Agri-Cube®

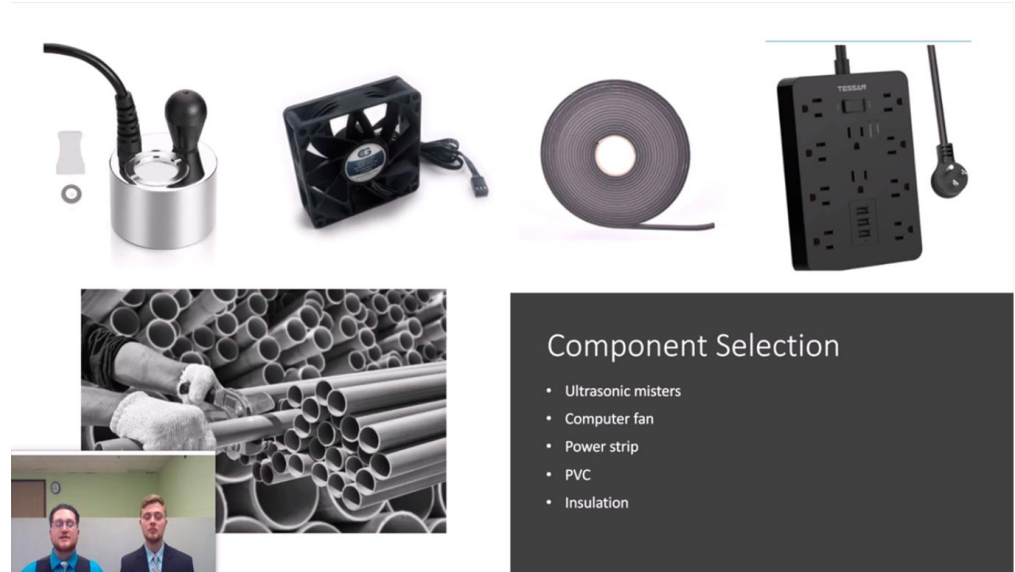By Joshua Jacobs and Christopher Illingsworth
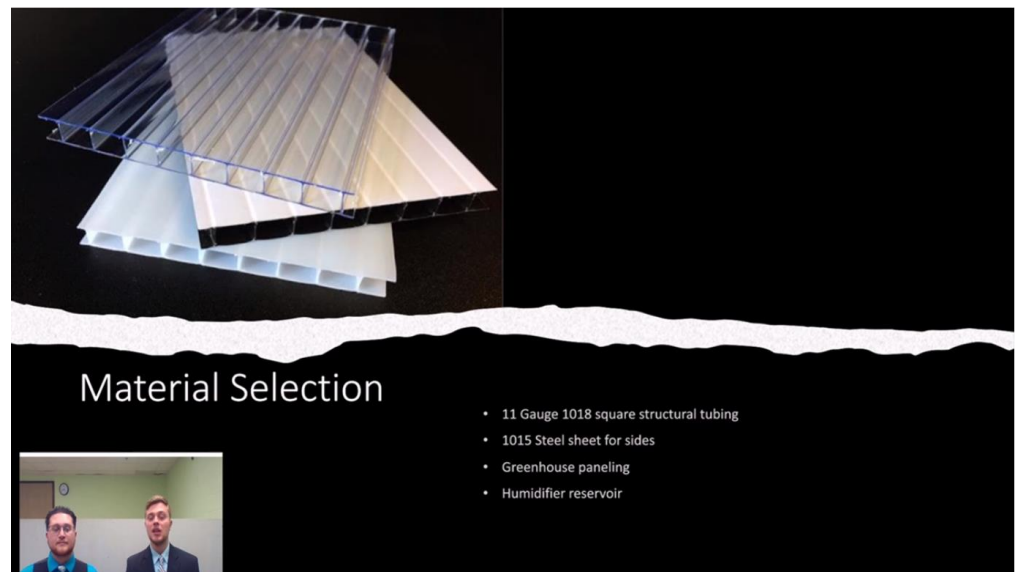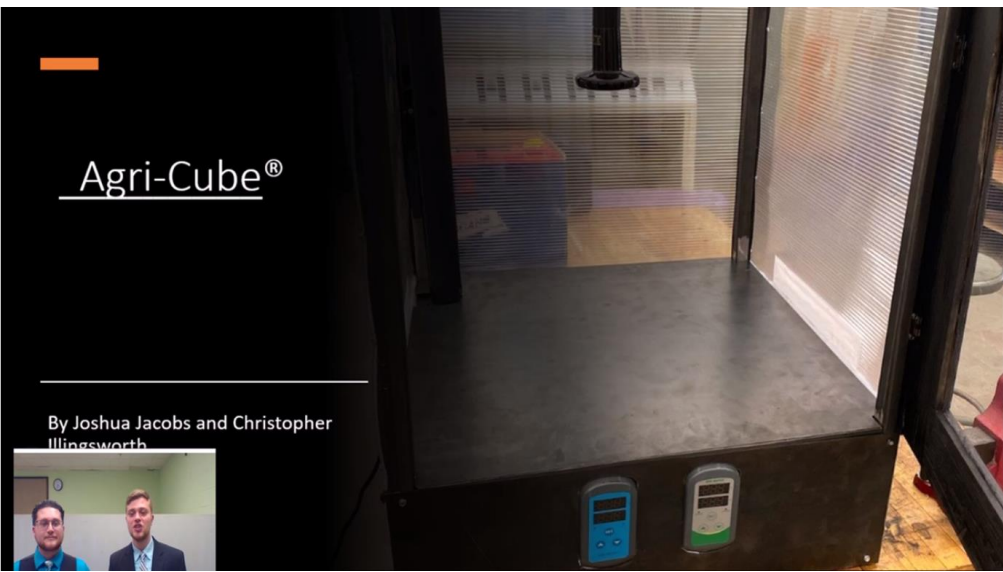
Material Selection

- 11 Gauge 1018 square structural tubing
- 1015 Steel sheet for sides
- Greenhouse paneling
- Humidifier reservoir

What Is It

- Self Regulating Grow Chamber
- Tailored to maintaining conditions for mushrooms
- Can be altered for other consumables

Component Selection

- Ultrasonic misters
- Computer fan
- Power strip
- PVC
- Insulation

Why This Project is Important

- This product promotes self sufficiency and learning hobbies
- Some mushrooms have specific growing conditions that need to be met for good production
- This product removes the stress of caring for mushrooms and meeting their needs
- This product has the potential to be targeted for many plants with the addition of lighting.
- The design is meant for indoor use and provides a climate for mushrooms any time of the year.
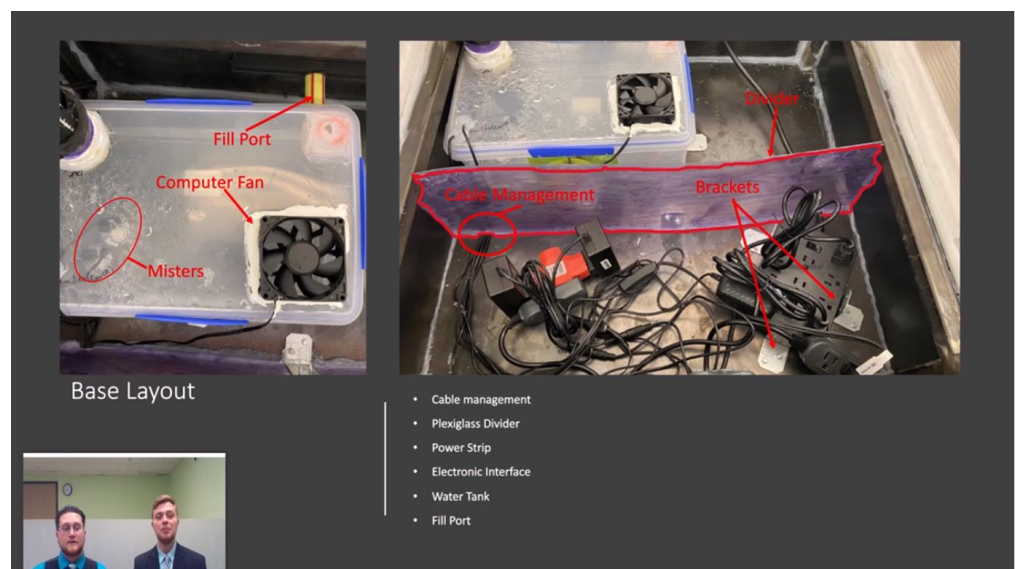
Base Layout

- Cable management
- Plexiglass Divider
- Power Strip
- Electronic Interface
- Water Tank
- Fill Port

Growing Conditions

- 5 Steps to growing mushrooms: substrate selection, sterilization, spawning the mycelium, pinning, fruiting.
- The enclosure was built to simulate the conditions needed for spawning, pinning, and fruiting.
- Spawning mycelium needs a humidity of 95% with a temperature of 75F
- Pinning needs a humidity of 90% with a temperature of 65F
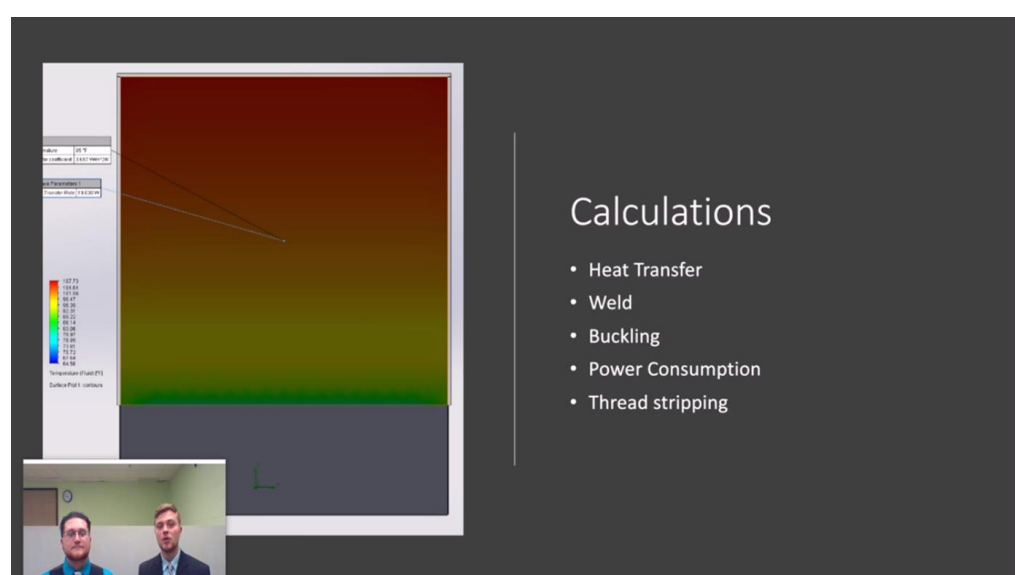- Fruiting needs a humidity of 80% with a temperature of 65F

Model Modifications

- Two Shelf Design
- Modular Design
- Frame pieces

Automation Options

Original plan was an Arduino

The next solution was a multichannel interface

Final design uses a plug and play controller

Calculations

- Heat Transfer
- Weld
- Buckling
- Power Consumption
- Thread stripping