

**ORISE CHALLENGE -  
MOBILE BEEHIVE AND RENTAL  
SERVICE: BEE BETTER**

Natalie - GA

# THE CHALLENGE

Find a problem in your community and use the Engineering Design process to solve it.

# THE PROBLEM

- National bee shortage due to exposure to pesticides, pollution, parasites, infections, etc.
- Less bees = Higher prices for food
- Higher prices = Nutrient-deficient diets

# THE RESEARCH

- **80% of pollination is done by bees**
- **Beekeepers report they're losing on average 30% of all honeybee colonies each winter**
- **Wild bees are in decline**
- **Bees pollinate 71 of the 100 crops that provide 90% of most of the world's foods**
- **One US-based study showed lack of bees in agricultural areas is limiting the supply of some food crops suggesting that declines in bees may be a serious threat to global food security**
- **Of seven studied crops grown in 13 states across America, five showed evidence that a lack of bees is hampering the amount of food that can be grown, including apples, blueberries and cherries.**

# THE RESEARCH

- Science shows that crops that get more bees have a greater yield
- As all this produce becomes rarer, it becomes more expensive causing national deficits in diets, especially affecting those with lower incomes



## THE RESEARCH

What does all of this mean? It means that without the bees, there is less pollination, which causes smaller harvests, which causes rising prices, which causes a national decline in the quality of the average American's diet, which ultimately leads to a worse quality of life. If there is no plan to grow the bee population in this country, we all suffer. I think my idea can be a very small part of that plan and help the environment in and with the help of my community.

## THE IDEA

A rental service of small, compact, discreet Langstroth beehive(s) for home gardeners, schools, and farmers. A beekeeper does all the maintenance and collects pollen and honey. It improves your crop yield and quality of plants and gives learning opportunity to students! There are currently already beekeeping clubs and things of that nature that place beehives in nature to help the environment, but my idea expands upon that and becomes a service and a community program, not just an environmental supplement.

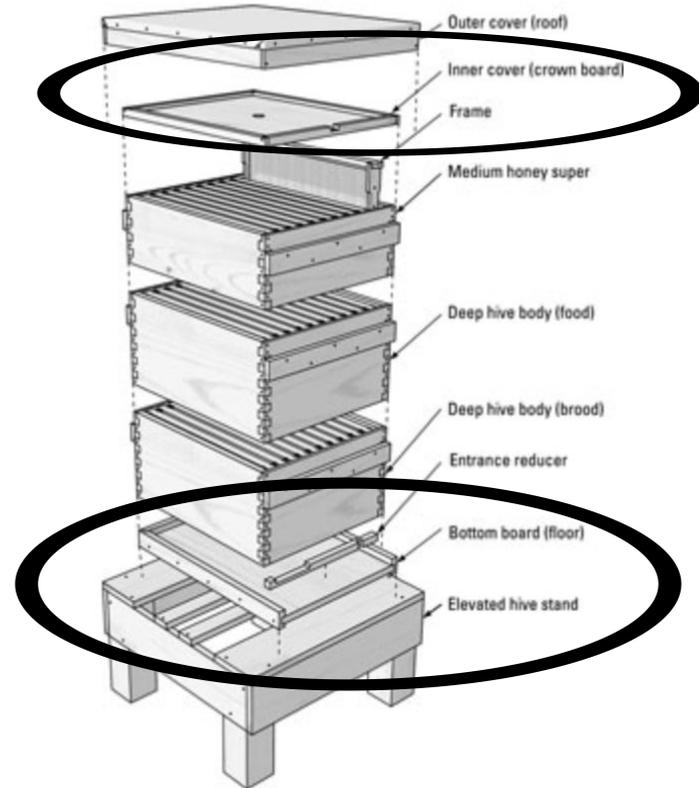
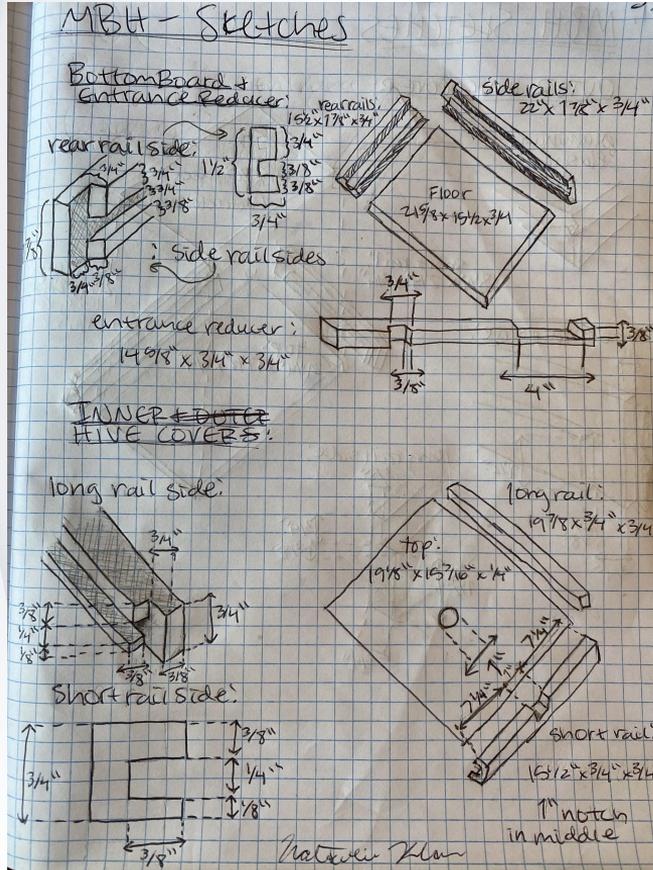
## THE IDEA

The reason I chose the Langstroth hive is because it is relatively small and easy to move. It comes apart in pieces and it is easy to collect honey from. The inside is organized in frames which can be easily removed for inspection and honey collection. It is also easy to customize the size of the hive without having permanently build onto anything existing. All there is to do is add another super, the box that holds the hive itself and where the bees live, on top of the stack. It makes it simple to have a small or large colony of bees. Overall, the hive is perfect for this use and meets all of this project's needs without any cost to the quality of life of the bees

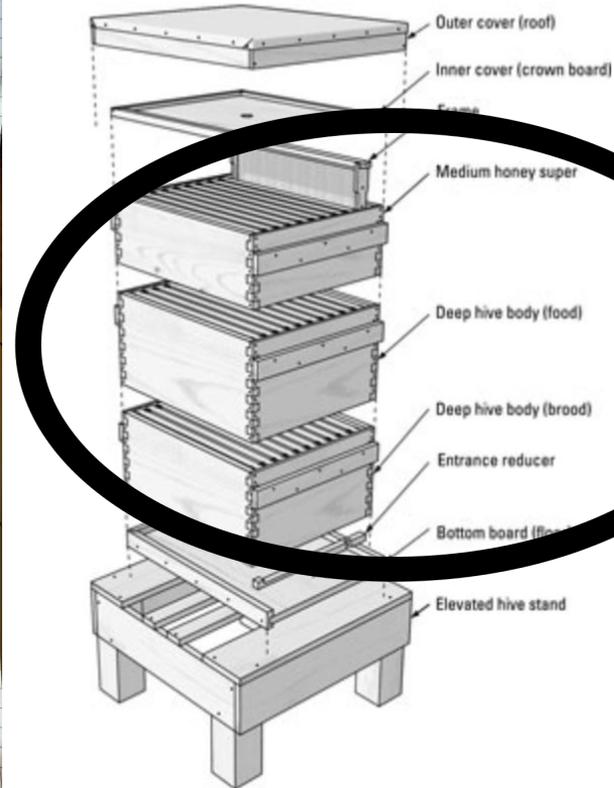
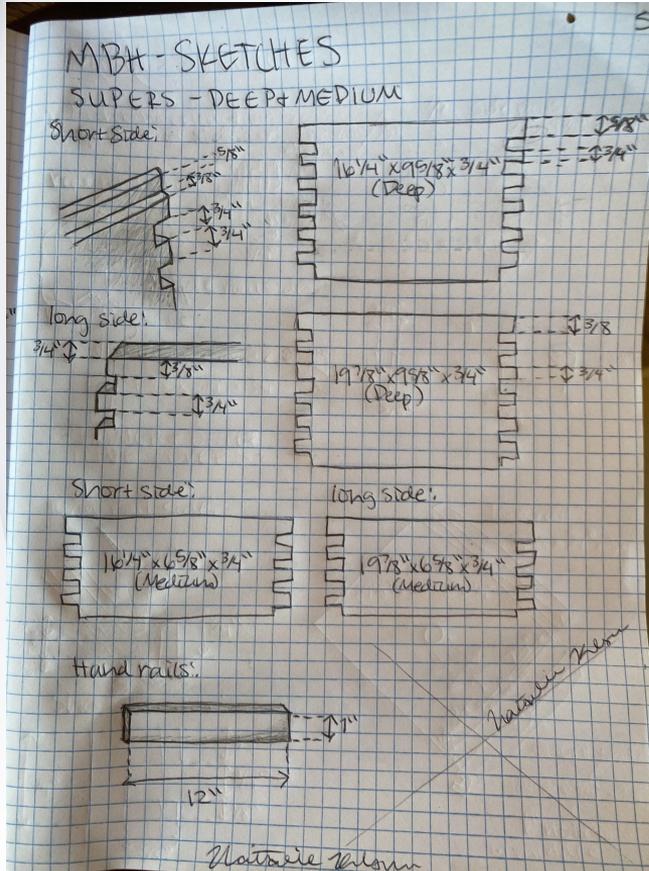
# THE PLAN

- Research everything about building a beehive, how to take care of bees, what they need to survive including type of hive, food, location, etc., and on how to build a website
- Find a location to put the beehive
- Make list of tools and supplies to required to make the beehive
- Draw sketches of each part of beehive in detail
- Build the website
- Collect all materials and tools
- Build and assemble prototype according to sketches and research
- Once recording what went wrong, what could be better, etc., build the true model
- Place in location
- Add bees into their new home
- Care for bees and observe if they are healthy
  - If yes, improve faults, and continue as normal
  - If no, identify problem, improve, observe again, and if yes, continue as normal
- Find customers and expand!

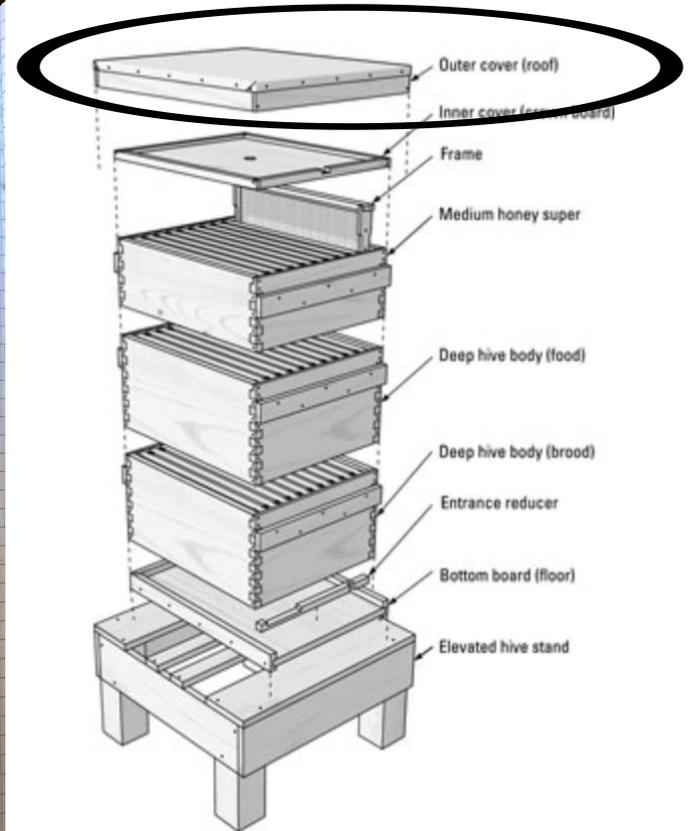
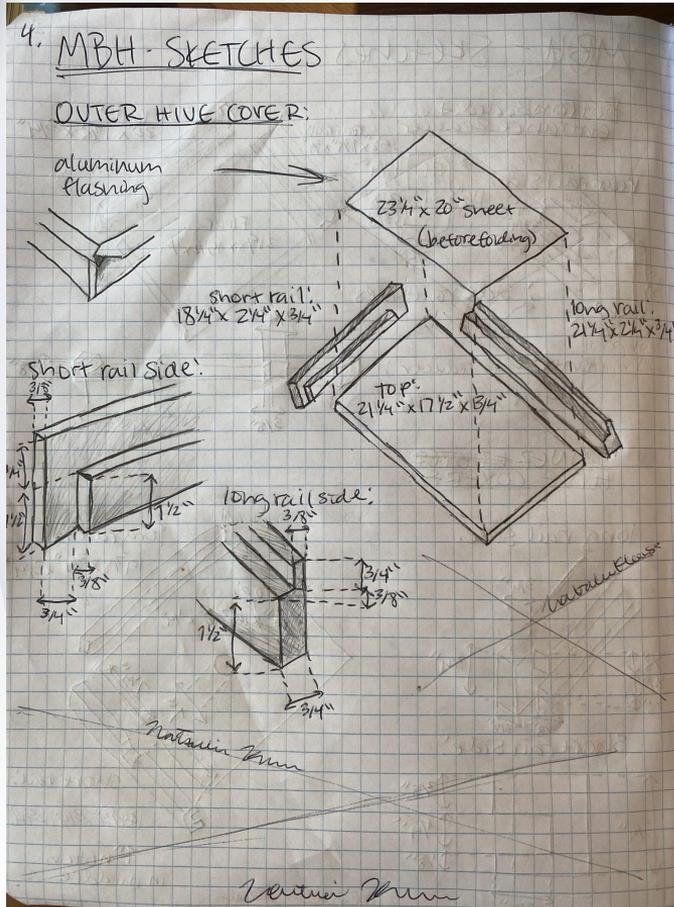
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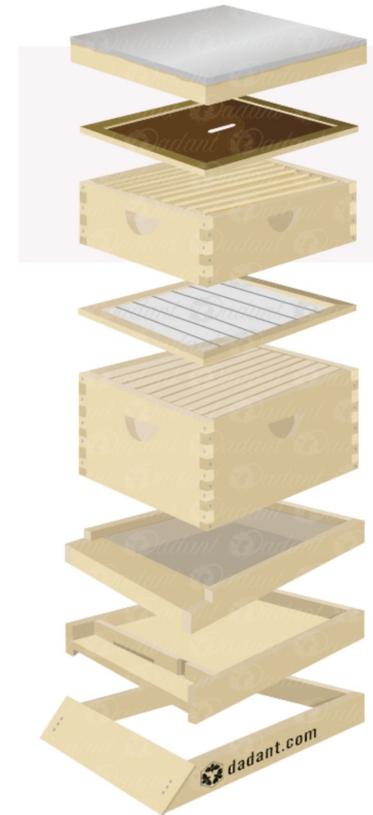


# THE PLAN



# THE PLAN

Put together it should look like this:



## THE CREATION

My process in making this prototype was to measure and cut all the pieces out of cardboard from a big box and tape them together with packing tape. Everything went to plan but I was surprised that it came together so simply. Although, if I could go back and do it again, I would've liked to use glue or brads or something more firm and secure. Making the website was also fairly simple and came together nicely, however, if I were to do it again I would add an information section so people could have an easy-to-read, concise source of information about bees and how much they do for the environment.

# THE CREATION



# THE CREATION

- [www.beebetter.today](http://www.beebetter.today)

## WHAT NEEDED IMPROVEMENT

- To really improve this project I wish I had a physical model of the real wooden beehive with finger joints or even real bees, but I only have a simple cardboard model.



# SOURCES

- <https://hgic.clemson.edu/factsheet/frequently-asked-questions-about-honey-bee-swarms/#:~:text=Typically%2C%20swarms%20only%20stay%20in,may%20remain%20for%20several%20days.>
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- <https://environmentamerica.org/feature/ame/no-bees-no-food>
- <https://www.dummies.com/home-garden/hobby-farming/beekeeping/cut-list-for-the-ten-frame-langstroth-hive/>
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- <https://www.beverlybees.com/parts-beehive-beginner-beekeeper/>
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