Studio Myca

Mycelium Inspired Side table

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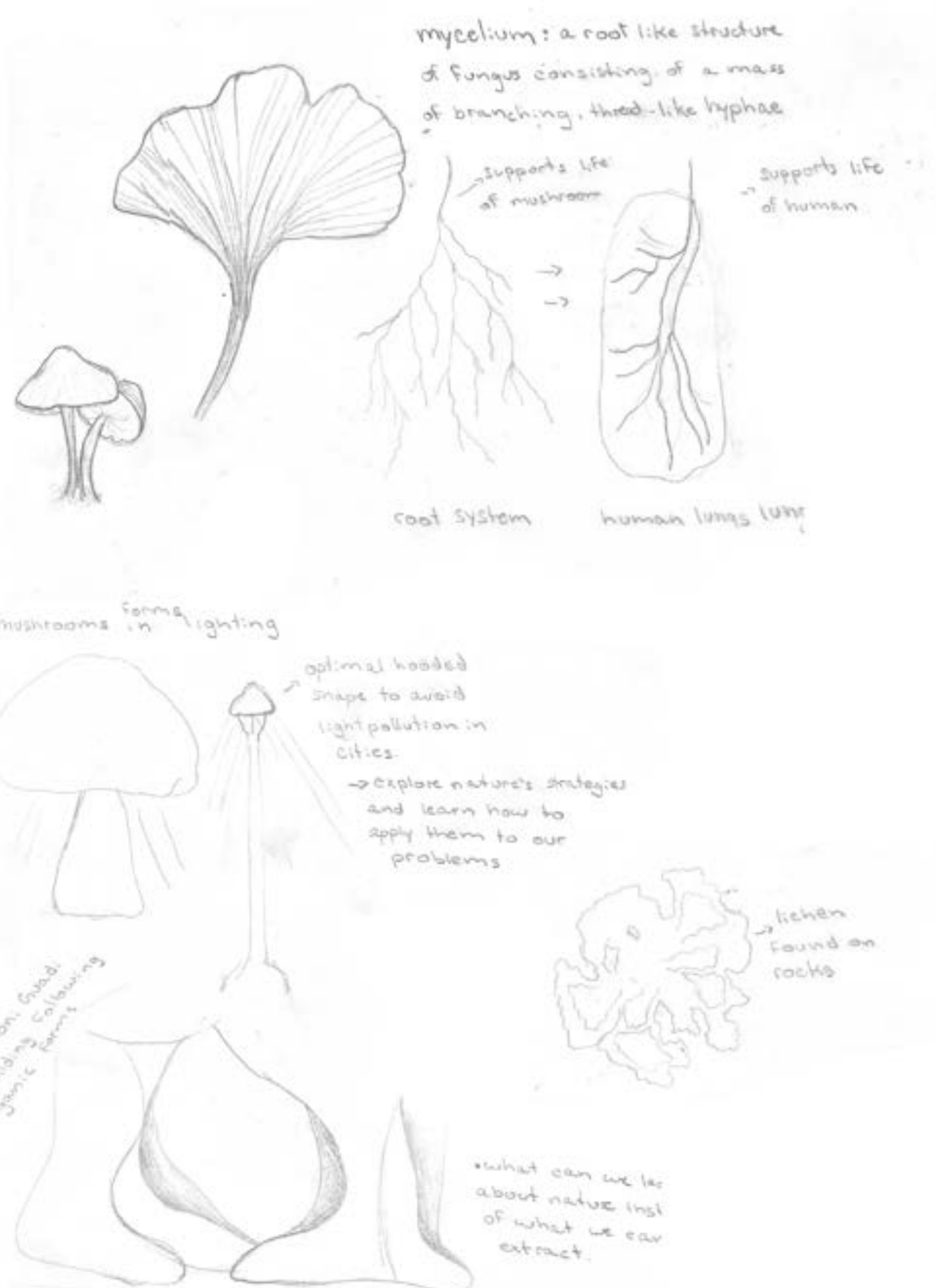
Jaya Guibert & Madeleine Mae Muir

DART 292 - April 2023

MYCELIUM AND MUSHROOMS

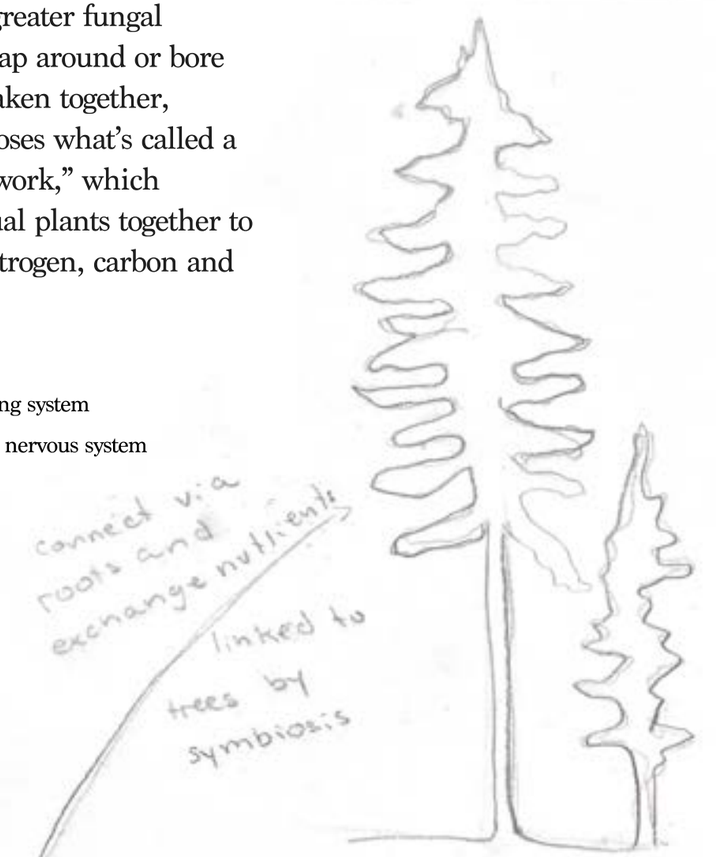


GROWING PROCESS

Mycelium are incredibly tiny "threads" of the greater fungal organism that wrap around or bore into tree roots. Taken together, myecelium composes what's called a "mycorrhizal network," which connects individual plants together to transfer water, nitrogen, carbon and other minerals.

Underground networking system

that resembles humans nervous system



- morel mushrooms are often found in fires that have recently burned. other kinds are found on the underside of fallen down logs.
- mushrooms can help break down wood and decay dead plants
- regenerative

Mycelium and the Environment

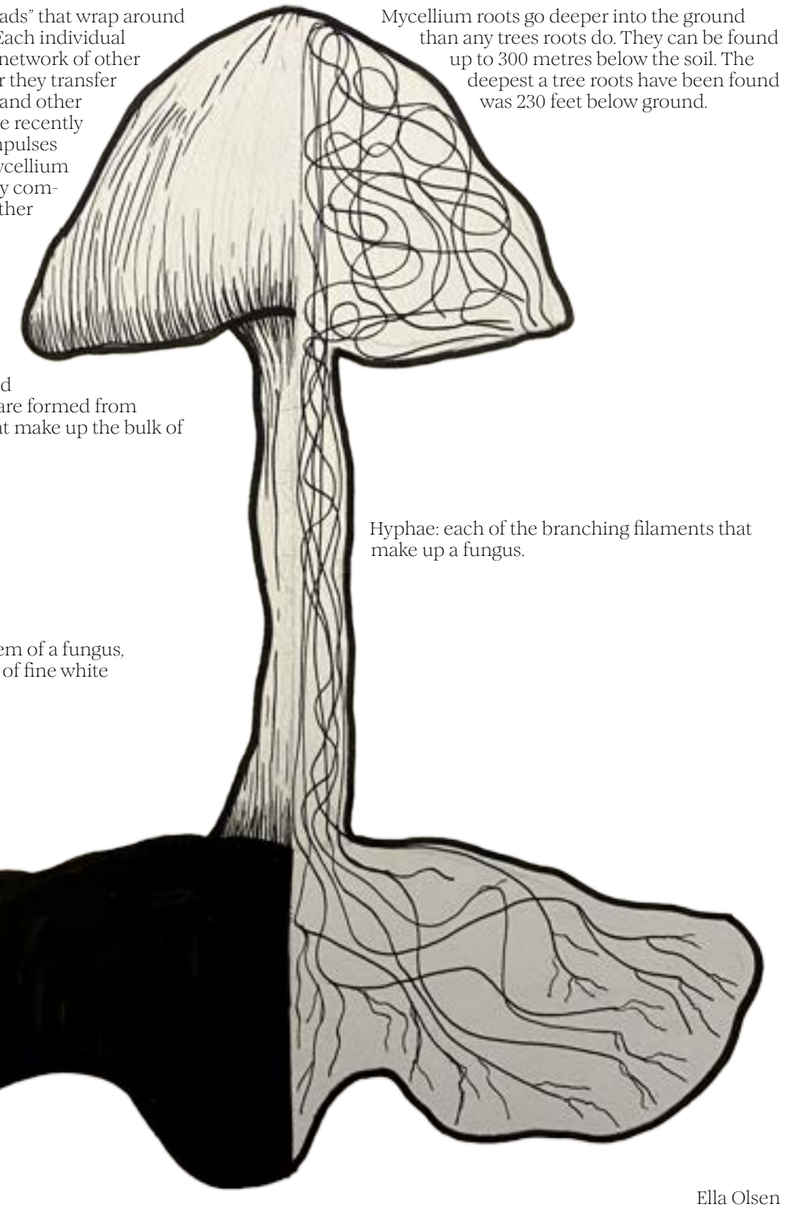
Fungi play an important role in maintaining healthy soil and biodiverse forests. They are decomposers that transform dead plant and animal matter into bioavailable nutrients. Fungi fix nitrogen and mobilize phosphorus which is critical to maintaining healthy plant life. If you check the ingredient list of any commercially available plant fertilizers, you will find phosphorus and nitrogen- fungi are a natural alternative to chemical fertilizers.

The mycelium- or root system- of fungi plays a role in carbon sequestration. Hyphae (the tubular filaments that make up the mushrooms fruit body and mycelium) convert inorganic carbon to organic carbon compounds that are stored in the soil. Healthy soil captures up to ten tonnes of atmospheric carbon per hectare per year- this would not be possible without fungi.

Mycelium are tiny "threads" that wrap around or bore into tree roots. Each individual plant is connected to a network of other mycellium and together they transfer water, nitrogen, carbon and other minerals. Scientists have recently discovered electrical impulses transferred between mycellium which suggests that they communicate with one another as well.

Mycellium roots go deeper into the ground than any trees roots do. They can be found up to 300 metres below the soil. The deepest a tree roots have been found was 230 feet below ground.

Mushroom:
The fruiting bodies of fungi which contain spores that are dispersed for reproduction. They are formed from hyphae, tiny threads that make up the bulk of most fungi.



Hyphae: each of the branching filaments that make up a fungus.

Mycelium:
the vegetative root system of a fungus, consisting of a network of fine white filaments.

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Mycelium \ Root-Based Mushroom

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Aesthetic:

Mycelium is a root-like mushroom that appears similar to a ball of cotton. Mycelia is formed by a network of hyphae bundled together found on substrates, soil or underground. Aesthetically, mushrooms and fungi have been used as inspiration for many different forms of art, along with their beautiful forms and textures they also represent interconnectedness and growth.

Colour

Mycelium may take on many different colors depending on different circumstances. Typically it will appear white or colorless but may vary and the color will change to brown, red, pink, yello, orange, green or purple. The substrate mycelia may appear to be transparent, slender and more branched under a microscope.

Shape

Mycelium's texture is cottony and long. Its long, single mycelia hyphae spread in all different abstract directions and their texture are one of the most impressive characteristics of Mycelium. Similar to those in a muscle, they are wooly, interwoven, matted groups resembling string. Small hyphal tufts stand out all over the mycelium.

Texture

Mycelium takes on many different interesting forms and shapes. Beneath the mushroom it spreads throughout the soil in many different abstract directions. The shape is very long, thin and spiral like. It is a tubular network of cells.

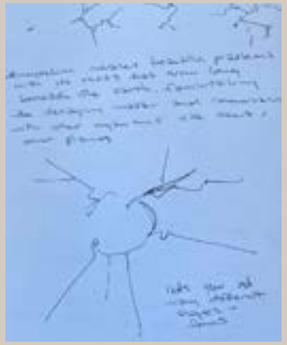
Aesthetic Composition

Mycelium is a beautiful abstract form that's aesthetic composition comes from its imperfections and irregularities as it grows through the soil. The spontaneous cells route themselves in all different directions. Once the Mycelium has molded it can be modified and used in many different ways. Within recent times mycelium has been used in many different sculptural projects, as it can be completely biodegradable and is a sustainable approach to creating different forms. Mycelia is composed of the vegetative part of a fungus, which can act as a natural glue when mixed with organic particles. As well as sculptural projects, mycelium has also been adopted into a variety of different mediums and art forms such as architecture acoustic panels, packaging design and speakers!

https://www.foodnavigator.com/Article/2021/02/04/Koreas-Tech-makers-alternative-protein-from-fungal-mycelium-growing-on-legumes-and-grains

Mayne Island Conservancy

MYCOAUDIO Mycelium Mushroom Speakers



Maddi Mae

Function

Fungi & Mycelium

Fungus is made of two parts, the fruiting body and the mycelium. Mycelium is made of a complex network of tubular filaments called Hyphaes. Mycelium grows by utilizing nutrients from the environment around it, which helps create the reproductive cells called spores. Spores then spread in the environment by various active or passive mechanisms to create a new fungus.
The fruiting body consists of Stalk, Gills, and Cap.
Some fungi, such as yeasts, do not grow mycelium. Instead, they grow as individual cells.

Mycelium also works as a network for trees to connect, communicate, and access nutrients. This network is also known as the “Wood Wide Web.” Through this web, mother trees can detect the illness of their neighbors through distress signals and send nutrients to help them recover.

Fungi are known to remove contaminants from environments and wastewater. These contaminants include heavy metals, organic pollutants, textile dyes, leather tanning chemicals and wastewater, petroleum fuels, polycyclic aromatic hydrocarbons, pharmaceuticals, personal care products, pesticides, and herbicides in the land, freshwater, and marine environments.
Fungi break down materials by releasing enzymes. The enzymes break down carbohydrates and proteins and release energy. The fungi only absorb some of this energy, and the soil, air, and surrounding water absorb the rest. Therefore, fungi are essential for recycling nutrients.

Structure

Fungi & Mycelium

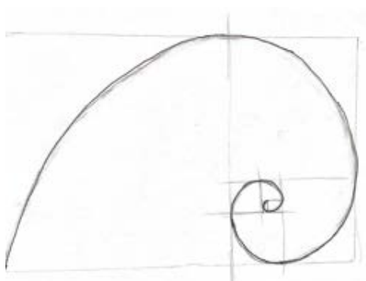
Oyster Mushroom

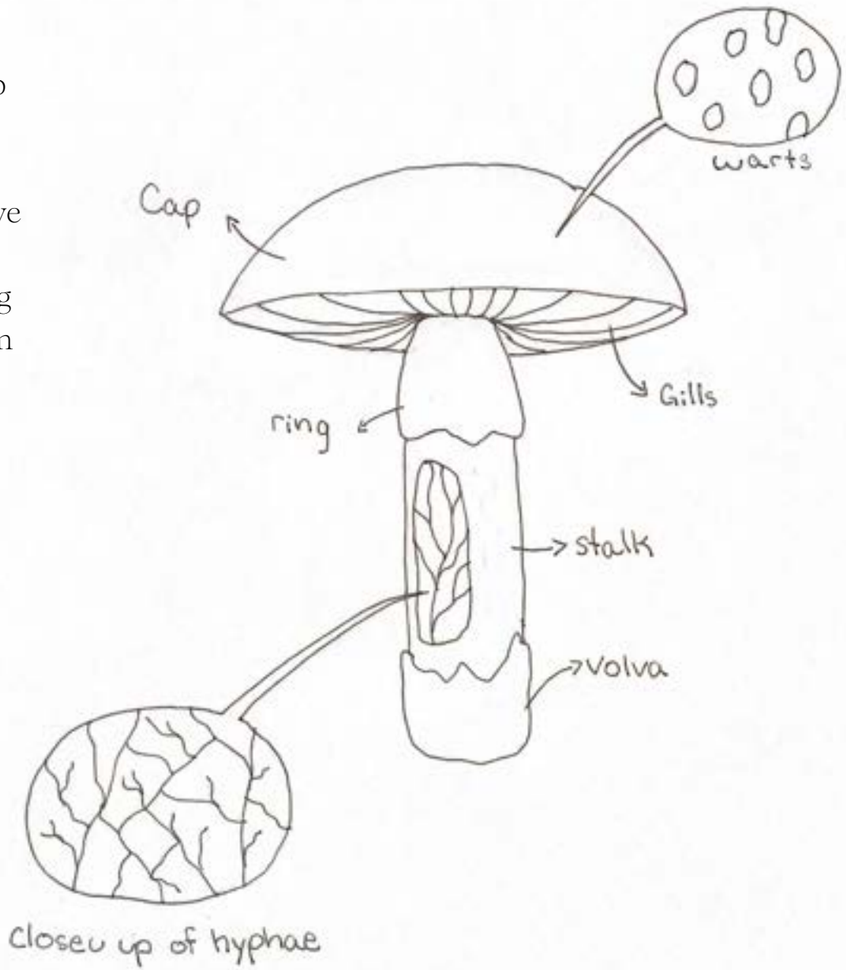
Details

The oyster mushroom is a tree mushroom with a cap that is up to 25 cm broad, fan-like and smooth. They are often light neutral colours. As opposed to other mushrooms that grow on the ground they do not have a distinct stalk or stem. They grow on tree bark and logs in a stacked formation with multiple overlapping each other. There are many gills visible on the bottom with smooth edges. They can be found in the surrounding areas of Montreal most often in the spring and fall.

Golden Spiral Relationship

The golden ratio can be seen in many parts of nature. The spiral finds itself in any plants including mushrooms. Tree mushrooms like turkey tail take a similar form to oyster mushrooms but have more of a spiral pattern in them. You can also find the spiral when looking at the bottom of certain gilled ground mushrooms.





Common ground mushroom anatomy

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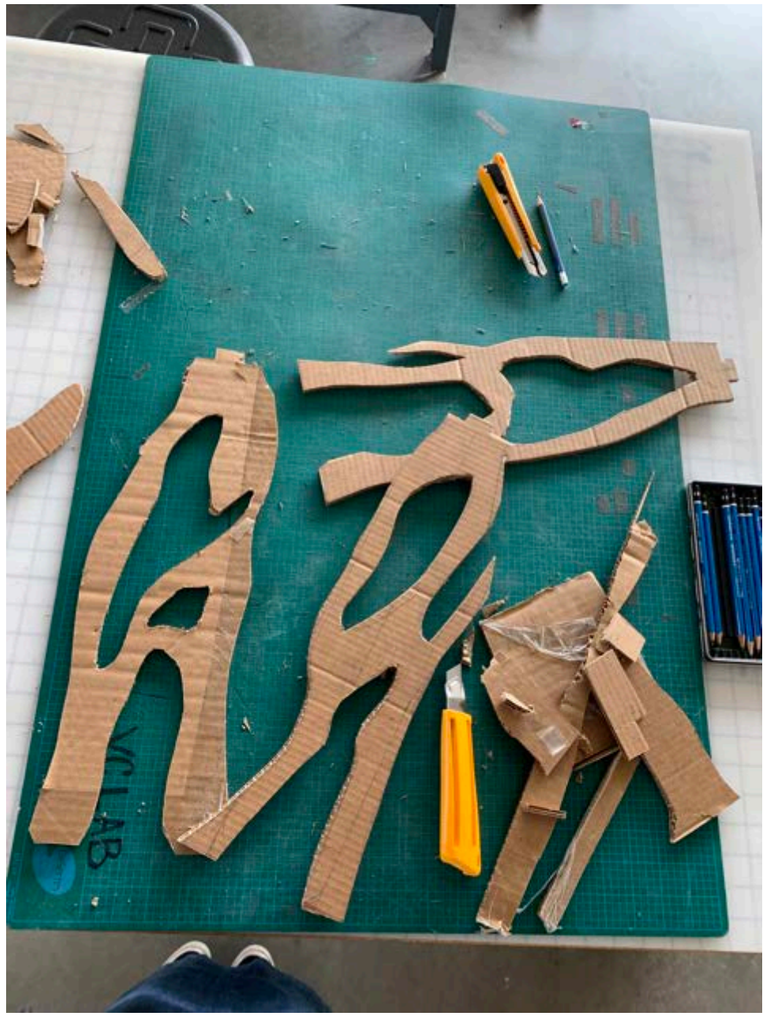
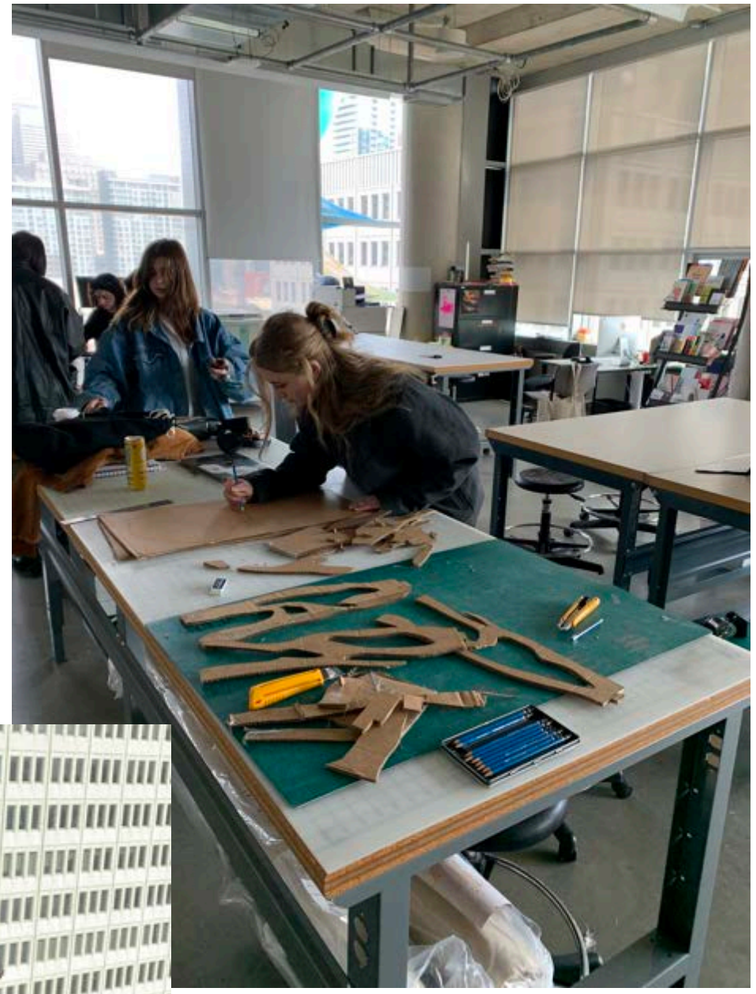
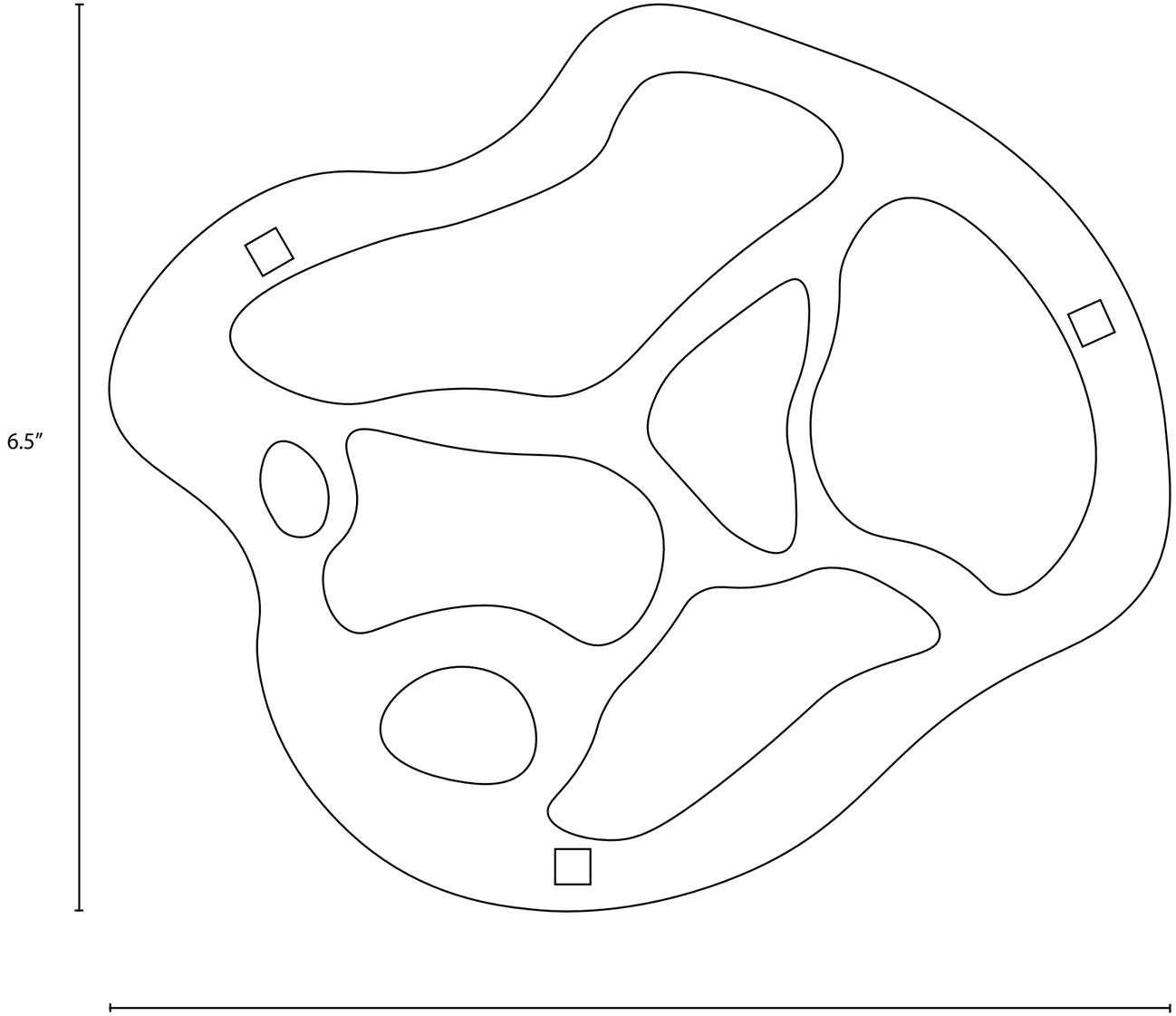
Maquette

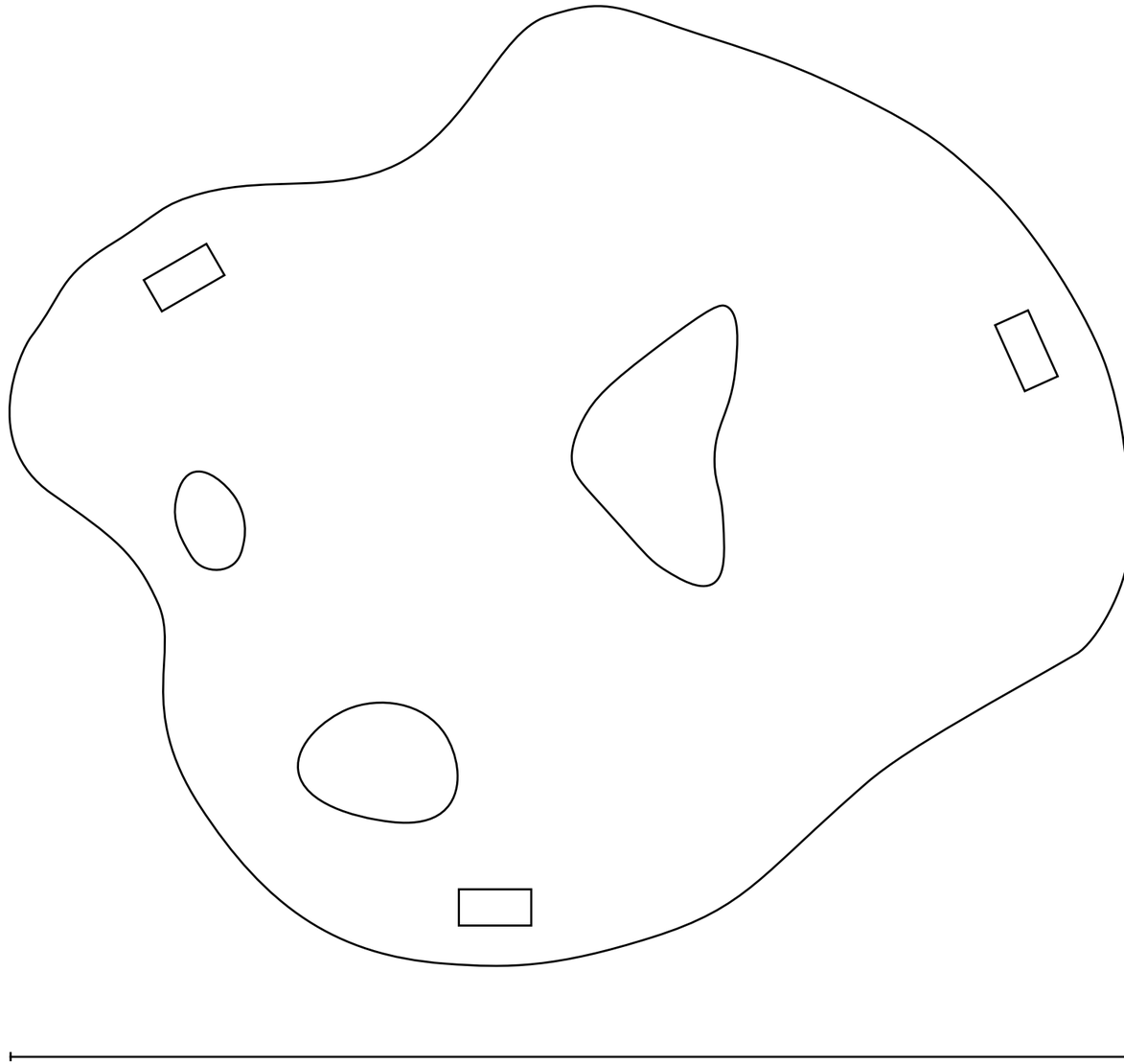


Freehand leg sketches to get an idea of how they will look together



First assembled maquette before adding the middle support.





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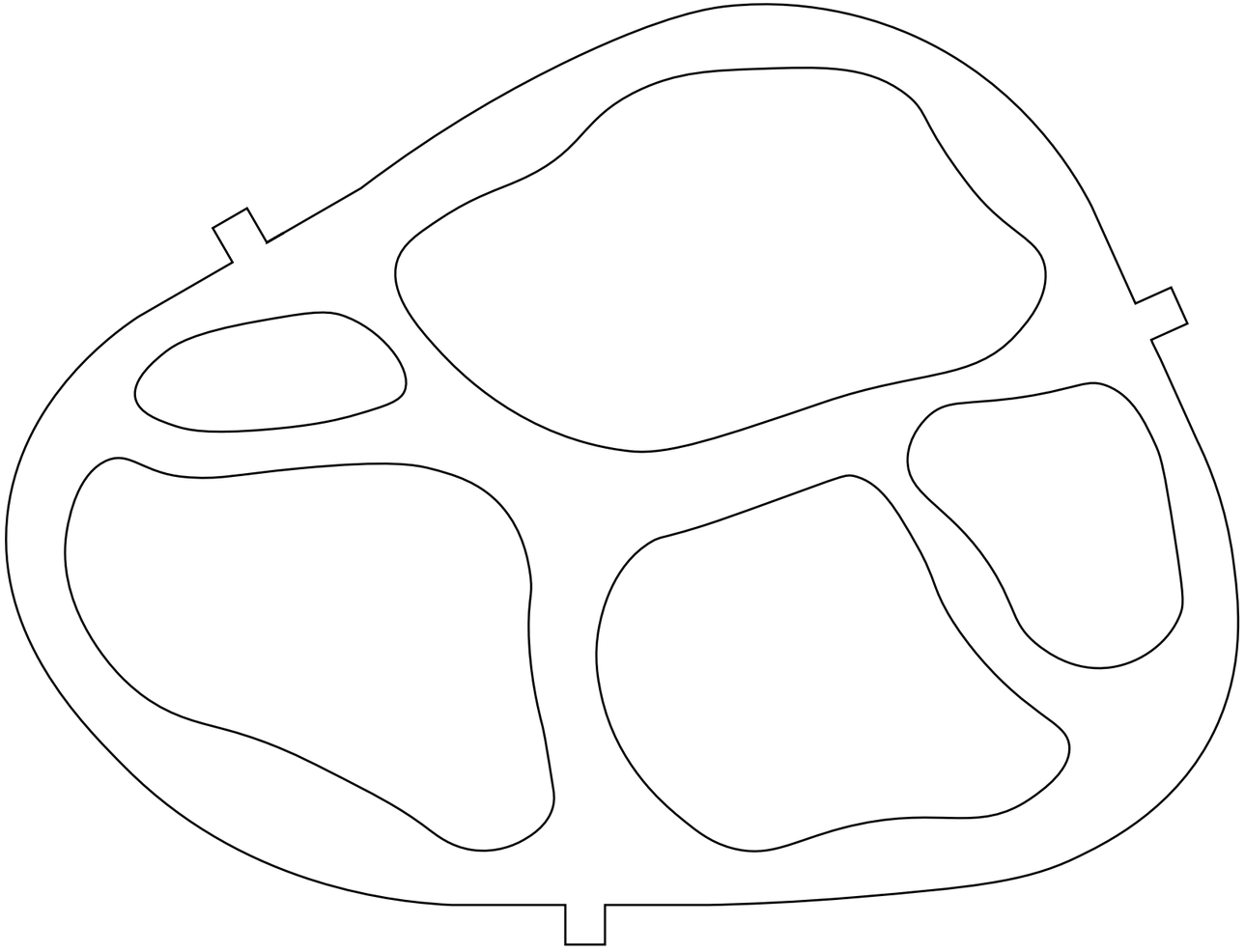
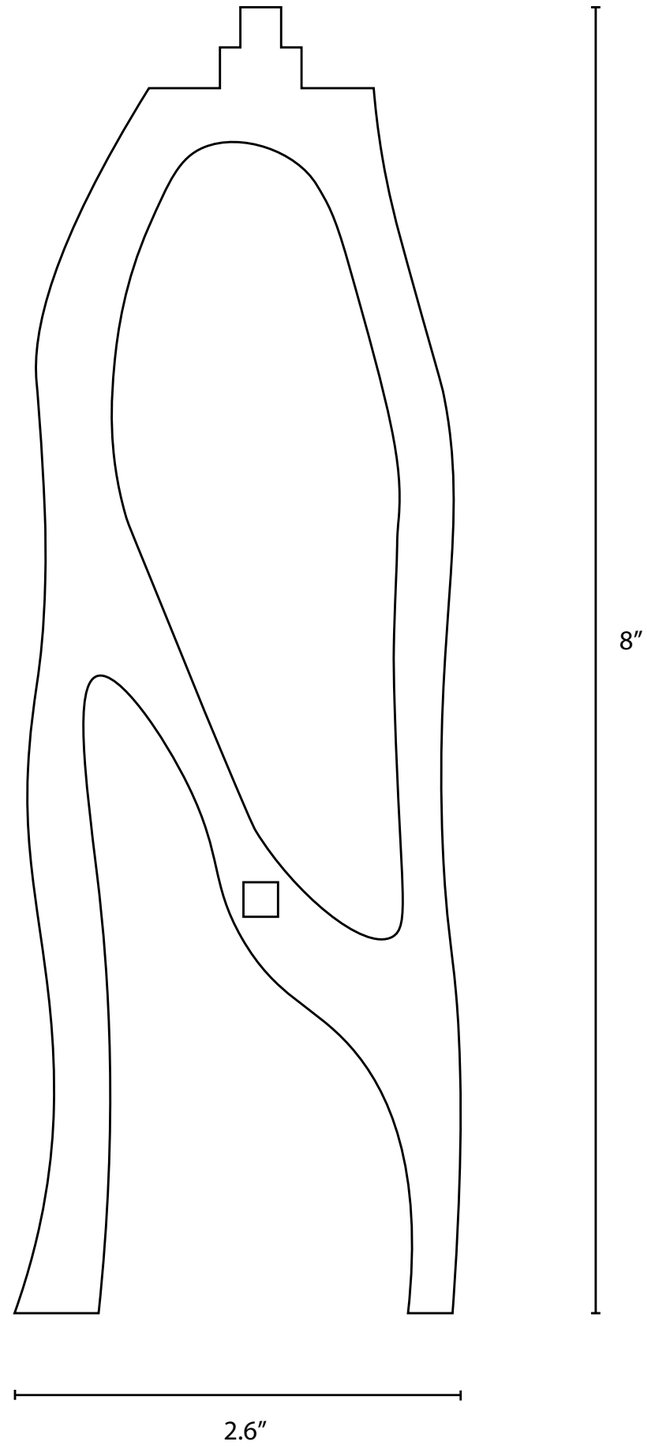
Parts drawings





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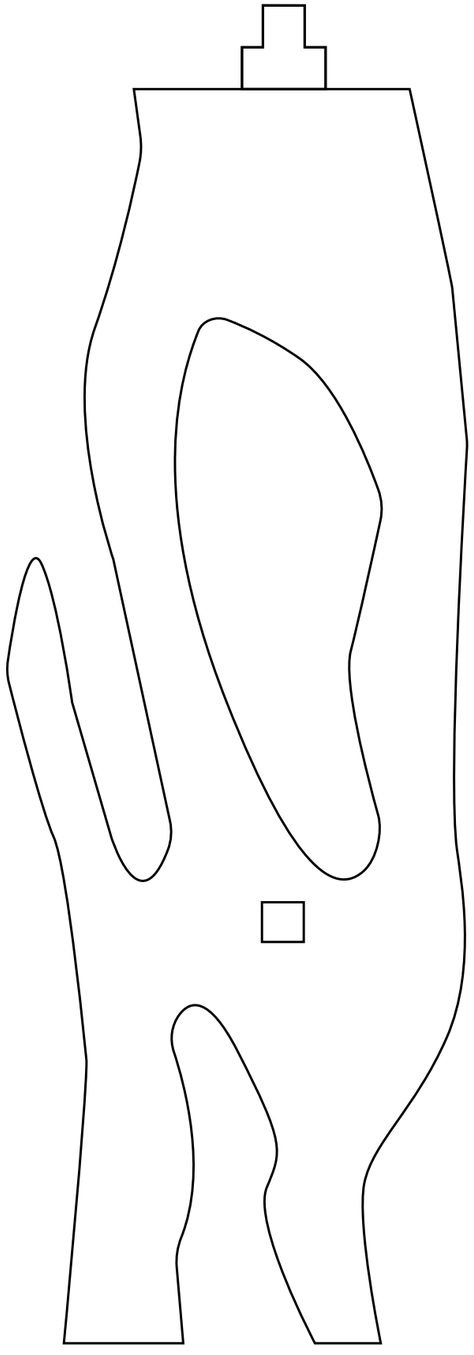
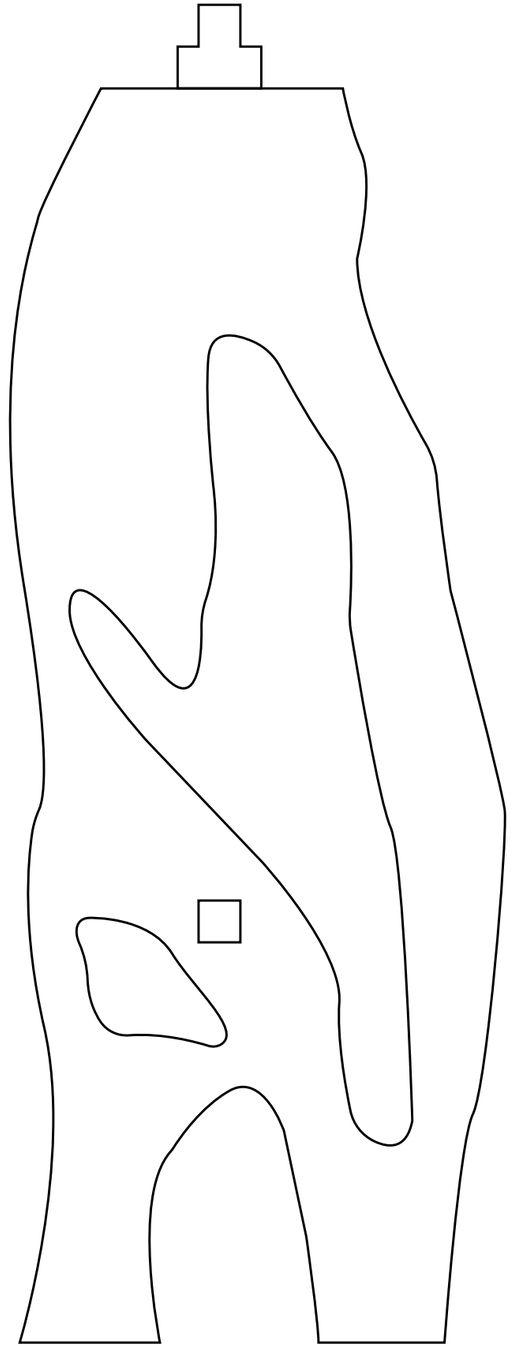


2.75″



3″

8″

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Process

Cutting our individual shapes using the CNC machine

Cutting off the tabs using the band saw

Assembling the pieces

Assembly

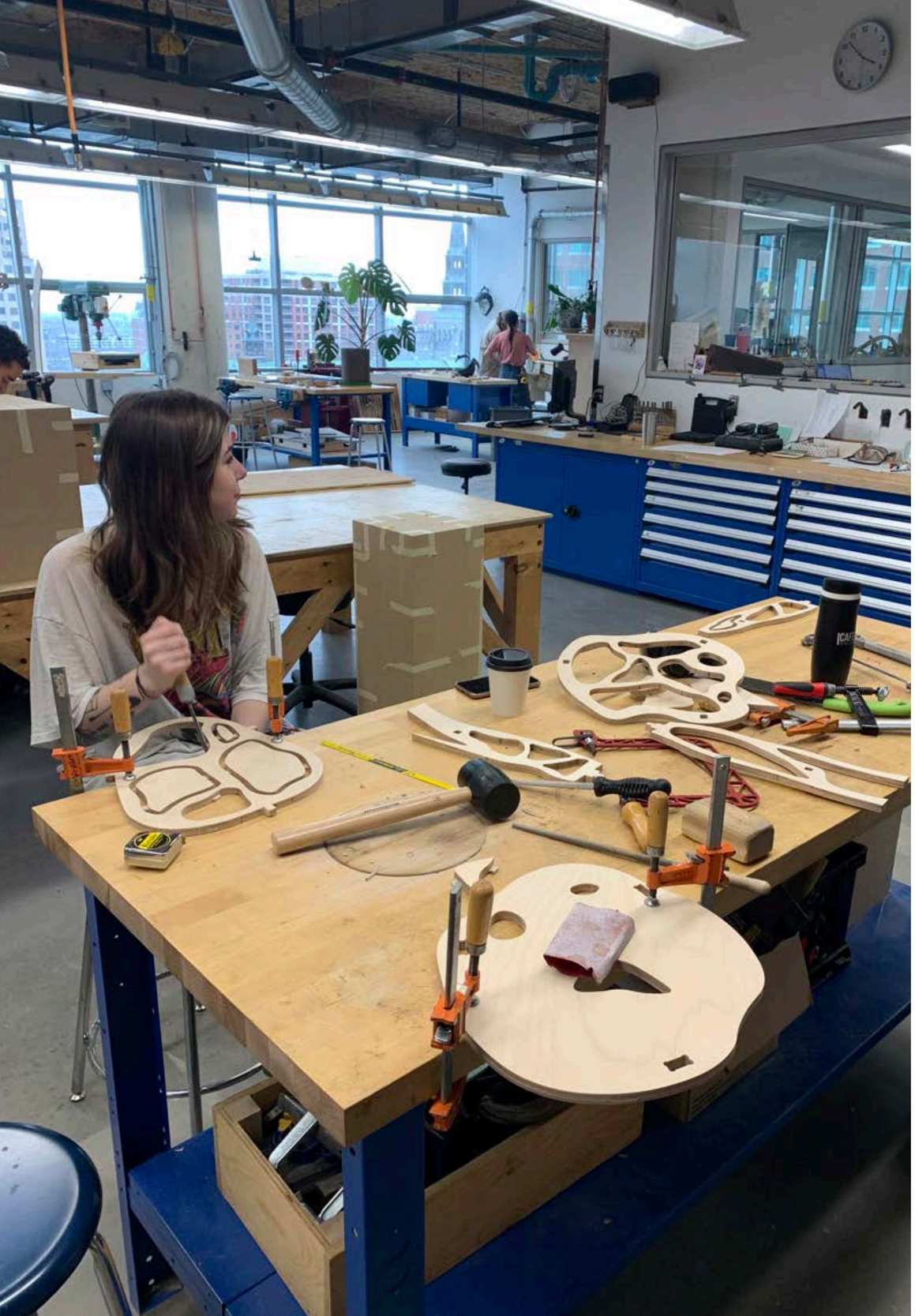
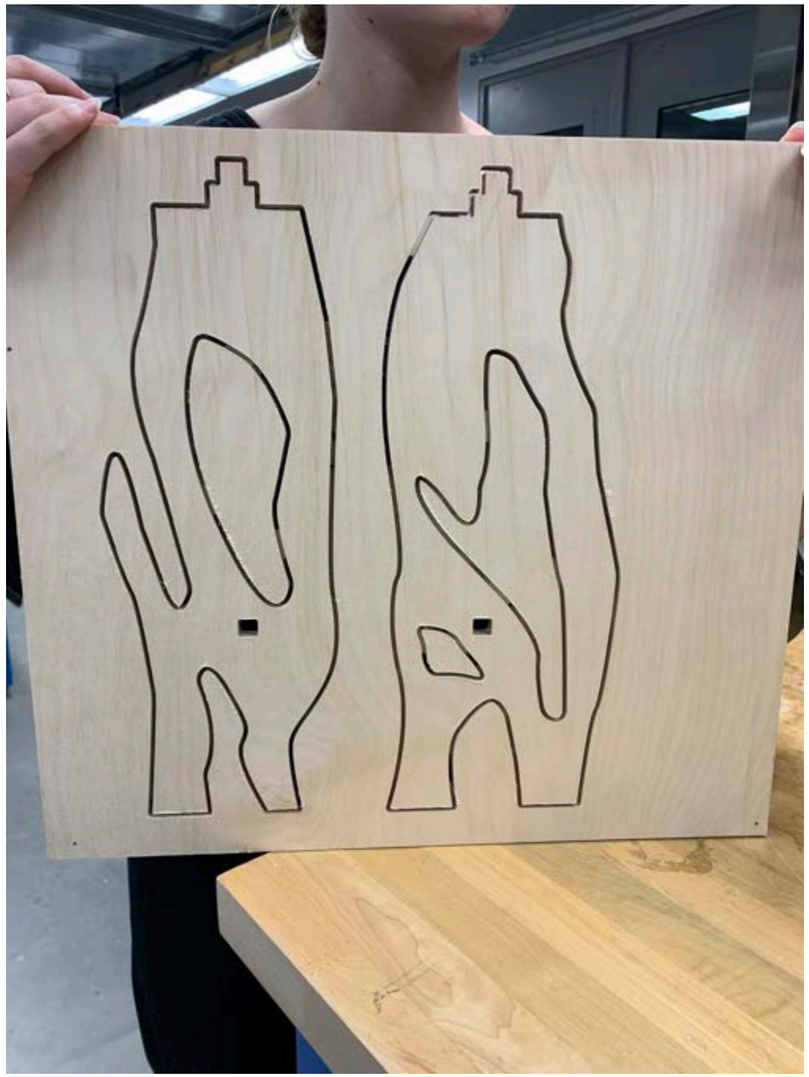


Table parts stacked together

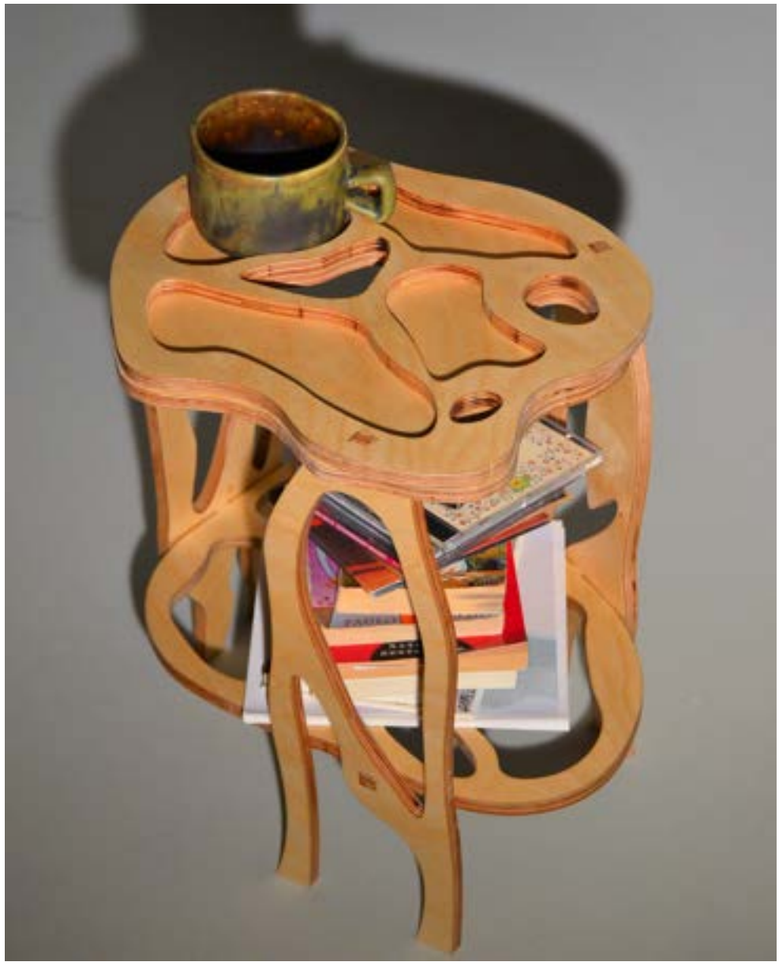


We realised some of the legs were too narrow so we decided to do a second CNC cut with new leg designs.

Oiling process using linseed oil

Final Documentaion

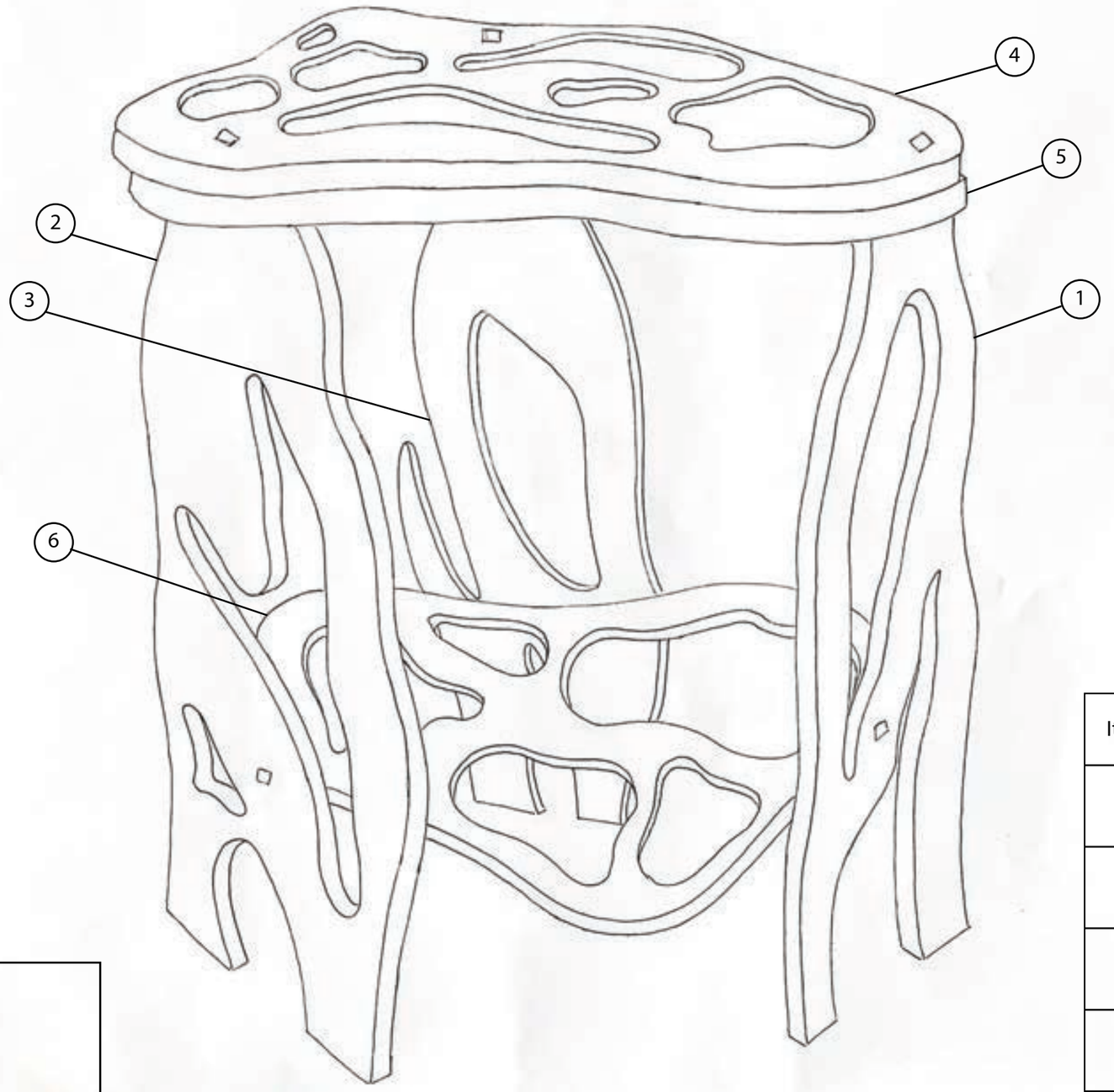
Staged 3 ways



Detail shots highlighting the round hole textures on top and where the legs join.

Using a shoulder method on the top of the legs and on the middle support piece allowed us to assemble the table without the use of nails or glue while still being sturdy.

Technical drawing



Ella Olsen, Helia Gol Mohammadi, Jaya Guibert, Madeleine Mae Muir	1:1.3 Scale
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Item	QTY	Part Name
1	1	First Leg
2	1	Second Leg
3	1	Third Leg
4	1	Top
5	1	Top Base
6	1	Lower Base