

# Algae Tree

**Team Members:** Abena Boateng, David Baker, Kipling Len, Jeffery Whitmire, Rajin Karpen  
**Faculty Advisor:** Dr. Kastner, Kevin Wu

## Problem, Definition and Objective

**Problem:** Large Carbon Dioxide presence

**Definition:** Aesthetically pleasing biomimicry device to sequester carbon

**Extra:** Produce biofuel

Sequestering **1 mt of CO<sub>2</sub>** in a **5000-gallon** bioreactor by producing **1.8 mt of algae**

Measure algae using *Secchi Stick*

95%

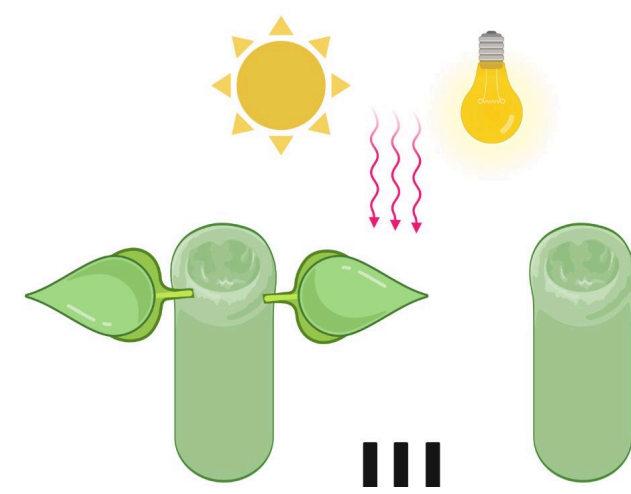
Product can last up to **6 months to a year**

## Key Impacts

**Environment:** Reduce Carbon amount in the atmosphere

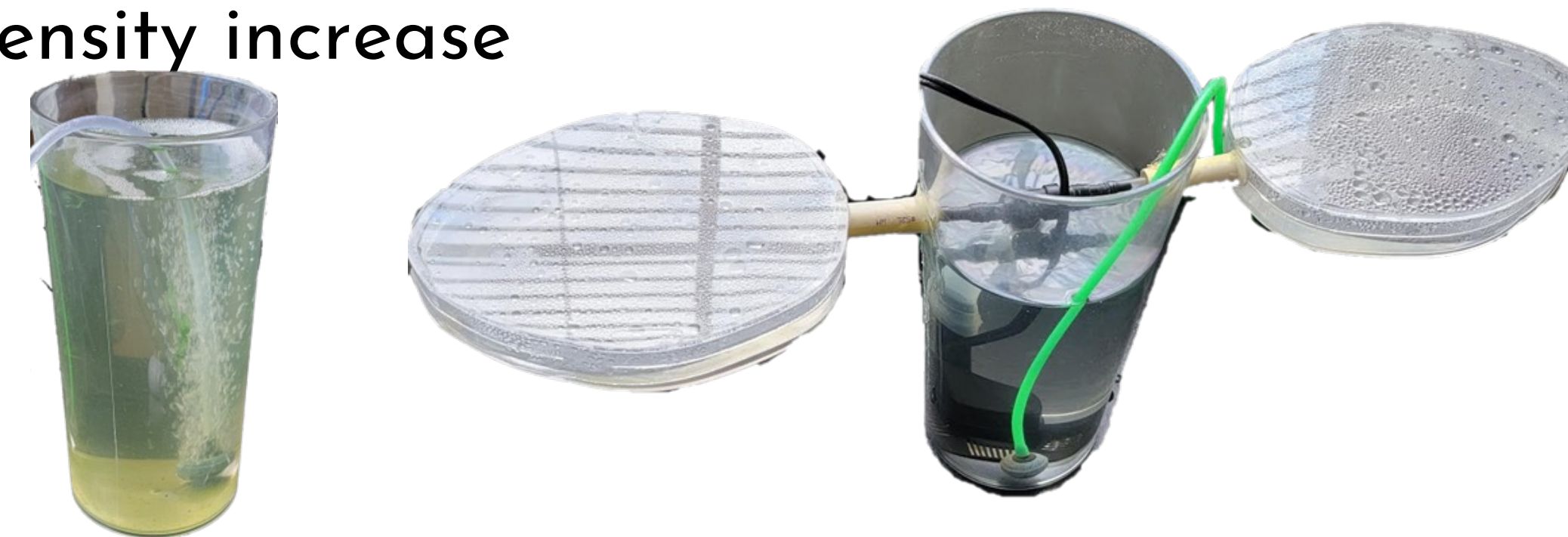
**Customers:** Add **beautification** to property in an **environmentally friendly** manner

**Client:** Bring awareness to **biomimicry**, Create a product to reduce **carbon footprint**, **Upscale** potential



## The Prototype, Tools and Techniques

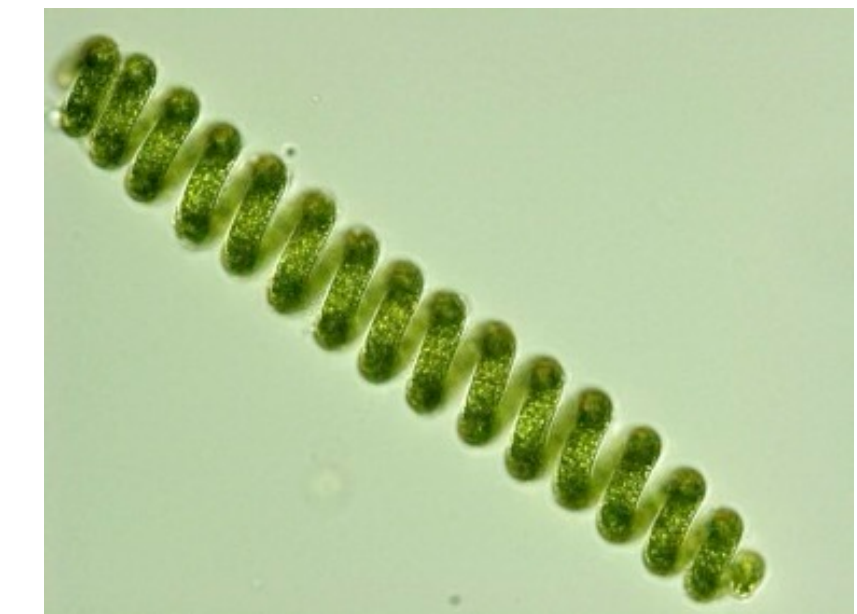
- Designed to be a storage vessel with leaves that increase light exposure
- Leaves made of laser cut acrylic
- Vessel was ordered pre-formed
- PVC pipes form branches
- Comparison of growth rates and overall density increase



- Efficacy of leaves
- Increased cell and optimal density in leaved prototype vs non-leaved
  - Comparative analysis of leaved vs non-leaved prototype
- Measuring Tool is a **Secchi Stick** : Measures the turbidity
- Analyze density change overtime & final dry weight: The density change can verify cell density increase
- Final dry weight: It tells us the amount of content we have negating extra fluid

## Client Needs

- **Appealing appearance (Biomimicry)**
  - Leaf Shaped Model
- **Easy to use**
  - Single Tank System
- **Clean/sterile reactor**
  - Ultraviolet Lighting
- **Produces algae biomass**
  - Nutrient Media and Salts for Algae
  - Aeration System



## Results

- 5-day period of cell density growth
- Leaf Shaped showed a greater cell density over a 5-day period

