

ECHINOIDEA

ANNA
NOEL
FALL 2023

DART 447
FUTURE
LIFE OF
OBJECTS

The Echinoidea lamp is made by Anna Noel.

The shape originates from a sea urchin, *echinoidea*, found on the shore of Burin, Newfoundland.

The sea urchin was examined – its' purpose, its' form, its' colour, its' strength.

Time spent with the object inspired the form of the lamp. How best to represent the essence of the sea urchin in another physical form? What do I care about and want to represent in a new way?

The final product is a reflection of care.

An object found while beach combing with my mom in a town she lived in during her 20s. Hours spent looking at, feeling and learning about sea urchins. Holding it, memorizing how each bump feels on my fingers. Doing form and material explorations to find what would work best. Carving the wood, revealing plywood layers and allowing the light to pass through. Finishing touches and a sendoff into the world.



DESIGN BRIEF

A creative couple looking for lighting for their innovative and sustainable beach house.

Shapes inspired from shells around their area.

Looking for an adjustable / transformable lamp that can serve as accent or task lighting.

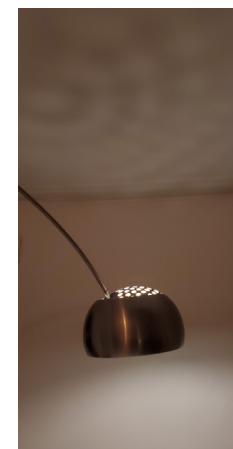


Space Inspiration

Fogo Island Inn, Newfoundland



Arco Floor lamp by Archille Castiglioni for FLOS



Structube arc lamp

Lamp Inspiration

The bottom shade opening provides functional task lighting over a table.

The top of the shade provides decorative accent lighting on the ceiling.

Urchin shells are an oblate shape

The shell naturally develops this shape from due to surrounding water pressure.

Urchins contribute to reef resilience. They help maintain conditions necessary for coral communities to recover after disturbances.

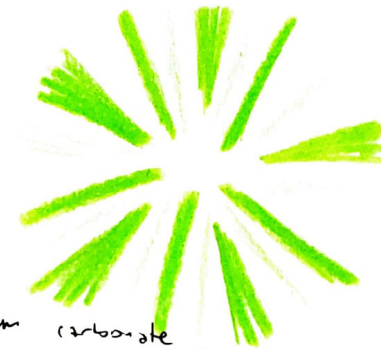
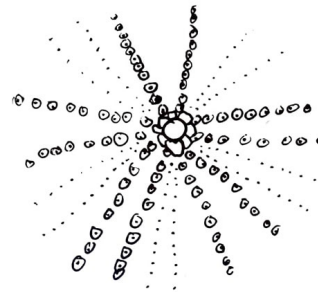
Five fold geometry.

Each bump is where a spine was. Spines serve locomotion, sensory and protection purposes.

WHAT DO THE SHELLS SAY?

URCHIN

interlocking nodes coming together in circle based dome



shell is oblate;
a flattened sphere naturally develops this shape due to water pressure

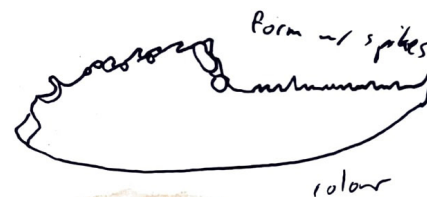
what they all have in common urchin, crab, lobster
small dots/circles not sharp, but spiny bits

-shell made from calcium carbonate
-made when calcium oxide, water and CO₂ are combined

Lobster claw

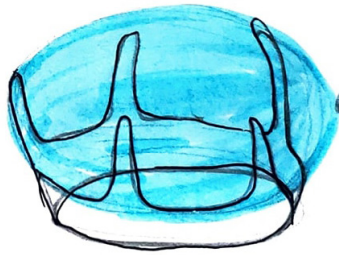
one side was lying face up so it's sun bleached, whereas the other side has richer colours and patterns

-lobster shells made of chitin, proteins, calcium, carotenoids
-chitin is 75%



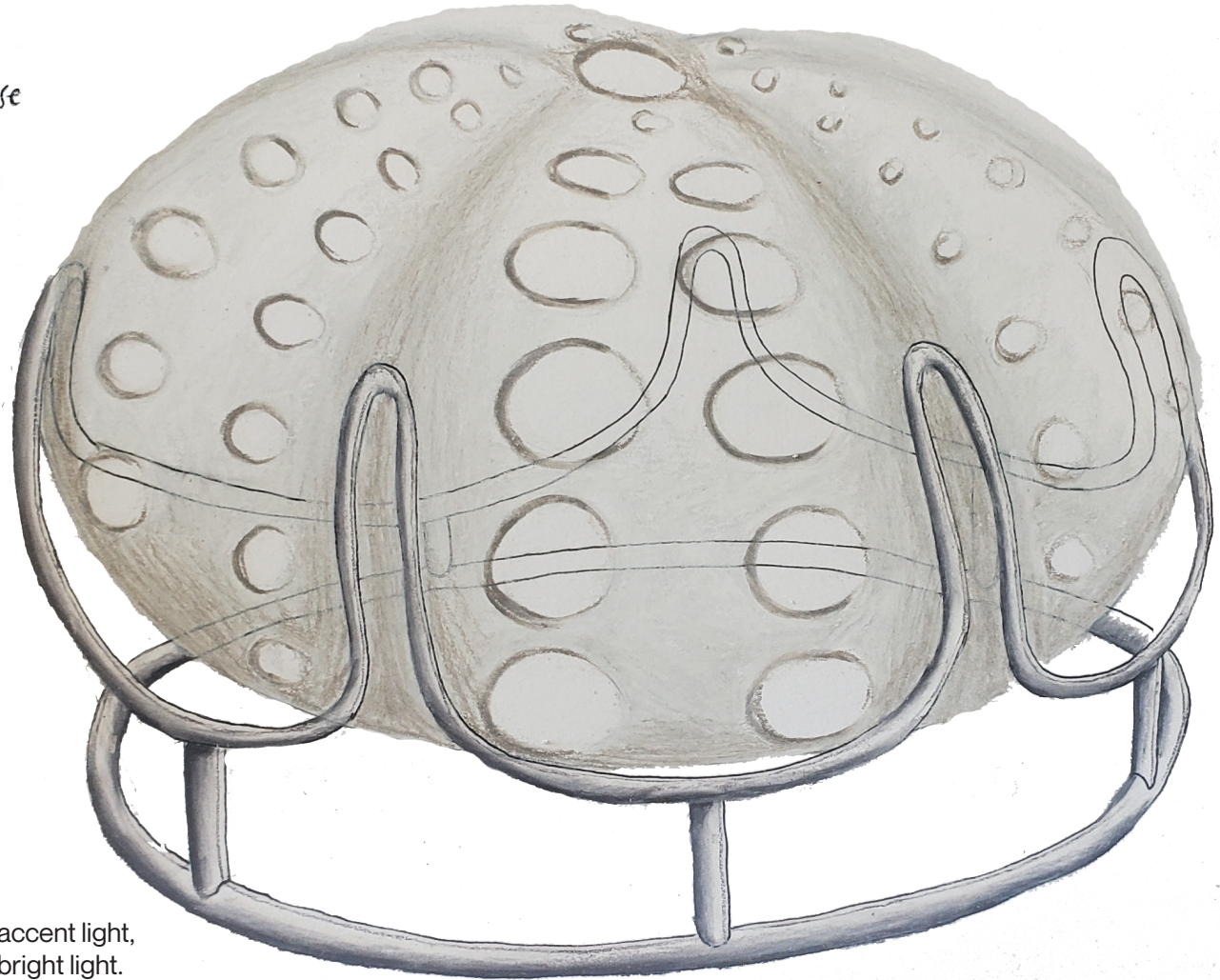
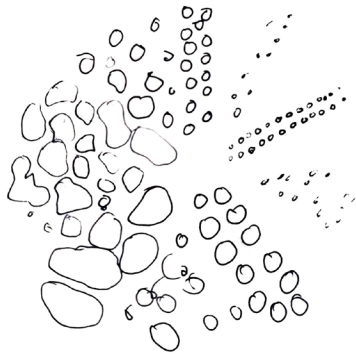
pores in lobster shells are called pits





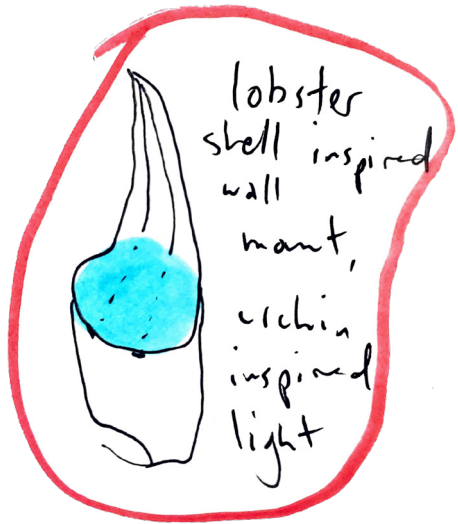
flat base
can be
on wall
or on
table

PARALLEL & CONVERGING

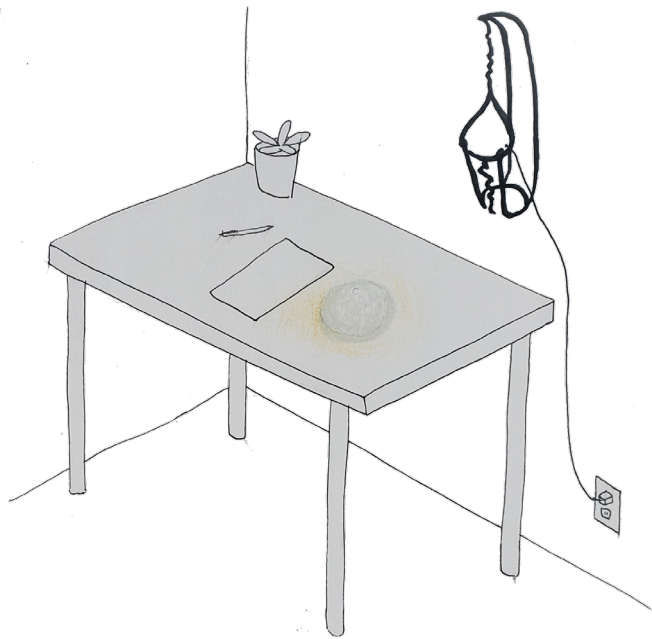


Small openings will create more focused accent light,
large openings will create more ambient, bright light.

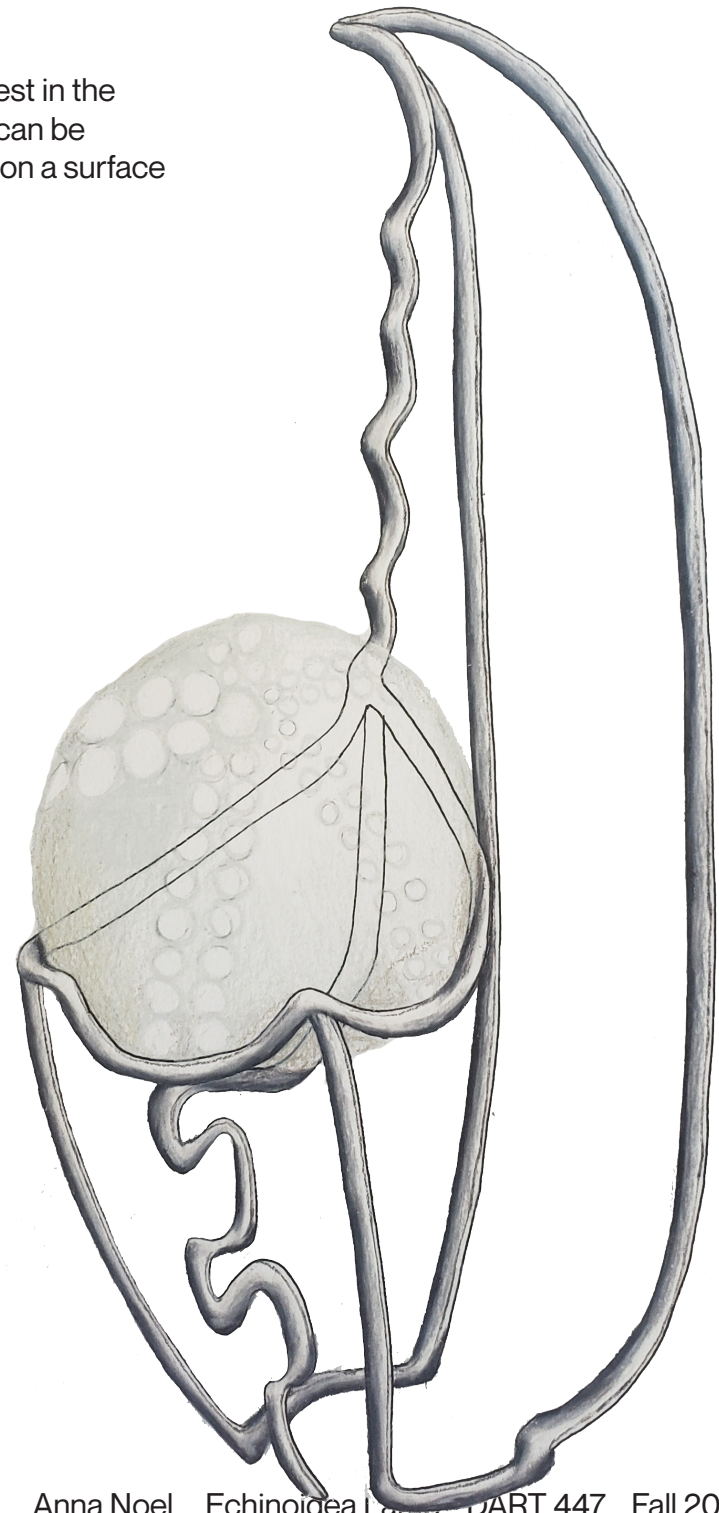
Frame: Repurposed metal bars
Lamp: 3D Print

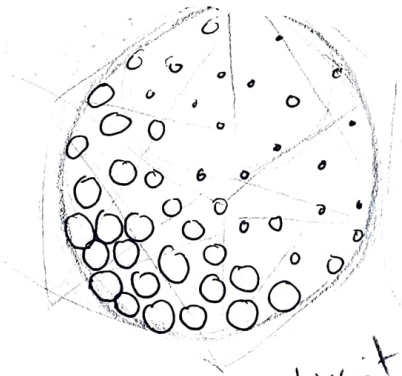


The light can either rest in the frame on the wall, or can be removed and placed on a surface as task lighting.

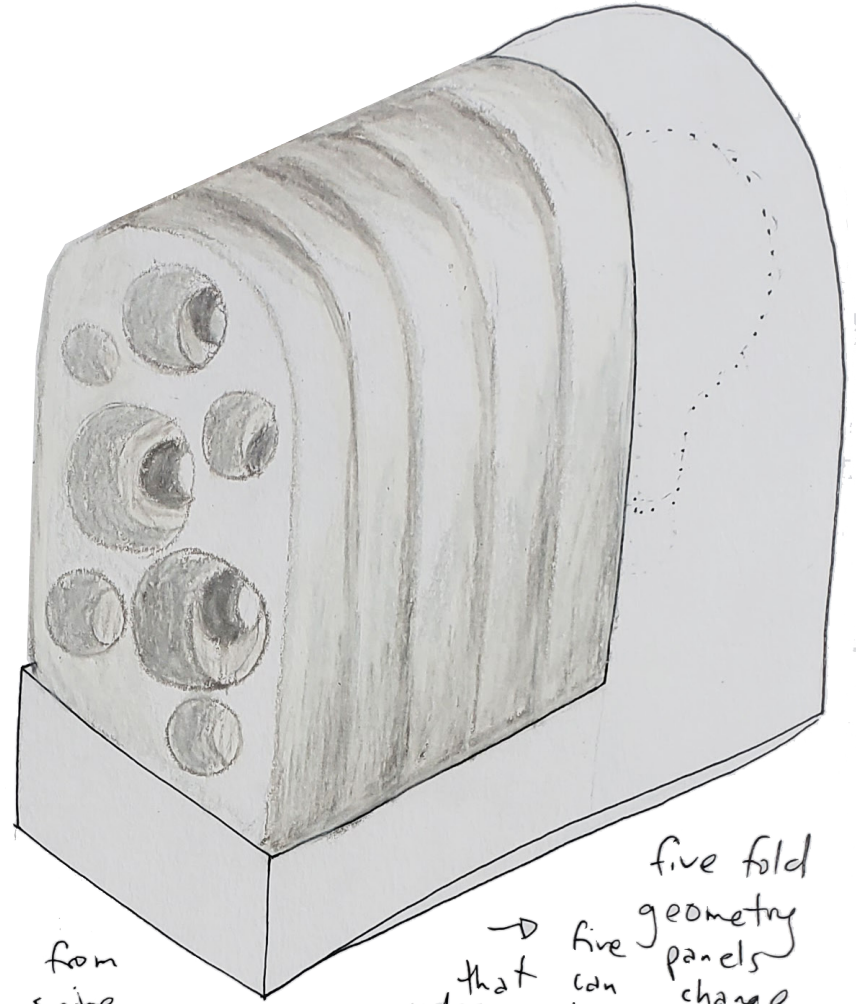


Frame: Repurposed metal bars
Lamp: 3D Print





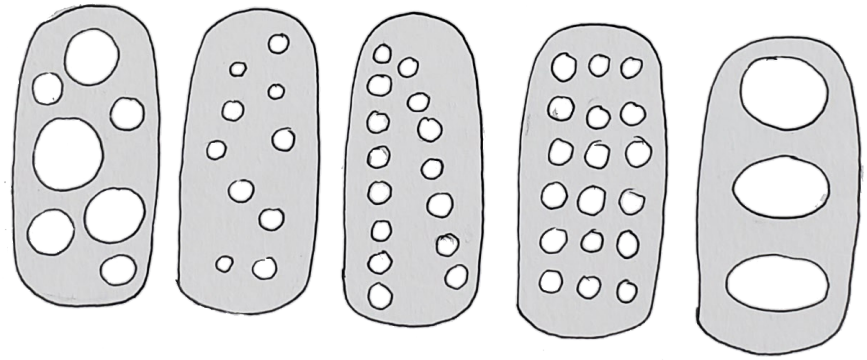
will the shade be 3-D printed? materials not reused
 doesn't have to be spherical!
 - don't want spherical
 circular economy strategy



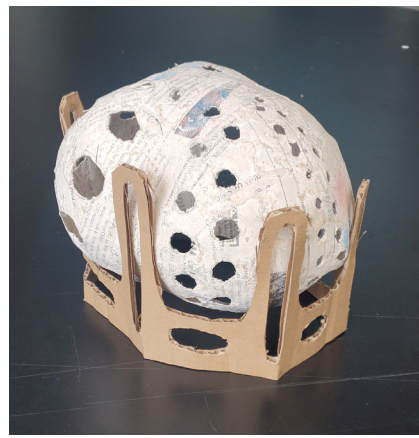
Panel designs from urchin spine nodes

five fold geometry panels that can change order that light can put out change

Stand: Repurposed metal
 Panels: 3D print



back light

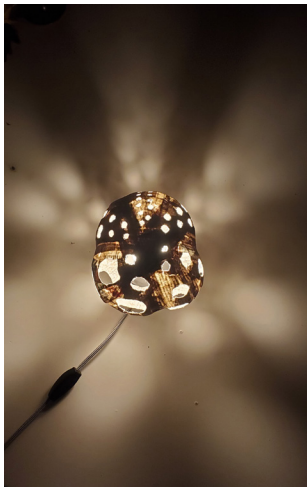


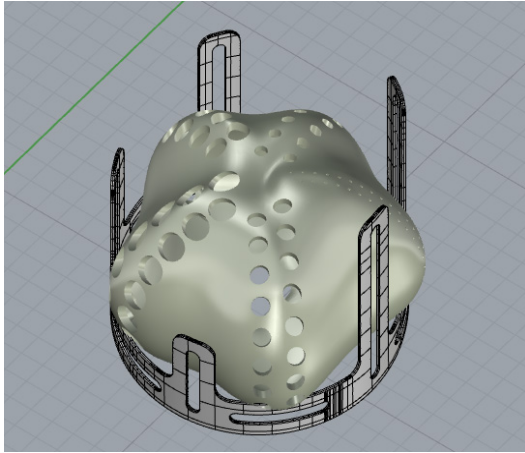
Maquette

Made using paper mashe newspaper and cardbaord

The light would be incased inside the shell, which would be detachable from the stand.

I loved the shape of the maquette and the light effects it made, but did not know how I would effectively make it out of another material.

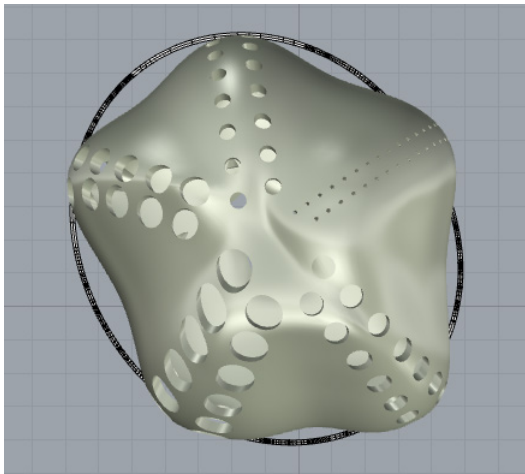




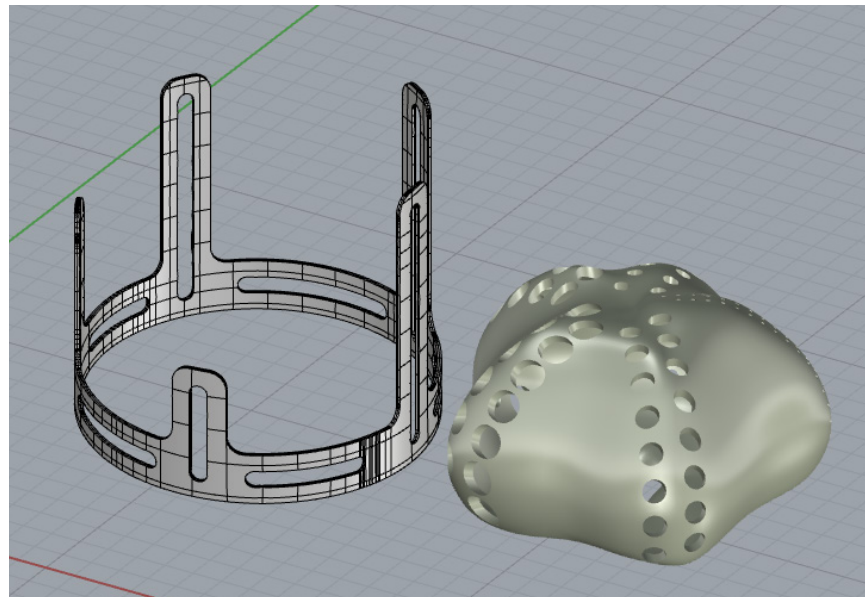
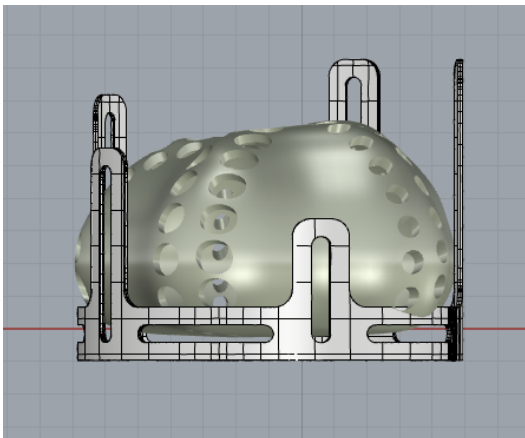
First idea - 3D model

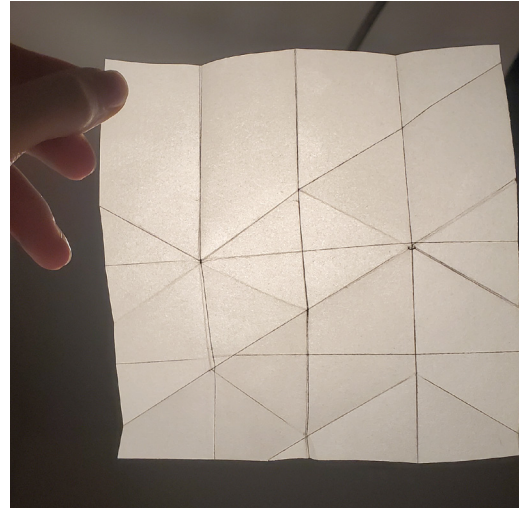
The shell would be 3D printed with PLA, the base would be aluminium.

This design succeeded in resembling the round form of the sea urchin but in a more organic way. The holes ranging in size and positioning would allow for light to be diffused differently. The smaller holes would create more of a accent light effect and the larger holes a more ambient light effect.



However, 3D printing a solid piece for the upper part of the lamp did not fully follow design for disassembly nor the circular design model. Using that much PLA for a single piece, which would also require a large support structure in the printing process, did not feel responsible and responsive enough to the ideological constraints of the project.





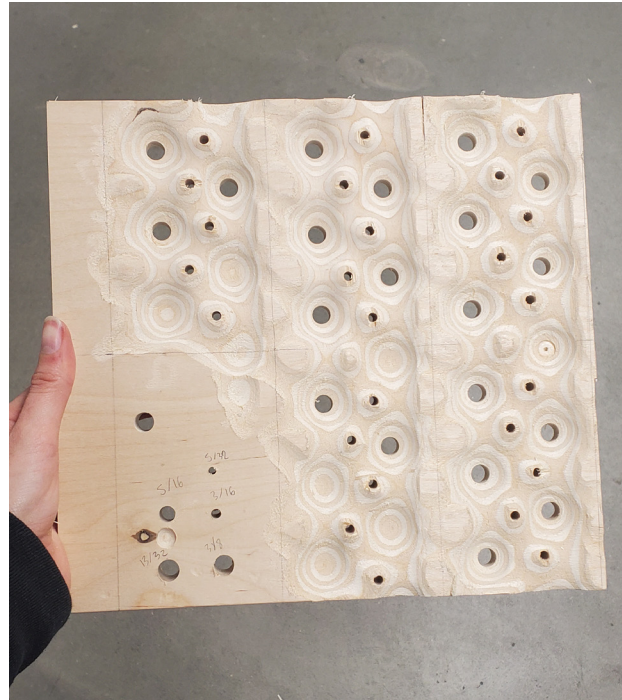
Moving on from 3D printing the entire shell, I experimented using origami to make a globe shape that would represent the sea urchin. I used vellum paper to be translucent and diffuse the light nicely.

Still following the five fold geometry central to the original design, the globe was made from 5 sizes of origami modules that fit together and were assembled with fish glue.

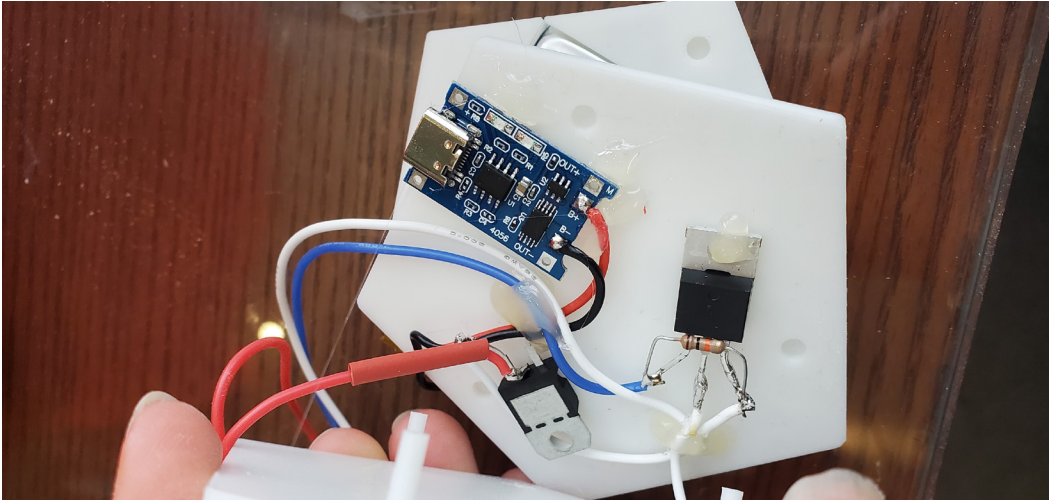
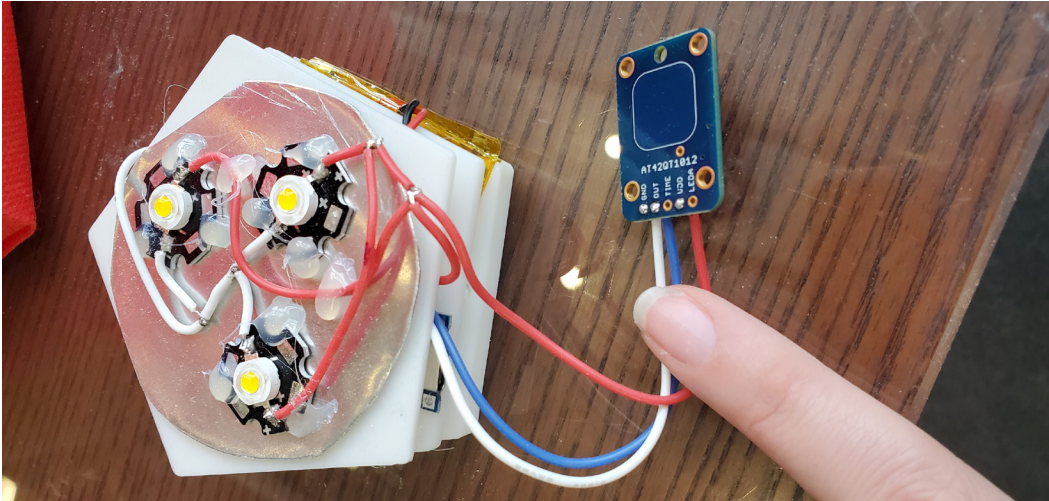
It was an interesting experience to work with a material I'm not very familiar with and a method of construction I haven't used for a large project before.



There were many drawbacks to using origami. The time it took to fold each module, figuring out the best methods to connect the pieces together, and planning how to connect each of the different sizes of modules together. The vellum paper was not strong enough to withstand much folding, and would rip along the folding lines. It was not a realistic option to make a final product from for this project.



When the other materials and assembly methods did not work out, I chose to use 3/4 inch baltic birch plywood that I had left over from another project. Using a 1 inch diameter rotary burr, I used a carving method I'm familiar with to create a wavy texture in the wood that would replicate the bumpy surface of the urchin shell. The holes for the light are 3/8 inch and 3/16 inch and fall in the peaks and valleys of the carving.



COMPONENTS

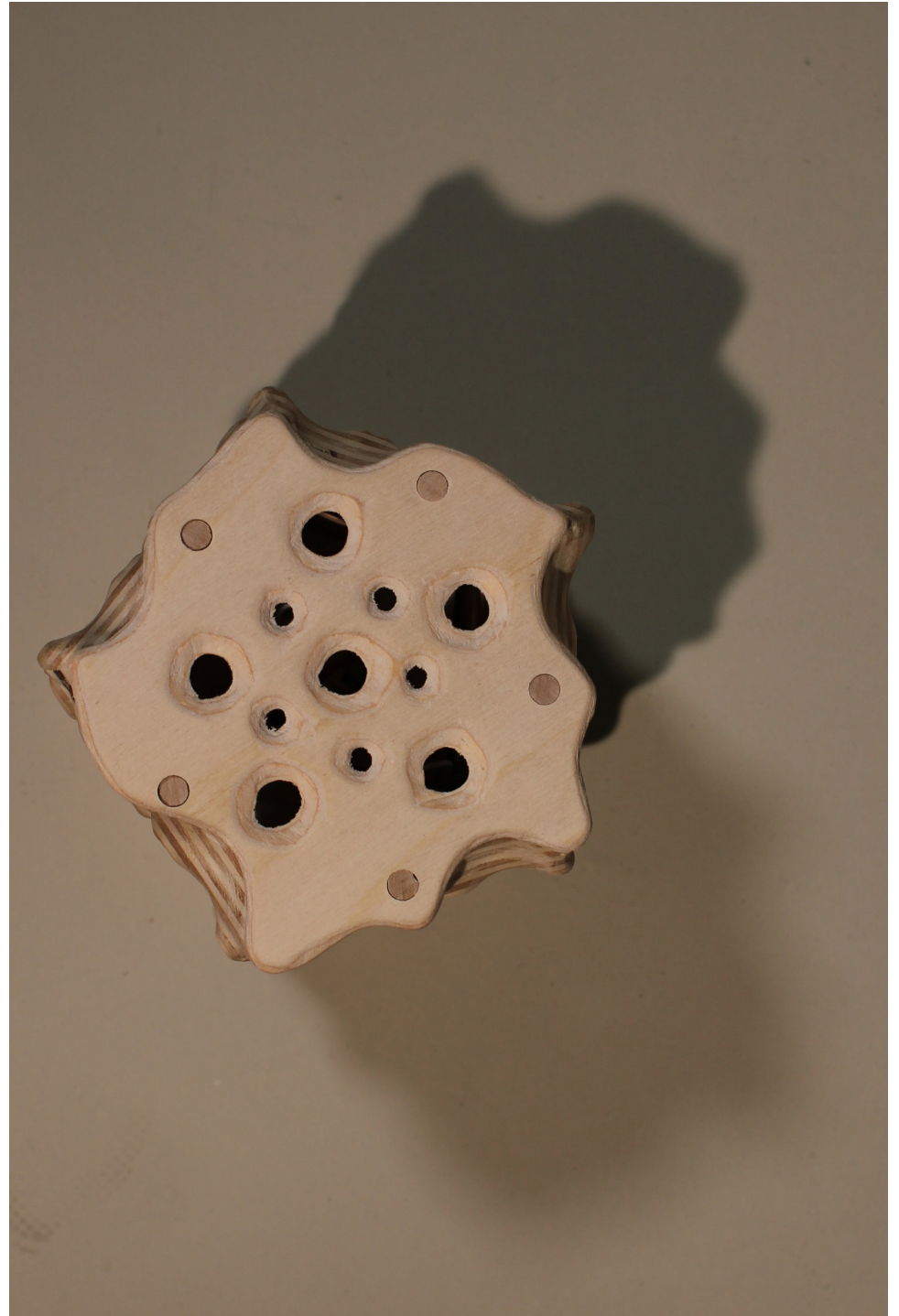
- 5 pieces of 3/4 inch Baltic birch plywood
- 2 pieces of 1/8 inch Baltic birch plywood
- 5 pieces of 1/4 inch diameter wood dowel
- Lee Valley High Tack Fish glue
- Clapham's Bees wax polish

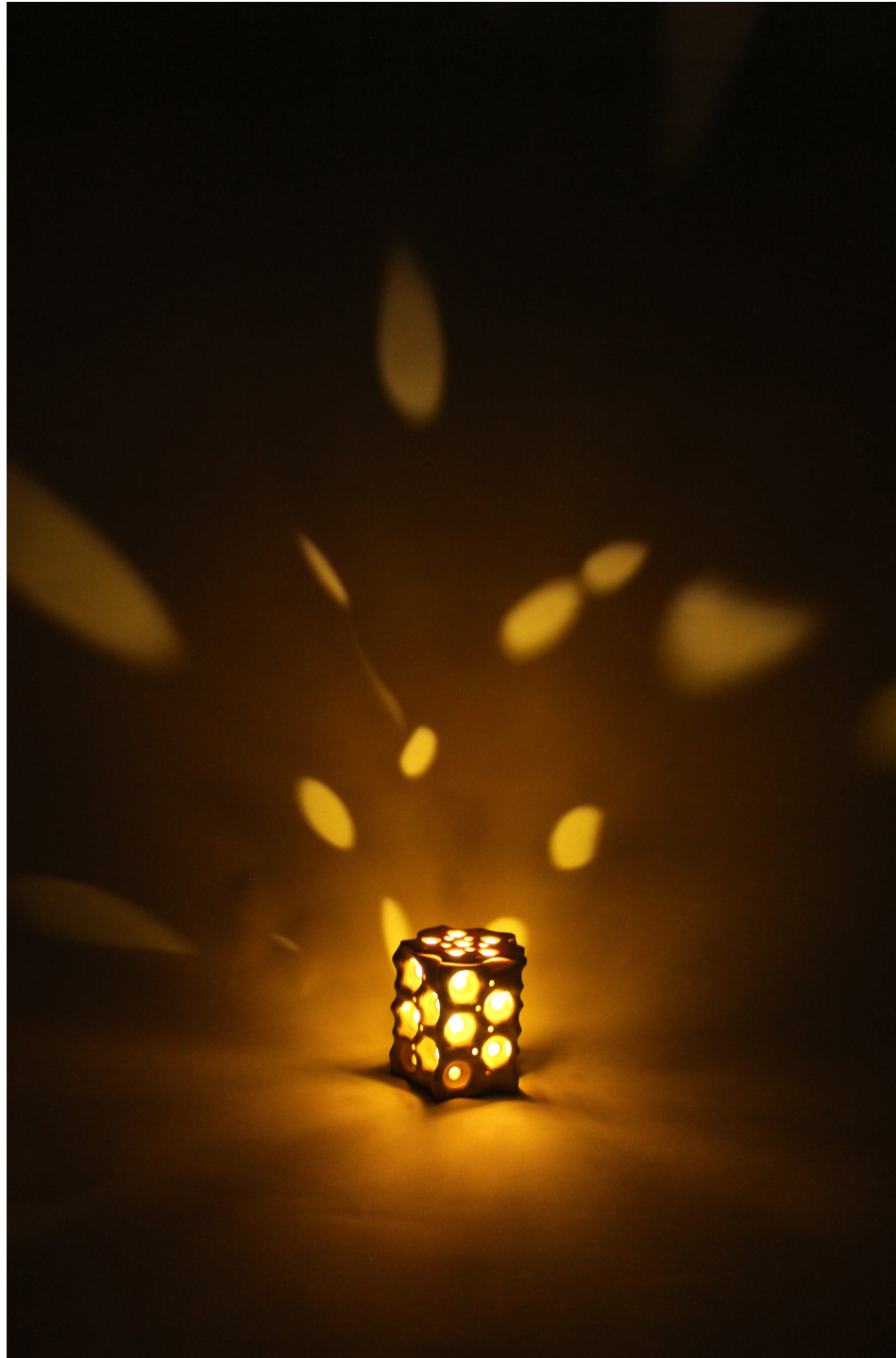
- 3 pieces of 3D Printed PLA plastic
- 3 LEDs - 3W Aluminum base
- Resistor
- Momentary Capacitive Touch Sensor
- 3.3 Voltage Regulator
- MosfET Transistor
- 3.7V 2500mAh Lithium Ion Polymer Battery
- 2 inch diameter aluminium circle





Anna Noel Echinoidea Lamp DART 447 Fall 2023





MATERIALITY

The lamp shell is not vegan with the use of fish glue and beeswax. Along with the wood, using natural and biodegradable materials allows for the lamp to be non-toxic and not contribute to the harmful effects of synthetic material waste.

Polylactic acid, or PLA, is a plant-starch based plastic, often based in corn starch, tapioca roots, or sugarcane. PLA can be recycled by shredding and reprocessing to create material that can be reused for other purposes. PLA can technically be composted; however, it is completely dependent on the composting conditions. It is still a plastic and could take hundreds of years to decompose if not handled properly.

HANDING OFF

Once the lamp is no longer needed in your possession, physically pass it on to its next user. A friend, relative, or mere acquaintance. Know who its' next user will be. Share the memories and care you experienced with the lamp with its new user. Share insights on how to interact with and cherish the lamp. Once the lamp is with its final user, follow the end-of-life plan.

END OF LIFE PLAN

1. Lift the top from the lamp body.
2. Slowly tilt the lamp upside-down until the lighting stack is accessible, and lift it out of the lamp body.

A) Use the lighting components and PLA for something else - another lamp, another project.

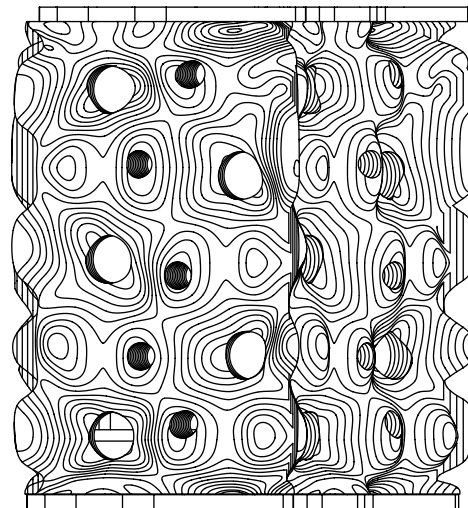
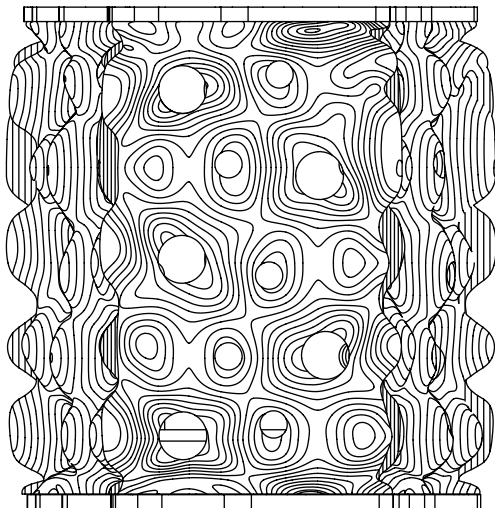
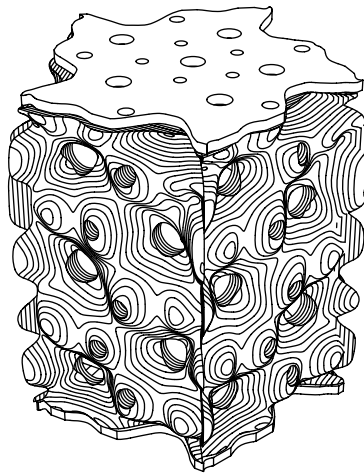
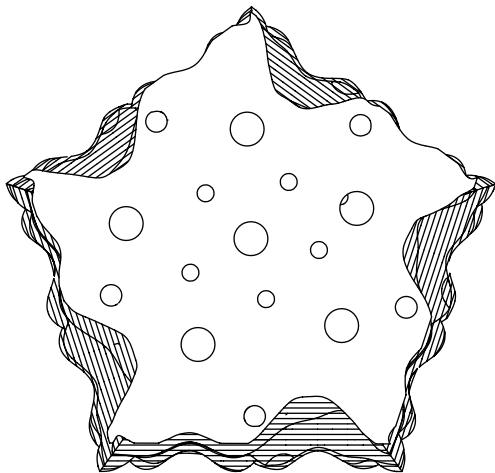
B) Disconnect the circuit and reuse the components for future projects or pass them on to another user. Locate your nearest recycling centre that can properly process PLA plastic.

3. Wet the seams of the lamp body. Fish glue is water soluble and will soften. Disconnect the pieces of wood.

A) Repurpose the wood pieces.

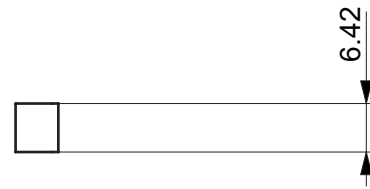
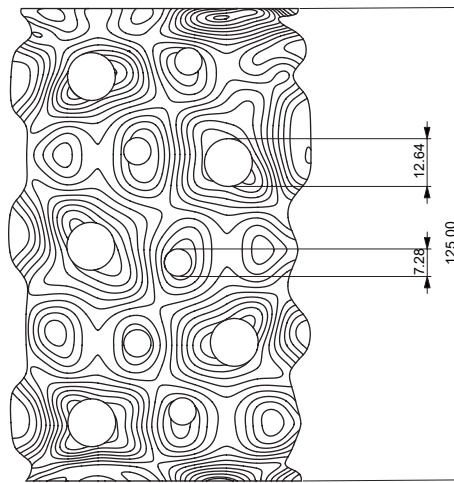
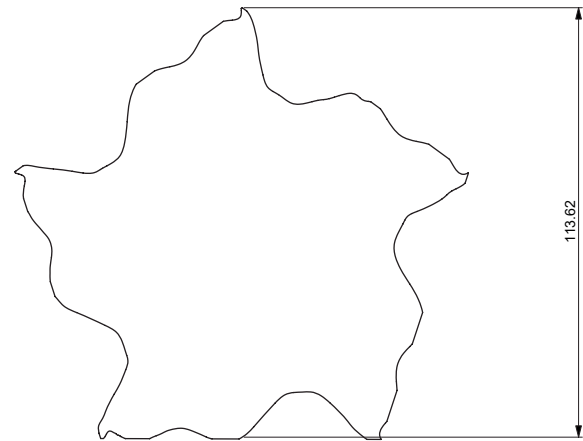
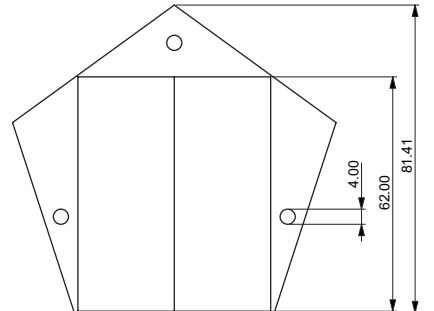
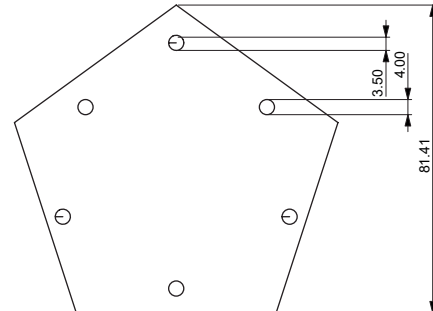
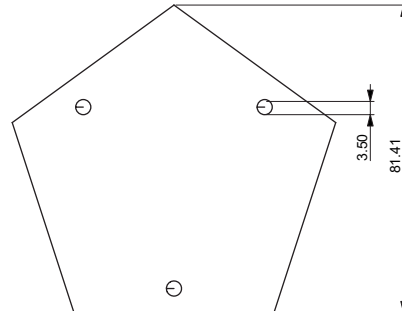
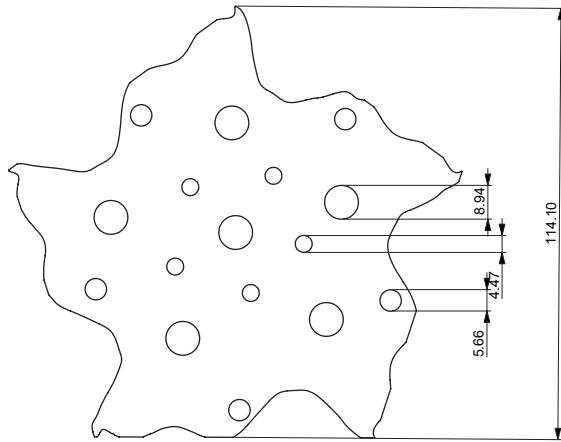
B) Burn the wood pieces. The lamp has served to provide light, so allow it to provide light one last time by being fuel for a fire. Honour the place the lamp

has held in your life. Be attentive and mindful of its' end-of-life process. Reflect on it's life, from origin of material, to place in your home, to fire bed. Be thankful for the light it provided and provides during this last ritual.

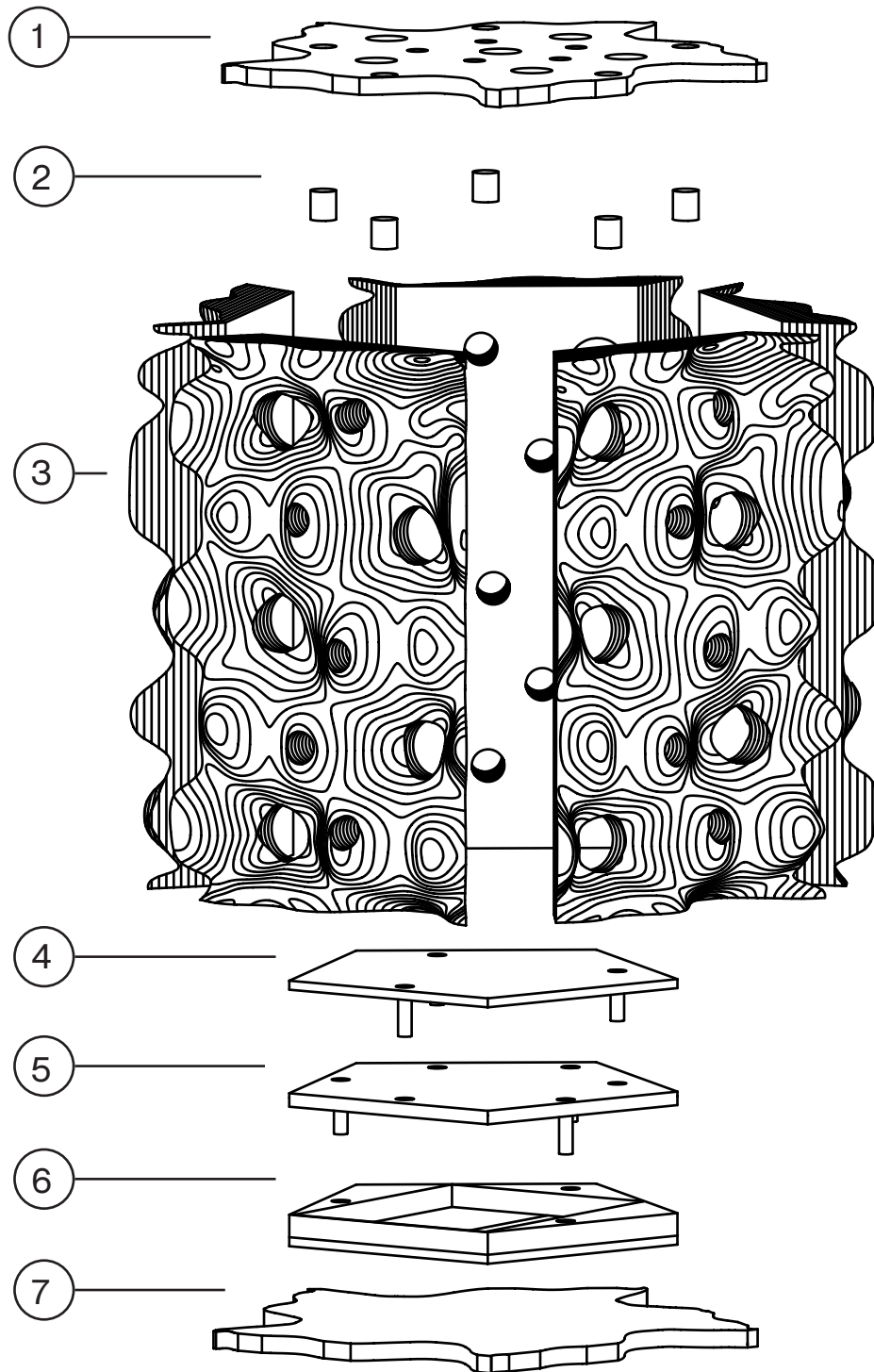


ECHINOIDEA LAMP

Name	Scale	Date
Anna Noel	1:2	December 7, 2023



Name	Scale	Date
Anna Noel	1:2	December 7, 2023



Item	Quantity	Part	Description
1	1	Top	1/8 inch Plywood
2	5	Pegs	1/4 inch wood
3	5	Side pieces	3/4 inch plywood
4	1	LED mount	PLA
5	1	Circuit components mount	PLA
6	1	Battery mount	PLA
7	1	Base	1/8 inch Plywood