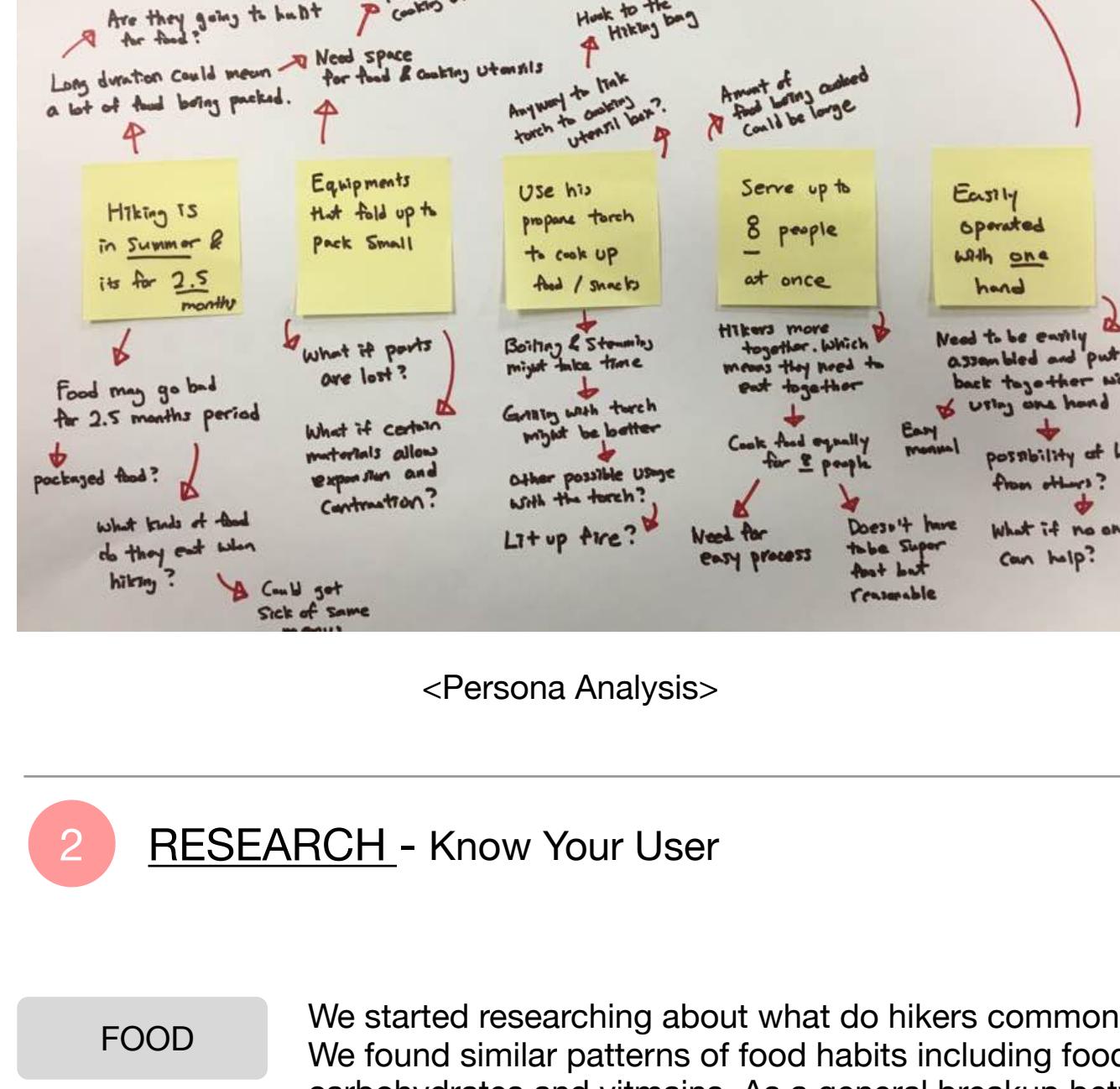


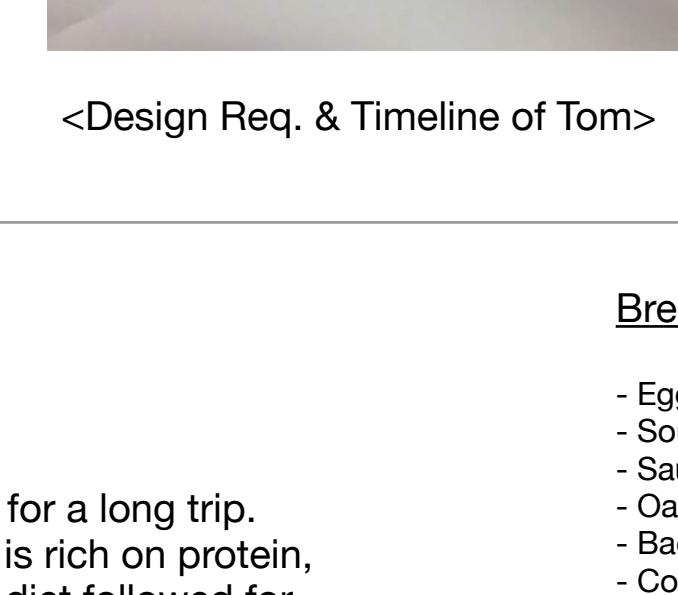
1 PERSONA DETAILED ANALYSIS - Understanding Our User (Tom)



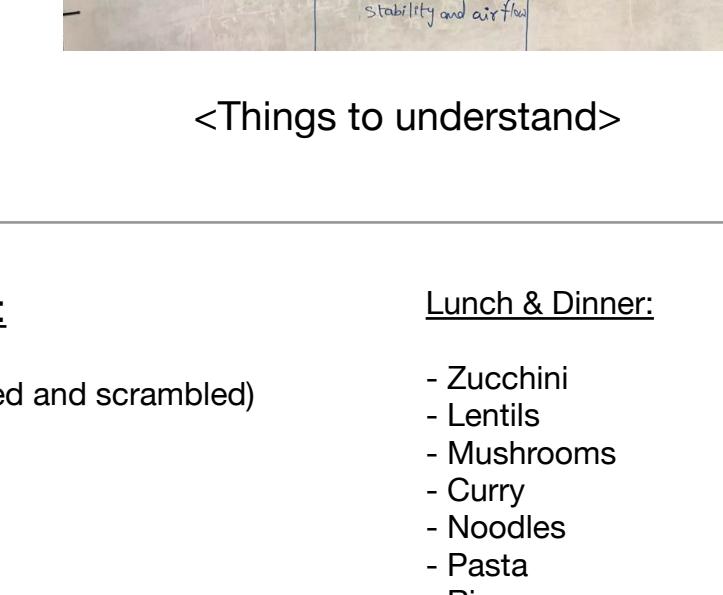
<Persona Analysis>

Based on the persona shared, we extracted key information about Tom likes:

- He is planning for a hike of 2.5 months during his **Summer** at the Appalachian trail.
- The cooking utensils have to be **folded** to pack small.
- He likes using his **propane torch** to cook food.
- The utensil to be designed should allow him to serve **8 people** at once.
- Should be operable with a **single hand**.



<Design Req. & Timeline of Tom>



<Things to understand>

2 RESEARCH - Know Your User

FOOD

We started researching about what do hikers commonly eat for a long trip. We found similar patterns of food habits including food that is rich on protein, carbohydrates and vitamins. As a general breakup between diet followed for breakfast, lunch and dinner is as follows:

Breakfast:

- Eggs (boiled and scrambled)
- Soup
- Sausages
- Oatmeal
- Bacon
- Couscous
- Wheat flour tortillas
- Pepperoni
- Boiled/Steam potatoes
- Corn
- Rice
- Hot Chocolate / Tea

Lunch & Dinner:

- Zucchini
- Lentils
- Mushrooms
- Curry
- Noodles
- Pasta
- Rice
- Beans
- Tuna

LOCATION

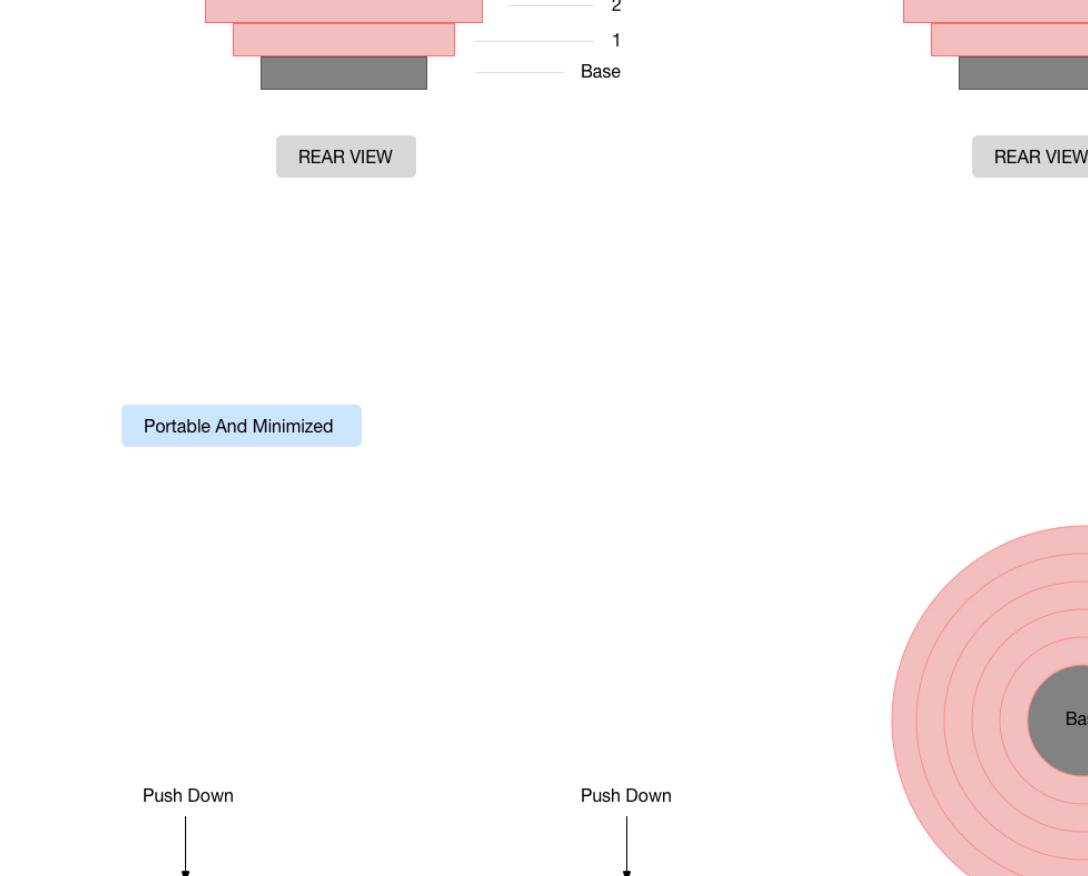
Our initial approach was to design a product such that it would facilitate food storage considering it was a 2.5 months hiking trip. However, we thought it would be an extra baggage to carry all the above mentioned food for a 2.5 month hike, especially they had a chance to go bad. That is the reason we researched on Appalachian trail to understand the hiking routes and resources accessible along their trip. Based on our research Appalachian trail is a long trail that extends from Maine to Georgia. The experienced hikers normally carry food that would last for 4 to 7 days and when it is the right time, they visit a local market to re-stock their resources. Therefore, our design objective shifted from serving as a storage option to a concise and lightweighted tool for cooking.

	Sustainable	Flexible	Durable	Heat Conductivity	Weight	Price
Stainless Steel	Yes. It is highly recyclable and has a wide industry use.	No. It is rigid in nature.	Yes.	Good.	Relatively more	Cheap
Copper	Yes.	No. It is rigid in nature.	Yes.	Good but heat distribution is not uniform	Relatively more	Relatively expensive
Titanium	No. Not widely recycled.	No. It is rigid in nature.	Yes.	Good.	Light.	Expensive
Aluminium	Yes. Widely recyclable.	No. It is rigid in nature.	Yes	Good and even	Light	Cheap
plastic	No. Only specific type of plastic is recyclable.	Yes.	No	Not good.	Light	Cheap
Silicone	Yes. Highly recyclable.	Yes.	Yes	Good conductor	Light	Cheap
Ceramic	No. Not readily recyclable.	No.	Yes	Good constant conductor	Heavy	Expensive

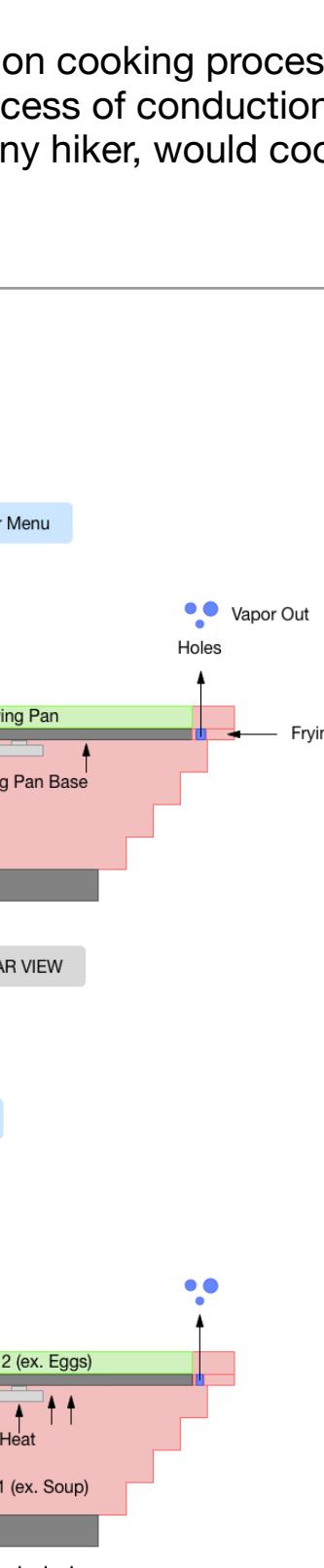
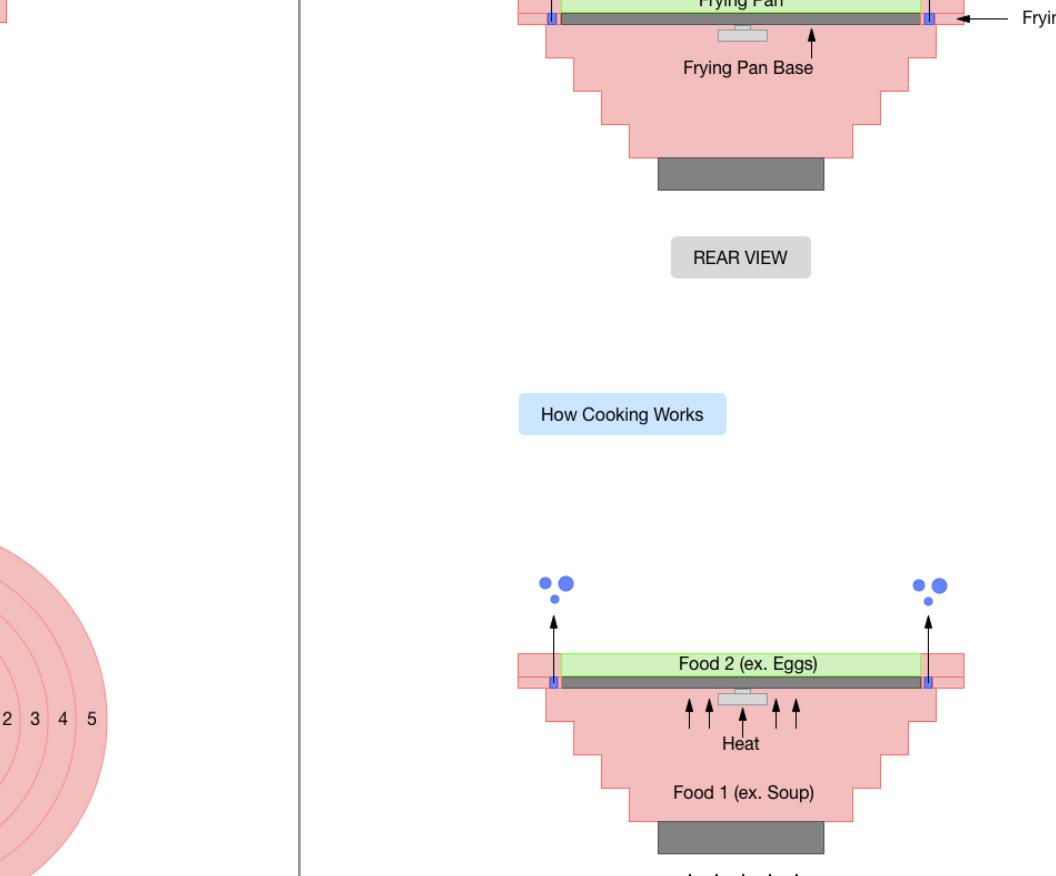
<Materials Research>

3 IDEATION - Pour Out Your Ideas

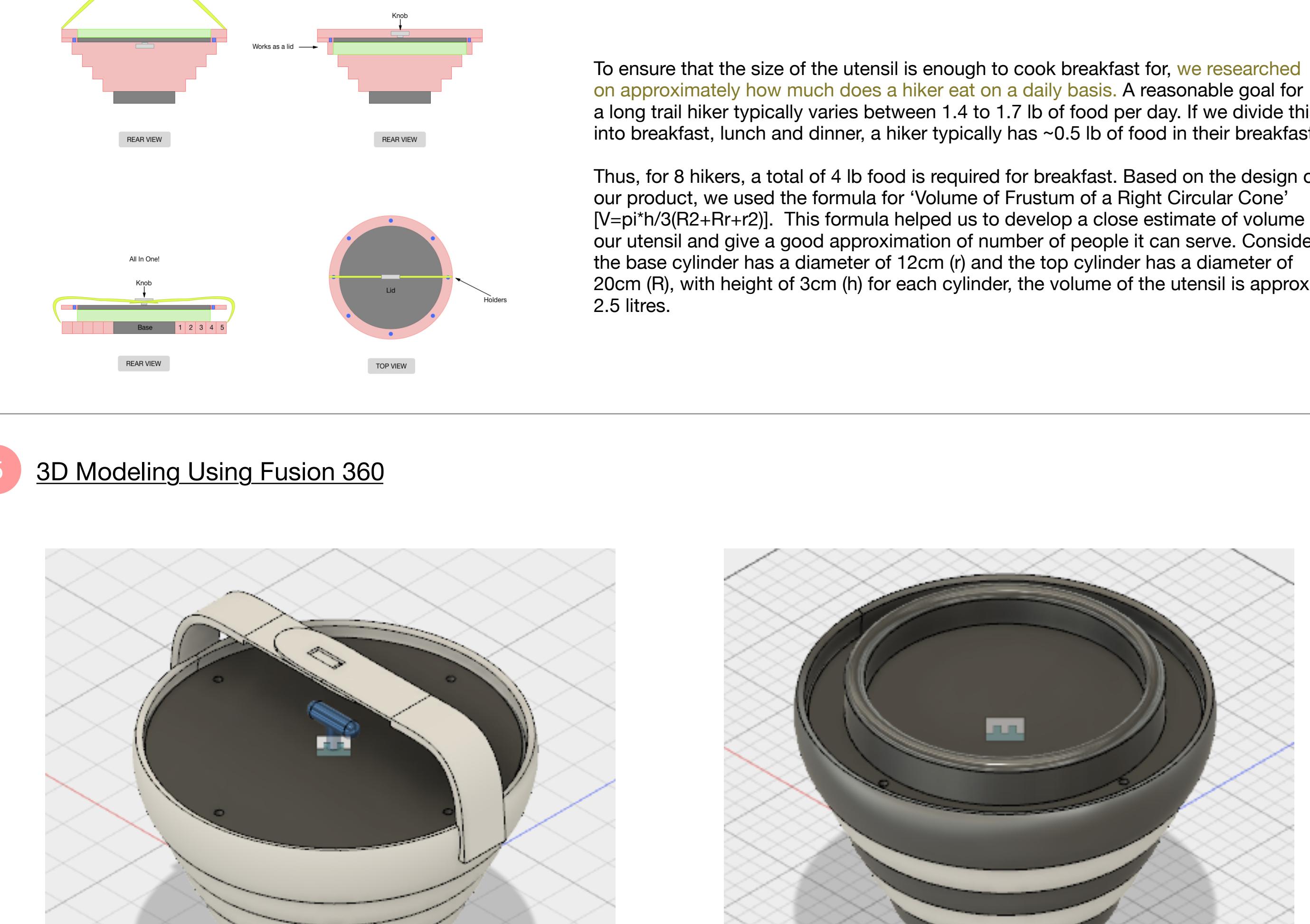
Based on the hiker's diet we discovered by research, we went through designs for utensil that can act as a pot and grill for cooking food. We designed the product as aesthetically correct as possible that would also serve upto 8 persons at a time, however, it used to lack in usability when using a single hand, as for Tom. You can check these design sprints below:



<Design Ideation Examples>



4 2D Modeling Using Sketch - Steps Before Going Onto Fusion 360

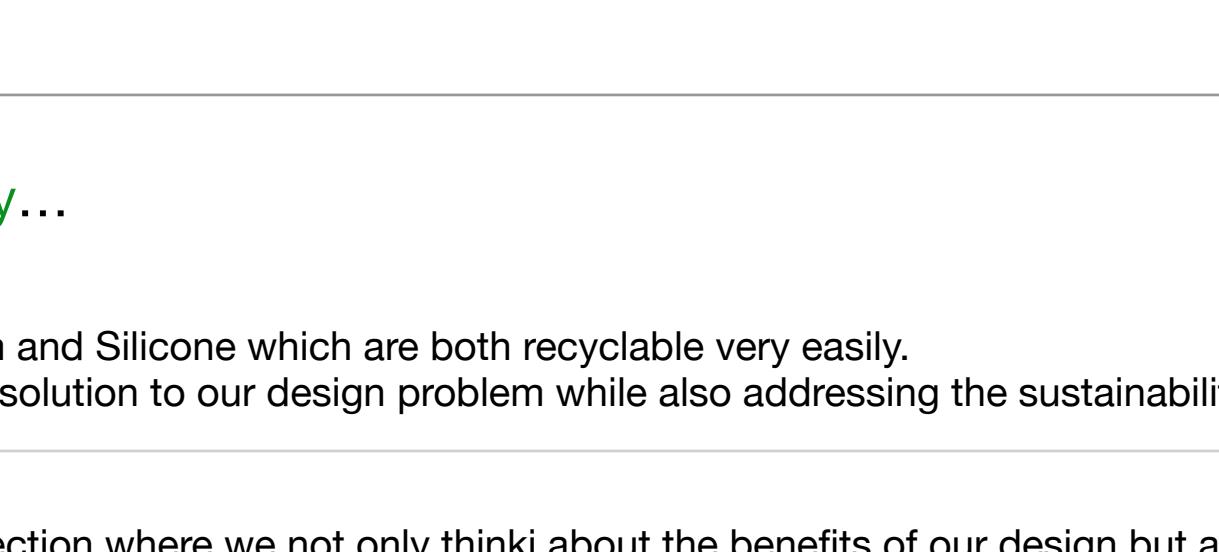
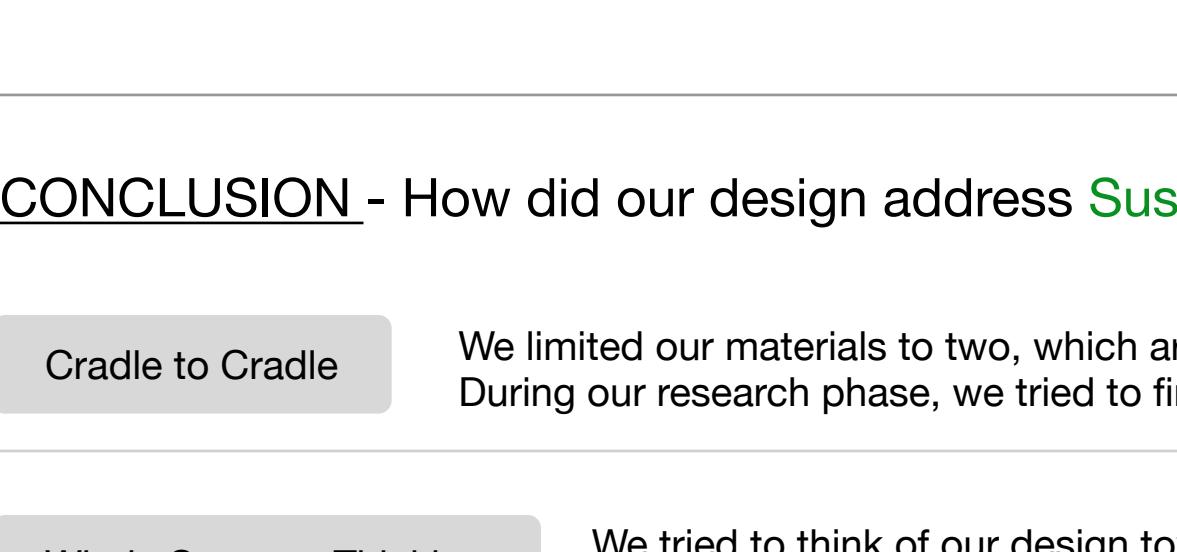


"Design is not just about aesthetics, it's also about being precise"

To ensure that the size of the utensil is enough to cook breakfast for, we researched on approximately how much does a hiker eat on a daily basis. A reasonable goal for a long trail hiker typically varies between 1.4 to 1.7 lb of food per day. If we divide this into breakfast, lunch and dinner, a hiker typically has ~0.5 lb of food in their breakfast.

Thus, for 8 hikers, a total of 4 lb food is required for breakfast. Based on the design of our product, we used the formula for 'Volume of Frustum of a Right Circular Cone' ($V = \pi r^2 h / 3(R^2 + Rr + r^2)$). This formula helped us to develop a close estimate of volume of our utensil and give a good approximation of number of people it can serve. Considering the base cylinder has a diameter of 12cm (r) and the top cylinder has a diameter of 20cm (R), with height of 3cm (h) for each cylinder, the volume of the utensil is approximately 2.5 litres.

5 3D Modeling Using Fusion 360



6 CONCLUSION - How did our design address Sustainability...

Cradle to Cradle

We limited our materials to two, which are Aluminium and Silicone which are both recyclable very easily. During our research phase, we tried to find the best solution to our design problem while also addressing the sustainability issue.

Whole Systems Thinking

We tried to think of our design towards a direction where we not only think about the benefits of our design but also how it can impact nature.

Lightweighting

Based on our material research, again, we picked Aluminium and Silicone to be the only materials for our design. We could have picked stainless steel rather than Aluminium but we used Aluminium instead because it weighs less. Moreover, rather than having the whole pot designed in Aluminium, in order to reduce weight, we added Silicone to it to extract less Aluminium. Save the environment!