

Daniel Noh

While my primary interest is in the research of pedagogical innovation, I am first, and foremost, a designer and maker. This document contains select projects I have produced and worked on within the educational and design domain.

Career World Explorer

Pittsburgh, PA

In Collaboration With
Steven Moore & Noor Hammad
Professor: Amy Ogan

Career World Explorer is an interactive game for students in eighth grade to gain exposure to niche career paths across different disciplines. Traditional career day events are limited to generic and well known careers, use the instructor or school's immediate personal connections as speakers for the students, and rely on text-based assessments. Career World Explorer uses role-playing mechanics, scaffolding through in-game mentorship and exposure to careers via "career worlds" to inspire and engage our target age group to see themselves in positions outside of the well-trodden paths of doctors, engineers and lawyers. We conducted multiple interviews with three eighth grade teachers to refine our educational goals, assessments and storyboard design. Our final prototype builds upon their feedback and the lessons learned from our iterative process.

Middle school students aren't properly exposed to a variety of career opportunities they could pursue in their bright futures. Traditional exposure to careers at this level is generally limited to 1) career day, 2) guidance counselors, and 3) non-interactive and nondescript job inventory assessments. These existing methods suffer from selection bias and only expose students to a handful of high-level career paths they could pursue. Research has identified middle school as a time when students can benefit the most from career exploration. This is particularly important for 8th grade, before they enter high school, where they'll select electives that align with their interests and future career paths. Students may not take courses that could set them up for success in their future careers, due to a lack of exposure and knowledge regarding what the career/field entails.

Much of the project focuses on both avenues of motivation (intrinsic motivators, extrinsic motivators). Intrinsic motivation becomes apparent both when the learner enjoys playing games and if the learner desires to discover potential careers. Users motivated intrinsically are able to utilize the game to their own terms. Moreover, with proper facilitation, this game may also become a great substitute to "career days", as remote learning and interaction becomes more and more prominent due to the pandemic.



...a career finding game for the junior explorer.

PROBLEMS + NEEDS

- Traditional exposure to careers is generally limited to:
 - [1] career day
 - [2] guidance counselors
 - [3] non-interactive and nondescript job inventory assessments
- Lack of instructor knowledge on the nuances of different careers, limited guest speakers in the class (career day), and a lack of guidance counselors for students to discuss their futures with.
- The national average for the ratio of counselors to students is 1:491

SOLUTION OVERVIEW

FOCUS ON NICHE CAREERS

- Explore a greater breadth of careers to expose the students to career paths they can see themselves in.

SIMPLE RPG GAME

- By creating a simple rpg game, with a character creation feature, the students are able to put themselves in the shoes of the in-game character. The gamification of this system would also motivate the students to spend more time and explore more possibilities.

A BALANCED SOLUTION

- Other systems are too entertainment focused (e.g. Job Simulator) or text/quiz heavy (e.g. VUS Junior). Career World Explorer affords a balanced environment, affording both engagement and education.



MAJOR FEATURES

STUDENT REPRESENTATION AND PERSONALIZATION

- Represent students of all genders, ethnicities, and disabilities through character creation and NPCs.

SCAFFOLDING THROUGH IN-GAME MENTOR

MOTIVATION THROUGH NARRATIVE AND BADGES

ENGAGEMENT THROUGH STORYTELLING AND TASKS

LEARNING OBJECTIVES

EXPOSE

students about the variety of career paths in the world

CONNECT

what they're learning in classes to potential careers

ENABLE

the students to project themselves into any of the career paths

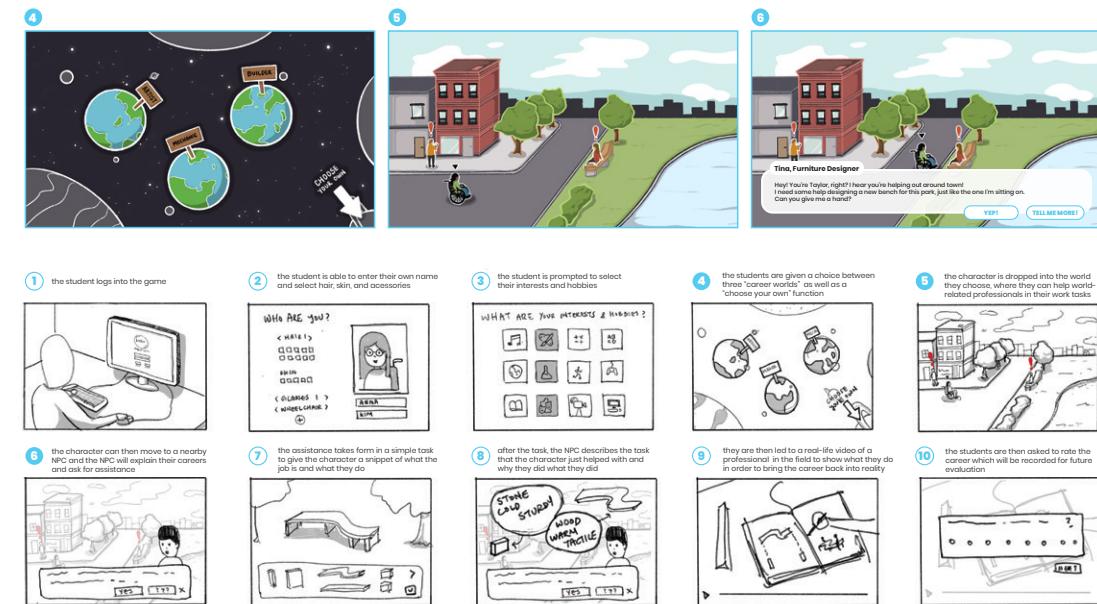
EVALUATION PLAN

- Heuristic evaluation with teachers
- Week long evaluation and assessments
- Pre and Post test to measure disposition
- Students explore three to five careers using our system
- At the end of the week, students must write an essay about their favorite career and what they learned about it from conducting research after using the system

LESSONS LEARNED

- Previous systems focus too much on educating students about career planning rather than career inspiration
- Participating in career path exploration can lead to higher academic motivation, grades, employability skills, career self-efficacy and college aspirations for students.
- We provide a low-cost and scalable way to bring engaging career exploration to students on most digital devices

STORYBOARD AND PROTOTYPE



Carrick ECS

Pittsburgh, PA

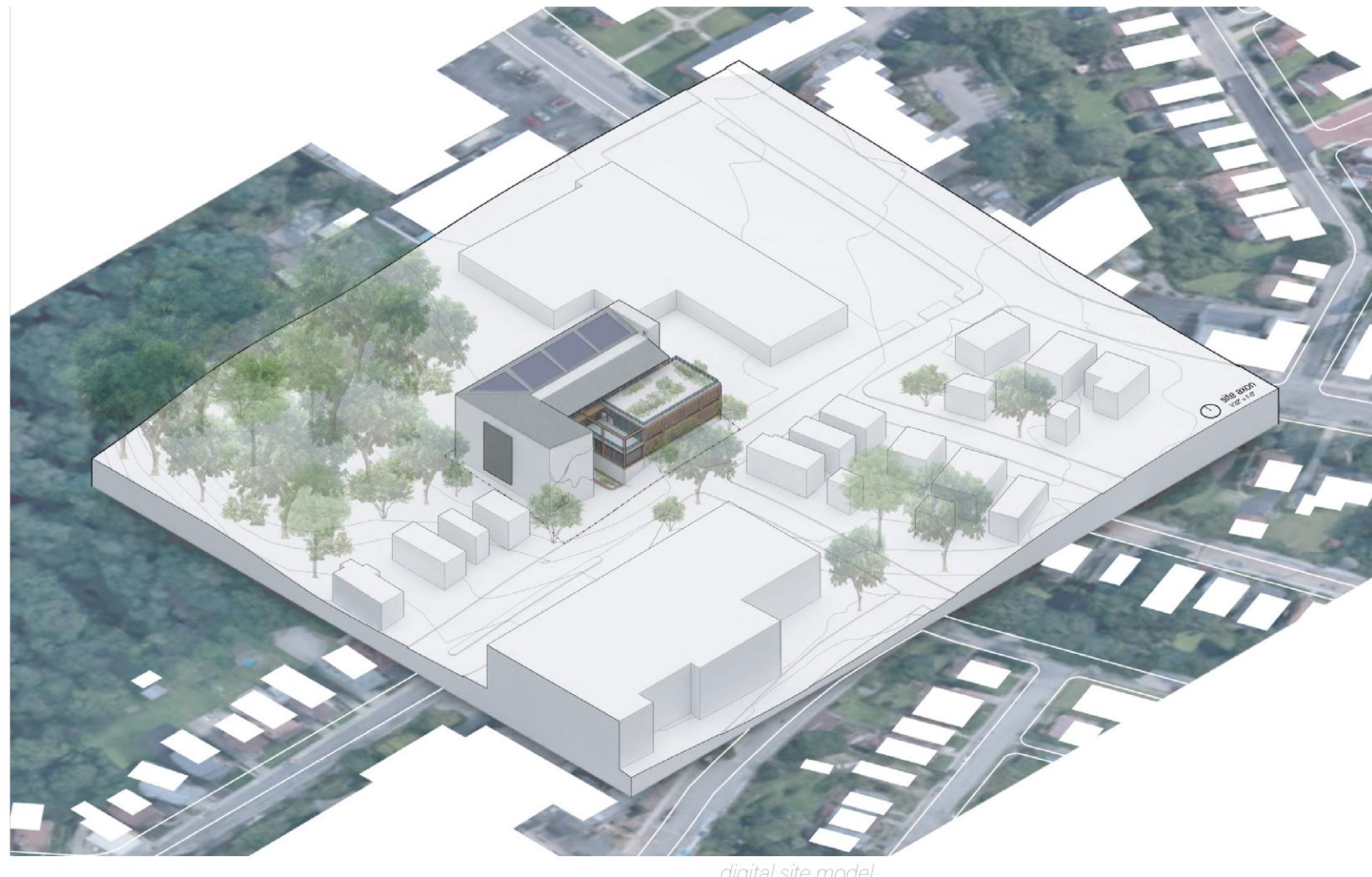
Professor: Steve Lee
Studio Professor: Lori Fitzgerald

The focus for the design of this Environmental Charter School was to introduce new learning spaces that are uncommon in schools and **rethinking the idea of classrooms**. Rather than keeping education confined within four rectilinear walls, this design focused on the spaces outside the classrooms. The building itself also considered various environmental objectives such as solar shading, natural stack ventilation, and water retention to increase the efficacy of the architecture and help economically.

As you enter the middle school, you pass a patch of greenery that exemplifies the school's vision of environmental awareness and are greeted by receptionist. From this location, **the circulation bifurcates into two different paths; the left side with a lobby that leads to a staircase for students and faculty and the other side a hallway that leads to different functional spaces in the facility for staff**. The hallway also directs the public into the cafeteria for public gatherings and events outside of school hours. This bifurcation allows for **safety and security** which is achieved through the separation of potential public access from the private student learning environment.

For the students, each programmatic element branches off of a **central, extensive social staircase that bisects the site**. The social staircase provides an open space where students can socialize and learn in a collaborative environment. **Under the staircase exists a branch-like framing system that houses collaboration spaces for smaller group activities or individual work**. On the exterior facade, following down the central staircase, is an exposed **water retention system** which directs rainwater from a green roof to a blue roof to a rain garden. This exposed system allows for visual learners to appreciate and learn about various environmental networks.

Each floor landing of the staircase leads to major programmatic spaces: the second floor landing allows access to the support tower, the third floor landing directs people into the thinklab, and the fourth floor landing opens out onto the green roof. This system allows each grade level to interact with each other through an **interweaving circulation**, which is important for social education. To engender inclusivity, the landings were extended to enable handicapped students to utilize the staircase as a social space along with fellow students.



digital site model



entry sequence



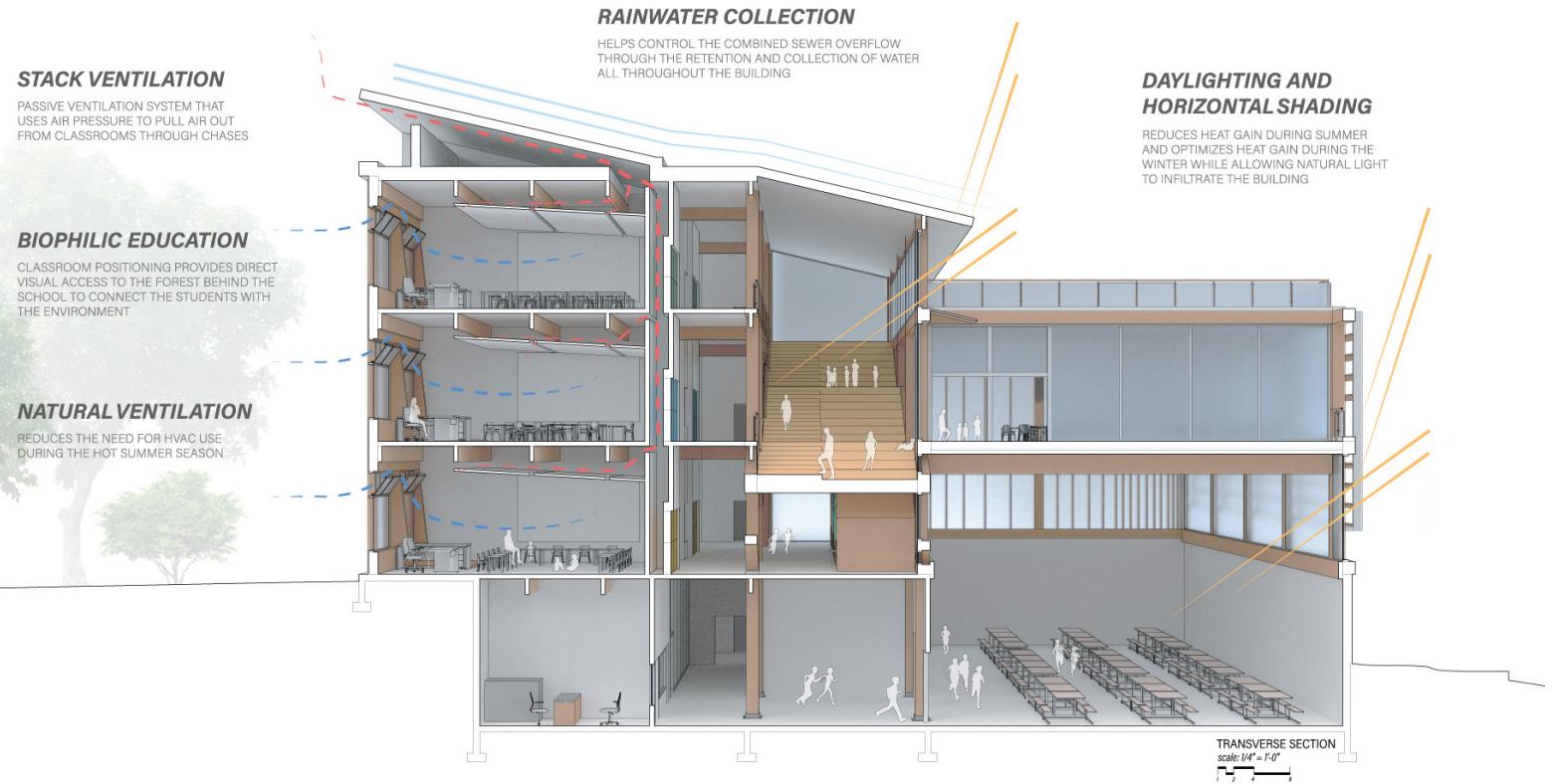
study nooks under central stairs



central staircase and classrooms



classroom interior



H2OME

Pittsburgh, PA

H2OME is an interactive booklet for children to learn about water in the Anthropocene beyond a school environment. To educate our users about the water system, our group designed a multi-page activity booklet, H2OME, aimed at children from grades three to five. The activity booklet consists of five activities, each one focusing on a different component of the water system.

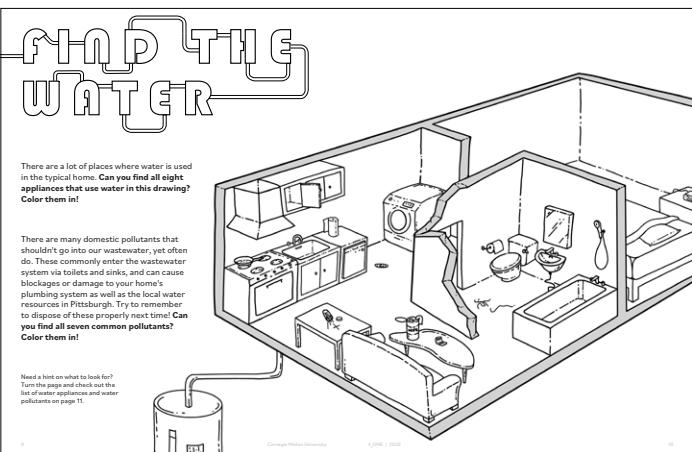
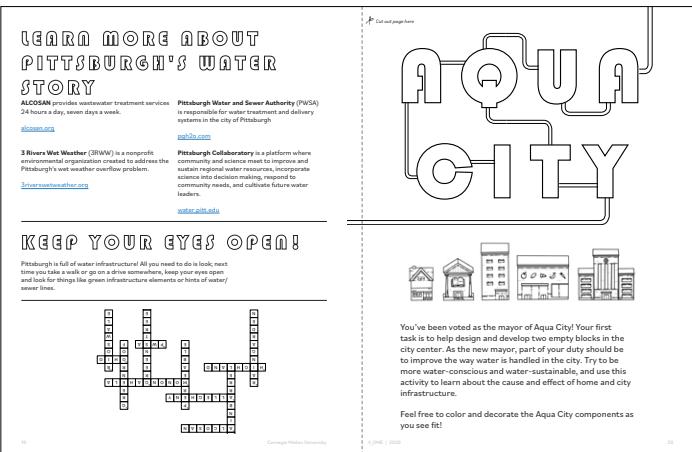
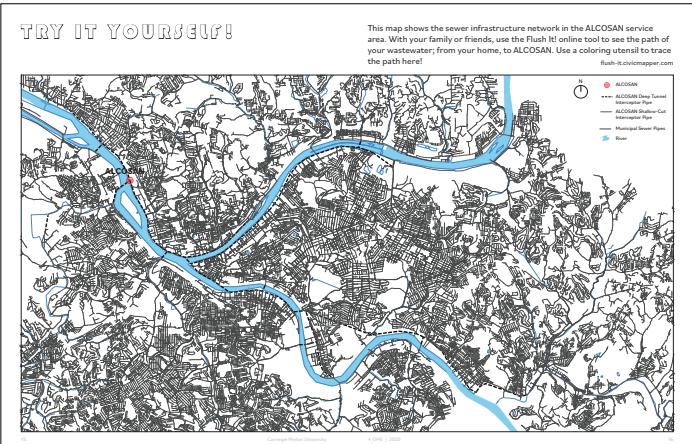
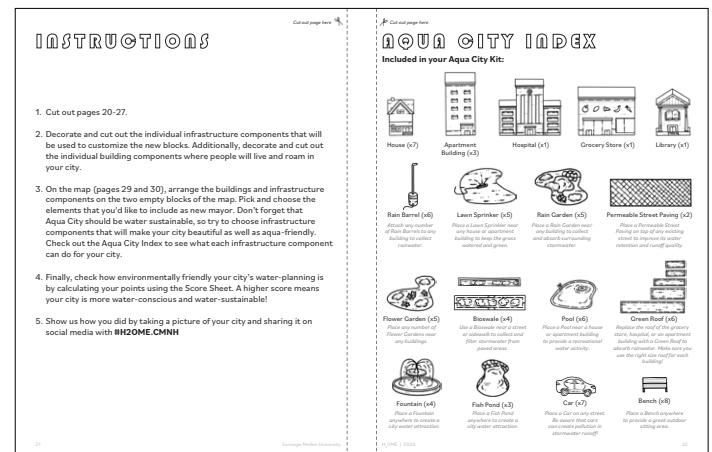
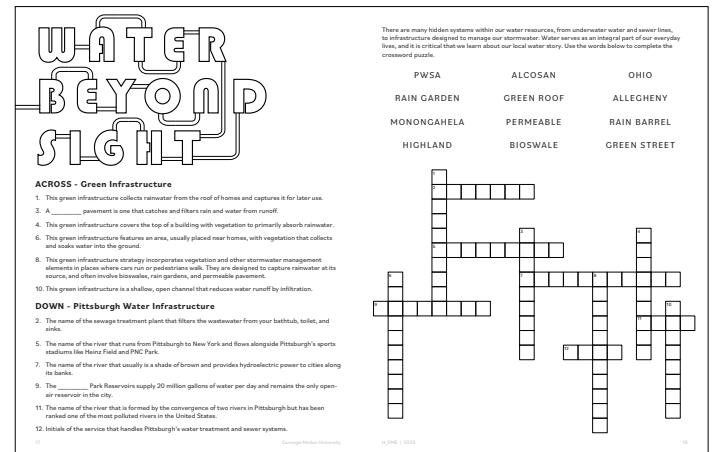
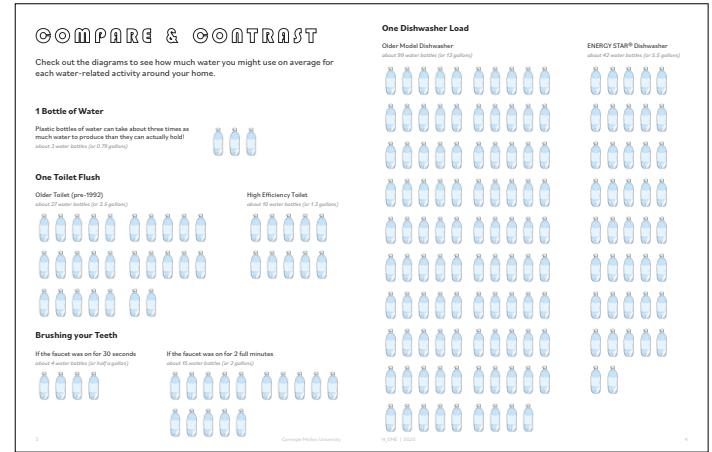
The learning goals of the activity booklet are:

1. To help visitors develop an understanding and awareness of domestic water use, amounts of water in every activities, green infrastructures, and water sources across Pittsburgh.
 2. To generate confidence in their water knowledge, such as identifying water sources, water contaminants, water infrastructures, and green infrastructures.
 3. To enable changes in users' cognitions in ways such that they are more aware of their water usage and are motivated to apply their new knowledge in ways that promote better water quality.

While designing H2OME, we used the **CUSP Theory of Action** for guidance. First, this booklet frames relevance because it depicts domestic water use in users' homes and focuses on Pittsburgh's water sources. Second, this booklet encourages participation because the activities are not only interactive, but also conversation starters. Third, this booklet is interconnected because it demonstrates how domestic water use (system 1) is closely linked to water misuse (system 2).

We took various features of classic activity books, such as coloring, crossword puzzles, and mazes and created our own version, taking education and design into consideration. *The elements within the booklet were hand drawn in a style that would be appealing for our chosen age group in order to grasp and maintain the attention of the users, while keeping our goal for educating the user on Pittsburgh's water system and how the user can affect it.* In the end, we came up with 5 different activities, a simple addition and multiplication based activity, a maze, an "I spy" activity, a crossword puzzle, and a cut out "design for yourself" activity.

*In Collaboration With
Selena Zhen & Don Lee
Professor: Marti Louw*



Carnegie Museum Internship

Pittsburgh, PA

Advisor: Asia Ward
(CMNH Program Manager)

My internship at the Carnegie Museum of Natural History continued upon my H2OME project. The internship started with preliminary research about water in the Anthropocene and how I could relay my findings in an engaging and interactive medium. Although this was my first time creating time-based media, I was able to utilize my previous experiences with illustration and creating visual narratives to finish this project.

The first video and blog post were about "fatbergs" and how human interaction with the inputs of the sewage system affects both other people and the environment.

The second video and blog post were about the water sanitation system and how water is treated and brought back to people and the environment.

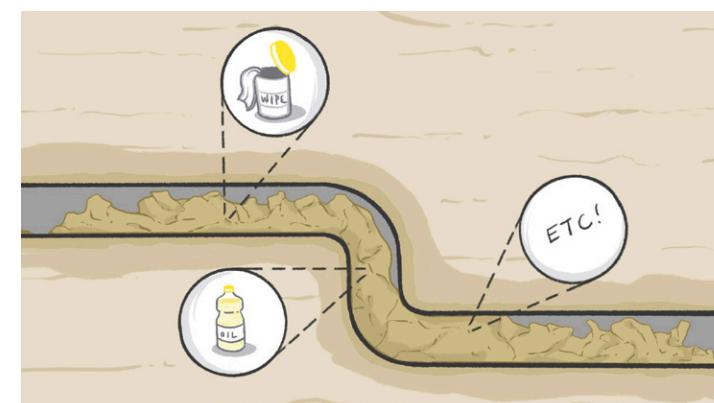
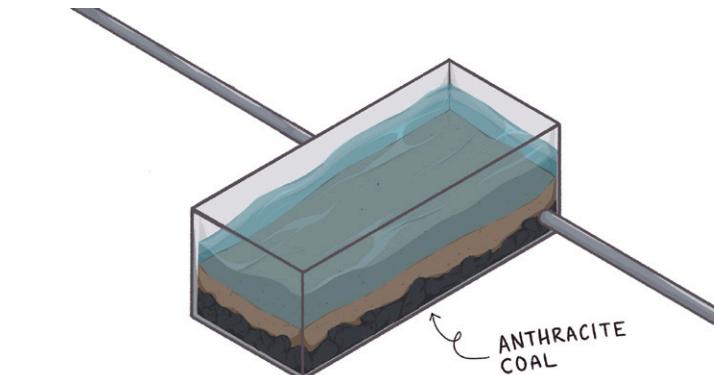
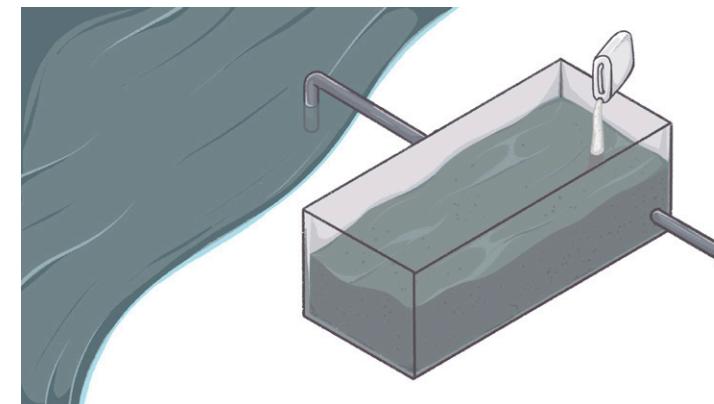
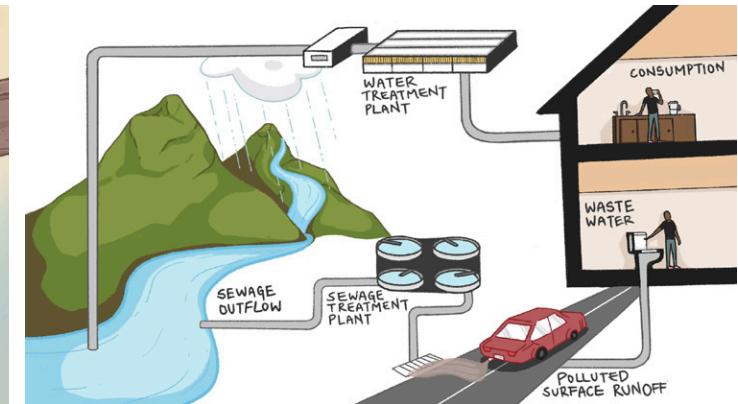
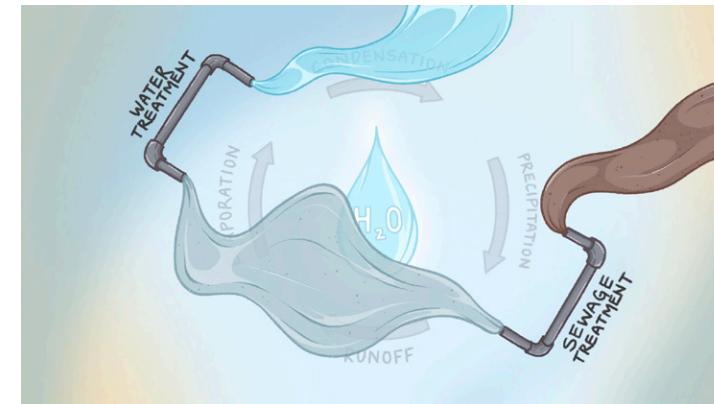
Both videos contain simple science experiments that young learners could try at home.

The first experiment is a simple test to see how and why toilet paper disintegrates, reinforcing the notion that, what people put into the water cycle affects it.

The second experiment is a more advanced experiment on how a water treatment plant works through flocculation. All that is required is dirty water from a local natural water source, and alum from a grocery store.

Fatbergs [Feeding the Monster in the Sewer]:
[Youtube Link](#)
[Article Link](#)

Flocculation [From the Allegheny to the Kitchen Sink]:
[Youtube Link](#)
[Article Link](#)



Cabinet

Pittsburgh, PA

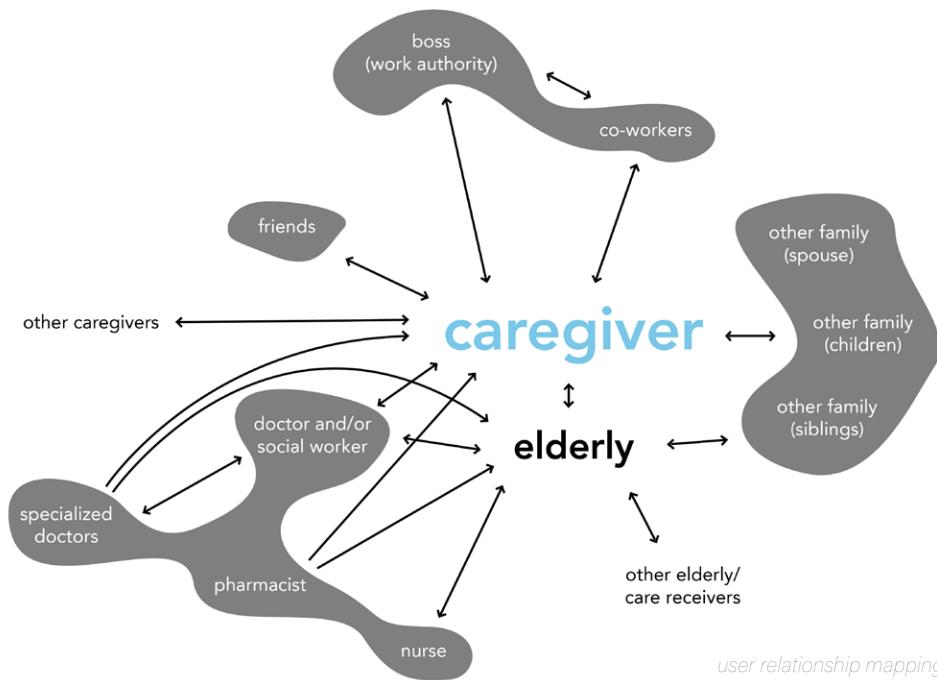
Professor: Victoria Crowley

Introduction

Cabinet is a mobile interface that allows the user to easily track their or their loved one's medication stock and daily intake. It is directed to anyone who has to take several doses of medication throughout the day. The caregivers who use this application can connect their accounts to their loved ones, whether it be family or friend, to help the caregivers keep themselves updated.

Research

The project first started from a given subject, in this case, a 60 year old taking care of an elderly relative. To be able to create accurate personas of our given age group, we conducted multiple live interviews. From the interviews, we were able to create journey maps for two personas in completely different situations. With the journey maps, I was able grasp several major pain points seen in this subject which include: organization, medication, emotional connection, and self-care.



user relationship mapping

caretaker 1 : Sarah



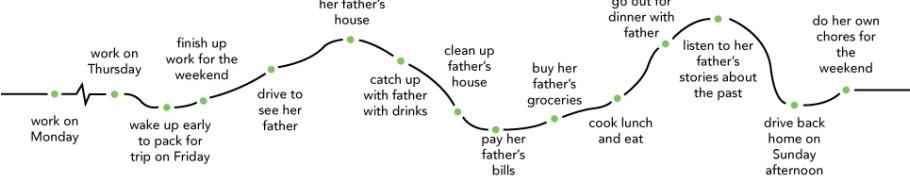
about Sarah
Sarah is a currently single, middle-aged woman living on her own and working a full time job. She is the primary caregiver to her father who is in his 80s. He lives over an hour away from her and she goes to visit him every weekend.

Name: Sarah
Age: 64
Job Type: Full-time

Sarah's father is currently healthy. He is able to drive and walk alone, but he requires assistance when hard labor comes into play. Although he resists moving closer to Sarah, he is very happy about the company he gets from Sarah. Her father tells her many stories when they are together. Even though Sarah lives so far, she wants to cherish all the time she has left with her father.

All in all, Sarah thinks her father's current situation is a temporary solution and her father will, sooner or later, move either closer to her or to an elderly's home. It could be rough at times, but she is glad that she is getting closer with her father.

Sarah's Weekly Journey Map



caretaker 2: Jen



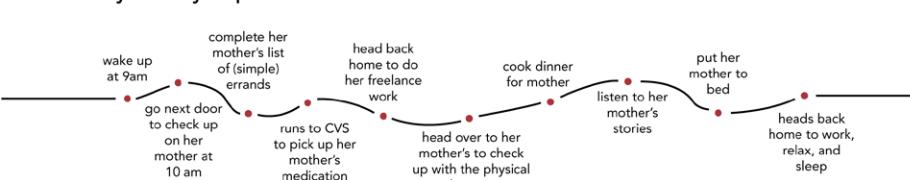
about Jen
Jen is a middle-aged woman who takes care of her mother who lives next-door. She and her other siblings take turn taking care of her mother. She is a freelance designer with 4 children.

Name: Jen
Age: 62
Job Type: Freelance

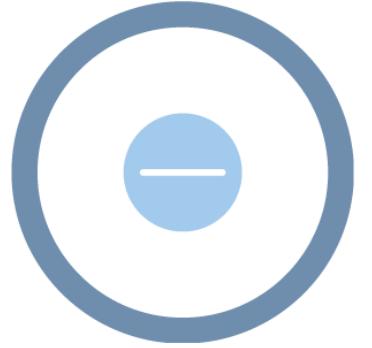
Jen's mother is very healthy, but she is not able to walk outside alone. Jen is very glad that her mother lives right next door, else she believes that life would have been a lot harder. She knows it was definitely worth it to give up her full time job to be able to stay at home and work, to provide for her mother. From having to take care of her children, to now, taking care of her mother, she wonders the number of things she could have been doing otherwise, such as other hobbies.

Jen is glad she is able to help out her mother. And although it is tedious, having to have this "daily-job" like responsibility, it is definitely worth it and she believes she doesn't regret everything she has done for her mother so far.

Jen's Daily Journey Map



two different personas of caretakers based on multiple interviews



Logo and Colors

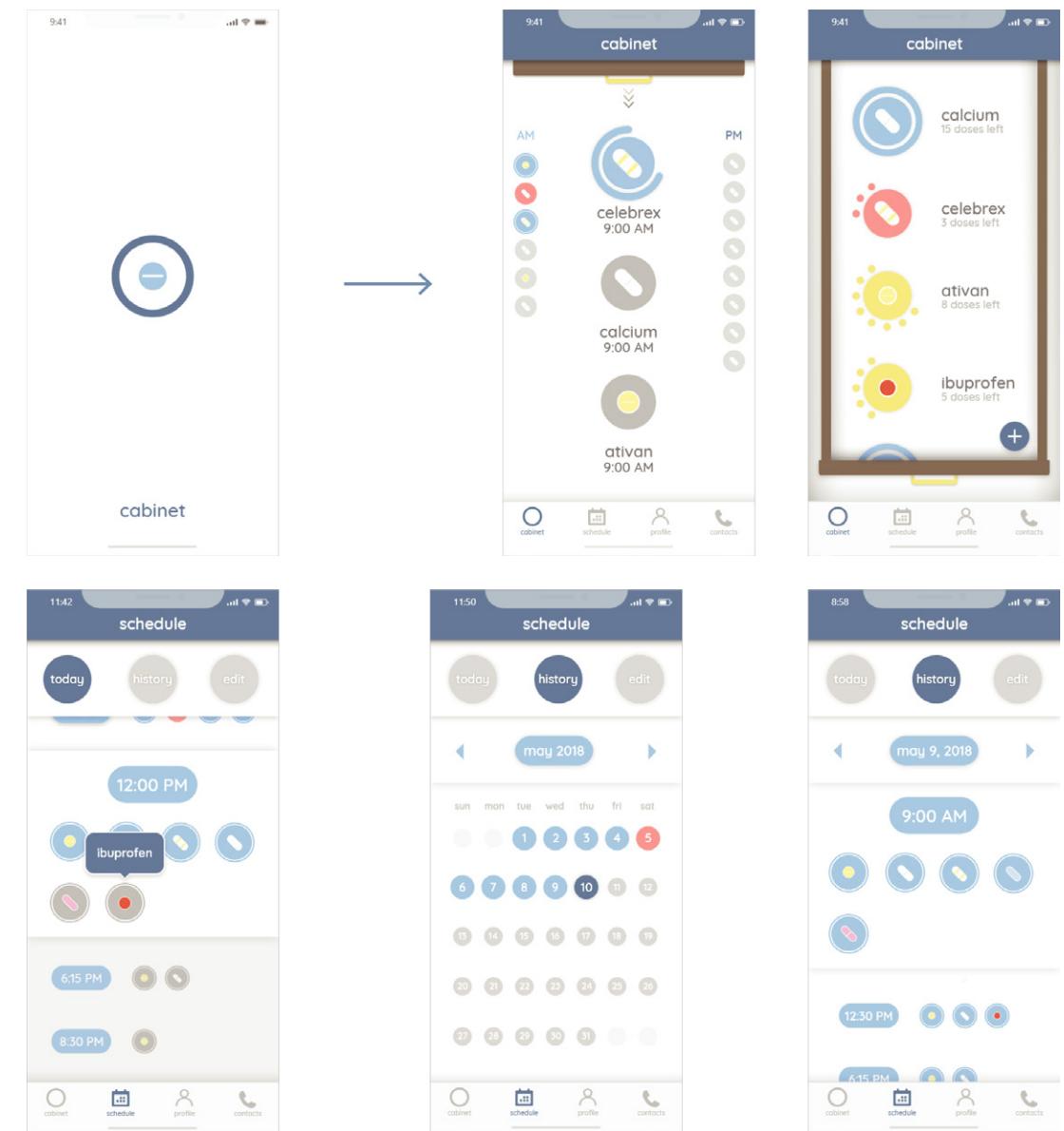
Initially, I was testing around with sketches of cabinets and pill bottles. However, after various iterations I decided to put off the logo and started designing the interface of the application. When working on the screens, I realized that the reoccurring icon/geometry in my design was the circle. The circle represents both the top view of a pill bottle as well as a sense of completeness which is essential in tracking medication. Inside the pill bottle I put in a circular pill rather than a capsule due to the lean towards a symmetrical and center-aligned design.

The colors seen in the application is fairly muted. I chose these colors because I wanted the interface to be very easy on the eyes and soothing to look at. Specifically, I chose two soft blue tones as the main colors because blue is a calming color. The soft salmon red/pink acts as a cautionary color, as it appears when certain things need attention (missed medication or need to restock). The yellow was a nice middle spot between calm and alarming which would act as a filler or transitioning color. The brown was simply used to replicate the look of a cabinet.

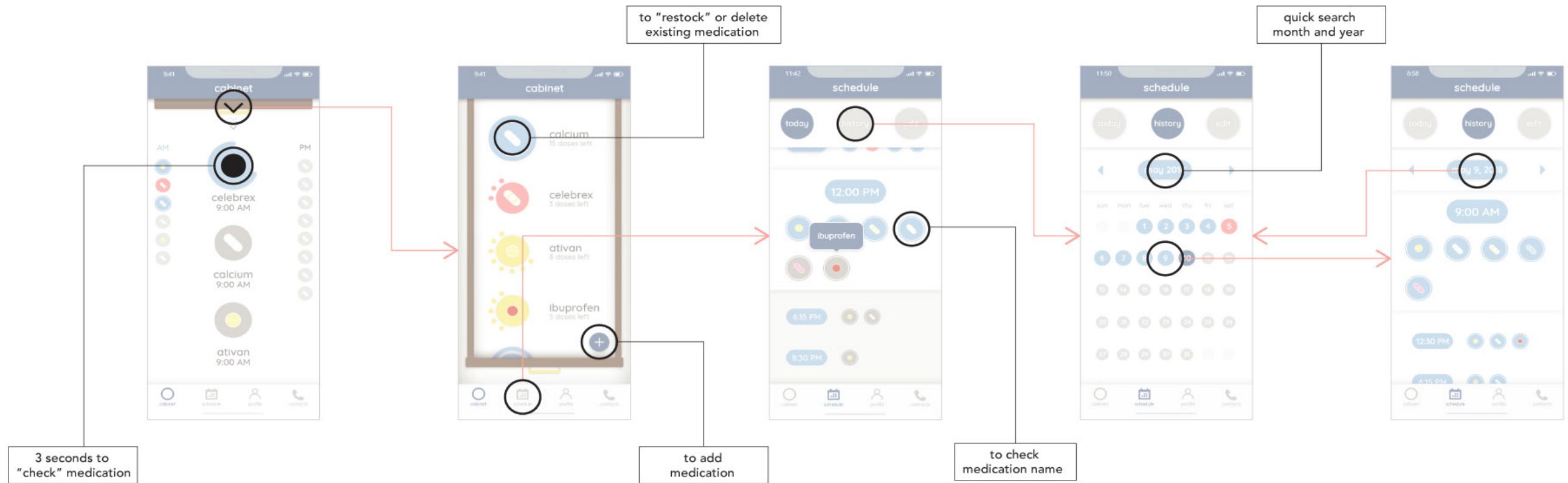
Prototyping

With the topic of medication, I was able to both tackle the pain points of my given subject as well as cater the app to a broader audience. The initial sketches demonstrate the general scheme for the application I had in mind. This application would allow the user to keep track of their current "medicine

cabinet" and also be notified on when to take their medication on a digital interface. The sketches themselves attempt to visualize the application utilizing visual hierarchy and graphic qualities that would be incorporated into the design (i.e. cabinet).



- tap
- tap and hold
- ▽ swipe down
- screen changes



Orientation Resource Guide Redesign

Pittsburgh, PA

In Collaboration with
Angela Rubin & Jarrek Holmes
Professor: Sara Moussawi

Introduction

The Orientation Resource Guide a reference guide for members of the Carnegie Mellon community which can be used to access introductory information easily, and can be used by orientation staff to learn about the services that Carnegie Mellon offers. The website incorporated all the information within the resource guide, and provides an easily accessible location to learn about the various services Carnegie Mellon provides.

Research

The Orientation Resource Guide was first created to reduce the amount of time spent during orientation training on teaching simple knowledge to the staff (Orientation Leaders/Orientation Counselors). This time spent would rather be spent on teaching the staff more people skills so they can more easily interact and help the Freshman. The resource guide was given to the staff to read over and learn before orientation training and then tested through games and icebreakers during the week. This however, was proven to be ineffective, as the games and icebreakers were done in large groups, so it was unclear if every staff truly understood the entirety of the resource guide--it was also not helpful that the current resource guide is a 29 page booklet with compact information.

In order to get further into what we were exactly looking for, we interviewed Julie Schultz, the Associate Dean of Parent and Family Engagement and First-Year Orientation. Initially, we thought that the website should be dedicated to helping the orientation staff easily access hours and locations of specific services. However, Julie mentioned that the resource guide should ideally be able to teach and test the students on the information. The website would be able to provide the knowledge, while the Head Orientation Counselors would teach the staff on the application of the knowledge. At the end of training, the staff should be able to point to which resources to go to for specific situations (which implied that the FAQ and Services were key points of the website).

Persona Development

SARAH PARK



kind	sociable	knowledgeable
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"I need to be able to help my residents if they ever need to know where to go for help."

Motivations
As an RA for incoming Freshmen, the students always have many questions. Michelle needs a way to, not only inform her residents, but also provide a place where her residents can find information in the future.

Goals and Tasks
+ To offer information to curious students
+ To provide a resource to find information in the future
+ To make sure her residents have a great time in college and take full advantage of all the resources offered at CMU

Interest in the Website
+ Be able to show the available resources at CMU to Freshmen
+ Have a useful and user-friendly website that is efficient at finding necessary information
+ Have a better way of providing information on resources than a cumbersome 29 page PDF

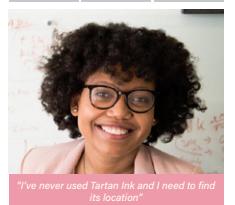
Frustrations with the PDF
+ Freshmen do not find the PDF useful and find it easier to look up information on Google
+ Does not show location of resource via a map so resources are difficult to use for physical locations

MICHELLE JAMISON

Year: Freshman
Major: Computer Science
Hometown: New York, New York
Orientation Position: Freshman Participant

Archetype: The Go-Getter

determined efficient inquisitive



Motivations
As a Freshman and someone who wants to know specific information quickly, Michelle is looking for a database that can provide specific information, such as a phone number or location of a specific resource at CMU.

Goals and Tasks
+ To find specific information fast
+ To pull up information on the go on a mobile device in order to physically locate a service
+ To have phone numbers and locations easily referenceable

Interest in the Website
+ Find a place to easily look up information when needed on any device
+ No downloads required!
+ One online location to answer all (or at least most) specific questions regarding CMU's resources

Frustrations with the PDF
+ It is faster to look up the information via the general CMU website or Google
+ No downloads required!
+ One online location to answer all (or at least most) specific questions regarding CMU's resources

SHUBHAM SINGLA

Year: Incoming Freshman
Major: Information Systems
Hometown: New Delhi, India

Orientation Position: Freshman Participant

Archetype: The Prepared Newbie

curious intelligent computer savvy



Motivations
As an international student and an incoming Freshman, Shubham is nervous about starting college and would like to be prepared for his first day on campus. He would like to know the resources offered at CMU and where to find them by the time he arrives on campus.

Goals and Tasks
+ To learn what resources are available to CMU students
+ Know where places are located when he arrives
+ To be prepared and understand the scope of CMU's available resources before arriving on campus

Interest in the Website
+ Have a place to find information on student resources that can be found online and accessible to all
+ Be able to get a general idea of the resources CMU has to offer from one website
+ Have an inviting, easy to navigate website for those not familiar with the CMU campus or resources

Frustrations with the PDF
+ The PDF is not accessible to all students
+ The resource guide is poorly made and thus the guide seems a bit sketchy

ALEX SCOTT

Year: Senior
Major: Harp Performance
Hometown: Dover, Delaware

Orientation Position: OC at Resnik

Archetype: The Fast Finder

methodical sociable resourceful



Motivations
As a Senior OC who went through training in the past, Alex is able to skip some training in order to practice the harp for his graduate school auditions. Although he remembers most of the general information, he forgets some specifics, such as hours, and must look up information quickly when asked questions.

Goals and Tasks
+ To quickly access resource information when asked questions by first-years
+ To access information on the go
+ To inform students who have questions in a quick manner

Interest in the Website
+ Find essentials information with minimal clicks
+ Not required to carry around a packet of information for reference
+ All information is found on a multi-device, accessible website so memorization is not required

Frustrations with the PDF
+ Takes too long to find specific information
+ Information is not organized neatly so it is difficult to find information in a timely-friendliest manner

Coded Demo Prototype

INDEX

RESOURCES

RESOURCES + HEALTH

SCHEDULE

SCHEDULE + SAT (OPEN)

SEARCH

LEARN

LEARN + HEALTH (Q)

SEARCH + TYPING

Detailed description of the screens:

- INDEX:** Shows a welcome message for Carnegie Mellon's Orientation & First-Year Programs.
- RESOURCES:** Shows a grid of categories: Academic/Career, Computing and Printing, Health, Inclusion and Equality, Police and EMS, and Student Living.
- RESOURCES + HEALTH:** Shows a grid of categories: Academic/Career, Computing and Printing, Health, Inclusion and Equality, Police and EMS, and Student Living. Below this is a "Health" section titled "University Health Services" featuring a large "Health" graphic, hours, location, and a map.
- SCHEDULE:** Shows a weekly schedule for the "Orientation Schedule" from Saturday, August 18, to Sunday, August 26.
- SCHEDULE + SAT (OPEN):** Shows a weekly schedule for the "Orientation Schedule" with Saturday highlighted as "OPEN". It includes details about residence hall move-in and dinner activities.
- SEARCH:** Shows a search interface with a search bar containing "Search Here...".
- LEARN:** Shows a grid of categories: Academic/Career, Computing and Printing, Health, Inclusion and Equality, Police and EMS, and Student Living.
- LEARN + HEALTH (Q):** Shows a "Frequently Asked Questions" section with Q&A pairs. One question asks about immunizations, and another asks about getting allergy shots without a car.
- SEARCH + TYPING:** Shows a search interface with a search bar containing "poli". Results include "C@CM CMU Police Department" and "CMU Emergency Medical Services".

Desktop Compatible Wireframes

The project has some clear future goals and necessary adjustments. First, although we were focused on the mobile version of our website, its responsiveness leaves something to be desired. Sizing, spacing, and alignment can sometimes look incorrect on the tablet and desktop version of the website. As well, there are some general layout and design changes we'd like to make, as detailed by our desktop wireframes. So I came up with several large scale wireframes for a desktop compatible display.

This wireframe shows a desktop view of the 'Resources / Health' section of the Orientation Resource Guide. The top navigation bar includes links for Home, Resources, Learn, and Schedule. Below the navigation, there are three columns of boxes, each labeled 'Carnegie Mellon University University Health Services'. Each box contains four sections: Services, Hours, Location, and FAQ. A dark footer bar at the bottom contains the text 'Orientation Resource Guide Date to Discover © 2018 by Jarvik Holmes, Daniel Noh, Angela Rubin. Carnegie Mellon University All Rights Reserved.'

This wireframe shows the main desktop view of the Orientation Resource Guide. It features a large banner image of students with the text 'DARE TO DISCOVER'. Below the banner, the title 'CARNEGIE MELLON UNIVERSITY ORIENTATION RESOURCE GUIDE' is displayed. The navigation bar includes Home, Resources, Learn, and Schedule. The main content area includes sections for 'Welcome to Carnegie Mellon!', 'Orientation 2018 Dates' (Saturday August 18 - Sunday August 26), and a 'Programs' section. At the bottom, there is a footer with the text 'Orientation Resource Guide Date to Discover © 2018 by Jarvik Holmes, Daniel Noh, Angela Rubin. Carnegie Mellon University All Rights Reserved.'

This wireframe shows the 'SCHEDULE' section of the Orientation Resource Guide. The top navigation bar includes links for Home, Resources, Learn, and Schedule. The main content area displays a grid of boxes representing the daily schedule for Orientation week. Each box is labeled with the day and date (e.g., SAT Aug 18, SUN Aug 19, MON Aug 20, etc.). Each box contains a list of events with times and descriptions. A dark footer bar at the bottom contains the text 'Orientation Resource Guide Date to Discover © 2018 by Jarvik Holmes, Daniel Noh, Angela Rubin. Carnegie Mellon University All Rights Reserved.'

ORIENTATION RESOURCE GUIDE
LEARN / HEALTH

max-width: 1140px;

Home Resources Learn Schedule

Frequently Asked Questions

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Q: Hey, I'm supposed to get some immunizations for the school, where am I supposed to do that?

Orientation Resource Guide
Date to Discover
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ORIENTATION RESOURCE GUIDE
RESOURCES

max-width: 1140px;

Home Resources Learn Schedule

Categories

Academic/Career icon

Computing and Printing icon

Health icon

Inclusion and Equality icon

Police and EMS icon

Student Living icon

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