

D'VAN HOWARD

Industrial Designer

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1.502.298.4418

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www.dvanhoward.com

## EDUCATION

University of Cincinnati  
*B.S. Industrial Design 2020*

Tama Art University, Tokyo Japan  
*Product Design Exchange Fall 2018*

University of Kentucky  
*B.S. Mechanical Engineering 2014*

Pamplona Learning Spanish Institute, Spain  
*Renewable Energies Study Abroad Summer 2013*

## INVOLVEMENT

Design For America  
Team Lead / Studio Lead 2016-2018

UC Honors Program 2015-2019

Ethicon ENCORE Award Recipient 2017

UK Habitat For Humanity  
Club President 2013-2014

## SKILLS

Advanced in Solidworks, Keyshot, and 3d Printing

Proficient in Fusion 360, Rhino, Photoshop,  
Procreate, Illustrator, InDesign

Functionally comfortable in AdobeXD, Blender, VR  
Gravity Sketch, HTML and Web Design

Comfortable with a mix of sketching, low fidelity  
exploration, and modeling to quickly iterate forms,  
then further research and sketching for details.

Adaptability, Troubleshooting, Analytical  
Thinking, Empathy, Human Centered Design, User  
Interviewing, Ideation, Scrum Planning, Spanish  
(Intermediate), Japanese (Intermediate Beginner)

Not a stranger to fdm printers, laser cutters, cnc,  
routers, hand sewing, soldering, and various  
woodshop tools

## EXPERIENCE

### **Pixel and Timber - 1 Year**

*Junior Industrial Designer*

Worked with a small team of designers to develop  
concepts and products from close to near future  
release for various clients. Design for/close-to  
manufacturing fast turn around. Collaboratively  
working with clients to research, ideate, sketch,  
create 3D workable concepts, and render concepts  
to use for consumer feedback. Low fidelity and 3D  
print prototyping. Communicating with clients and  
light project management. In house FDM expert/  
troubleshooter.

### **39A Design - Fall 2019**

*Junior Industrial Designer*

Interacted directly with clients to transform their  
ideas or technology into a marketable concept.  
Creating graphics and presentations for grant  
proposals. Research, project planning, developing  
concepts, client reviews and updates. Internally  
for 39A, updating and managing website, various  
social media (LinkedIn, FB, GoogleMaps, Insta),  
office tech support as problems arised.

### **Cramer Inc - Spring 2019**

*Design Intern*

Part of R&D team developing Helix chair and  
other upcoming line. Participating in weekly  
scrum planning, concept development, CAD  
development, prototyping, and testing of chairs.  
Seamlessly flowing between office and workshop  
to meet scrum goals and deadlines.

### **DePuy Synthes - Summer 2018**

*Design Co-op*

Worked with team on presentation illustrations,  
user research, and concept development. Cintiq  
sketching, UI/UX, prototyping concepts. Lead  
design of personal project, printing prototypes,  
and presented concept to engineers.

### **Ethicon - Fall 2017**

*Design Co-op*

Supporting design team with concept  
development and research implementation.  
Sketching, ideating, Keyshot, InDesign, prototyping  
concepts. Presenting ideas in small meetings.  
Working with other J&J employees on various  
projects.

### **NottinghamSpirk - Spring 2017**

*Design Intern*

Assisting design team with sketching, ideating,  
prototype creation to meet client deadlines.  
Preparing concepts for internal review. Working  
with internal shop team to develop client  
prototypes.

### **NACCO - 1 Year**

*Design Engineer*

Constructing and modifying component models  
of forklift trucks for specialty batch orders.  
Providing engineering support to solve internal  
manufacturing issues.



Something in me is wired to find joy into learning new information, connecting the dots, and creating something people enjoy. In this intersection is where I want to find my place.

# RESET

Mental Health Wearable  
Senior Capstone



## BACKGROUND

Thinking about my time before design school, I noticed that I haven't played as much games as I used to in the past. I've heard about the positive benefits of gaming on people's brains, so I thought I'd dive deeper into how gaming effects our lives, with the goal of creating a device that could help people improve their mental health.

## INSIGHTS

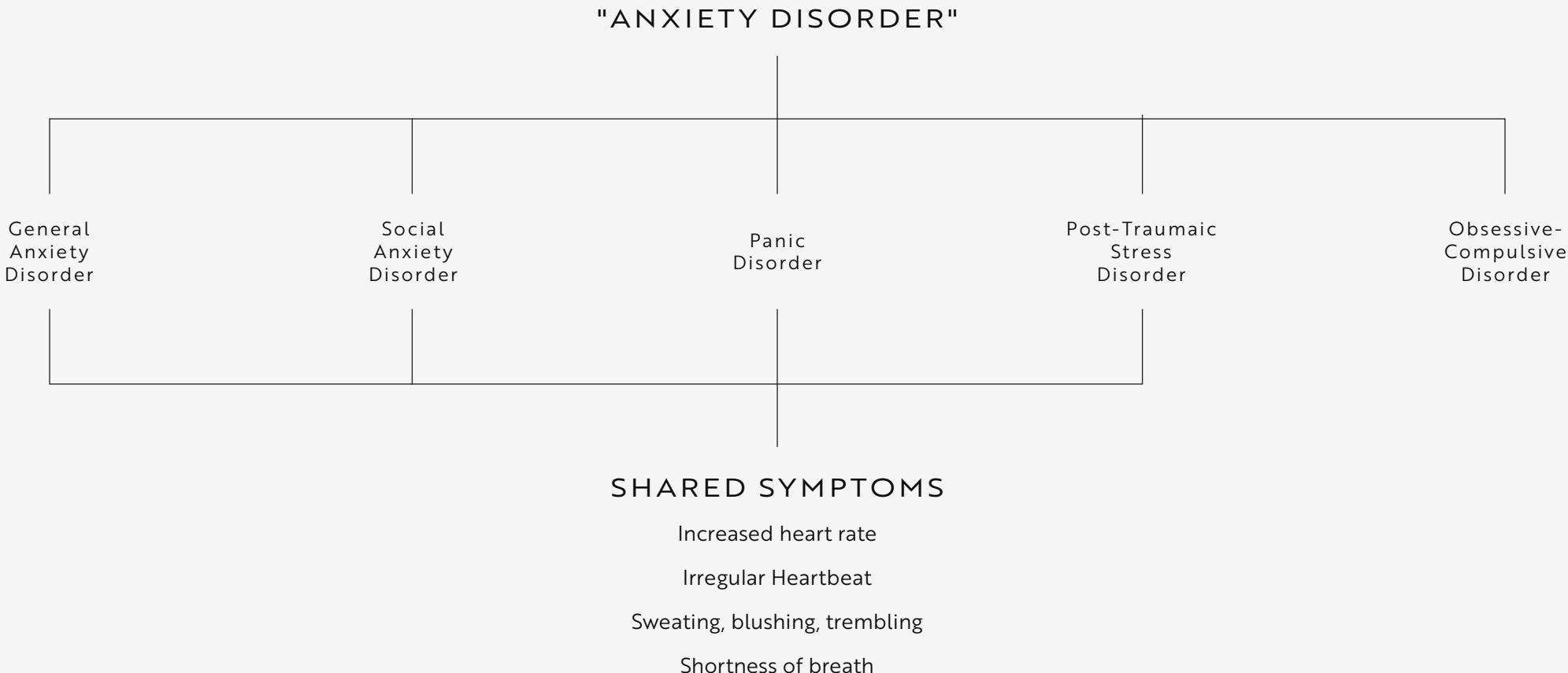
Noticing that many people used games as a form of escapism, and everyone had different lifestyles, I decided that a wearable would be the best form to provide relief. I also noticed that a few people admitted that gaming helps with their anxiety, and further research supported that connection, so I choose to make those users my main focus.

G	H	I	J	K	L	M
ch bests describes 7. What barriers prevent you from playi	8. Do you schedule time to play games o	9. How often do you play gan	10. Why do you play games?	11. Random events, quests, boss battles,		
games an appropri Money, not enough friends, time	Spontaneous	Once or Twice a Week	To socialize and have fun	Loss aversion, flow, exploration, certificat		
games too much Money, I play the same games a lot es; Both	Both	Once or Twice a Week	I love stardew valley to help me with my anxiety! I also play b	Easter eggs, in game I like that they force		
I played more gam Time	Spontaneous	Once a month	For fun, bonding with friends etc	Easter eggs		
I played more gam Time, Energy, money for consoles/apps	Both	Once a month	Fun, release, entertainment, social gatherings	Narratives are my favorite! Also explorati		
games too much paying for online, paying for games, fig!	Both	Daily	entertainment	tutorials, random rewards, easter eggs		
I played more gam Time	Both	Once or Twice a Week	An escape	Easter Eggs		
I played more gam Time	Both	Daily	To unwind and de stress or socialize	Experience points would give me some m		
I played more gam Time. Money. Attention span. Comfort s	Spontaneous	Daily	They are relaxing sometimes. I enjoy a good story. They cont	Easter eggs and side quests.		
games an appropri Don't have enough time to play. Gaming Both	Both	Once or Twice a Week	Escapism!	Exploration, Narrative, Challenges		
I played more gam Money	Spontaneous	Once a month	Good escape and stress reliever	Easter eggs		
games an appropri Time and money	Spontaneous	Once or Twice a Week	depends on the game, mobile/social/as a way to connect with friends	Experience points		
I played more gam cost and lack of skill	Spontaneous	Daily	Enjoyment and/or accomplishment	quests		
games an appropri Balancing time	Both	Daily	Procrastination	Easter eggs would be a fun concept		
games too much Money, time	Spontaneous	Daily	With DnD, it's for social interaction and making friends.	Customization, Save Function		
games an appropri Time. Never enough time. Also money. Scheduled	Scheduled	Once or Twice a Week	fun and time fill	Exploration, Meaning/Purpose, Feedback		
games an appropri time	Both	Once or Twice a Week	So much fun, exploring different worlds and losing yourself in	HUD		
games too much Adulting. Money, time, chores, laundry : Both	Both	Daily	Tutorials, attribute points and a way to re			
games too much Time, effects of sitting too long	Both	Depends on the time of year	Helps me take a break from my other thoughts and tasks. I lik	Optional quests		
games too much none	Both	Daily	Because they are fun & immersive!	quests!		
games too much money	Spontaneous	Daily	For fun, to pass the time	Narrative		
games too much Time	Both	Daily	Theyre fun	Boss Battles		
games an appropri Most games bore me, I'm too picky. Mo	Spontaneous	Daily	To have fun and socialize.	I would like to level up and be able to cus		
games too much Friends, Work, Family	Both	Daily	To play with friends, Because I love games	Strategy		
I played more gam Time, money	Spontaneous	Once or Twice a Week	Social time with friends, general fun, story	Spontaneous 1v1 encounters - I think poke		
games too much Mom	Both	Daily	Fun:	Boss battles		
I played more gam Time and money	Both	Once or Twice a Week	To solve puzzles, to overcome challenges, and I like the storie	Narrative/Story		
I played more gam time, adulting	Scheduled	Once or Twice a Week	Path of Exile, Guild Wars 2, Stardew Valley	Quests		
games too much Since I play too much to begin with, bas	Scheduled	Daily	For fun, for an escape, for a sense of purpose.	I think badges/achievements would be co		
				For PC games, I love the art. Total game art dork. And puzzle		

Survey on Gaming Habits, Desires, and Motivations

## ANXIETY

Anxiety Disorder is an umbrella term that covers multiple types of disorders (panic, social, phobias, general, etc). The different types of anxiety all have similar symptoms, while the triggers depend on the individual. Currently the most effective anxiety treatments are medicine and regular therapy with a trained professional, however, it takes trial and error to find the correct medication, and therapy is usually a limited schedule time, which does not always help you in moments of immediate need.



## USER INTERVIEWS

General Anxiety Disorder has become more common in college aged students and young professionals. Studies have also found that these generations are more stressed than previous ones, so I decided to make this the target user group. Multiple rounds of interviews with people between the ages of 18-32 were conducted throughout the entire design process. To maintain privacy, general personas were built to represent the data.

From the research and interviews, it became apparent that there was a strong link between a person's heart rate and their mental state, so this would be the path to a solution.



"I usually feel most anxious at home when I'm refelecting on my day. I get **heart palpitations** and I panic and hyperventilate."



"I feel most anxious in large crowds and events. I sometimes get a **tightness in my chest** and I tend to cry like a fountain for any reason."

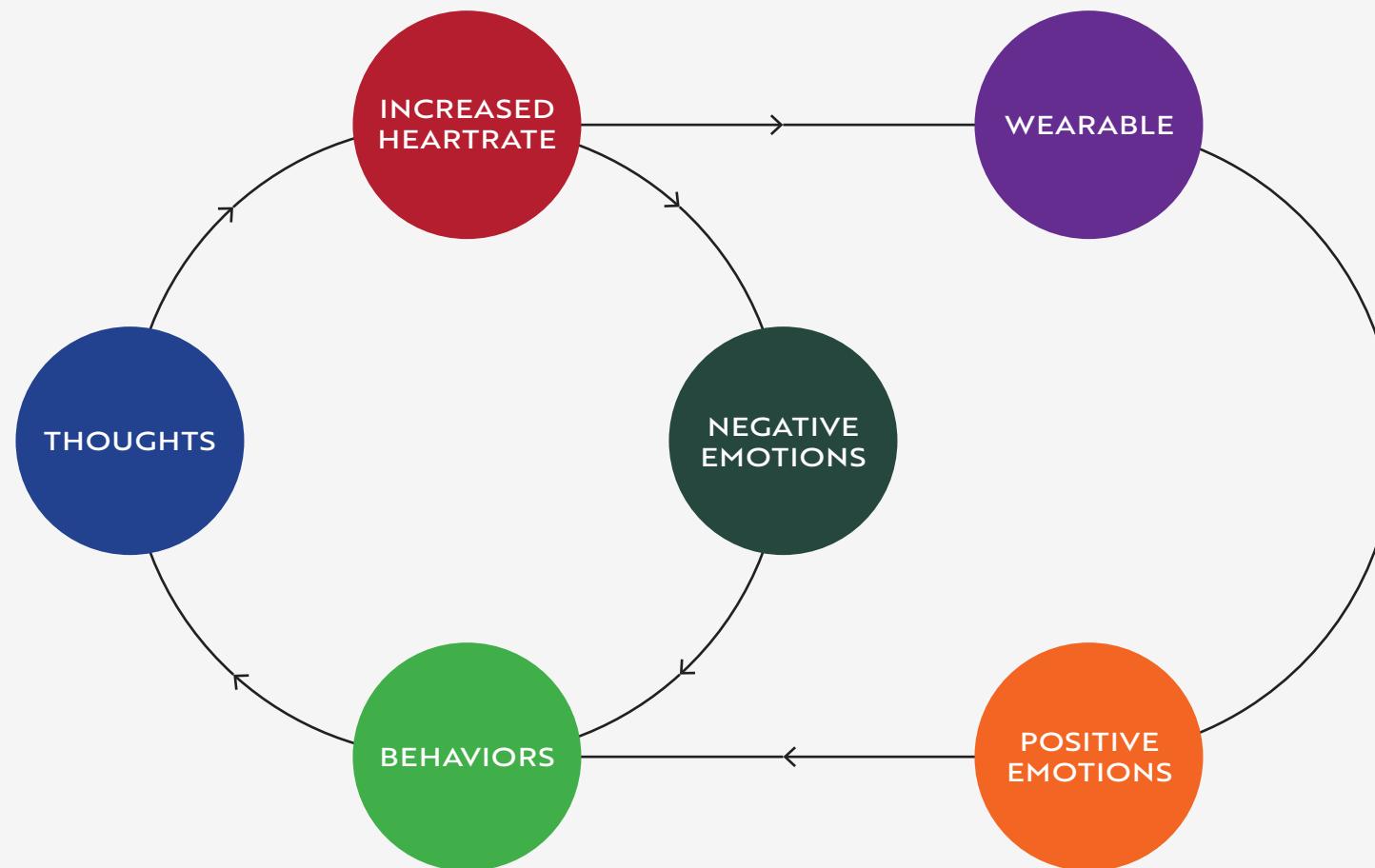


"I feel most anxious in unfamiliar situations, work, driving, social events, etc. I notice my **heart rate increase**, shortness of breath, insomnia, and I grind my teeth occasionally."

\*personas summarizing the interviewed users to keep their identity private

## BODY AND MIND

Comparing the research to the interviews I conducted, I saw a clear connection between the heartrate and the onset of symptoms. This aligned with the theory of Cognitive Behavior Therapy, where it's believe that thoughts influence emotions, which influence our behaviors, which reinforces our thoughts. **It became clear that disrupting this loop would be the key to managing the user's stress and emotions.**



## USER CONCEPT VALIDATION,

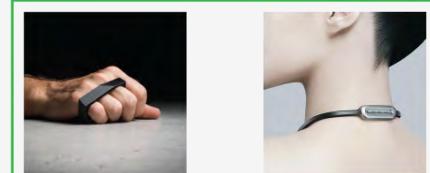
With heart rate tracking in mind, I reviewed existing wearable forms with users to get their input on what kind of daily device that they would be willing to carry throughout their daily routines. After ruling out what wouldn't work, I created testing concepts to figure out which forms and interactions would work best within the user's lives.



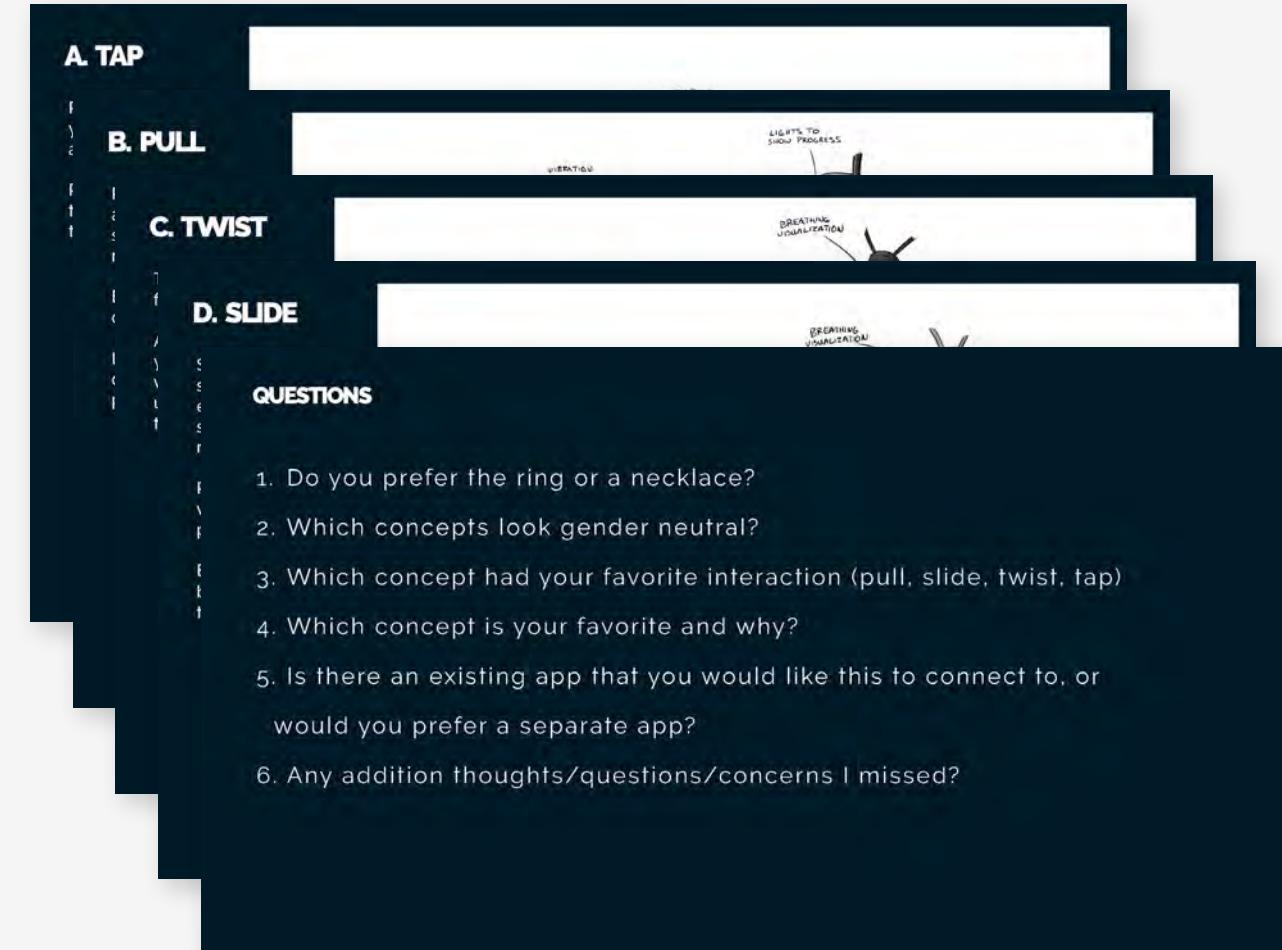
"Too noticeable"



"I already own a smartwatch"



"I can imagine fidgeting with that!"



**A. TAP**

**B. PULL**

**C. TWIST**

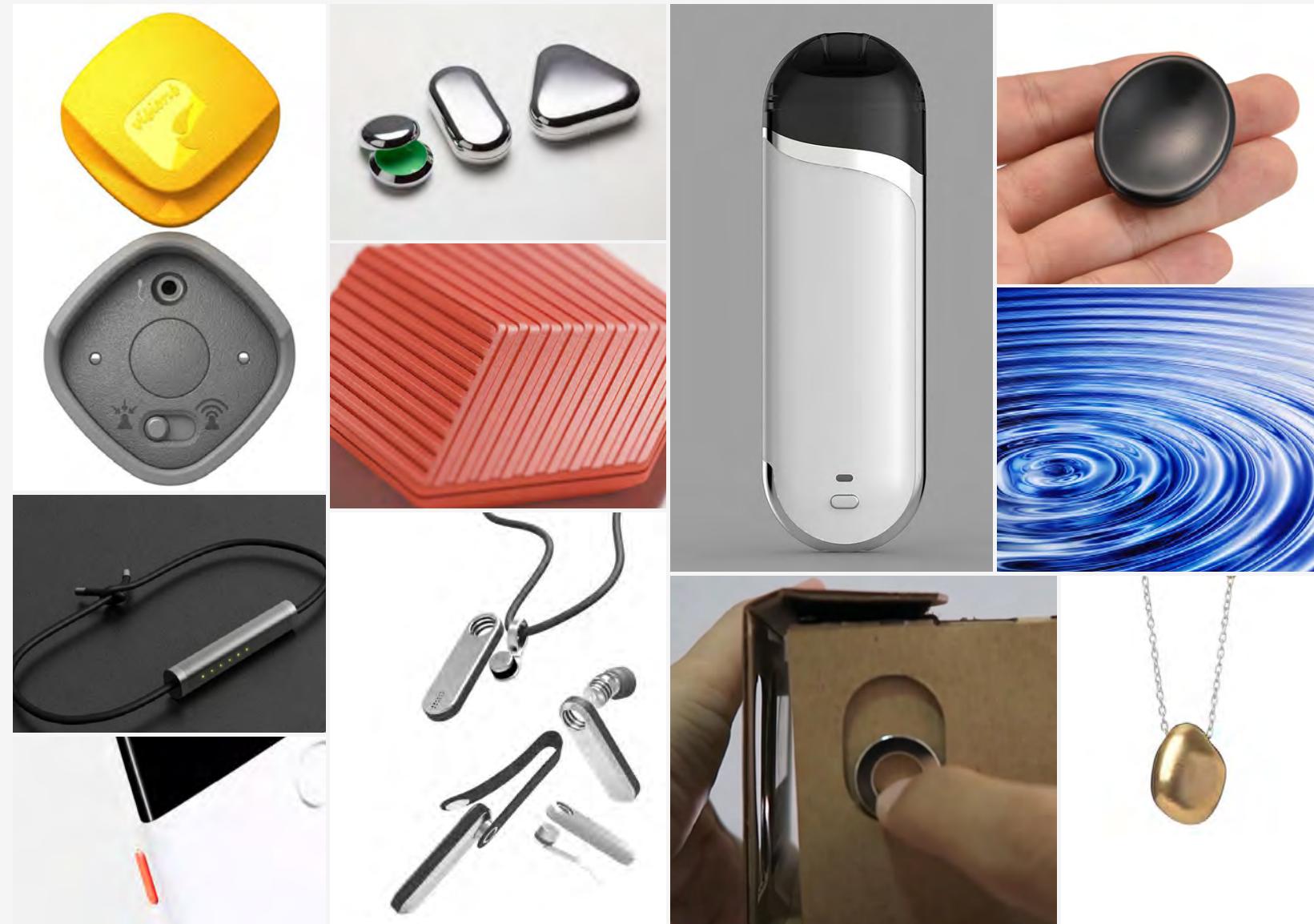
**D. SLIDE**

**QUESTIONS**

1. Do you prefer the ring or a necklace?
2. Which concepts look gender neutral?
3. Which concept had your favorite interaction (pull, slide, twist, tap)
4. Which concept is your favorite and why?
5. Is there an existing app that you would like this to connect to, or would you prefer a separate app?
6. Any addition thoughts/questions/concerns I missed?

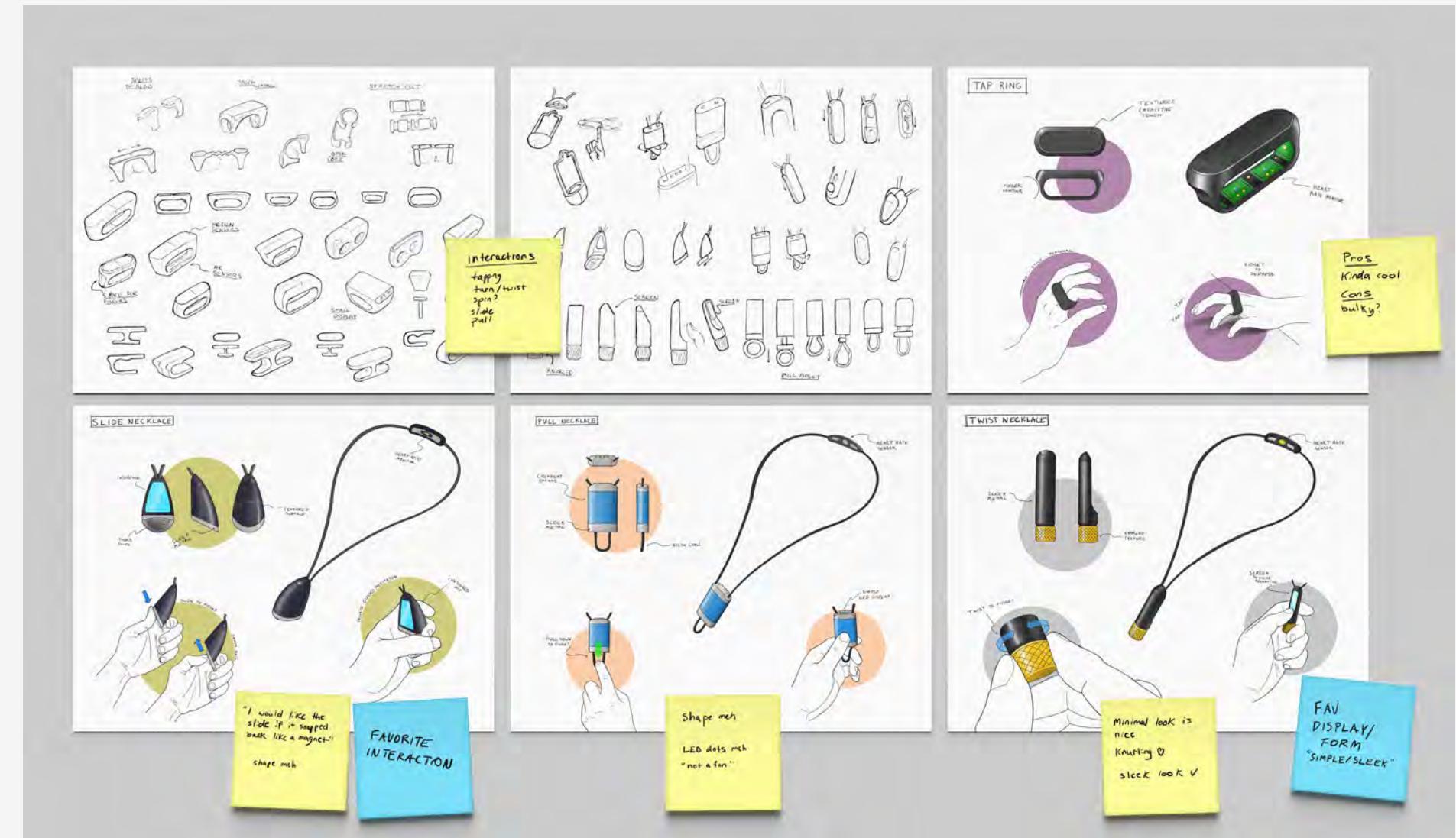
## DISCRETE AND PLAYFUL

With there being a stigma around mental health, something simple and discrete seemed necessary for the design language. While being discrete, the use of texture and form will guide the user on how to interact with the device.



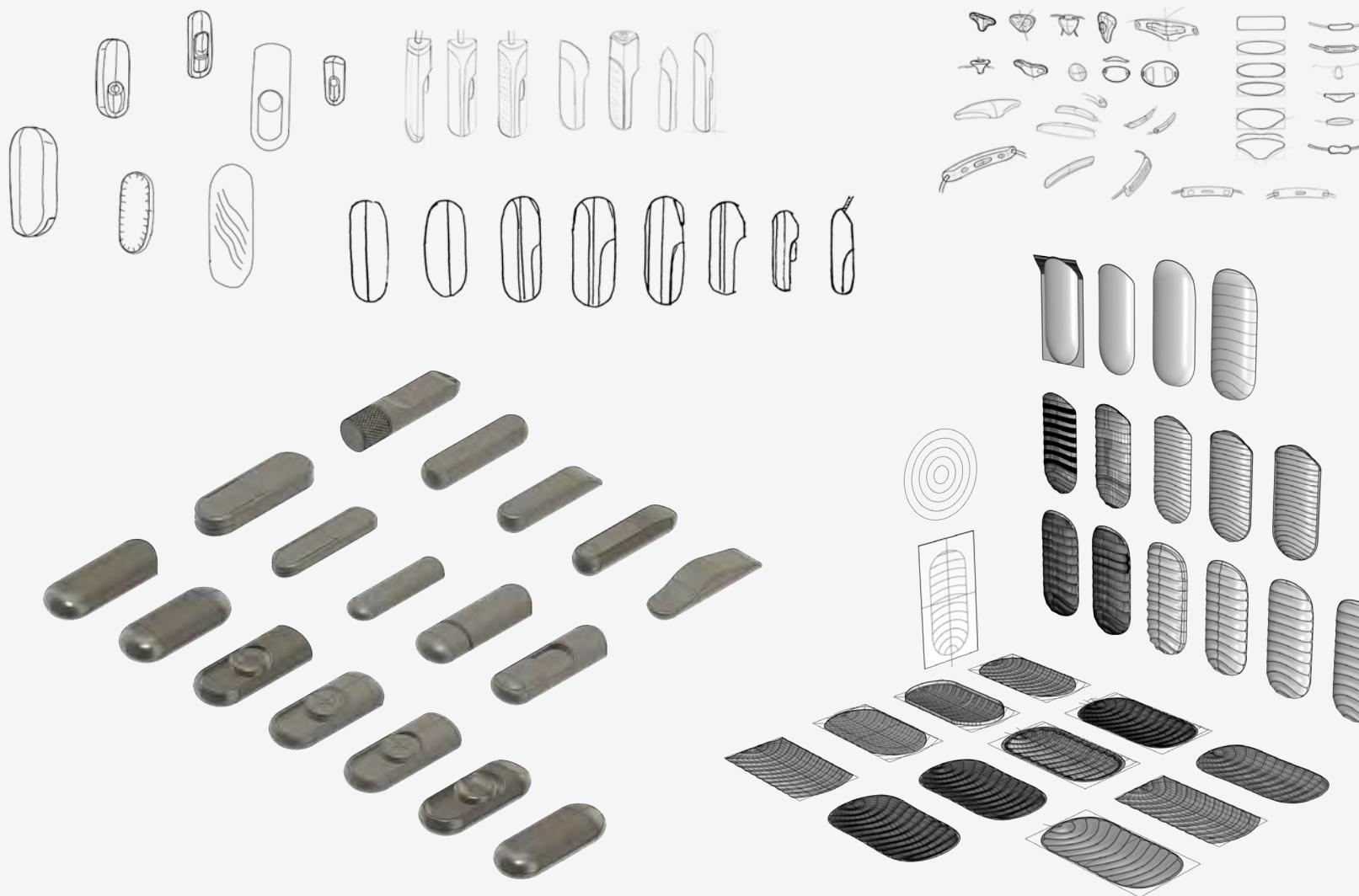
## USER CONCEPT VALIDATION<sub>2</sub>

After narrowing down the form factor to a ring or necklace, I came up with some rough concepts to explore possible interactions with the potential device. The goal was to explore a set of possible interactions and different form factors, and then after getting user feedback, I would further explore the design.



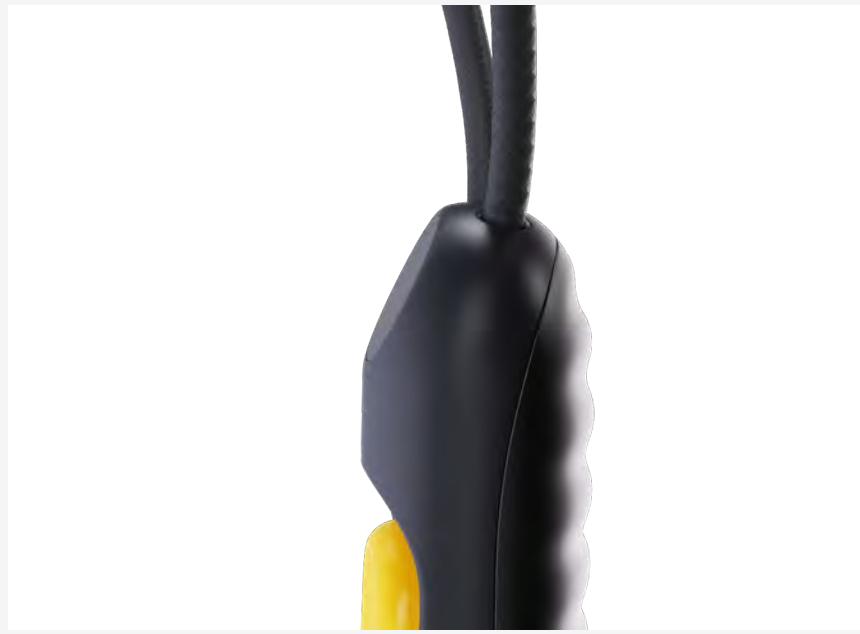
## PHYSICAL - DIGITAL

This stage of the process was very rough. Going back and forth from physical to digital and even trying different CAD programs to get something I was happy with and felt good in the hand. It was also spring 2020.





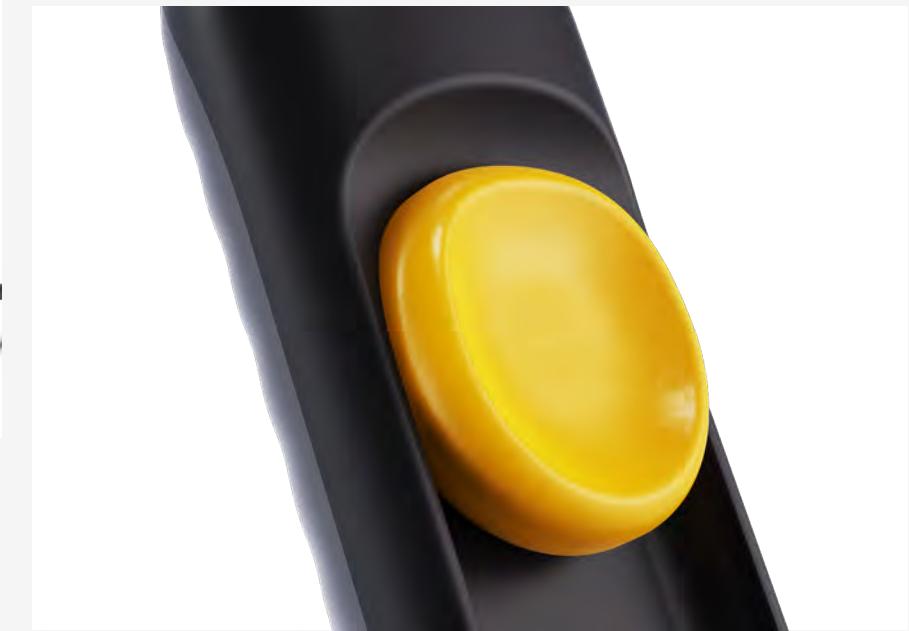




Low power E-ink screen angled to give the wearer a private view when they are alerted of their rising stress level.



The aluminum surfaces are inspired by the calming rippling of water and serve as a contrast to the hard metal material, as well as a focus point to shift to when stress occurs.



Derived from a worry stone, this gives the user a smooth touch point to rest their thumb. The button also works as an interaction point to utilize several calming techniques.



**Click the link below to watch to watch the video**

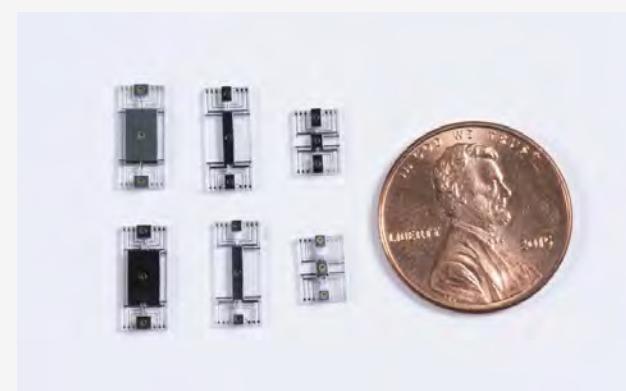
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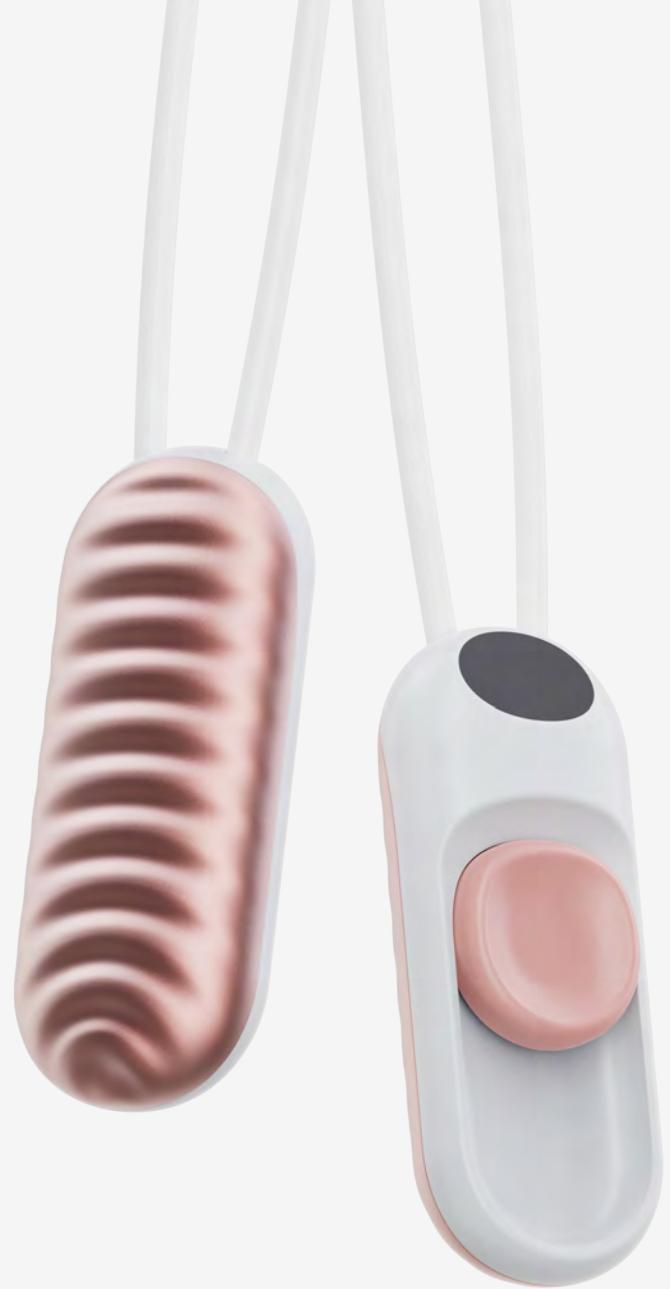


## HARDWARE

The guts of the device are modeled from examining the components of various devices. The internals are relatively simple as most data is sent to the user's phone via Bluetooth. Traditional heartbeat sensors require stationary skin contact for continuous monitoring, but from some research I found a new type of EMF (electromagnetic field) sensor, developed by Draper Labs, that could allow for more comfort while monitoring.







ROSE  
TOUCH



RAVEN  
WAVE



SILVER  
SMOOTH



R.I.N.G.

Personal Project



## FUTURE OF WEARABLES

Looking at the trend of wearables and how technology invades into fashion



Timepieces have always been trendy, and as smartphone technology has gotten smaller, the smartwatch market began to bloom.

With health tracking technology shrinking, smart rings are now entering the market, but is still in it's early stage until technology catches up.

## DESIGN GOALS

Several design directions followed throughout the course of the design



### READILY ACCESSIBLE

A simple to navigate UI that delivers the necessary information when you need it..



### INCONSPICUOUS

Doesn't present as a smart device to the world, and blends in seamlessly with your style.



### NATURAL GESTURES

Embrace the way our hands move and react to the world and each other.

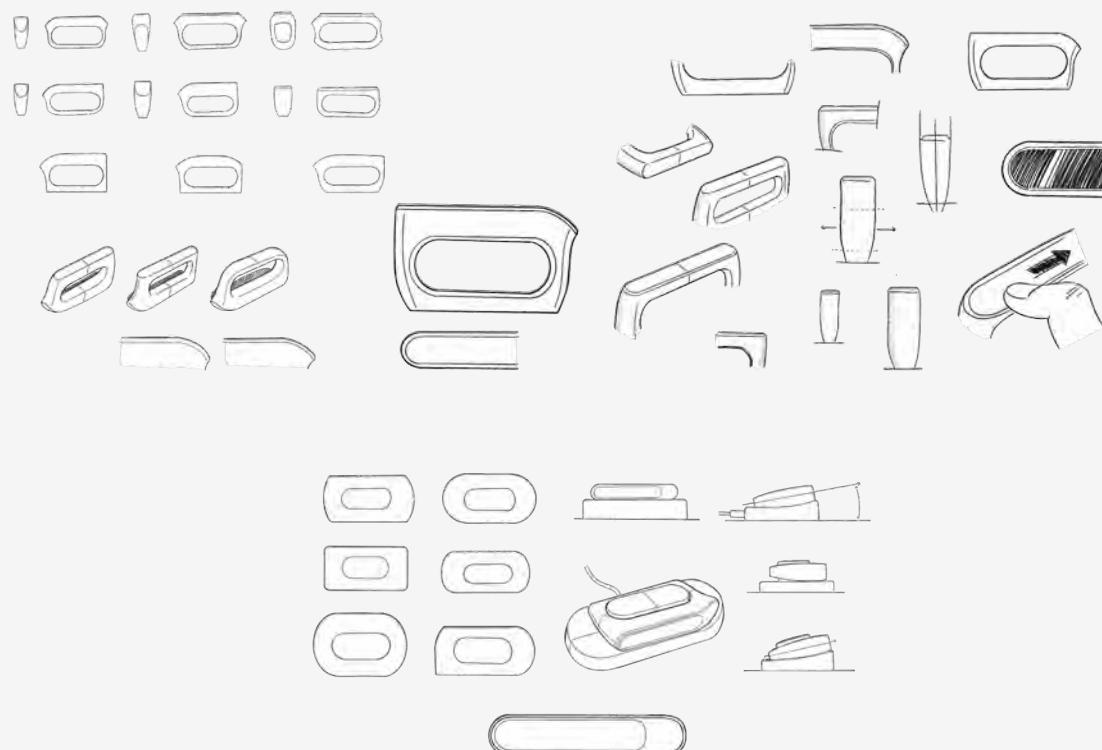
## INSPIRATION

What excited me most about the idea of a smart ring, is that it could deliver the use cases of a smart watch while allowing a style focused watch enthusiast to show off their collection.



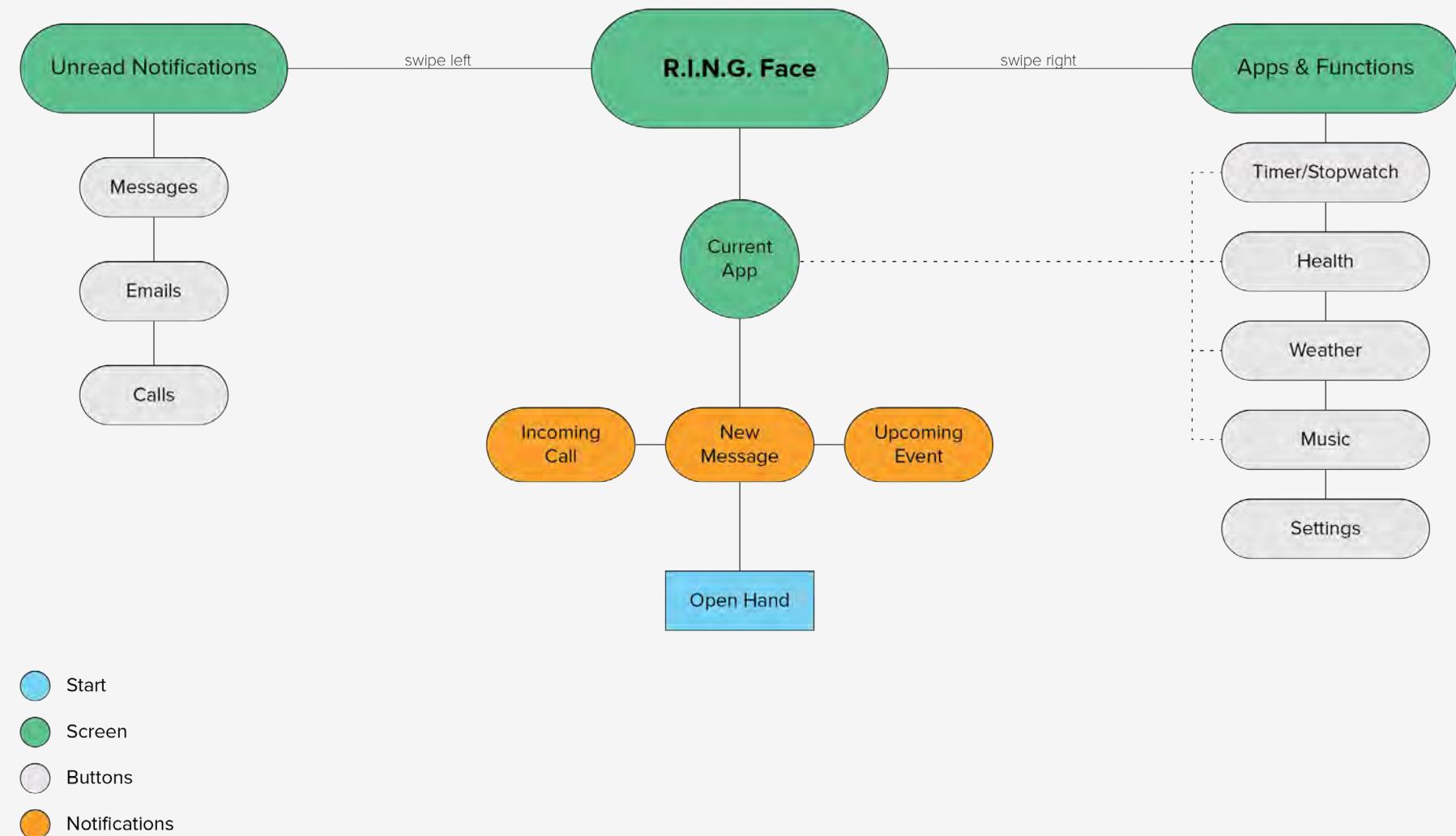
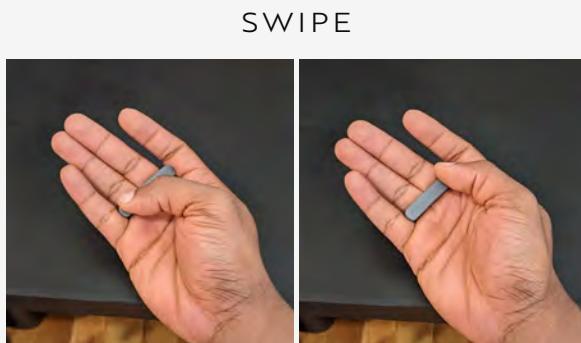
## PROCESS

Starting from an idea that sprung up from capstone, I began exploring some different forms through sketches, and then began 3D printing to get a feel of potential gestures, interactions, and use cases to bring back into the design.



## INTERACTION

My goal for this device was to reduce the need to look at your phone. Simple things like checking the time, weather, or schedule often spiral into mindless scrolling. By moving these necessary bits of information to a glance of the hand, you are able to stay in the moment.



## R.I.N.G.

Readily Inconspicuous Novel Gestures is a distraction reducing smart device that brings your most vital notifications to the palm of your hand. One glance at your phone starts off a chain reaction of phone use, but by moving those small temptations to the ring, you stay focused and in the moment.

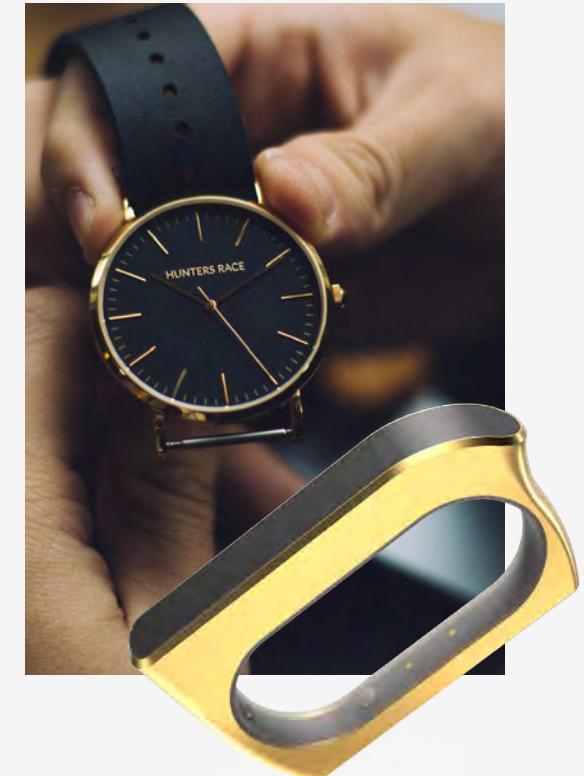




1. Biosensors
2. NFC
3. Charging electrodes
4. Proximity sensors
5. Touch sensors
6. OLED display

## CMF VERSATILITY

R.I.N.G. is meant to blend in seamlessly with your main accessories.





## GESTURE POTENTIAL

Interconnectivity of devices could provide other interactions



SOCIAL

Through app integration, R.I.N.G. can serve as a natural method of contact sharing



VR/AR

R.I.N.G. can serve as a more comfortable controller, as well as an aid to VR/AR hand tracking



SECURITY

Two-Factor Authorization becomes a breeze when you have the security key at hand

VASE MODE

Curiousity Project  
w.i.p.

## VASE MODE

is an experimental setting in Ultimaker Cura. The outer contour of an object is spiralized creating a form with a single wall thickness

### ADVANTAGES

because the printhead continuously forms the outer profile, it results in a faster print

### DISADVANTAGES

the thickness of the print is limited to the width of the nozzle

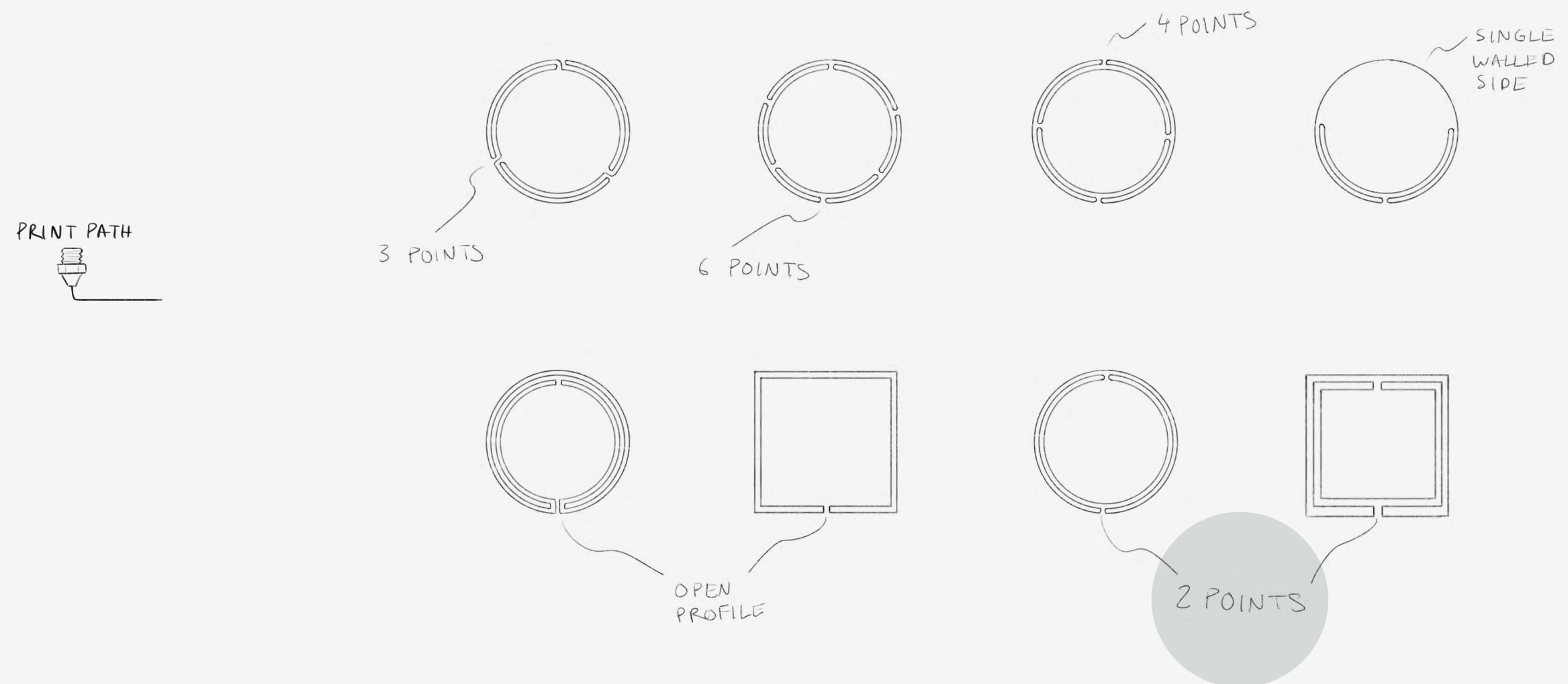
## CHALLENGE

how can the surface be altered to still utilize  
the advantages of vase mode?



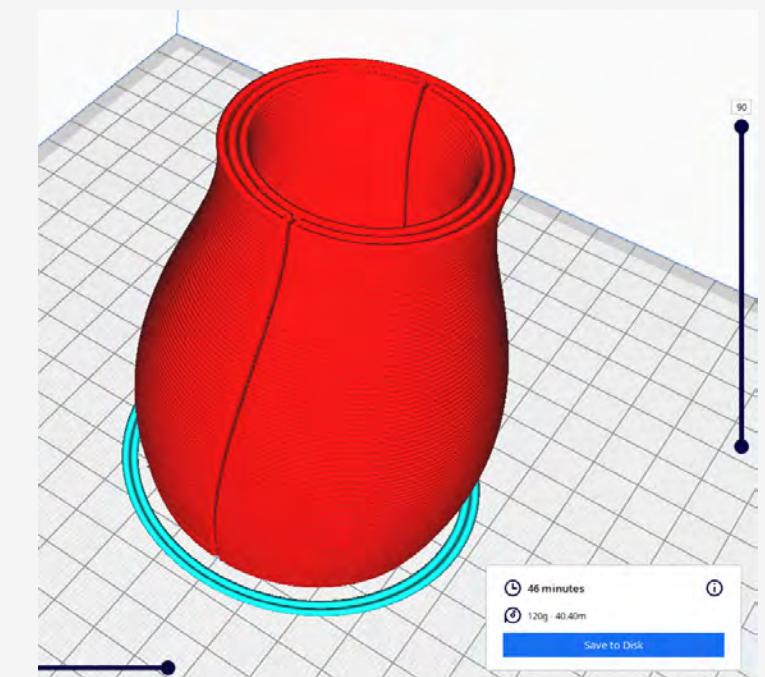
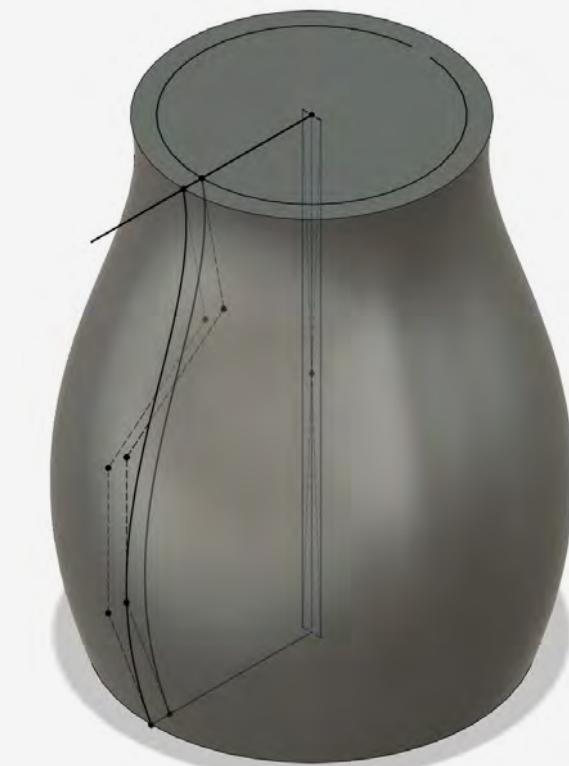
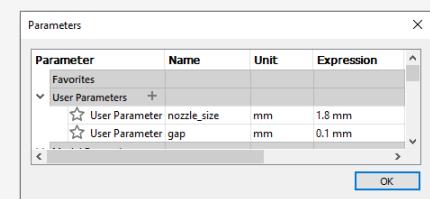
## ITERATIONS<sub>1</sub>

after the 'ah ha' moment of wrapping surfaces arrived, I began some rough sketching on ways the surfaces could wrap around each other



## IMPLEMENTATION<sub>1</sub>

implementing it took some trial and error, but the result was a process that on completion, can be easily modified for different nozzle sizes by utilizing equations



6% FASTER

SMOOTH OUTER PROFILE

3X WALL THICKNESS

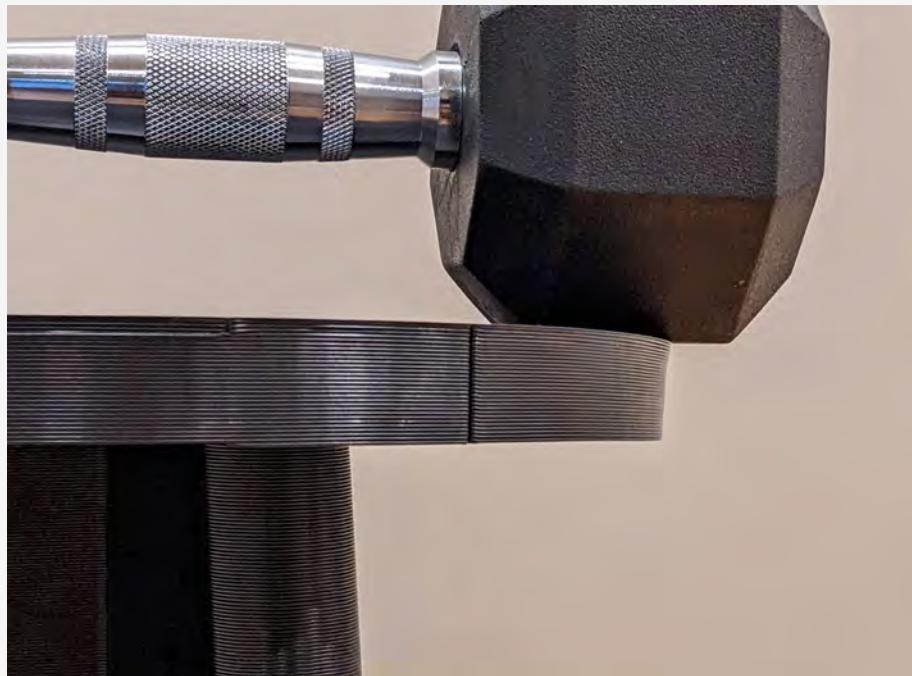
## IMPLEMENTATION<sub>2</sub>

'vase mode' is traditionally meant for vases, so I quickly iterated a form to fold the surfaces into legs. The test stool only took about 8.5 hours to print.



## ISSUES

the stool was simply meant as a test to evaluate the strength of a single walled print from a 1.2mm nozzle. This print highlighted a few constraints for using this design.



The unsupported edge flexes downward when weight is applied. The stool will topple if weight is only on that edge.



Three legs make the stool feel wobbly with very little movement.

## DISCOVERY

this project started with discovering the possibilities of fdm.  
That lead to seeing an opportunity in the furniture space.  
Individually designed pieces within this process to come...

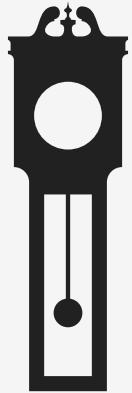
w.i.p.



# PENDULUMEN

Modernizing Traditions





## MODERNIZING THE GRANDFATHER CLOCK

The Grandfather Clock is an iconic heritage piece that

## TREND TIMELINE

Reviewing how the Grandfather clock grew out of relevance in order to discover new ways to breath life back into it



The Grandfather Clock at it's time was a status symbol

Electricity allowed us to make time more compact

Lifestyle and technology meet and created fashionable timepieces

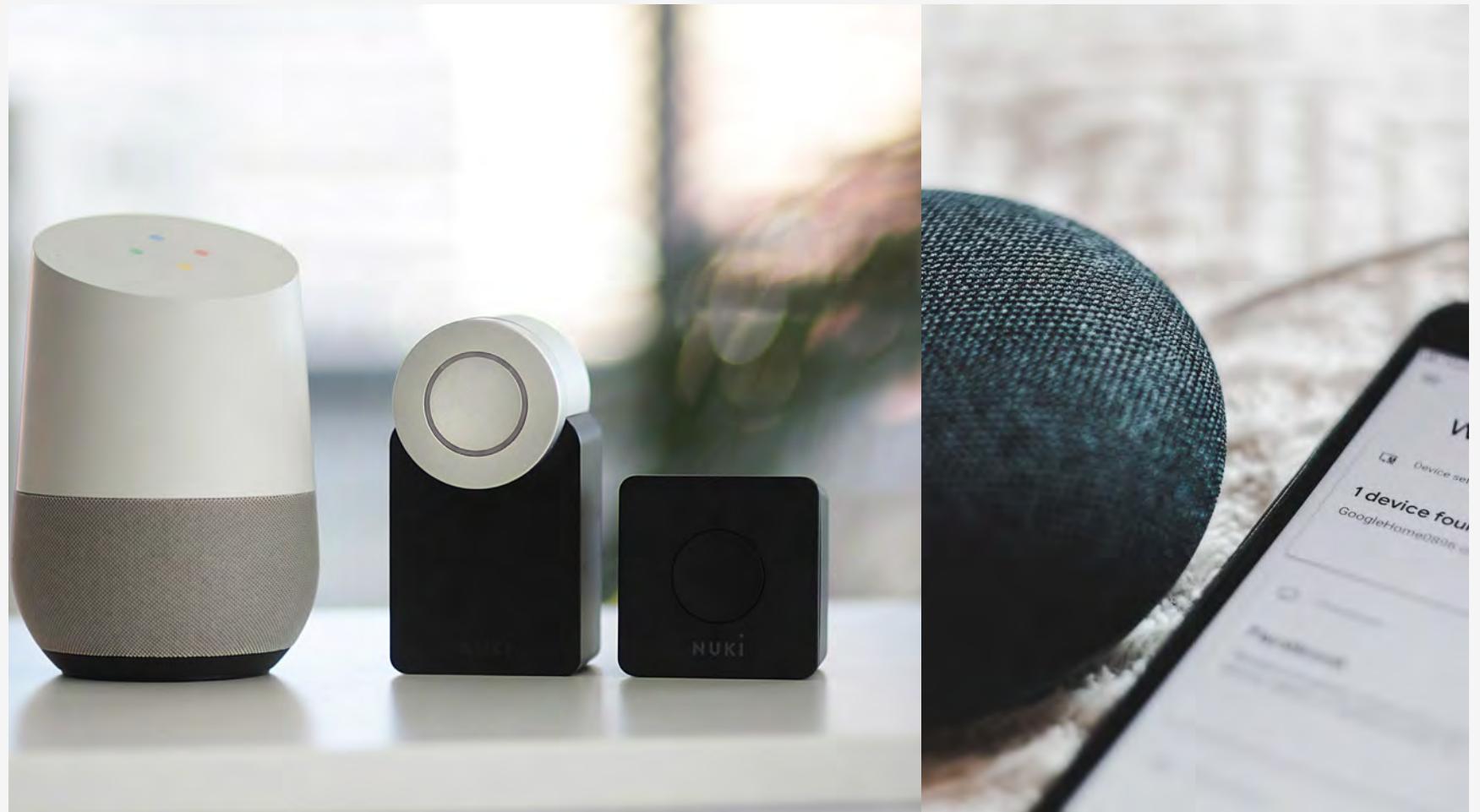
Advances in technology continue by bringing the computer to our wrist

Technology is the trend that advances how we advance our timekeeping

## SMART HOME

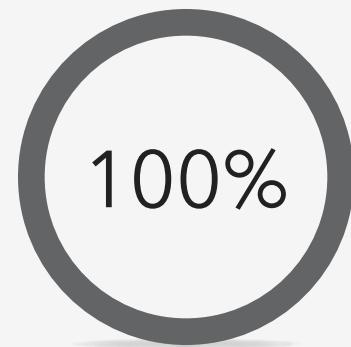
Noticing the trend of technology advancing our timekeeping methods, technology would be the way to bring the Grandfather Clock back into light

With the growing trend of "smart" objects in our home, this seemed like the perfect pairing, as these new devices don't yet have a designated place in our homes.

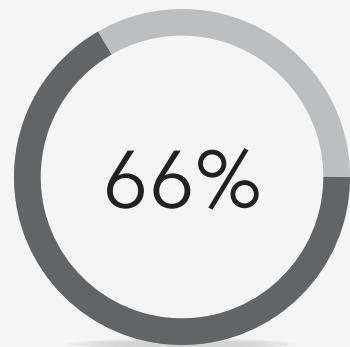


## KEY FINDINGS: Smart Assistant Use and Clock Survey

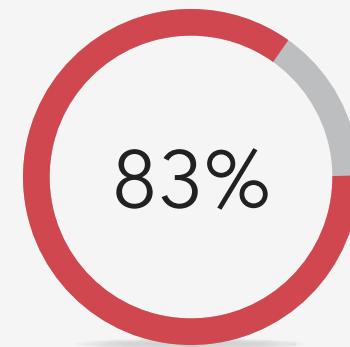
A survey conducted to examine the relationship of how smart assistance owners use their devices and other timekeeping related methods



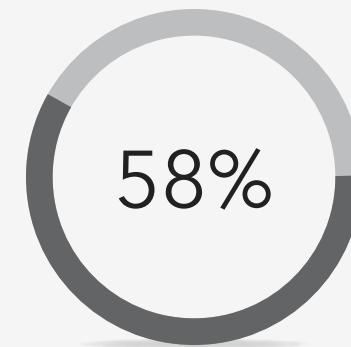
Own Smart Phones



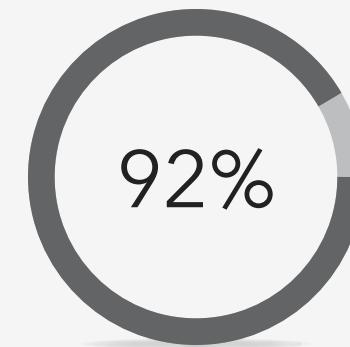
Use Calendar Apps



Don't Check Schedule With Smart Home Assistant



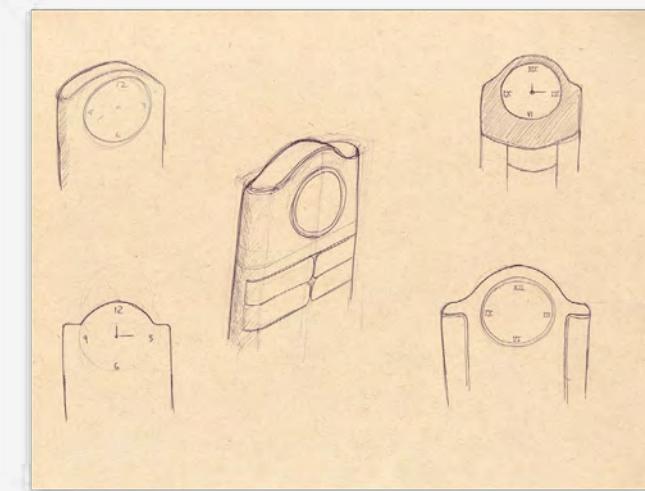
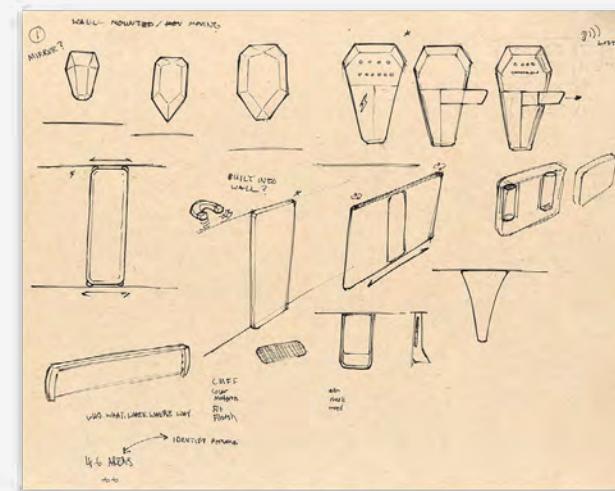
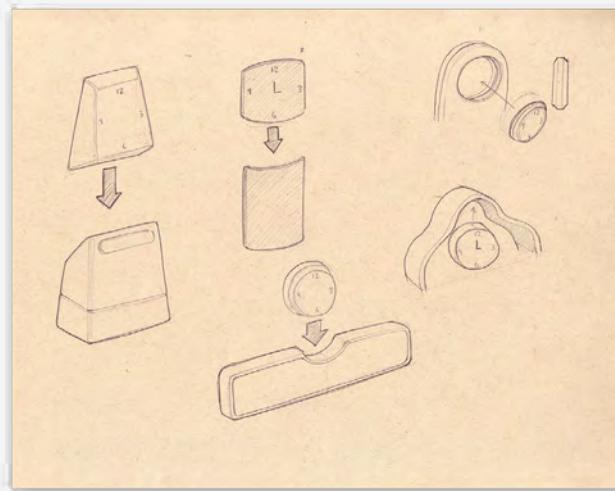
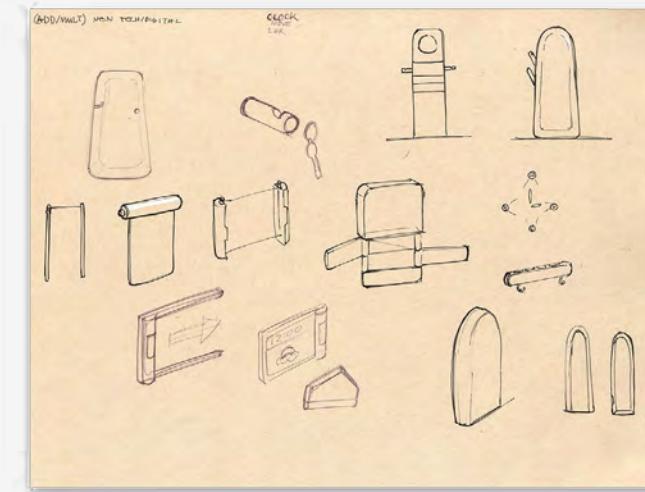
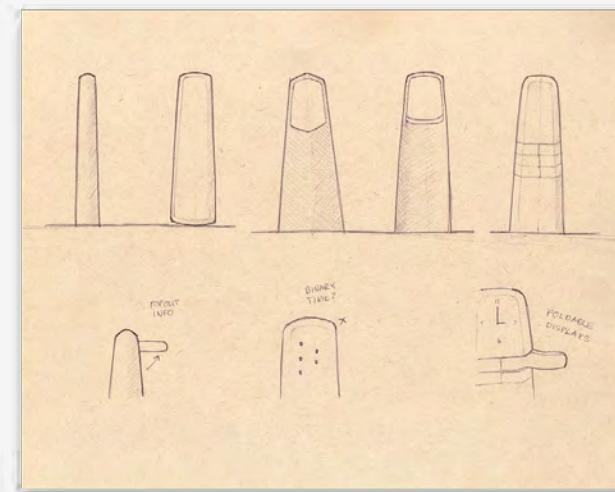
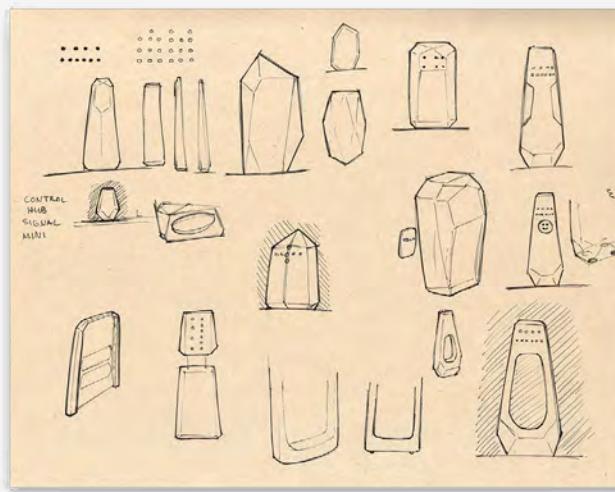
Own Wall Clocks



Prefer Quiet Notifications

## BRAINSTORM PROCESS

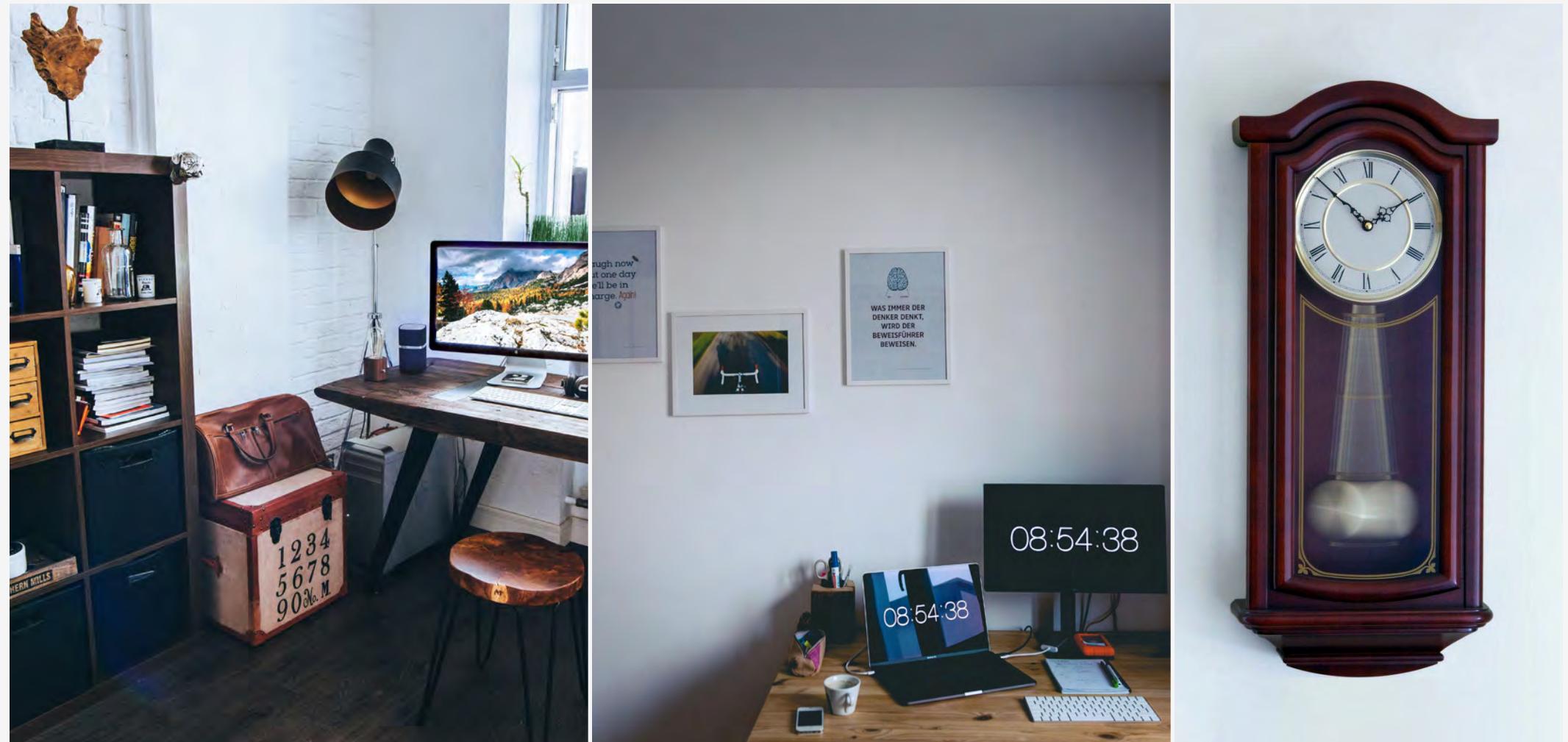
Informed by the research I brainstormed on modern functions, technology, and home use cases that could rejuvenate the grandfather clock.



## THE PIVOT

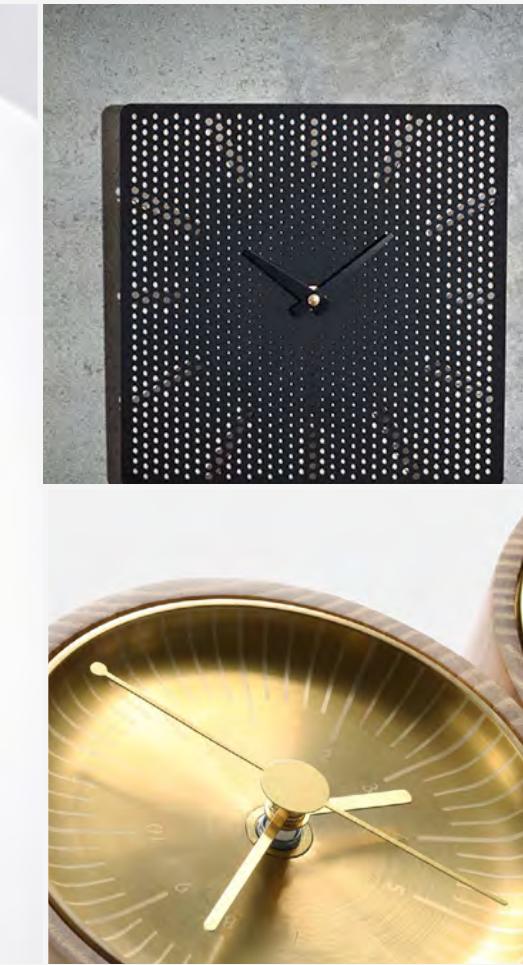
While thinking more about the main adopters of smart home assistants, millenials, I noticed this same group has been trending away from home ownership, and towards smaller apartment lifestyles.

A large monolith didn't seem like the right fit for this user, so I pivoted slightly to the pendulum clock. With a smaller body, the pendulum could become a primary focal point.



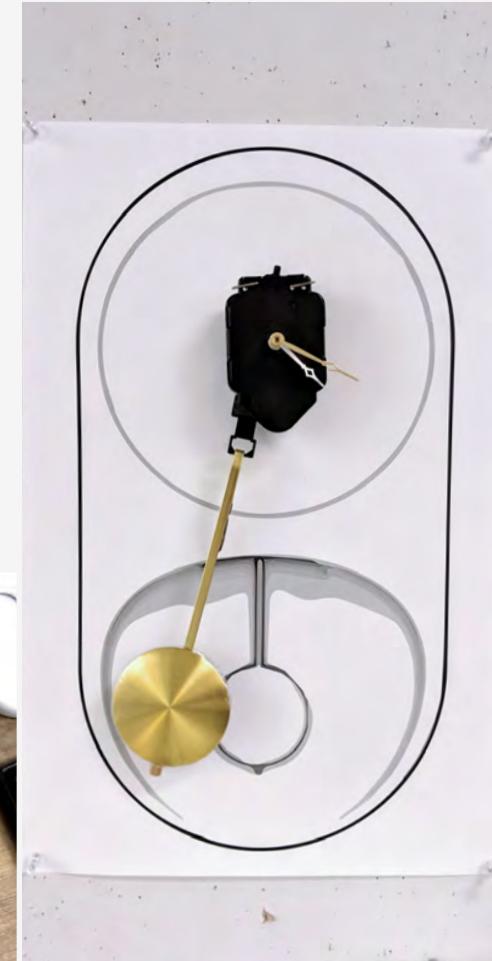
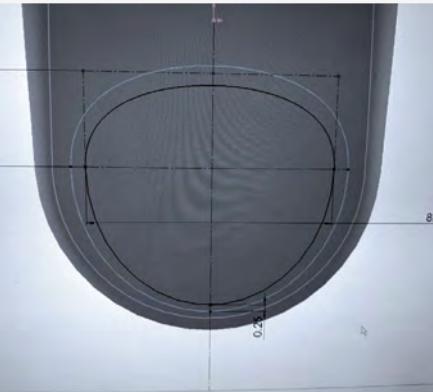
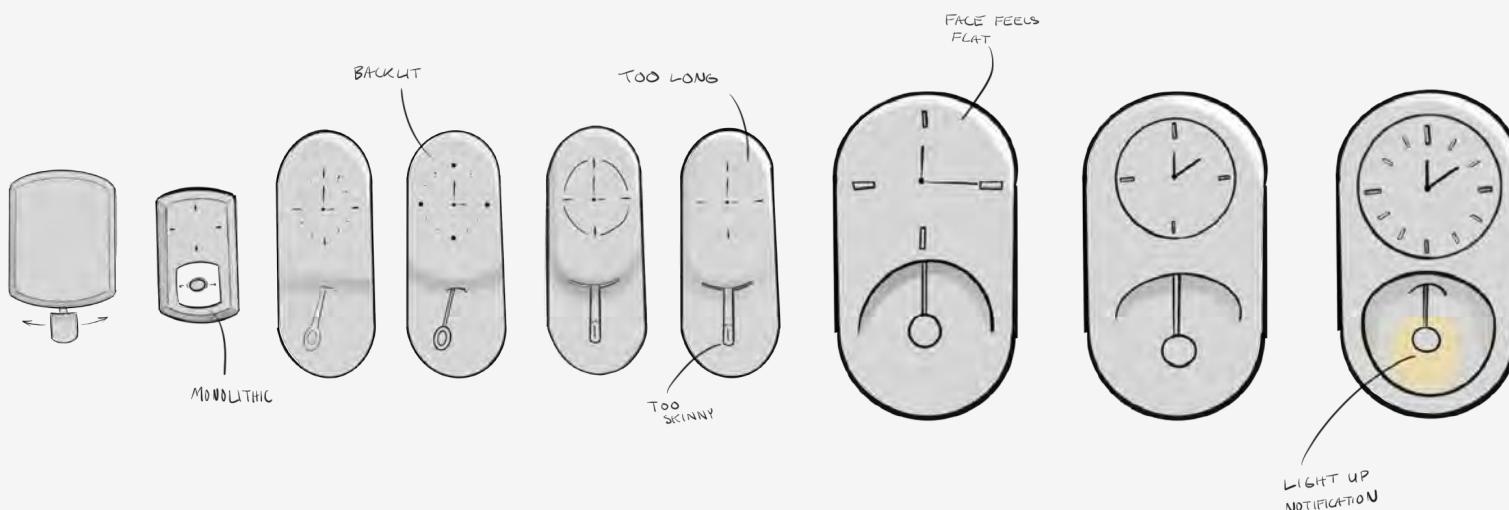
## PREMIUM SIMPLICITY

A premium aesthetic ties back to the origins of the Grandfather Clock being a status symbol.



## CONCEPT TO REALITY

Bridging earlier concepts together.



# PENDULUMEN

SMART HOME ASSISTANT



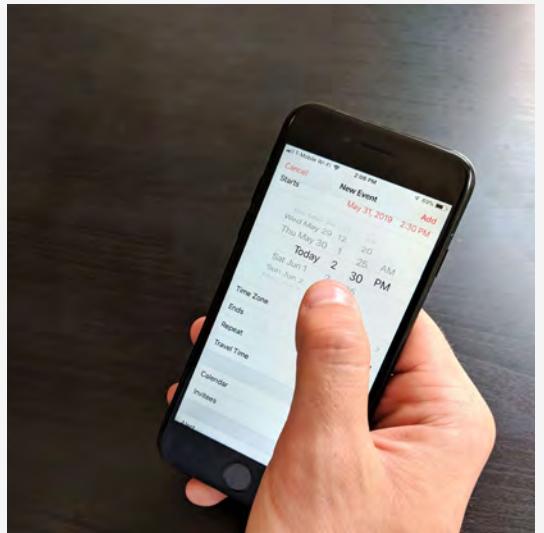


#### NOTIFICATION PENDULUM

The swinging pendulum glows to remind you of your scheduled events

## NOTIFICATION PENDULUM

MAKE PLANS



REMEMBER



ENJOY



## REPAIRABLE

The internals are easily accessible through the back panel, making repairs and updates easy for the user



PENDULUMEN

Designed and Manufactured  
in Louisville, Kentucky

CE

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## Pixel & Timber

Projects are under NDA but feel free to ask  
about my experience

THANKS FOR THE VIEW!

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