

# Nebraska State Fair Sustainability Pavilion 2020



Kayla Arlt- *Excalibur Sword in Stone*

Braxton Adrian- *Upcycled Bird Feeder*

Katy Ayers – *Myconoe, MycHotel*

Cynthia Garcia – *Hydroponics*

David Meyer- *Algae Photobioreactor*

Liang O'Brien – *Plarn*

Kazia Podraza – *Solar Globe Lamp*

Leah Wagoner – *Rain Chain*

# Excalibur-Sword in Stone

- Made from upcycled plastic and cans melted in a forge into pure aluminum for sword
- Clamping mechanism with coin
- Outside of stone- high-density polyethylene (HDPE, #2) and polypropylene (PP, #5) melted in an oven at 400 degrees





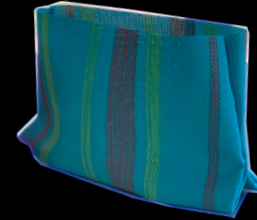
2018

SUSTAINASPACE



2019

REUPHOLSTERED STOOL

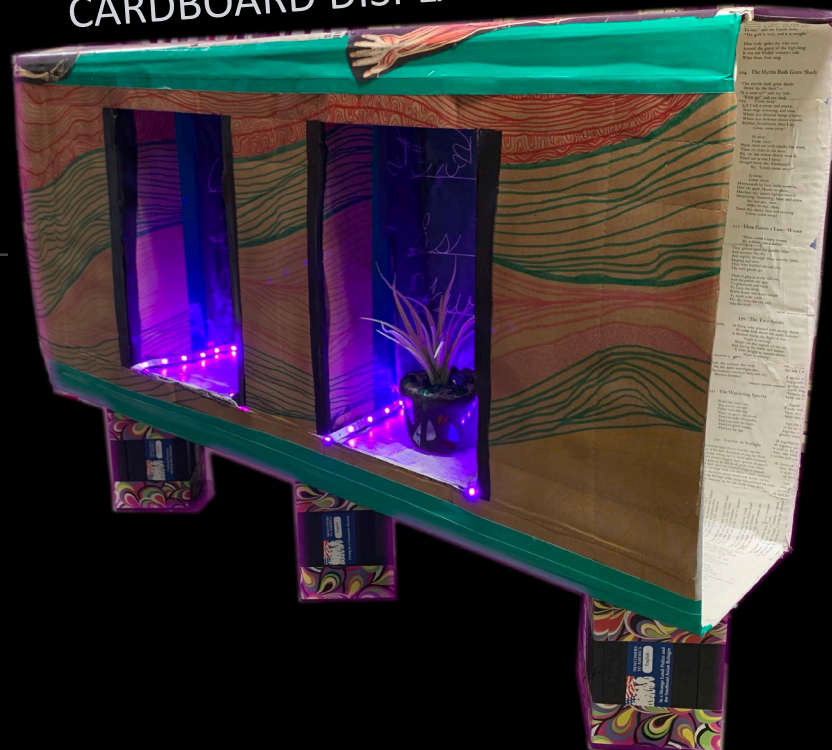


PLACEMAT PLANTER

CARDBOARD CHAIR



CARDBOARD DISPLAY SHELF



TIRE STOOL

2020



## Windmill Mural Installation

- Bottle caps, screws, plywood, paint
- Reused and salvaged materials
  - An ode to the growth of renewable energy in place of fossil fuels

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**2021**



# Myconoe: A canoe grown from mushroom mycelium



Photo of Katy Ayers canoeing in the Myconoe at Eagle Scout Lake in Grand Island, Nebraska

# The Process



Above: A photo of the inner oak frame of the boat.  
Right: Papier-mâché mold for the canoe.







Above: "Canoe hammock" hanging in the work space.



Above: The two molds and inner frame before being filled with spawn.



Above: The Myconoe mold partially filled with spawn.



Left: After one week of growth the mold was removed to reveal a fully grown boat.

Above: A photo of the Myconoe being dried in the sun after one week of growth outside the mold.



Left: Picture of Katy Ayers canoeing in the Myconoe.  
Above: Photo of Ben Newton and Katy Ayers in front of the Myconoe display at the 2019 Nebraska State Fair.

# Native Bees

- There are 4,000 native bee species in the United States.<sup>1</sup>
- Many native bees are gentle, meaning they don't sting (unless you step on or squish them).
- They live solitary lives in which each female has a nest.
- Many are cavity dwellers that utilize naturally occurring holes in nature (trees, rocks...etc.). There they construct brood cells, usually lined up end-to-end in a row, which they individually stock one by one to serve as nurseries and growth chambers for the larvae, pupae, and young adults.<sup>1</sup>

1. Moissett, B., Buchanan, S., & Buchmann, S. L. (2010). Bee basics : an introduction to our native bees /. doi: 10.5962/bhl.title.149919

# Social Bees

- Social bees are those that live in a colony or hive and are the most well-known of the bees. Example: Honey bees and Bumble bees
- In both honey bees and bumblebees, an overwintering queen emerges in the spring. The queen builds a nest, collects food, and lays eggs. The female workers hatch and work together to feed and care for the colony until fall when new queens emerge, mate, and hibernate until the following spring when the cycle begins anew.<sup>1</sup>
- The European honey bee is even the state insect of Nebraska.



# Bee Mychotels

A NATURAL STRATEGY FOR CONSERVING  
NATIVE BEE AND WASP SPECIES



## Nesting blocks

Growing bee hotels from a native fungus is a great way to increase nesting habitat while boosting biodiversity. Some research indicates that this may even increase the insects viral resistance.

# Next steps

Spring 2021 – 40 Bee MycHotels will be deployed statewide to gather data.

The data will be collected by students in Project GPS and used to write a research paper.

Winter 2021 – Bee MycHotels will be retrieved from research sites and kept in cool mesh bags. When the larvae emerge as fully grown insects in the spring, we will quantify the species utilizing our innovation.

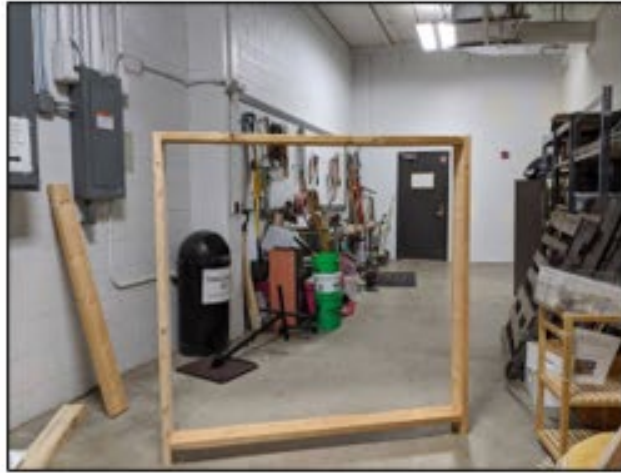


# Algae photobioreactor

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Outer Frame fabrication



Completed support frame



Post fabrication



Creating base for algae chutes



Assembled chutes



First algae growth



# Upcycled bird feeder- Braxton Adrian

- Scrap Wood
- Reused bottle



# Problem Solving eBadge

- **Listed on co-curricular transcript**
- Identify a Sustainability-Related Problem
- Identify the Factors or Variables Leading to the Sustainability Problem
- Identify Factors and Variables Susceptible to Change
- Identify Factors and Variables that are Difficult to Change
- Applied Skills: Project Development
- Applied Skills: Data Analysis
- Applied Skills: Critical Thinking
- Applied Skills: Effective Communication



E-Badge brochure with hands raised



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