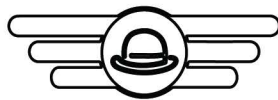


# FLYER DERBY



## *Process Book*





The Capstone process began for me with a group visit to Dayton Aviation Heritage National Historic Park where Ranger Ryan took us on a guided tour through all of their associated locations. Here is where I was able to first get a sense and a feel for what Dayton had to offer. It felt a lot more like a museum than it did a park. There was plenty to see and learn. Hands on exhibits scattered the museum, but I left feeling a little bit underwhelmed. It was clear to me that Dayton was well saturated with historical content that helped inform and educate visitors on the Wright Brothers and their life. Some of the exhibits were immersive and did a good job at captivating the visitor, but aviation is more than just an exhibit. The Wright Brothers spirit is more than just an exhibit. This is when I asked Ryan about what he wanted visitors to walk away with, and he said he wanted them to leave feeling inspired by the Wright Brothers and how they did the impossible.





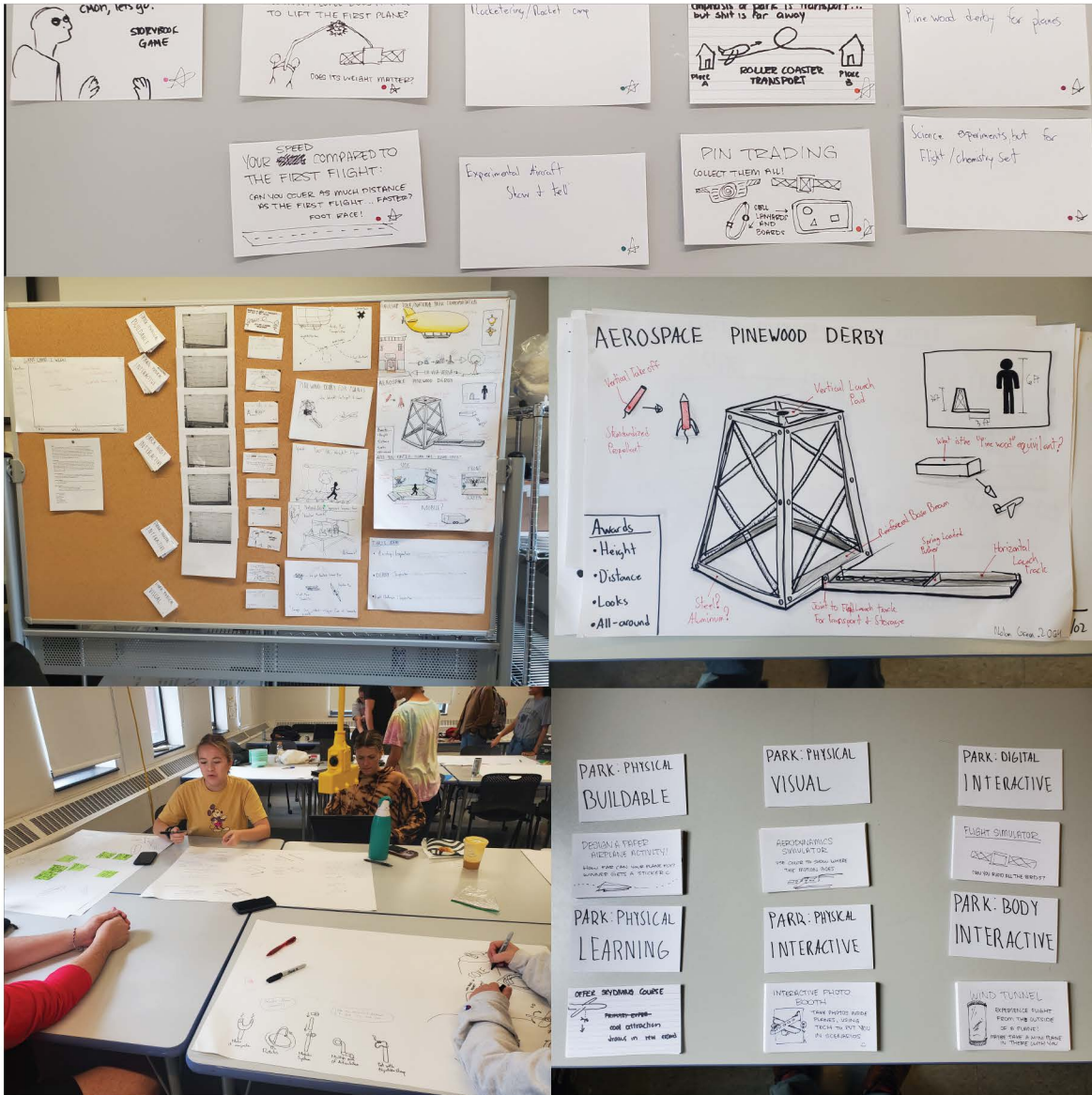
The Ohio State University Campus has some museums and exhibits of its own and so we thought it was a good idea to see what they had to offer. This focus of this experience was to gather information and inspiration from other exhibit designs to see what works and what doesn't. The first stop was Orton Geological Museum which is a small space that has some very fascinating exhibits like fossils and glowing rocks. It also provides some underwhelming exhibits comprised of normal looking rocks with black text and a white background. It really provided a range. After Orton, my group went to Thompson Library to see some of the exhibits on display there. It was a temporary exhibit of feminist artworks and it was not curated and displayed in a way that caught my groups attention. From these few stops on campus I learned that exhibits don't always have to be over the top expensive with high-tech interactivity to be interesting. Sometimes a few glowing rocks that have a curtained room around them is all an exhibit needs to keep you coming back for more.





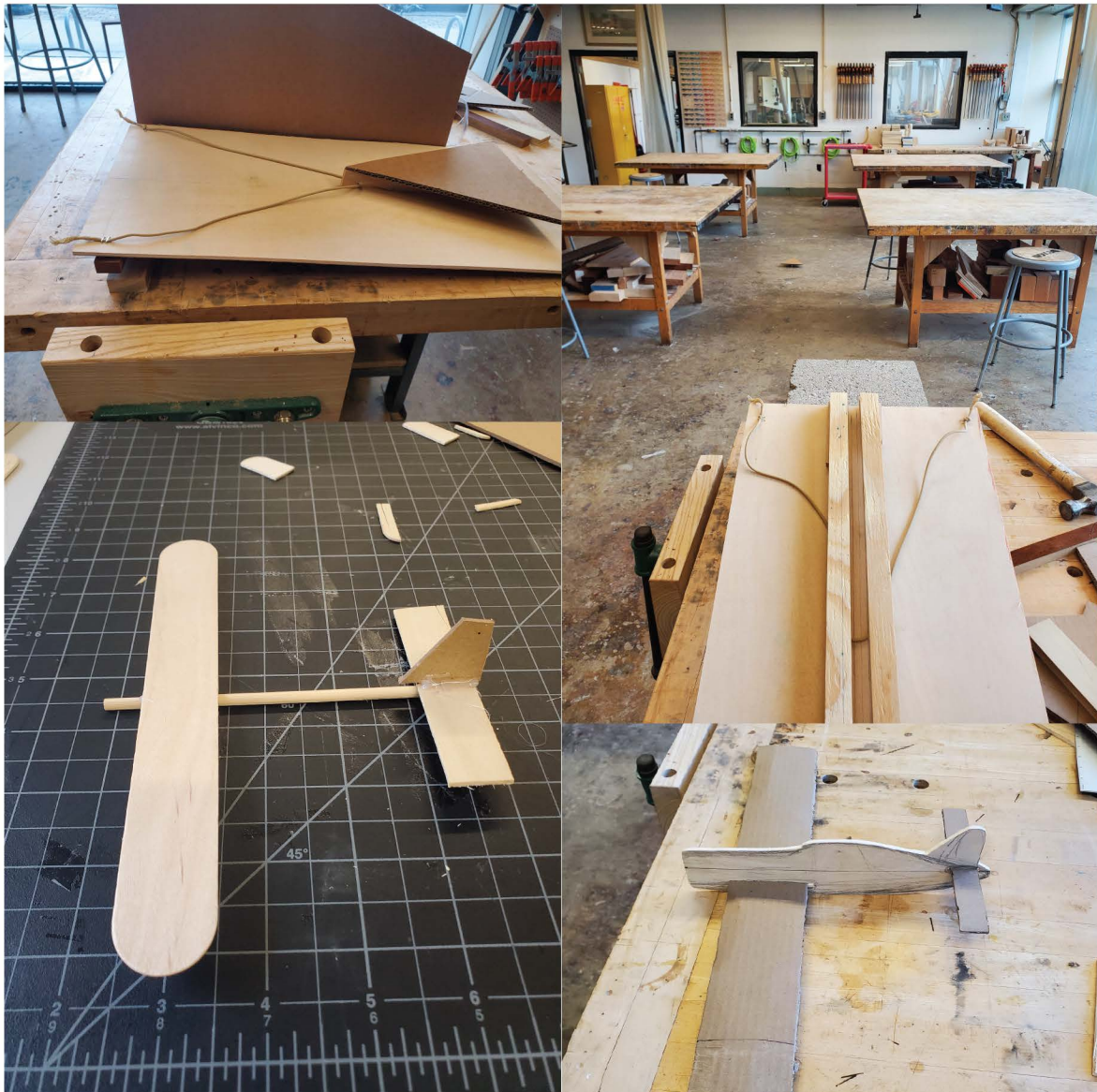
The next step during the research phase was the Franklin Park Conservatory. This was my favorite place that I visited because it was immersive throughout. I would not consider myself a plant person, but I enjoyed every second I spent there. They provided something for everyone. A local artisan glassblower was making ornaments in front of us, that would later be taken to the gift shop to be sold. As my group entered the Conservatory we were met with entire biomes recreated indoors. Lots of water features and rock features complimented the flora as we made our way through the winding paths. Outside of the conservatory there was more native plant life and more interactive exhibits. There was something there for people of all ages and abilities. The conservatory left me with a complete experience that made education accessible, enjoyable, and pleasant. From signs and other displays we could see that they had a big focus on community engagement which I found inspiring and a good target to aim for.





After gather all the research, I summarized my findings. The main idea that I took forwards was that I wanted to design an experience that inspired park goers to use their imagination to innovate. I wasn't sure what that would look like. To get a better understanding of the direction that I wanted to take that statement, I began rapid ideation with a group of four fellow designers. Together we generated close to 80 different ideas. From there I began categorizing the ideas to better sort and filter the ideas. I took the different ideas and began plotting them based on their effectiveness at meeting my goal of having an accessible, inspiring, digestible, and engaging experience. Based on those results I was able to narrow down the ideas down to 11 ideas. Taking a group poll from my cohort, I was able to narrow it down to 6. Those 6 ideas were further refined and I was able to reduce it down to 3. With the help of my professors I chose one idea. The Aerospace Pinewood Derby. At this point I began some additional refinement to focus the scope of the process by excluding rocketry.





The typical Pinewood Derby is easily identifiable by the block of wood given to each of the contestants. Everyone is given a level playing field and there are limitations and restrictions to how each derby car can be made. They also have a standardized launcher. I wanted to carry some of these design decisions over to the aviation version of the pinewood derby in order to have that cohesion and recognizability between the two. In the iteration process I tasked myself with making something wooden fly. I found that this is far more complicated than I originally thought. I found the easiest way to make something fly was via the paper airplane approach. Launching a plane from the front is also a lot more stable than from the rear or the center. A simple notch in the front of the plane allowed for the elastic band of the launcher to grab on and release the aircraft consistently. The addition of rails to the launcher drastically increased launch consistency and flight stability. These were all simple adjustments to make, but they are all things I would not have known without doing the rigorous testing required to figure them out.





**ANNUAL PINEWOOD FLYER DERBY  
RULES**

**Section I.  
FLYER REGULATIONS:**

I.a. Flyers may NOT have any modifications made to the launch joint. The painted end of the flyer woodblock must stay intact in order for the submitted flyer to be eligible for the competition. Contestants may be permitted to attach wings or other flying elements to the front at the discretion of the judges.

I.b. Flyers may NOT be permitted to have any added form of propellant in any form. This includes but is not limited to propellers, rockets, explosives, compressed air, or fireworks.

I.c. Contestants are permitted to only submit one flyer for contest each year.

I.d. Contestants may be permitted to perform repairs to their flyer if damage occurs at anytime throughout the day, but may not be permitted to further modify their flyer. Repairs must be done in front of a judge or ranger to ensure fairness.

**ANY INFRACTION OF FLYER REGULATIONS MAY RESULT IN DISQUALIFICATION**

**Section II.**

**LAUNCHING PROCEDURES AND REGULATIONS:**

II.a. The catapult attendant is the only one permitted to operate the mechanism, this includes the set up and launch of flyers.

II.b. Each contestant is permitted 2 launches and may chose ONE of the launches to submit for scoring after having seen both launches.

II.c. if their is a catapult malfunction or the flyer is unable to make it to the end of the ramp the contestant is allowed up to 3 do overs until being disqualified for failure to launch.

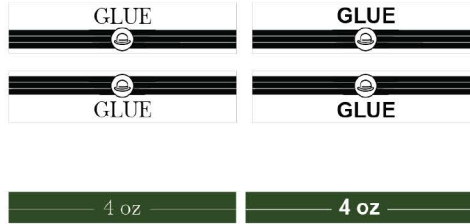
**ANY INFRACTION OF LAUNCHING PROCEDURES OR REGULATIONS MAY RESULT IN DISQUALIFICATION**

**Section III.**

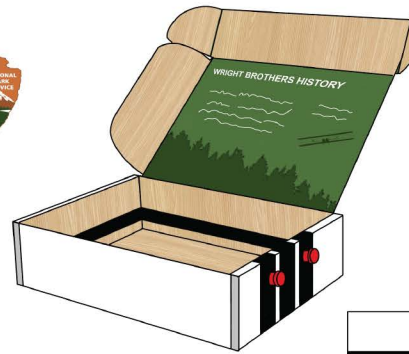
**AWARDS**

III.a. Awards will be split into two age groups 6th-8th grades and 9th-12th grades.

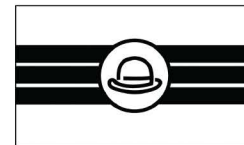
III.b. Contestants have no limit to the amount of awards they can win



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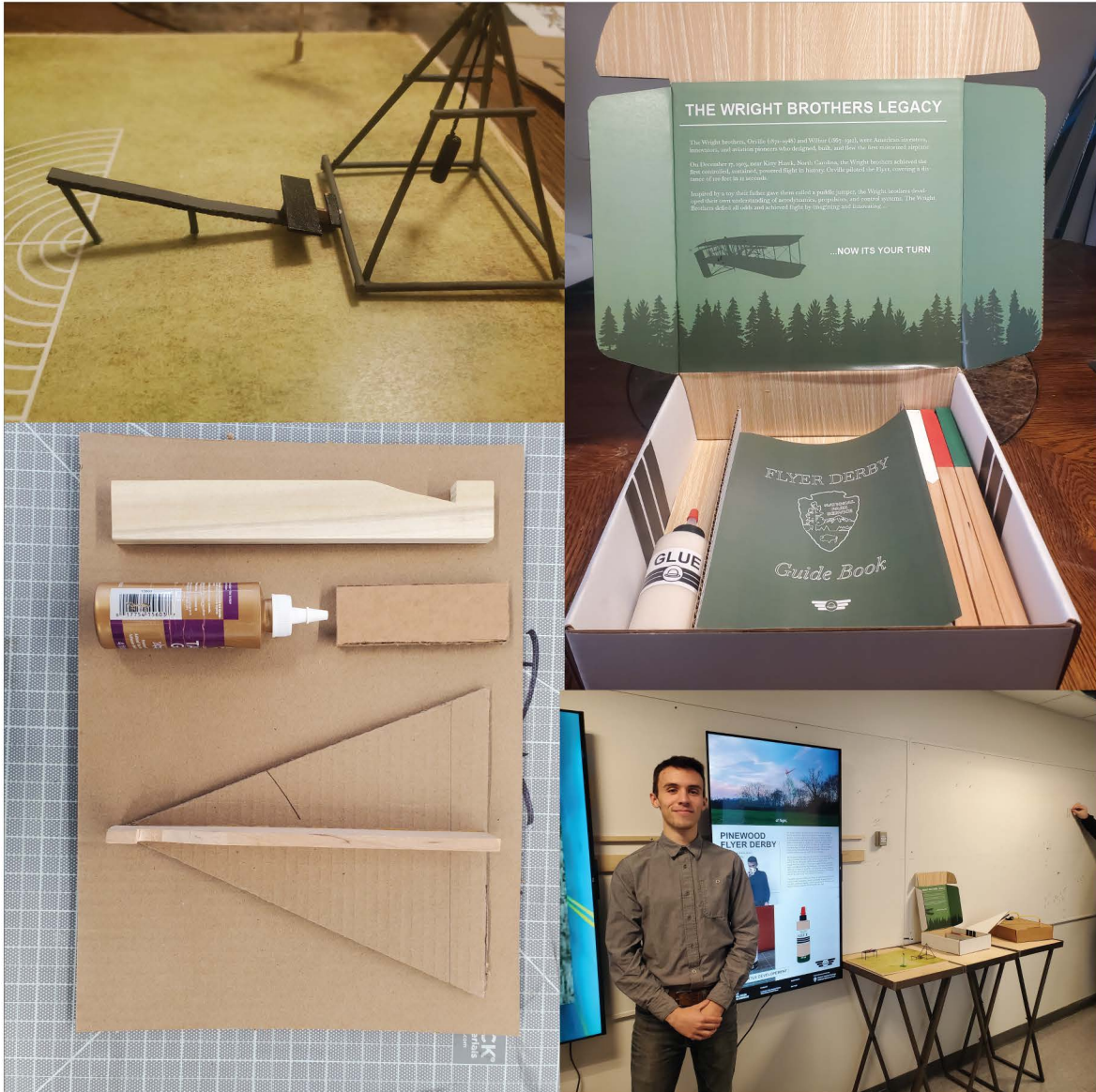


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During the desing process, I found that the Pinewood Flyer Derby was more than just a flyer and a launcher. With that came the need for supporting assets. Questions were raised about what the launch day looks like and what all is given to the participants to make sure they have what they need to start making their flyers. As a result of these questions I began creating an extensive network of supporting assets that included rules, regulations, an itinerary, awards, a guide book, stat recording sheet, printable branding, a sign-up sheet and much more. These were decisions I made based of of my prior knowledge of events and also based off of how the original pinewood derby conducts their own events. I found these to be most helpful for story telling. It provided me with the ability show a more fleshed out concept and show a greater picture of what a design like this entails. There are a lot of moving pieces, and it is these supporting elements that helped make it feel more complete and more alive.





The final part of the design process came down to packaging and presentation. Outside of the pinewood fuselage, I felt that the participants deserved to have all the materials required to begin making their flyers. By simply applying the branding to all of the assets I was able to create a more unified product. Packaging was a matter of providing enough space for the glue, knife, fuselages, test launcher, etc. I decided to include history of the Wright Brothers on the box itself to have a callback to the inspiration and meaning behind the project as a whole. I designed and included an instruction book to help guide contestants along their journey of innovation and exploration of flight. To bring the whole thing to a close, I added a 1:12 scale diorama of what launch day would look like to help give a more holistic sense of what the Pinewood Flyer Derby is all about. I presented my work via a video poster at THE Ohio State University at the end of the semester, and I also took my work to Dayton to present in front of the Rangers that worked at the Park there.

