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OVERVIEW



CIBO

Senior Capstone

Charles Barilo

Jefferson 2020





**CIBO is an all inclusive portable
prep and cleanup station designed
to increase the linear workflow in
the kitchen**



RESEARCH

As I began to explore the kitchen market, I discovered some problems. I read through numerous articles, and I was beginning to get an understanding that there was an issue with clutter in the kitchen. People were constantly looking to organize and consolidate, and the root of this problem happened to be the amount of single use tools that people owned in the kitchen. People seem to own a tool for everything.

8 Ways to Create Extra Counter Space in a Tiny Kitchen

How to Organize Your Kitchen—Once and for All

8 Serious Reasons You Need to Declutter, Once and for All

Piles of junk aren't doing your physical or mental health any favors.

The Powerful Psychology Behind Cleanliness

How to stay organized, and reap the health benefits

Space-saving ideas for small kitchens

5 ways how cleanliness effects productivity



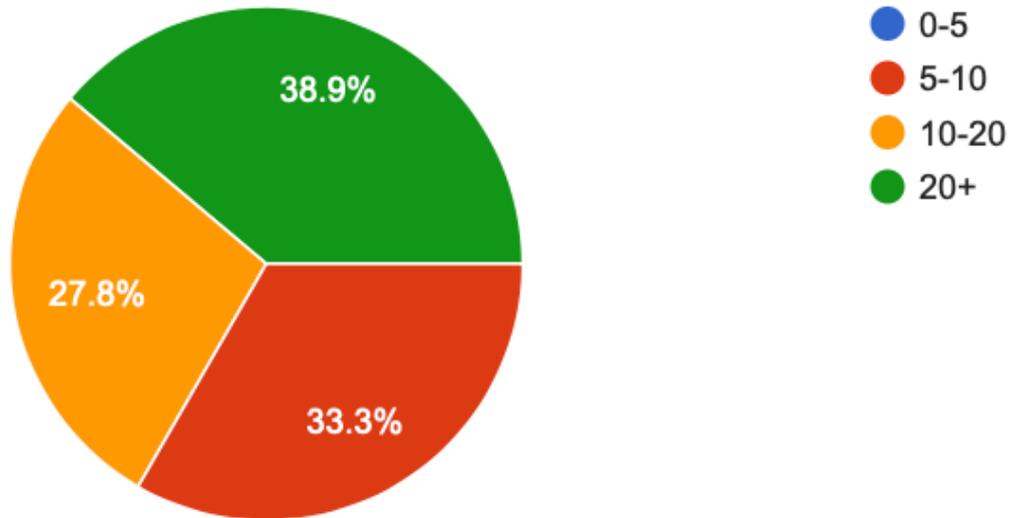
The kitchen market is a fast growing expansive market globally, and additionally the kitchen appliance market makes up a large portion of the overall market. This market segment includes appliances, as well as kitchen tools and utensils. With such a high expectation for the growth of this market going forward I set out to determine a product solution to address current issues.

The global kitchenware market size was valued at ***56.8 billion***

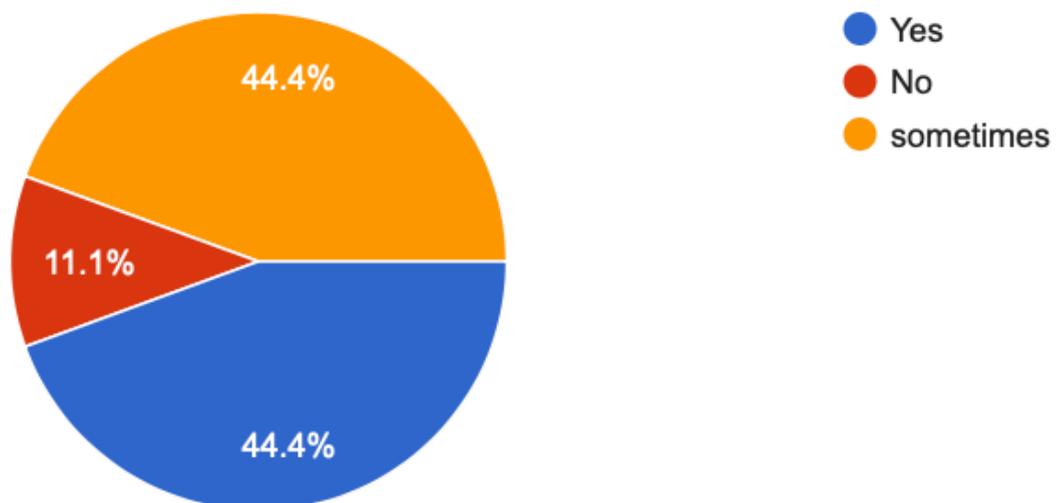
The kitchen appliance market is expected to reach ***242.5 billion*** by **2023**

I had completed research online, and now it was time to survey a broad demographic to determine if everyone felt the same way. I surveyed people who cooked in all sorts of kitchens from a domestic house to a shared kitchen, a dorm kitchen, and even an RV kitchen. The results came back validating that people owned a vast amount of stuff and that they wanted often times to declutter this mess. Now with a valid problem I had to begin to understand the specifics.

How many kitchen utensils/tools do you own ?



Do you feel that your kitchen is cluttered ?



Now with the understanding that this is a serious issue in the kitchen and that people across many different demographics are experiencing frustration with this issue; I realized I needed to get out of the studio and into the kitchen to begin to make more indepth observations first hand. I needed to not only see the clutter and the mess for myself, but I needed to determine other contributing factors and maybe even uncover more problems during my observations.



After observing family, friends, and others in the kitchen I compiled some observations:

Many people do not spend a lot of time prepping meals

A lot of tools in the kitchen rarely get used

Often times some portion of the cleanup process gets pushed off to a later date

Prepping food is where the mess is at

Looking for utensils to use wastes time



After making numerous observations in the kitchen I realized there was a lot of problems I observed. I was not able to tackle them all in one product solution so I refined the scope of the project to focus on the prepping part of the cooking process. I chose to do this because this seemed to be where the most amount of mess and problems were located. The prep part of the cooking process is basically everything from the time food and ingredients come out of the fridge and cabinet to the time they make it on the stove.

Prep: All of the auxillary and secondary work done in the kitchen



I found some products that begun to address the need to consolidate the prep part of the kitchen process. After surveying the market there is a few products in specific that attempt to act as a full prep kit/station. These products vary from stations without many tools to a complete kitchen in a box. All of these products are unique in their own ways and attempt to achieve specific goals.



-  100% Organic Bamboo
-  Dual Board Design
-  Two Knife Sharpeners
-  Digital Timer
-  254nm UVC Light
-  Battery That Will Last Up-To 30 Days
-  Groove For Catching Juices
-  Water-Proof
-  Weighing Scale
-  Quick Charging

Chopbox

\$199

- No tools included
- All features in one spot
- Quirky features
- Kickstarter project



Mason Cash Set

\$100

- Compact
- Includes some prep tools
- Includes mostly baking tools
- Clever details



Prepdeck

\$199

- Lots of storage
- Huge footprint
- Flatpack tools
- Most prep tools included



Kitchen in a Box

\$199

- Includes a little bit of every thing needed
- Cheap materiality
- Larger footprint

While each of these products is clever in its own way, they have their own failures independently. None of these products seem to address all of the the problems I have researched and observed in the kitchen.



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-  Quick Charging

Missing all the needed prep tools, prepping takes just as long as it did before.



Not a universal solution, too specific to baking

Now with benchmarking and research completed I was ready to build my design criteria for what I needed out of my prep kit. I was able to address the failures of other products, and build design criteria off of those failures.



Many parts that all have to be cleaned individually



No consideration for storage of entire unit

After conclusive research and validation about a need to consolidate and clean up the clutter in the kitchen, I was able to build some of my design criteria. My initial design criteria primarily focused on reducing the clutter of the kitchen and helping to streamline the linear workflow in the kitchen. After some further insights mid-way through the project, new design criteria was added to strengthen the final result.

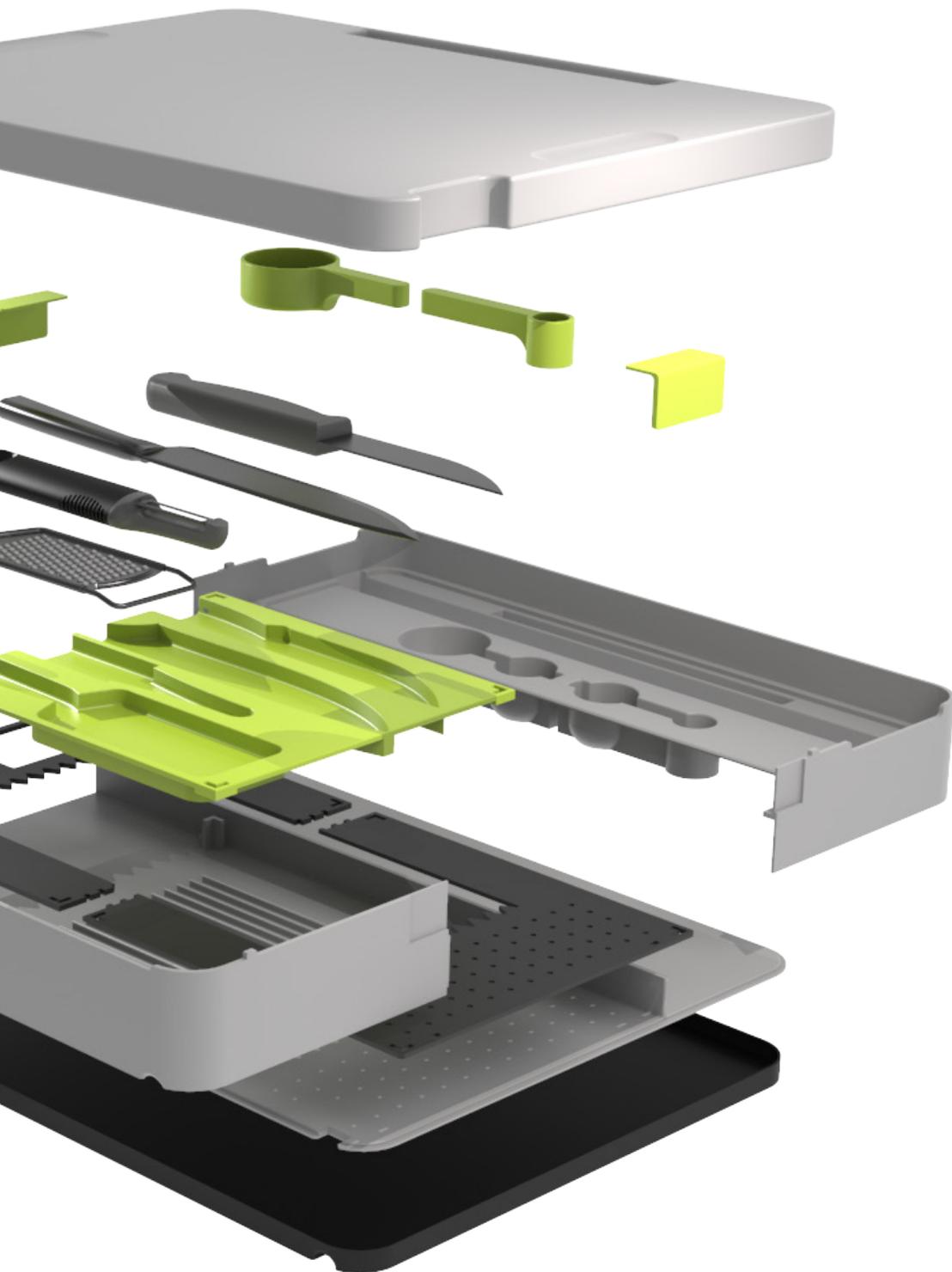
DESIGN CRITERIA:

**Includes all necessary basic
kitchen prep tools**

**Has a small and compact
overall footprint**

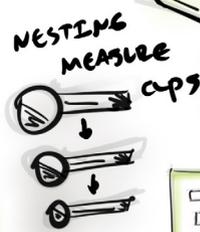
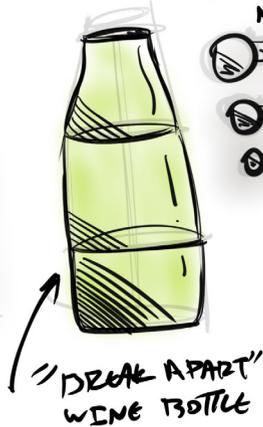
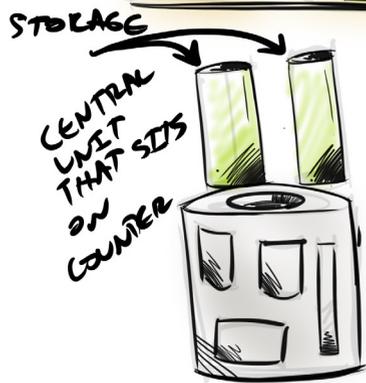
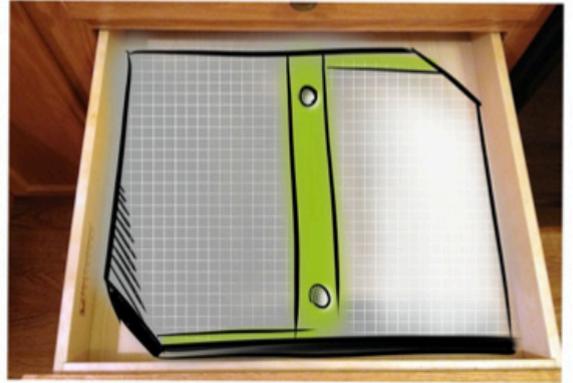
**Helps to streamline the
workflow during prepping**

**Consider portability and
storage**



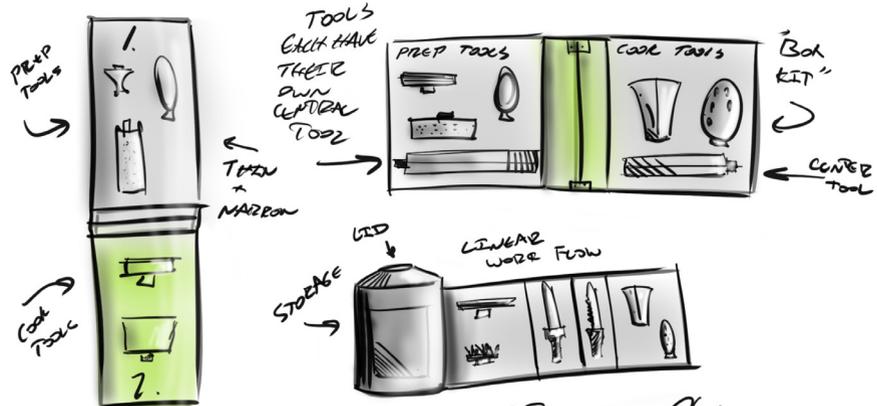
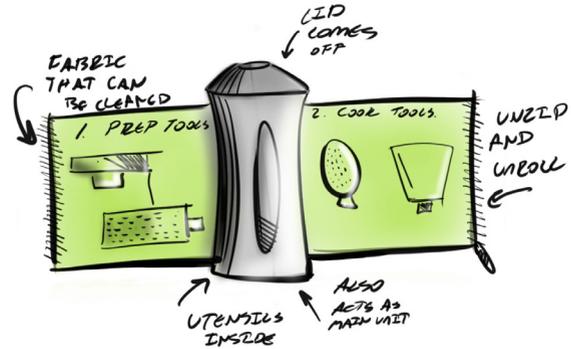
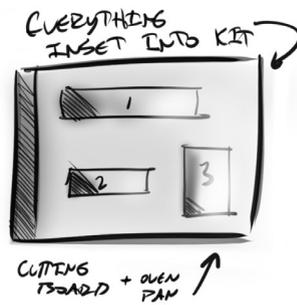
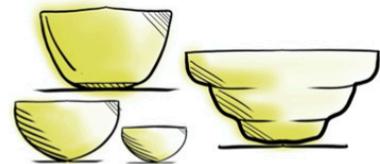
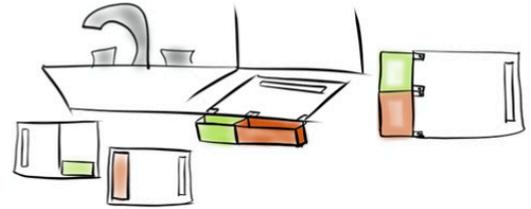
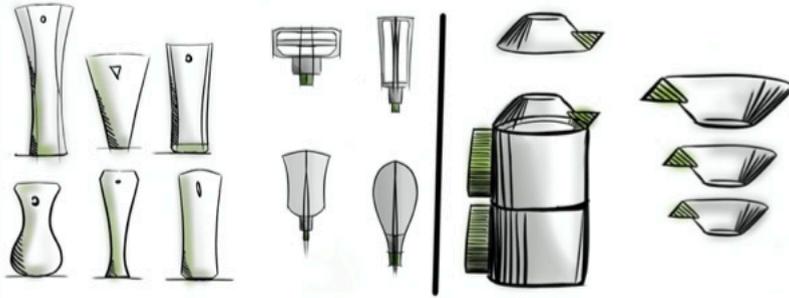
DESIGN DEVELOPMENT

Initially the iterative process was all over the place, CIBO really didn't have a home yet to start off with. There were prep-kit ideas for all different kinds of kitchens. From a portable camping station, to an RV kitchen, to a tiny home; early iteration began to take a look at where this kit was needed most.



CHARLES BARILLO

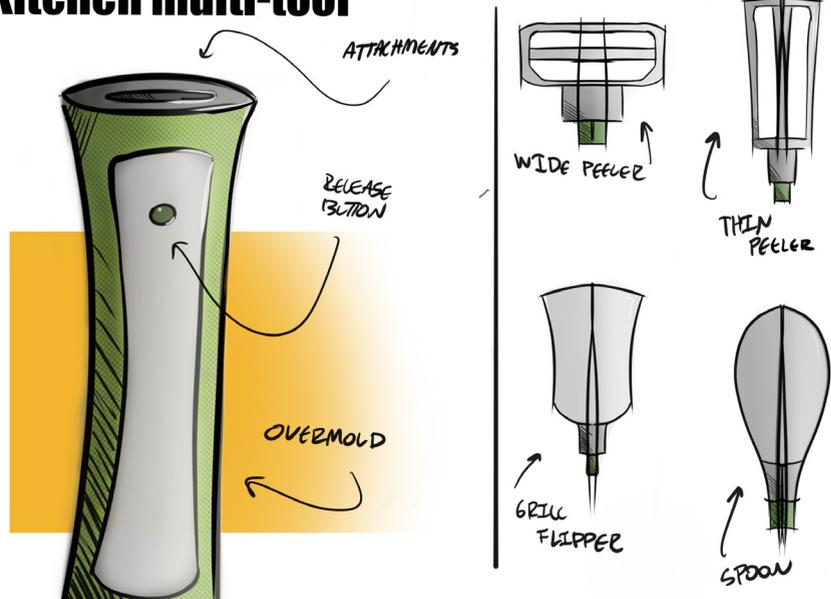
Simultaneously while figuring out a home for CIBO, I was ideating what tools and features went into CIBO. Versions such as roll out kits, and fold out kits were originally on my mind. Some interesting features such as silicone pop out bowls and hanging landing spots also were considered during this time.



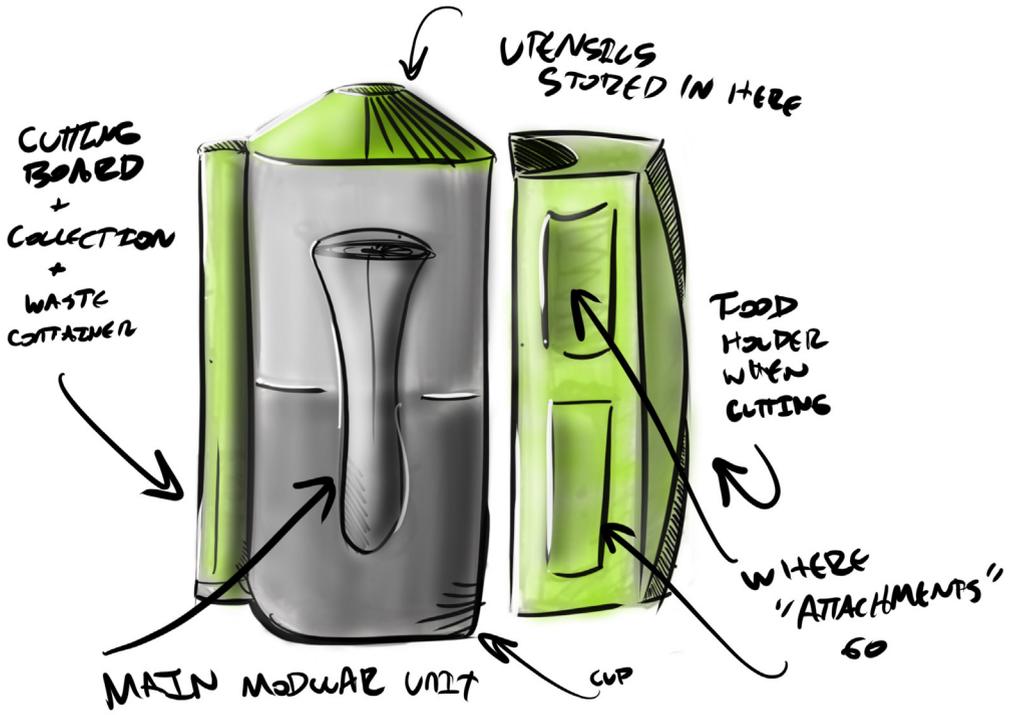
CHARLES BARZILU.

For a brief moment there was the idea of making a sort of multi-tool for all sorts of different kitchens. I thought that this would save space by packing away into a larger body, but I soon realized the faults this would have and steered away from this idea.

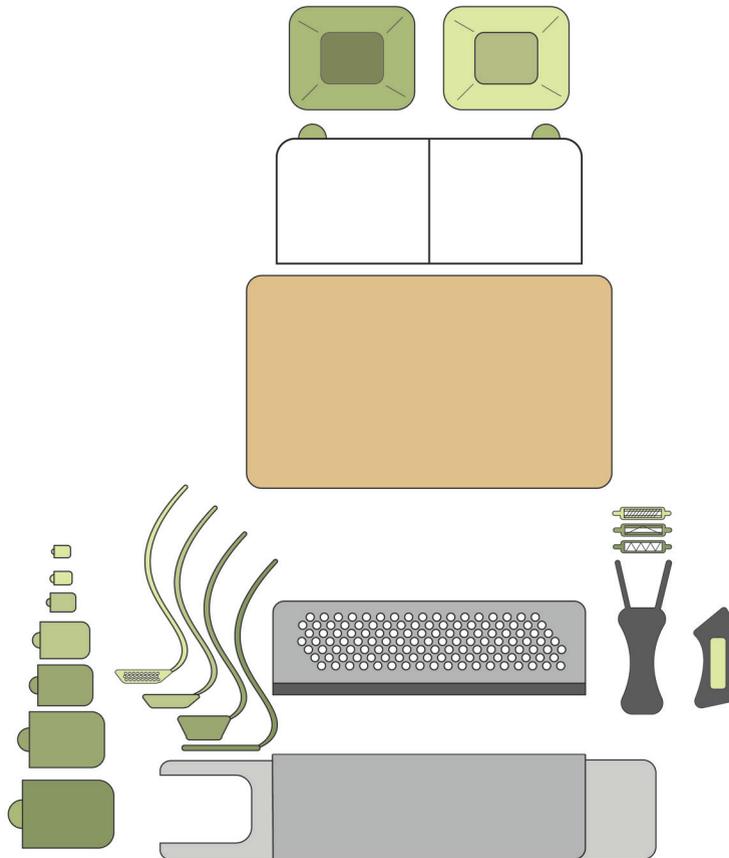
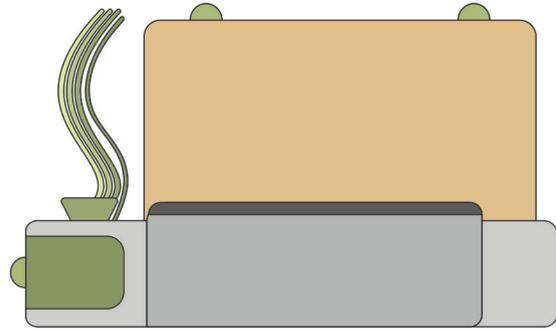
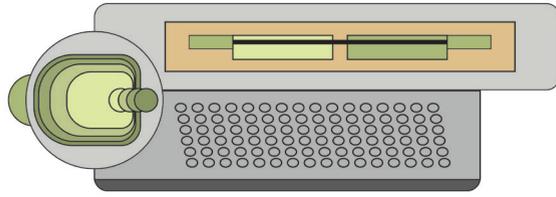
"Kitchen multi-tool"



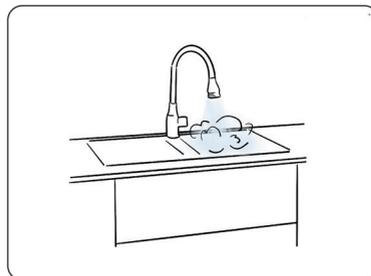
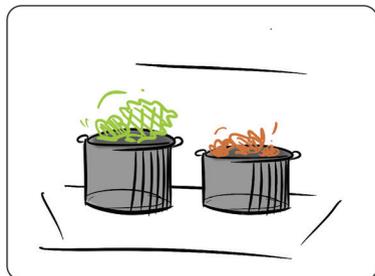
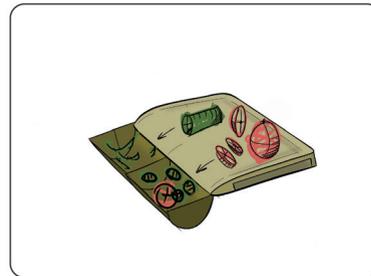
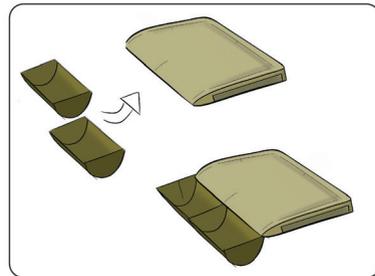
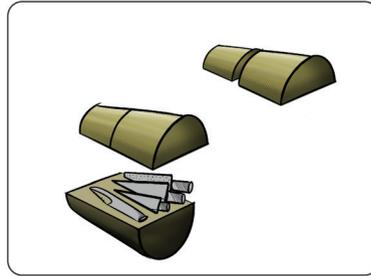
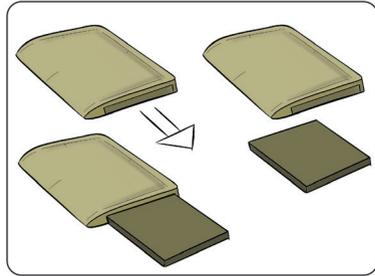
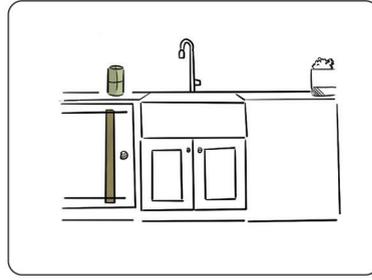
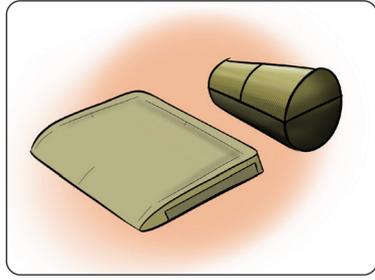
CHARLES BARRETT



After the kitchen multi-tool, a more solidified idea came to fruition. The idea for this concept revolved around a work station with absolutely everything you needed to cook. This version of a prep-station included everything from a strainer to multiple peelers, and it even had landing spots for food coming off of a cutting board. The idea of being a prep-kit was decided after this iteration as I realized I cant fit everything into one small package.



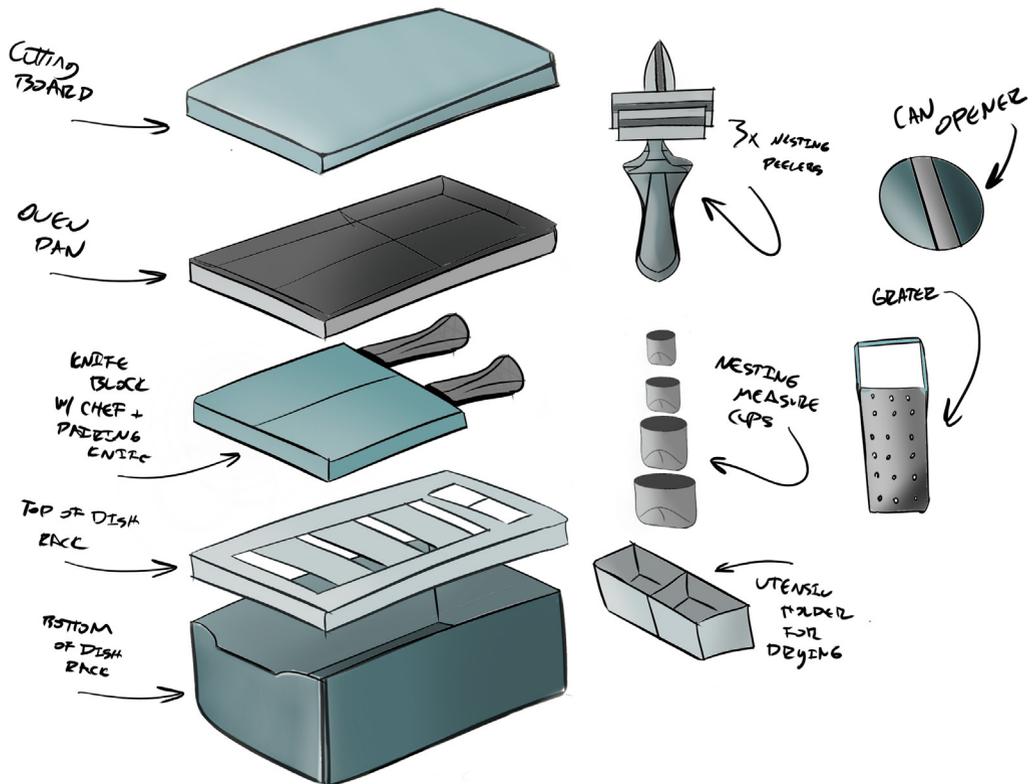
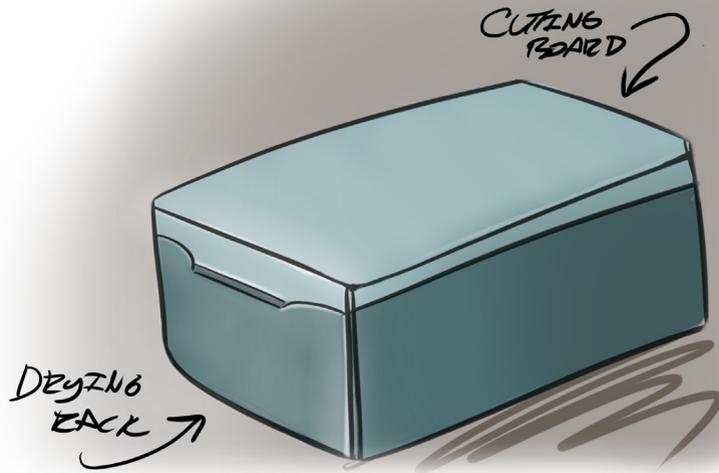
After deciding for the most part on moving forward with a prep kit rather than a cooking kit I storyboarded out a few slides of a two part kit that included the cutting boards as one part and all the tools in another separate housing unit.



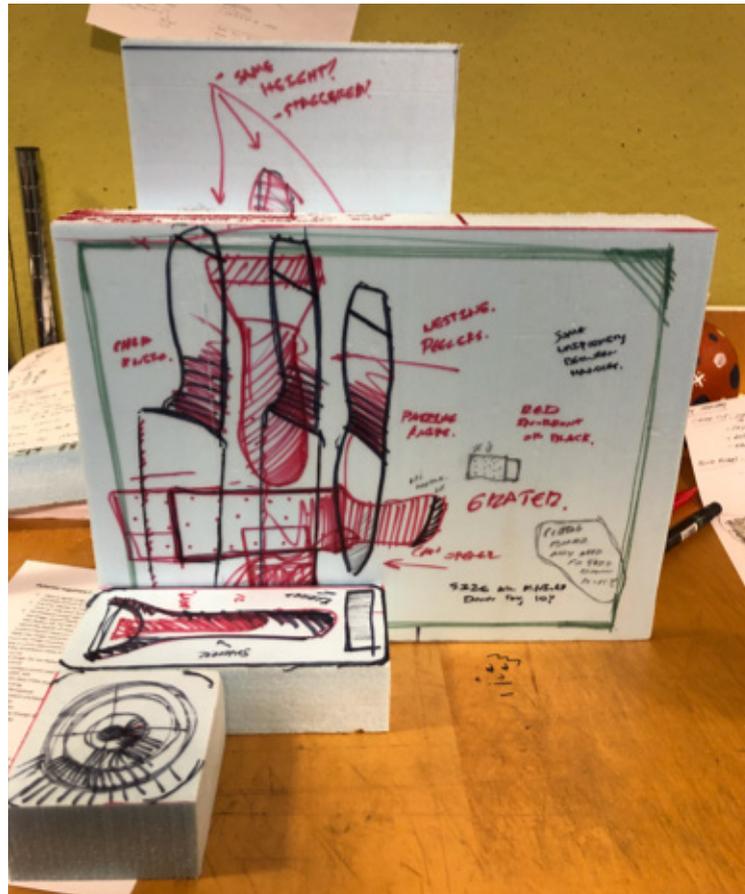
I took this two part idea into blue foam as I ideated with different forms and shapes. I wanted to have two forms that complimented eachother, and also looked attractive when sitting on the counter not in use.



After dedicating many hours trying to come up with a two part system, I decided to scrap it and move forward with only one sole housing unit. Here is an early idea of flat packing in a giant box. While it doesnt look to appealing, the idea of flatpacking stuck and I moved forward with this concept.



Flatpacking seemed easy, but I soon figured out that there was hundreds of different way to organize even a few tools. I drew on blue foam to represent scale and tried many variations to see what worked best. Shown on the right are two flatpacking ideas that also doubled over as a work station. I really needed to figure this flat packing component layout out....

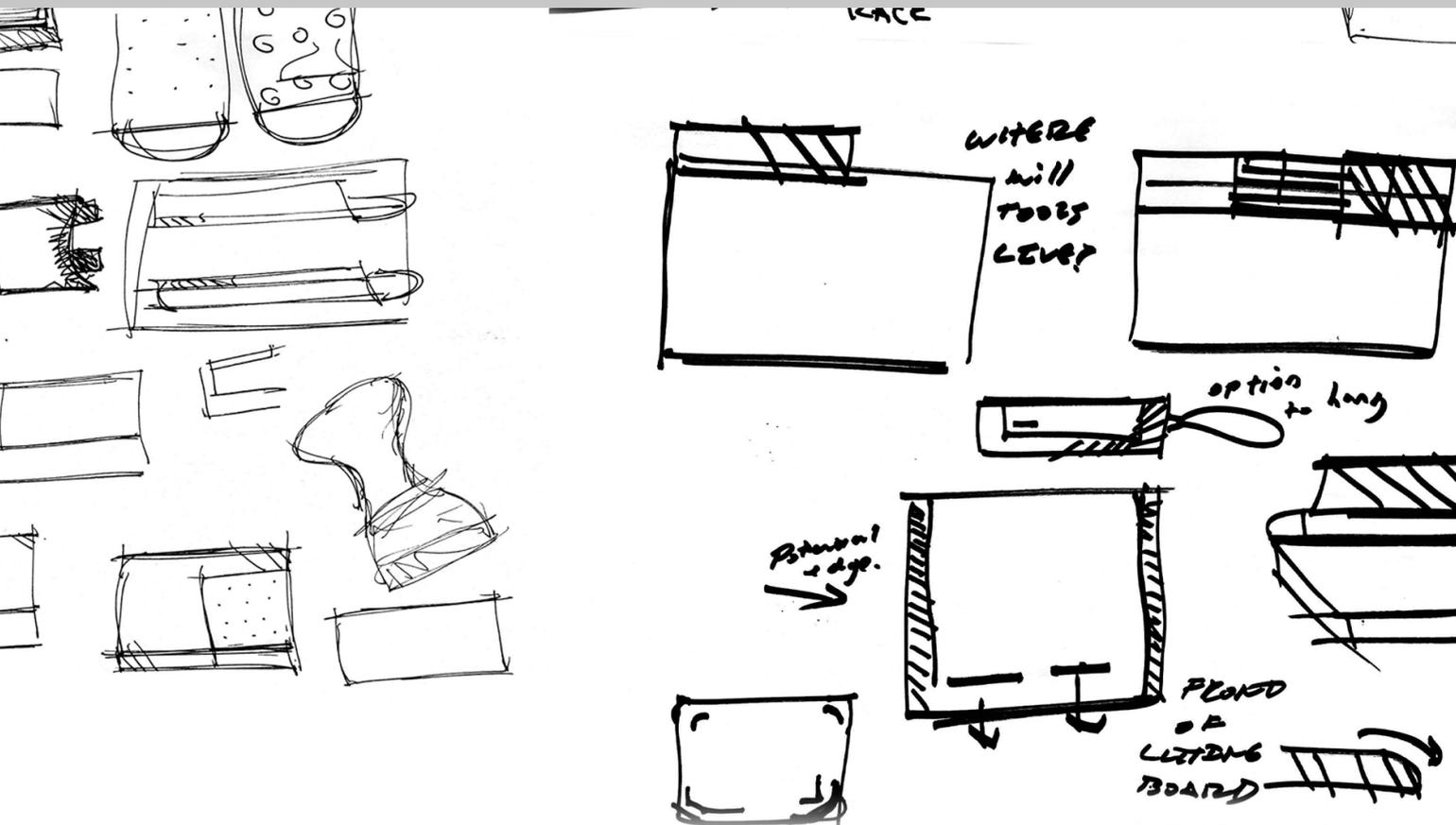


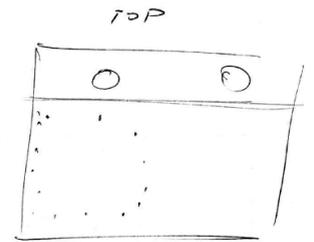
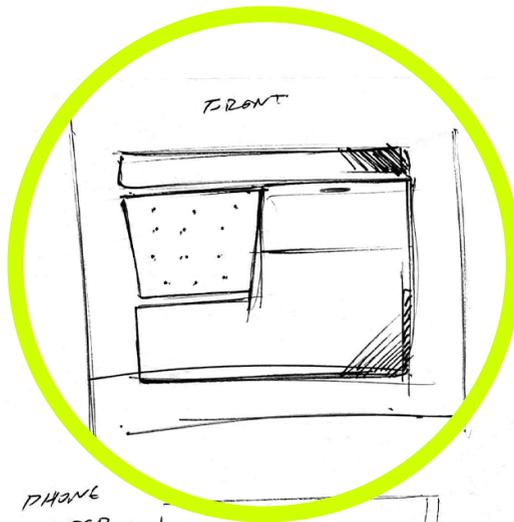
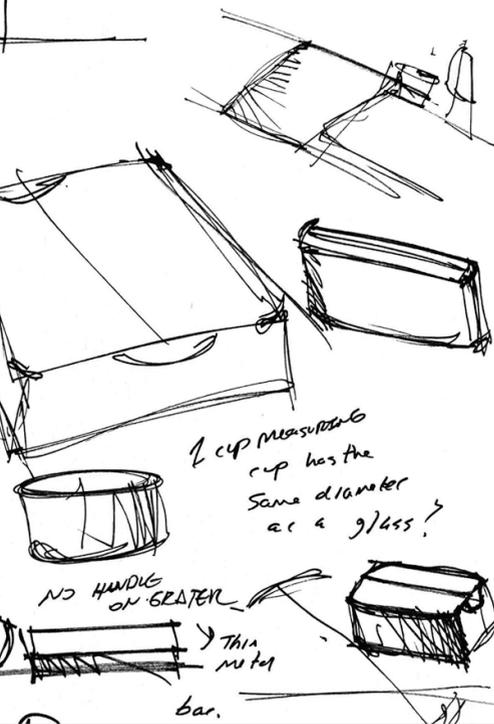
DESIGN DEVELOPMENT

SKETCHING



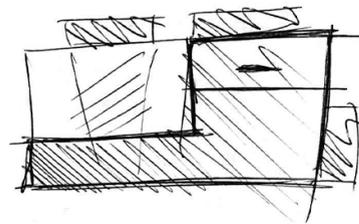
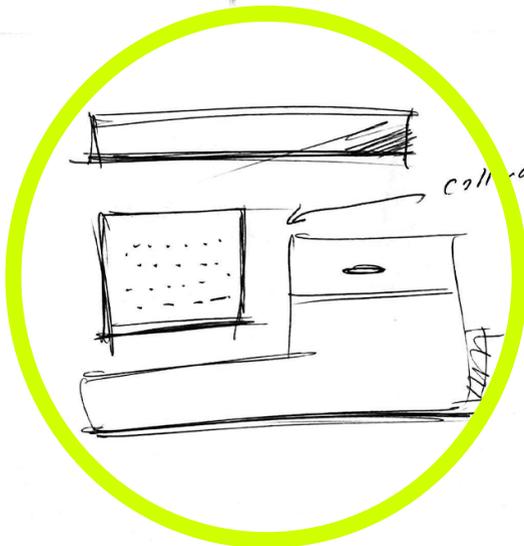
The Blue foam models were giving me trouble as I could not decide on how to orient all of the components. I hit a really tough wall and realized I needed to go back to sketching.



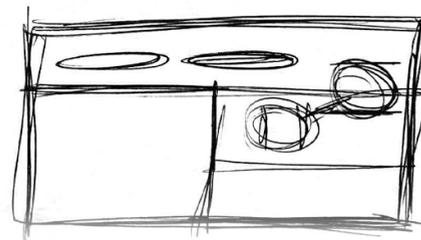
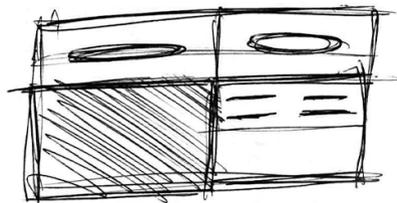


PHONE
HOLDER

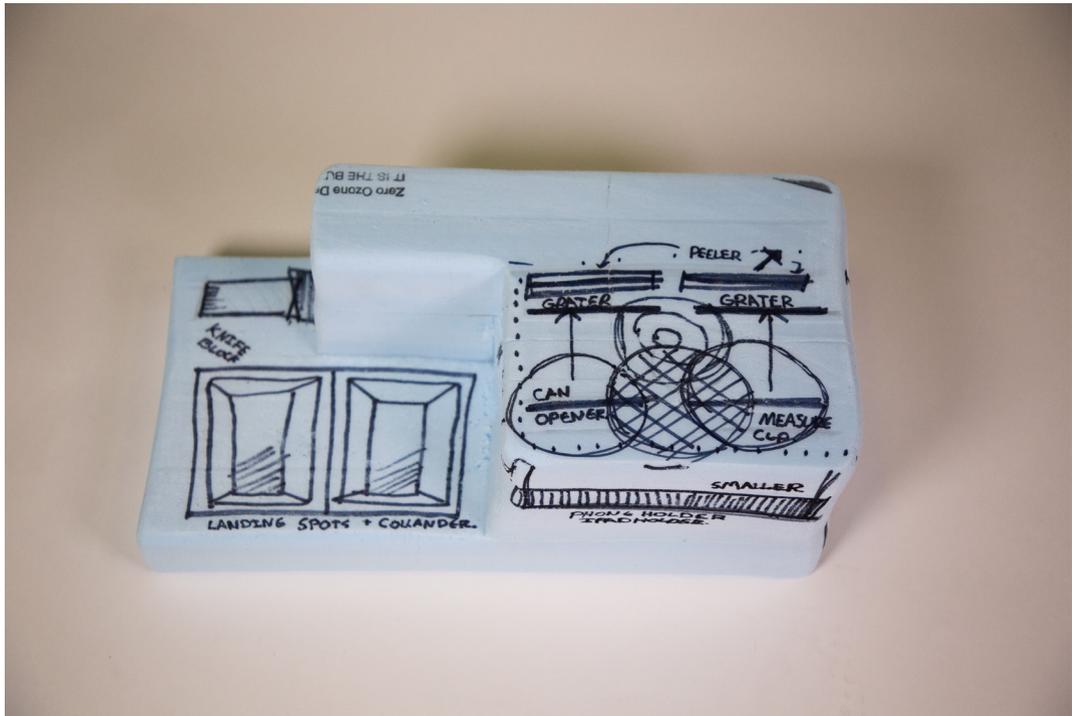
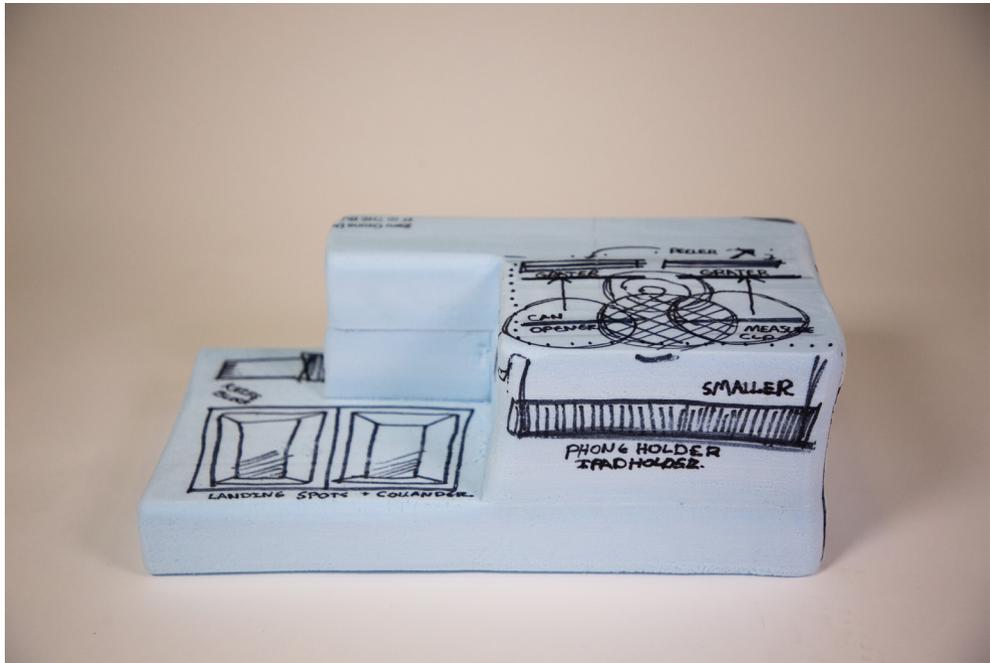
While sketching I derived some sketches that seemed to have some potential and I quickly began to model this new form up in blue foam.



DIFFERENT
ARRANGEMENT
of
DOOR
GREATER.



The sketches that I moved forward with drove me to a decently though out blue foam model. This model included all of the components to prep and a few extra ones as well. While This model was quite large, and I wanted to model it in CAD to really figure out scale and see how all of the full scale kitchen tools fit inside.



This was the first conceptually refined model I settled on, version one. This model had a lot of good about it and a lot of issues that needed to be addressed as well.

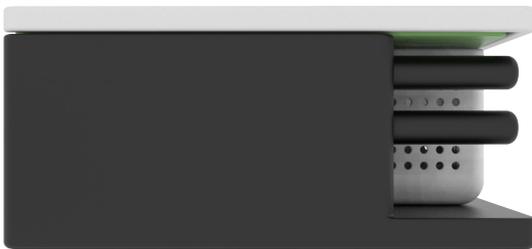
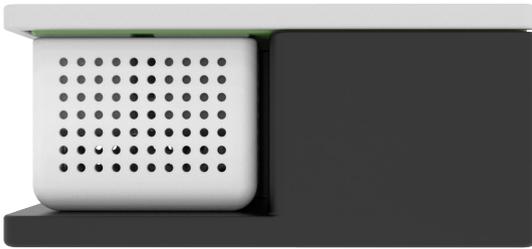


Some of the positives about this model were a decisive component layout, as well as an idea of what the overall form should look like in a 3D perspective.



CAD V1 TOP VIEW

While it was great to visualize this model in 3D there were items in this model that were not correctly proportionate, such as the extra tiny collander. I think only a handful of veggies could fit in there.

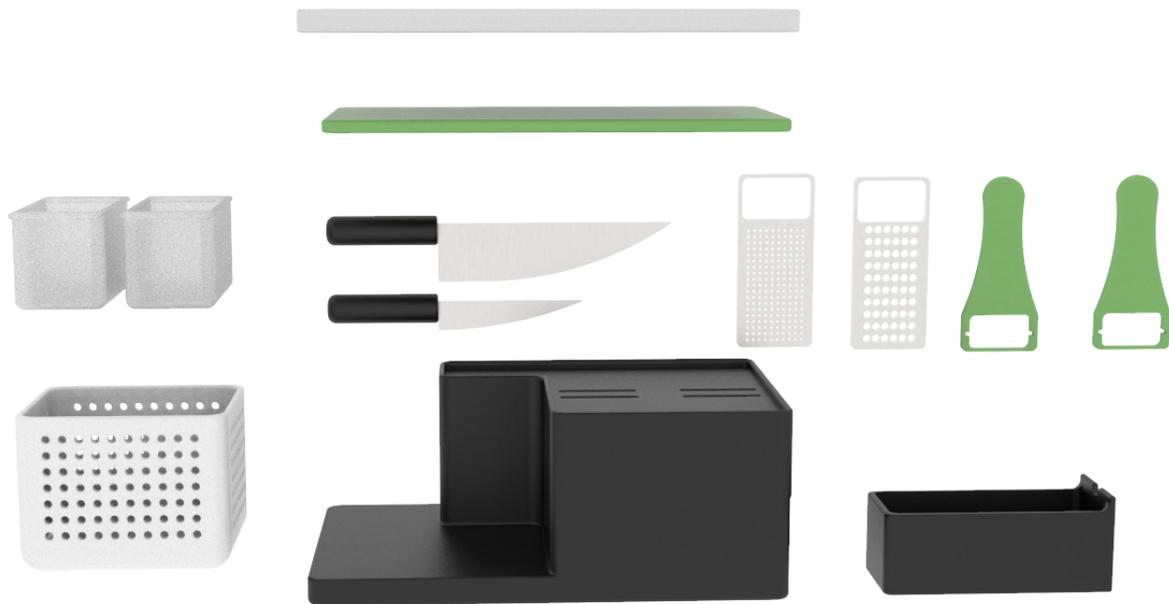


CAD V1 SIDE VIEWS

Having one cutting board for meat and one for veggies was one of the better parts of this model. Looking at this model ,it may be time to take another shot at a more flat packed version. This overall footprint is quite cumbersome.



In addition to the idea to move ahead with flat packing it became clear that there were unnecessary tools in this model. Things like the landing spots and the extra peeler and grater would have to hit the chopping block going forward.

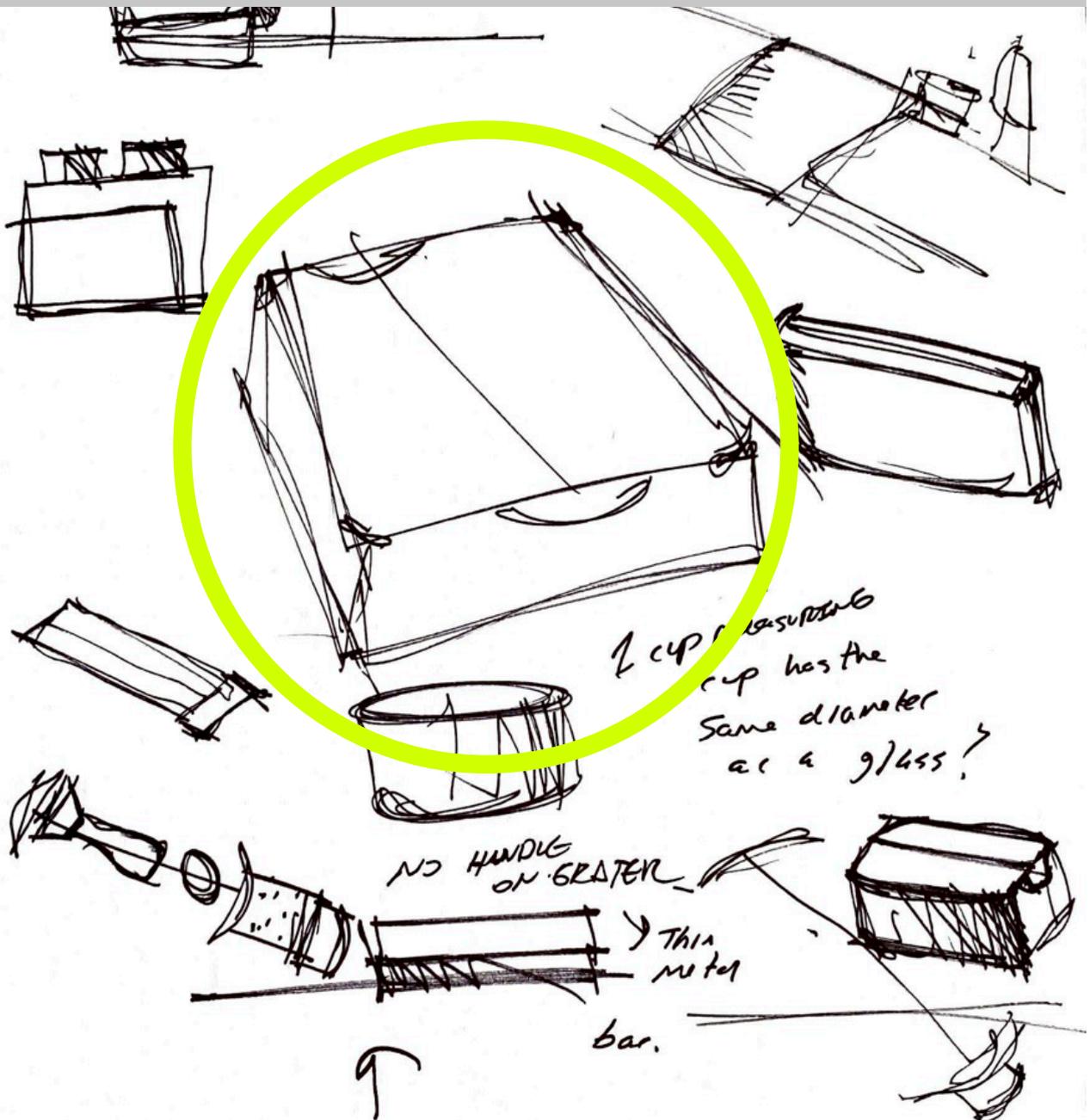


CAD V1 EXPLODED
COMPONENTS

Some other great conceptual features such as the drawer for your own tools and the collandar wouldnt make the cut going forward either. While version one was far from the finish, there was a lot that was learned from this model.



After receiving feedback on the first model I went back to early iterations and drawings for inspiration. An early sketch showed a slimmer profile that could potentially fit in a drawer. I used this to help ideate version two.

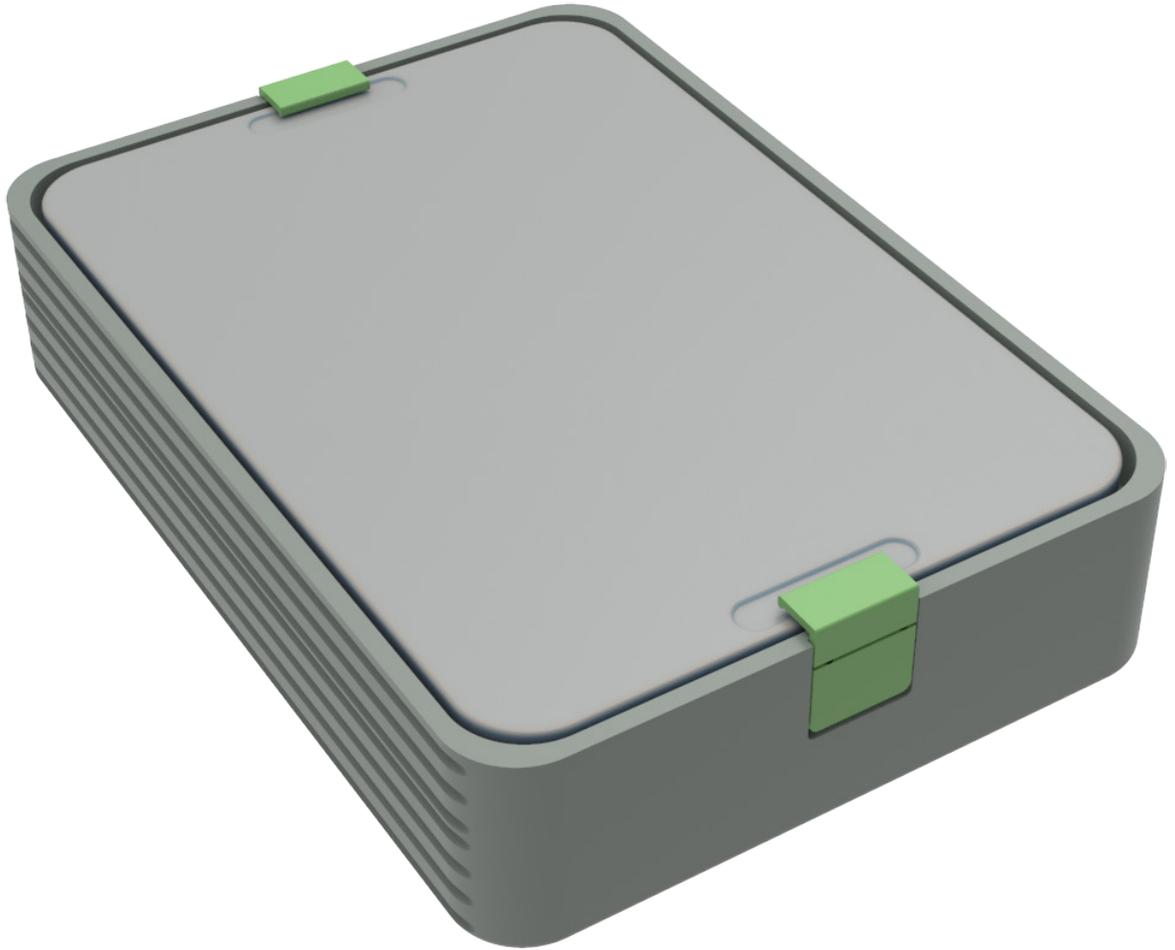


After feedback from the first CAD model I realized I had to determine the final tools that were going into CIBO. I observed friends and roommates cooking over the next two weeks and saw there was only about four tools that were being used to complete a vast majority of the prepping for all meals. Those tools were: a chef's knife, a pairing knife, a peeler and a grater.



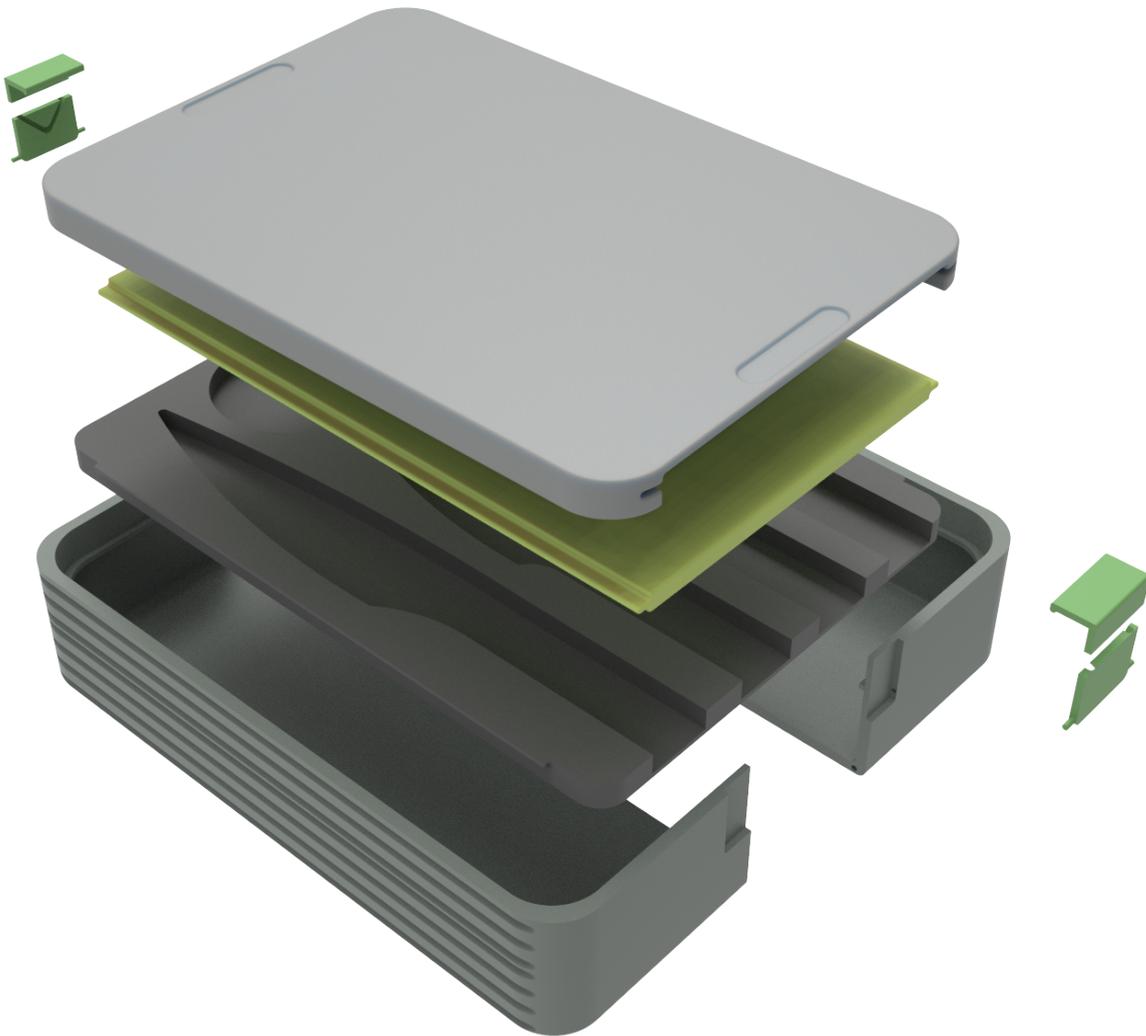
FINAL TOOL SET

The final tools were figured out, and after a few rounds of sketching and concept development this was the new look for CIBO. Something more slimmed out and flatpacked seemed to be good for storage as well as portability.



CAD V2

Version two brought again both positives and negatives, but was far closer to the final look than the first CAD iteration. This model also began to consider case snap hinges to secure everything inside the kit.



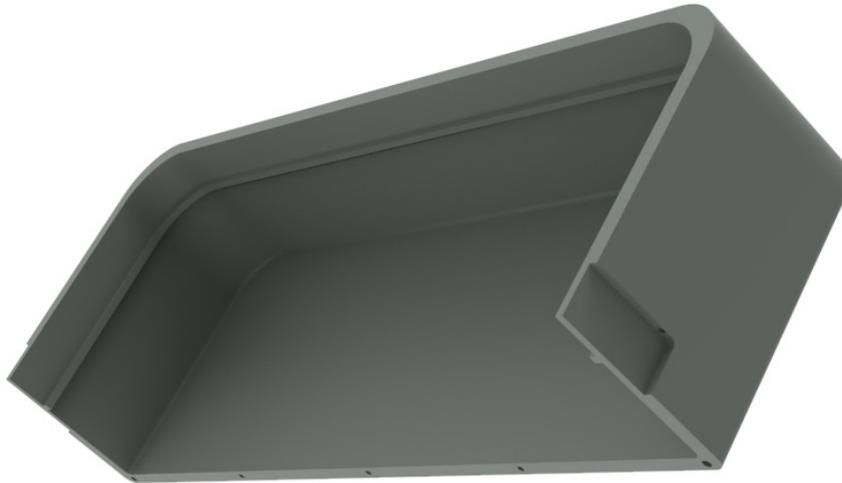
CAD V2 EXPLODED

This version was the first to really begin to take into consideration the flat packing idea of storage. The slim profile made it seem conceptually like everything was going to fit into this tiny package.



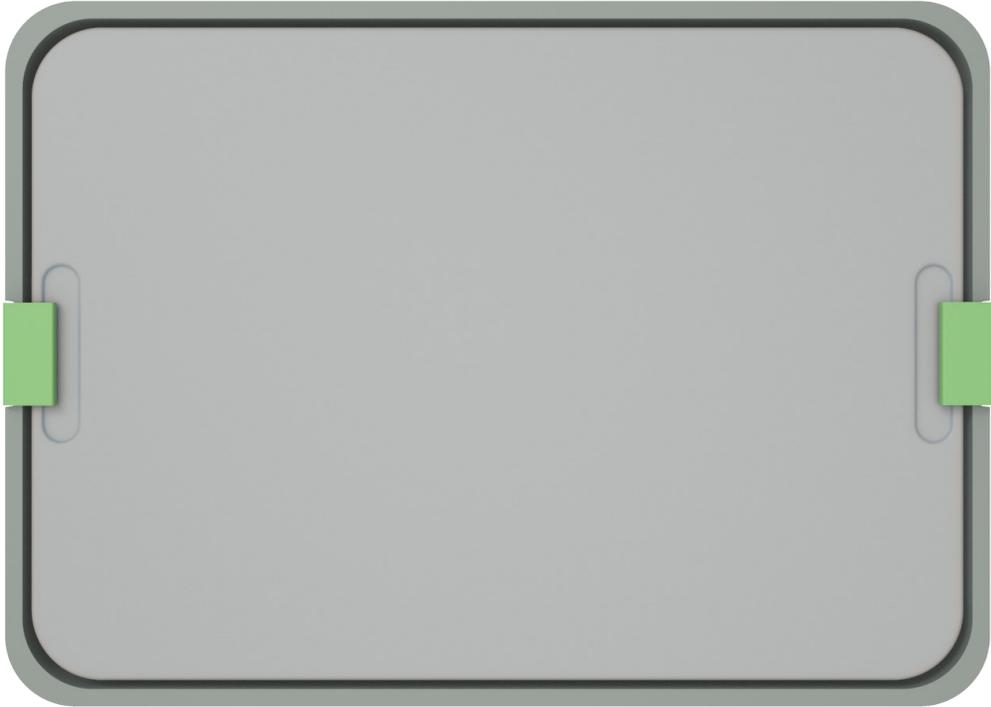
CAD V2 EXPLODED

Another good thing about the second version is the consideration regarding manufacturing. Shown below is an early version of one of the main casework parts.



CAD V2 CASEWORK

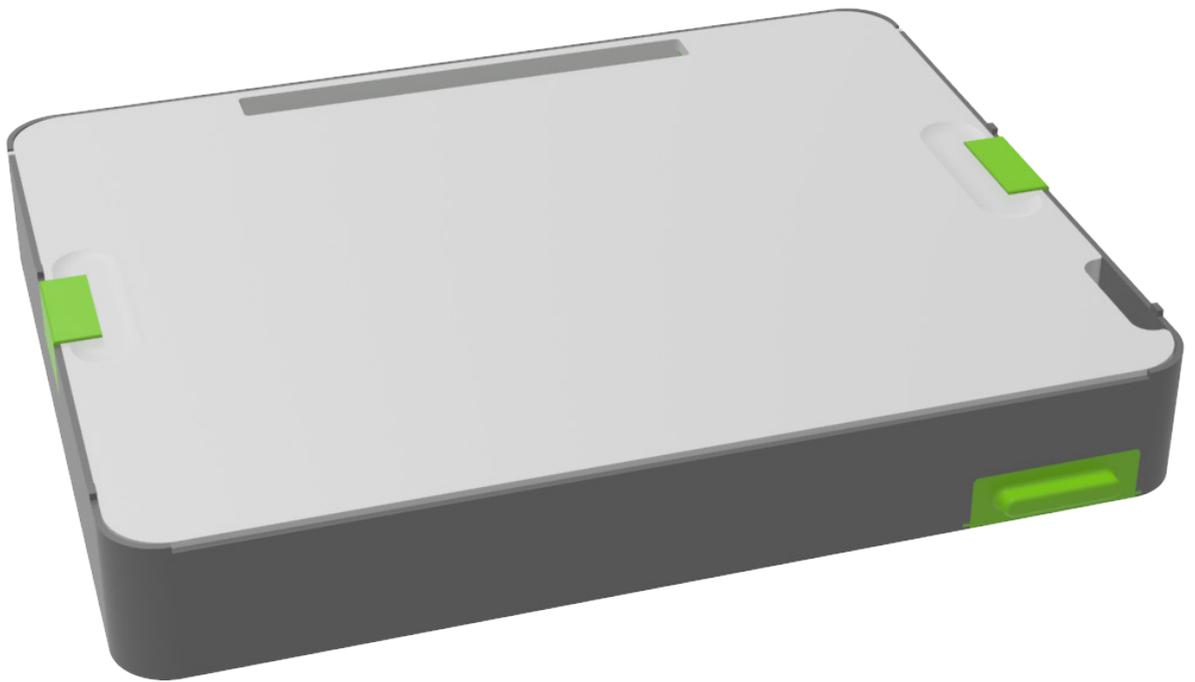
Now with an idea of flatpacking in mind, an early consideration of manufacturing, and a seemingly in place final list of components, there couldnt be too many iterations of CIBO ahead...



Version two moved in the right direction, but it had all of this extra casework that did not have any function. After some brief sketches I concluded the base could double over as a drying rack by adding in a few more parts. The addition of a drying rack would help curb negative cleaning habits, which was a part of the CIBO's new design criteria.



Here it is, version three. Out of all of the models this one is the largest jump from iteration to iteration, as it made vast improvements from the earlier models, despite still yet again having its setbacks. The integration of the drying rack became quite the problem to solve.



CAD V3

One of the best parts of version three was the added integration of the drying rack. This made CIBO significantly more valuable in terms of usability and differing from what is out there already.



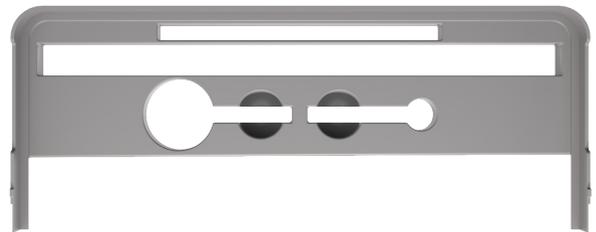
Version three works in three separate stages. The three stages include: a workstation stage, a drying stage, and a store away stage.



The three stations of version three would continue all the way into the final iteration. In addition to this, a deep dive into manufacturing was looked at as parts were being designed for injection moulding.



PORTABILITY

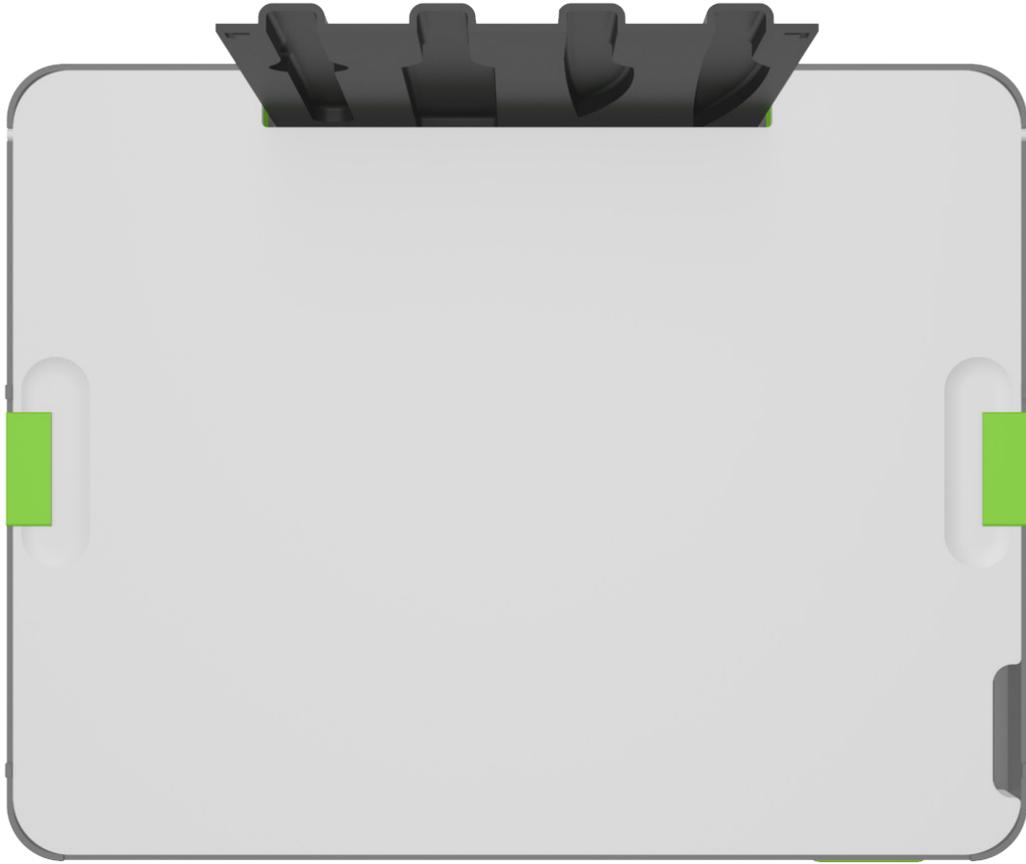


CASEWORK



TWO CUTTING BOARDS

Some of the negatives included the lack of feasibility of the sliding cutting boards and the lack of design of the kitchen tools. Despite both of these setbacks there was a lot of solidity in this model to push forward with.



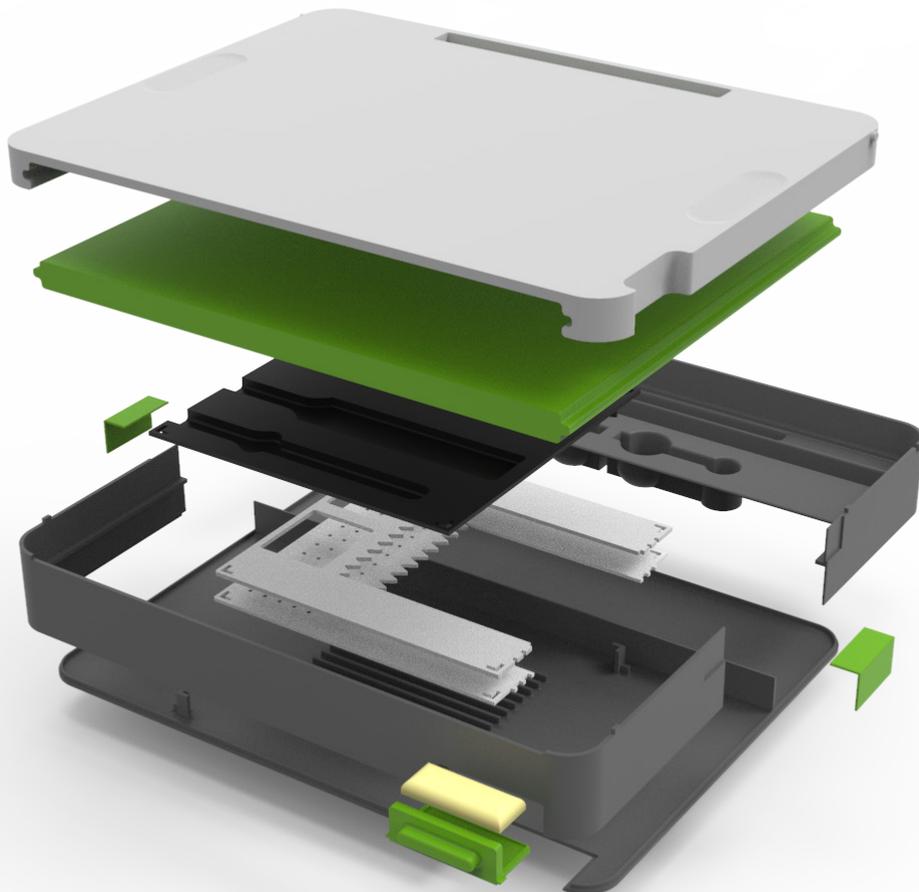
WORKSTATION TOP DOWN

The drying station in version three was able to dry everything inside of CIBO as well as additional plates, utensils, and other cooking tools.



CAD MODEL V3
WORKSTATION

Some features, such as the sponge in the bottom right corner of the model was one of those features, but CIBO was finally beginning to take shape as this model was looking very similar to the final result.



CAD MODEL V3 EXPLODED

With some features scraped, version four brought a higher level of feasibility than the other models were far behind on still. The method for draining water was seemingly worked out, feet were added, and this model sat only right behind the final design of CIBO.



CAD MODEL V4

Due to manufacturing constraints, the cutting board was changed to a single HDPE cut piece instead of the slotting boards. Silicone feet, measuring cups, and the finak kitchen tools were also included in this version.



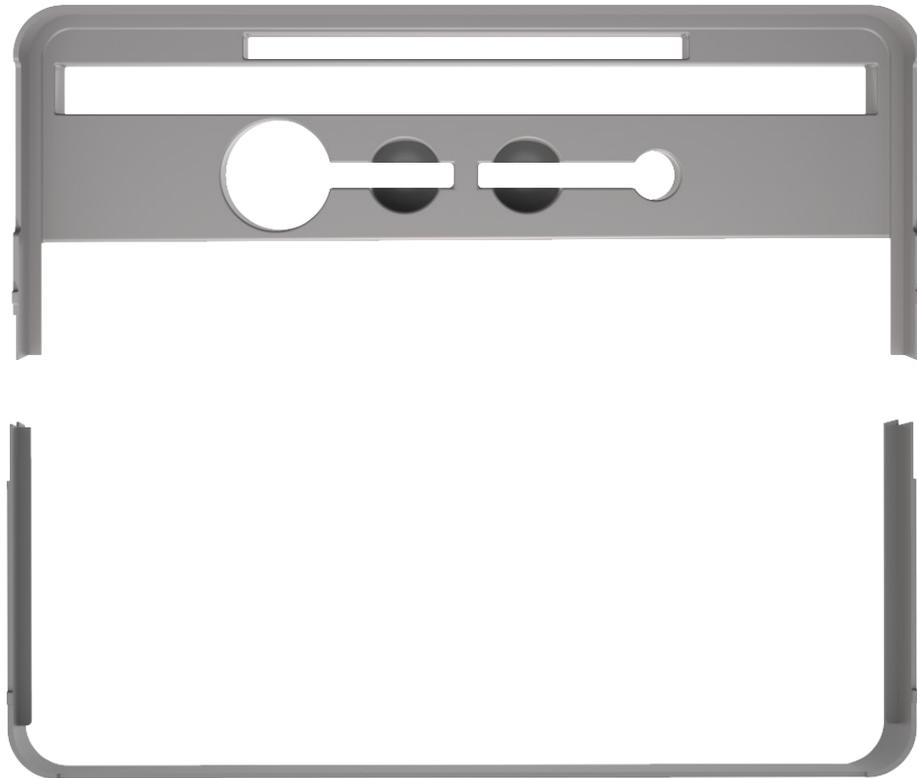
CAD MODEL V4 EXPLODED

This last version before the final design kept the idea of three different stages for CIBO; the prep stage, the drying stage and the storage stage.



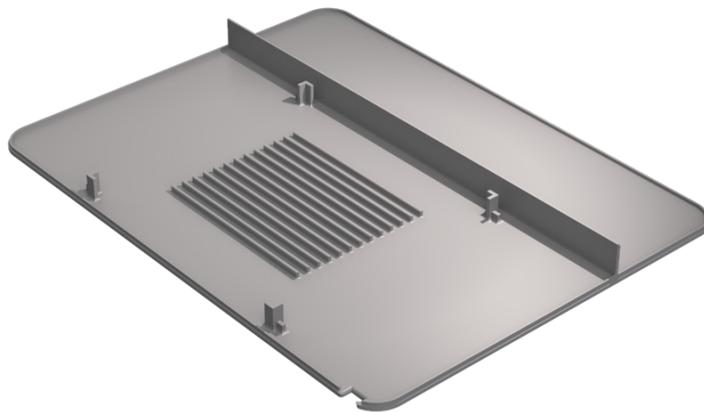
CAD MODEL V4
THREE STAGES

The casework components were almost finalized, and it was concluded that they would be ultrasonically bonded together in the final design.



CASEWORK COMPONENTS

Version four had mock tools to fill the toolkit. And additionally did not include any plates or utensils for the drying rack. Only a few small changes were needed to be made before the final design.

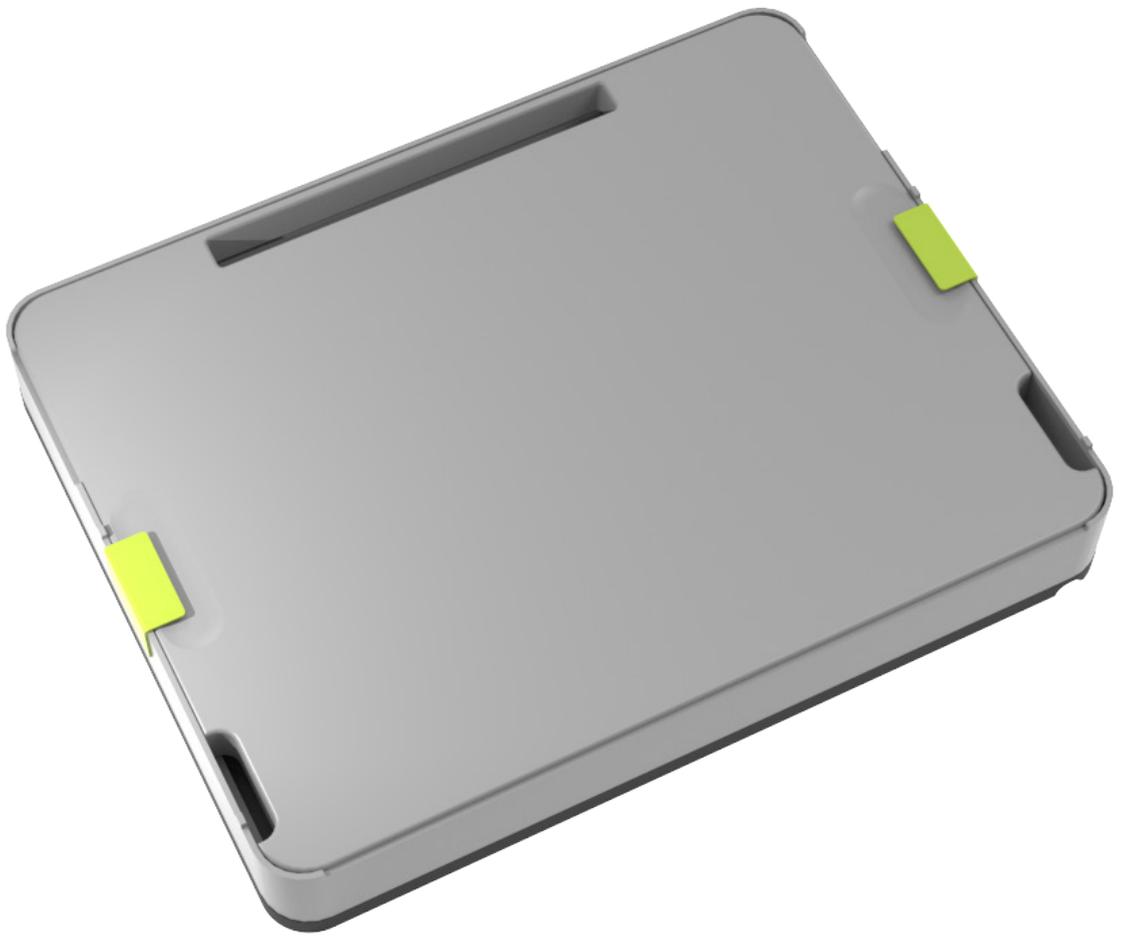


TOOL SET AND BASE



FINAL DESIGN

This is CIBO, an all inclusive portable prep and cleanup station designed to increase linear workflow in the kitchen.



The new splash of color on the toolkit makes the darker tools stand out more compared to previous versions. Additionally the cutting board is now a more neutral grey color.



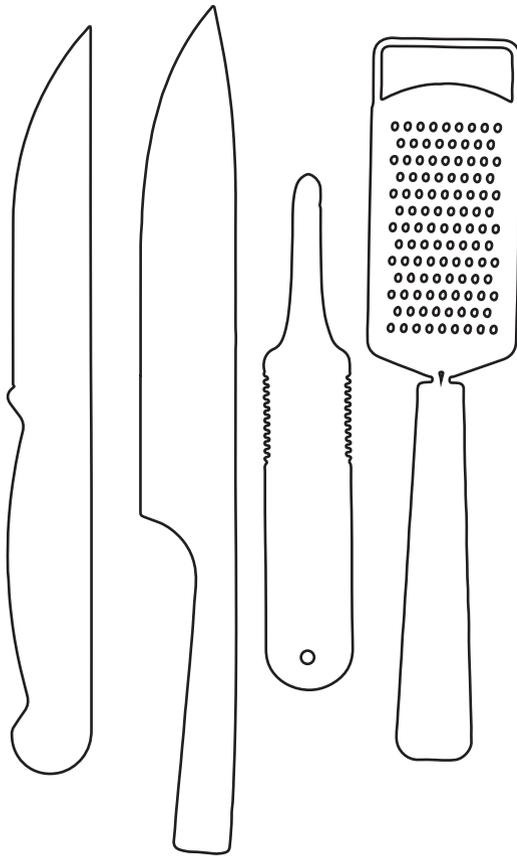
The final version of CIBO continues to have the three part system that originated in version three.



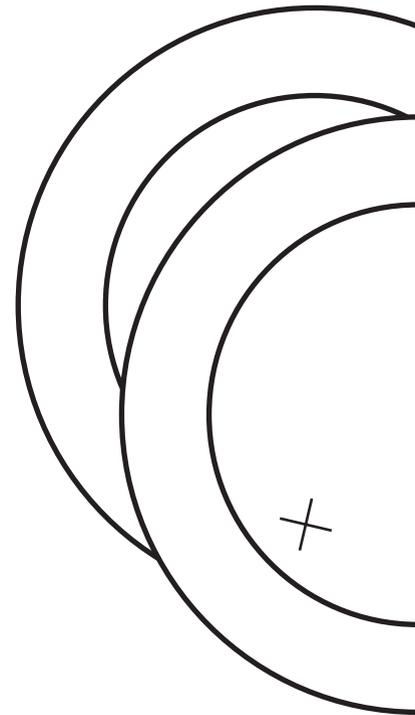
CIBO still has the same three stages of workflow that were first seen in version three; a prep stage, drying stage and a storage stage.



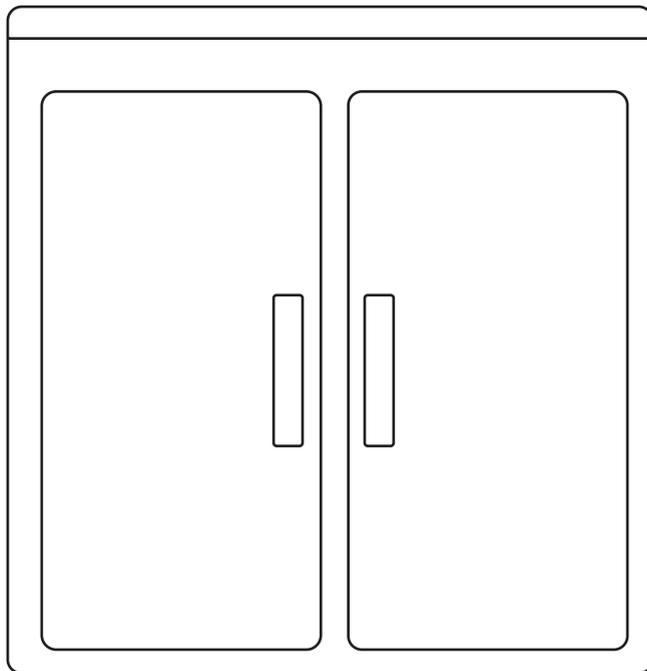
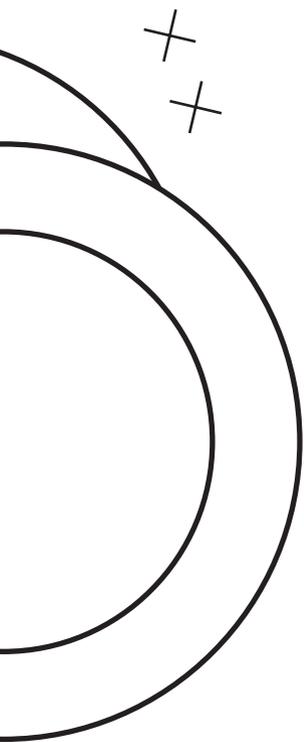
Each of these stages have their own unique features. The next few pages will walk through how to use CIBO in more detail, and take a deeper look at the prep, clean, and storage stages.



PREP FOOD



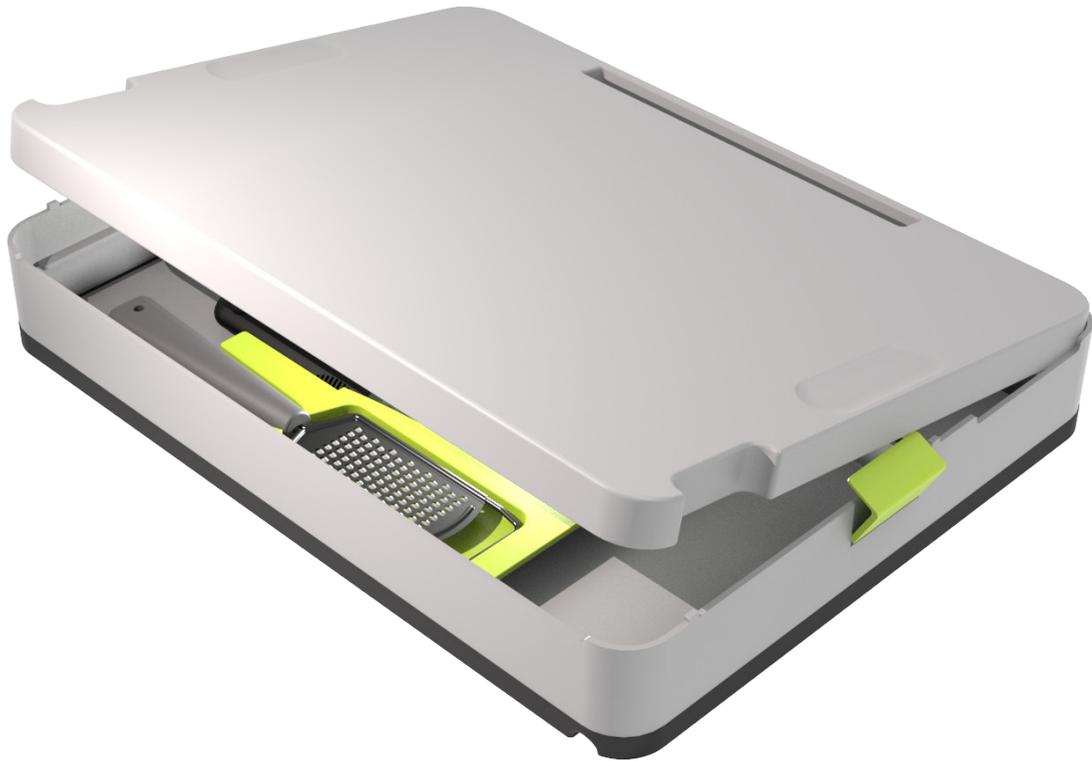
CLEAN



UP

STORE AWAY

It time to prep your meal with CIBO. Lift the cutting board up and grab out the kitchen toolkit. All the tools stay in place while they're moved with a magnetic strip. Place the tools right behind the cutting board, and its time to prep your food.

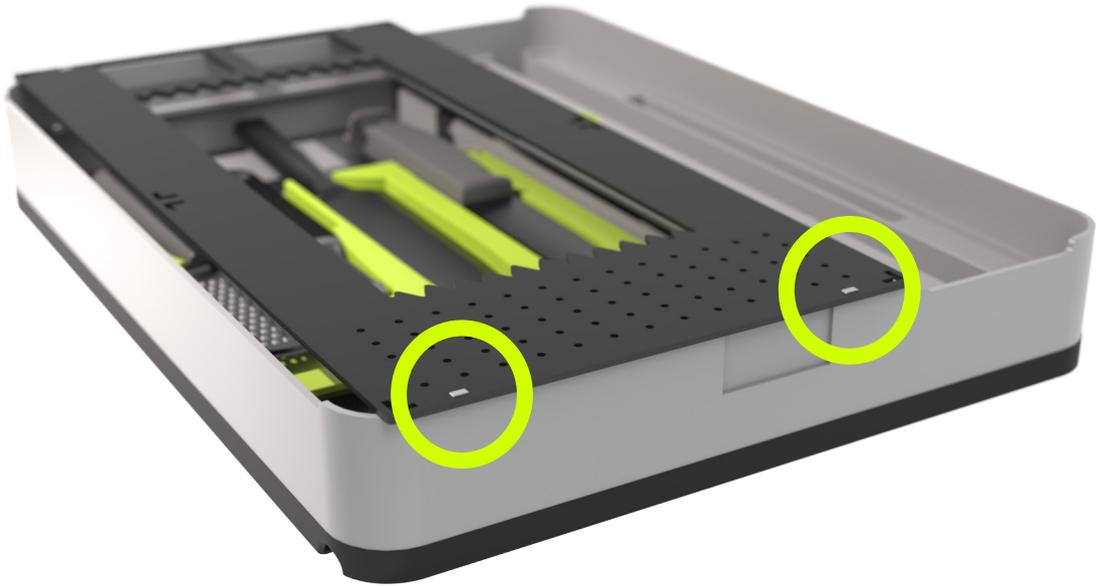


FINAL DESIGN
WITH OPEN LID



PREP STAGE
WITH FOOD

After eating and washing the dishes, it's time to use the drying stage of CIBO. A folding drying rack sits on features in the casework. Plates, utensils, and more drip-dry through an angled interior base, and water runs out the front corner. A paper towel can be placed under CIBO to soak up the water runoff.



FINAL DESIGN
MATING FEATURES

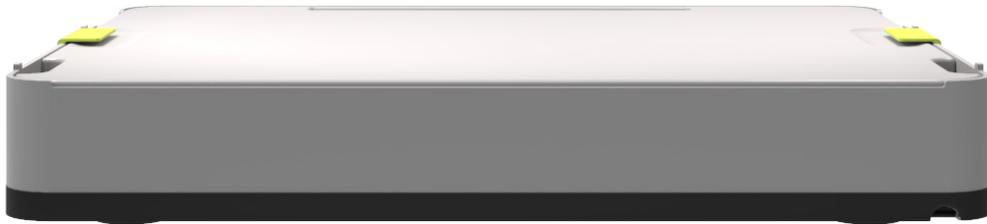


FINAL DESIGN CLEANING
STATION EMPTY



FINAL DESIGN CLEANING
STATION FULL

Now that all of the dishes and kitchen utensils are dry, CIBO can be put away until further use. The slim profile allows CIBO to be stored away in the cabinet for later use, or it can even be taken out of the kitchen to be stored away elsewhere.



FINAL DESIGN
SIDE PROFILE



FINAL DESIGN
STORAGE

FINAL DESIGN

IN CONTEXT







PRODUCT SPECIFICATIONS

HDPE cutting board

ABS measuring cups

ABS case snap hinges

Stainless Steel Tools

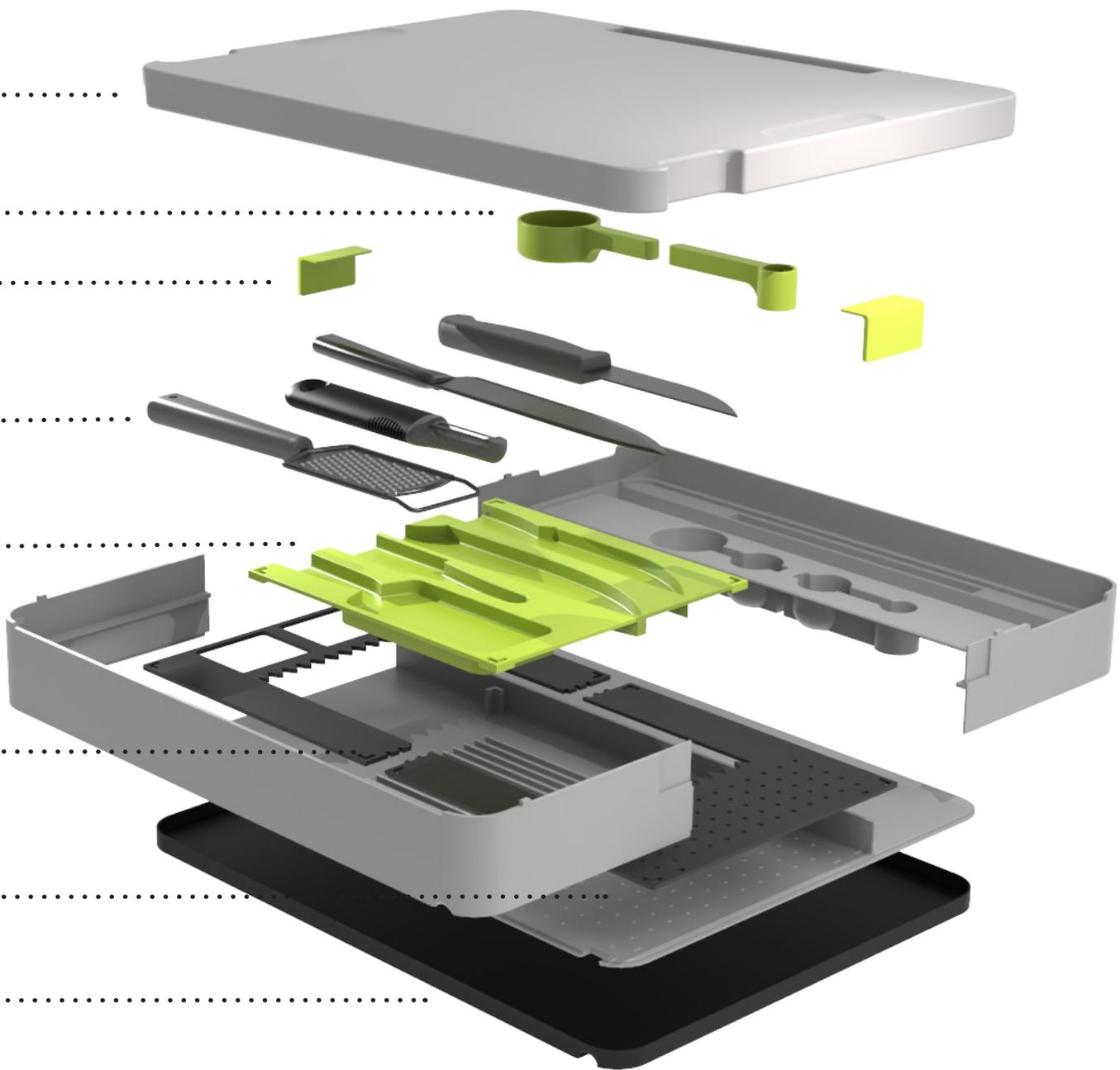
Polypropylene tool holder

ABS casework frame

ABS drying rack

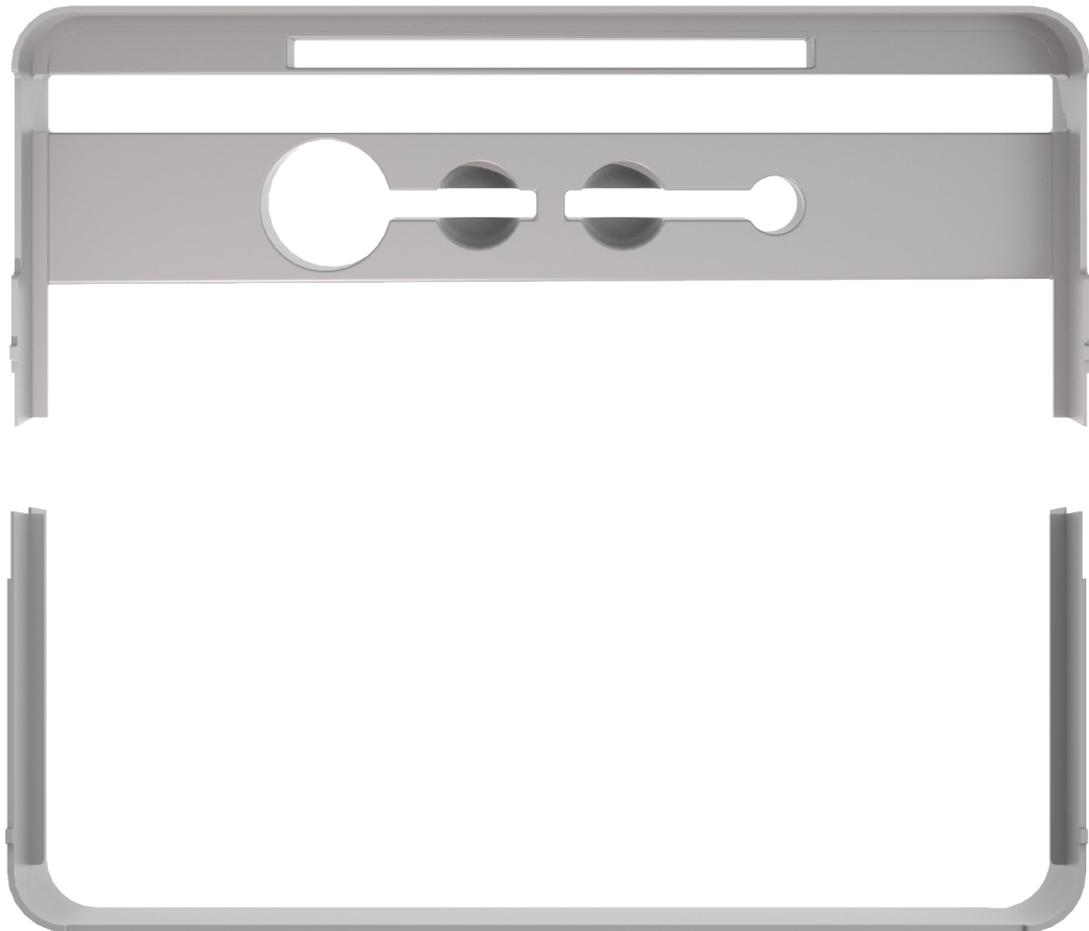
Structural foam base plate

Silicone overmoulded base

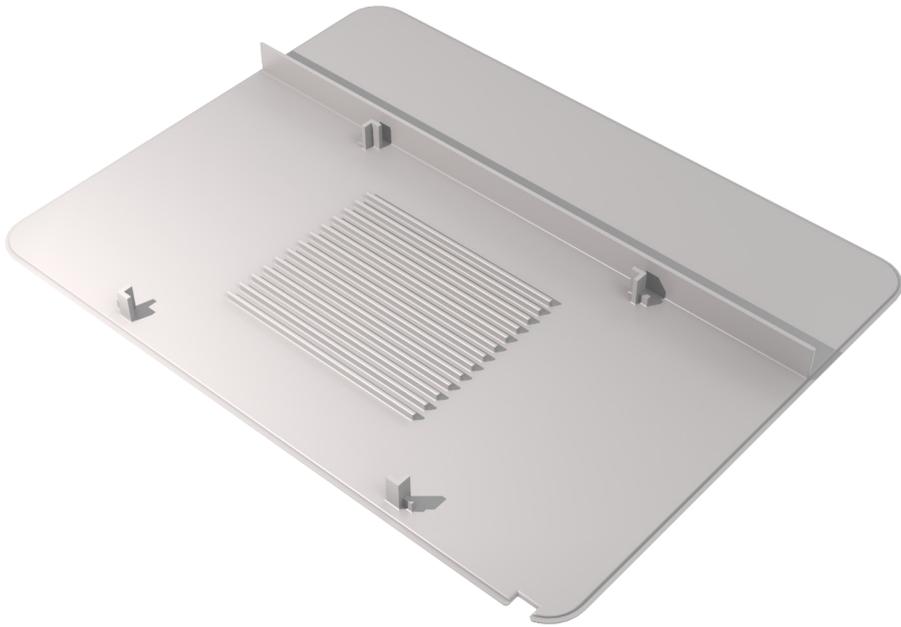


FINAL DESIGN EXPLODED VIEW

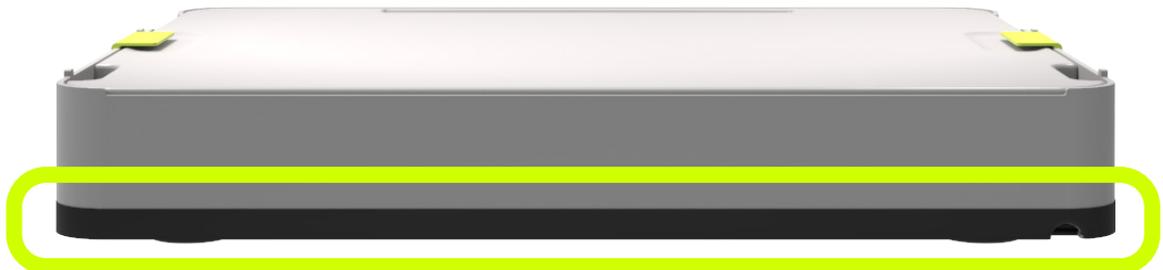
All of the casework parts are designed to be injection moulded, and the base will be made out of structural foam for added support. Additionally the base of CIBO is overmoulded with a silicone after ultrasonically welding the casework pieces.



UPPER CASEWORK

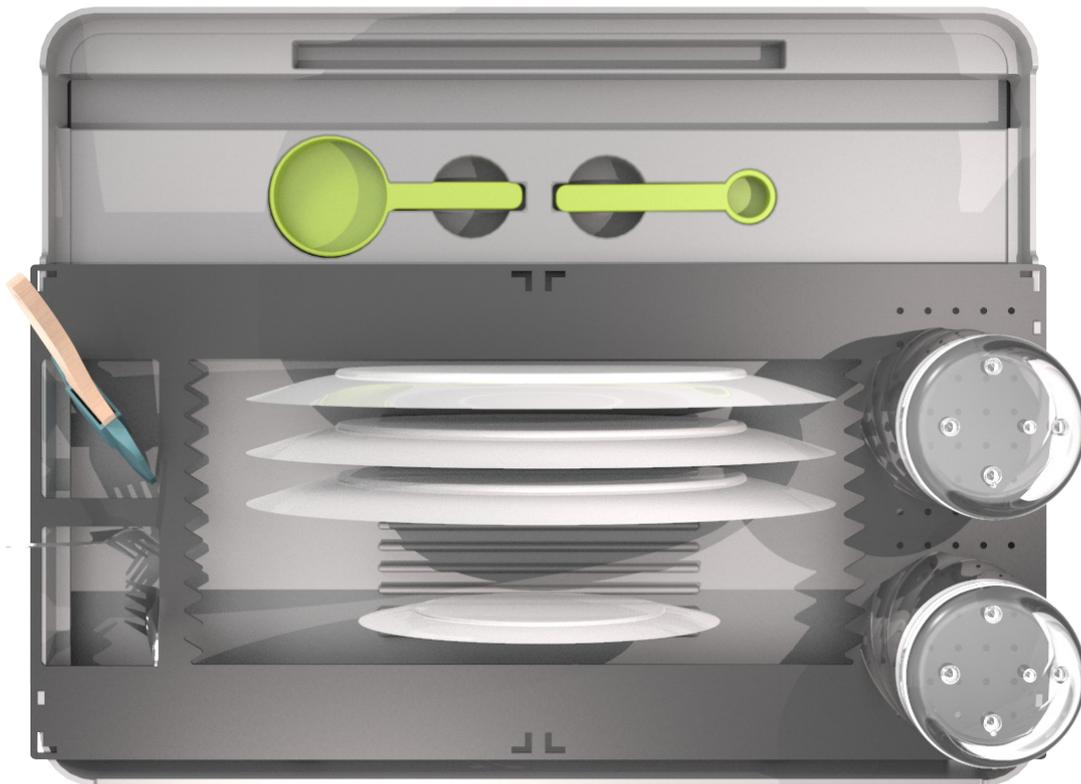


BASE



SILICONE OVERMOULD

When it comes to drying the cutting board and prep tools in CIBO there are slots in the casework for these pieces to stand up and drip dry.

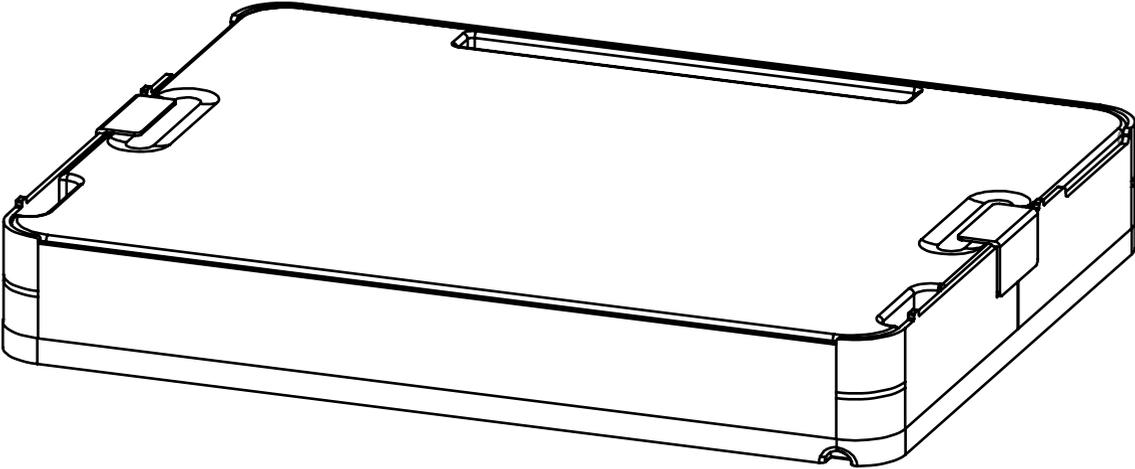


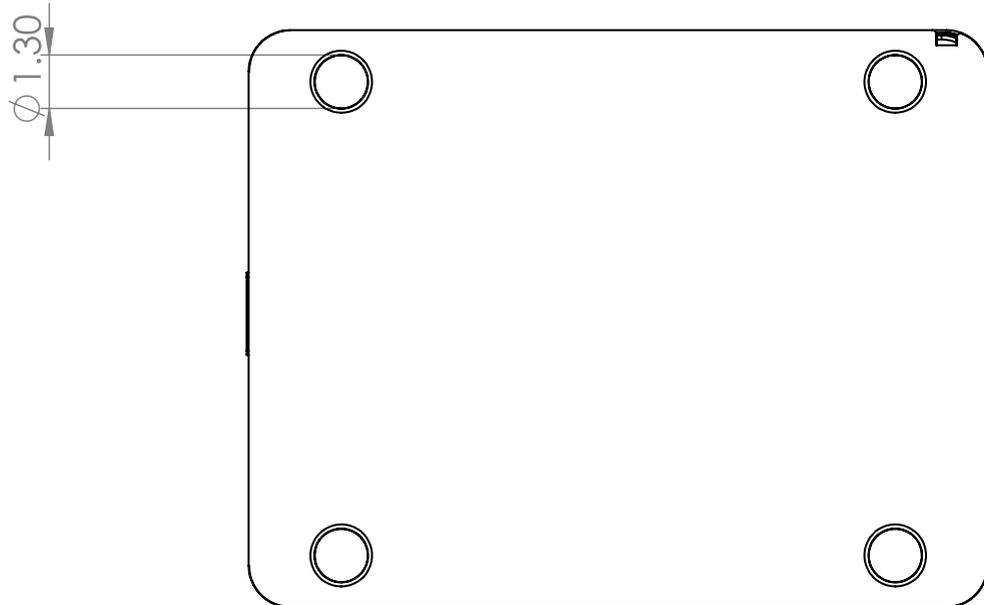
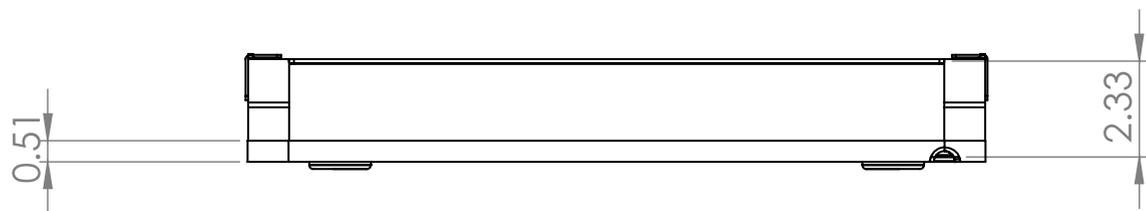
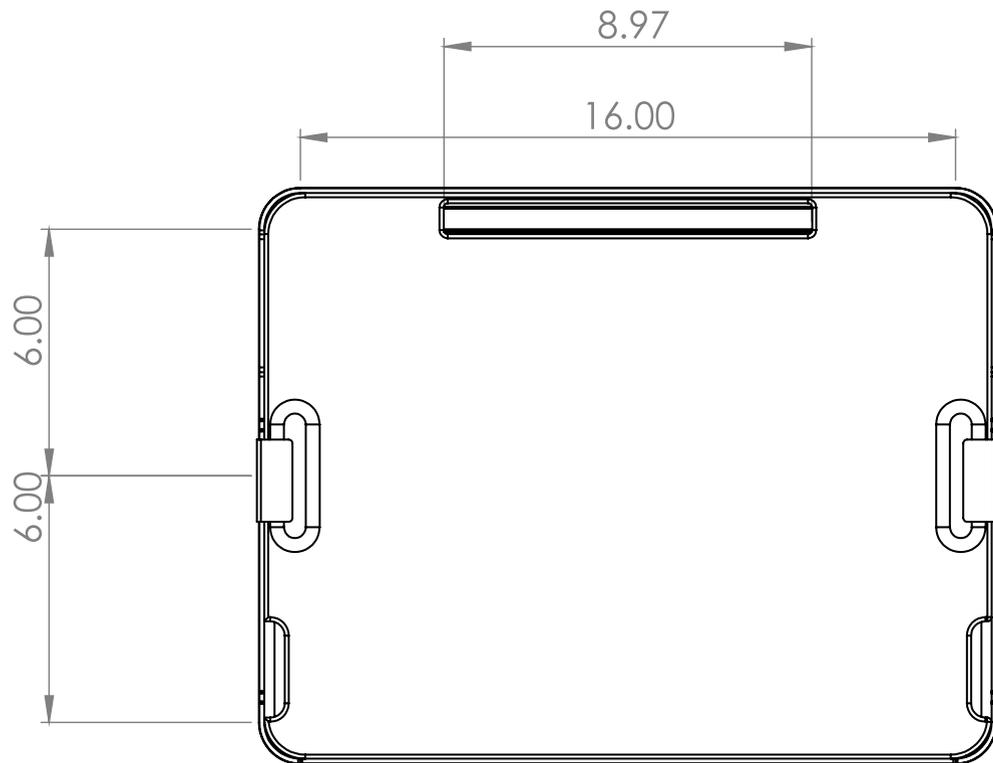
FINAL DESIGN CLEANING
STATION TOP VIEW

There is also room for drip drying additional silverware, kitchen tools, plates, and cups. The angled base allows water to drain out the front corner of CIBO.



FINAL DESIGN CLEANING
STATION







CONCLUSION

These past months designing CIBO have taught me a lot. While productivity levels and morale were all over the place this year, it is refreshing to look back on the final result. This project taught me most importantly to prototype early, to not get too hung up on aspects of a project, and power through even when times get tough. While the final design was not prototyped, I hope to continue developing CIBO and get a working prototype made when the COVID-19 pandemic blows over. Looking back over four years of industrial design it has been quite the incredible journey. Big thanks to the ID class of 2020 and all of the other people who made these past four years at PhilaU worthwhile.