

Lecture prepared by Carlos Fiorentino
using multiple sources, for the purpose
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DES *337-437-537 *Bio-centered design*

DES***337**
437
537



Grade distribution

Assignment 1 + participation w1
25% of the final grade

Assignment 2 + participation w2
25% of the final grade

Assignment 3
50% of the final grade

Bio-centered Design Concepts on Health and the Senses:

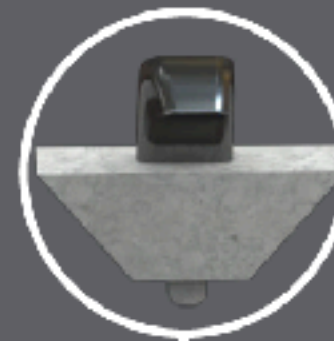
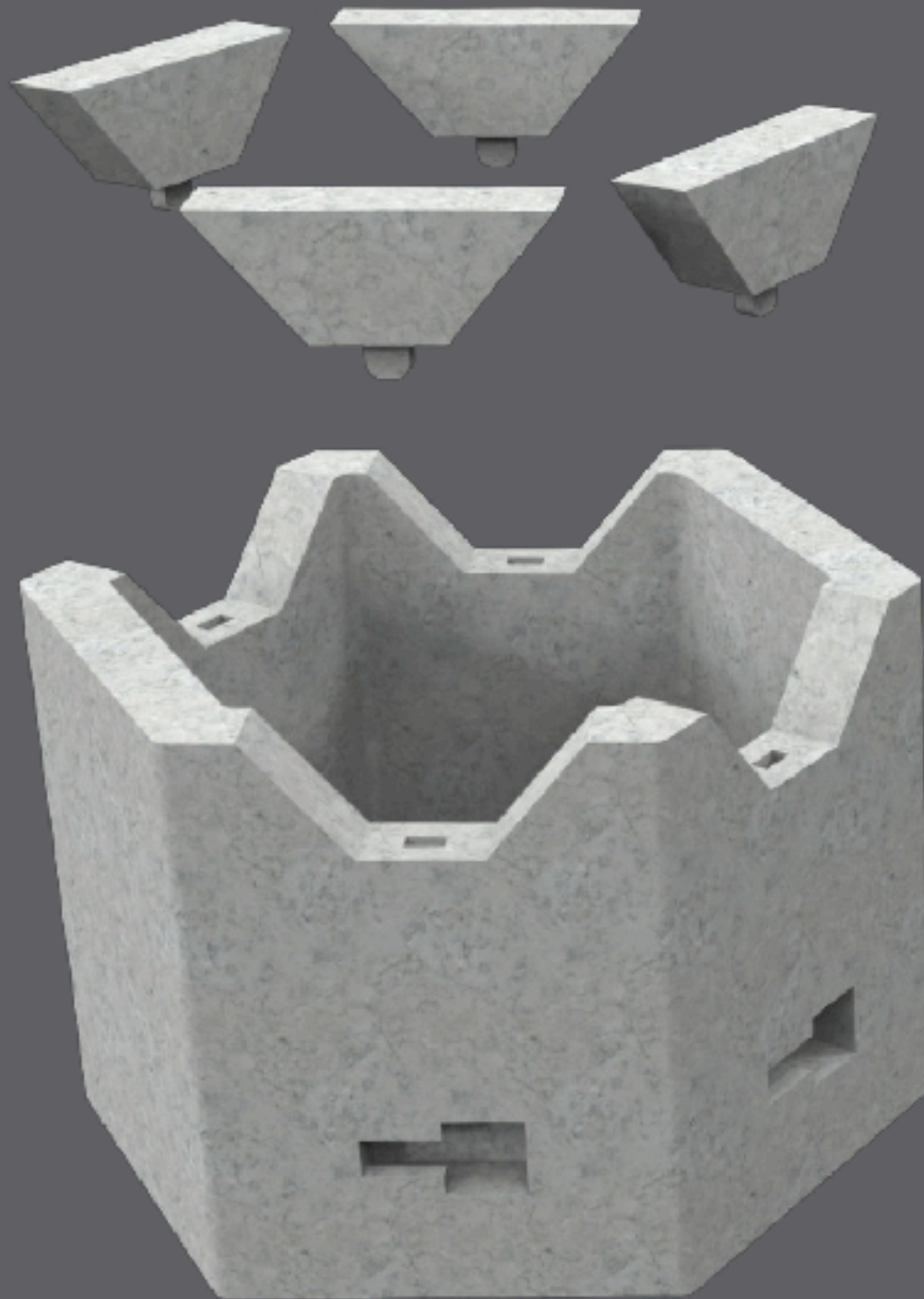
- **The Built Environment**
- **Mental Health**
- **Human Behaviour and other related areas**

Problem Statement:

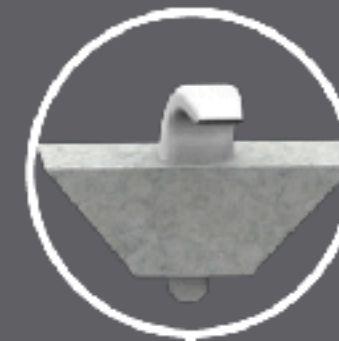
How might I introduce contact with the natural environment for individuals working in an office job in an inner city setting?

Hexa Modular Environment





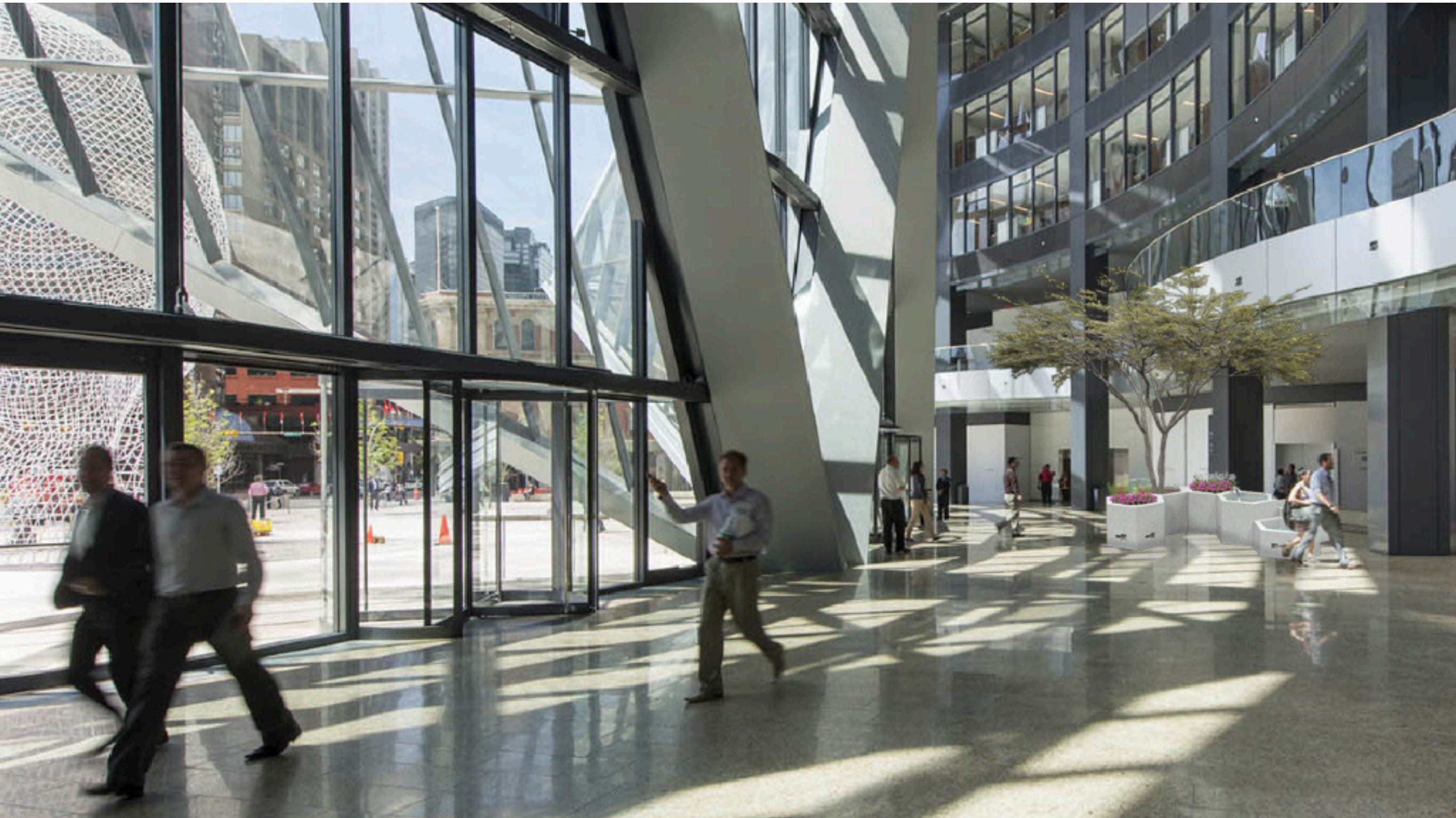
L.E.D Lamp



Fountain



Waterfall

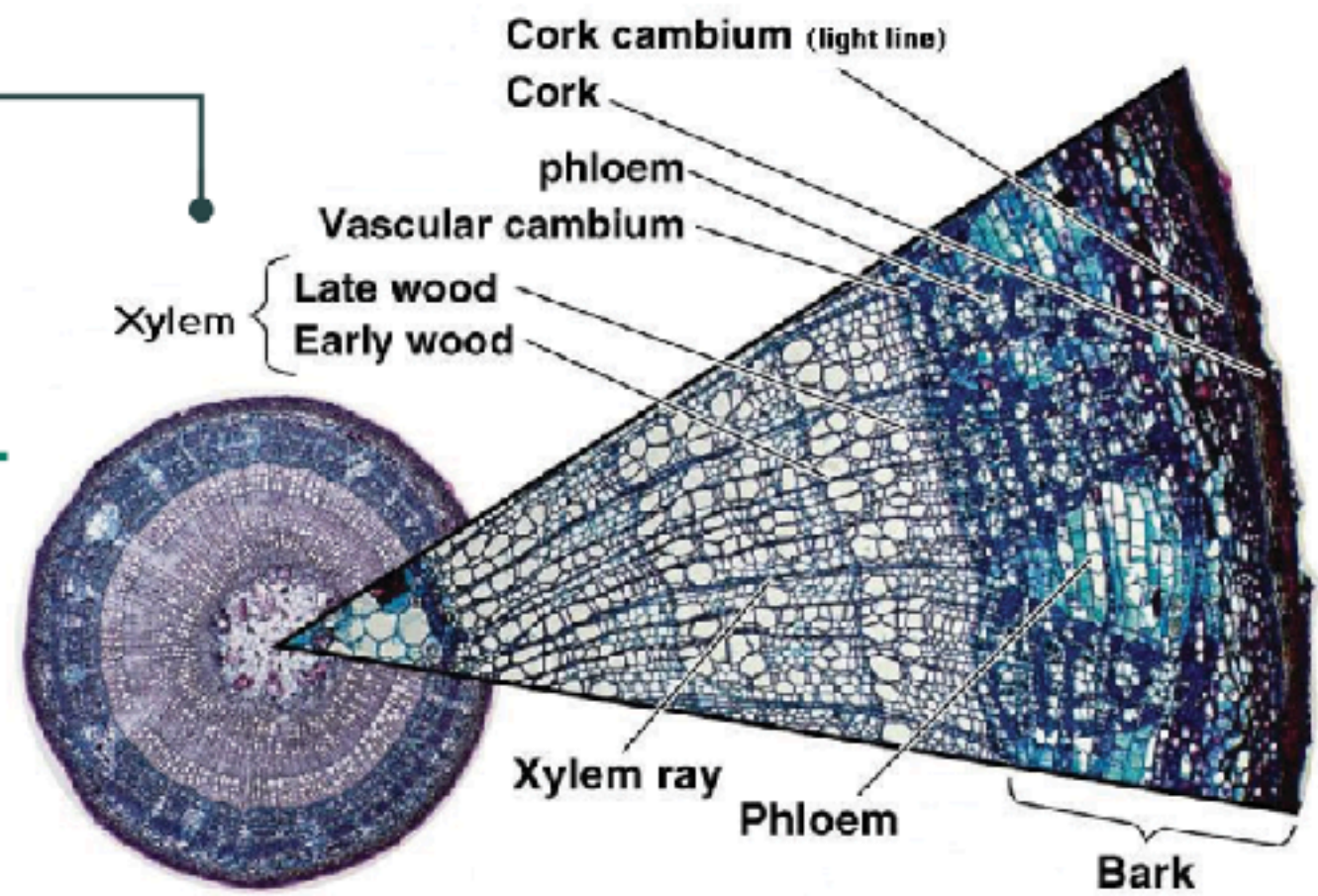




Noise pollution.

Research Question


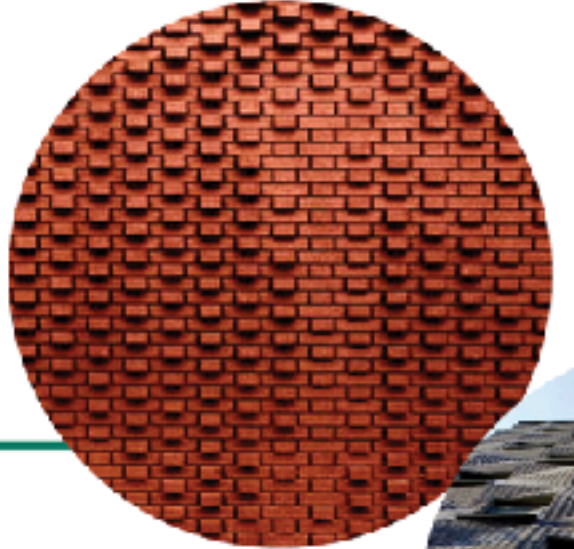
how might we utilize biomimicry methods in urban development and design to support hearing health and overall wellbeing of the populations in developed cities?





Implementation & Challenges

BioBricks to be created with biodegradable materials to produce pathways and construct buildings. Limitations of brick mould and to what extent is lignin biodegradable?



Research Question

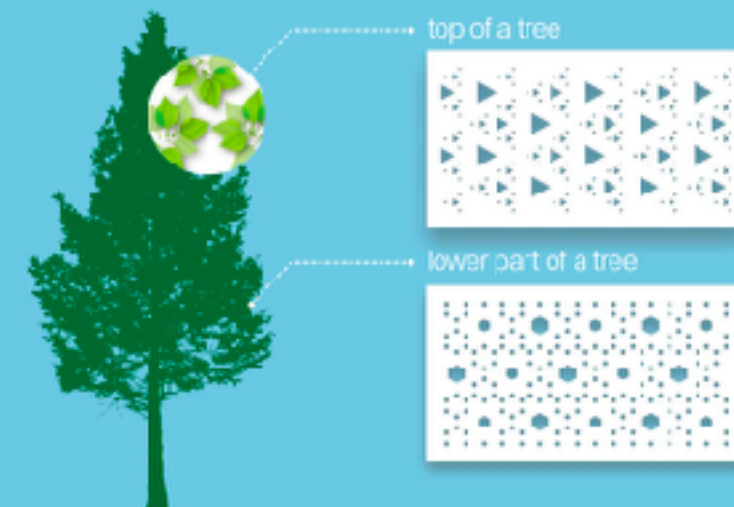
How might we integrate biomimetic systems into ultraviolet protection for children aged 0—11?

Fractal Shade (COMOLEVI)

Dr. Satoshi Sakai

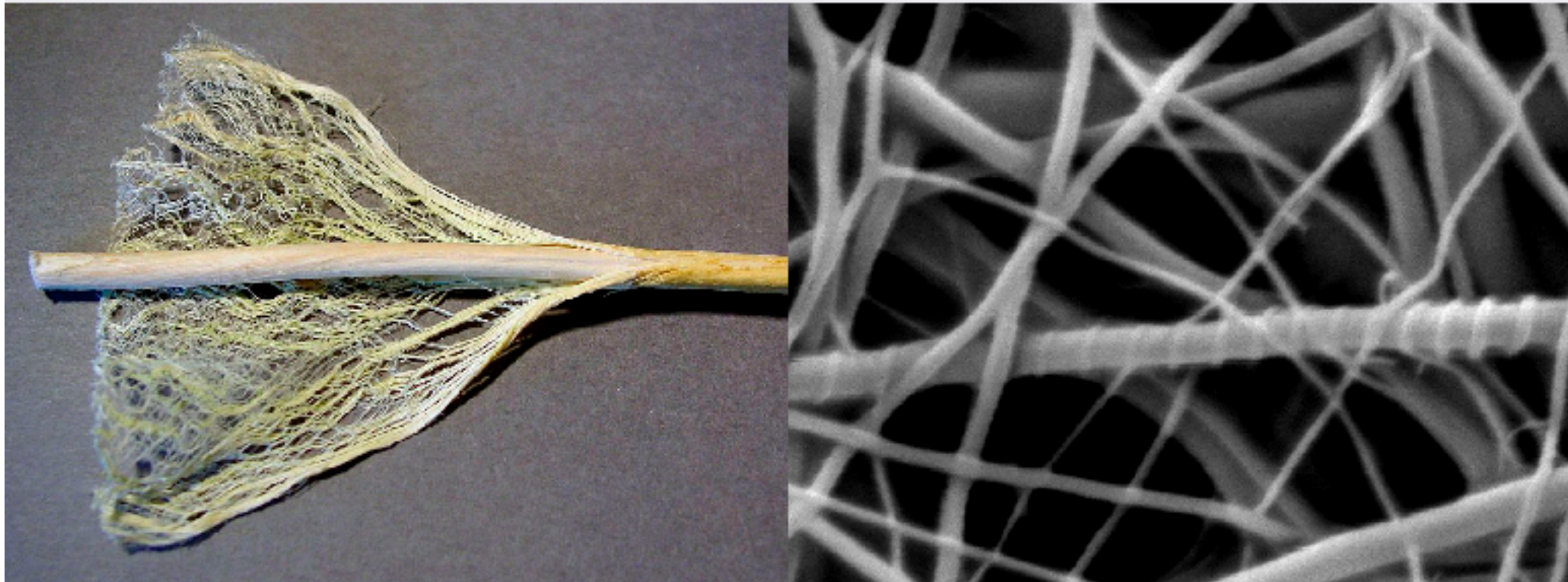


Fractal Shade (COMOLEVI)



Hemp Fiber & TiO₂

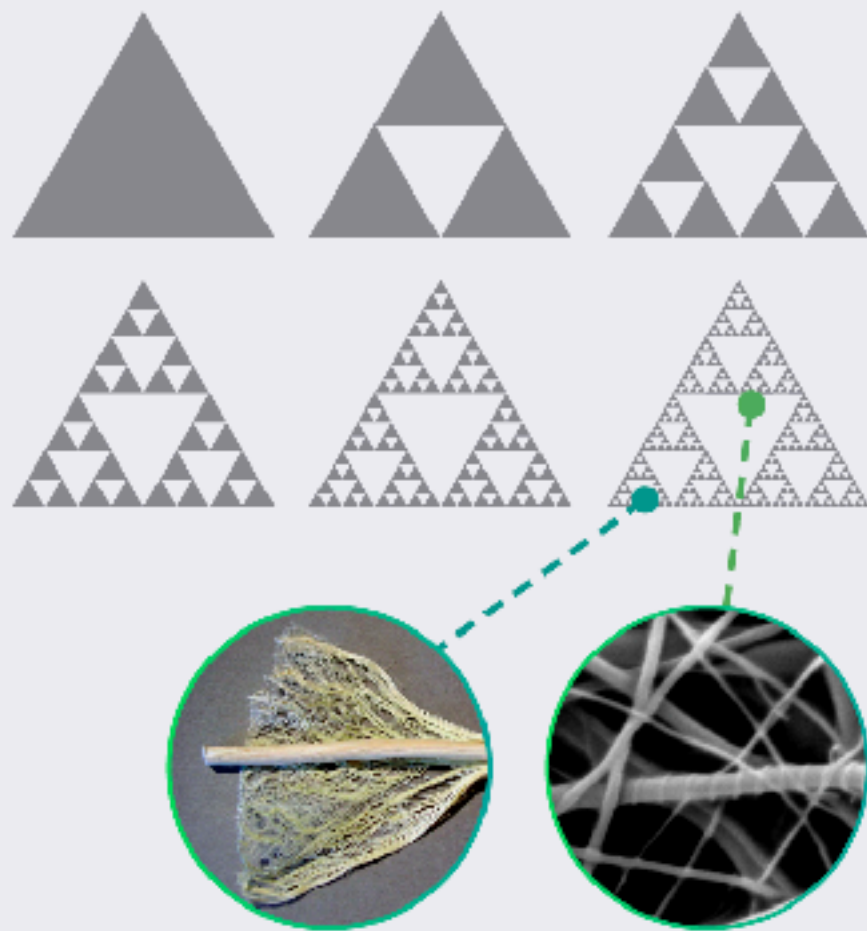
Integrating Sustainability



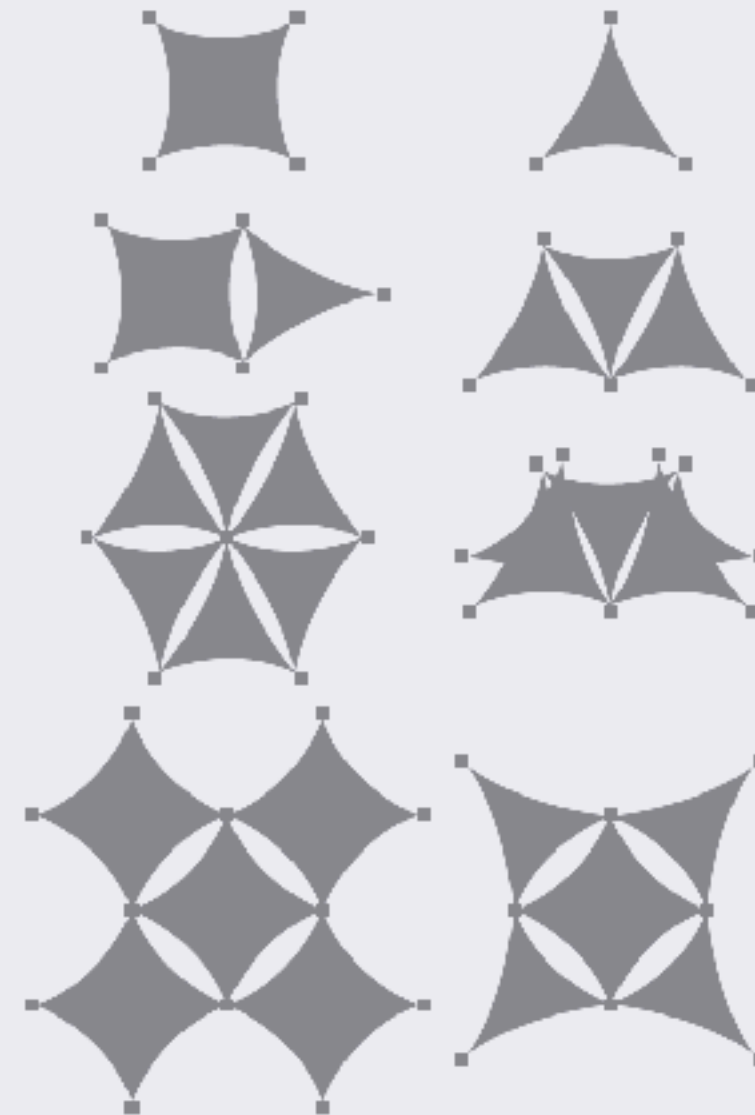
Hemp Fiber (Left)
Titanium Dioxide Particle (Right)

Final Solution

Bio-centered Approach

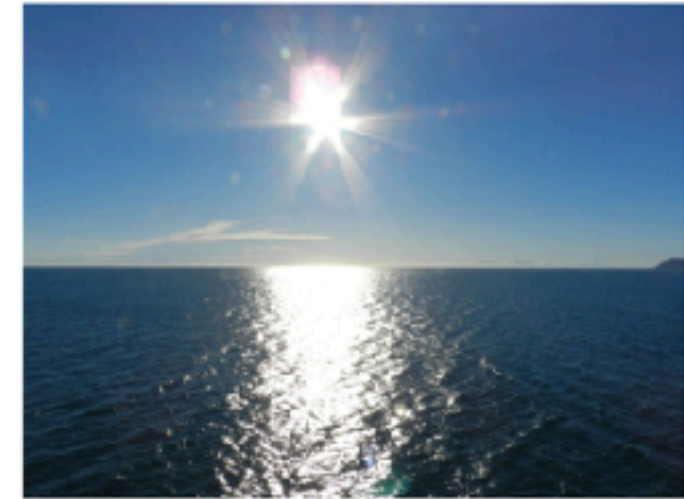
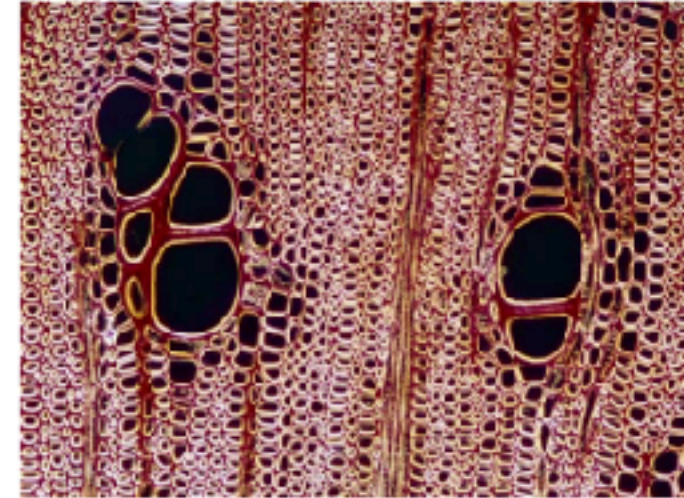


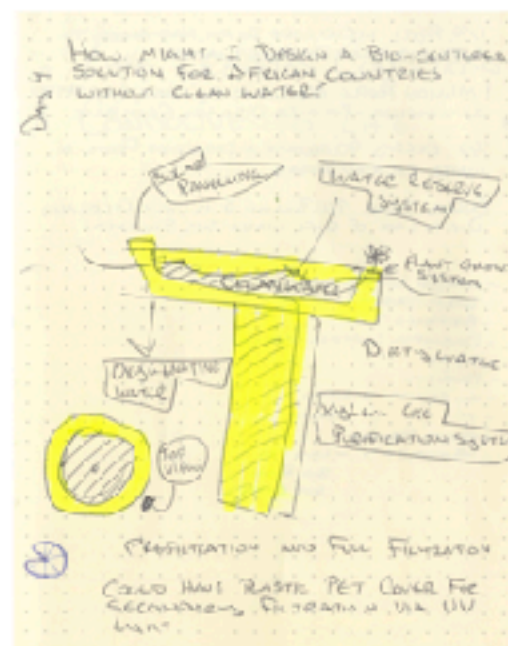
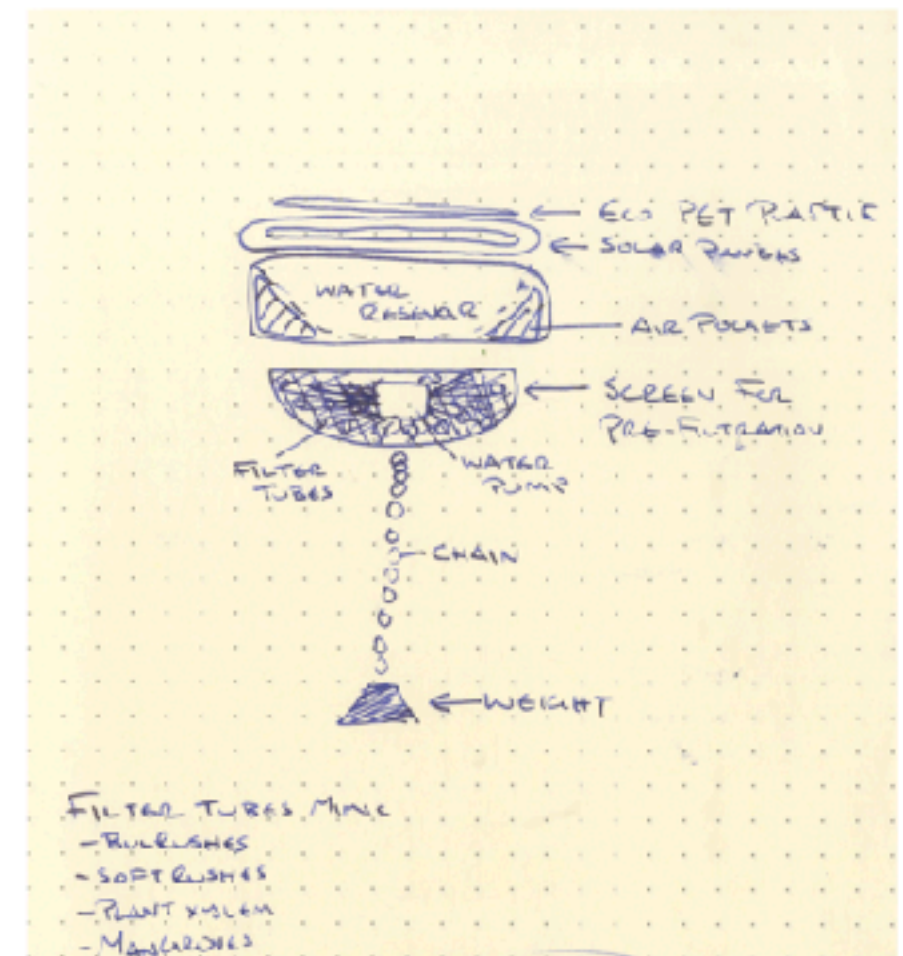
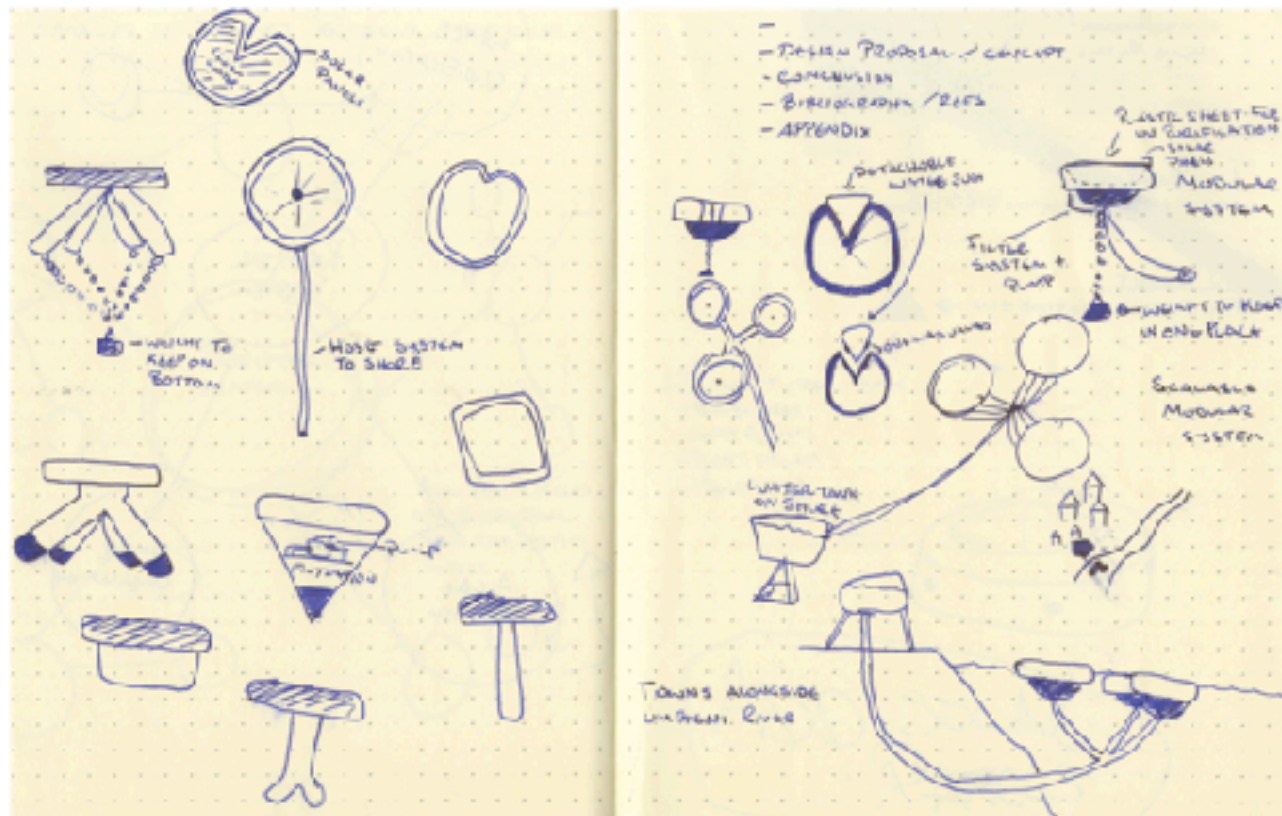
Individual Fractal Composition
& Material Integration



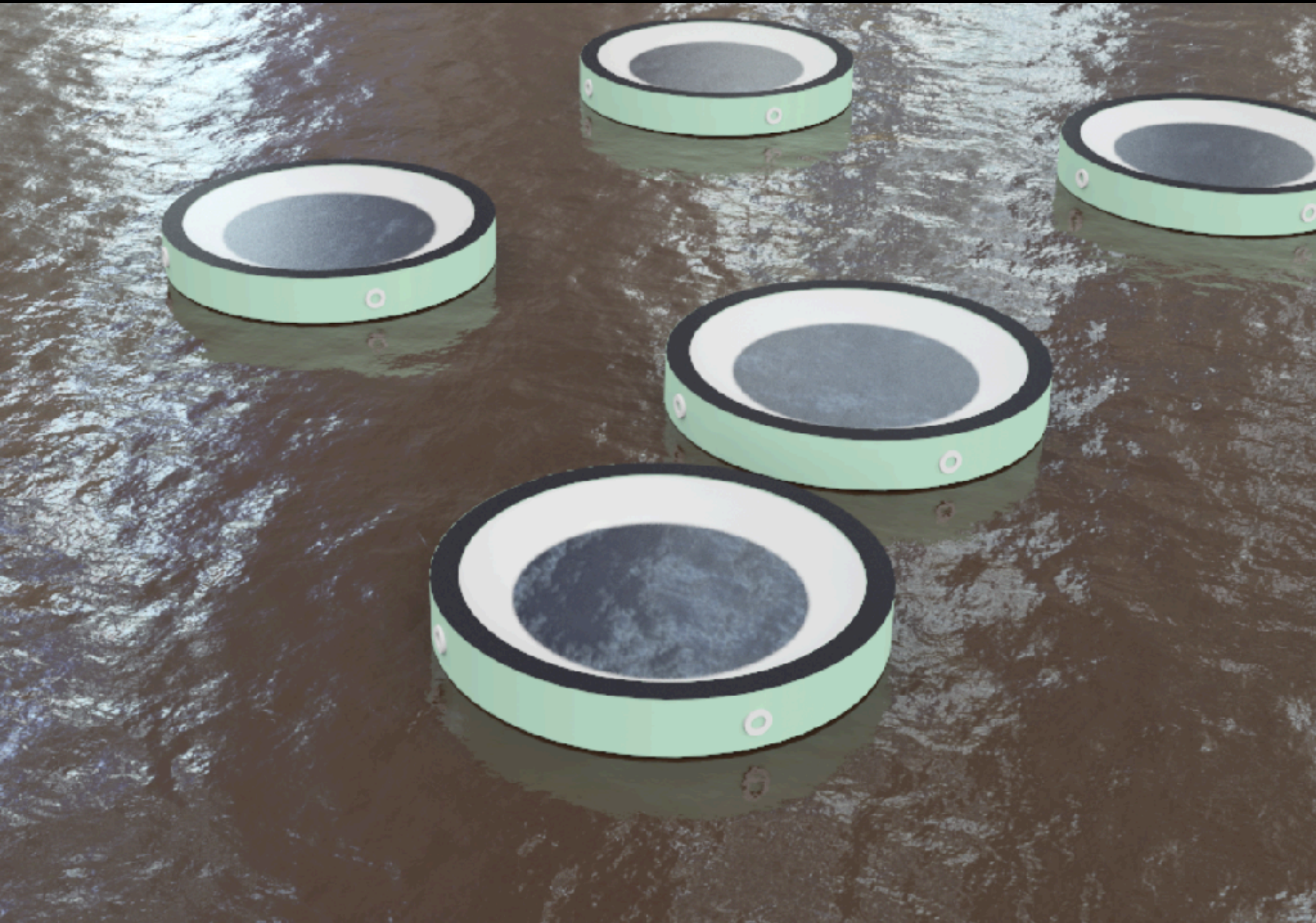
Triangular Fractal Shade Design
(Aerial View)

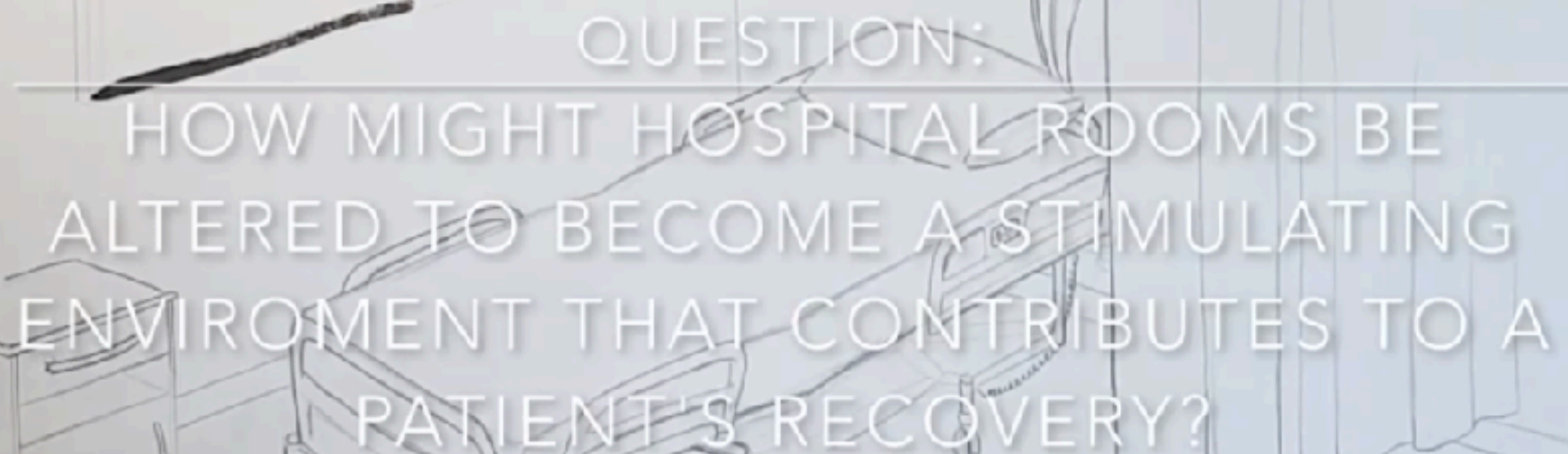
How Might I Design A Bio-Centered Solution For
African Countries Without Clean Water?












QUESTION:
HOW MIGHT HOSPITAL ROOMS BE
ALTERED TO BECOME A STIMULATING
ENVIRONMENT THAT CONTRIBUTES TO A
PATIENT'S RECOVERY?

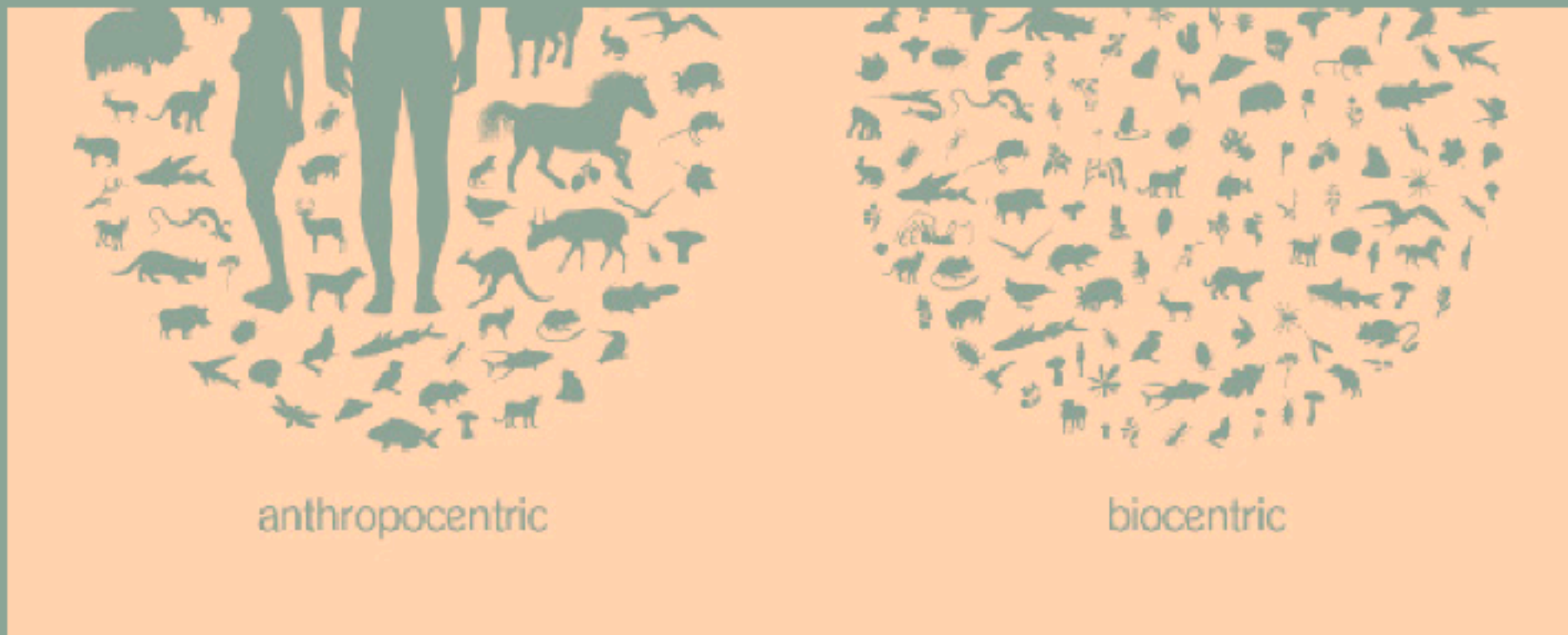
Visual stimulation



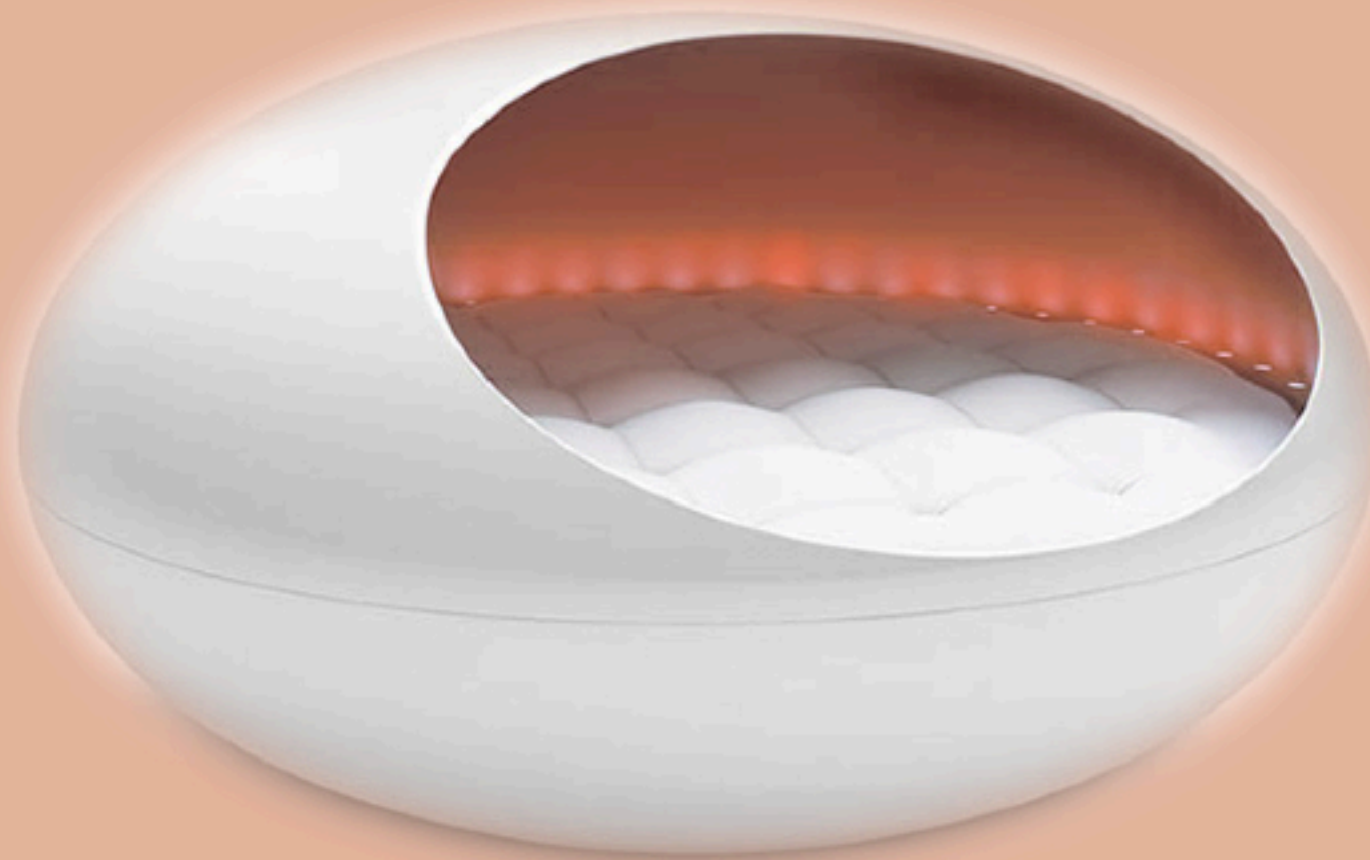




How might we create an improved sleeping environment for autistic children affected by chronic sleeping problems?



BIOSLEEP
POD



*a biocentered approach to improve sleeping
environment for autistic children affected by chronic
sleeping problems*

HOW MIGHT WE
HELP PEOPLE SUFFERING FROM NON-
SEVERE NON-24 HOUR SLEEP WAKE AS
A RESULT FROM TOTAL BLINDNESS RE-
ADJUST THEIR CIRCADIAN RHYTHM
NATURALLY?



Mexican Tetra



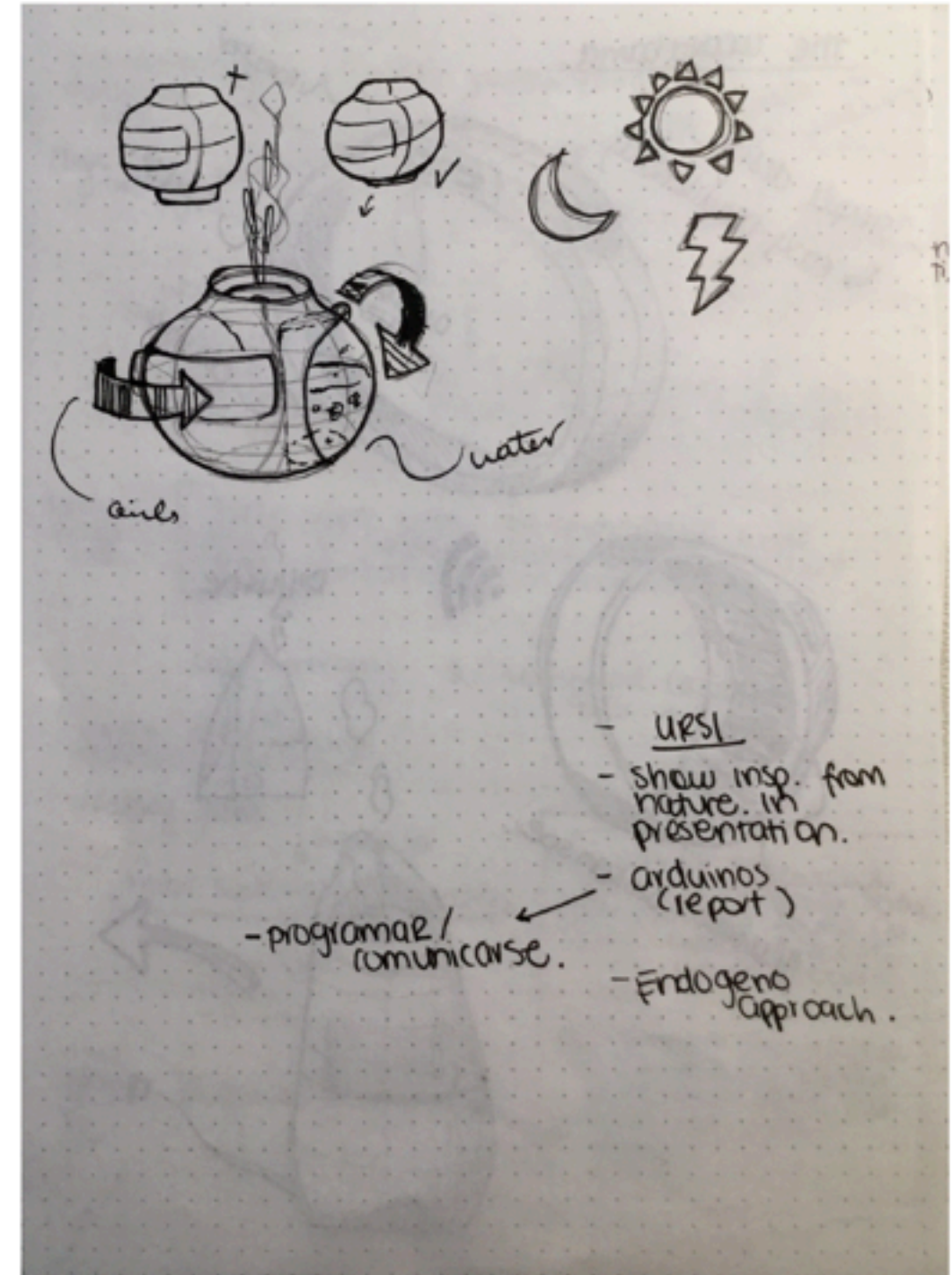
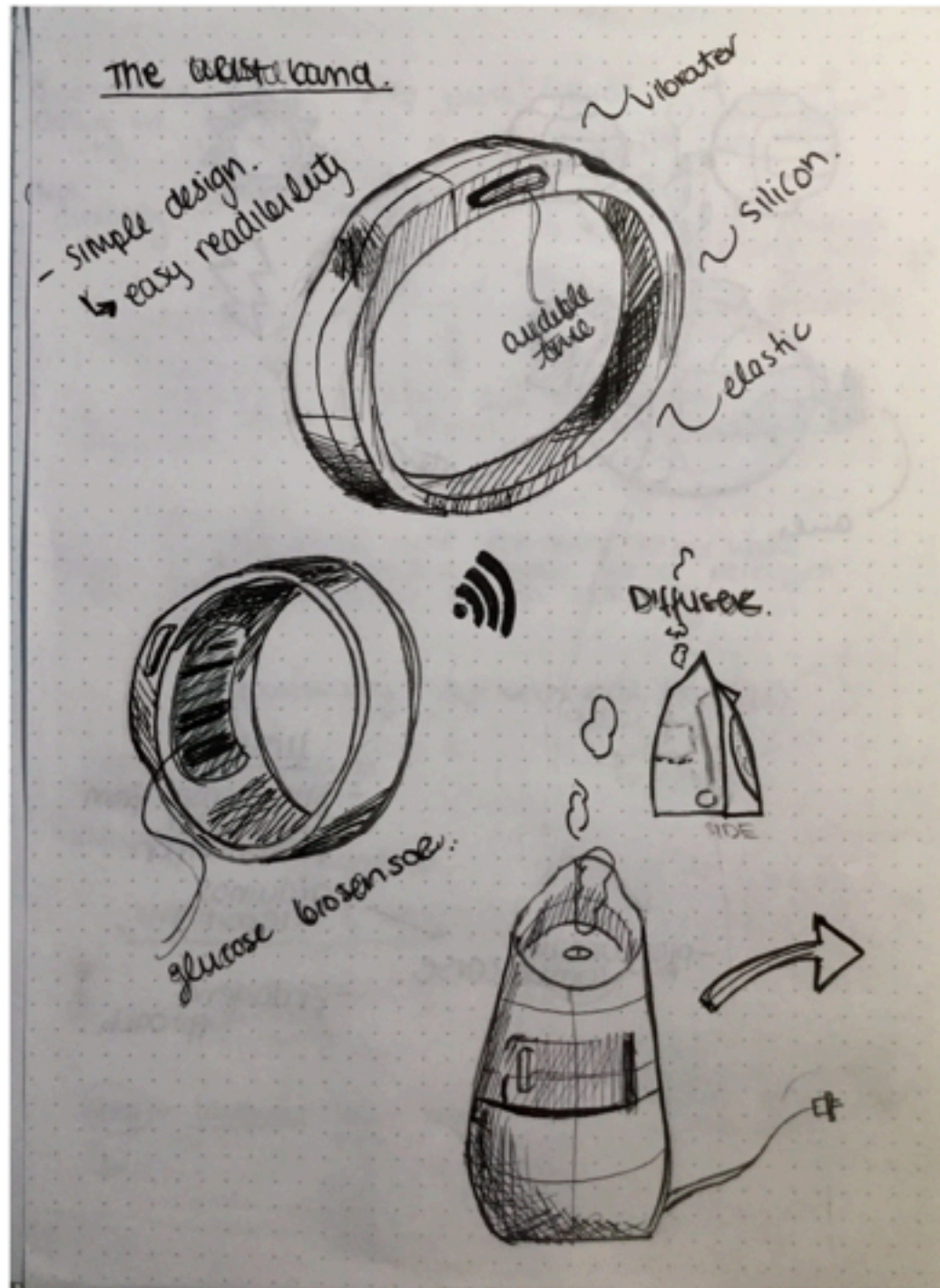
Star-nosed Mole

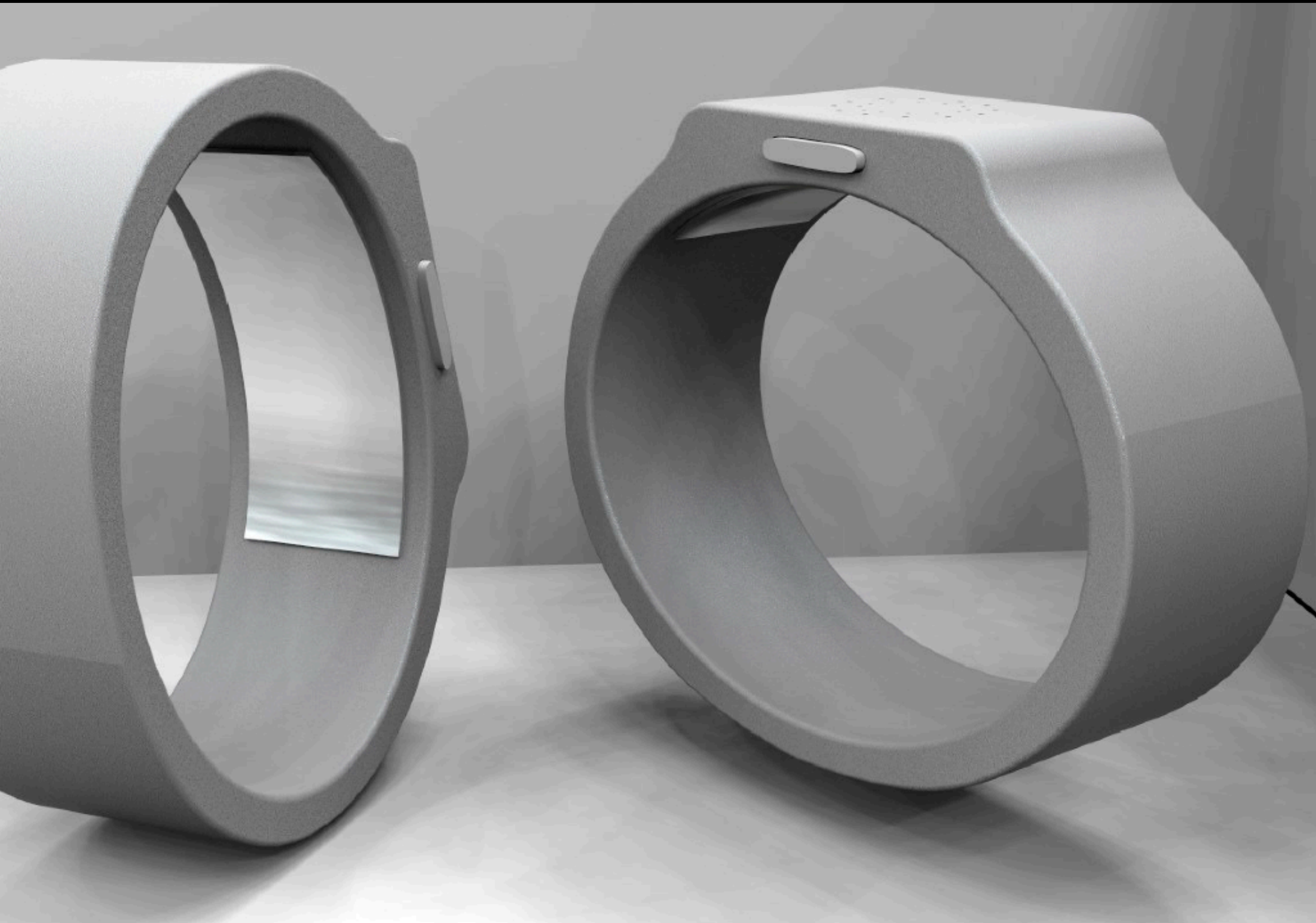


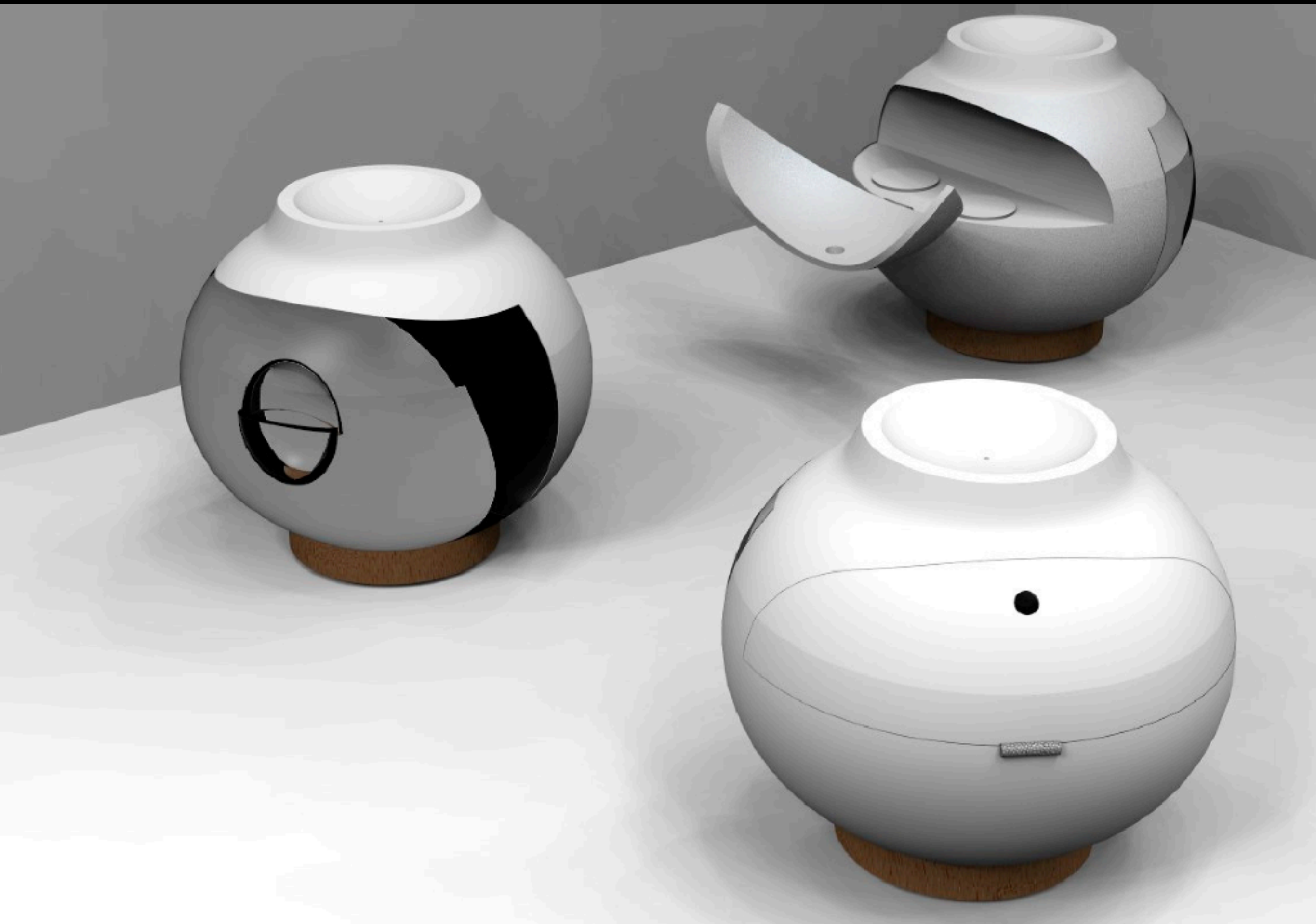
Sinopoda Scurion

I looked for analogous examples in nature and found a couple species that although naturally blind, are able to keep a regulated circadian rhythm. unfortunately, this is an under-researched topic and it is still unclear how exactly are they able to do this.

IF THESE NATURALLY BLIND ANIMALS CAN REGULATE THEIR CIRCADIAN RHYTHMS WITHOUT ANY MEDICATION AND LIGHT CUES, WHY CAN'T WE?







“How might we use a biocentered design approach to reduce separation anxiety in children between the ages 4-6?”



charlie

5 years old, kindergarten

likes:

- puppies
- kittens
- rainbows
- lasagna

Ha, Lisa



hugwear



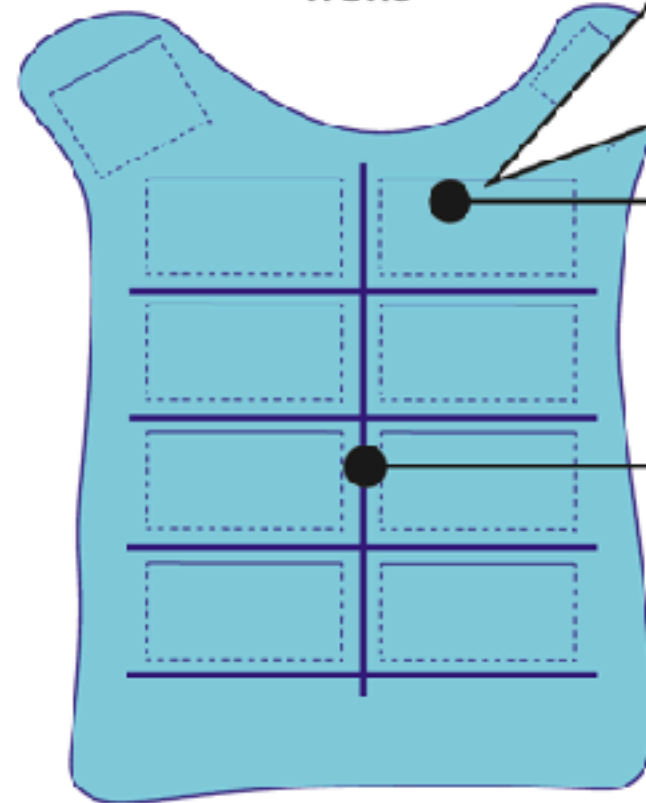
made with cuddles!



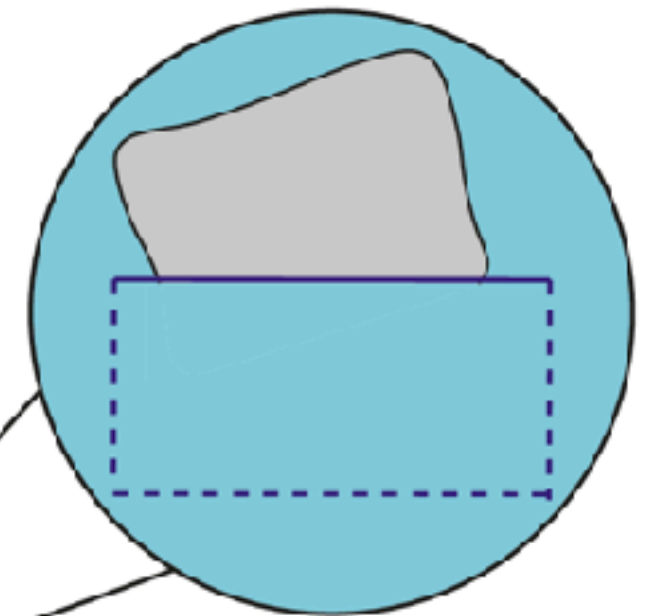
sweater details



front

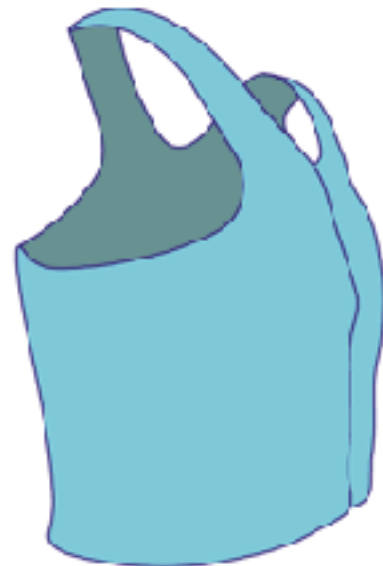


back



heat pad pocket
*microwaved and placed into
the pouches where the user
requires warmth.*

structure support
*inflatable evenly distributes air
with the hand pump, giving users
flexibility on how much deep
pressure they require.*



inflatable



hand pump



heat pad

inflatable details



monkey



koala



dog



duck



basic colour



styles

How might we mimic the natural world's strategies of keeping feet free of infections for the homeless population?



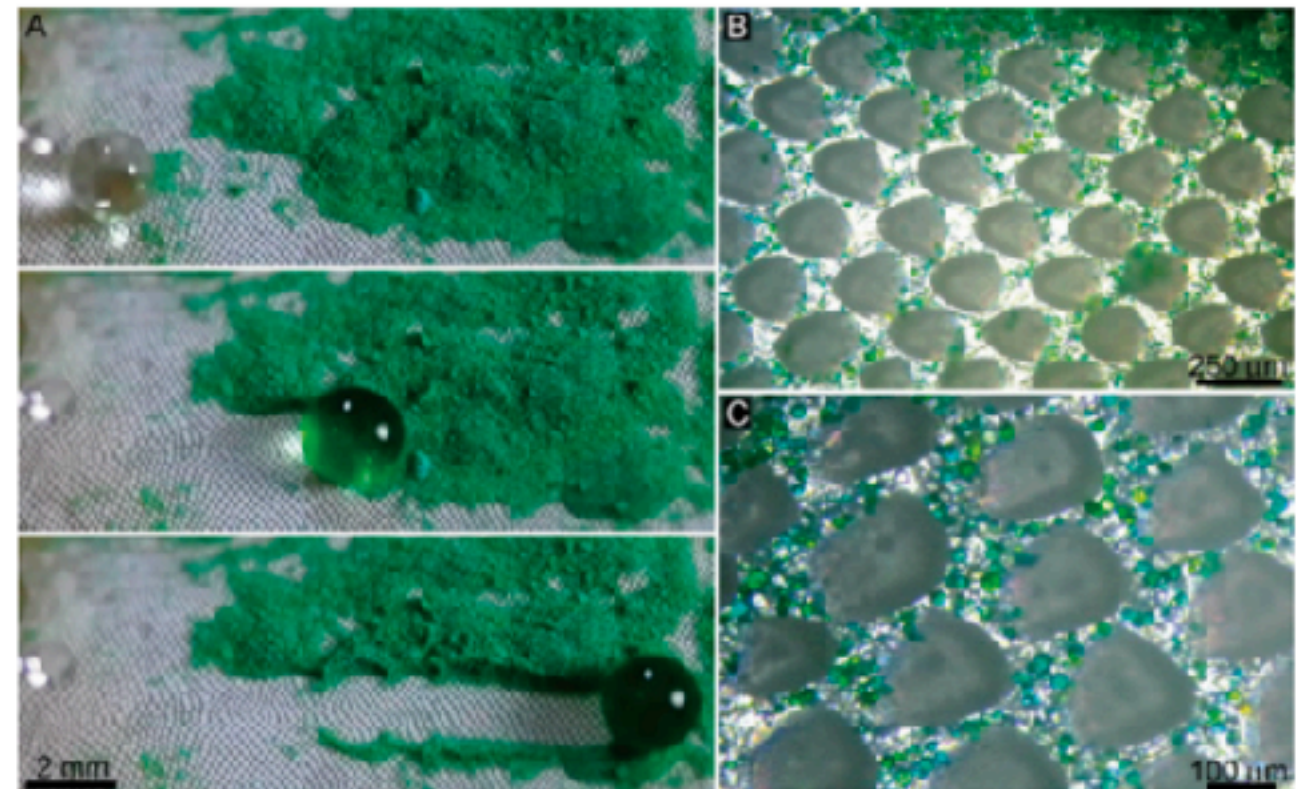
ULTRALOW
ADHESION

SUPER
HYDROPHOBIC

ANIT-WETTING

SELF-CLEANING
PROPERTIES

ANTIBACTERIAL



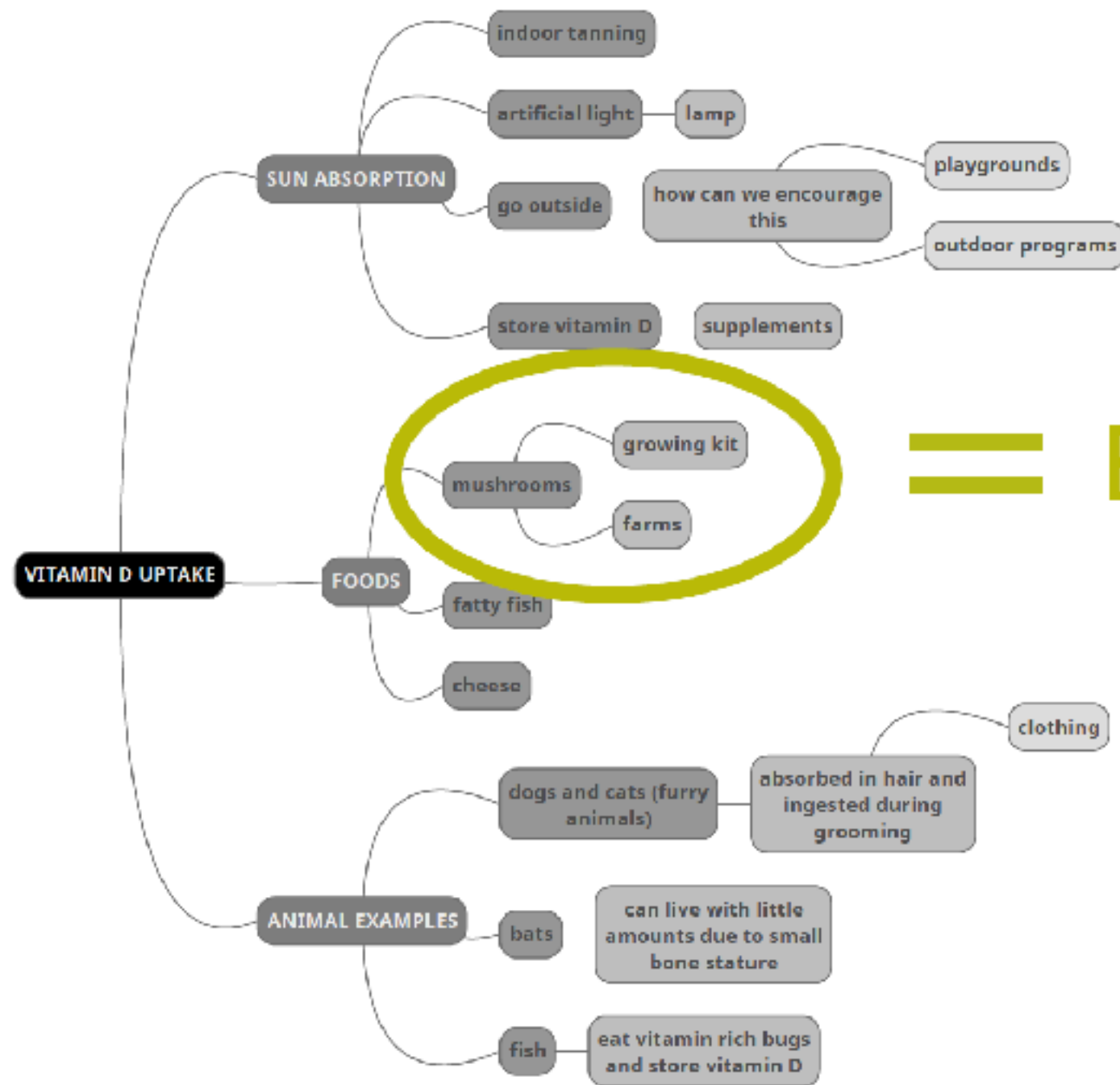


VITAMIN D DEFICIENCY

1.1 million Canadians are vitamin D deficient [3].



How might we aid in reducing vitamin D deficiency
in places like Edmonton where there is a lack of
sun during the winter months?

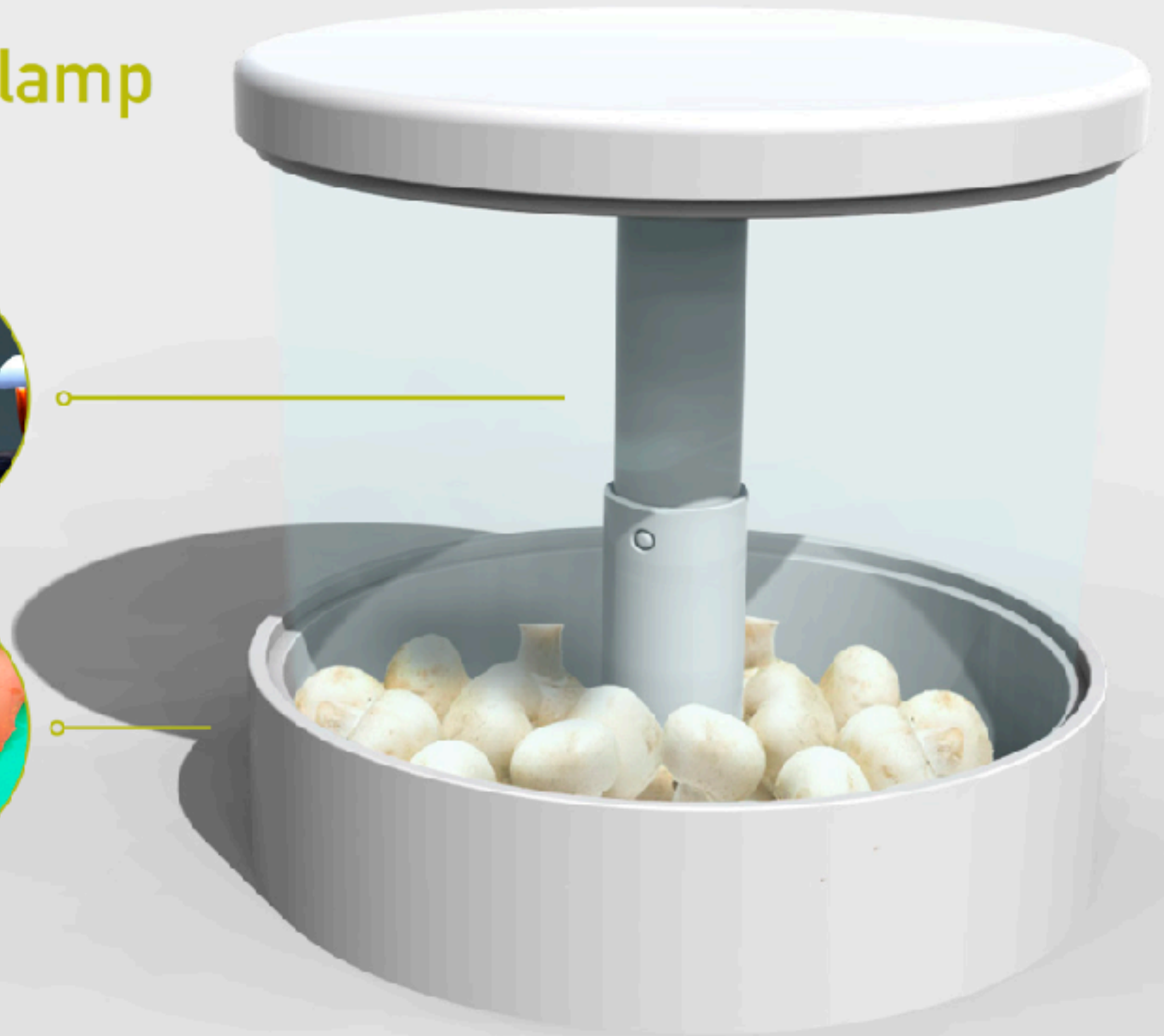


= BIO-centered

"exposing mushrooms to UV light whether by design or unintentionally causes measurable increases in the vitamin D content" [4].



MUSHROOM vita lamp



HOW MAY I SPARK
THE APPRECIATION
ON THE ABILITY TO SEE
IN PEOPLE?

SPARK

APPRECIATION

SEE

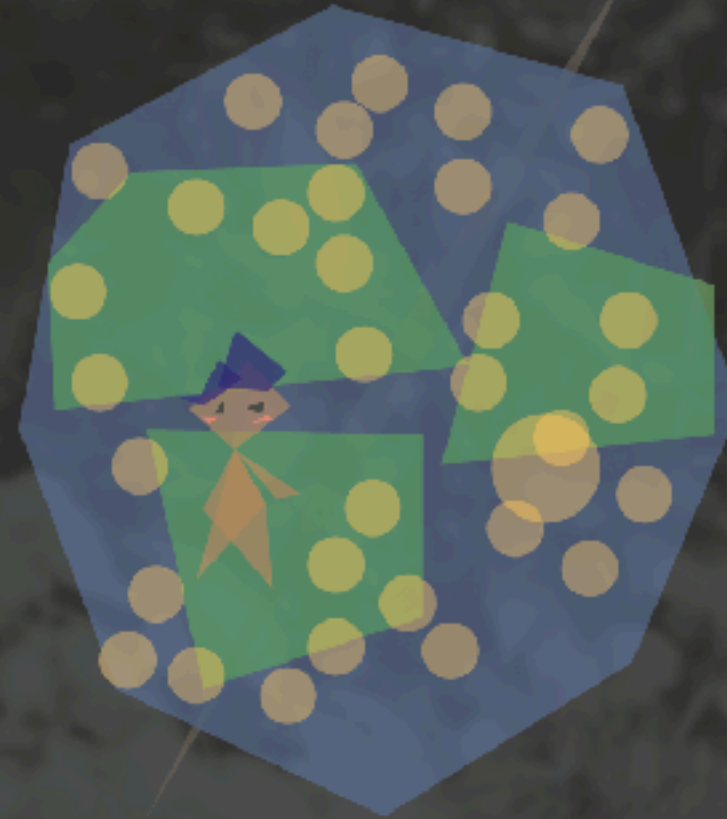


- ▲ #Taoism
- ▲ #Harmony
- ▲ #Inner Peace
- ▲ #Balance
- ▲ #Enough Is As Good As A Feast
- ▲ #Appreciate
- ▲ #Fullness
- ▲ #Enhancing Life

Research Question



**Anthropocentric
Approach**



**Bio-centered
Approach**

Design Process

Kao, Koei



Kao, Koei



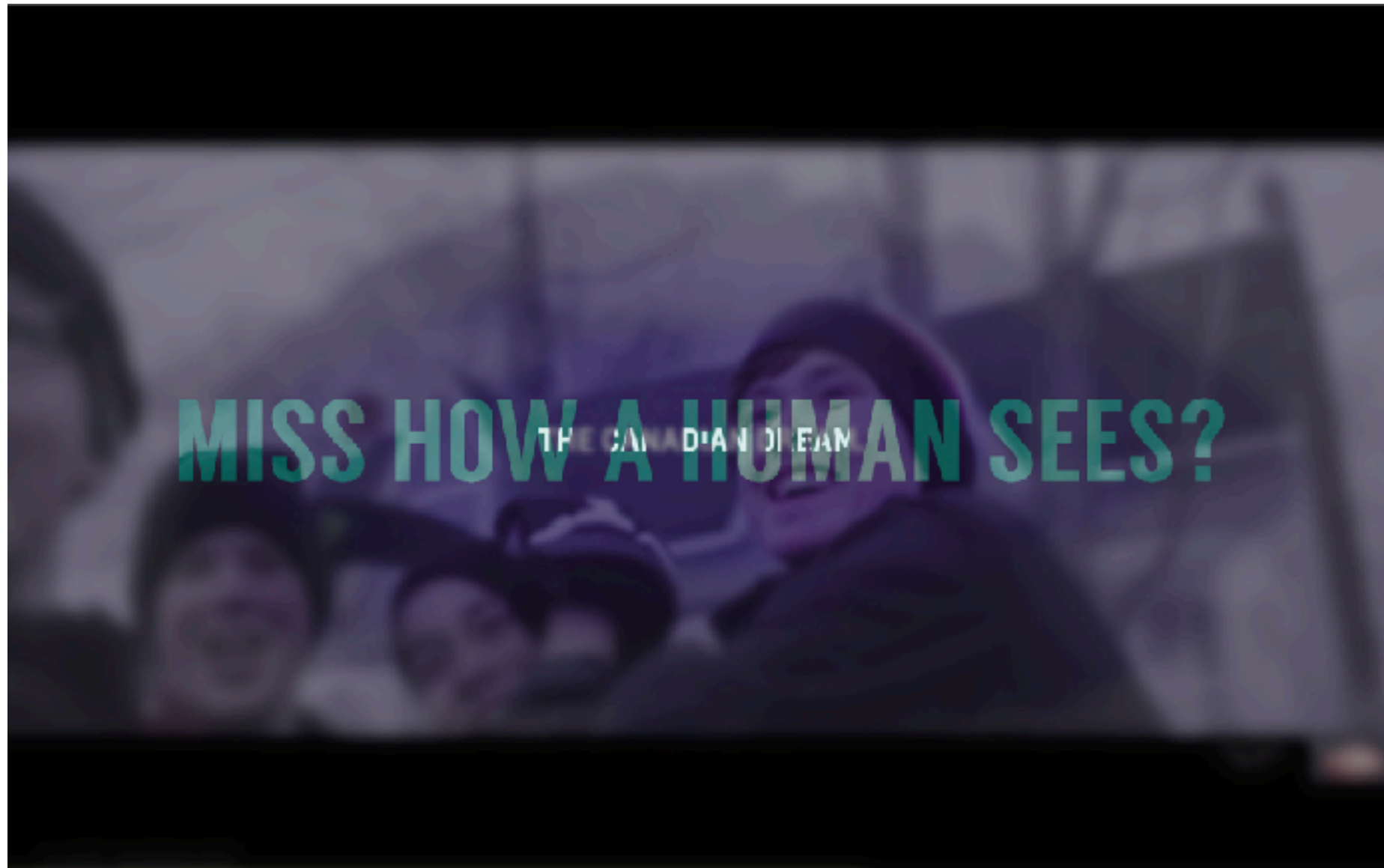




Kao, Koei









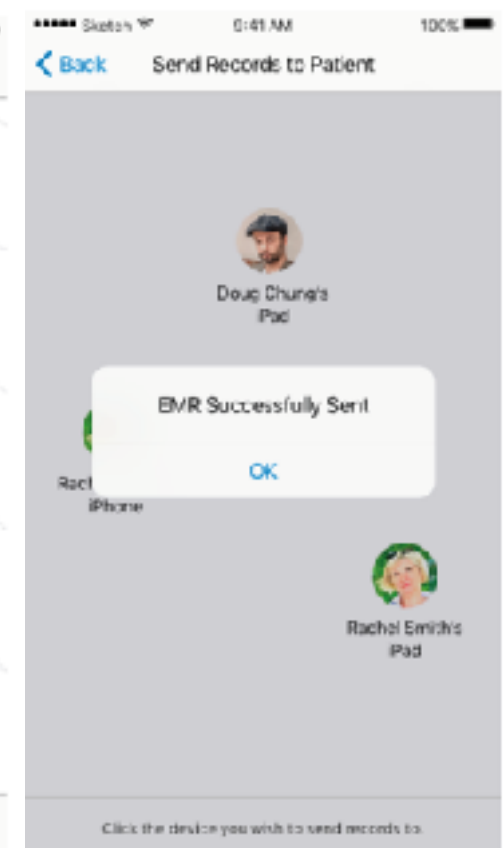
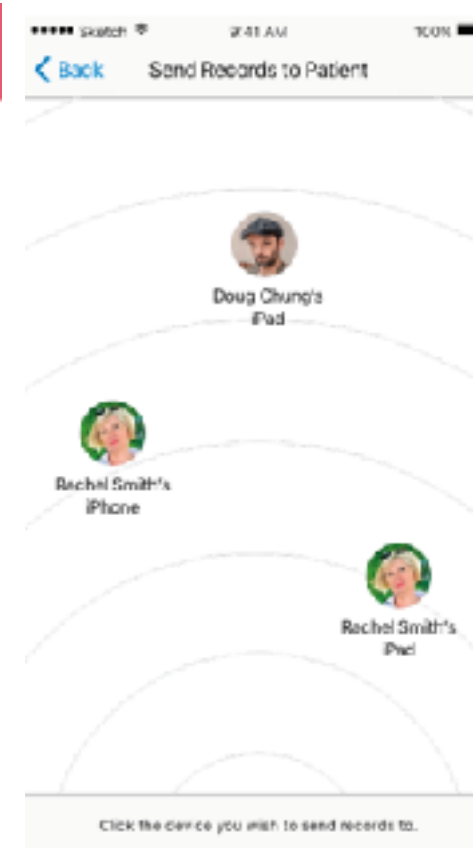
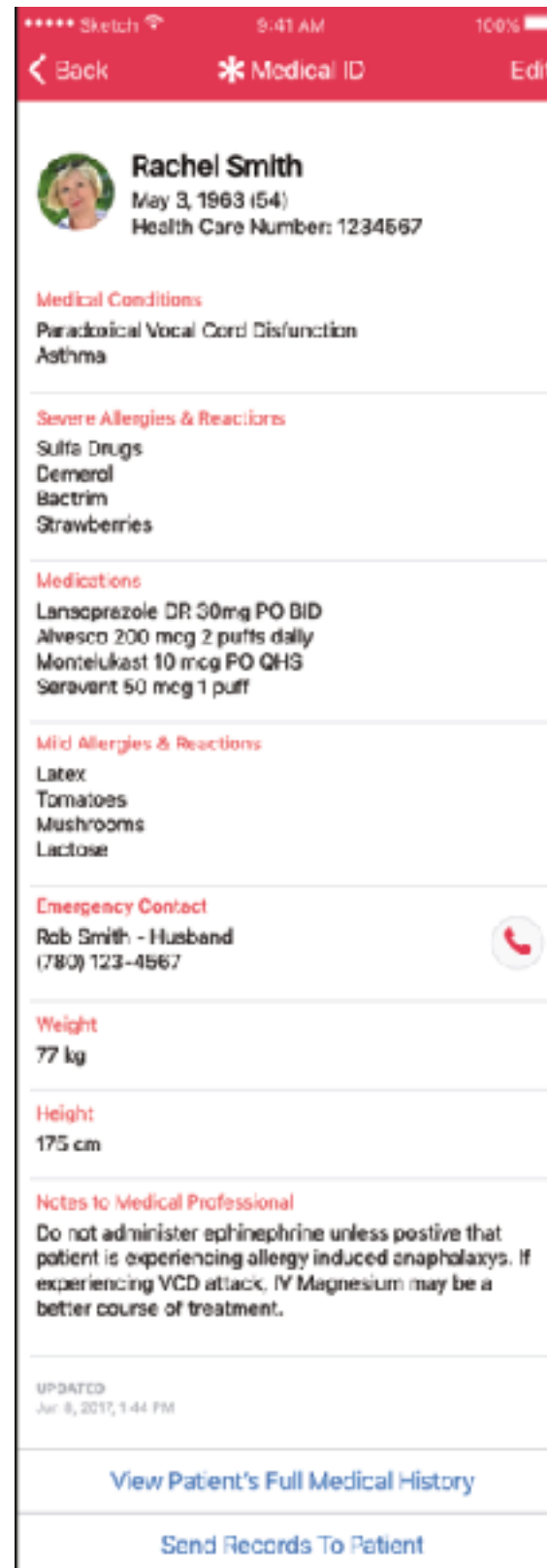
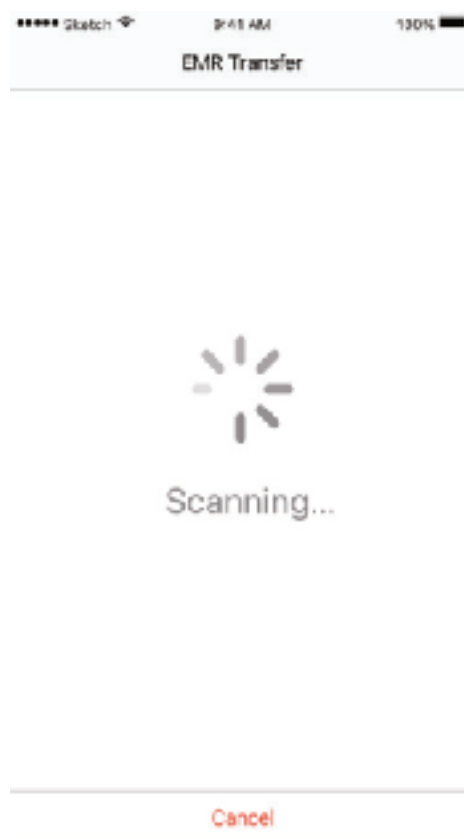
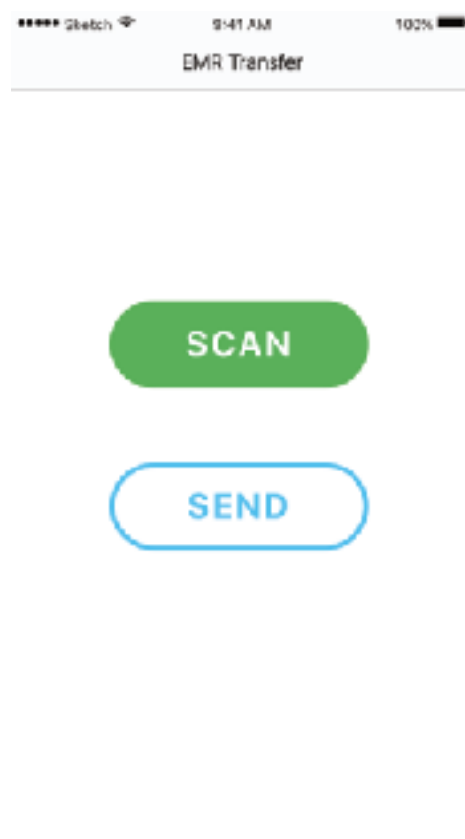
IMPROVING PARADOXICAL VOCAL CORD DYSFUNCTION THROUGH NATURE

How might we...

provide an efficient and effective means of communication to healthcare professionals regarding VCD without requiring patient interaction?

Research

Mormyrid Electric Fish which communicate through electrical pulses released into their surroundings.



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Grade distribution

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Assignment 3
50% of the final grade

Illustration: Pablo Labato

Boulos, Sara

Carbonio Ruiz, Carla Stephania

Kao, Koei

Sun, Wenbei

Torgrimson, Laura

Vander Leek, Caleb

Bui, Melissa

Ha, Lisa

Jaehn, Liv

MacCuish, Colleen

Matthew, Dylan

Mousek, Hannah

Nash, Amelia

Brownoff, Matthew

McKay, Jarred

Thank you!