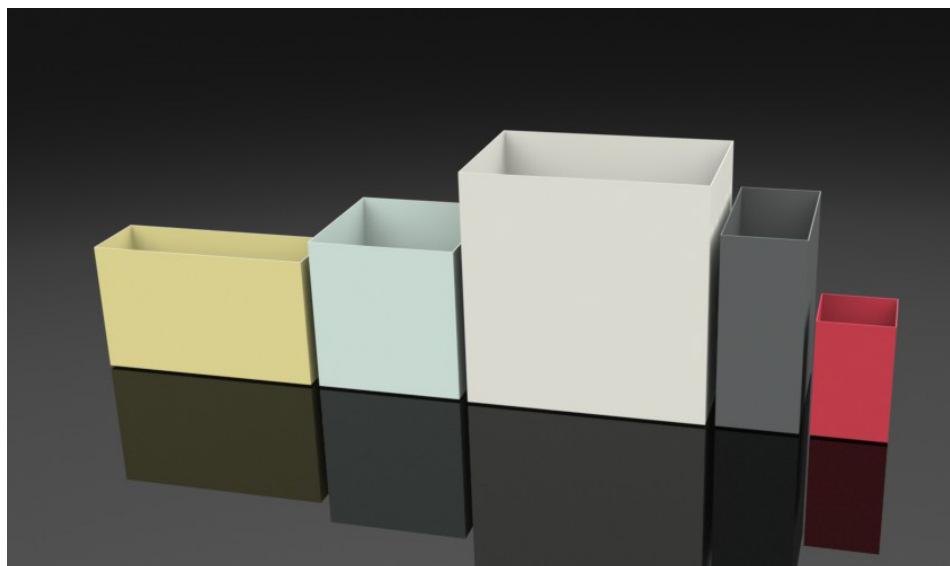
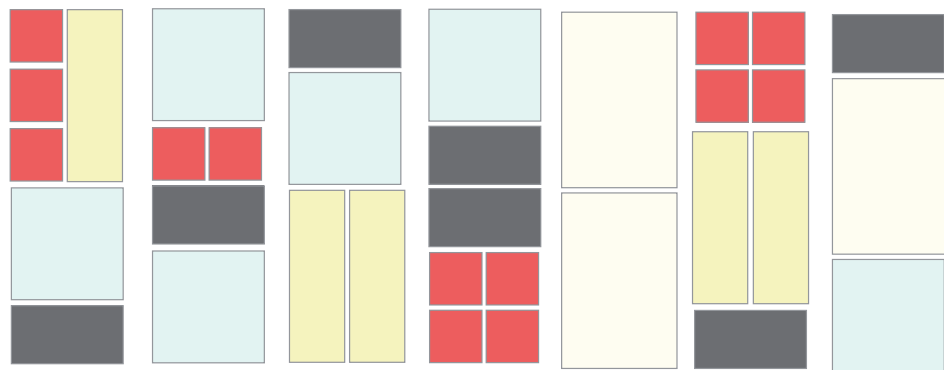
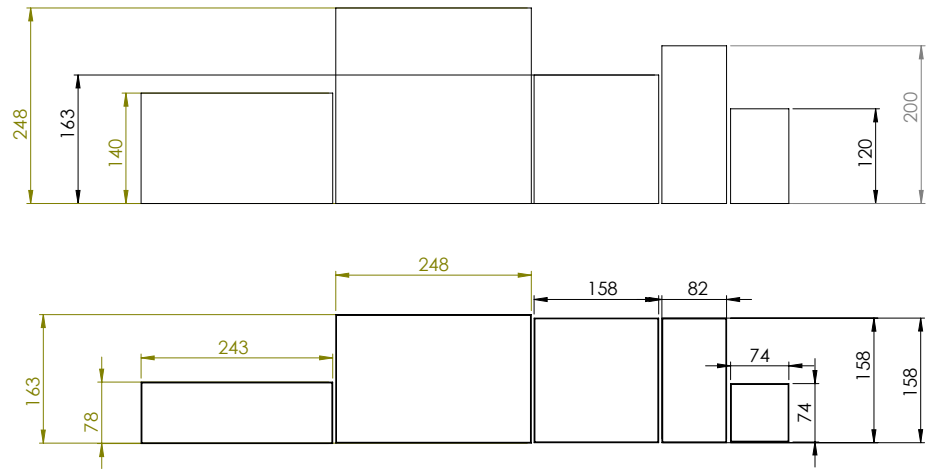
-A illustration on how the sloping plane works..

PHASE TWO OF THE CULTIVATION, TRANSPLANTING INTO LARGER CONTAINERS

After a while, depending on what the user is growing it is time to transplant the small plants into bigger pots.



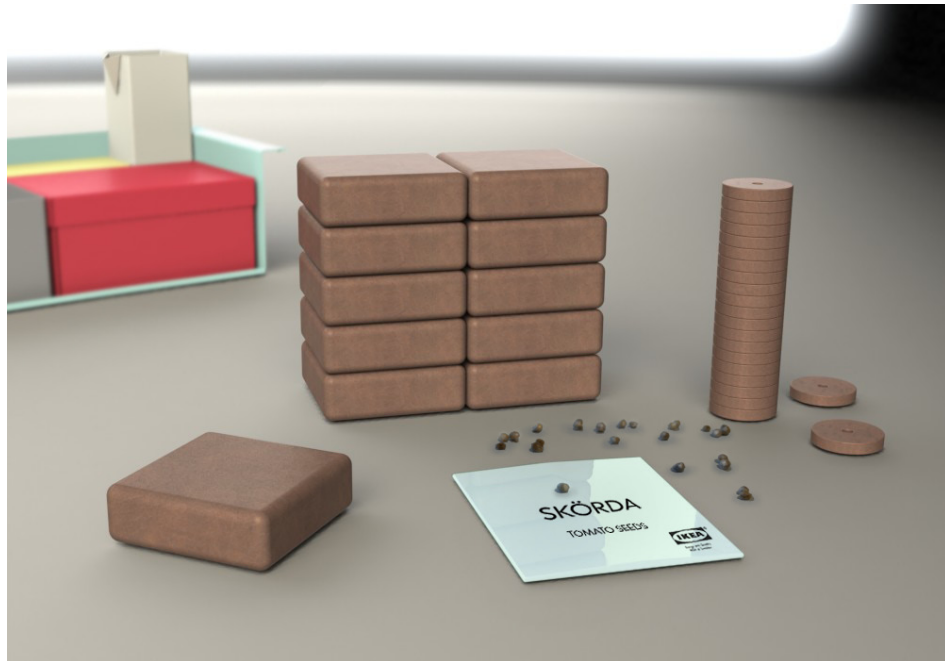
- A collection of pots which can all be combined within a given growing area of 163x500 mm, referring to the growers own allotment. The pots have different heights and sizes to accommodate different kinds of plants and should inspire the user to grow different plants.



- Five different post can be combined and be used for different kind of plants. All adapted to the growers own allotment.

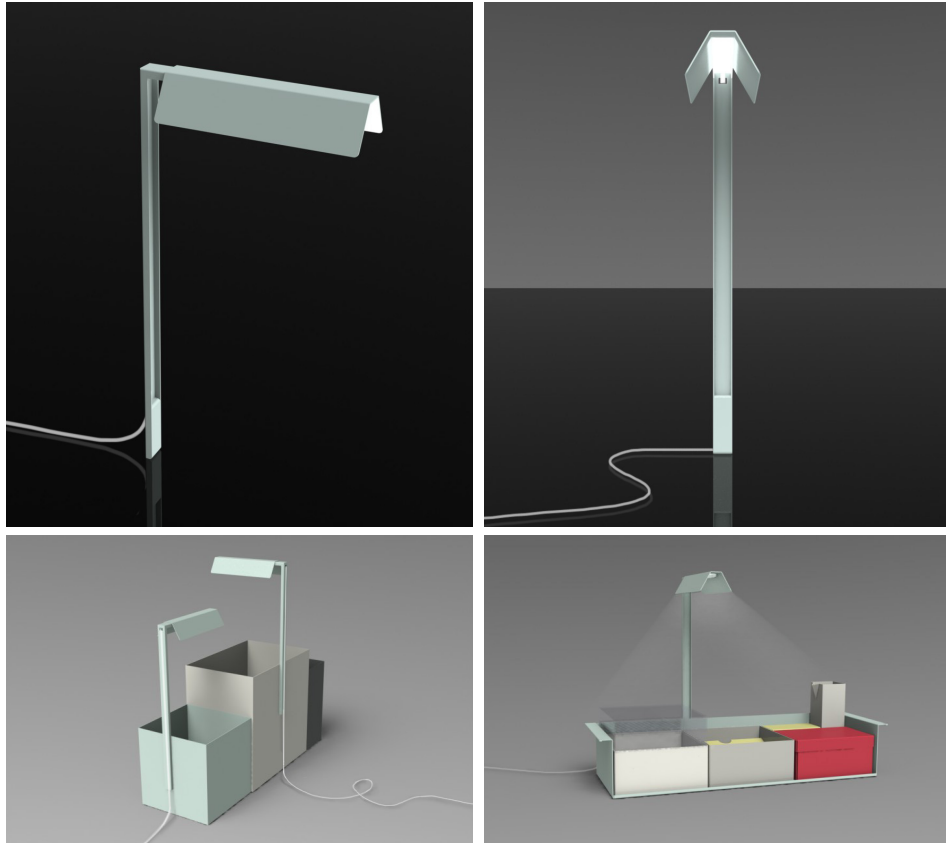
GROWING MEDIUM

To facilitate the user, I have decided to use coconut fibers instead of traditional soil. Coconut fiber has the advantage that it can be formed into briquettes and when adding water it swells up to 8 times its own volume. This avoids having to carry a 15 liter bag of soil home from the store. I want the briquettes to be in a size wich is adapted to the pots. Meaning that, for the smallest one would you need one briquette, the middle one two pieces and the biggest one, three. This would help the user to make dosering easier.



LED-LAMP

Usually it is the lack of light that is causing problems for growing indoors. To help out with this, a LED-lamp is included and adapted to the other growing pots and tray. With the help of magnets, the user can easily raise and lower the lamp depending on how large the plant is.





REFLECTION

REFLECTION OVER THE RESULT

Much of my time for the thesis was spent to read and learn about growing, plants and different cultivation methods. I usually use a lot of my time to be in the research phase and I did so in this case too. Now, with hindsight, I wish I had delimited myself before, but on the other hand it is not certain that I had achieved the results I wanted to reach without the long and deep research. More than half the time was spent exploring the variety of more technical solutions, but after having zoomed out what it was I wanted to achieve with my project, I realized that the solution is not a technical solution. Instead it was in a much more simple use of the products and where the user had to take more responsibility. This gives the user a greater understanding of the cultivation process and its various stages. At the same time by taking more responsibility for the cultivation the user gets more pride and joy of having succeeded.

I think I have achieved a good result when I look at the products. The products have all taken the different steps of cultivation in mind and fill their function, which is the most important thing since they are tools to facilitate growing at home. The result may be perceived as something strict and stripped, but this was a conscious choice since I wanted to use a different design compared to other products on the market today. I peeled off as much as possible to let the plants be in focus and the objects just adding functionality without unnecessary embellishment. I believe this provides an easier understanding of how the objects should be used. I also think that this type of aesthetics fills a gap that doesn't exist on the market today which can lead to a new target group can more easily embrace the concept. On examination some suggestions for smaller adjustments were made, for example, should the tray get feet so it won't scratch the surface where the user place the tray. This was something I had already thought of but was not made for the final result.

It was also questioned if it was not too difficult to pick out all the items on the tray, in that they were very close together. I would agree that it is a bit complicated to lift out the boxes, but I think it is more important that it look beautiful while it grows. The time working with the tray's different parts are relatively small compared to the time you watch it grow. I thought it was better if it looked aesthetically good during this time. When it is very close between the items it will not be perceived as if something is missing on the tray, but everything is in order.

I see great opportunities with the lamp and would like to develop it further and wished that it had been included sooner in my process. If I had done for my graduate work again I would have focused only on the light and developed it further, both design wise and technical. Partly because I see such great opportunities with the idea of being able to establish a fully functioning plant lighting that is both beautiful and affordable. In addition, more people could be successful with their cultivation and also be able to start the growing process earlier and harvest longer no matter the season. I struggled for a long time to find a form for the lamp. I thought it was very important that the lamp would not take over and become a distraction from the plants and destroy the simplicity that I had managed to accom-

plish with the tray and the larger pots. After many sketches and models, I think I got what I wanted to achieve. A lamp that does not take over and distracts with its design and which fulfill its function and can grow in height together with the plant.

REFLECTIONS ON WORKING WITH IKEA

I have during my exam been at IKEA of Sweden in Älmhult. This has had both its pros and cons. Sometimes, the process felt very lonely when I did not have my classmates on hand to share thoughts and job anxiety. I know from before that I like to share my process, while I get a lot inspiration of taking part in someone else work. Although I feel that I have received support from IKEA, it's not the same as sharing the experience of a thesis project with someone else who is doing the same thing.

The main advantage of having been at IKEA and working with the thesis is that I have been able to take part at many educational meetings and met a lot of people who have extensive experience in both design issues related to sustainability and technology. I have gained a greater understanding of processes and product development in a large company, which was one of my goals with my thesis. I have also developed my ability to deliver drawings, 3D models and improved my communication with the technicians and craftsmen in the model shop. Of course, it has also been incredibly fun to get to know the other designers that I have met at the design department.

I can feel that I have met some criticism in that I have done my thesis together with IKEA. I felt at mid-presentation that there were personal opinions about IKEA that was reflected in the comments I received. The brief I chose to work with came from me and together with Marcus Engman, we delimited it to focus on food and self-sufficiency in the home. Perhaps I was not clear enough with how I had chosen to work with IKEA, but I never felt controlled by IKEA and that I always had the freedom to explore areas that I would have chosen if I did my thesis alone.

HOPES AND EXPECTATIONS

By launching SKÖRDA with several products related to questions concerning food and self-sufficiency, one could get a much bigger impact of the concept at IKEA. In this way one would not risk that that the concept would be lost in IKEA's own range of products.

Other suggestions on how to communicate and motivate and get customers involved could be trough growing workshops at the store. This way the customers could get tips and tricks on how to succeed with their cultivation. I also see the possibilities that there could be forum on the internet where IKEA could post their tips in the form of videos, for example show how to use the coconut plug and how often you need to watering the plants. The forum would then be open to customers and users to be able to help and learn from each other.

I also think that we could get people to look different at SKÖRDA if it were sold, not only among plants at IKEA, but also at the dining area to show that this is a tool that you use to prepare food, just like a knife or vegetable peeler.

I wish for my project that it will be a launching pad for people to dare to grow, take part of the joy that cultivating can provide and feel rewarded and proud after harvesting. Hopefully it will be a springboard to do more and to later take on larger cultivation challenges. I believe that it is through joy and rewards, people are willing to change their behavior, to see the bigger picture and feel that it is possible to make a positive change for the future. To be able to feel; what I do matters.

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