MONASH ART DESIGN & ARCHITECTURE

Reusable UberEATS packaging for home delivery



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IDE3116

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⁶⁶Packaging is the silent salesman"

-Pilditch, 1961

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brief

Design the future experience of food and beverage service.

Select a topic from the two categories listed below and envisage / describe a consumer experience that you would like to deliver:

- 1. Wine
- 2. Quick Service Restaurants

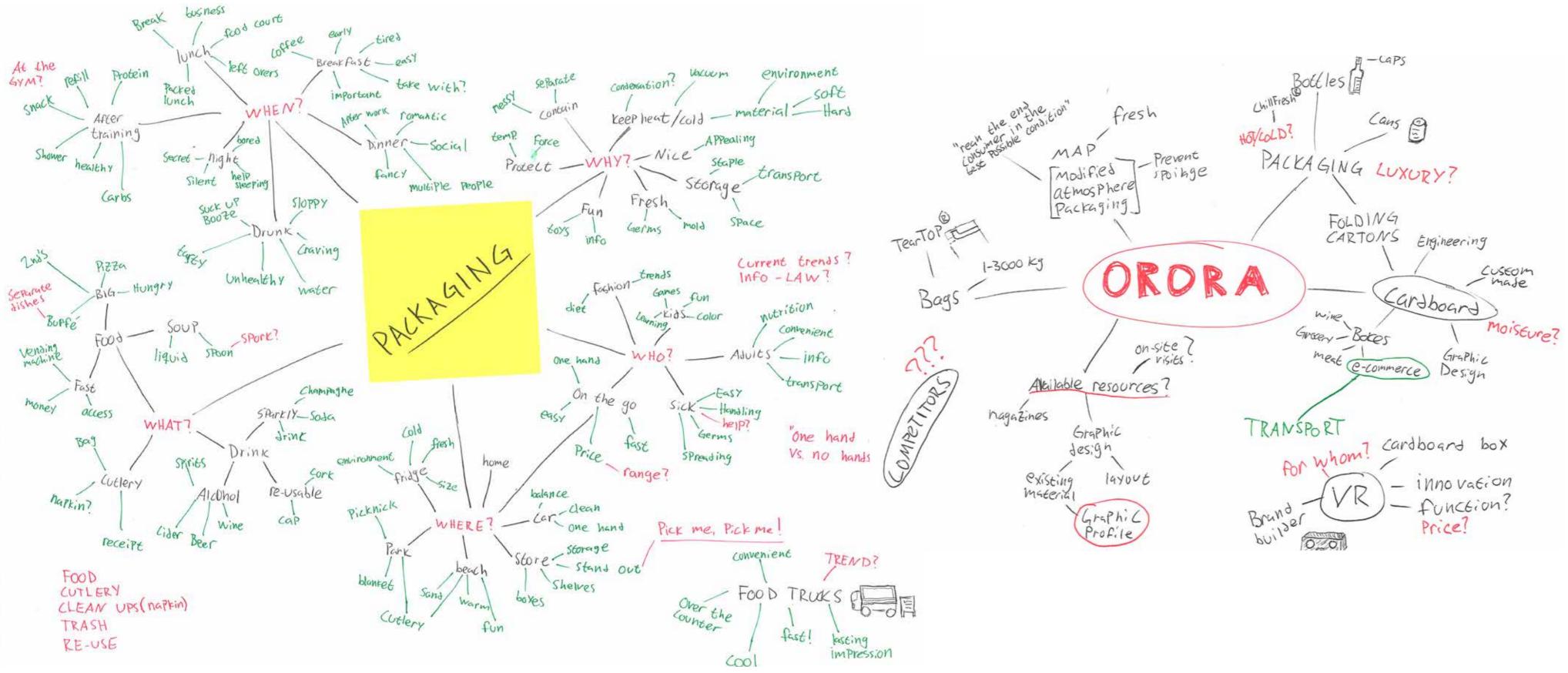
Initially, put forward a theme and why you would like to address this, rather than describing what the designed solution might look like or how it might be made.

Try to clearly articulate the experience and your observations.

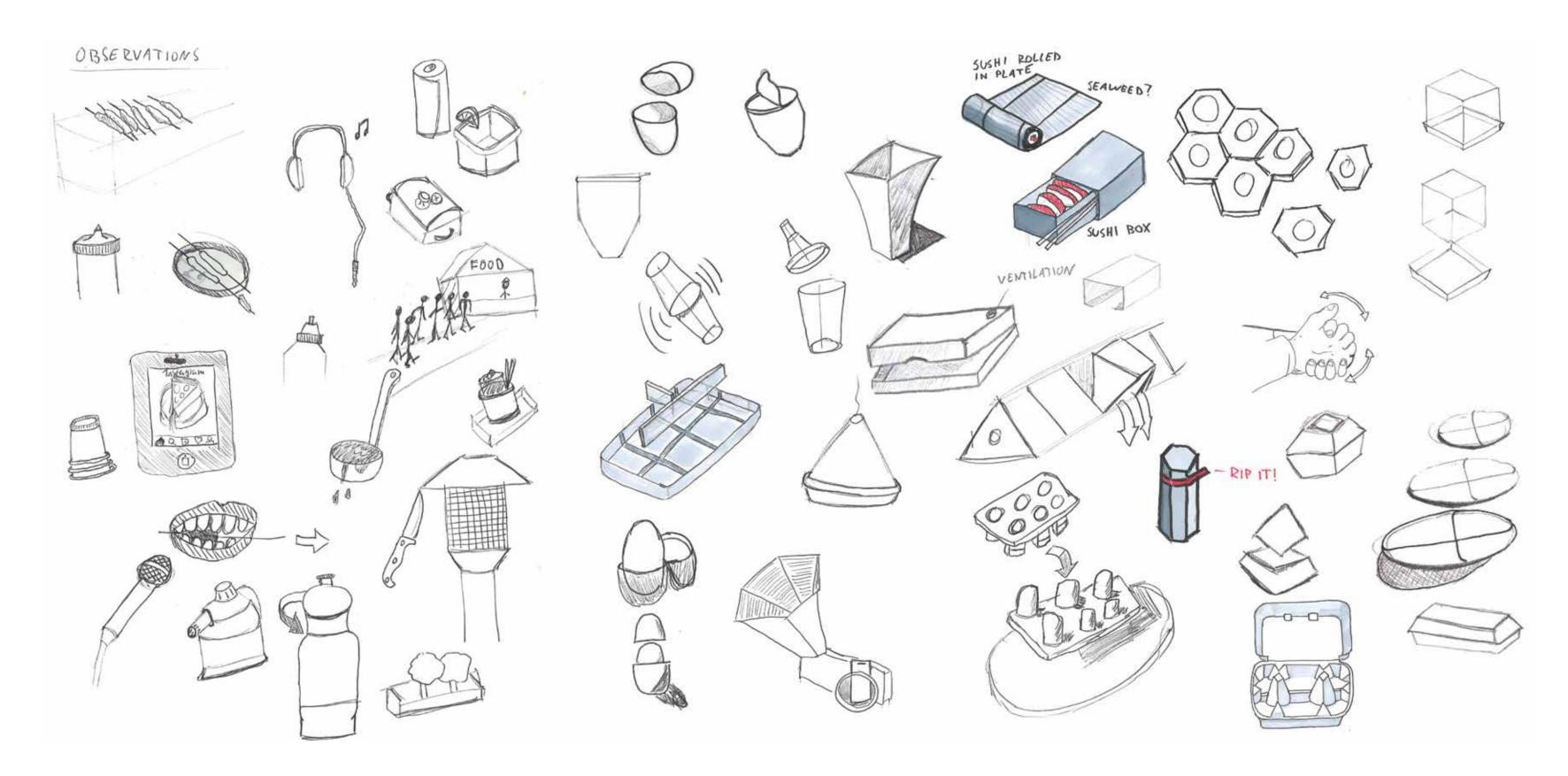
These might include (but are not limited to):

- functional packaging challenges (how you consume the product)
- opportunities for enjoyment that are being missed (the occasion)
- life cycle (closing the loop)

concept ideation brainstorming



concept ideation sketching



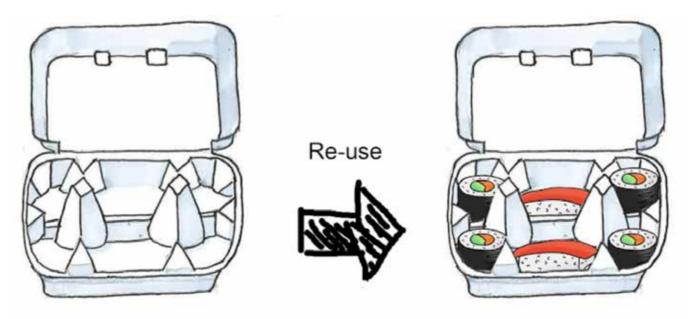
concept ideation

13 initial concepts based around the food experience service.

A lot of old food containers get thrown away after the food inside have been eaten. This concept focuses on exploring the re-usability of everyday food containers normally found in the supermarket.

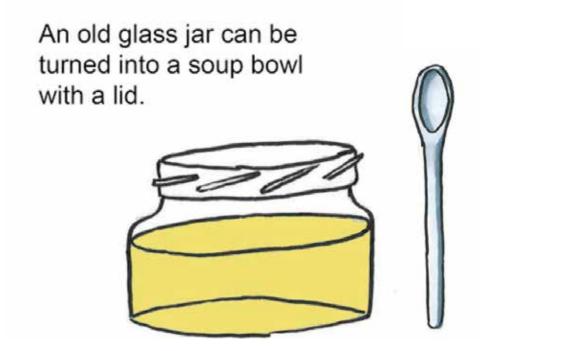
The original inspiration for this idea came from the use of old newspapers as a way to wrap and serve Fish n' Chips and it's interesting to investigate what other disposable packaging can be reused before it's discarded.

By collecting the discarded packaging and providing it with a new purpose it decreases the impact a single package have on the environment.



Empty egg box

Sushi box



concept 2 protein capsules

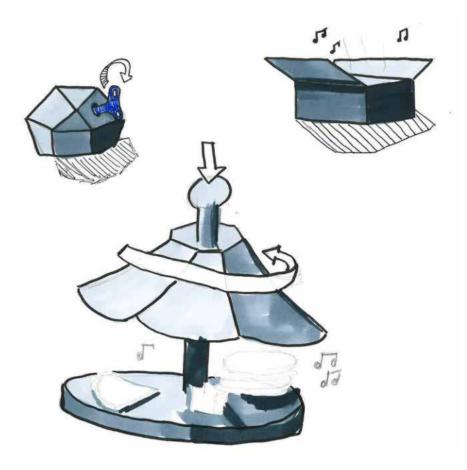


After the gym it's important to feed your body the energy it needs in order to grow stronger. Often people take supplements in correlation with their training. The supplements are bought at bulk which makes it necessary to carry powder in a shaker that takes up a lot of space or scoop some over in a plastic bag.

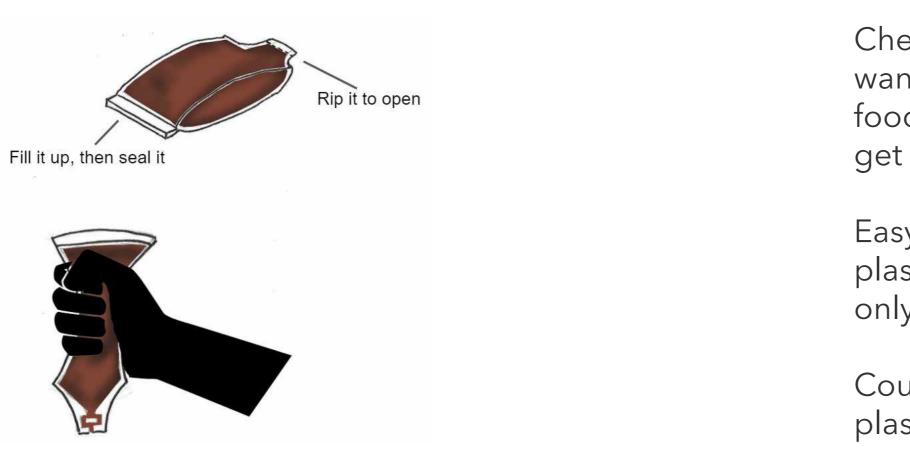
With this concept, of protein powder capsules, the idea is to make it easier and more accessible for people training to get the energy and nutrients their bodies require, without having to sacrifice space in their gym bags. Whether it's from a food truck, a restaurant, the Queen Victoria winter night market, or at a dinner with friends at home; music is always playing in the background.

The marriage between music and food combines two of our time's largest cultural interests. So what if you could offer that experience with takeaway or home delivery?

A concept aimed at integrating the two even further, "Jukebox vending machine", or "Music box home delivery". All in order to enhance the experience of quick service or fast food.



concept 4 **fillable sauce bag**



Cheap "bags" for food trucks or smaller restaurants that want's to send some of their own sauce or dip with the food, without having to pour it all over the food and let it get saggy.

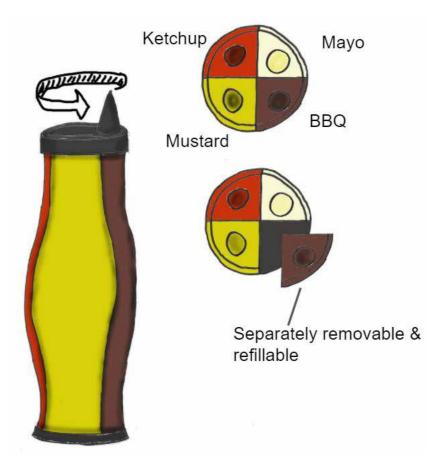
Easy to spread out evenly over a meal unlike the small plastic jars which requires cutlery to spread out if you don't only want to dip your fries.

Could also be an alternative packaging for large, hard plastic sauce containers, such as for ketchup.

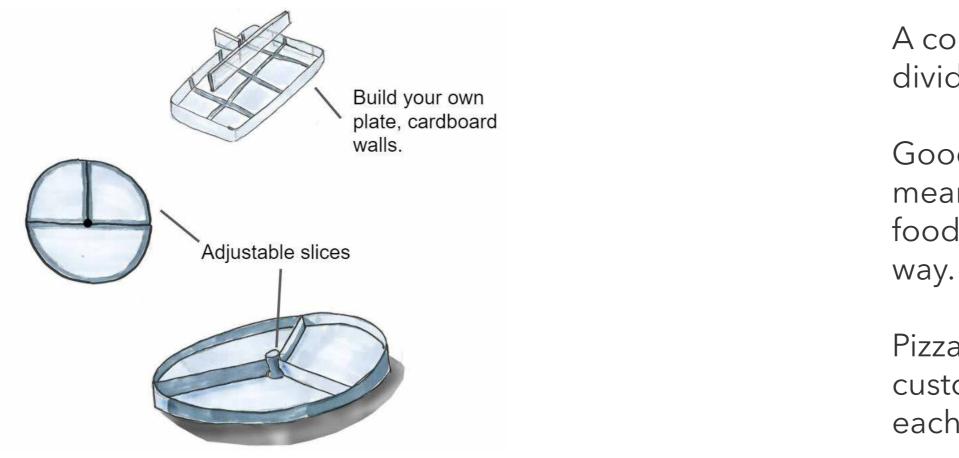
The basic sauces served in a quick service restaurant or fast food place can lift the dining experience tremendously. This concept includes working the service and product for serving the extras to the actual meal.

Instead of having 4 separate bottles (which takes up space) you can have one with all. Allows quick service restaurants to buy bulk and refill whenever it's out - saves both money and the environment.

The lid rotates over the different sauces and can even allow you to put on two at the same time, never again will you have to put ketchup and mustard on your hot dog separately.



concept 6 adaptable plates



A concept that focuses on the ability to split your food up, divide it to avoid mixing flavours and dishes.

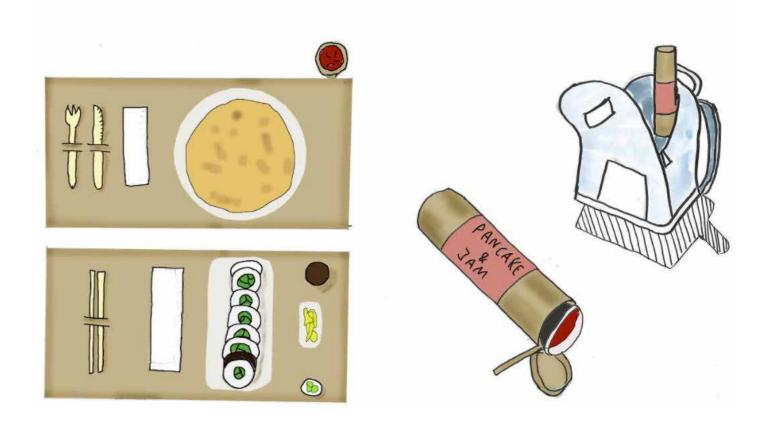
Good for a takeaway buffet, in lunch cafeterias or as a means for parents to show their kids how much of each food they should take to maintain a balanced diet in a fun way.

Pizza places that serve pizza by the slice can use it to allow customers to decide on their own how much they want of each pizza.

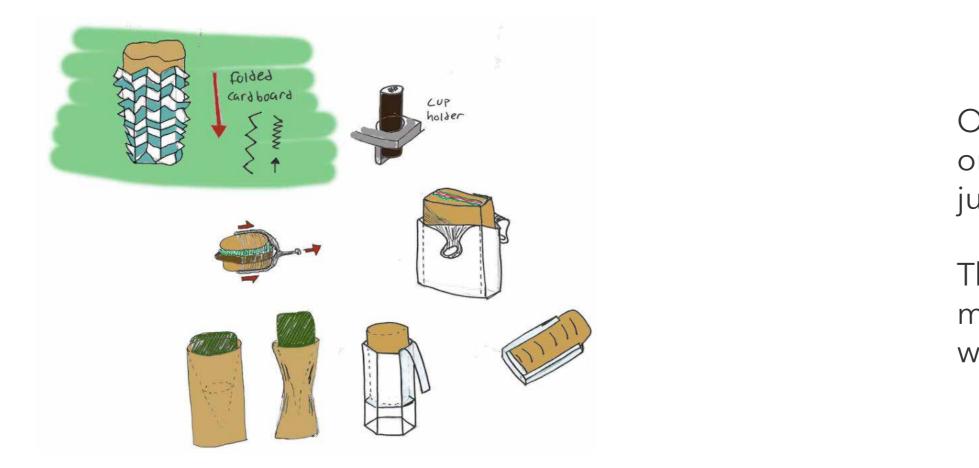
Packaging is used as plate and in some places even as cutlery when you eat your quick service food.

This concept focuses on how to make the packaging as small as possible, without compromising with the packaging's function as a plate.

It should be easy to bring with you, take up as little place as possible and you shouldn't have to bring anything other than the package itself.



concept 8 one hand is all you need



One hand should be all that's needed to eat a quick meal on the go. In the car, on the tram, while carrying bags or just surfing on your phone.

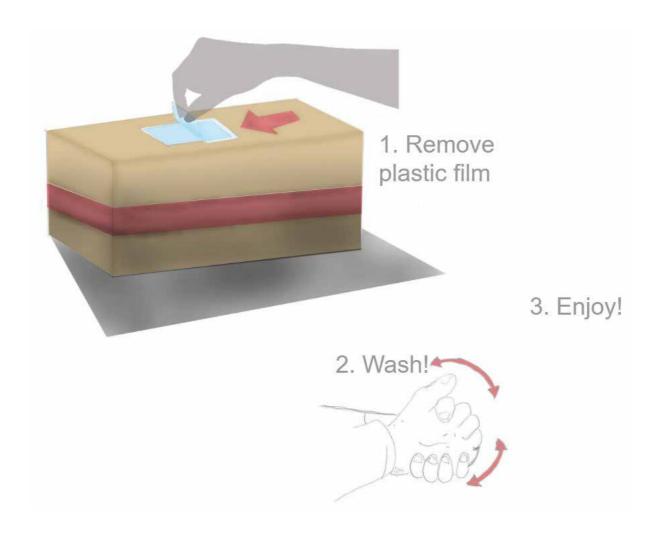
This concepts aims to develop a package for fast food that makes it possible to peel back/ bring the food forward with only your mouth and one of your hands.

When you get your food from a food truck or as take away from a quick service restaurant you don't have the opportunity to clean your hands before eating.

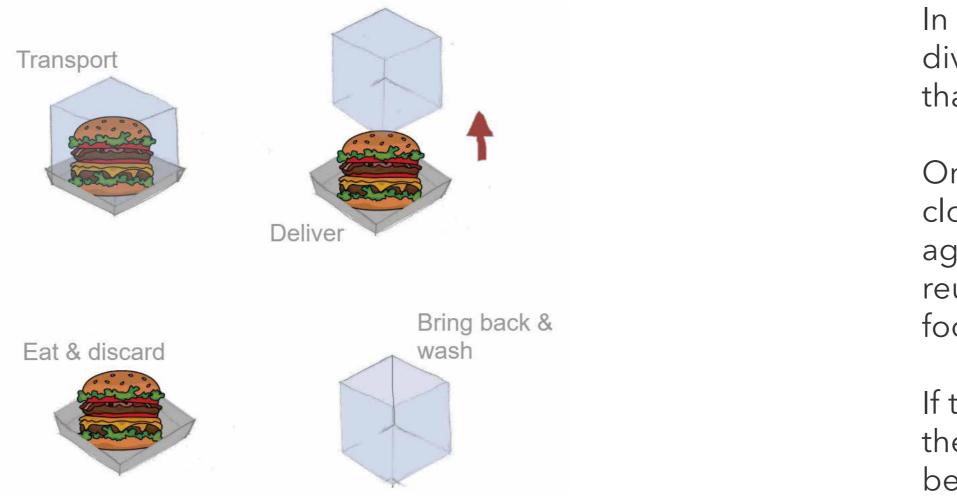
A lot of the time your hands are filled with bacteria and food such as pizza, hamburgers, fries etc is most often eaten with your hands.

By integrating a way to clean your hands into the packaging of the food you make a tremendous increase in food hygiene.

A hand sanitizing napkin or simply a strip of hand sanitizer covered by a thin plastic film would solve the issue.



concept 10 partly reusable packaging



In order to decrease the amount of waste it is possible to divide the food packaging for home delivery into one part that is re-used and one part that is kept and discarded.

Once the food reaches the house, the need for a full closure packaging vanishes. Ideally the home delivery agent would bring back the entire packaging for wash/ reuse and simply wait while the recipient takes out the food and places it on a plate of his/ her own.

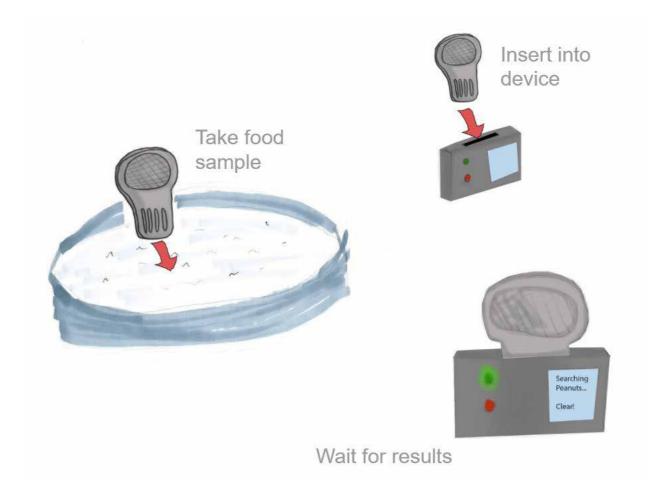
If the recipient wishes to keep down the amount of dishes, then the bottom part, the plate, can be removed and left behind.

concept 11 allergy detection

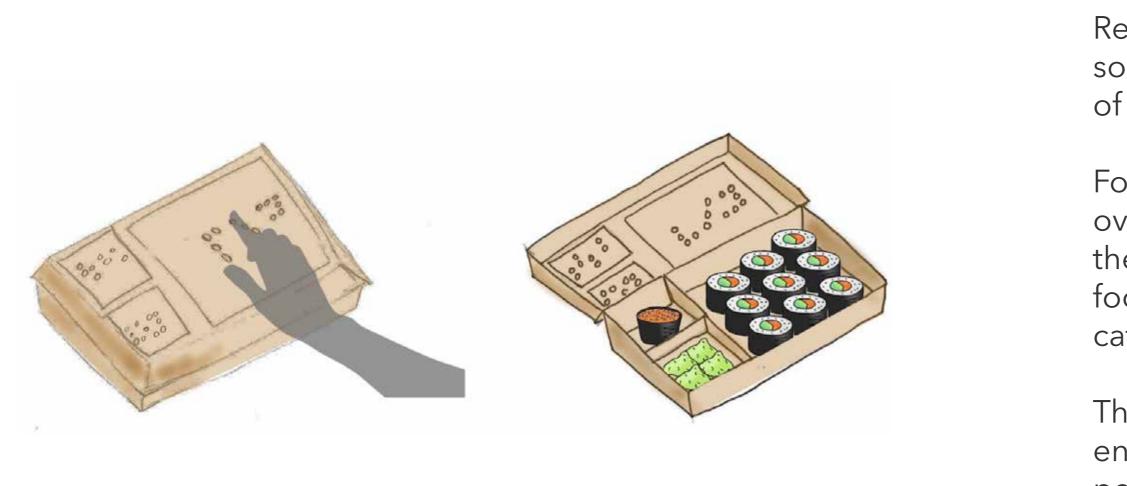
Use of a small chip to test food for allergies. The chip contains specific proteins that react with the allergen in the food. It can be used by people with allergies (seafood, nuts, dairy, etc) that are unsure whether or not they can eat certain foods.

The chip is cheap and for one time usage, they should be available at quick service restaurants and can be provided upon request as an insurance for allergic people.

The device for measuring the food sample can be personalized or mounted inside the quick service restaurant.



concept 12 packaging for visually impaired



Really good food appeals to all of our senses. However, some people have certain disabilities which reduces some of them.

Food packaging that enables visually impaired to get an overview of the plate on their own in order to improve their independence by adding braille to the top of the food packaging. Clearly marked edges on the lid to indicate the area in which the specified food is placed in.

This concept can be extended into a theme aimed at enhancing the quick service restaurant experience for people with different disabilities. "Breakfast is the most important meal of the day"

The upsides of having breakfast as a kid are many. Children who eat breakfast every day generally have a more nutritional diet, better weight management, better handeye coordination and an increased verbal fluency.

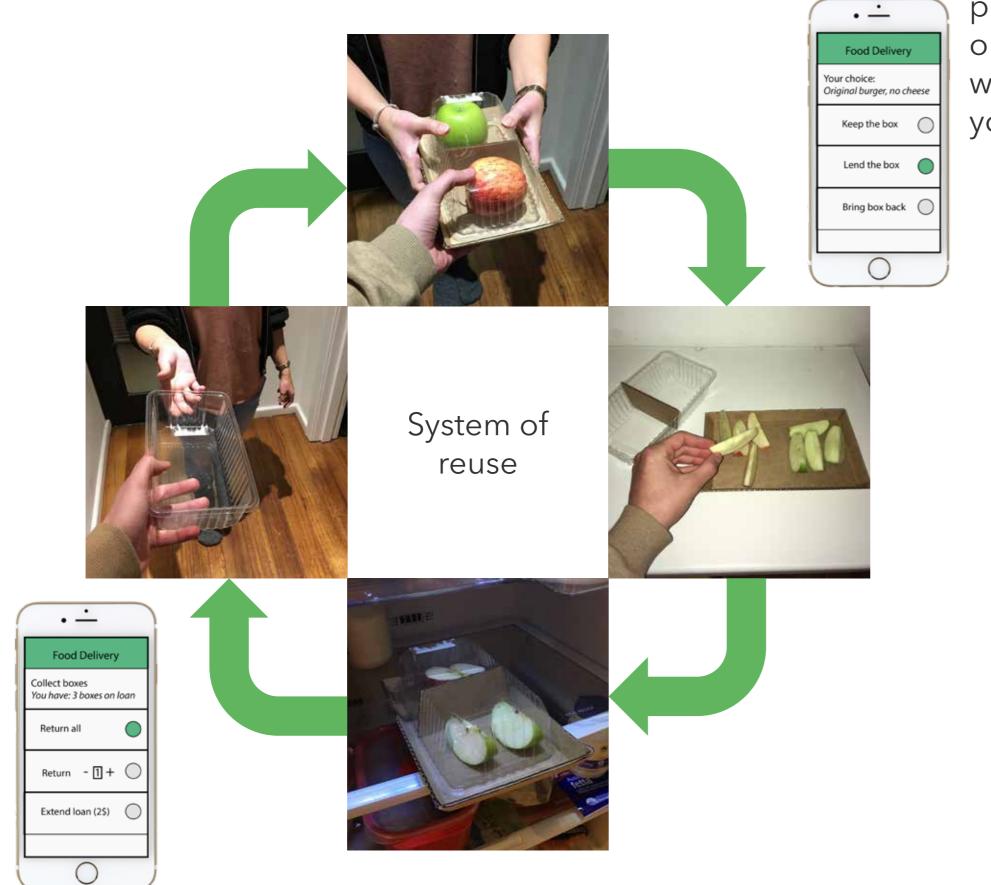
One breakfast bag to go for every age group with different contents.

Pre-packed breakfasts for the days when you don't have the time at home. Important to start building a breakfast routine from a small age so that you don't stop it when you get older. Should be easily accessible, to get it and eat it on the school bus is good in order to make the best use of the time otherwise only spent looking out a window.



concept refinement 3 concepts based on the strongest ideas from the ideation

concept 1 reusable packaging for home delivery



Choose

want to

when you

return the

reusable

parts.

pick the packaging option in the app when you place your order.



The partly reusable containers for a home delivery system is meant to decrease the amount of waste being generated by food packaging.

By making it partly reusable it will be easier to implement into an already existing system as the change for the customers will be minor.

refillable takeaway container concept 2



1. Pack your own lunch



2. Roll it up and put in container

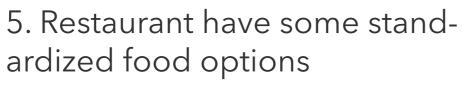


3. Take with you



4. Refill at restaurant







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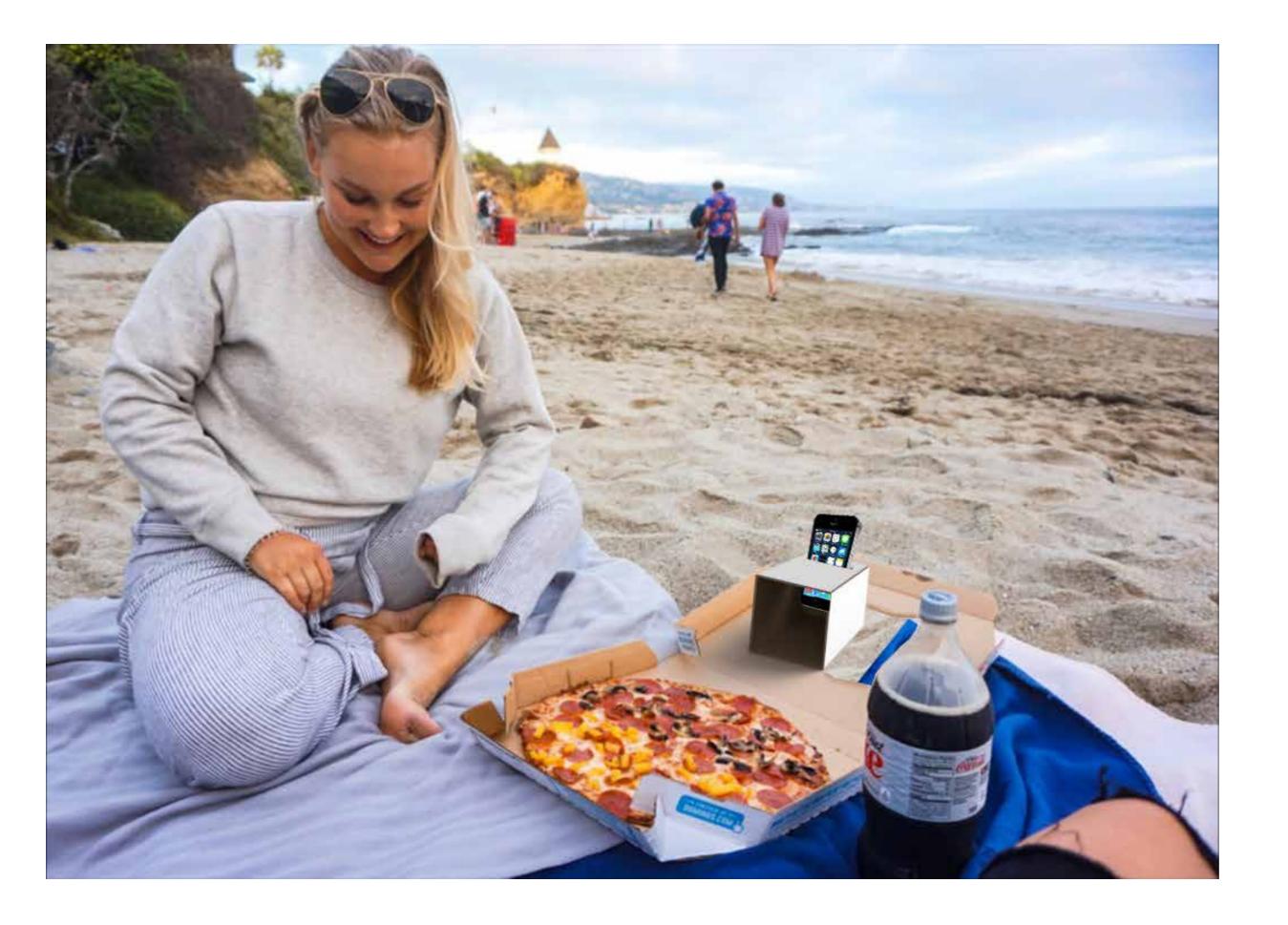
The container can be perzonilized and be brought every day.

6. Resturant repacks container



8. Seal it for takeaway

concept 3 takeaway music experience





What we hear can greatly impact the experience of a meal. most restaurangs have music playing in the background and research suggest that different types of music affects us in different ways during a meal. It can impact both our behaviour and the taste that we percieve.

When customers order food for take away or home delivery, retaurangs lose the ability to influence the meal experience and the environment in which it is consumed.

This concept encourages interaction with the packaging and can be combined with a QR-code downloadable audio tune or song.

task clarification

Moving forward with concept 1 as it potentially would have the biggest impact on a growing problem, the increasing amount of packaging waste being generated.

task clarification introduction

Packaging is an essential component of our modern day lifestyles. Without packaging, handling products would be messy, inefficient and costly. It ensures the security of the product and makes sure it is delivered in a safe way that have prevented spoilage or spillage.

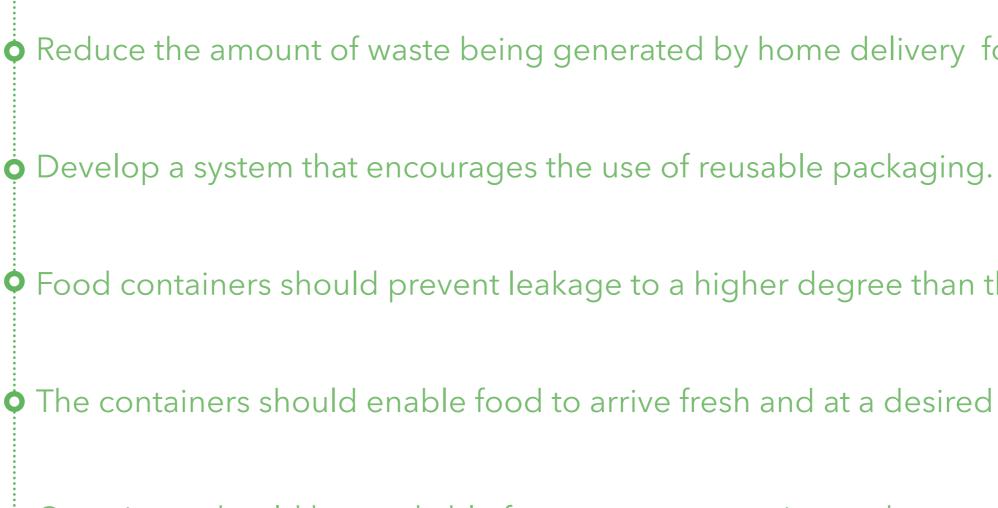
Above all else this becomes evidently clear when it comes to fast food packaging for takeaway and home delivery. The market for restaurants and QSRs is changing rapidly and food delivery is already a giant industry with the demand for home deliveries of ready-to-eat food growing ten times faster than for dining out in 2016. Consumers can now enjoy restaurant quality food in the comfort of their own home with only a quick selection on the app in their mobile phones. However, this new way of dining in and getting food delivered in single use, disposable food containers is accompanied by a growing amount of packaging waste being produced and the need for it keeps on increasing. The fastest growing type of packaging is plastic and yet only 14 percent of plastic packaging is recycled in the US. The rest ends up in landfill or is littered on our streets.

Due to the rise in environmental consciousness amongst consumers, commercial and environmental pressures are requiring a reduction in the amount of packaging. Consumers are showing more interest in the environmental credentials in products, services and the companies who supply them. Some retail chains are starting to ban what is considered to be environmentally unacceptable packaging such as polystyrene boxes. One Australian city, Hobart, have issued a ban on plastic takeaway containers by the year of 2020.

objectives task clarification

The aim of this project is to develop a series of reusable food packages for home delivery services as well as implementing the accompanying service into the already existing system of a third-party food delivery firm.

This solution addresses two main problems occurring when ready-toeat-food is being delivered: First, it reduces the amount of waste being generated. Secondly, it protects and contains the food in a better way than existing disposable packages.



- Reduce the amount of waste being generated by home delivery food packaging.
- Food containers should prevent leakage to a higher degree than their disposable counterparts.
- The containers should enable food to arrive fresh and at a desired temperature.
- Containers should be stackable for easy transportation and storage.

task clarification research insights

















There are few, if any, truly sustainable options when it comes to packaging for home delivery or takeaway.

During field the research, including site visits at twelve different restaurants offering take away and home delivery through third-party delivery agents, it became clear that the existing packaging on the market is produced for single use.

task clarification research insights











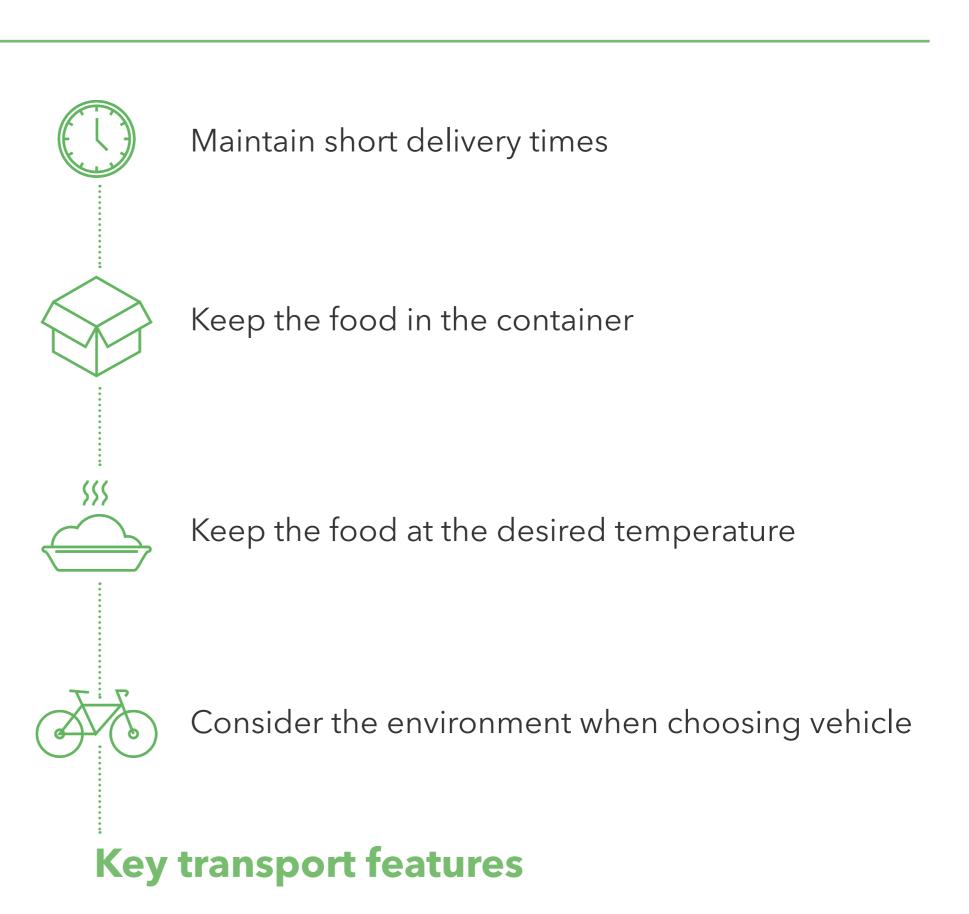


During home delivery, even smaller meals generate a lot of waste. Two burger and one small chips equals three cardboard boxes, paper bag, reinforcing cardboard bottom in the bag and napkins. A lot of which, due to the grease from the food, is unrecyclable.

In addition, the packaging is not always fully protective which make food or sauce spill outside the containers. The lack of ventilation holes in the containers may cause crunchy foods, like chips, to get soft during longer transports.

Why we need food packaging

- Provides a physical barrier ensuring hygiene and reducing the risk of contamination.
- Provide customers with information and instructions.
- Needed for safe and efficient transportation.
- Some forms of packaging prolong food life.



research insights task clarification



Once the food reaches the house, the need for a full closure packaging vanishes. During transportation it is vital the the food stays uncontaminated, fresh, keep the desired temperature and is easy to transport without making a mess.

The amount of waste being generated through disposable, single-use food home delivery packages too high. A big portion of it will never get recycled either due to contamination or unfavourable materials.



Apps and third-party food delivery partners have changed the restaurant business with home delivery growing at an accelerating rate. Systems are more easily optimized and control with the existing technology.



1. Reduce

2. Reuse

3. Recycle

task clarification **market**

The modern consumer is busy. Work, studies, social life, family, exercise and getting enough sleep often swamps the day for many, leaving little or no time for for grocery shopping or cooking on a daily basis. Time for lunch break or dinner at a sit-down restaurant might even be considered a luxury.

Services such as Uber have accustomed people to get things on demand. The rise of digital technology and online shopping with maximum convenience and transparency have made consumers to increasingly expect the same experience when ordering dinner. With food delivery becoming increasingly popular consumers turns to apps and online services to supply their meal for them with delivery directly to the door or office.





Time is critical, speed of delivery is the biggest variable for customer satisfaction. App users order food when they are hungry, expecting it to be delivered to them ASAP.

Even so, there is a widespread sustainability thinking among consumers. Reduction of waste, recycling and viable materials have become key requirements for products, services and companies to fulfill. "Ordering ready-to-eat food for delivery via an app or by phone is growing so fast that eating in is becoming the new eating out."

-Cyril Lavenant, NPD's UK food service director

task clarification **inspiration**

My initial ideation was inspired by the use of old newspapers as a way to wrap fish n' chips which adds more value to a discarded product before disposal. It awoke my curiosity to find out what other products could be, or was already used in a similar way.

For the chosen concept the main source of inspiration could arguably be the home delivery service of milk bottles during the early 20th century. This concept adapts the milk bottle service with delivery to your door to a modern day setting, allowing it to solve problems faced now, almost more than 50 years since the final home delivery of the milk bottle.

A modern day source of inspiration is the Keepcup, a piece of tupperware that you bring with you and reuse for a longer period of time. It's glass cup makes it easy to rinse with water and keep clean. They have also introduced it as a part of a system on University campuses and company offices in order to reduce the amount of waste being generated by takeaway coffee mugs.



secondary research

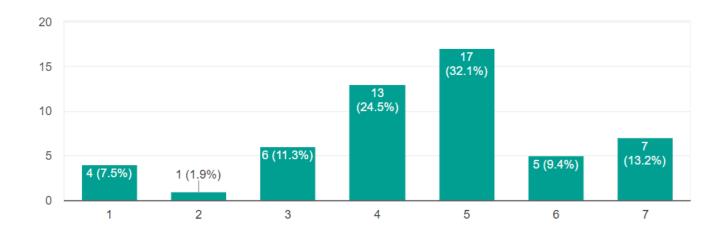
After the task clarification it was time to fill in some of the knowledge gaps with an additional round of research.

secondary research survey home delivery

Both temperature and containment can from the survey results be considered important criteria for food packaging to fulfill.

54,7% of replicants considered the importance of environmentally sustainable food containers to be more important than average.

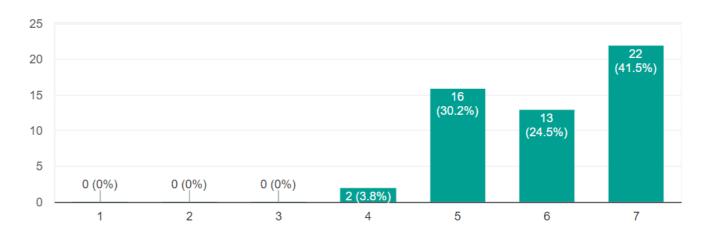
How important is it that the food containers are environmentally sustainable? 53 responses





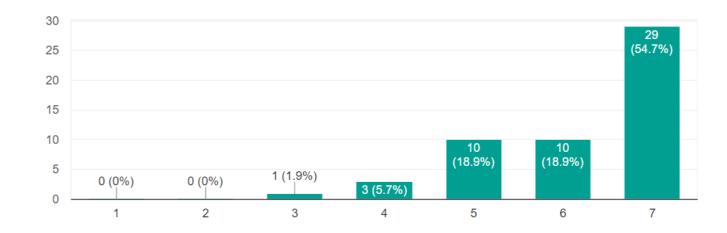
How important is it that the food stays warm during transportation?

53 responses



How important is it that food containers doesn't leak during transportation?

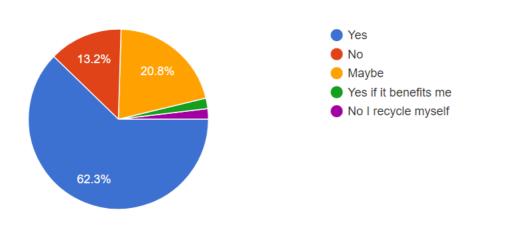
53 responses



secondary research **Survey home delivery**

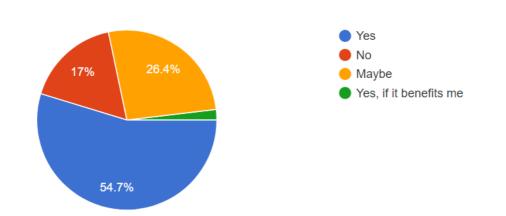
If you get food delivered to your home, could you imagine giving part of the food container back to the delivery agent for reuse?

53 responses



If you get food delivered to your home, could you imagine unloading the food onto a plate and giving the entire food container back to the delivery agent for reuse?

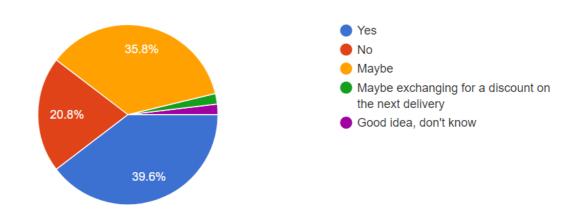
53 responses





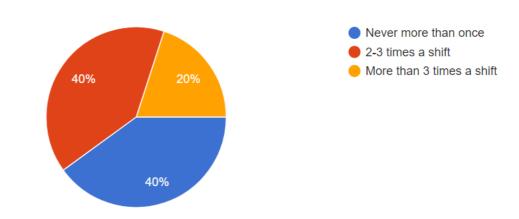
Could you imagine bringing the food container back to the restaurant yourself at a later point, if it meant you get a discount on your next order?

53 responses



On average, how often do you revisit the same restaurant during a shift?

5 responses



secondary research types of food

Types of food that delivery firms and restaurants have found hard to keep fresh for home delivery

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ice cream melts

pairing dry and wet ingredients soft shell tacos loaded gyros avocado toast

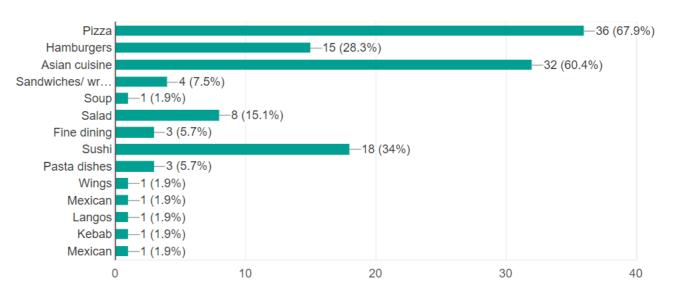
hot crispy foods grilled sandwiches thin-crust pizza french fries

gets soggy



Which type of food would you say that you order the most often? (You may choose two options if you wish)

53 responses



Prioritized dishes

secondary research **current packaging options**

Paper and cardboard are the two most widely used materials for fast food packaging. Thereafter comes all kinds of plastics, with varying environmental impacts. Paper and cardboard are in most cases considered to be the best options for recycling, however, in for example pizza boxes the grease released from the pizza and absorbed by the box makes the cardboard unrecyclable.

PET is the most widely recycled plastic whilst polystyrene (styrofoam) is one of the absolutely hardest to recycle. In addition, even though most black plastic containers are recyclable they may not be recycled due to limitations of optical sorting equipment.

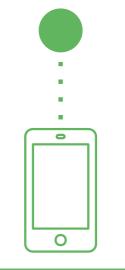


Recycled packaging material Australia

Paper/ cardboard	64%
Plastic	20%
Aluminium	64%
Steel	44%
Glass	35%
Others	10%

secondary research UberEATS

1. You place your order in the UberEATS app where you can choose between various restaurants in your area.



2. The order gets confirmed by the restaurant that cooks and package your meal for transport.

4. As the driver makes their way to your location the food is under his/ her responsibility.



5. The driver arrives with your food usually within 20-40 minutes from when your order was made.



3. A driver in the area picks up the meal, make sure everything is Included and puts the items in their insulated bag.



6. You may give the driver and the restaurant a review in the app. The driver resumes circling the area awaiting the next delivery.

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secondary research UberEATS

396 Restaurants in Melbourne

67% of riders revisit the same QSR during a shift

UBER

EATS

...........



.....

secondary research **Survey UberEATS riders**



Only 20% could imagine bringing packaging back to the restaurant after delivery if compensated.



80% thinks it would be good to reduce the amount of waste being generated by food packaging.



40% visits the same restaurant 2-3 times

40% visits the same restaurant more than 3 times

20% visits the same restaurant only once



All of them considers it very important for food home delivery to be environmentally conscious.

system refinement

With the additional research completed it was time to start the iterative process to get the system and packaging to come together.

system refinement implementation into UberEATS

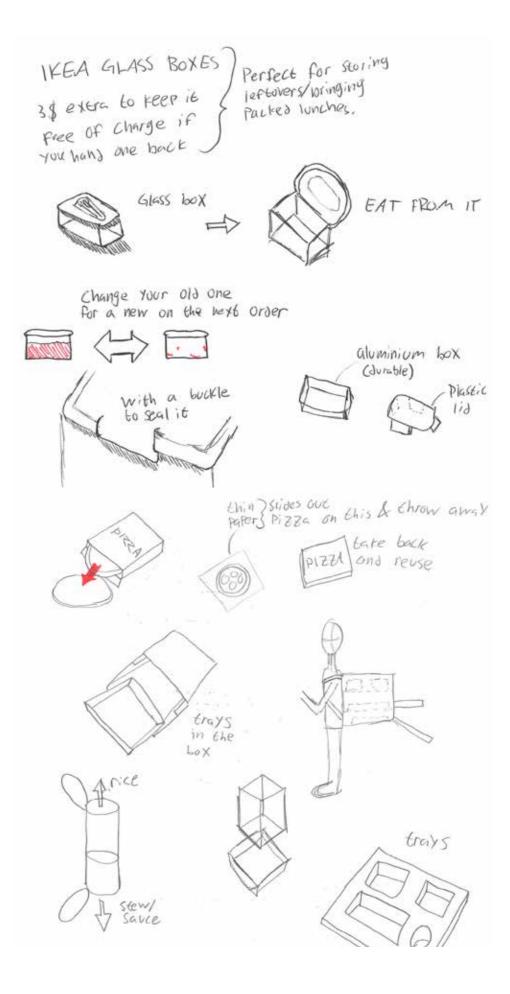
Rather than creating a whole new service system for food home delivery, a deision was made to implement the reusable food packaging into an already existing food delivery system. The choice of UberEATS was based on the fact that they are one of the few really big home delivery services that doesn't yet provide restaurants with an option to purchase packaging from them. These more sustainable packaging options could therefore become their first physical appearance for customers.

UberEATS also has the resources to introduce this on a larger scale globally and the existing app system that can be modified to easily incorporate the reusable packaging in an effective way.

system refinement first draft

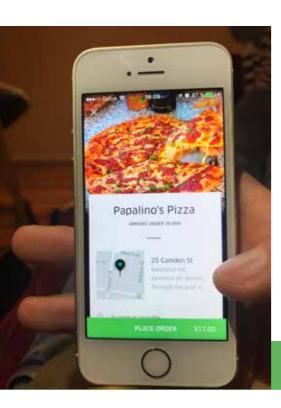


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system refinement second draft

 Place the food order in the UberEATS app.



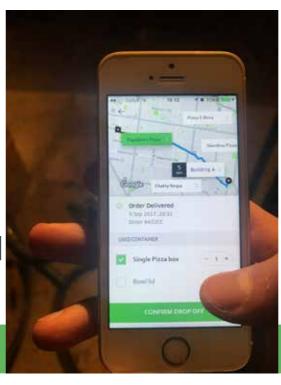
2. Selected delivery method determines the packaging.



4. Customer unpacks food in their home and hands back the reusable part.



5. Driver chooses drop off site on the way to the next food pick up.

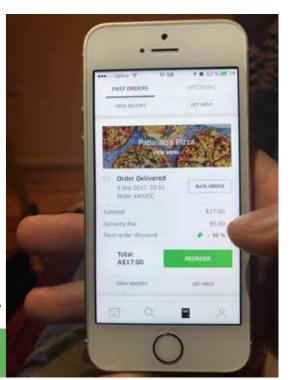


3. Driver brings you your food and hands over the container.





6. Customer receives a % discount on the next order at the same restaurant as incentive for choosing reusable packaging.



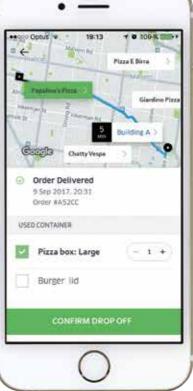
system refinement final version

system



it is drawn in case you wish to keep the reusable part of the food container.

3. Delivery rider picks up your food at the restaurant and brings it to your house.



6. After drop off at restaurant you receive deposit back and 5% off your next order in the app as incentive.

5. Delivery rider drops off used packaging at any restaurant using the same standard container for wash and reuse.

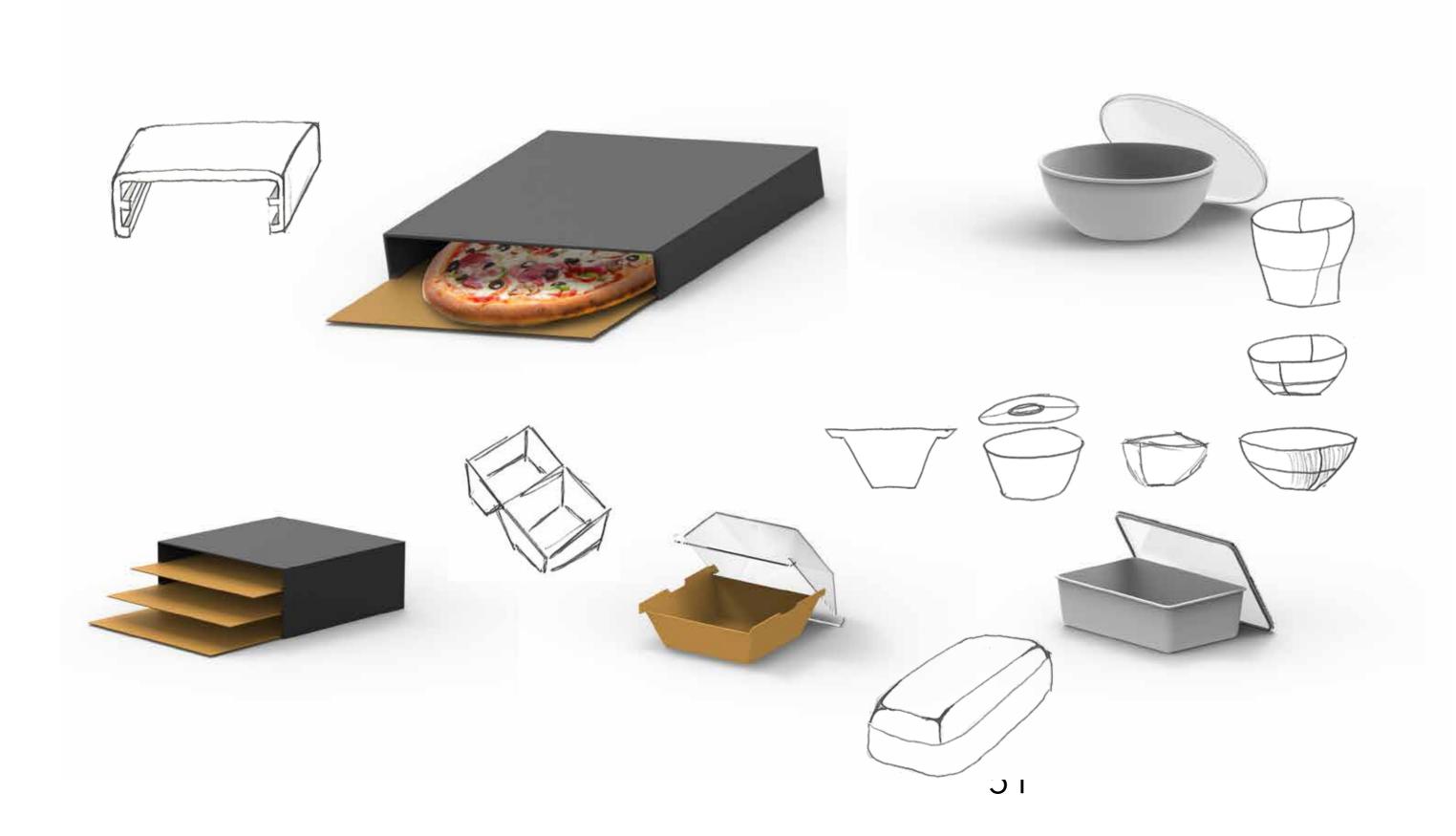
The used packaging can be dropped off by the delivery rider at any connected restaurant using the same standard packaging. This ensures minimum effort for the rider who can drop it off either on the way to, or at the their next food pick up.

designing packaging

Designing the actual packaging to be used in the developed system. The inital packaging series consisted of four different types of containers, aimed at covering the most commonly ordered dishes from restaurants within the UberEATS system.



designing packaging form and function



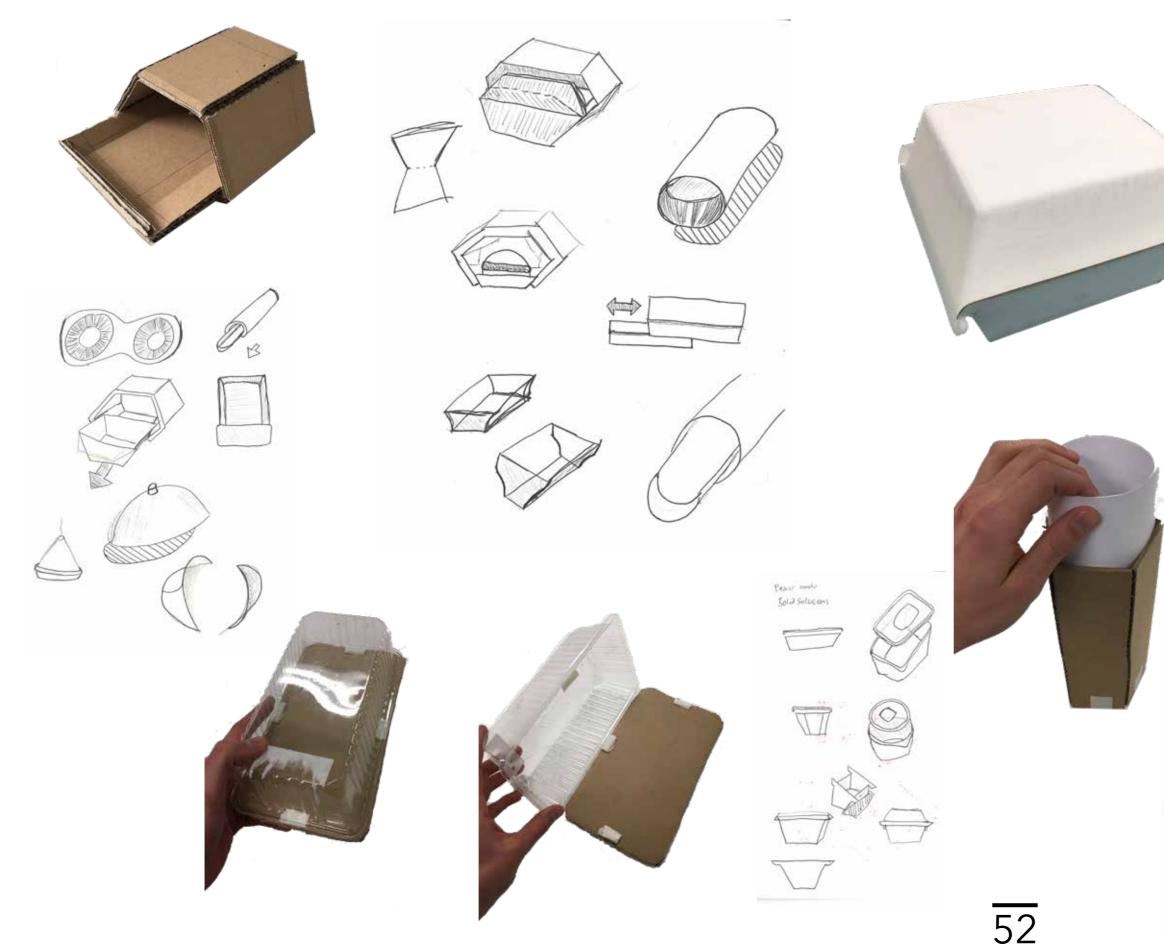
Keep it simple.

When it came to designing the form and functionality of the packaging series the main objective was to make the unpacking of the food as simple as possible.

It should be intuitive and should not take longer than a few seconds to remove and place the reusable parts back in the bag.

As large quantity as possible of the packaging should be designed for reuse as long as it doesn't interfere with the customer eating from the packaging. A plate should never be required for consuming a delivered meal in order to ensure customer convenience.

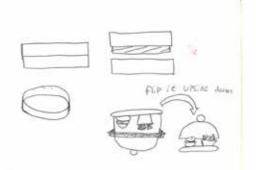
designing packaging sketching and testing





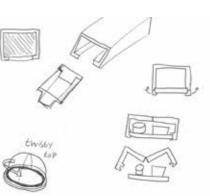


BOWI Pluseic - lid gluss Storectangle plassic - lid glass Pizza box plassic - Pluse Cardboard burger bottom Cardboard - burger top gluss

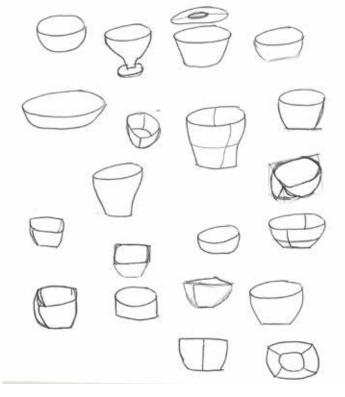


I. Leave the revsable Part

2 Bring With the reusable Art sconge Whos responsibility SZE - Wost Use Anisonment - E







designing packaging **standard bowl**



Reusable glass lid that snaps around a biodegradable bagasse bowl. The glass lid has an indent to facilitate stacking and the bowl itself is also easily stackable.

designing packaging **standard box**

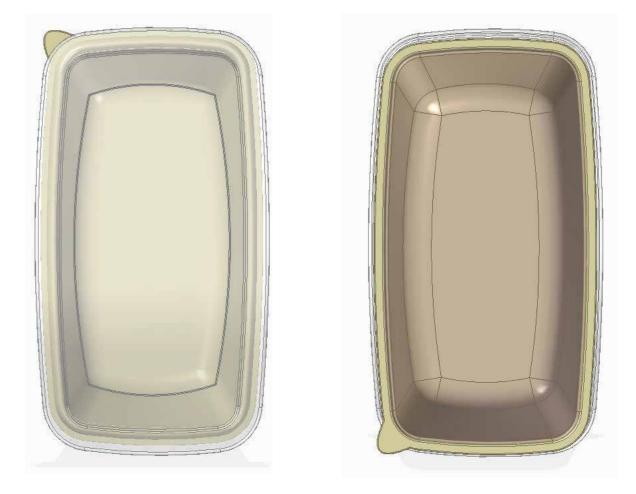






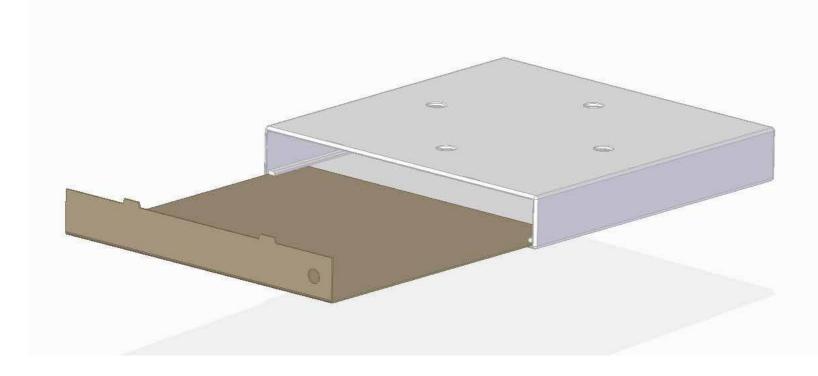


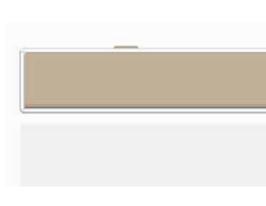
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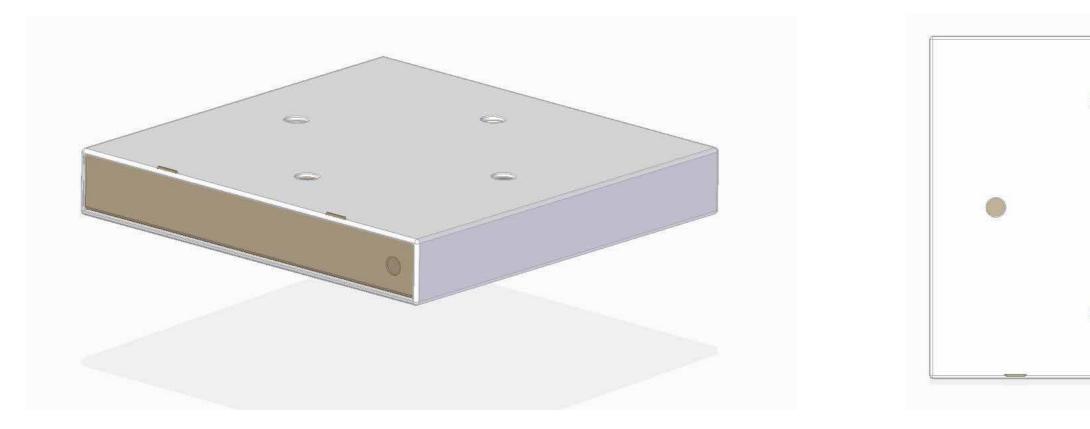


Reusable glass lid with indent for transporting multiple boxes on top. Bottom in biodegradable bagasse.

designing packaging **pizza box**







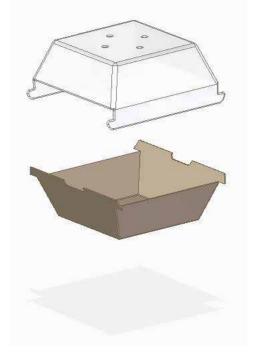


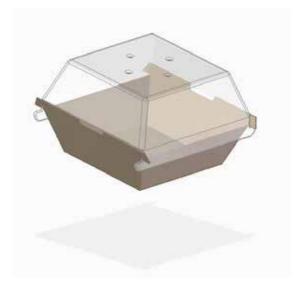
Hard plastic to ensure durability with additional ventilation holes to keep condensation away and keep the pizza crispy. The plate is recyclable cardboard and also acts as the closing mechanism for the box to protect the food from contamination.

burger and chips box











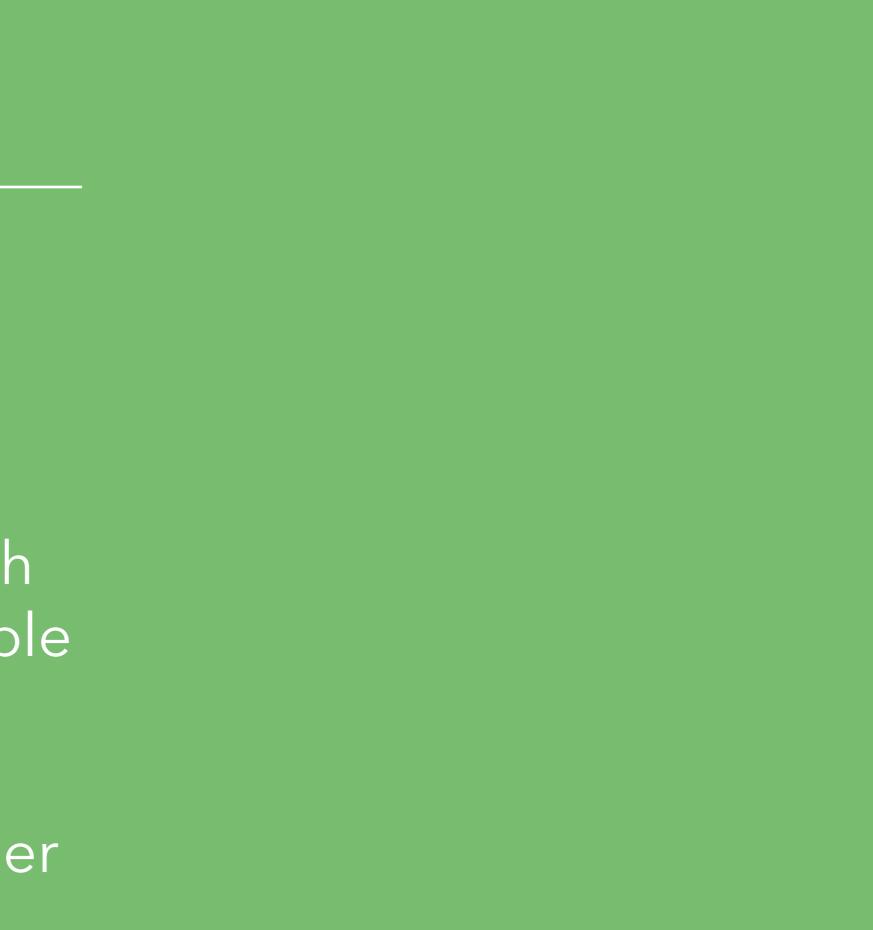


Glass lid with condensation holes at the top to prevent food from getting soggy. Bottom part in thin cardboard which can be recycled if not to dirty. The lids can be stacked to reduce storage- & transport space.

model making

The main shape and functionality of the packaging being set, I moved on to creating the physical representations of the packaging and finalizing the outcome through making and testing through multiple iterations.

I decided to make the pizza-, burger and fries- and standard box.





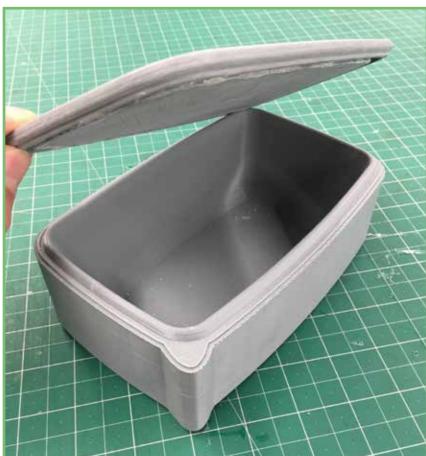
First attempt att creating a texture similar to that of a bagasse bowl was made through paper mache.

Using ordinary newspaper strips and a water/ white flour mix for adhesive. A standard plastic takeaway box was used as a mold and was covered with aluminium in order to ensure the paper mache doesn't stick to the mold whilst drying.

The model to a long time to dry with roughly 70% water and 30% flour in the paste.









The second time, I FDM printed a mold of the actual shape of the box and switched to a brown, thicker paper that more resembled the bagasse surface I wanted. The paste was changed to 50/50 water/flour and dryed faster but left white marks as it dryed.





two layers of glossy white.

The lid for the standard box is meant to be in glass but vaccuum forming wasn't available and SLA print was too expensive, therefore the shape acts as the indicator for the physical lid.

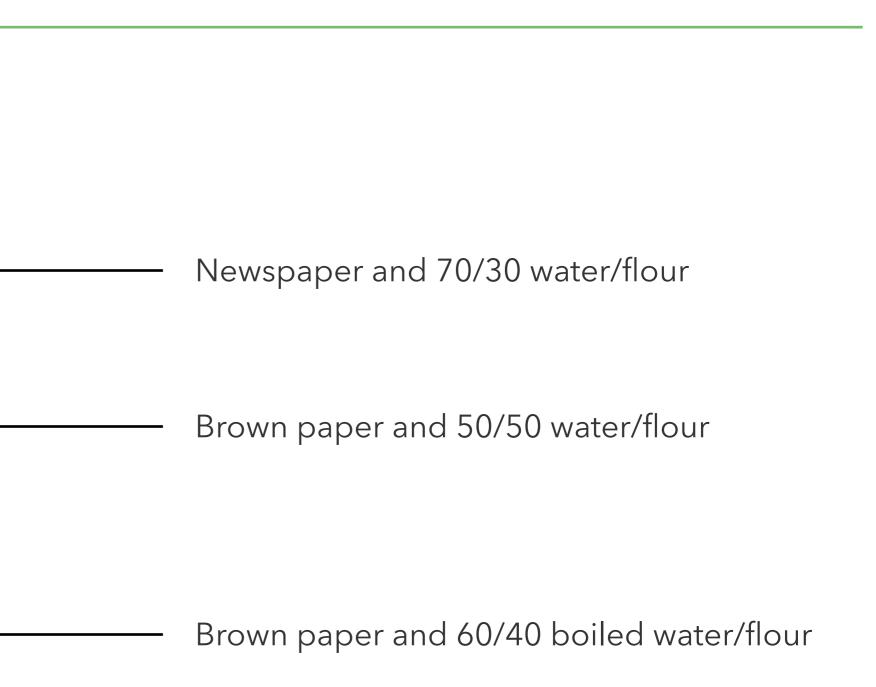


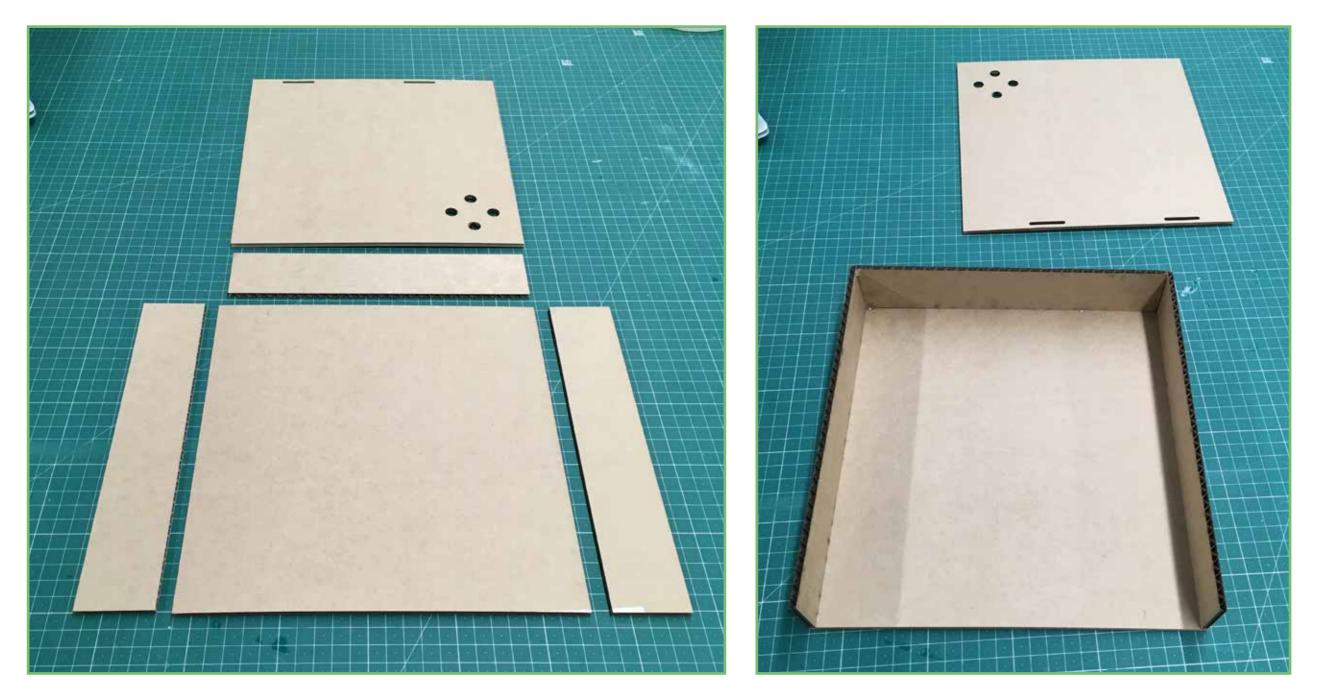
The same process was repeated. However, the paste was changed into a 60% water, 40% white flour and boiled which made it dry clear without any white marks.

The lid was FDM printed, then sanded and sprayed with primer. After the first coat of primer dryed it was sanded after which a second layer of primer was added. Thereafter two layers of white undercoat followed by



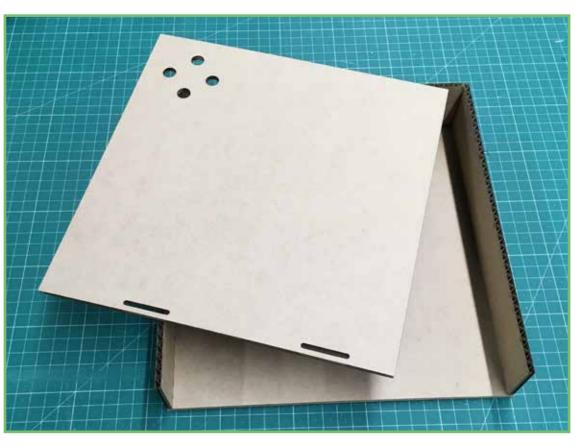


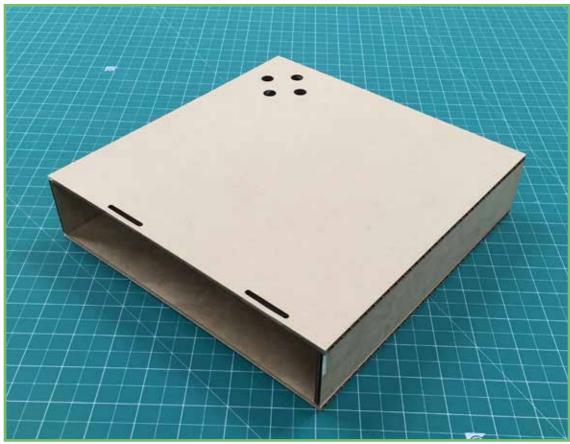


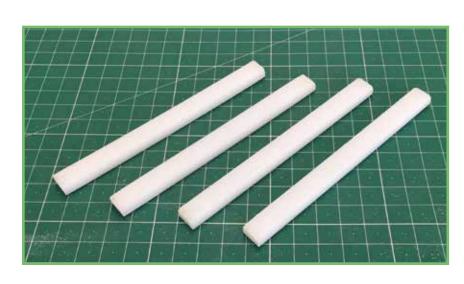


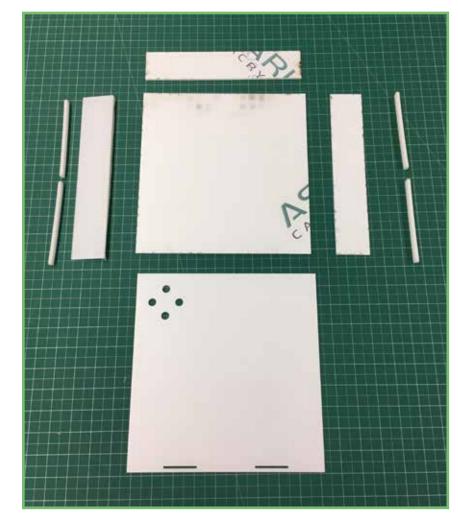
A cardboard mockup was cut out using a laser cutter. Assembled to try out size, details and dimensions.

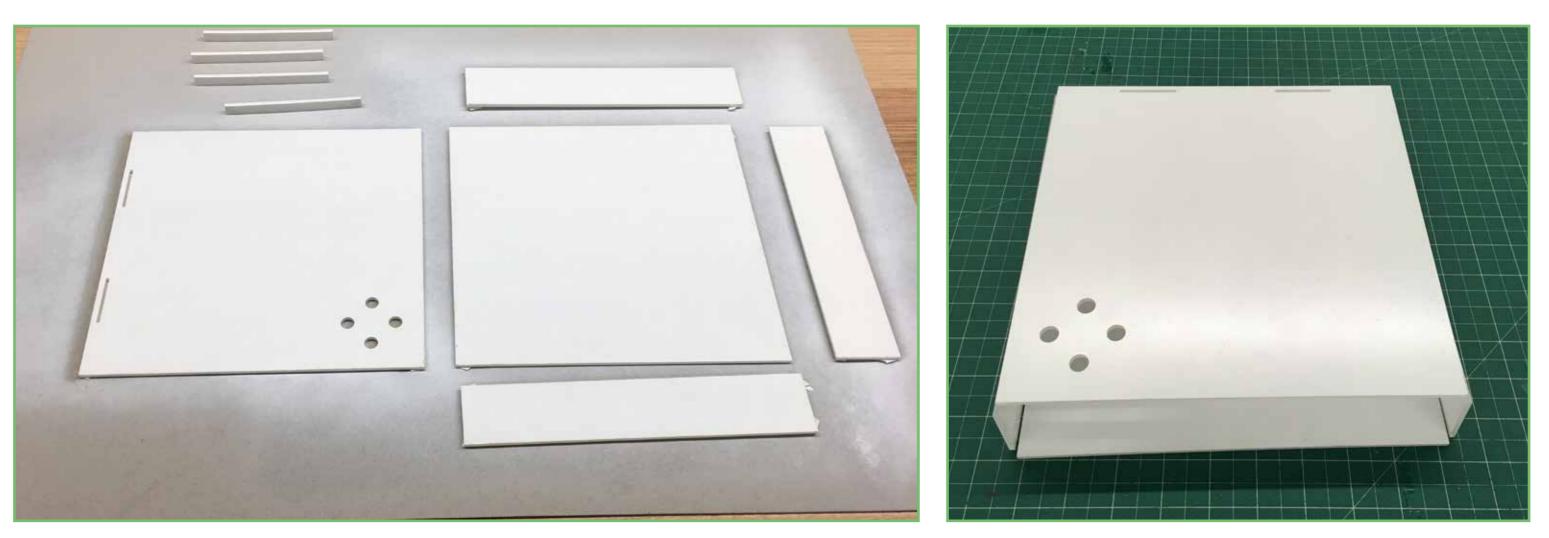
The smaller version of the pizza box was made to keep the material usage down.

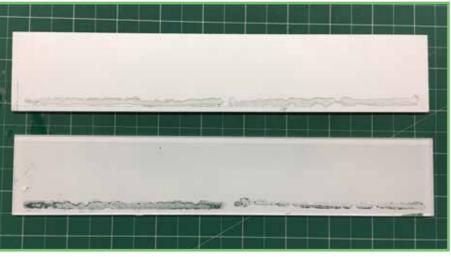












First attempt with acrylic. A clear acrylic was used and spray painted. However, the glue needed for assembly dissolved the paint and left clearly visible marks. Therefore I moved on to working with solid white acrylic afterwards.

The dimensions of the box was good and fit well together. The only components salvaged from this model to the final one was the FDM printed supports to be put on the inside of the box in order to hold the cardboard plate in place during transport.



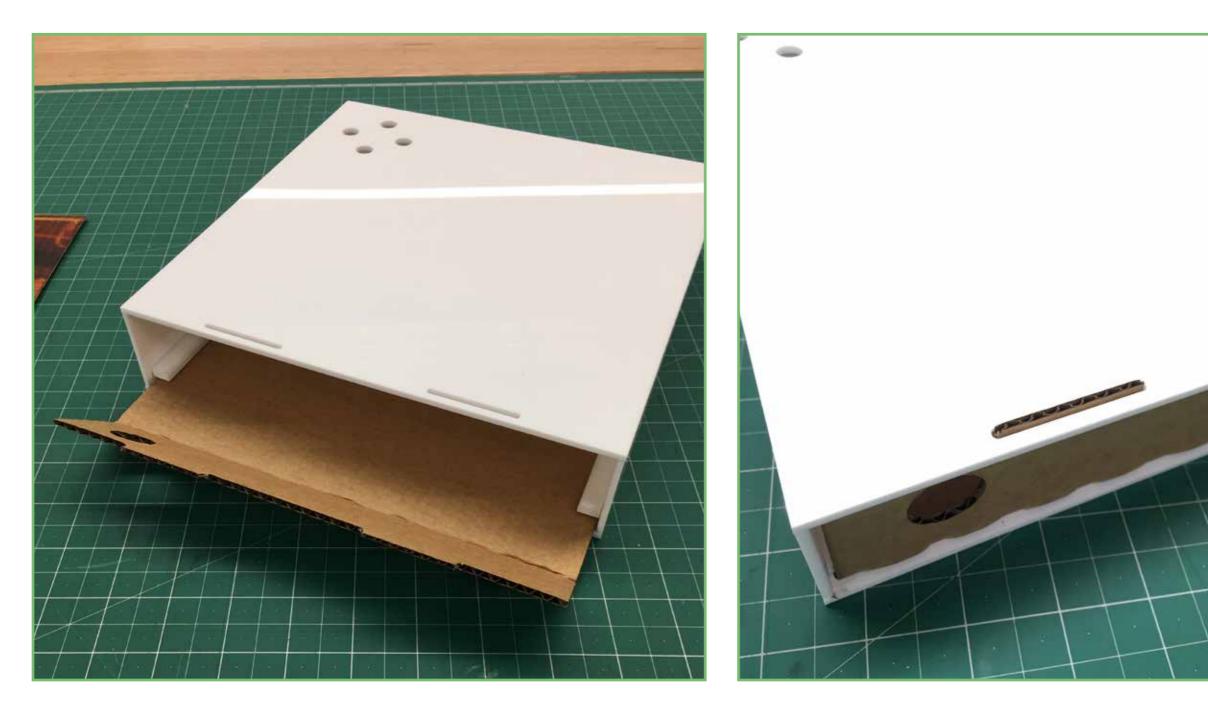




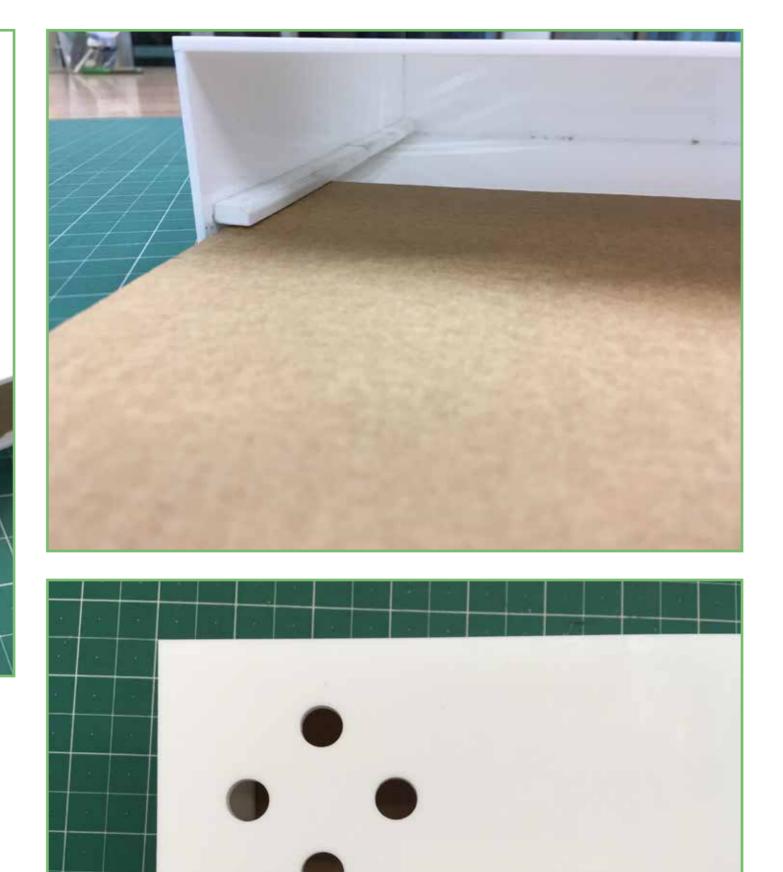


With the plastic parts assembled the focus was put on finalizing the size and shape of the cardboard piece to fit everything together.

It required some iterations to get the working proportions perfectly adapted for the closing of the pizza box.



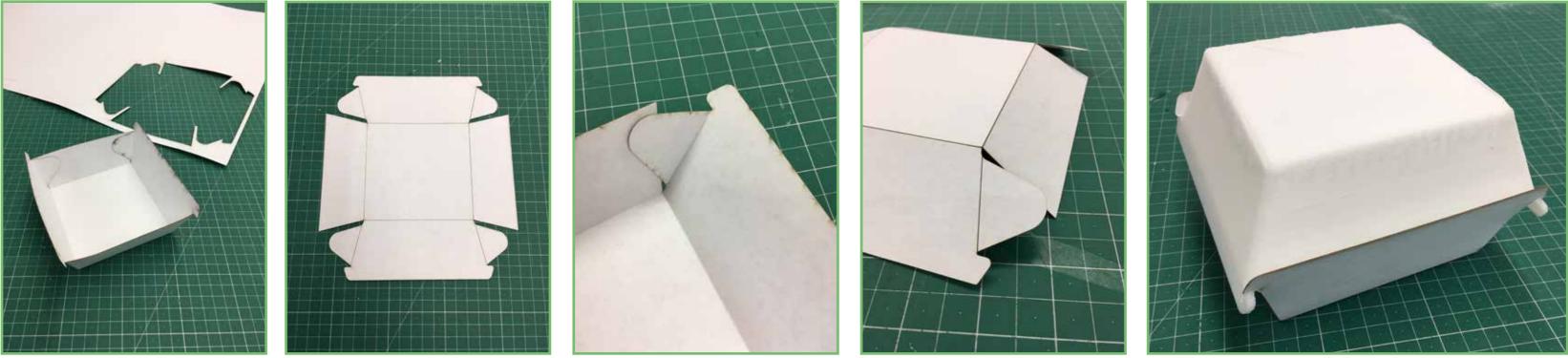
Finished model of the reusable pizza box made out of 3mm thick, solid white acrylic plates that was laser cut and a 2mm thick piece of cardboard to eat from, also laser cut.



model making burger and chips box

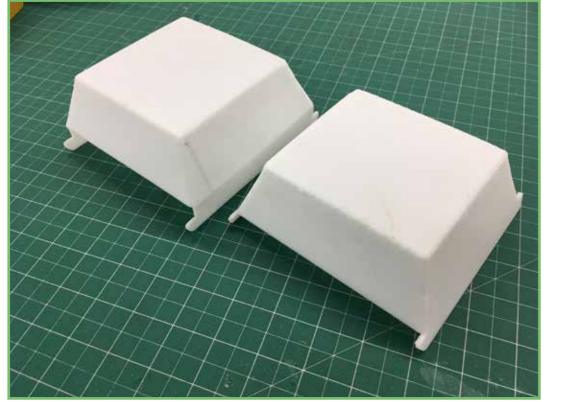


A first edition of the lid was FDM printed and tested with similar, cut up, existing packaging. The first bottom shape was based on the existing packaging but with moderations to fit the first lid better.



The modified bottom part was laser cut and folded together similarly to how boxes are manufactured today.

burger and chips box model making



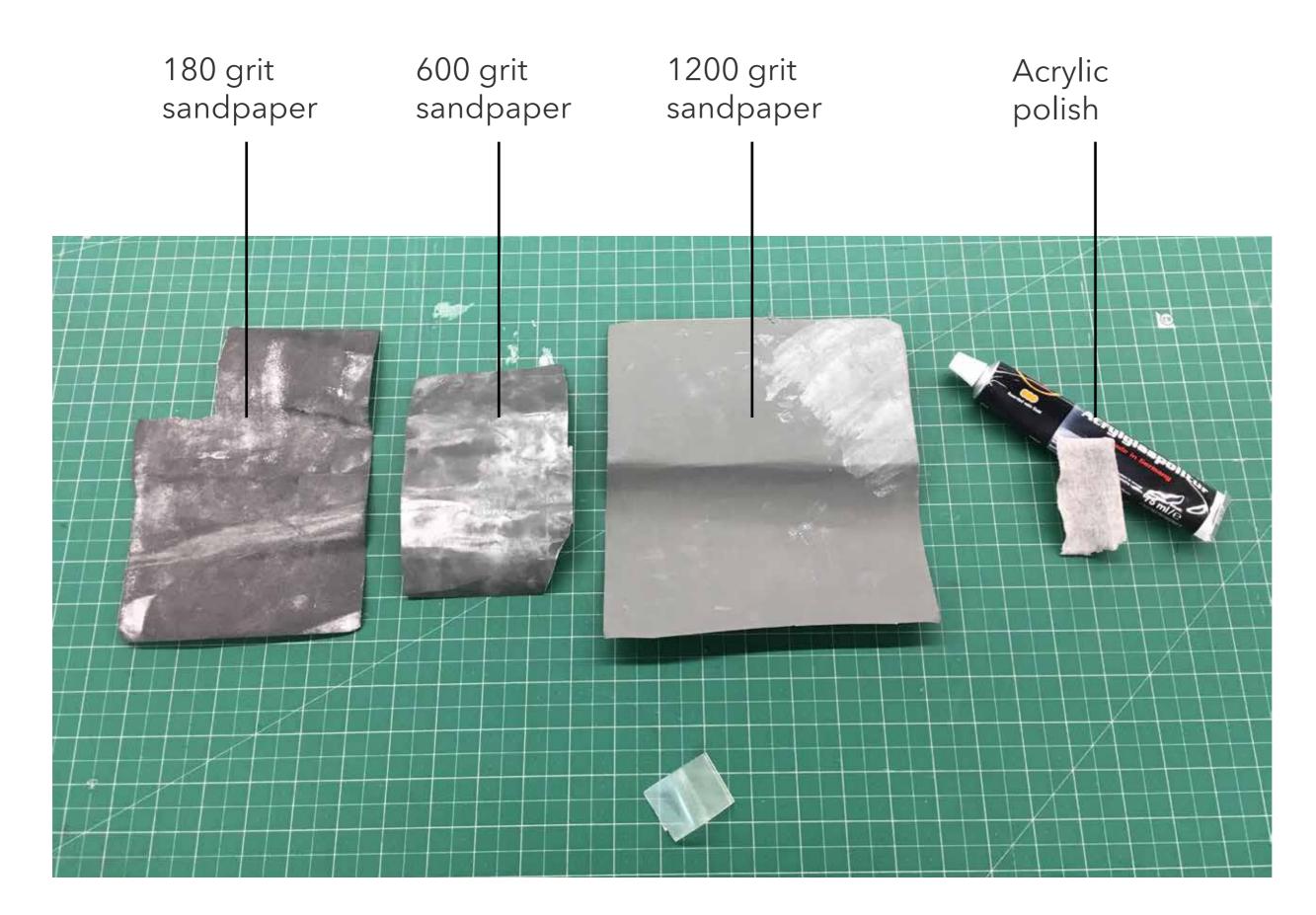


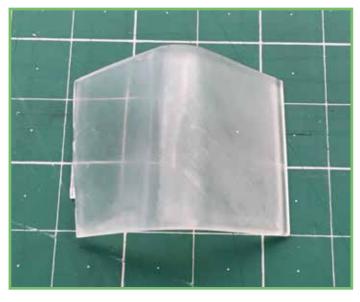


FDM printed a second version of the burger lid which fit the designed bottom better and that would be easier to manufactur and less fragile. Iterating the size and details for the bottom parts, trying different materials and laser cutting methods to get a good fit between lid and bottom.

The next step was to SLA print the lid in clear resin and try to make it resemble glass as much as possible.

model making clear resin test

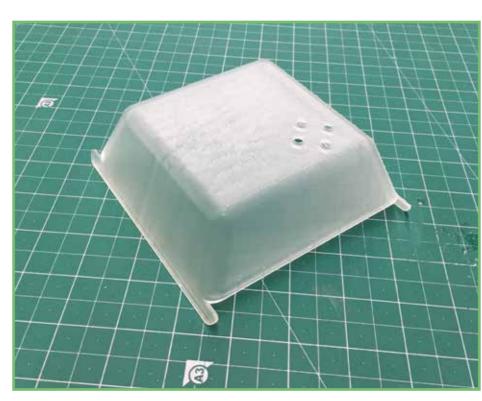


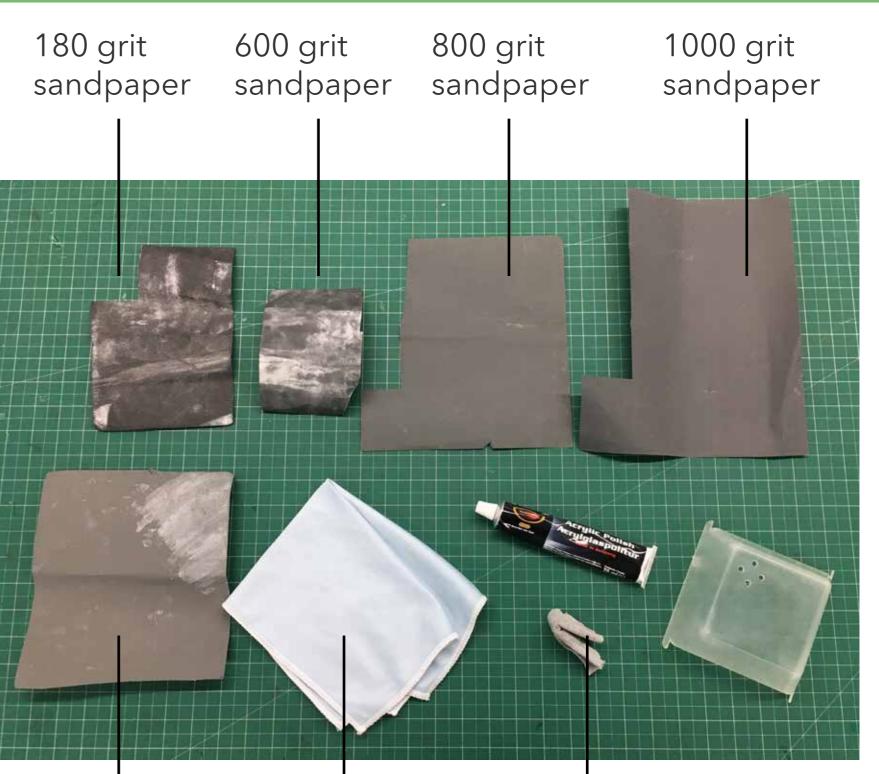




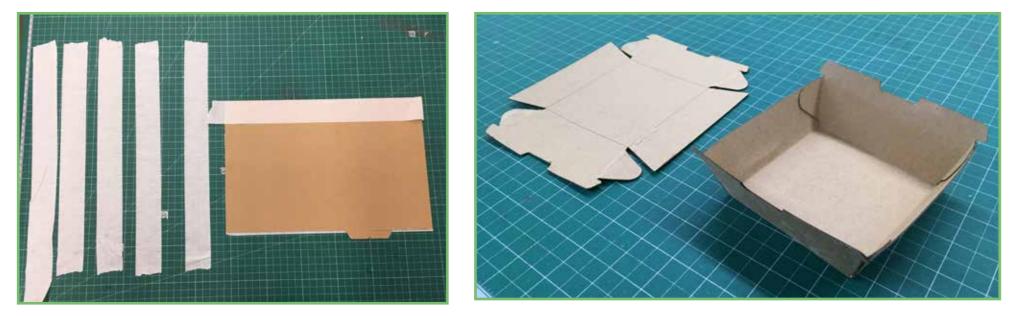
burger and chips box model making







Model out of the SLA printer, very rough surfaces.



Final bottom part made from two 0,5 mm hard brown paper glued together, then covered with masking tape to avoid burn marks from he laser cutter.

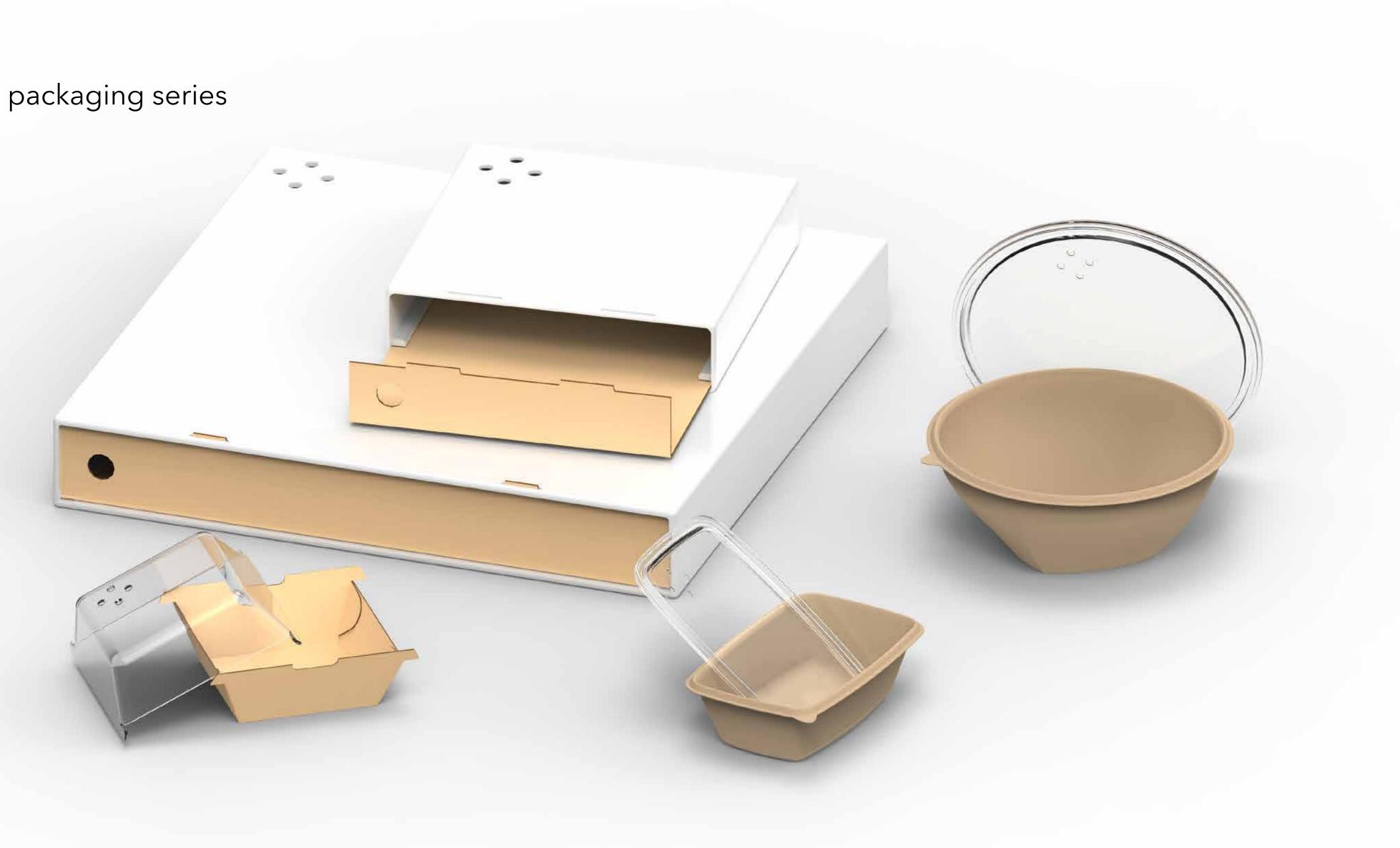
1200 grit sandpaper



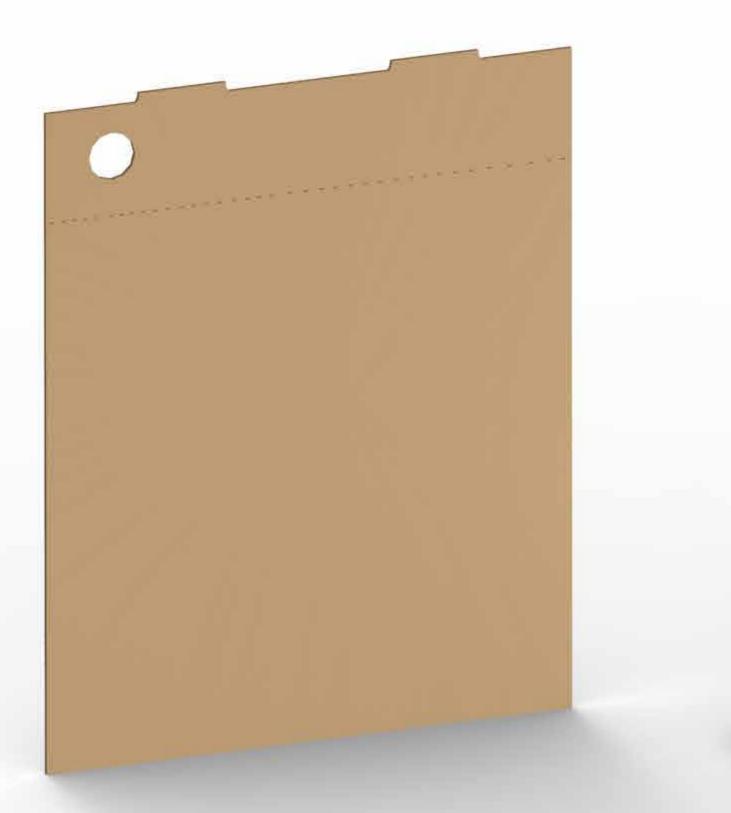
Microfiber cloth

Acrylic polish

final design The finished reusable packaging series to be implemented into the UberEATS system of home delivery.



final design **pizza box**



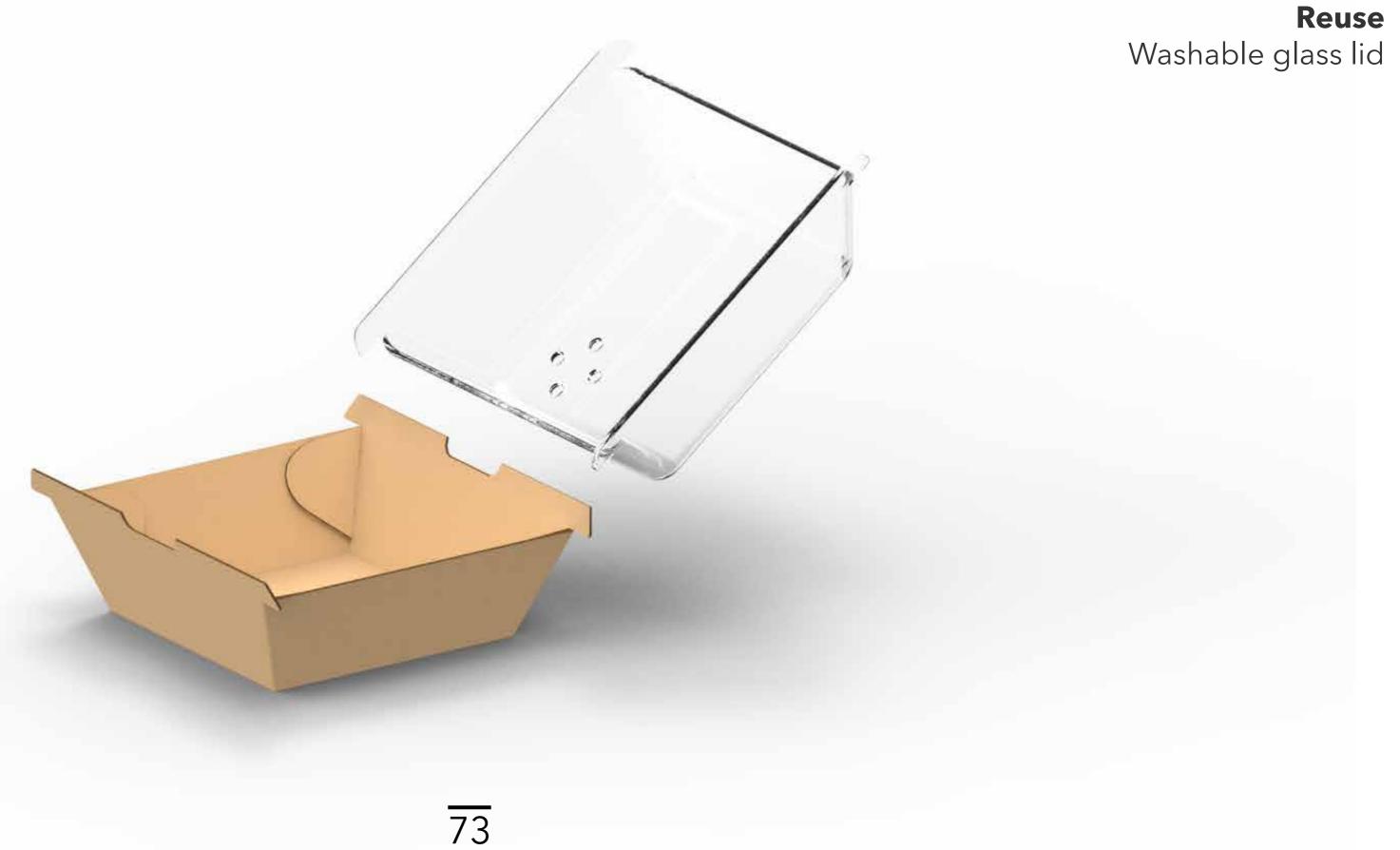
Recycle 2 mm thin piece of cardboard

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Reuse Washable plastic container

final design burger and chips

Recycle 1 mm thin cardboard bottom



final design **bowl**

Compost biodegradable bagasse bowl 3

Reuse Washable glass lid



final design standard box

Compost biodegradable bagasse box



final design branding





Reusable part branded for UberEATS

Disposable part branded for restaurant

1. Reduce

2. Reuse

3. Recycle

In order to decrease the amount of waste being generated by home delivery food packaging there are three steps to follow.

The implementation of reusable food containers into the UberEATS system will reduce the amount of disposable material being produced, hence reducing the amount of waste being generated.

One reusable part of a container can substitute well over 100 equivalent disposable parts.

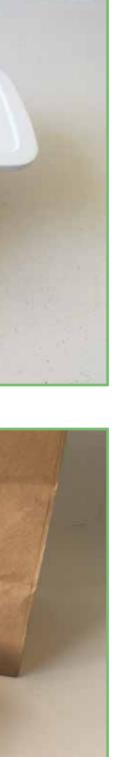
The disposable parts in the system will be recyclable or biodegraded instead of becoming landfill.

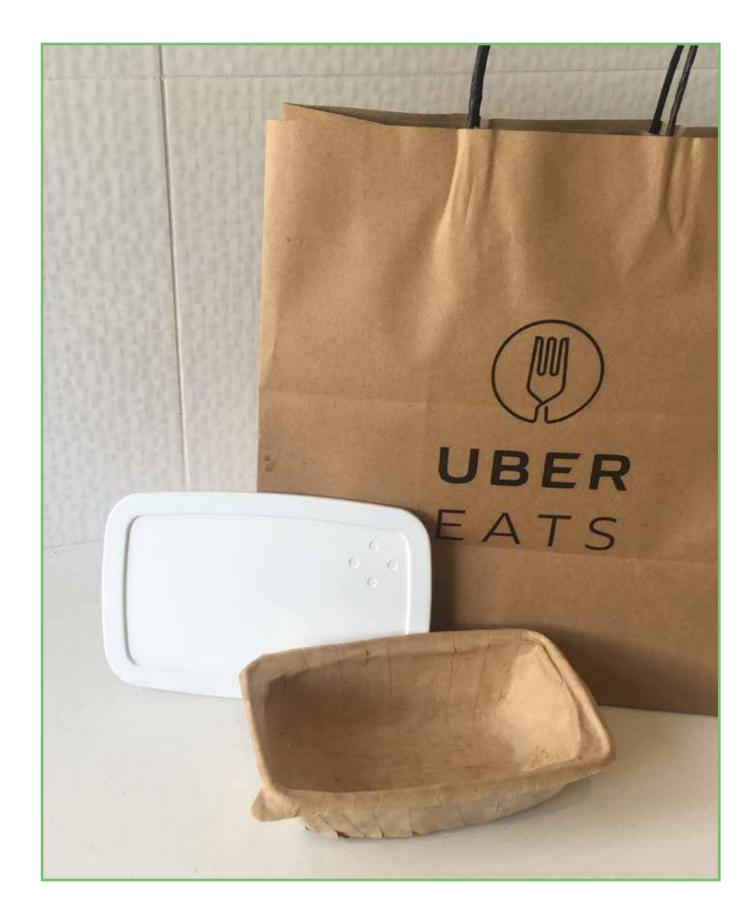


The physical models for the UberEATS packaging series.

models standard box







models **pizza box**



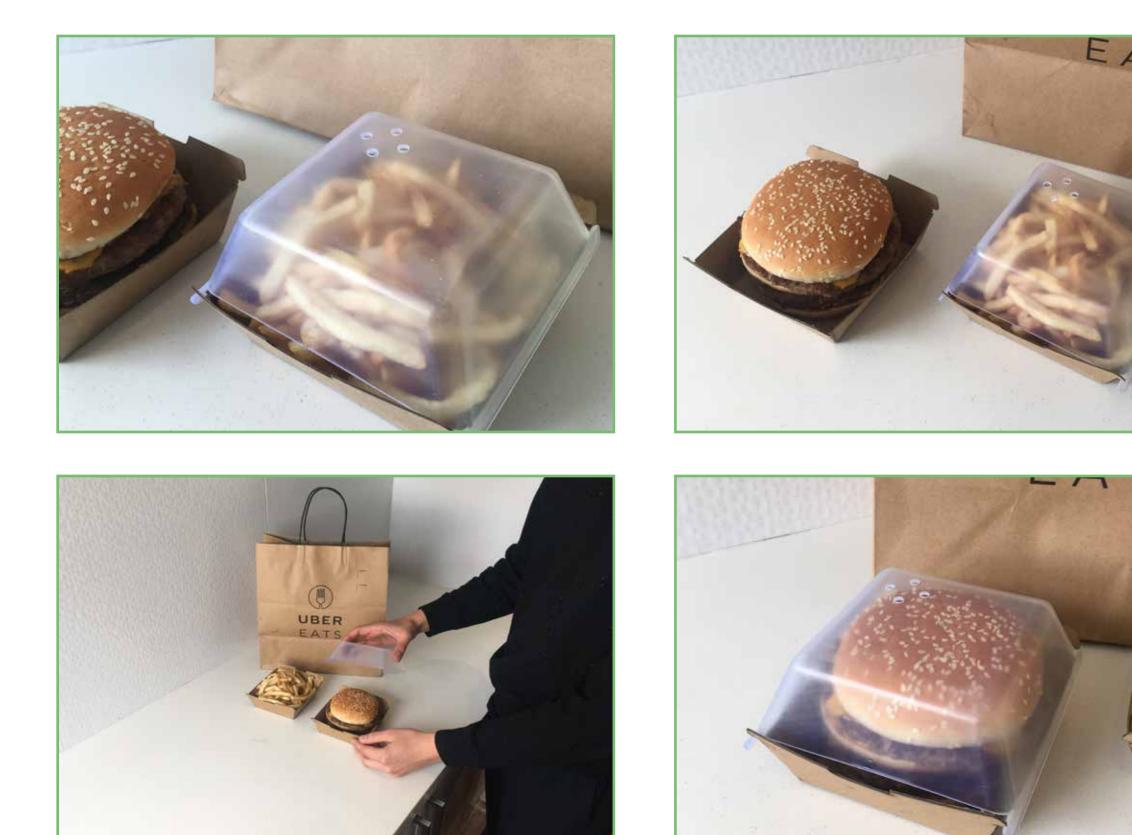






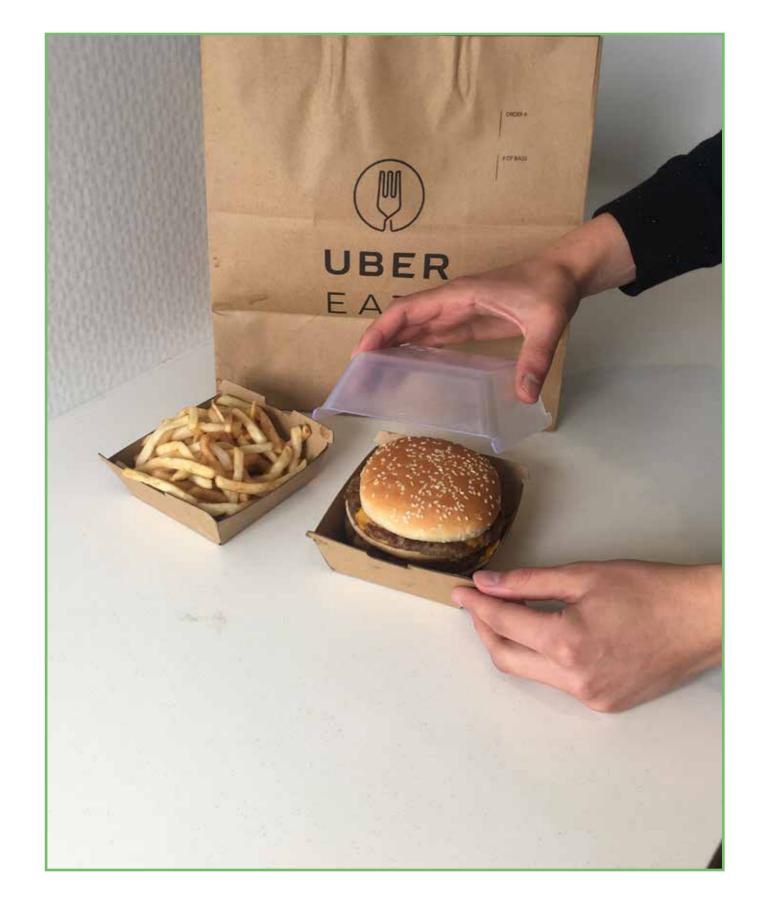


models **burger and chips box**







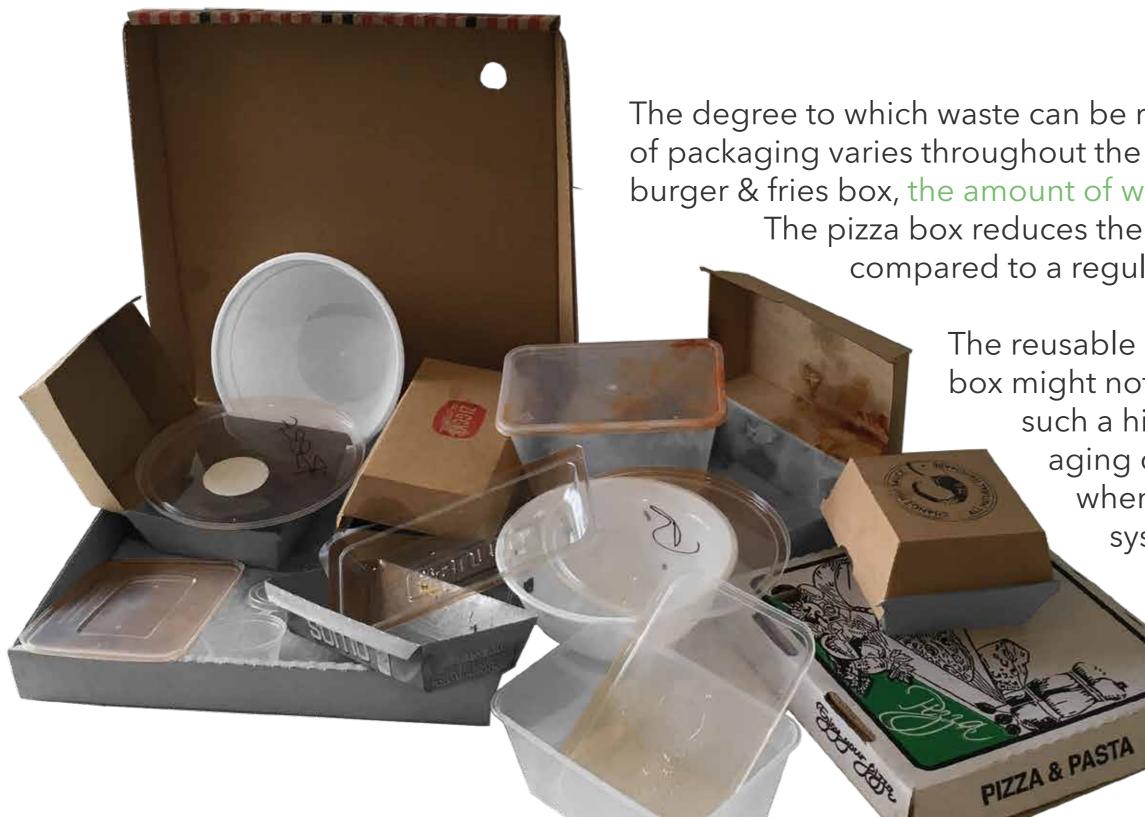






EATS

conclusion what will be saved?





The degree to which waste can be reduced with the different kinds of packaging varies throughout the packaging series. With the burger & fries box, the amount of waste generated is cut in half. The pizza box reduces the cardboard waste with 70% compared to a regular pizza box.

> The reusable parts of the bowl and standard box might not reduce the amount of waste to such a high degree as the other packaging options in the series. However, when the entity of the vast UberEATS system is being considered, saving a lid for every box or bowl adds up to tonnes of plastic being spared each year.

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