



THE  
 AERO-LOOP   
PROCESS BOOKLET

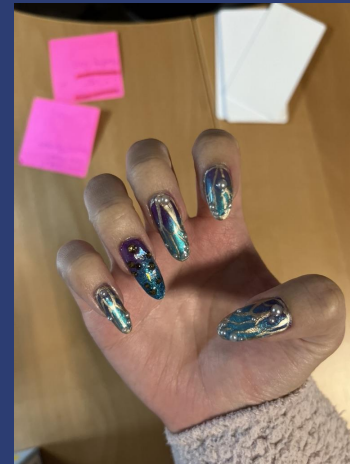
AVERY CAIAZZA  
THE OHIO STATE UNIVERSITY INDUSTRIAL DESIGN 2023 SENIOR CAPSTONE PROJECT  
DESIGN 5101-5201

# PRE-SEMESTER STATUS REPORT

PHYSICAL STATE: NORMAL

EMOTIONAL STATE: NEUTRAL LEANING NEGATIVE

ENVIRONMENT: CLEAN



FUN FACT: THE STRONGEST INDICATOR OF WELL-BEING IS THE STATE OF MY HANDS



GROUP PLACEMENT

# THE DAYTON AVIATION HERITAGE NATIONAL HISTORICAL PARK



# THE PROMPT

The Wright Brothers were once inspired by the "puddle jumper," a hand-propelled flying toy. Contemporary versions of this toy are now handed out to the Dayton Aviation Heritage National Historical Park visitor to demonstrate some aspects of the principles of flight. Yet, those puddle jumpers are made of single-use plastic and do not promote sustainable practices. How do we continue educating about flying principals, share the heritage of the Wright Brothers, and mass produce a sustainable product?

**NOTE: After our first meeting, Ryan (our partner) was amiable to a broader prompt**

NEW PROMPT

HOW MIGHT WE DESIGN SOMETHING  
FOR THE PARK THAT INSPIRES  
VISITORS ABOUT AVIATION?

ROUND ONE:

RESEARCH

# FIRST VISIT

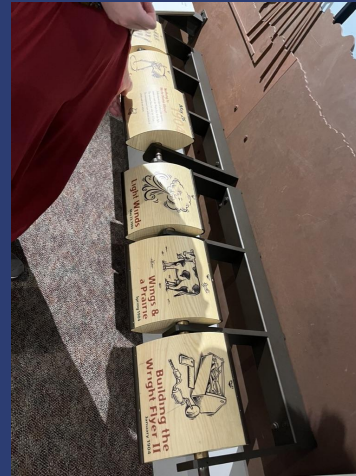
Once we got our assignments, Maria and I decided to visit Dayton and the park right before the semester really got started. We both wanted to experience the park as normal visitors before going in as researchers or designers. We figured it was important to get to know the park in as many roles as possible.



Selfie in front of Wright Brothers' porch



Looking at interactives in Wright Dunbar and Huffman Interpretive Centers



FUN FACT: We also visited the Air Force Museum

# THE RESEARCH PLAN

I really didn't know what I wanted to do for this project going in. This was before we met with Ryan so all I had to go off of was, 'Create a new eco-friendly flying toy.' In some ways I found making a plan so early really unhelpful because I knew it would change drastically as we got further into the project. At the time of creation, I was more curious about the environment in which the park exists. I had been to Dayton before and it always felt like such a ghost town, I was surprised that there was this sprawling park hiding in plain sight. In my mind it was important to know the people that interact with the park if we were to make something for the park.

NOTE: The documents will be linked to the header

# THE SURVEY

Per our first meeting with Ryan, I remember asking if speculative design had any place in this project, and somehow I wonder if I subconsciously kept that sentiment with me through this entire project looking back. Since I was still very untethered I decided to include questions that focused on both experiences outside parks and museums and experiences in parks and museums.

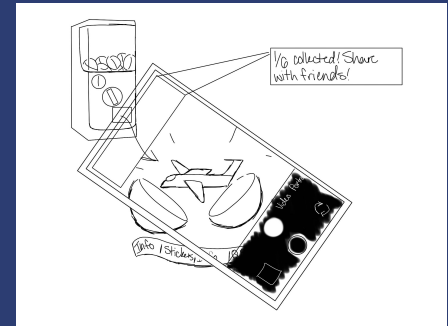
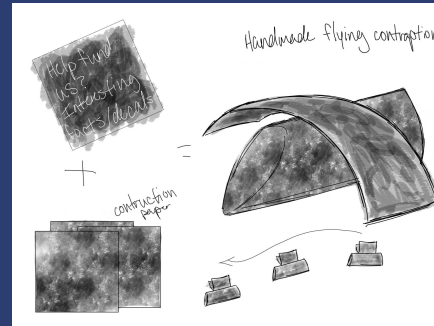
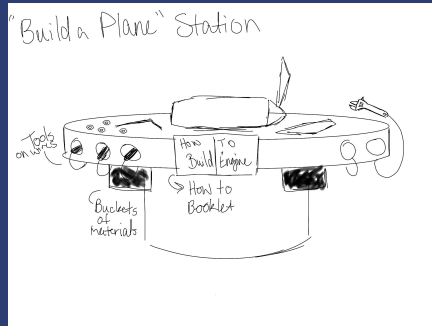
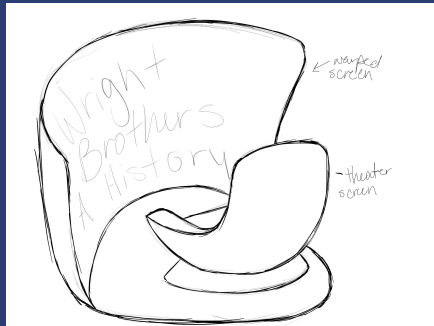
I wasn't focused on a certain group of people, just anyone who has gone to a park, zoo, or museum.

I distributed through facebook groups, tumblr, and friends and family.

I was blown away by the amount of responses I got. And I was especially proud of my data poster. Poster and results [here](#).

# NEWSPAPER/RESEARCH DOSSIER

Again I was frustrated because it felt like we were putting the cart before the horse. I still didn't have a topic/focus so many of my articles were picked at random. I made sure to look into aviation, museums, and souvenirs. Looking back, I am grateful we did start doing secondary research so early in the process. I kind of liked the freedom to research whatever I wanted so long as I related it back to the prompt.



My conjectures from each section. I tried to have a balance of ideas that were in the park and ideas that could be taken outside the park



# SECOND VISIT

We went back to the park for our tour with our partner, Ryan showing us around. It was incredible to hear from an insider what it takes to run the park, seeing the offices and employee spaces, and just being able to pick his brain about all kinds of small facts about the ins and outs of the park. This was the first time I saw the Dunbar House and the Wright Estate.

[HERE ARE THE NOTES I TOOK ON THAT TRIP](#)



Some pictures from the visit

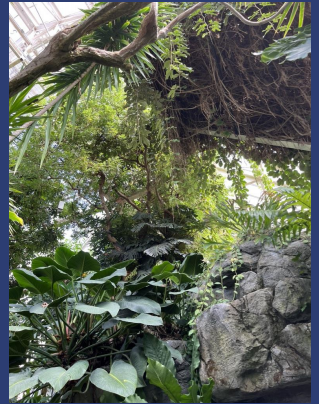
# DESIGN BRIEF

By this point I had noticed the topic of manpower come up a lot from talking to Ryan about current attractions in the park and the ones that had to be shut down. If an attraction was shut down, it was either the lack of rangers, the outdated system the attraction ran on, or the inability to get their partners to agree to fixing it. Making something that could run without the need for a ranger was something that started to take shape in my mind. I also fixated on storytelling, and if there were other ways to tell the Wright Brothers' story without the need for so much reading and watching. It just seemed so dull for the story of flight.

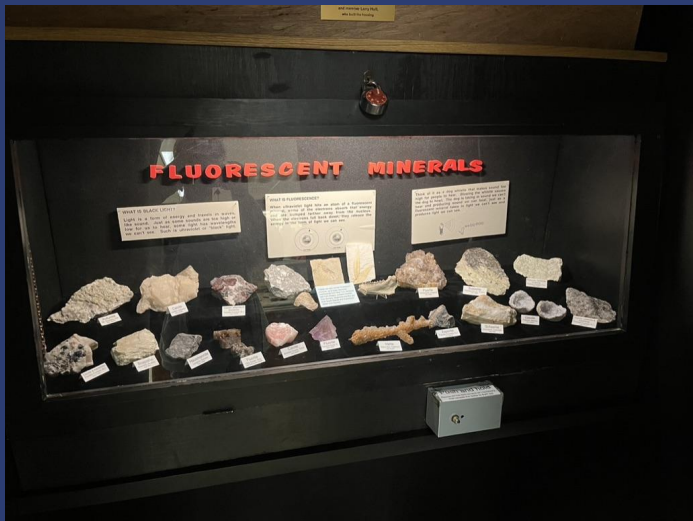
You'll notice a huge jump between my first and second draft in terms of topic. It was thanks to my further exploration that I was able to narrow my topic down.

# INTERMISSION AT OSU GALLERIES AND FRANKLIN PARK CONSERVATORY

By this point I was starting to sweat a little at having no clear vision for this project. We were recommended to not just visit the park but other parks and museums as well to get a feel for different interactions and experiences within the same contextual space. So we visited Orton Hall's Geological Museum, the Thompson Library Gallery, and the Franklin Park Conservatory.

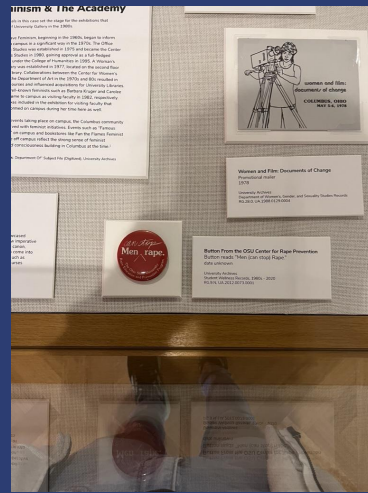






# ORTON GEOLOGICAL MUSEUM

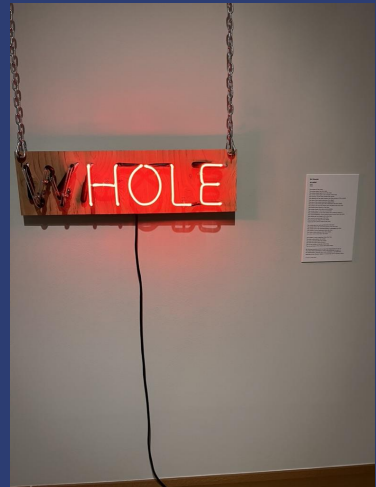
FUN FACT: WE WENT TO EVERY DIFFERENT PARK/MUSEUM IN THE SAME DAY. IT WAS A LONG DAY. CAN'T SAY I FELT ESPECIALLY INSPIRED AT THE OSU LOCATIONS.



LABELLED  
'ABJECT OBJECT'  
THE GALLERY  
CELEBRATED  
FEMINIST WORKS  
THAT HAVE BEEN  
ARCHIVED IN OSU  
COLLECTIONS



## THOMPSON GALLERY



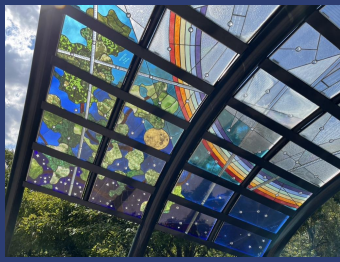




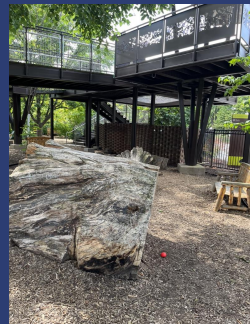
WE VISITED IN SEPTEMBER  
SO THEY WERE IN THE  
MIDDLE OF PREPARING FOR  
AUTUMN. EVERYTHING  
WAS ABSOLUTELY  
STUNNING.

FRANKLIN PARK  
CONSERVATORY





I WAS FASCINATED WITH THE CHILDREN'S PARK. THEY HAD SO MANY GREAT EXAMPLES OF ATTRACTIONS FROM MUSIC GARDENS TO AROMATIC HERBS TO NATURAL PLAYGROUNDS.



# THIRD VISIT

Now that I had some kind of idea I decided to turn to the other rangers to get an idea about attendance, types of visitors, and their personal perspective on working at the park.

I had the opportunity to interview two rangers. I was fortunate in unknowingly setting up an interview with the ranger in charge of the pop-up programs, the focus of my entire project.

I also had an impromptu interview with one of the volunteers in Carillon.

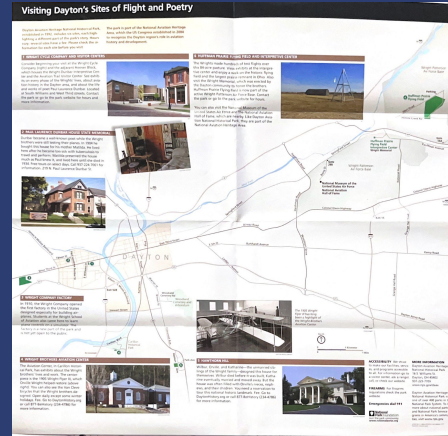


QUESTIONS FOUND [HERE](#)  
NOTES FOUND [HERE](#) AND [HERE](#)  
AUDIO [HERE](#) AND [HERE](#)



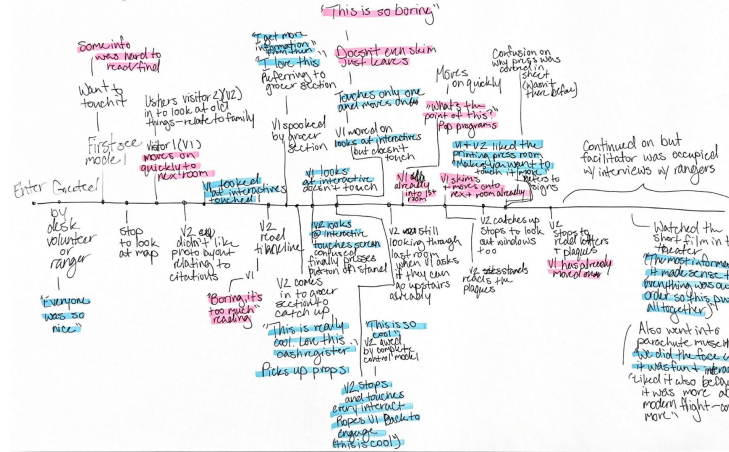
# THIRD VISIT cont.

Seeing as we were designing something for the visitors of the park and we (My peers and I) were too deep in the project to be unbiased, I took my parents to the park and followed them for ethnographic style research. This trip was the most enlightening, it felt as though the fog had lifted from my mind. The pieces just suddenly all fell into place: the lack of manpower, the dismal after-visit experience, the confusing visuals and directions, and the feedback that echoed these sentiments.

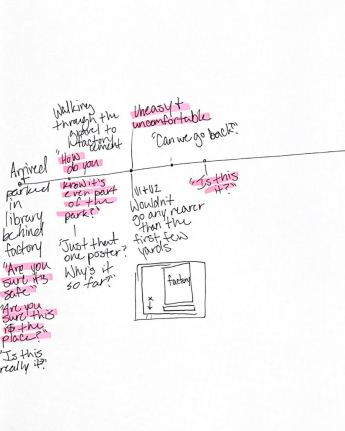


[NOTES HERE](#)  
[AUDIO HERE,](#)  
[HERE, AND HERE](#)

# Visitor's Center Timeline

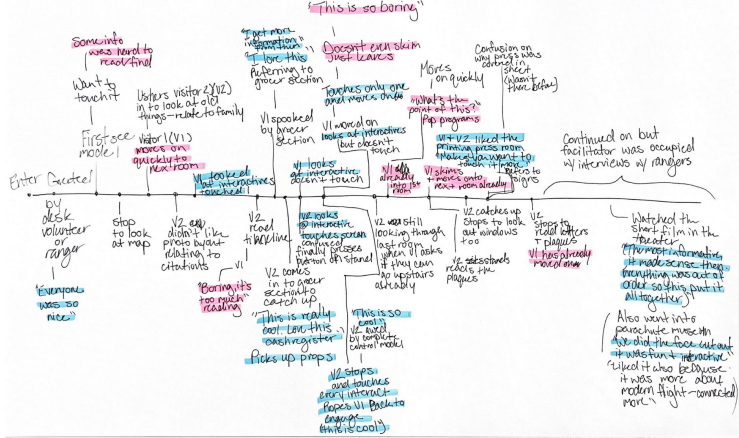


# Factory timeline?

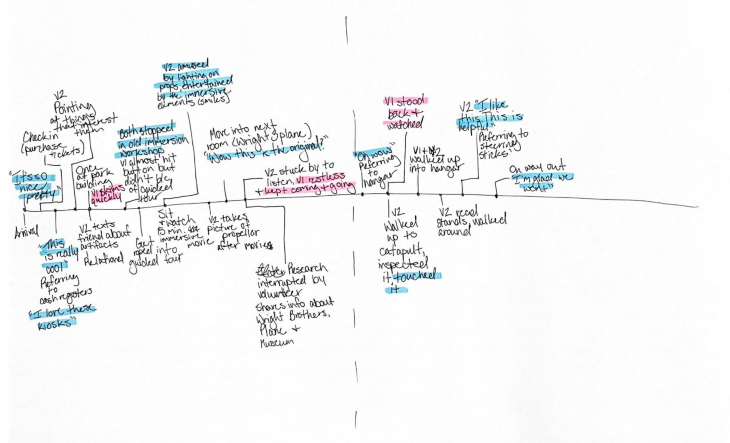


ONCE I GOT BACK FROM THE VISIT I LAID OUT MY FINDINGS ONTO AN EXPERIENCE TIMELINE. I THEN HIGHLIGHTED ALL THE PAIN POINTS IN PINK AND ALL THE GOOD MOMENTS IN BLUE.

# Visitor's Center Timeline

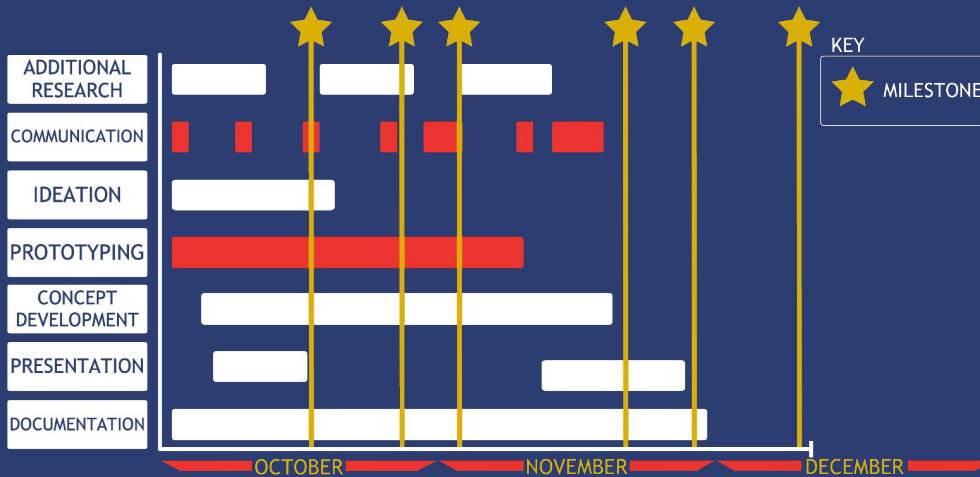


# Carlton Timeline

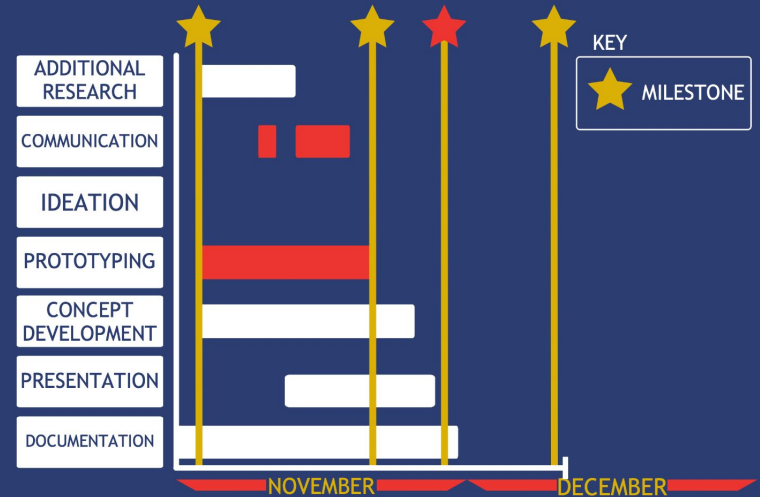


# GANTT CHART

I understand the importance of the chart and being able to look at every task for the rest of the project at a glance but again this was difficult for me to do because I know I change my mind on the dime. Regardless I did it and tried to pay extra attention to the time I'd take for concept development because I knew that mattered a lot to my project.



This is the first version



This is the second version for the mid-point review

## OP-ED

This was fun to write and more helpful to my personal workflow because I was able to fully write out my experiences and points behind my research in a storyline format. Also, it was at this point in the project that I knew exactly what I was doing and what I wanted.

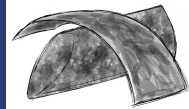
# Op-Ed: The Struggle to Engage After the Visit

By **Avery Caiazza** - September 28, 2023

 41  0

# ADDITIONAL WORKS

I made sure to check in with Seb every time I finished a big chunk of research or reached a conclusion and needed to make a big decision to keep him in the loop of my progress. It was during one of these talks that he recommended I look into extra conjecture analysis. So I created extra conjectures and analyzed them on pros, cons, issues, and opportunities.



## The Gliding Tube

• A quick activity to create a flying contraption out of paper

**Pros**

- Quick
- Easy to make
- Easily sourced materials
- ↳ Household items
- ↳ Unusual shape
- ↳ Not just a paper plane

**Cons**

- Short lifespan
- Simple to the point of dullness
- Breaks easily

**Issues**

- Need to print out templates
- Doesn't connect someone to park

**Opportunities**

- Doesn't take park manpower to make
- ↳ No maintenance
- Easily taught + trainable program
- ↳ convenient off-site



A monthly build kit  
↳ Models are planes though history  
Could be split up by region time period type, etc.  
Includes anything related to make  
Box doubles as display  
Fully articulated

**Pros**

- Convenient
- Novel
- Hands-on
- ↳ collectors item + toy

**Cons**

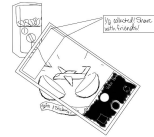
- Timey pieces
- ↳ What if you lose one?
- No
- ↳ need to wait every month
- ↳ Sit on shelf after finished

**Issues**

- Who's putting together the kits
- ↳ What are they made out of?
- ↳ Perhaps out of scope

**Opportunities**

- Don't even need to visit park
- ↳ Out of park exp.
- ↳ Should it connect to park or



## Collector's Series

Gashapon station w/ different planes through the ages  
• Collect all of them  
• Upload to showcase + share w/ others

**Pros:**

- Novel
- Entertaining
- Element of luck/surprise
- Connect post-visit
- ↳ Through website
- Hands-on → Build it

**Cons:**

- Novel
- Small
- Short lifespan
- Still environmentally impactful

**Issues**


- Someone needs to build + maintain website/app
- Would need to source all the gashapon capsules
- Requires maintenance to maintain + install

**Opportunities**

- Can address in park + out of park experiences
- Convenient


These were the conjectures based on things that could be taken out of the park

# ADDITIONAL WORKS cont.




Start your engines  
Build a plane engine from scratch

<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>Extremely comprehensive</li> <li>All tools + materials provided</li> <li>Team effort</li> <li>→ Rewardable for multiple visitors</li> <li>Hands on to the max</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>Terrribly complicated</li> <li>Not available for everyone</li> <li>→ Fine motor skills, concentration, handling tools</li> <li>→ Next fashion in it</li> <li>→ can't run out if stuck</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Requires a worker for help + to "start" engine once its finished</li> <li>→ Process need reassessing</li> <li>→ Does it actually inspire someone about aviation or engineering?</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Spend more time in park</li> <li>→ Environmentally friendlier</li> <li>→ Encourage, won't actually run</li> <li>→ Sense of accomplishment</li> </ul>




Flight, Not to Present Personalized Thusters that play small clips that summarise a specific portion of history or park

<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>Can use pre-existing material</li> <li>→ Societal + atmospheric way to recap information</li> <li>Breaks up monotony of stand + read</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>Not the most accessible</li> <li>→ Is this the best way to convey information?</li> <li>→ Must be part of experience in park</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Requires maintenance to install + repair</li> <li>→ Already have bigger thusters in all indoor facilities w/ informative films</li> <li>→ No space to place them</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Way to distribute information</li> <li>→ More immersive + interactive than plaques on wall</li> </ul>




Recreate the wind tunnel

<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>Hands-on</li> <li>→ Placement in certain area</li> <li>Educational</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>→ Too similar to an egg machine</li> <li>→ Has to be in park building</li> <li>→ Part of ongoing visit exp.</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Needs maintenance</li> <li>→ Is it too disconnected from season?</li> <li>→ Looking people element focus</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Doesn't require park ranger to operate</li> <li>→ Already has the tech in house</li> </ul>




Add a pre-existing building or a new station  
Be able to take like in for repairs

<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>Less people on park grounds</li> <li>→ Better experience</li> <li>→ Take rich business history</li> <li>→ Better flight sim</li> <li>→ Functional + <del>also</del> actually beneficial</li> <li>→ Location</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>Not aviation focused</li> <li>→ Doesn't inspire location</li> <li>→ How many people actually able to do aviation location?</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Need a manager on hand that can make repairs easy day</li> <li>→ Would need to source tools</li> <li>→ <del>Could be</del></li> <li>→ How to stay on park grounds</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Better integrate of community</li> <li>→ Fun could be an element of immersion</li> <li>→ Work it out flight</li> <li>→ Dip shop</li> </ul>



Small prop tours & park from flight sim

<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>→ Occupational Deput + Park location</li> <li>→ Immersive</li> <li>→ All day on in the air</li> <li>→ Personal experience</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>Risk</li> <li>→ Must not be totally para</li> <li>→ maintenance is considerable exp.</li> <li>→ Environmentally impactful</li> <li>→ Flying cap</li> <li>→ Must be done in park</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Need a licensed pilot on hand</li> <li>→ Based on aircraft + baggage</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Visual experience</li> <li>→ Could be incredibly impactful</li> <li>→ Last first-hand exp.</li> </ul>



Like these little tikes walking cars

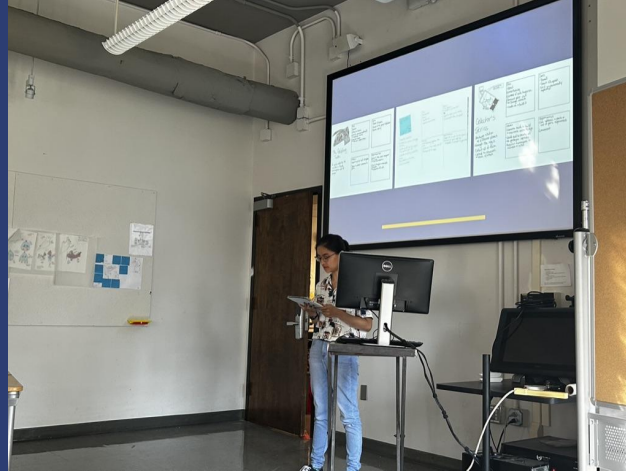
<p><b>Pros</b></p> <ul style="list-style-type: none"> <li>→ Not a very so cute</li> <li>→ Encourage spending time on park grounds (walks) / looking time to take in park</li> </ul>	<p><b>Cons</b></p> <ul style="list-style-type: none"> <li>→ Could be quite specific</li> <li>→ Immobility</li> <li>→ Bored older + visitors</li> <li>→ Only for toddlers</li> </ul>
<p><b>Issues</b></p> <ul style="list-style-type: none"> <li>Need maintenance</li> <li>→ Would need a system to keep track of all the cars</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>→ Play + maintenance</li> <li>→ Shouldn't require park maintenance to operate</li> <li>→ Physical movement</li> </ul>

These were the conjectures based on things that could be done in park



# RESEARCH PRESENTATION

Part One's big presentation. I really had to workshop the ideas I wanted to show into an understandable timeline. The theme is something I've carried up to the end, with the colors based on the Wright Flight Company (The Wright Brothers' airplane company) colors and the font based on the font used, or as close as I could get it.



[SCRIPT HERE](#)

FUN FACT: THE REASON I  
SOUNDED LIKE I WAS  
GASPING WITH EVERY  
BREATH WAS BECAUSE I  
WAS SO ANXIOUS I  
LEGITIMATELY THOUGHT I  
MIGHT PASS OUT.

# FEEDBACK

I was blown away by the positive feedback I received. I had watched as the day had gone by, how every detail was nitpicked, every plot hole found and put under a microscope. While I was confident in my work, as Plato put it in our first week's reading, 'You don't know what you don't know.' Most of the response I got just asked me to think about the finer details, something I would naturally hammer down in the coming weeks.



Maria was kind enough to document for me to review after



ROUND TWO:

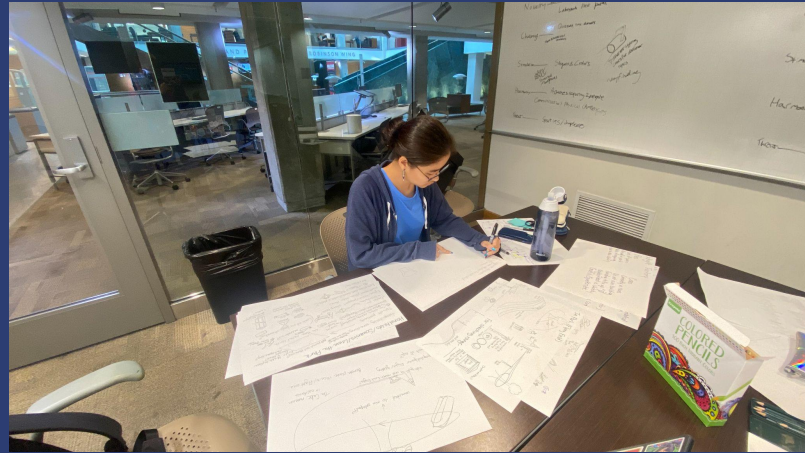
CONCEPTUALIZING

# BRAINSTORMS

We got a few days off before we jumped into conceptualization. It started with group brainstorm sessions. I felt constricted working on my iPad so almost all of my sketches are on paper.

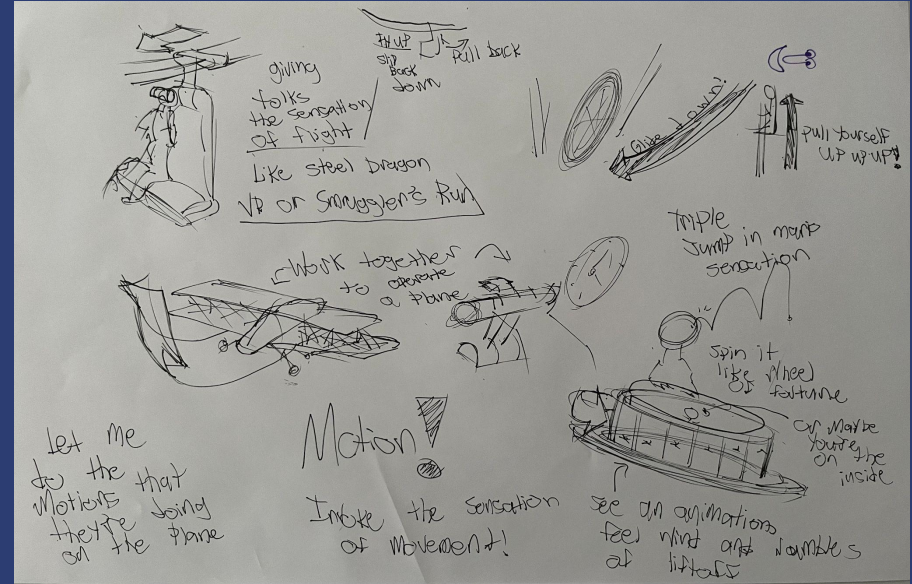
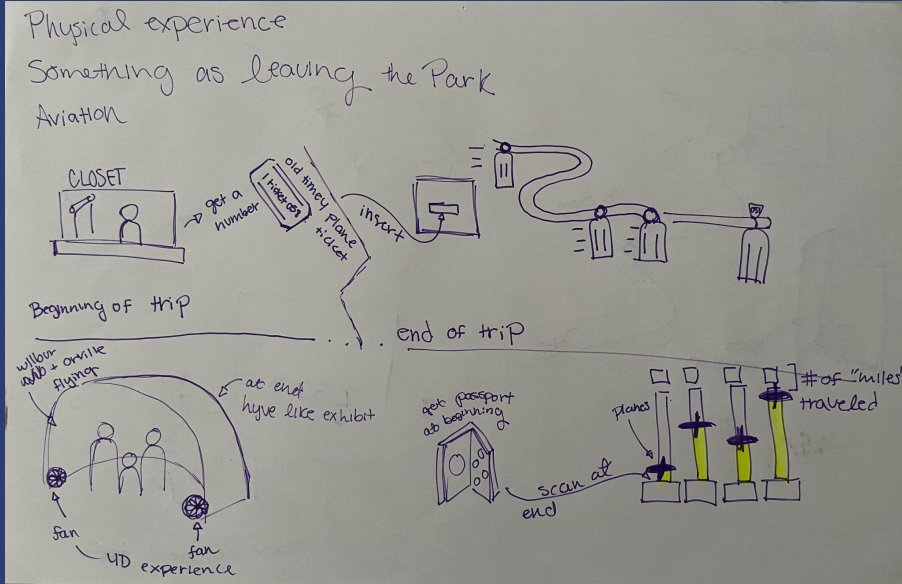


The first brainstorm session



An out of class brainstorm with Maria

# COLLABORATIONS



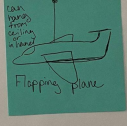
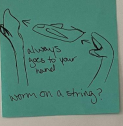
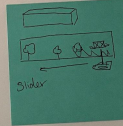
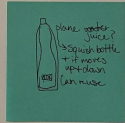
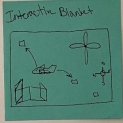
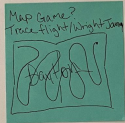
My peers were very enthusiastic about putting something in the park per my explanation of my topic. I got a lot of feedback on how we might scale flight down to a personal level. From giant zoetropes to flight simulators, they were great for fostering ideas.



Even though I was thinking more about an attraction inside the park, I sketched out some ideas for souvenirs or things that could be taken outside the park to make sure I kept my options open. It was too soon to completely ignore that aspect.

### Car Souvenirs

Connect to aviation  
Physical



Canned index  
Mechanical shift  
Reference to (table) to  
to  
to be able to what they  
in  
can't make impression  
something good to be able  
to make (and make real)

### Hand holds / Souvenirs / Leave the Park

Vintage looking something → Aviator clothing? Toys from 1900-1980  
 → punch out plane toy? bird? futuristic plane/space ship?  
 → be able to place it back?

Spin off postcards

Time actors making something?  
 → Book, food, plane wings?  
~~Dinners w/ the Rangers?~~  
 Timed toy  
 Tinned - (Tinned potato chips)

Enamel pin  
 → Detachable flyer?

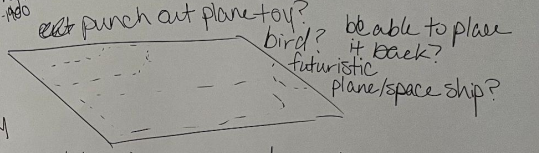
A plane ticket / passport stamp book?

Remote control plane take home

A coin press that turns it into a plane?

⊕ → [ ] or [ ] or [ ] 3

Get a display box?



Like those metal earth  
 an aviator kit?  
 Fake license? Passport or ticket?

Look at air force decoration?  
 tank  
 parachute?

plane?  
 tin is vessel contains all elements to change out (mods)

punch out canned paratrooper?  
 Lantern?

Even though I did divide my time between souvenirs and attractions, I spent more time exploring attractions for their larger nature. I am comfortable creating small products (especially soft goods) that I wanted to push myself into thinking up something that couldn't fit in my hand.

major elements of bike wheels in what?

A self-powered merry-go-round-esque globe attraction

A set of plane fronts connected to main spoke

Use whole handles + starts remaining

Once hit certain speed easy to jump + disengage in air + glide down after a few sec.

hands-on / interactive / placed within / background board v

Conceptual Board / merry-go-round

Spokes / Add depth / Use for it / ...

How could it be shown / Use car / ...

Translucent / ...

Mean / ...

How to fly?

2017 Anne Galloway

In Park (Flying Field)

already shot

lift / ...

run to wind up / then it lifts / in few sec up / then unwinds and falls

run to wind up / then it lifts / in few sec up / then unwinds and falls

multiple

use it for / community / ...

For shooting range

need some dirt

2017 Anne Galloway

Build a Plane

Pick a base

cutty / ticket

Test fly it / in facility / simulator fly

assemble

Take with you home / wrapper turns into runway

2017 Anne Galloway

Lift off

Mimics poble jumper

Mini space ships that need to be twisted

Small jump / lifting feet + it spins + flies

Stops at top + slowly glides back down

hands-on / interactive / ...

How could it be related to ...

Lift / ...

2017 Anne Galloway

Flight simulator

photo-op-ish

Big wing kiter

like the tarp / ...

2017 Anne Galloway

Mini plane / ...

connected to main catapult?

kids pull it and watch it fly?

Self propelled power flight / gliding

Risk part of exp?

Remote plane races / flight area

The Cube museum in California

2017 Anne Galloway



Separate attributes  
make note ideas for each involved  
Combine

Attributes:

is in park  
Huffman Flying Field  
is a sculpture  
with many interactive  
to make one  
needs to be able to be  
placed in a car  
with a top

In park:

Need to use body

Through own means you "fly"

↳ The physical effort/struggle emulates Wright story  
↳ Pay off to keep working at it



## Wright Factory

Pros

Lots of space  
Already in park  
Talks of acquiring  
Near a new library

Cons

Currently in ruins  
Do not own building  
Funding to fix up?  $\emptyset$   
Neighborhood is sketchy  
Graffiti/Squatters/etc.

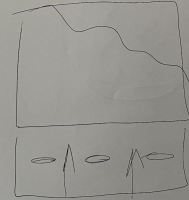
## Huffman Flying Field

Pros

Lots of space  
Already part of park  
Underutilized by park  
Better end point

Cons

The Shooting Range  
Sits on an aqueduct  
On air force land



## Transcend Park:

Pros

Continue ~~the~~ visit exp.

Cons

Needs to be somewhat small  
Needs a system of distribution

## Huffman Interpretive Center

Pros

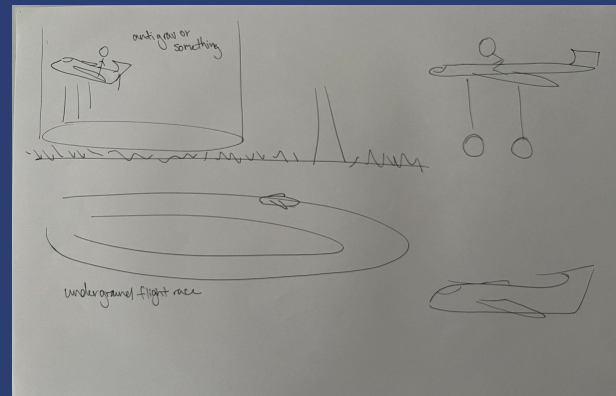
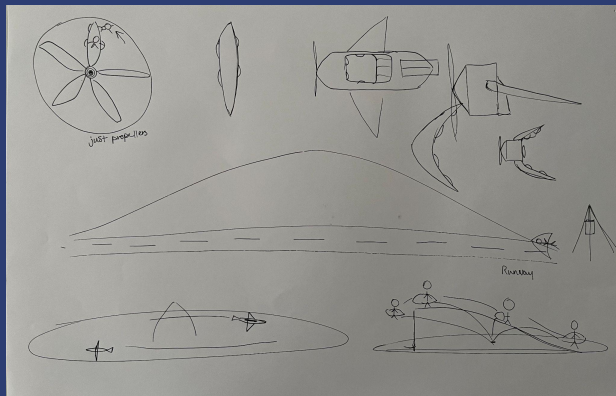
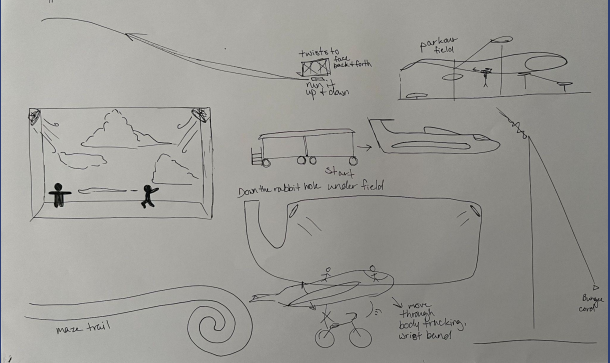
Already part of park  
More of an endpoint in visit

Cons

Small  
On air force grounds  
Outdoor used up  
Maintenance takes forever

Perhaps out of order, I went back and did a pros and cons of each location in the park. I didn't consider the Wright Dunbar Interpretive Center because that's where the current pop-up program resides and makes no sense given my research. This may have been somewhat unnecessary as this is a speculative design but I also wanted to think this through in its entirety. Call it practice.

Archetype: self powered play

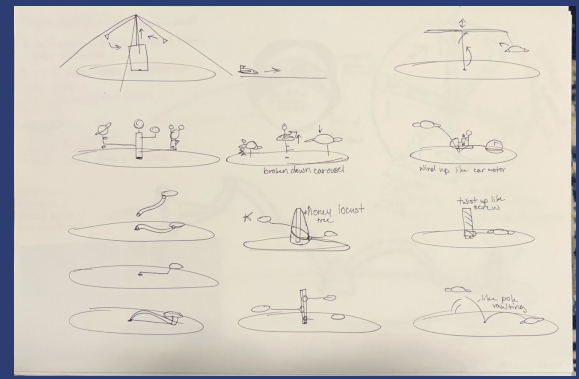
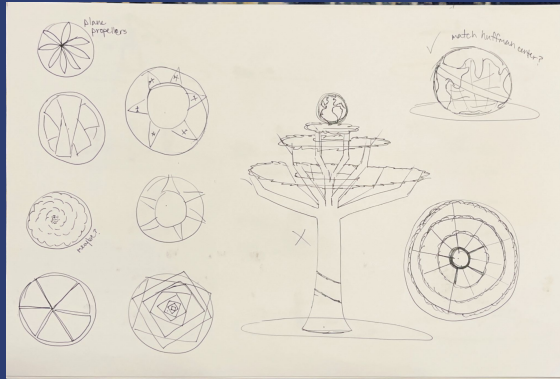
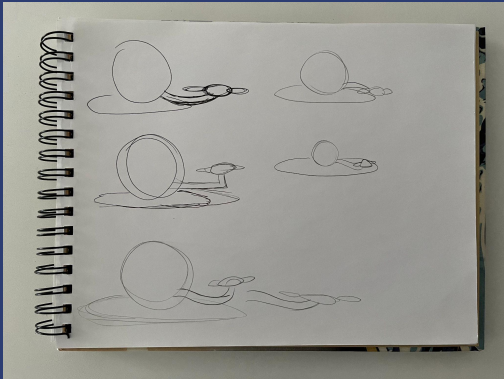
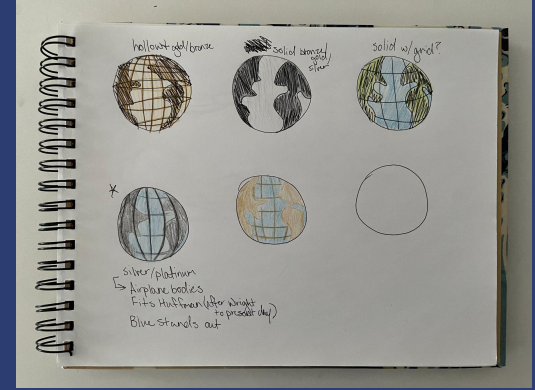
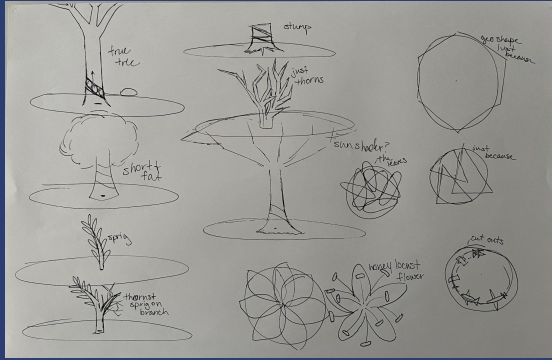
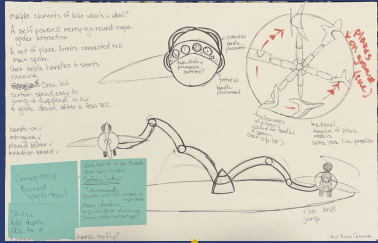


Carousel	Parkour	Shadow
<ul style="list-style-type: none"> <li>not a machine operated</li> <li>need to use self as flight vessel</li> <li>you are the plane</li> <li>Touch it</li> <li>Weird</li> <li>Not something you expect to see in flying field</li> <li>It's powered by you</li> <li>Infinite replay</li> <li>Planes or faithful recreations</li> <li>Switched buttons</li> <li>Ground is squishy</li> <li>Helps w/ impact</li> <li>Don't have to wait to play</li> <li>Putting together makes it easier to move</li> <li>Like the <del>old</del> aesthetic</li> <li>not shadow 20' out there</li> </ul>	<ul style="list-style-type: none"> <li>use body as vessel of play</li> <li>interestingly looking environment</li> <li>Touch it</li> <li>Climbing all over a plane</li> <li>Freedom of direction</li> <li>Can move any way I want</li> <li>really high + jump down</li> <li>some moving parts (gears) making</li> <li>Plane controls more</li> </ul>	<ul style="list-style-type: none"> <li>Emerging tech</li> <li>Secondary vessel</li> <li>Though more visibly direct approach</li> <li>Actually flying</li> </ul>

	Carousel	Parkour	Shadow
hands-on	✓	✓	✗
placed better	✓	✓	✗
intuitive	✓	✓	✗
immersion	✓	—	✗
navigation focus	✓-	✗	✓
simple mechanism	✓	✓	✗
self-operated	✓	✓	✗
multiplayer friendly	✓	✓	✗
durable	✓	✓	✗

I freaked out in the middle of brainstorming feeling like I wasn't doing enough so I kept pushing myself to keep coming up with new ideas, which was not the best idea. The reason I freaked out was because one of my initial ideas was looking really viable but we've been fear mongered and threatened too much about using first ideas that I kept going and going and I should have realized this and stopped myself. Instead I kept getting recycled ideas and useless analysis charts.

Eventually I conceded with myself and pushed one of my initial ideas further. The reason I chose this one is because I felt that being able to move your body and embody flight were important feelings to leave with visitors. It ticked all the boxes for my research (location, immersion, self operational, interaction) along with being able to tell a kinetic story of the Wright Brothers. You need to put in the effort to get off the ground. It might take some time and it may hurt but you have to keep going to fly.



**FUN FACT: I WAS GOING TO MAKE THE AXIS THE HONEY LOCUST TREE THE WRIGHT BROTHERS FLEW AROUND, ALONG WITH A SUN SHADE. THESE WERE SCRAPPED A) IN FAVOR OF FOCUSING ON MODERN AVIATION AND B) THEY BLOCKED THE SKY**



# FORMATIVE ASSESSMENTS

One of my biggest hurdles was making the Aero-Loop ergonomic, so my formative assessments echoed that. I struggled most with what the cart/vessel would look like.



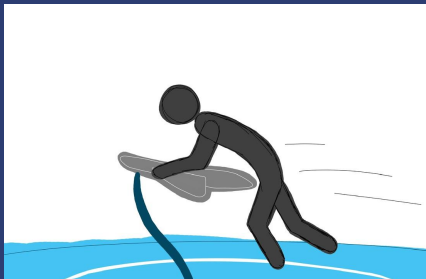
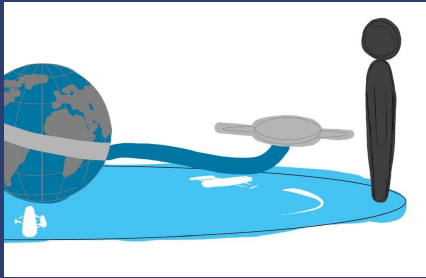
Some photos of the day I did my formative assessments. One of which we went to some playgrounds and the other in which we used an office chair to test how best to get on the cart/vessel.

Notes [here](#)



# MID-POINT REVIEW

By this point the main body of the Aero-Loop had been decided. The design of the floor (Blue with the 3 Wright Flyers), the axis (Blue and Silver globe), the number of planes (5), and the ideal way to use.



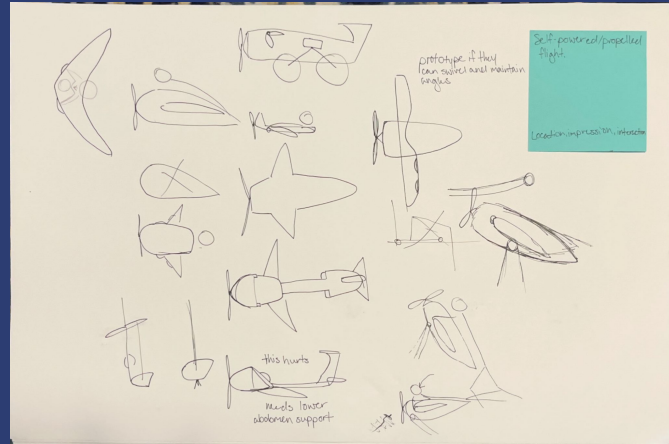
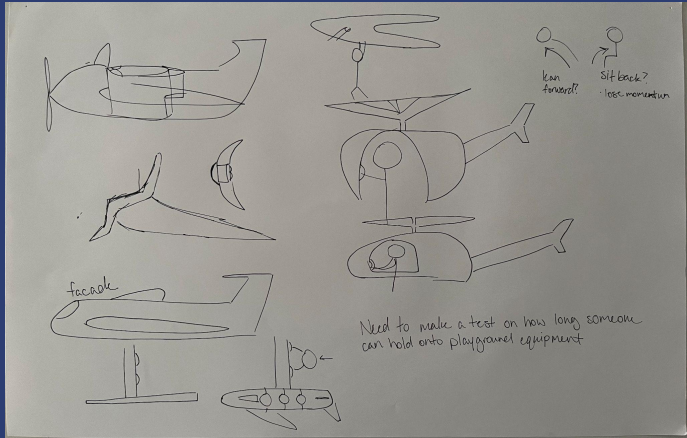
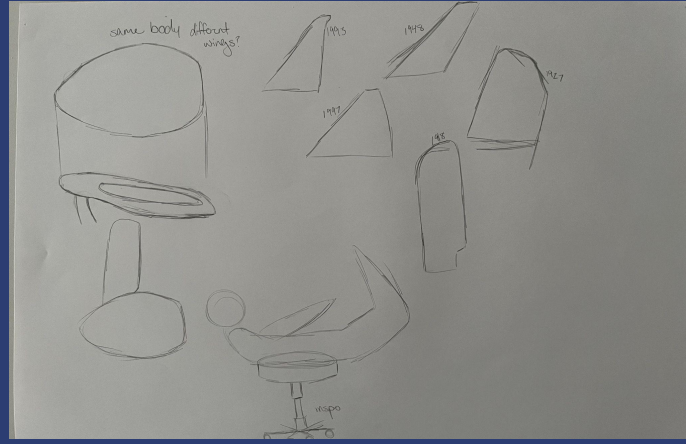
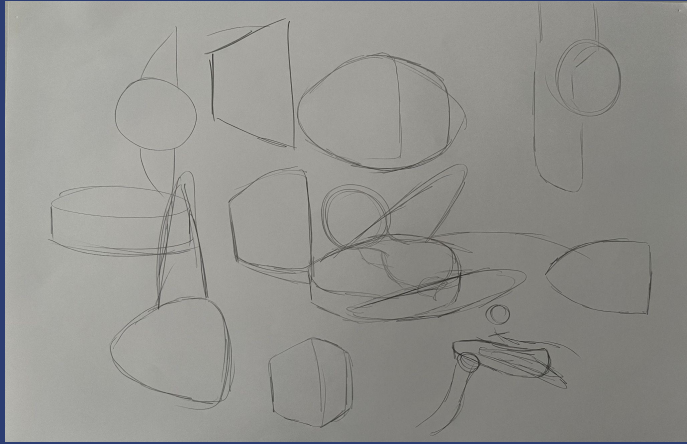
Left: My ideal scenario of use

Right: The list of attributes I knew going into the Mid-Point Review

FUN FACT: THE AERO-LOOP RUNS COUNTER-CLOCKWISE TO EMULATE AMERICAN CAROUSELS, BUT ACCORDING TO RYAN THE WRIGHT BROTHERS ALSO FLEW COUNTER-CLOCKWISE IN THE FIELD. HOORAY FOR HAPPY COINCIDENCES!

Elements of Exp.

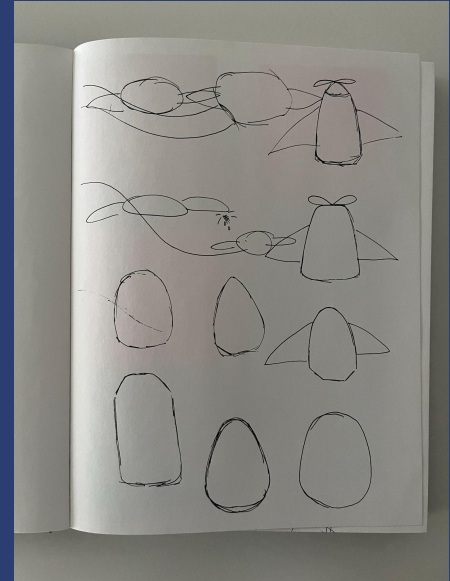
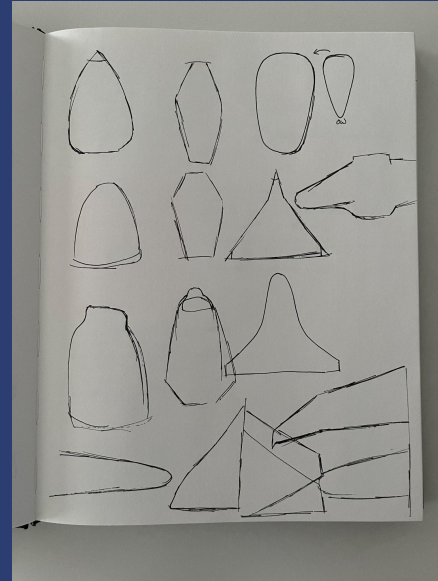
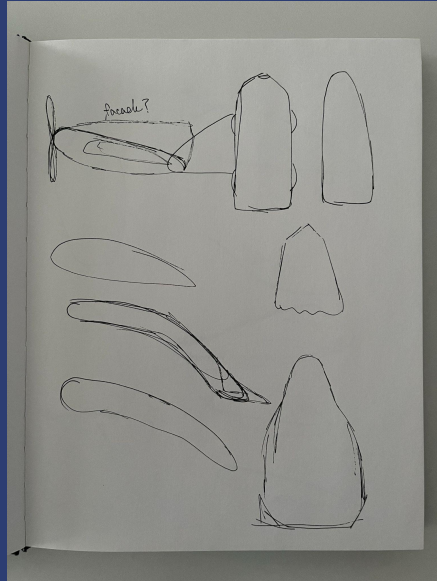
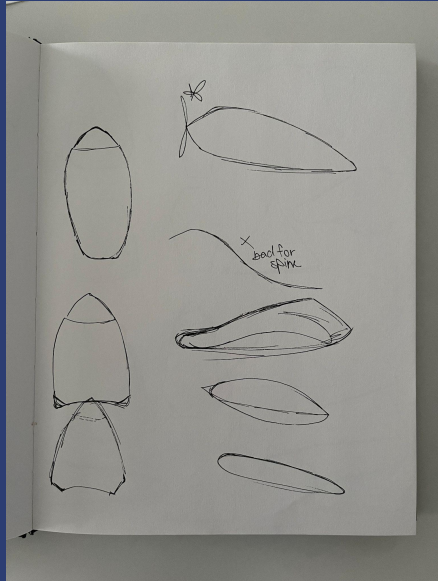
- Turns counter clock-wise  
(Traffic, carousel turn that way Americans)
- Floor circle + squishy turf? Playground + loop
- 3 planes for the 3 wright flyers
- Axis is a globe
- Globe is solid, silver panel + grid lines + blue ocean



I have so many pages of nothing but planes, plane extractions, simplified planes, miscellaneous flying machines, etc.

Originally my idea was to make every plane the same so here I am trying to make a universal plane carousel cart.

# THE PLANE ITERATION CONTINUES





To figure out the ergonomics of the planes once and for all, I went to look for real life examples of using your body as part of the vessel. For example, I went to look at snowboards, sleds, boogie boards, kayaks, paddleboards, and surfboards.

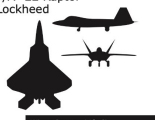













Eventually I figured out that the planes should be no longer than 3 feet long and the main body should be no wider than 20 inches.



# THE EPIPHANY

People come to the park to look at real planes and aviation history. Why in the world am I trying to make a single plane shaped thing when I should be looking at the planes they have on display for my inspiration?

<b>Sky of Honor Aircraft Spotter</b>		
<p>Look up! The U.S. military aircraft that you see patrolling our Sky of Honor represent almost 100 years of aviation design evolution and innovation. Each airplane features some element that was invented, tested, built, procured, or flown here first - Huffman Prairie Flying Field and its aeronautical successors in Dayton and Wright - Patterson Air Force Base.</p> <p>Use this "Aircraft Spotter" to identify the flying machines above you.</p>		
<p>1997 F/A -22 Raptor Lockheed</p>  <p>Wing Span: 44ft 6in Max Speed: Mach 1.8 Use: Fighter/Attack</p> <p>REMARK: This multi-mission stealth aircraft employs multimode electronically scanned radar, internal weapons carriage, a sophisticated fully integrated sensor array, and flies at supersonic speeds without the use of afterburners.</p>	<p>1993 B-2 Spirit Northrop Grumman</p>  <p>Wing Span: 172ft Max Speed: High subsonic Use: Bomber</p> <p>REMARK: This stealth bomber with a unique flying wing shape introduced a revolutionary blend of low-observable technologies, high aerodynamic efficiency, and a large weapons payload.</p>	<p>2001 RQ-4A Global Hawk Northrop Grumman</p>  <p>Wing Span: 116ft 2in Max Speed: 300 - 400 KTAS Use: Unmanned Reconnaissance</p> <p>REMARK: Piloted by remote control, the unmanned Global Hawk provides battlefield commanders with the most current information about enemy resources and personnel.</p>
<p>1967 F-111 Aardvark General Dynamics</p>  <p>Wing Span: 32ft (swept) 63 ft (extended) Max Speed: Mach 2.2 Use: Fighter Bomber</p> <p>REMARK: Employed by the Air Force as both a tactical fighter and a strategic bomber, the F-111 was the first production aircraft with variable sweep wings.</p>	<p>1955 B-52 Stratofortress Boeing</p>  <p>Wing Span: 185ft Max Speed: 650 mph Use: Bomber</p> <p>REMARK: The most recognized military aircraft in the world, the B-52 has been the nation's workhorse bomber for over 40 years.</p>	<p>1948 F-86 Sabre North American</p>  <p>Wing Span: 37ft 1in Max Speed: 685 mph Use: Fighter</p> <p>REMARK: The F-86's jet engines and swept-wing aerodynamics dominated the skies for the U.S. Air Force during the Korean War.</p>

<b>Sky of Honor Aircraft Spotter</b>		
<p>Look up! The U.S. military aircraft that you see patrolling our Sky of Honor represent almost 100 years of aviation design evolution and innovation. Each airplane features some element that was invented, tested, built, procured, or flown here first - Huffman Prairie Flying Field and its aeronautical successors in Dayton and Wright - Patterson Air Force Base.</p> <p>Use this "Aircraft Spotter" to identify the flying machines above you.</p>		
<p>1940 B-17 Flying Fortress Boeing</p>  <p>Wing Span: 103ft 9in Max Speed: 292 mph Use: Bomber</p> <p>REMARK: The B-17 was a state-of-the-art, four-engine bomber when America went to war in 1941. It became the most recognized bomber of World War II.</p>	<p>1934 Martin B-10 "Flying Whale" Martin</p>  <p>Wing Span: 70ft 6in Max Speed: 215 mph Use: Bomber</p> <p>REMARK: The single wing B-10 was the U.S. Army Air Corps' main bomber. It was the first two-engine, all metal, mid-wing monoplane bomber produced in quantity.</p>	<p>1943 P-51 Mustang North American</p>  <p>Wing Span: 37ft Max Speed: 437 mph Use: Fighter</p> <p>REMARK: The P-51 was the best all-around American-built fighter of World War II.</p>
<p>1918 DH-4 Liberty Plane Dayton-Wright Company</p>  <p>Wing Span: 43ft 6in Max Speed: 128 mph Use: Bombing and Observation</p> <p>REMARK: The DH-4 was the only U.S.-built aircraft flown in combat during World War I.</p>	<p>1905 Wright Flyer III Wilbur and Orville Wright</p>  <p>Wing Span: 40ft 6in Max Speed: 30.1 mph Use: Pilot-Practical Airplane</p> <p>REMARK: Designed, built, and tested by the Wright brothers at Huffman Prairie Flying Field in 1905, this machine was the world's first practical airplane.</p>	<p>1927 Curtiss A-3 Falcon Curtiss</p>  <p>Wing Span: 38ft Max Speed: 123 mph Use: Fighter</p> <p>REMARK: The U.S. Army Air Corps' first production attack aircraft, the A-3 biplane was the standard attack type aircraft of its era.</p>
<p>Huffman Prairie Flying Field Interpretive Center</p> <p>2380 Memorial Road, Building 4003 Wright Patterson Air Force Base, Ohio 45433 (937)425-0088</p>		

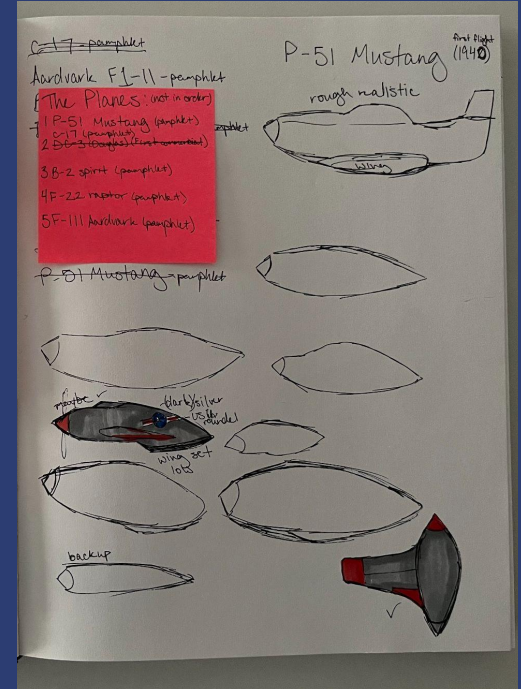
A pamphlet that can be found in the Huffman Interpretive Center

# A QUESTION OF ETHICS

I struggled with whether or not it was morally right to use war planes, as most of the modern aviation history in the accompanying interpretive center was focused on war planes. However, therein lies the loophole. The park has no qualms displaying and teaching about war planes, so it wouldn't be out of place to use war planes. Also, the Huffman Flying Field, the chosen location, is on Air Force Base ground.

This does not reflect my own stance but for the project it was the best design choice tying the interpretive center, location, and history together.

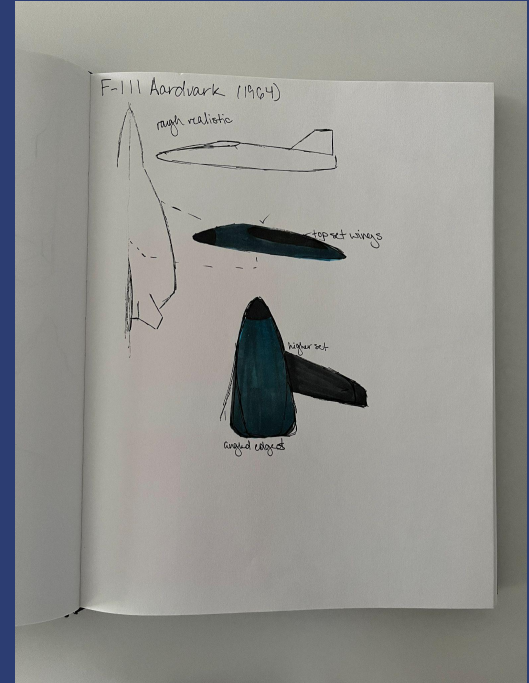
# P-51 MUSTANG



I thought it was important to preserve one of the most iconic fighter planes, along with the plane having a very iconic silhouette. Also, these planes were really decorated compared to modern day war planes, and I wanted to make sure there was not only body diversity but color diversity.



# F-111 AARDVARK

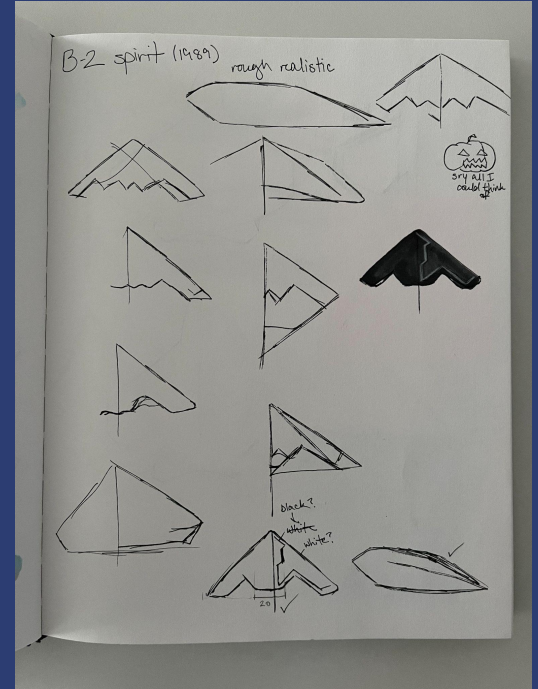


F-111 Aardvark was picked for its ability to move the placement of its wings. I decided to combine the shape of when its wings are tucked in and when they're spread out in the final form. The general shape of the nose and placement of the wings stayed the same from real plane to carousel ride.

# B-2 SPIRIT

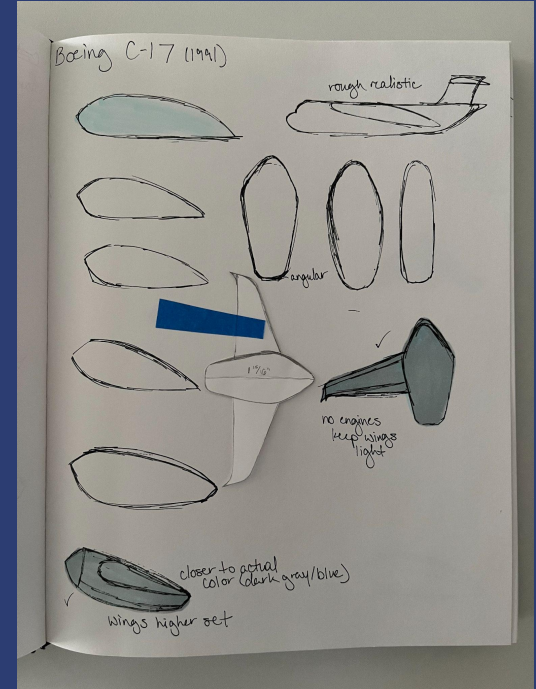


**B-2 Spirit**



This had a really unique body shape, I just had to include it. The back was simplified for the sake of ergonomics. The white outlines were just so striking.

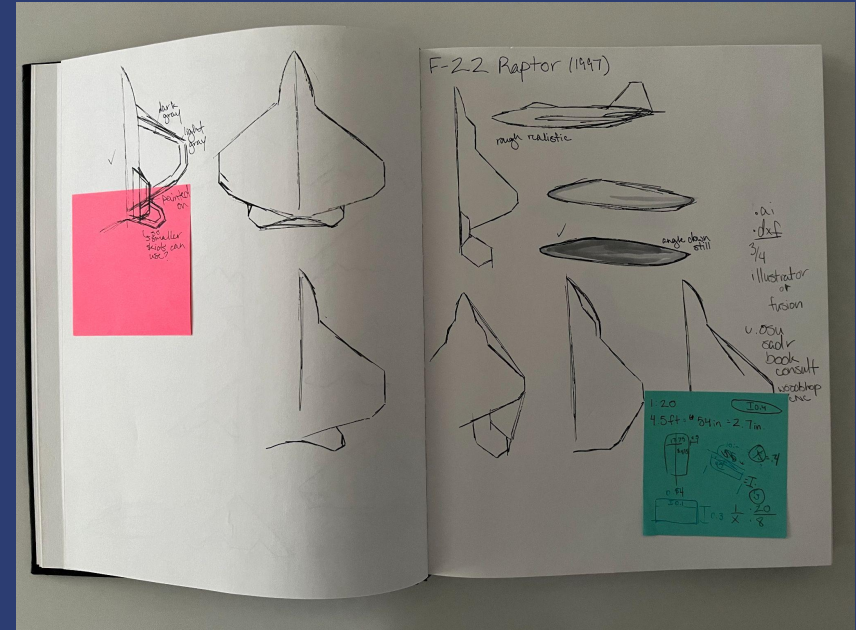
# BOEING C-17



This is the most plane shaped plane of the bunch, which is why I included it. Since all the other planes are distinct planes, I figured one plane should be a generic plane shape to get the whole breadth of plane shapes. However, the little sharp tips of the wings were important to keep it distinguishable.



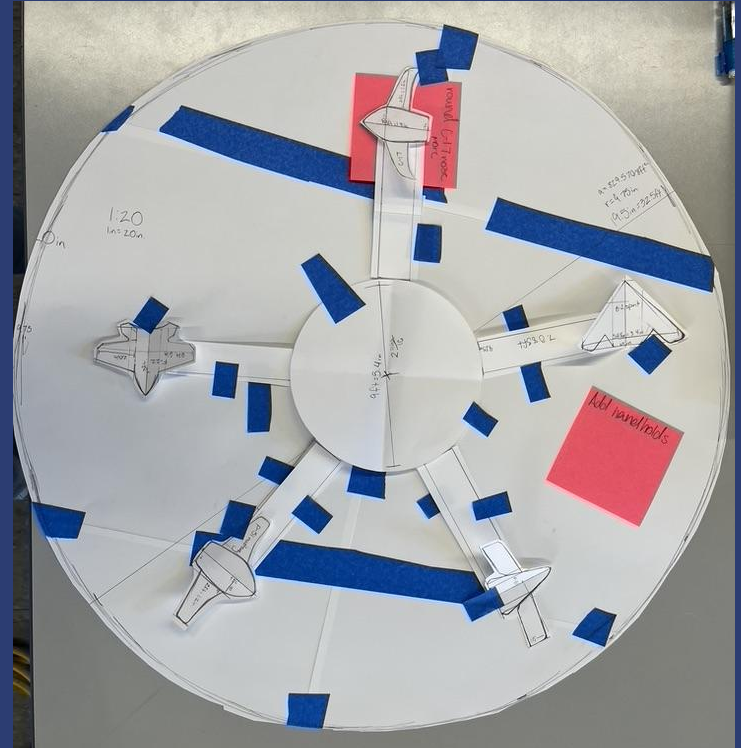
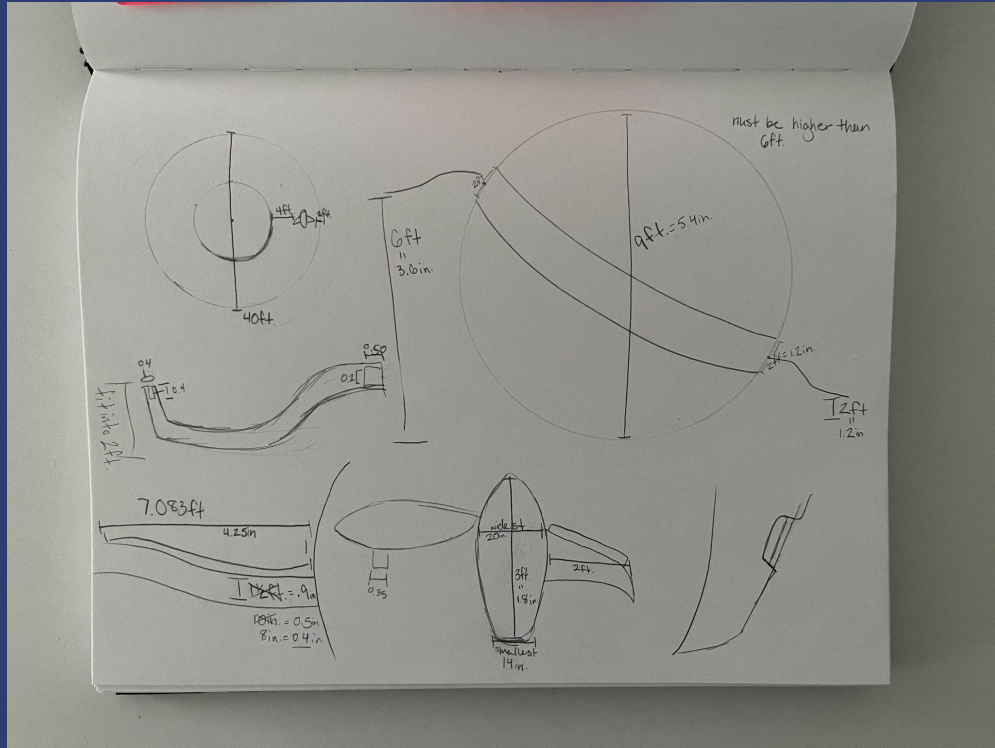
# F-22 RAPTOR



A sleek, modern looking silhouette that rounds out the collection. I thought the stabilizers were important to the visual so I knew they'd be painted on since they can't be part of the physical model.



# SCALE

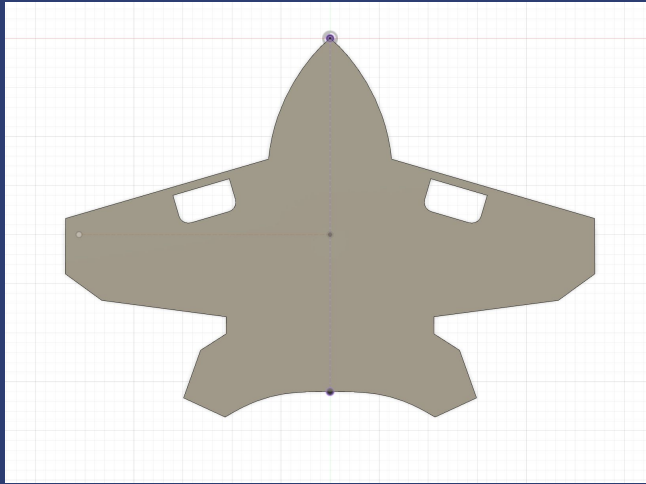


The last thing I had to figure out before diving into physical modeling was the scale of my scale model, and I finally settled on 1:20 where one inch equals 20 inches.

ROUND THREE:

# PHYSICAL DEVELOPMENT

# LIFE-SCALE PLANE



I modeled out the F-22 in Fusion 360, downloaded the file and sent it to the CDC machine in Hopkins. After break I could pick it up, remove it from the board, sand it down, and start painting. While it can't hold the same shape as the ideal model, it is sized correctly for life-scale.

**FUN FACT: WE COULDN'T FIT THE BOARD IN MY DAD'S CAR SO WE HAD TO DRIVE BACK AND FORTH TO PICK UP MY MOTHER'S AND THEN GET IT TO HAYES. IT WAS A LONG DAY AND ALMOST DIDN'T PAN OUT SUCCESSFULLY.**



## LIFE SCALE PLANE cont.

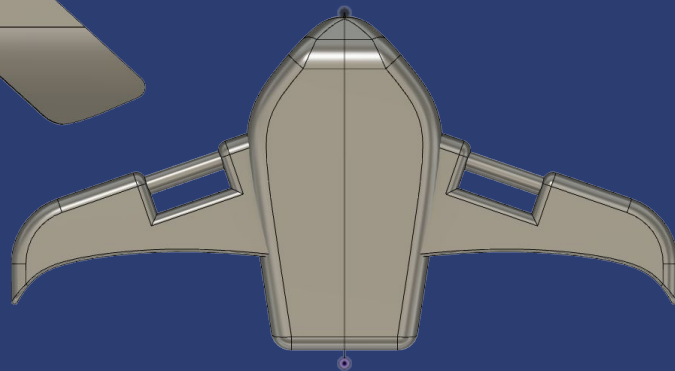
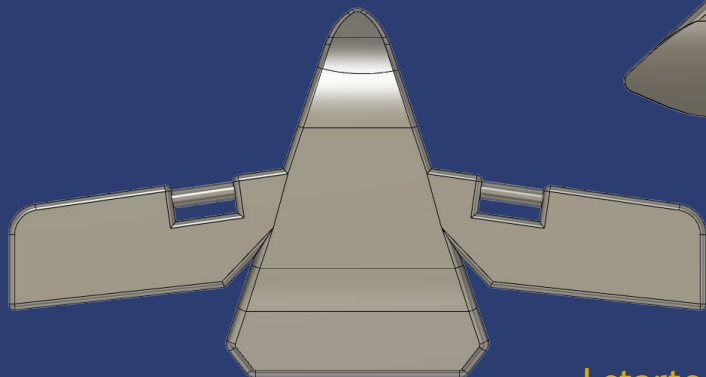
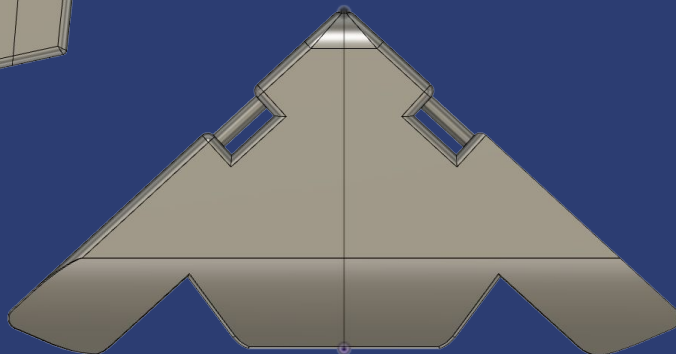
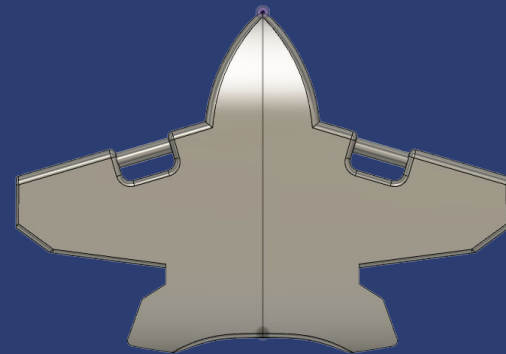
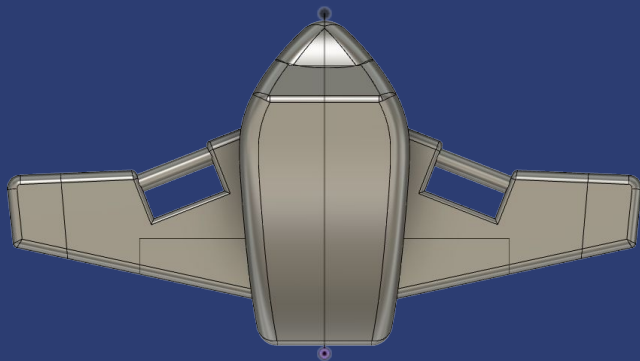


I used an old office chair (My dad has had it since I was a child) for the wheels to mount the finished plane on so it could move the way the actual plane would on the Aero-Loop. I had to add a second small slab of wood to the bottom because the plane is too thin and the screws poked up.

FUN FACT: I DON'T RECOMMEND SANDING WOOD IN YOUR HOUSE. YOU CAN FIND THE PLANE IN ACTION [HERE](#).

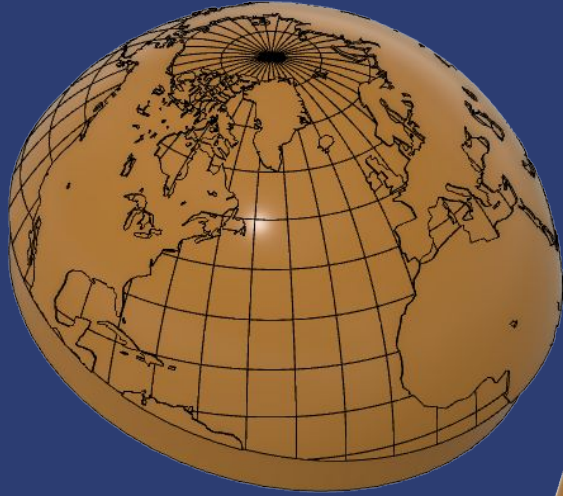


# FUSION 360

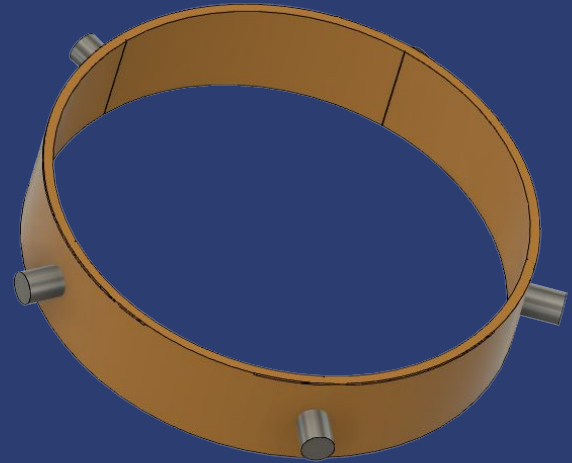
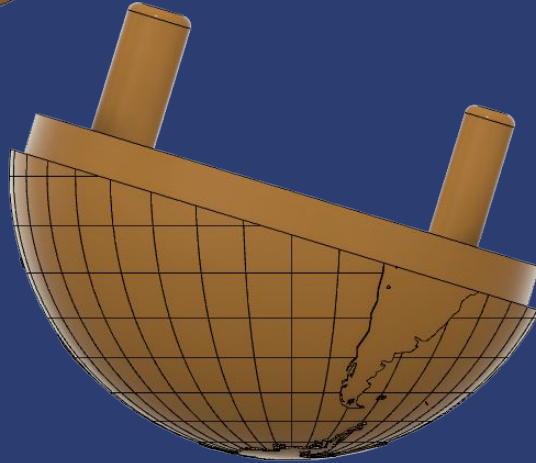


I started by modeling out the planes in Fusion based on my scaled sketches.

## FUSION 360 cont.



I found a hollow gridded globe on Grabcad, edited it, added the band and modeled out the arms.

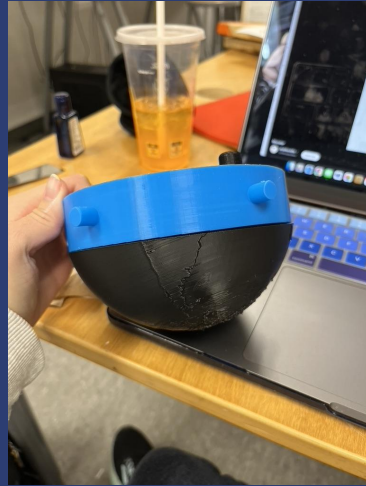


# FUSION 360 cont.

Looking pretty nice



# 3D PRINTING

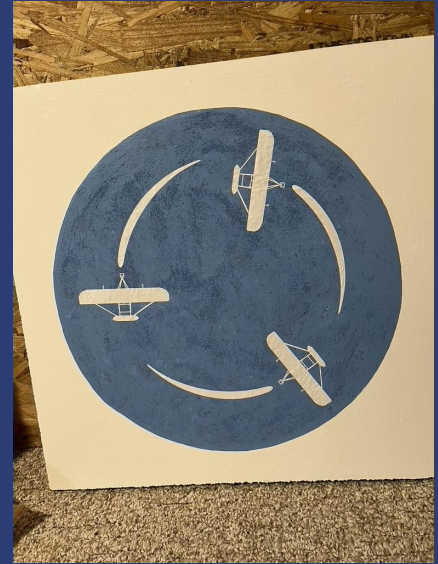
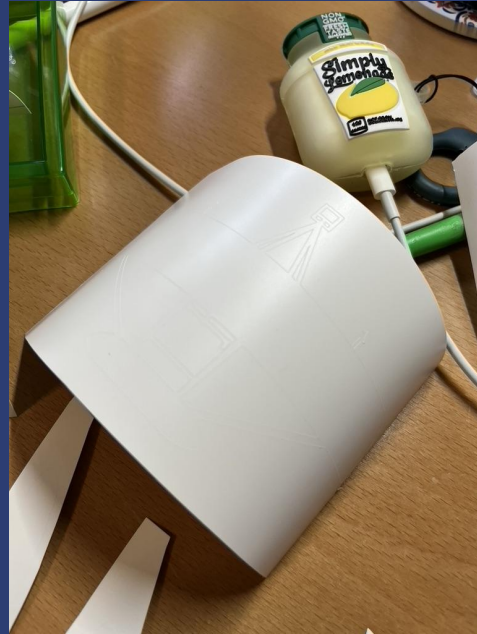


I 3D printed all the parts and sanded them down. Originally I planned to have the globe be able to turn but the supports sizing got messed up and it refused to turn and became too fragile to push unfortunately.

**FUN FACT: MY APARTMENT HAS TERRIBLE ELECTRICITY SO MY PRINTER WOULDN'T GET A STRONG ENOUGH CONNECTION AND SHUT OFF MID-PRINT SO MANY TIMES. THANK YOU 210 PRINTERS.**

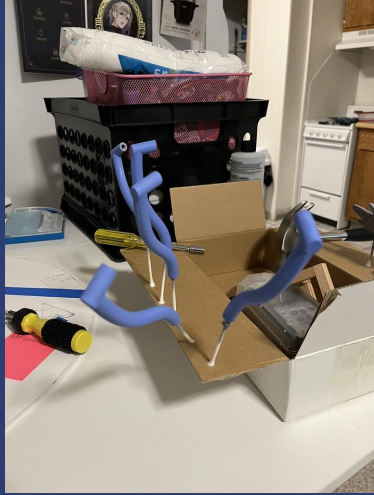


# MODEL BASE



The base is a 2x2 foam board I painted white, then painted on the turf. I wanted it to have the texture of turf so I speckled the blue base with different blues, black, and white. Then I mixed salt into my paint and overlaid the speckled layer. I also used my cricut to cut out the Wright Flyers.

# PAINT JOB



I handpainted all the parts of the model and I am especially proud of the P-51 Mustang's emblem. After I painted them I sprayed a semi gloss sealer over every piece.

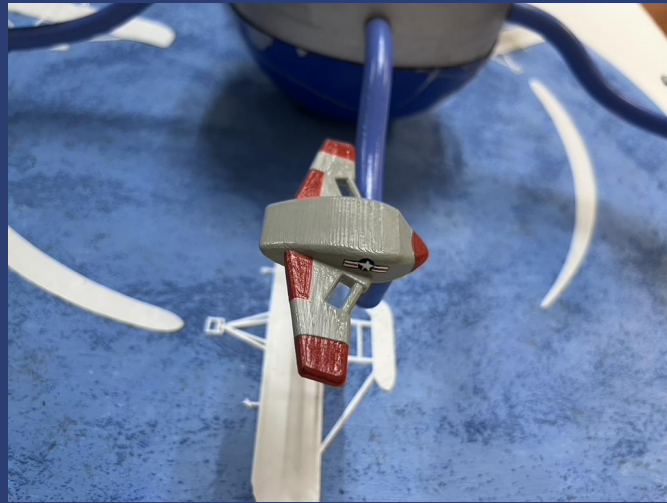
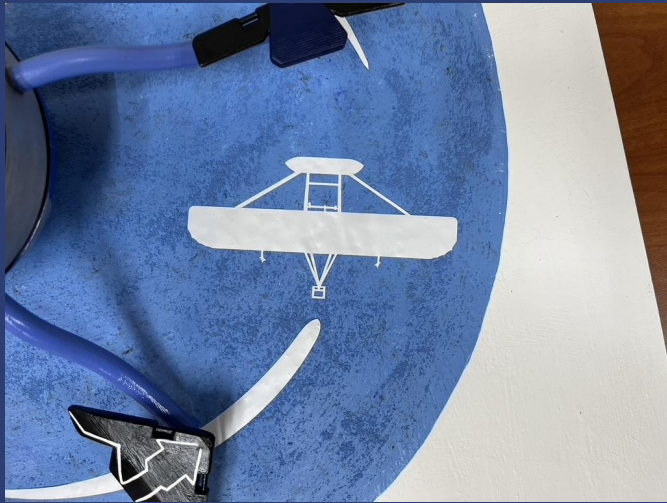
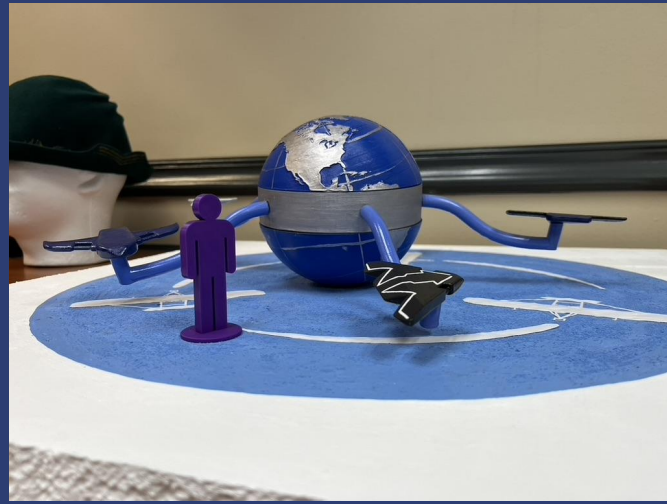
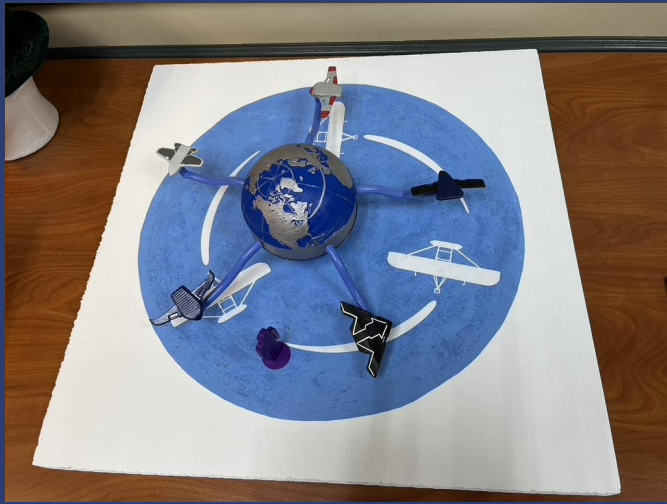


# ASSEMBLY



FUN FACT: I WAS SO NERVOUS BECAUSE I HAD TO KEEP SANDING DOWN PIECES TO GET THEM TO FIT.

The planes are in order of the year of their first flight: P-51 Mustang, F-111 Aardvark, B-2 Spirit, C-17, F-22 Raptor



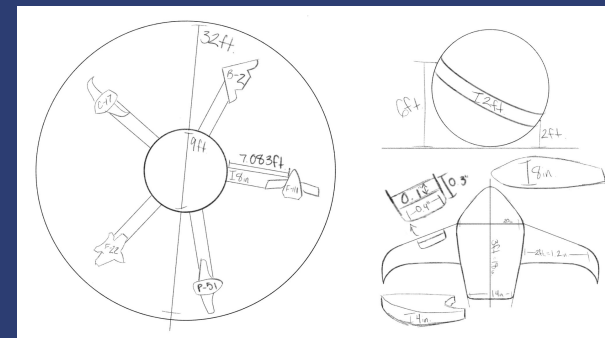
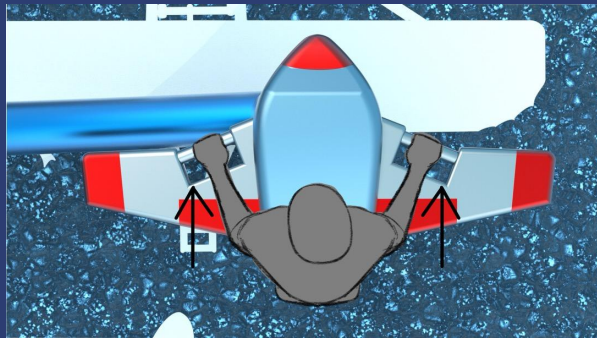
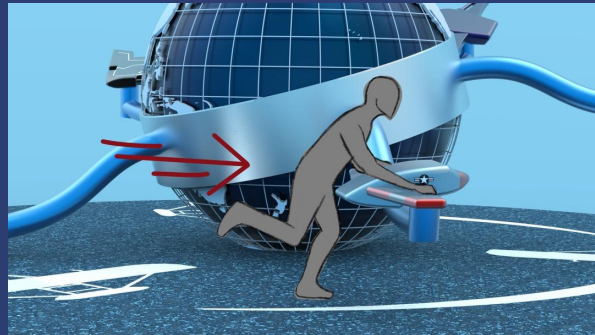


# KEYSHOT



I took all my assets into Keyshot to model for my slideshow, video, and to create more refined assets.

# SKETCHBOOK



Just some additional assets for video, slideshow, and poster



# ABSTRACT



FUN FACT: I HAVE SO MUCH KNOWLEDGE ON MY  
PROJECT (I'M IN TOO DEEP) THAT IT WAS DIFFICULT TO  
WRITE A SUCCINCT BLURB THAT CAPTURES ONLY THE  
MOST IMPORTANT FACTS



# MOVIE



## SCRIPT

I got the videos of the park from videos on Youtube, found some not too YouTuber sounding music from Motion Array, and thank every project that my father is a videographer with the tech to support it.

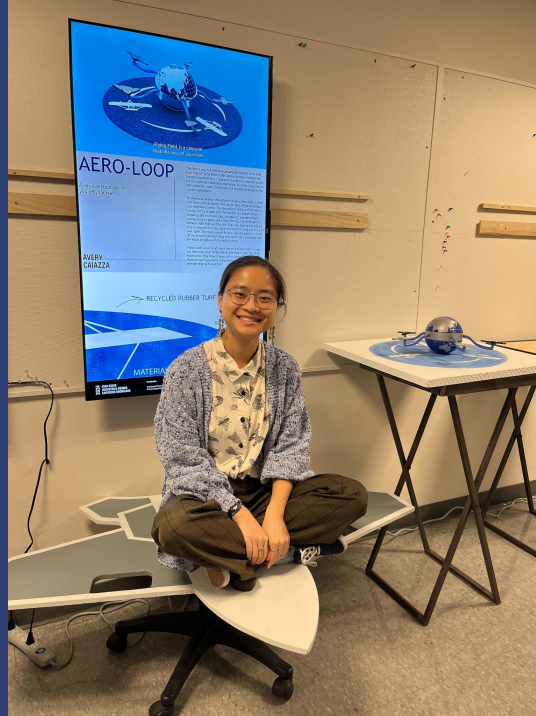




# SLIDESHOW



# GALLERY WALK



Finally, the day came. The end I never thought I'd actually get to. In some ways I thought it'd never end. I actually felt really engaged in my discussions with both Seb and Will about my project and I really enjoyed the more casual approach. It felt easier to talk about all the ideas and reasons and choices sloshing around in my brain.

# PRESENTATION AT DAYTON



And so the second day of reckoning was upon us. Ryan and the park were so good to us. We figured out the technology quickly and were wrapping up by noon. It was a whirlwind of pride and relief. We went for lunch with Ryan and then the Mayor came up and congratulated us.

I printed us all wings with a bowler hat, since we all seemed to gravitate to hats or planes. I printed one for each teammate and Ryan. I also made sure the correct parties received a thank you note and we chipped in for Cheryl's cookies for the park. And this is Maria and I on our way home at the end.



# WORKS CITED

HERE

HERE



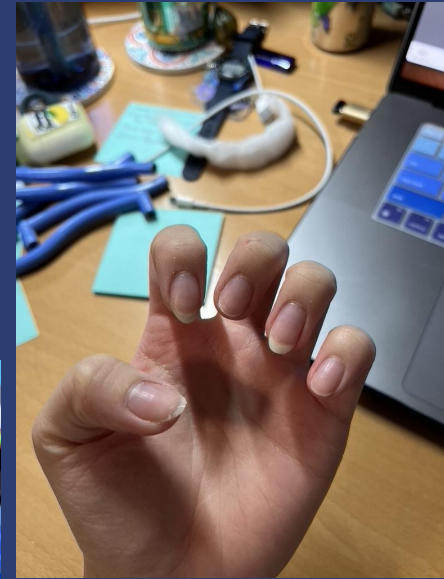
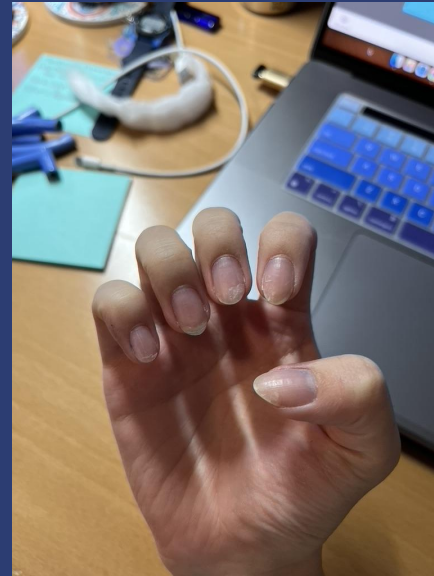
# POST-SEMESTER STATUS REPORT

PHYSICAL STATE: EXHAUSTED

EMOTIONAL STATE: MANIC

ENVIRONMENT: LIKE A

CATEGORY FIVE HURRICANE HIT

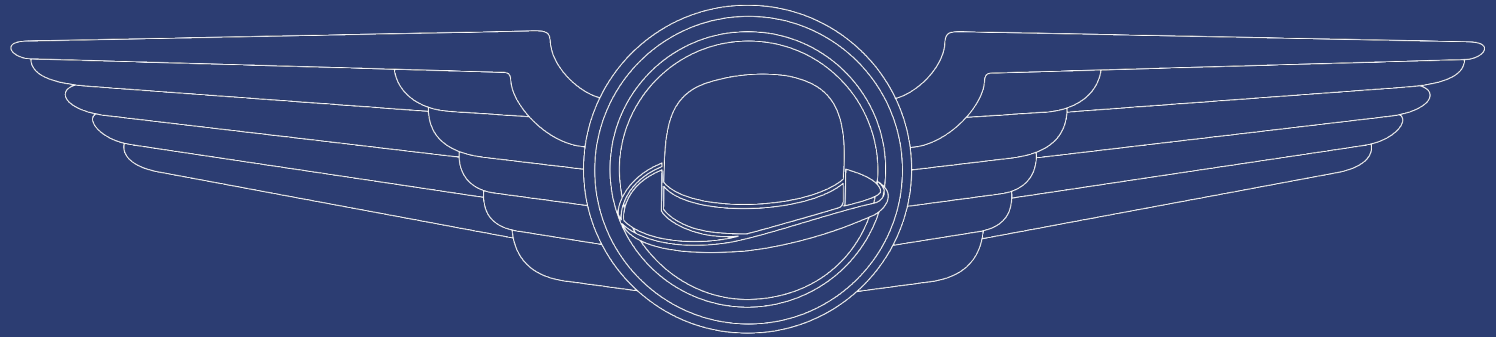


FUN FACT: I HAVE NEVER HAD SO MANY ABRASIONS, CUTS, AND BURNS ON MY HANDS AT THE SAME TIME

THE

END





Thank you