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- TRU
designing for ability
- LET'S GROW!
designing to teach empathy
- AGING & TECHNOLOGY
trans-disciplinary design
- CHIPPING AWAY AT POVERTY
THROUGH COMMUNITY DESIGN
designing with the community



TRU
designing for ability

How do we design a prosthetic to embrace confidence and comfort?

This project aims to solve current problems with osseointegrated prosthetics. My users and experts helped guide me in exploring a design with beautiful form and function. Through interactions with my users, the design evolved to one of embracing ability rather than disability.





research
stage 1: background
stage 2: exploratory

- anatomical research
- user interviews
- market research
- literature review
- observation
- photo documentation
- sketching
- mind mapping
- ideation

analyze

- mind mapping
- identify design opportunities
- highlight patterns
- 2D sketching
- 3D sketch models
- user interviews
- expert interviews

explore

- 2D sketching
- 3D sketch models
- prototyping
- user interviews
- expert interviews

test

- prototyping
- user testing
- documentation
- user interviews
- expert interviews

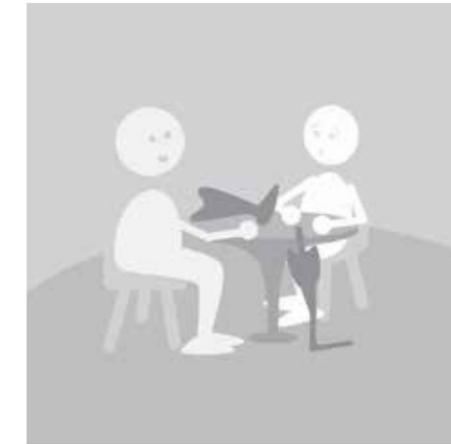
AN EMPATHETIC START

My first priority was to engage in conversations. I met with amputees of different ages, abilities, and experiences. Despite their differences, **socket-related problems** were a reoccurring theme.



Ben
above knee amputee

As we were running a lap around Central Park together, Ben was reminded of how “in the summer the limbs kind of swell up” and the heat causes sweating and loosening of the **socket** fit.



Susan
below knee amputee

Sipping tea at an outdoor cafe, Susan pulled out three prosthetic legs. We examine them together as she explained their different **socket** attachments. She bought them in search of the most comfortable fit. They were all very expensive.



Mel
below knee amputee

Mel explained to me her journey in getting a leg that allowed her to finally wear heels again. Her first socket was “cast and recast over 50 times.” She had to wear 6-8 layers of socks to make up for the extra space in her **socket**.

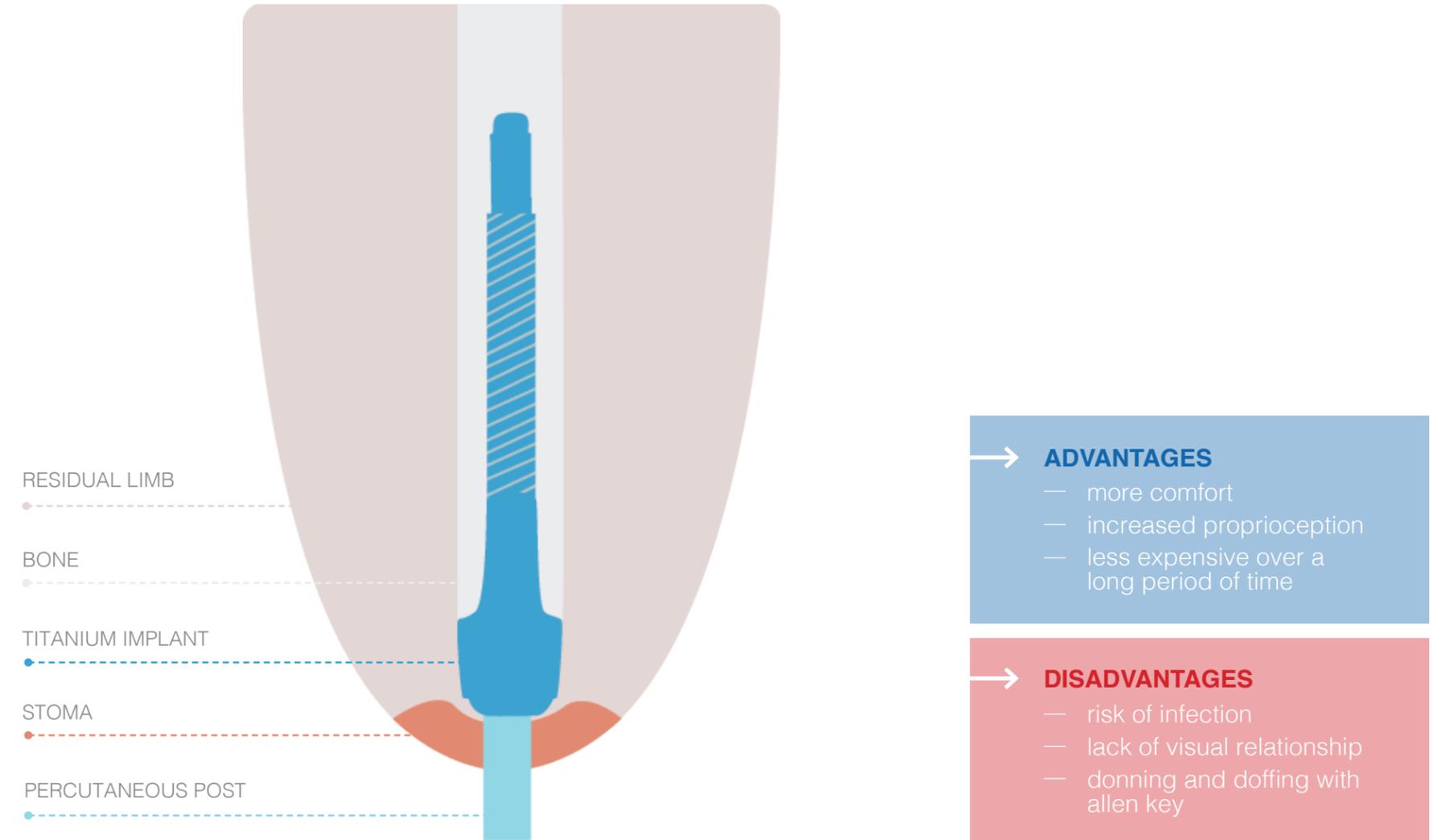
CONTEXTUALIZING INQUIRY

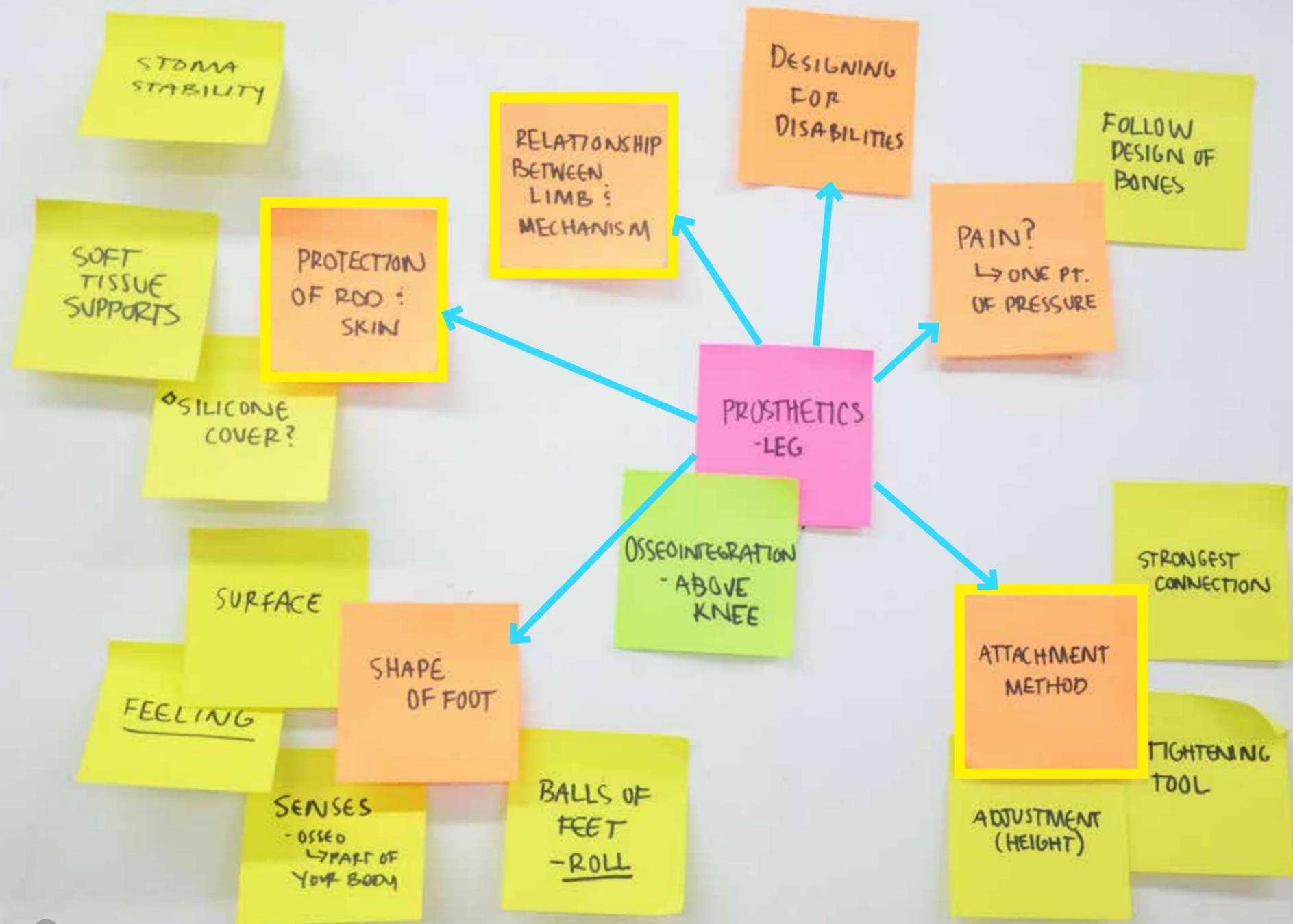
Through contextual inquiry, I joined Mel at The Joyce Center. I observed the timely, costly, and highly customized process of fitting a new socket, .



OSSEO-WHAAT??

I dove deep into the web, books, and case studies. I discovered a fascinating procedure: osseointegration, a prosthetic solution without the socket.





IDENTIFYING OPPORTUNITIES



attachment method



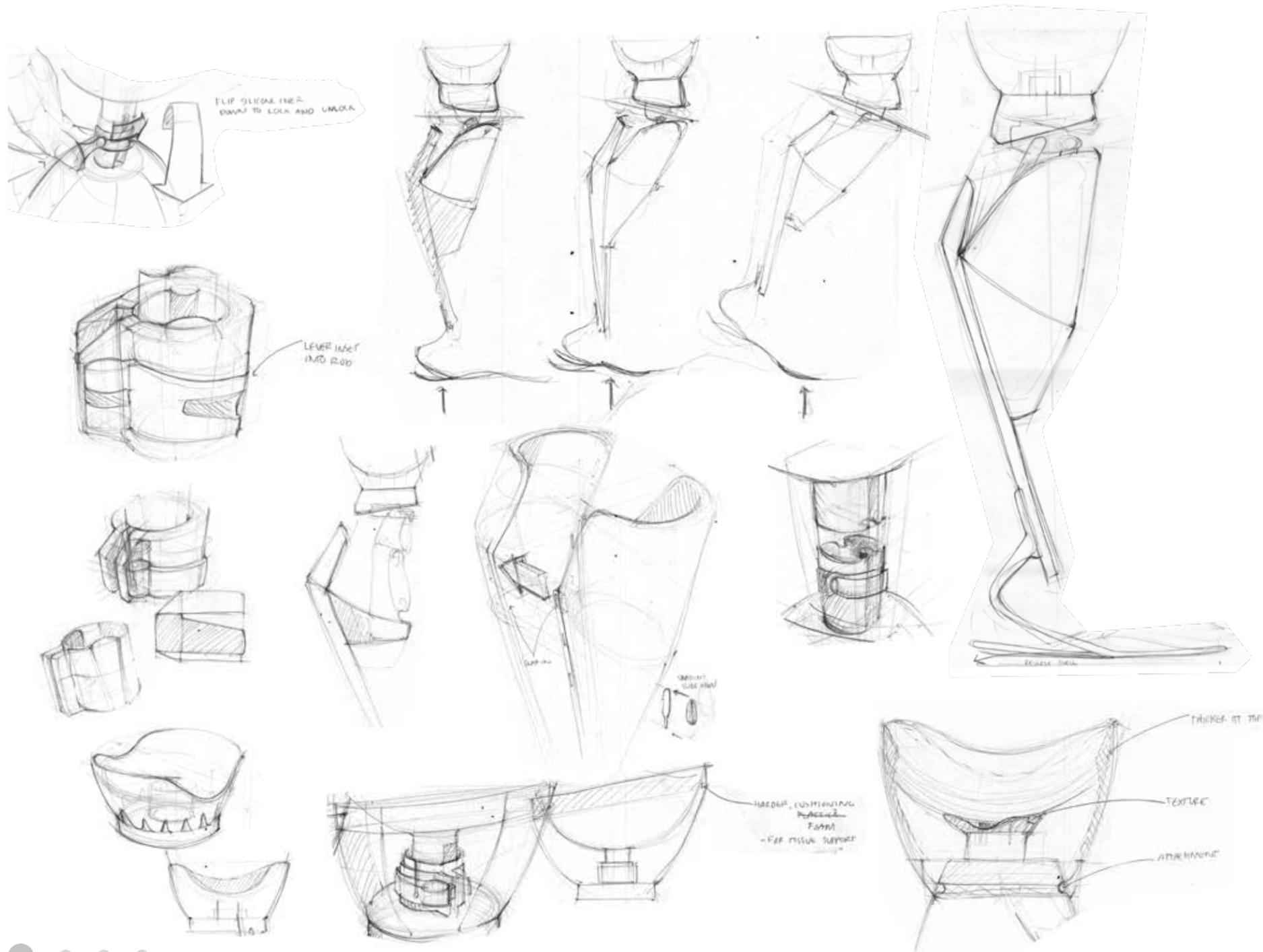
visual relationship



stoma stability

"Motion of the skin around the percutaneous post is clinically associated with irritation and increased infection risk. Lower rates of infection are seen when the skin at the stoma is stable."

Alex Drew
University of Utah
researcher of osseointegration



USER TESTING

I tested the shape and comfort of the cover against Mel's residual limb to decide the final form.



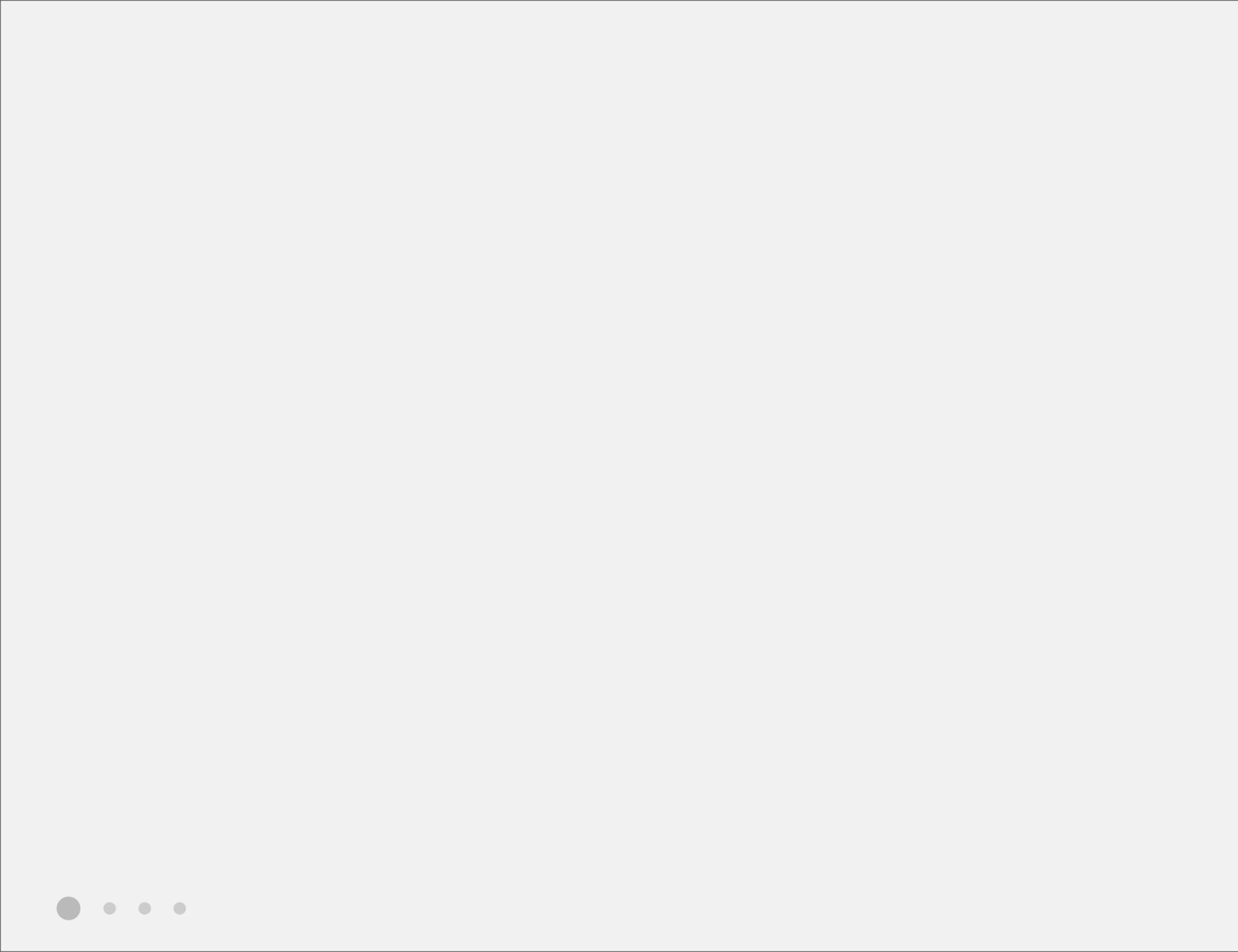
provides comfortable support under the limb



walls need to dip to accommodate



comfortable and secure fit

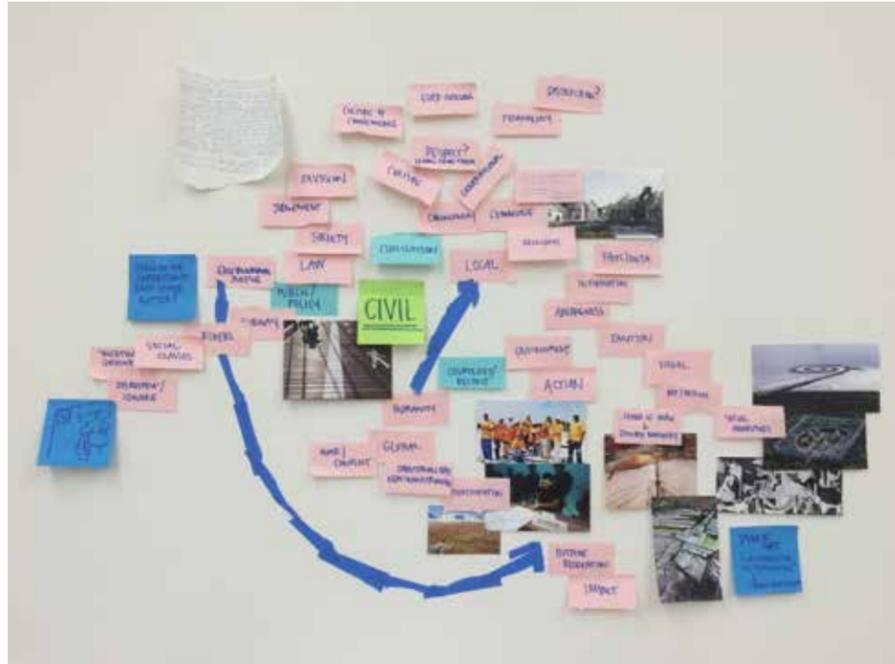




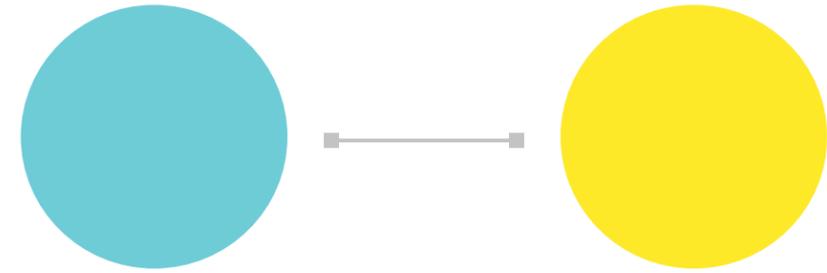
LET'S GROW!
designing to teach empathy

How do we encourage physical interactions in a rapidly-growing digital society?

In my initial research phase, I was influenced by my surroundings and the underlying structures of environmental degradation. Let's Grow! is my response to this frustration. It's a learning experience that encourages environmental stewardship to our up-and-coming leaders. It finds a unique balance between our digital and physical spheres. These spheres work together to teach empathy by guiding children through the process of taking care of a plant. A sensor-based LED works in tandem with a narrated application to communicate the plant's need for water and sunlight.



RESEARCH (AKA WALKING AROUND GOWANUS LOOKING FOR INSPIRATION)



As technology rapidly increases, our relationship with our environment becomes more and more distant.

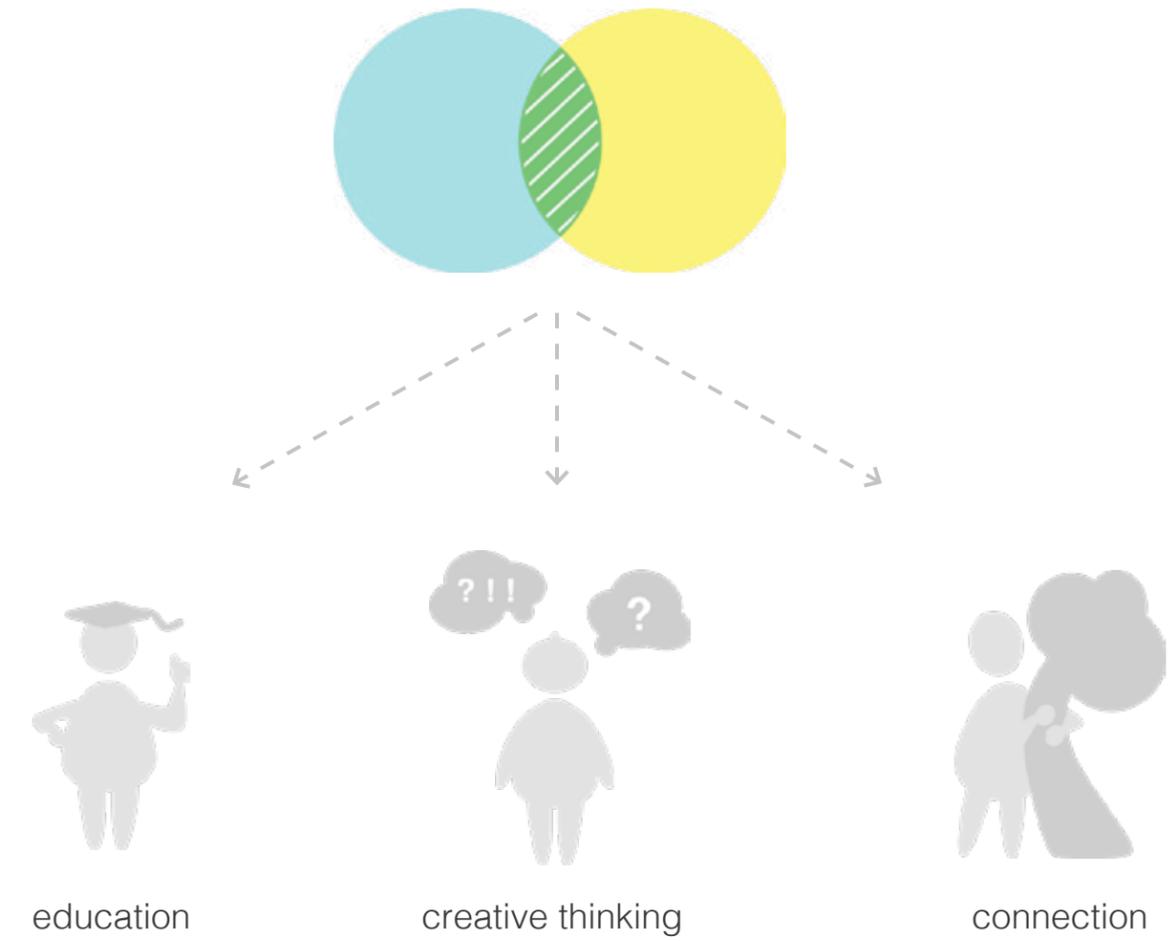
How can I, as a designer, influence this behavior?

I turned to our young generation...



DESIGN OPPORTUNITIES

How can I foster this relationship?



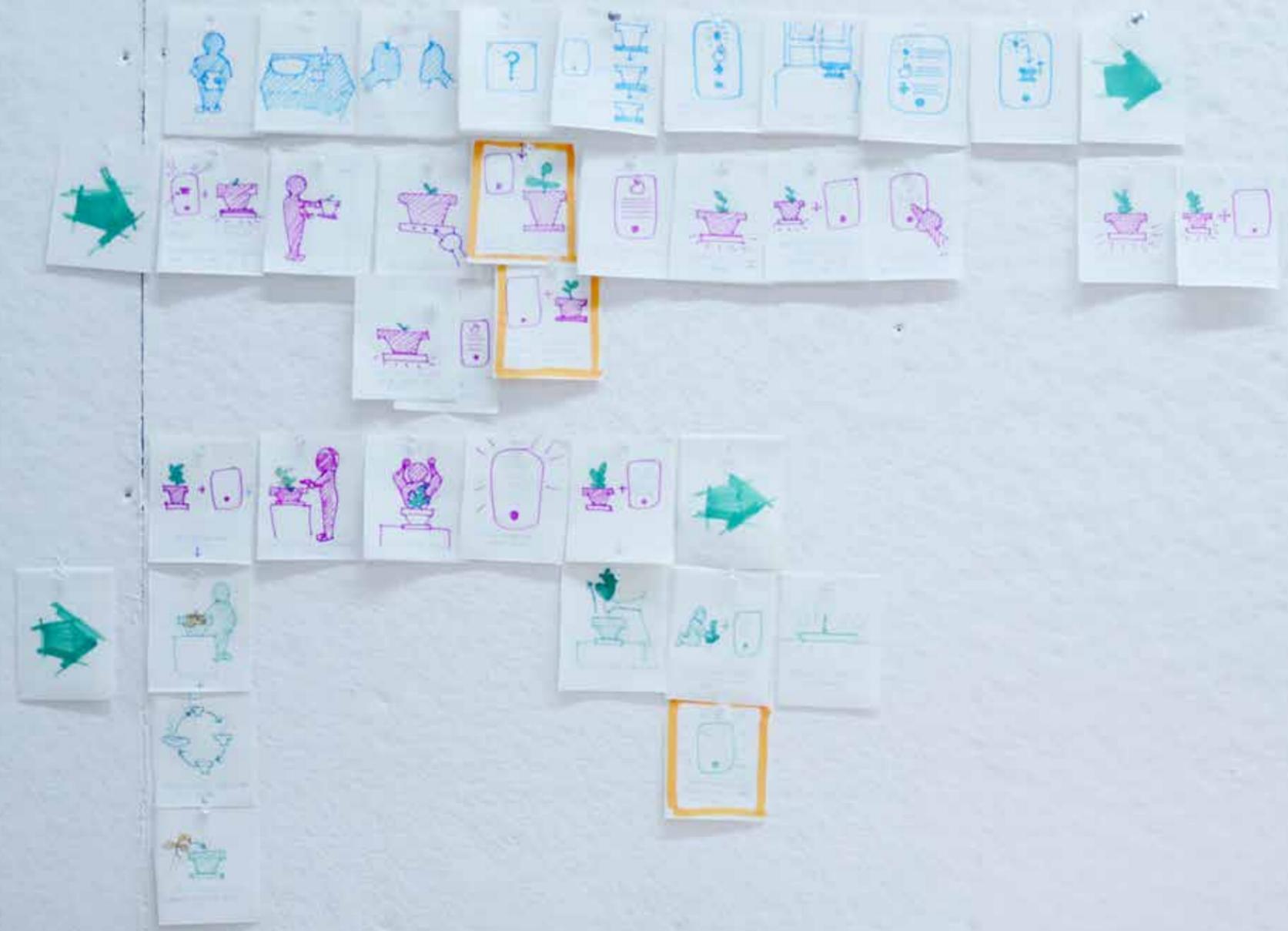
LET'S **GROW!**

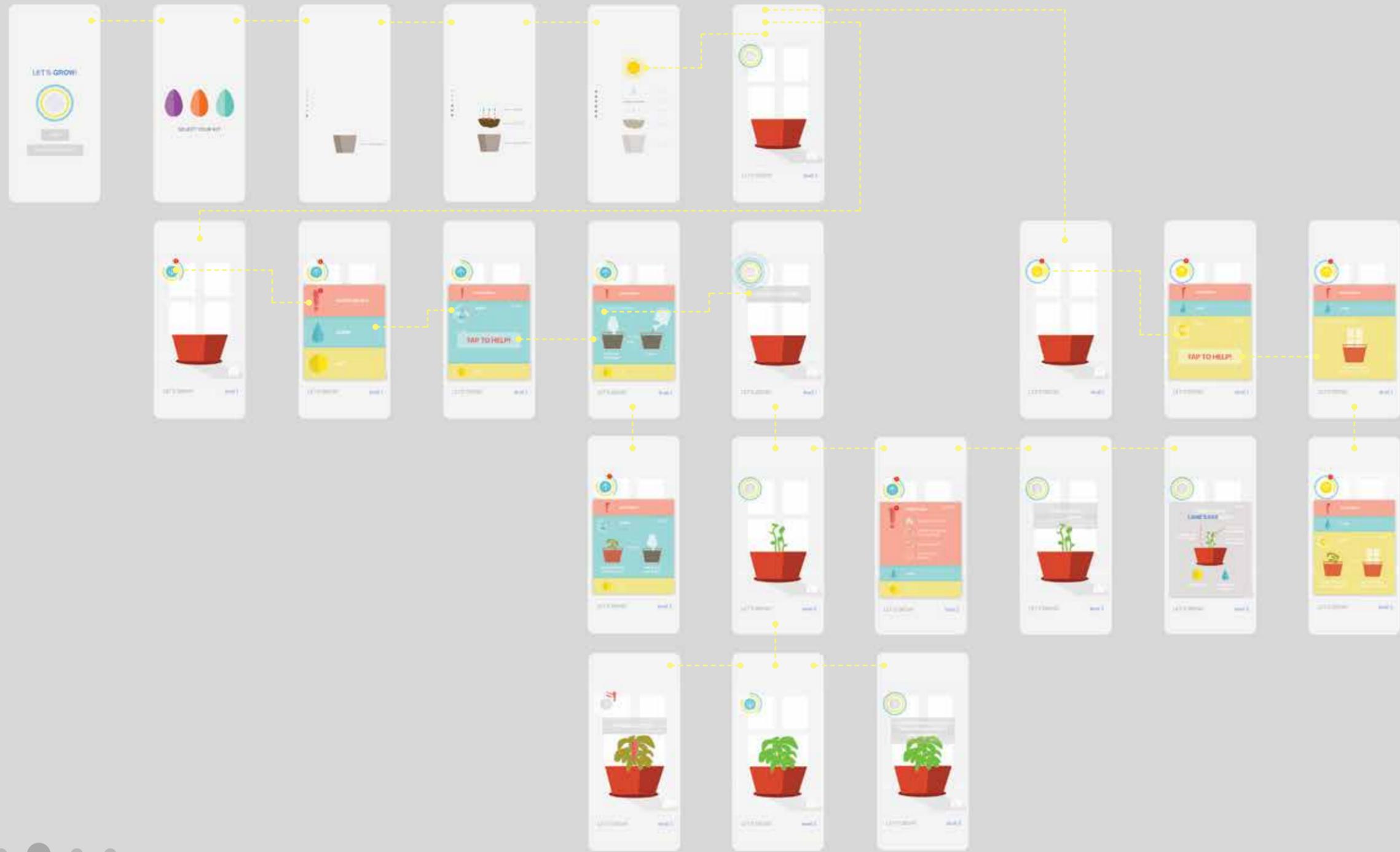


EXPLORING ON TWO SPHERES



I prototyped physically and digitally: designing the story, the platform that would house the story, and the product that would facilitate it.



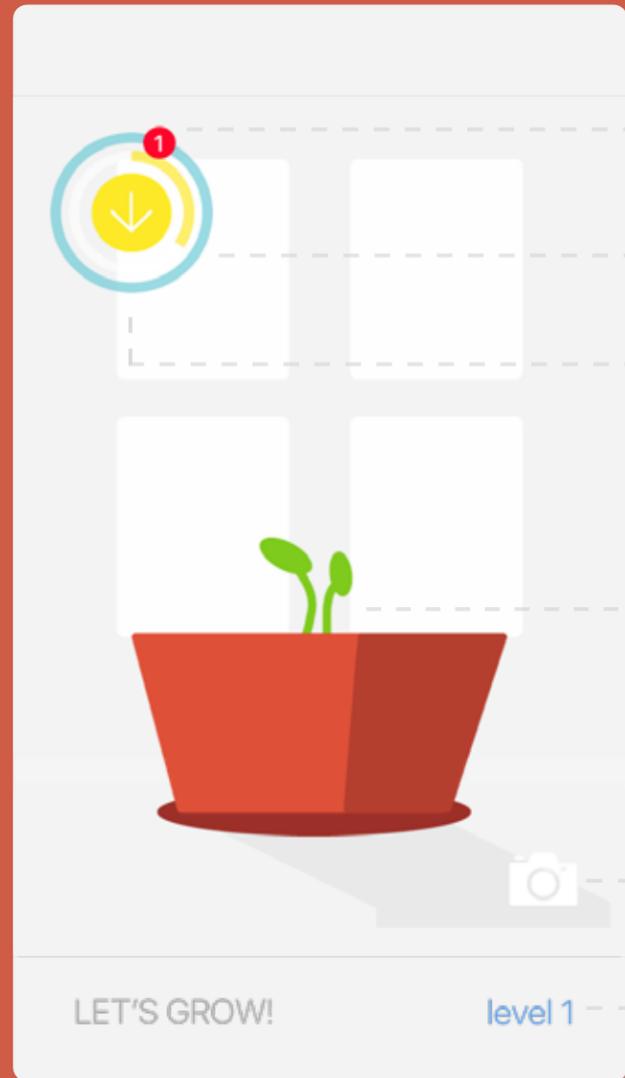


As the narrative evolves, you move through a series of levels that represent different stages of the story. Notifications become vague over time, embracing **learning through failure**.

- level 1**
- notifications pop up consistently and are color-coordinated with your water/sun needs
 - instructions on how to "help" are specific
 - you receive consistent feedback

- level 2**
- notifications appear only in the app
 - instructions become less specific and rely on your observations
 - your plant reveals its species based on your observation and plant documentation

- level 3**
- you must observe your plant and its status because no notifications appear



● **menu notification** pops up when your plant needs attention! The center arrow changes color based on sun/water needs.

● **element bars** decrease in fullness as your plant loses sun/water

● **category tabs** appear when the arrow is tapped

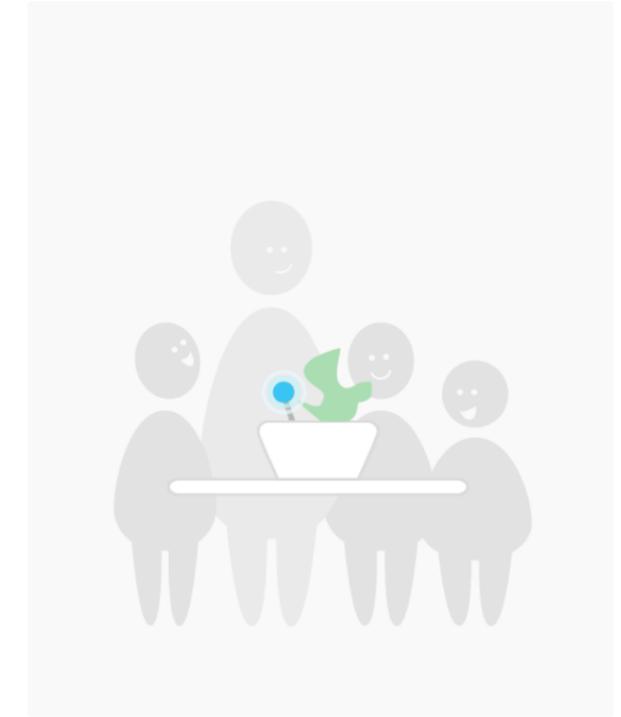
● the **plant icon** shows growth and health

● the **camera** allows you to document your plant's progress

● the app moves through **levels 1-3** as your plant grows. Notifications decrease as you level up.

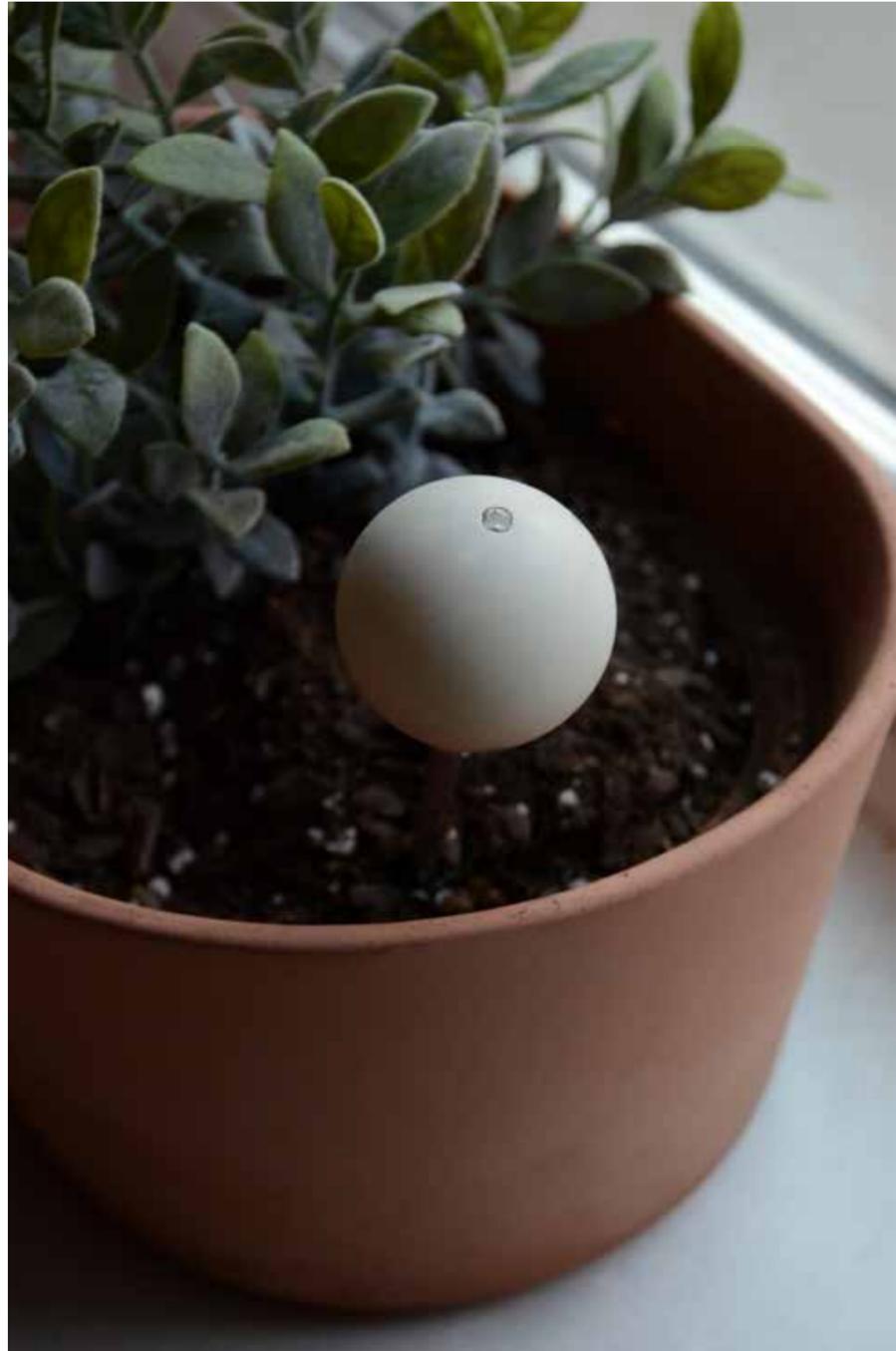
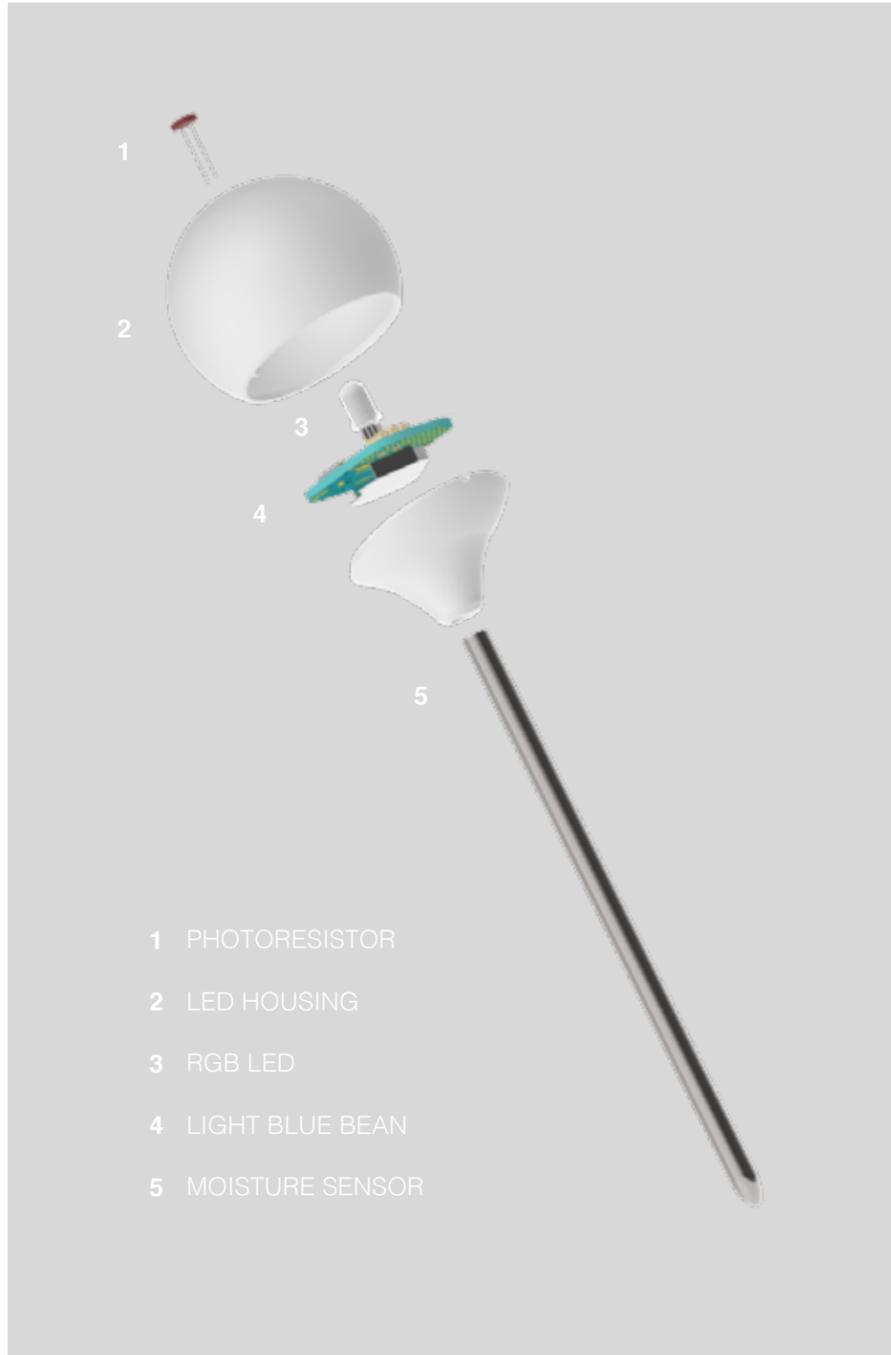


at home



in the classroom







AGING & TECHNOLOGY
trans-disciplinary design

How can we give those aging & living in the city a seat at their own table?

As a team of engineers, a social scientist, a medical student, and a designer, we worked to establish Age-Friendly Bethlehem. Our goal was to facilitate communication, innovation, and education between the Lehigh Valley and the aging population in order to improve quality of life and self-sufficiency. My main role as the designer was to guide my team through a human-centered design process and push us to work visually.

in collaboration with...



research

stage 1: background
stage 2: exploratory

- informal discussion
- expert interviews
- mind mapping
- literature review
- observation
- workshop: design thinking
- ideation

analyze

- mind mapping
- highlight connections & patterns
- identify design opportunities
- user interviews
- map discussion talking points

engage

- group user interviews
- expert interviews
- group discussions
- literature review
- observation
- notebook activity
- mind mapping
- group ideation
- 2D sketching
- gather & present ideas

propose

- write proposal
- present to students, professors, professionals

We interviewed anyone and anything to do with the aging population!



Age-Friendly NYC- Project Assistant



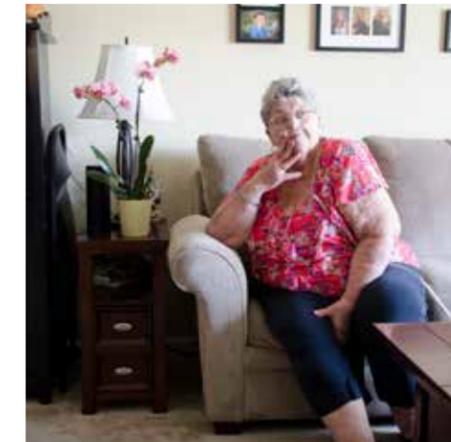
independent living facility



film director



Age-Friendly NYC- Policy Associate



independent resident



EMT

We used participatory design to empathize and design together!



engage

facilitate

collaborate



CHIPPING AWAY AT POVERTY
THROUGH COMMUNITY DESIGN

designing with the community

How can we encourage community relationships through composting?

From a class prompt to a year-long grant, this project aims to close-the-loop with the Park Slope Food Co-op, the Park Slope Community Help, Inc. (CHiPS), community gardens, and the local government. Through connecting community stakeholders, we designed a self-sustaining program that encourages the reduction of food waste.

in collaboration with...



PARK SLOPE COMMUNITY HELP, INC. (CHIPS)

CHIPS is a non-profit soup kitchen that lives in the rapidly changing Park Slope neighborhood. Local and organic food stores and green spaces are popping up all around. New developments have prompted more litter fines, diverting CHIPS from their mission: doing everything in their power (despite limited funds) to serve the hungry.

There's a long-divided history between environmentalists and poor communities. The "cleaning" of the neighborhood creates visible tensions. My goal for this project is to disprove the common stigma that the poor are unproductive members of society and prove that they can contribute to sustainable efforts and must be included in fighting for social and environmental change.

research

- community engagement
- volunteer
- questionnaires & surveys
- ethnography
- literature review
- expert interviews
- user interviews
- stakeholder mapping & engagement
- group interviews
- mind mapping
- 2D sketching

analyze

- mind mapping
- highlight connections & patterns
- ideation
- identify design opportunities

explore

- 2D sketching
- prototyping
- system mapping
- system prototyping
- user interviews
- expert interviews
- connecting stakeholders
- expert interviews
- group interviews
- literature review
- group ideation
- write proposal
- graphic development

test

- contextualize system
- test & fail!
- continue!





community

- strong community ties
- close proximity to many **community gardens**

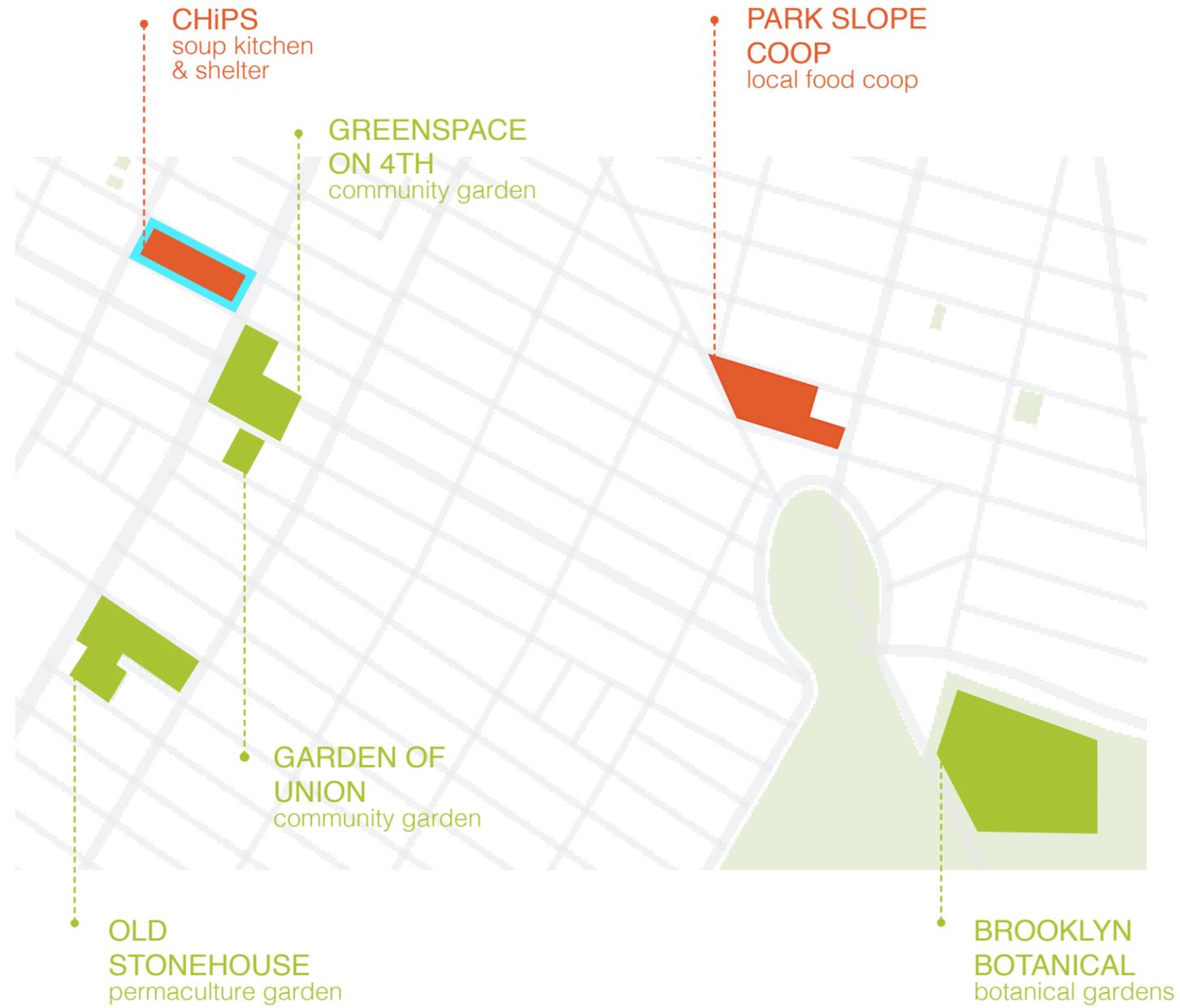


volunteer-run

- 75% of work is volunteer-based
- new volunteers come in and out everyday

resources

- over 80% of CHiPS' food donations come from the Park Slope Food Co-op
- a huge amount of **food is wasted** after kitchen prep



CLOSING THE GAP

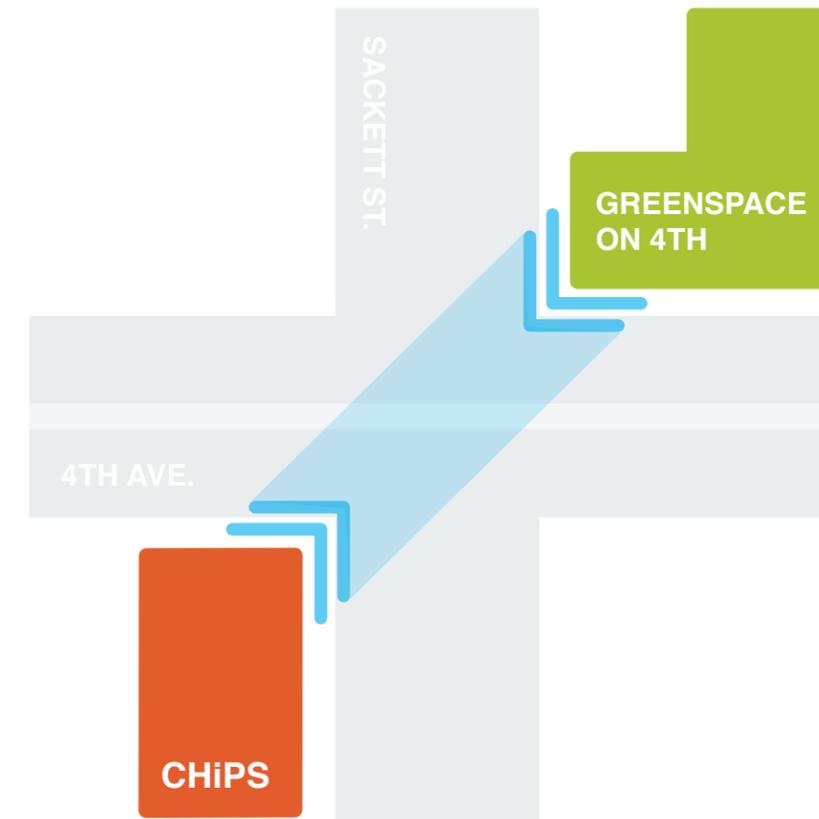
social vs. environmental

My research identified an interesting physical and structural barrier between social and environmental issues. The closest community garden from CHiPS was right across the street! I was surprised there's no existing relationship between them. Often, environmentalism ignores the root of the climate crisis, that of social inclusion. Waste and place is directly linked to the poor communities of the United States. There's an overwhelming amount of low-income families whose homes sit next to a waste facility.

My goal is to close this gap between social and environmental through designing with CHiPS. I want to foster stronger connections and relationships within this community system.

“Waste is a social process.” It “informs the construction of our social and cultural values.”

(Clean and White: A History of Environmental Racism in the United States, Carl Zimring, 2015)



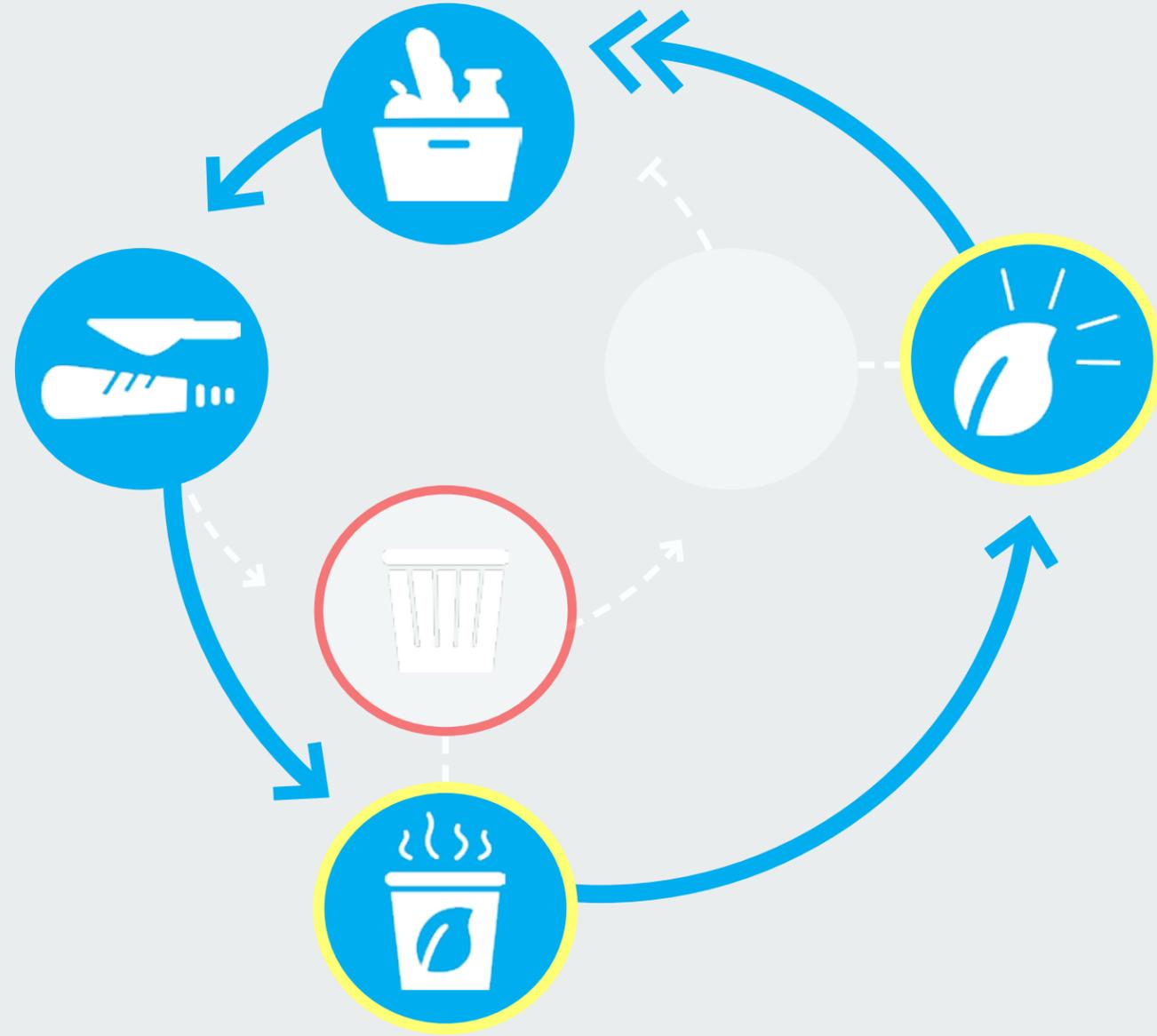
CHiPS seen across the street from Greenspace on 4th. Image courtesy of Greenspace on 4th.



IDENTIFYING...

Not necessarily a problem, but an opportunity!

The food waste leftover from CHiPS' kitchen was a perfect opportunity to reconnect with the outside community. It closes-the-loop between the Park Slope Food Co-op, CHiPS, and community composting.



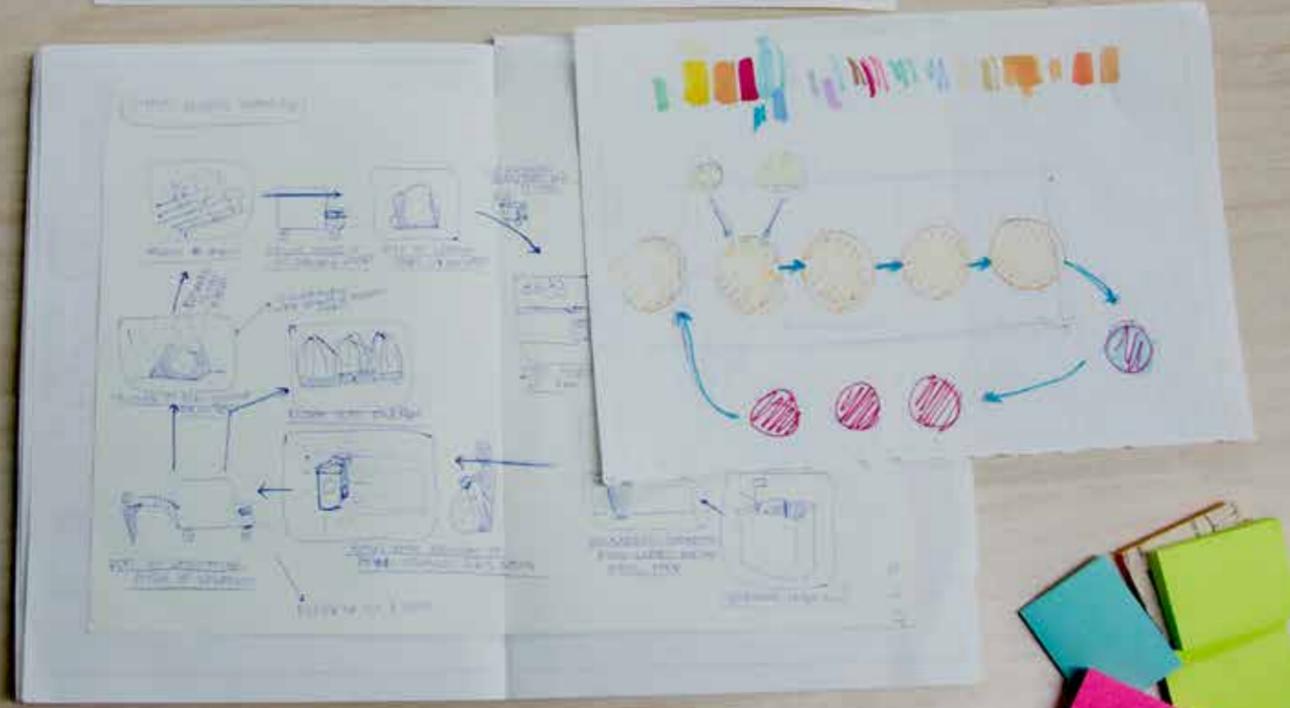
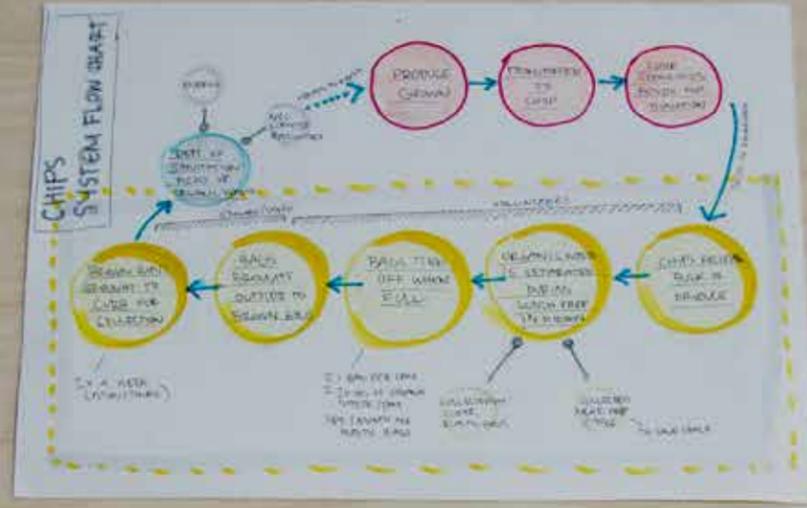
→ benefits for **CHiPS**

- establish relationship with community gardens - potential for future opportunities
- future volunteer growth
- work alongside other soup kitchens in NYC who are diverting food waste
- less trash to pick up = saving money
- prep for future sustainable initiatives in NYC

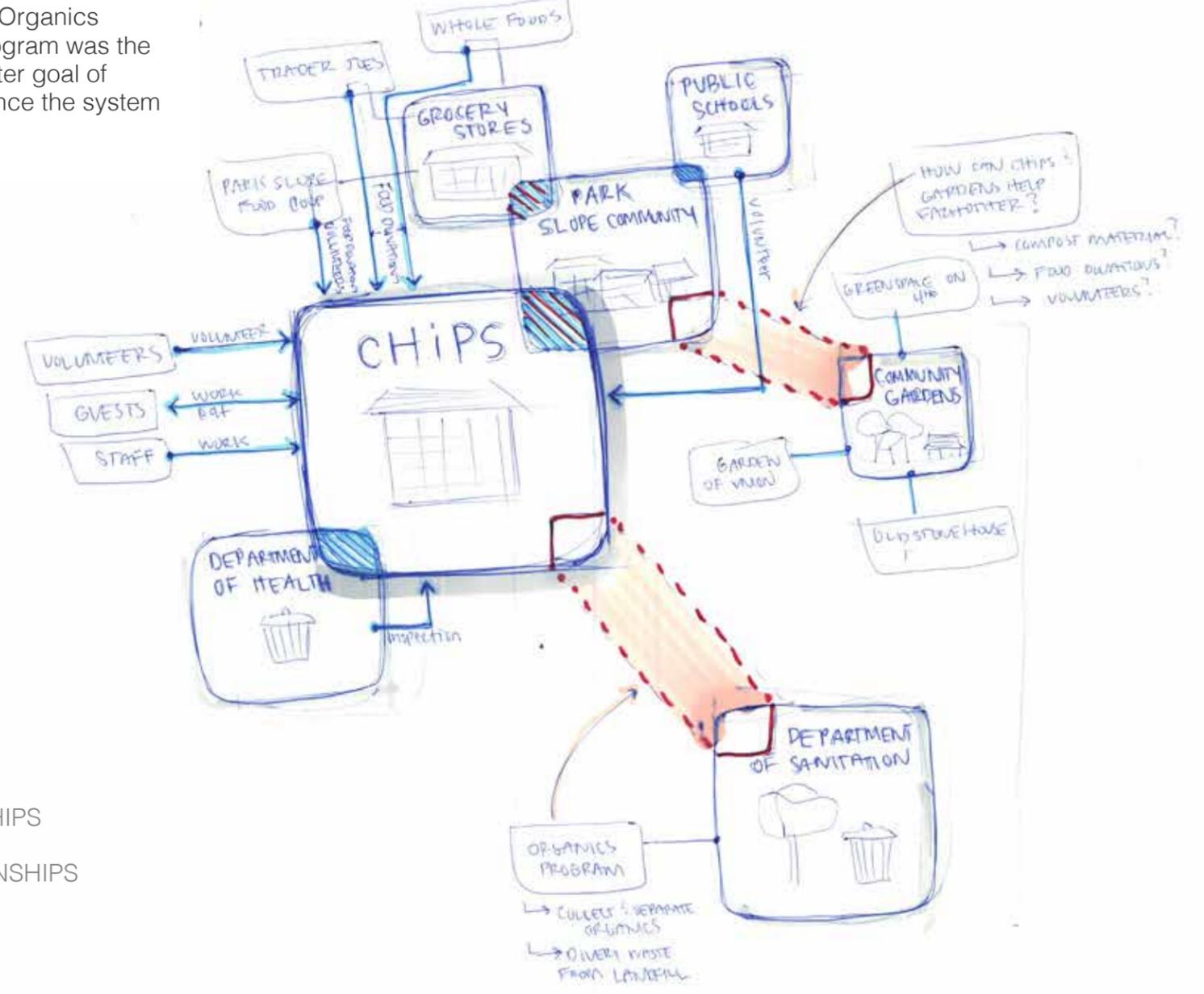
→ benefits for the **community**

- improve livelihood and opportunities for poor communities
- relationship with long-time community residents
- increase in compost material
- future volunteer growth
- combating climate change together

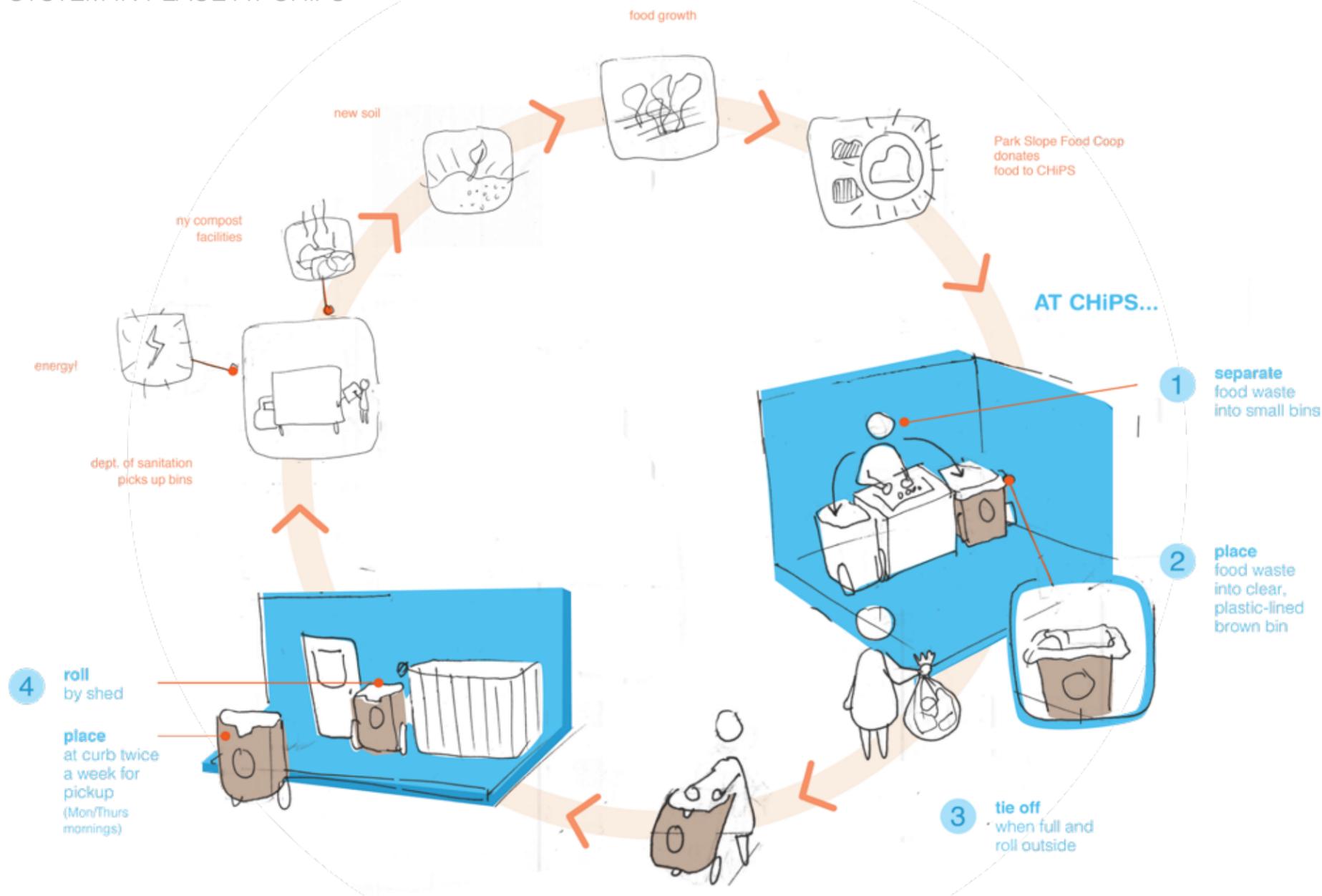
STAGE II DESIGNING THE SYSTEM



Through mapping my stakeholders, I identified two main opportunities to activate relationships: community gardens and the Department of Sanitation's Organics Program. The Organics Program was the best place to start with a later goal of connecting with gardens once the system was learned at CHiPS.



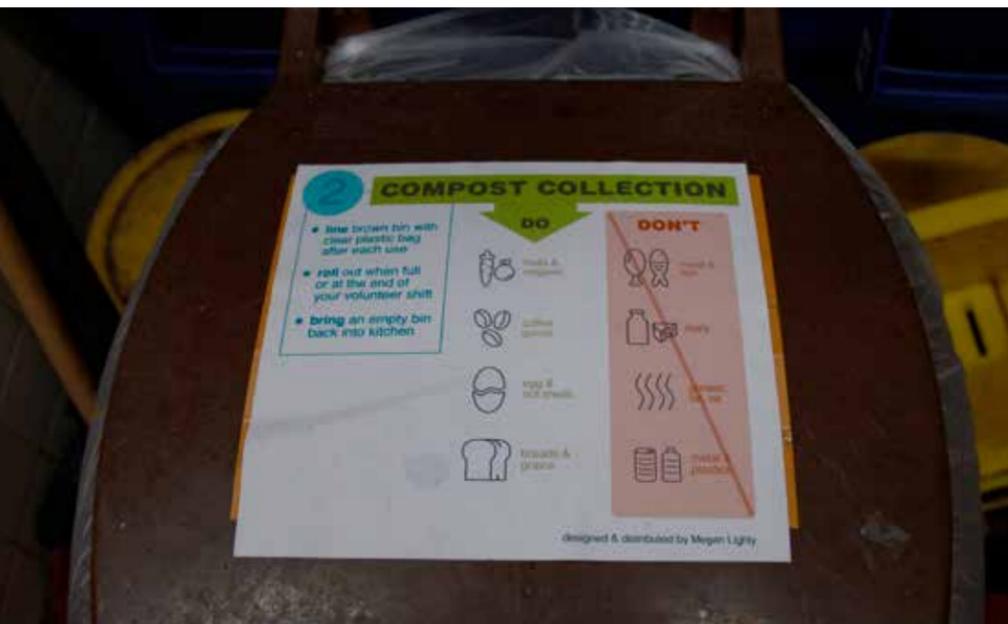
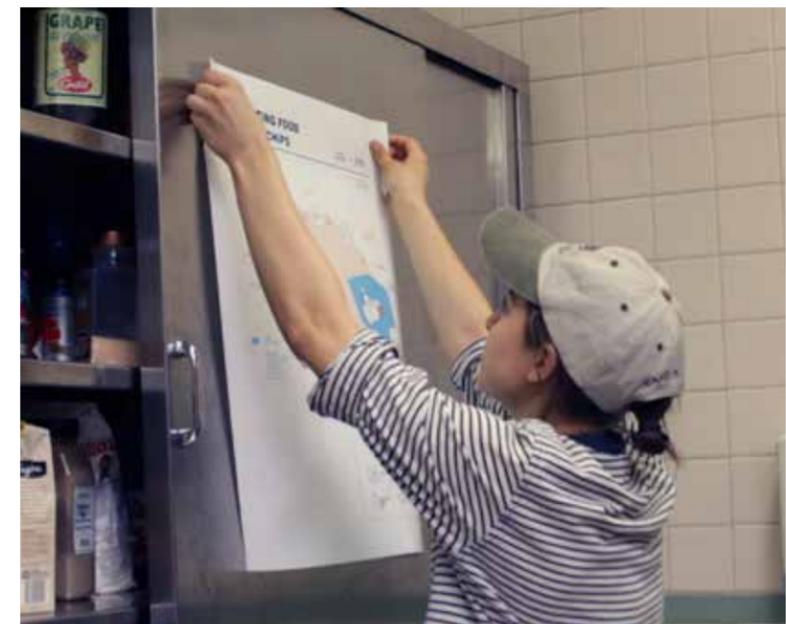
SYSTEM IN PLACE AT CHIPS



1 COMPOST COLLECTION

DO		DON'T	
fruits & veggies	egg & nut shells	meat & fish	grease, fat, oil
coffee grinds	breads & grains	dairy	metal & plastics

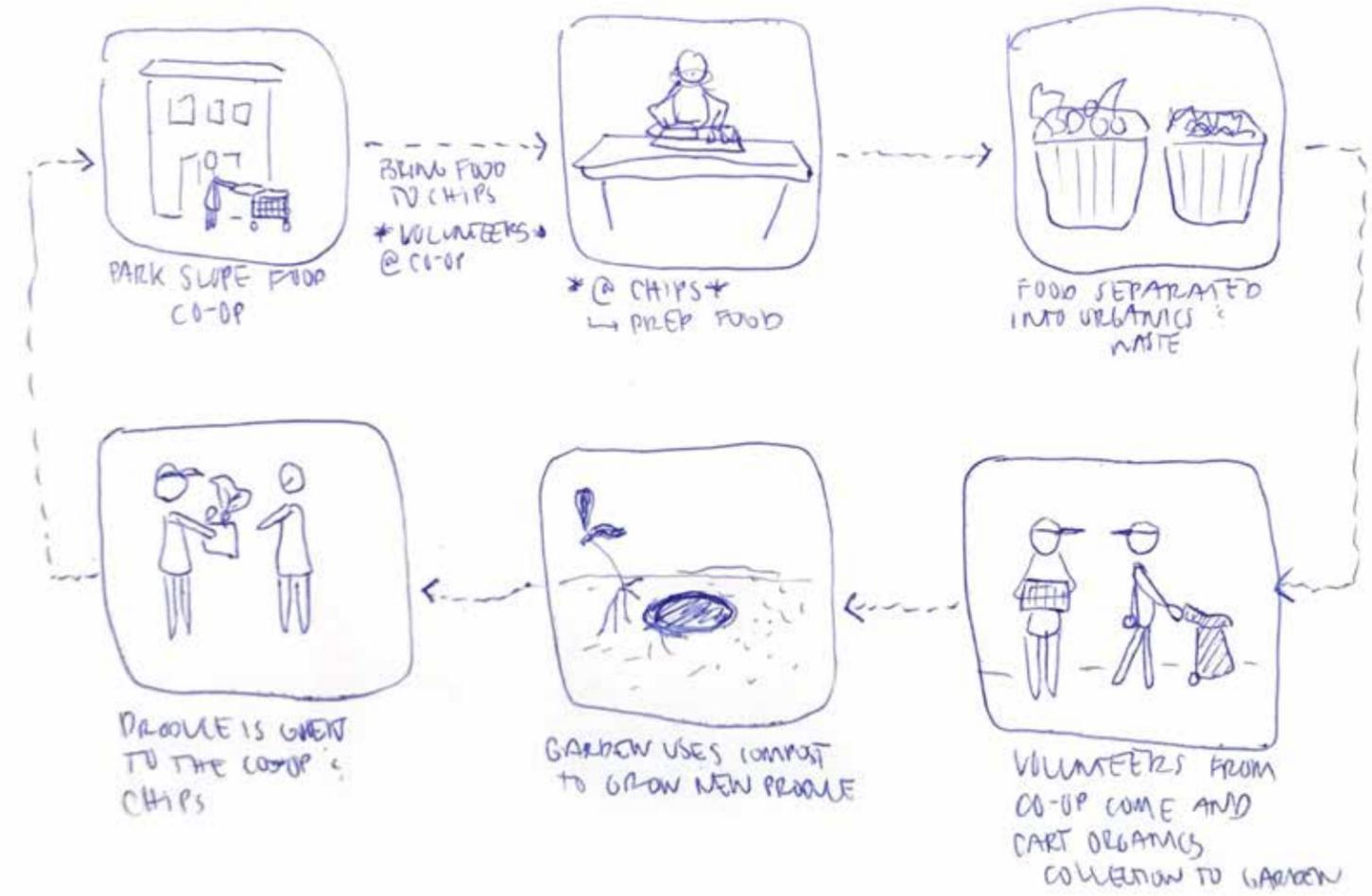
Designing graphics that would accommodate commercial and local composting methods.





CONCLUSIONS

- CHIPS
- GREEN SPACE ORGTH
- PARK SLOPE CO-OP



to be continued...

Thank you for your time.
Now, let's have a chat!

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