

COMMON MILKWEED 3D MODEL



Milkweed from Danforth!



**Why model
the Common
Milkweed?**



- Wanted the challenge of modeling a complex Missouri native plant
- Common Milkweed is a key plant in prairies across Missouri
- Common Milkweed plays a big role in Monarch Butterfly conservation





Background on the Common Milkweed





LOCATION

Found in the Midwest and East U.S., found statewide in Missouri



SCIENTIFIC NAME & FAMILY

Scientific name: *Asclepias syriaca*

Family: Apocynaceae



SIZE

Grows to 5 feet tall with 2-5 clusters of flowers near the top



CHARACTERISTICS

General: Upright plant, perennial, contains toxic sap

Flowers: Pink to lilac, grow in clusters along stems

Leaves: 6 inches, broad and elliptical on leaf stalks





Importance of the Common Milkweed



MONARCH BUTTERFLY

Monarch Butterflies use the Common Milkweed as a larval host plant, and caterpillars eat the Milkweed plant.

The Milkweed is a common, but extremely important plant to the conservation of Monarch Butterflies,

The use of herbicides and destruction of other weedy places have also affected Monarch Butterfly conservation.





GENERAL ECOSYSTEM IMPORTANCE

Milkweeds are important to the texture of Missouri native prairies.

Other insects drink the nectar of Milkweed flowers while some others hide in the Milkweed flower clusters.



DESIGN PROCESS

01

Brainstorm

02

Experiment

03

Model

04

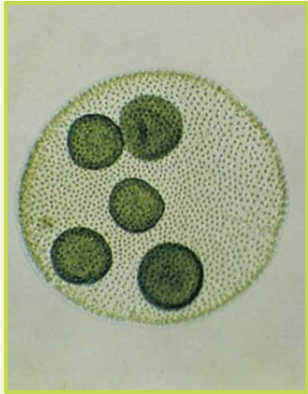
Finalize



Brainstorm

Volvox

Already had experience w/ the organism



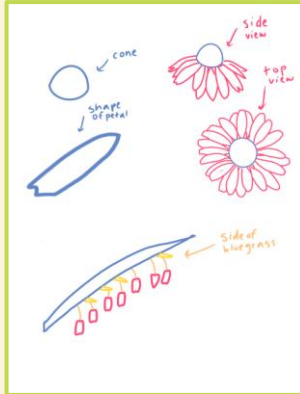
Purple Coneflower

Very interested in prairie plants native to Missouri



Prairie Grasses

Switchgrass, Bluestem or Indiangrass



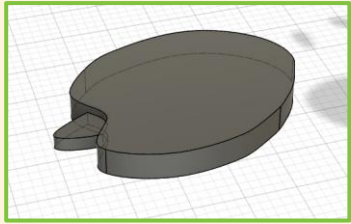
Common Milkweed

Settled on the Common Milkweed

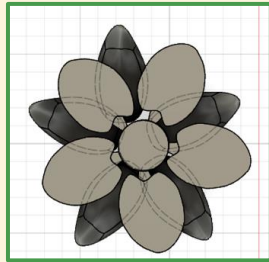


Experiment + Model

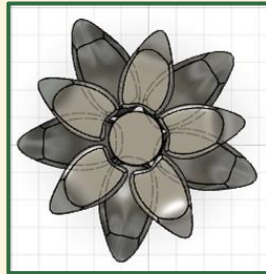
- Experimented with different tools (forms or sketches) to form the various parts of the Milkweed plant.
- Once we found the tools that worked the best, we started to create the actual model!



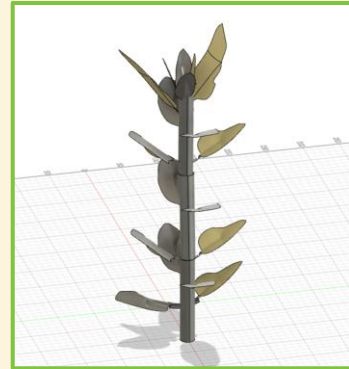
First Petal



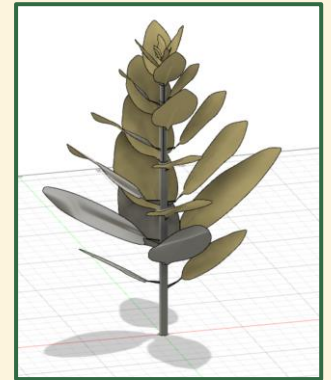
First Flower



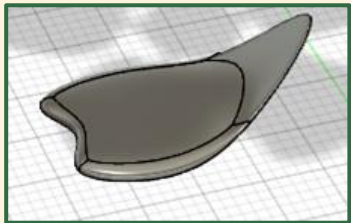
Second Flower



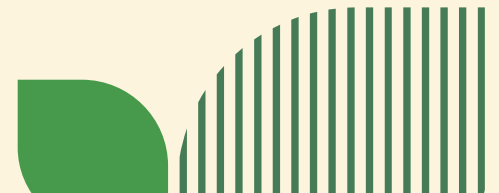
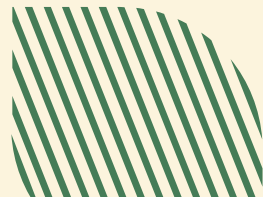
First Stem +
Leaves



Second Stem
+ Leaves



Second Petal





Final Product

- Two components:
- Stem and Leaves
 - Flower



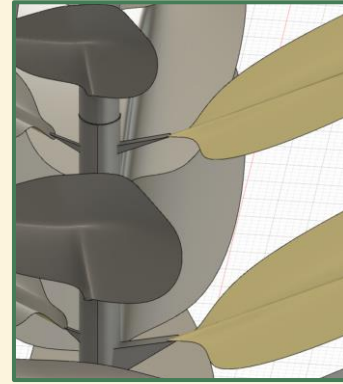
Final Product- Plant

AESTHETICS

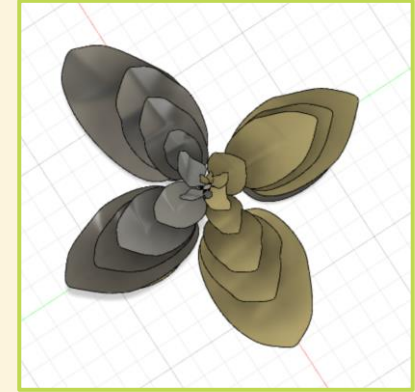
General: Tapered shape

Leaves: Perpendicular leaves, ending in a bud at the top, where clusters of flowers attach

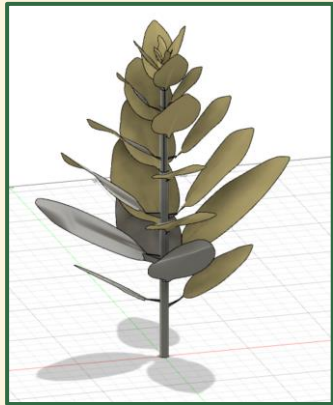
Stem: Stacked cylinder shapes that get narrower



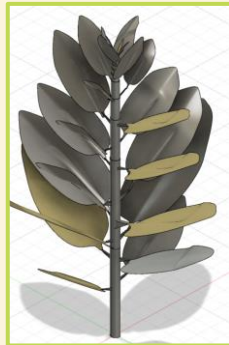
Leaf stalk & leaf close up



Top view



Plant- side view



Side view- leaf pattern

PROCESS

General: Studied pictures, sketched 2D renderings, and transferred them to a 3D model

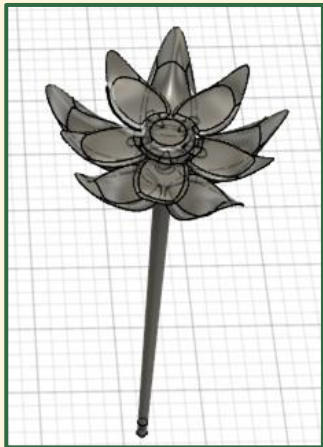
Leaves: Traced leaf pairs and used scaling properties for the tapered shape. Leaf stalks were traced triangular prisms.

Stem: Sketched progressively smaller stacked cylinders

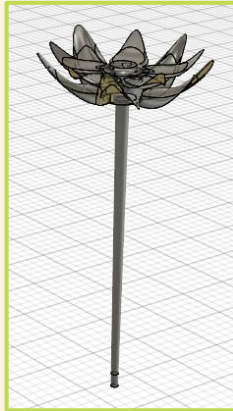
Final Product- Flower

- **Frontal Hoods:** five appendages (hoods) connected to the center with an oval-shaped piece; has depth and angles
- **Flower (underside):** five lower petals positioned between upper hoods; leading downwards with a tip (pointed up)
- **Stem:** very thin and long

Side/Top View (with stem)



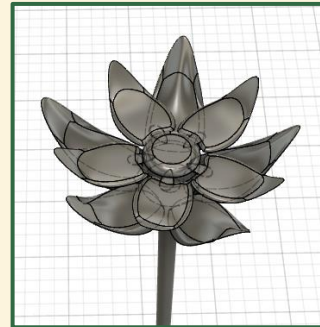
Side View



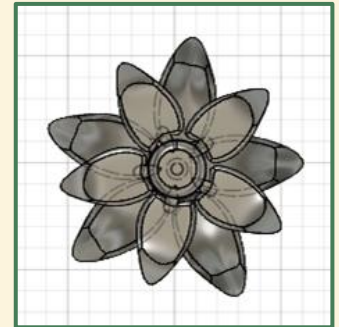
Top/Side View (2nd angle)



Flower Side/Top View



Top View





Challenges (& what we enjoyed)



RHEA

- Fusion 360 tools + applications were occasionally tedious
- I enjoyed the collaboration + problem solving aspect

GRACE

- Figuring out how to incorporate both parts of the Milkweed plant
- Learning new technology & getting to learn more about the Milkweed

ISABEL

- Learning how to navigate Fusion 360
- Doing research to decide on what plant to model



RESOURCES

- **US Department of Agriculture Common Milkweed Profile:**
https://www.fs.fed.us/wildflowers/plant-of-the-week/asclepias_syriaca.shtml
- **Missouri Department Conservation Common Milkweed Profile:**
<https://mdc.mo.gov/discover-nature/field-guide/common-milkweed#:~:text=This%20and%20other%20native%20milkweeds,the%20caterpillars%20eat%20the%20foliage>
- **Missouri Department of Conservation Milkweed Information:**
<https://mdc.mo.gov/discover-nature/field-guide/milkweeds>
- **Friends of the Wild Flower Garden Common Milkweed Profile:**
<https://www.friendsofthewildflowergarden.org/pages/plants/commonmilkweed.html>
- **Photos Courtesy of Google Images and Dr. Arango-Caro**



THANKS!

Do you have any questions?

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