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Designing for Humanity's Growing Disconnect from Nature

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Designing for Humanity's Growing Disconnect from Nature

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Honors Capstone Project in Your Major

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Abstract

The Industrial & Interaction Design 5th year thesis project process began with an exploration of our personal passions. I started by researching mental health and outdoor activity. After realizing the fact that the two have been very closely connected in my own life, I decided to investigate the extent to which this linkage exists in the context of the wider world. A paradox I discovered early on while conducting my critical literary review and focus group this fall led me in the direction of *Designing for Humanity's Growing Disconnect from Nature*. Researchers around the globe are proving that there's a scientific connection between being in nature and improved health and happiness, while humanity sits somewhat idly by, more disconnected from the natural world than ever before. Where does the distance continually forming between mankind and the planet that supports it come from?

The short answer is technology. The word nature has come to mean many things throughout history, but it can be split and redefined as internal, external, and universal nature more definitively. Internal nature is what's inside of us, human nature, whereas external nature is what's outside of us, the green, growing world full of flora and fauna, which is the nature that my project focuses on. Part of our human nature (internal nature) has always been a desire to dominate the plants and animals around us (external nature), and technology is the tool that makes doing so possible. The very essence of my design solution addresses this extremely oppositional quality of nature's relationship to technology head-on.

TurRARIUM is an augmented reality gaming mobile application for Android. It rewards New York City residents for time spent outside in Manhattan's parks with discounts redeemable at the city's shops, restaurants, and attractions that support the environment. It was developed according to a six-phase design process that I've been practicing and perfecting throughout the course of my 5-year Industrial & Interaction Design education. Its six phases include, discover, frame and define, ideate, design, refine, and finalize.

Executive Summary

The correlation between exposure to nature and improved health and happiness is being proven to an extent that it hasn't been previously. Yet, mankind is growing more disconnected from nature than ever before. People should reconnect with nature for their own sake (mentally and physically), and arguably more importantly, for the sake of the planet, because we won't take care of things we don't experience or enjoy. Our government's current unwillingness to fight phenomenon devastating our planet such as climate change and global warming makes now an extremely important time to improve people's appreciation for the environment, and help them participate in efforts that support it.

The multitude of conclusions I came to while writing my research book this fall became a much more condensed list of key insights, which very directly informed the creation of a defined set of design criteria. My in-depth literary review indicated that the way a person interacts with nature (stimuli type) determines the kinds of benefits they'll receive from doing so (mental vs. physical). It also became clear that children and adults value nature differently. Children think the best reason to conserve nature is for its own sake, whereas adults feel like it should be conserved to preserve the resources it provides. In addition, I found that continued appreciation of nature could require a redefinition of what it, and interacting with it entails, because of the way rapid, unavoidable urbanization is decreasing and changing our opportunities to interact it. New York City residents who care about the environment, and want more nature in their lives, but admit that things like lack of knowledge and will power get in the way became my user group because of this.

The fact that people living in urban areas need nature's benefits the most (city-living takes a toll on one's mental and physical health), while simultaneously having the least amount

of access to it also contributed to this focus, as did information gathered during a focus group conducted with my Honors Being Human on Earth class. All participants expressed a desire to have added nature reconnection opportunities in their lives, and the vast majority reported wanting said opportunities in and around the areas where they live, as opposed to elsewhere. Another insight that influenced my criteria revolves around technology, which became a crucial consideration for my design. The irrational fears keeping people from getting acquainted with nature are the product of the open flow of information defining today's digital age. The Internet has just as much potential to mitigate these fears as it does to inspire them. Furthermore, I realized (in part from first hand observational work) that many designed nature experience expose participants to nature, and provide them with information about how they can protect it, but remain too disconnected from any means of doing so.

My design criteria consisted of 5 main points. I ultimately decided that the design needed to actually get people outside. Digital nature couldn't replace the real thing, because of that aforementioned difference in stimuli. It needed to engage the user's five senses because nature's power comes from its ability to teach us things that traditional education can't, thanks to its realness, it's inherent stimulation of our five senses. The design also needed to be personal, and provide something personally beneficial for the user, because people connect with nature better when it's presented an answer to an existing problem, as opposed to another cause they should support for reasons a, b, and c. The design's focus needed to be on doing something with nature, not knowing about it, because people (children in particular) gain more from being active in nature than they do from learning about it. Finally, the design's engagement needed to feel quick, easy, and novice, because nature simply isn't high up on people's list of priorities (even for those that outwardly express affection for it).

TurRARIUM is an augmented reality gaming app for Android. The interface functions as the center of a month-long initiative that could be adopted by cities other than the one it revolves around, that being New York City. It motivates people (in Manhattan) to interact with the nature already available to them by gamifying the New York City parks system. Users have 4 weeks, and 30 parks to choose from. They receive points for visiting these parks and discovering the three at-risk animal species digitally hidden within each one using TurRARIUM's augmented reality "Explore" feature. They can redeem these points for promotional rewards valid at eco-conscious shops, restaurants, and attractions in the area. The reward options change weekly, and users support the environment by bringing their business to theses establishments instead of less environmentally ethical ones. The app does more than just connect them to these places; it provides them with opportunities and incentives to actually take advantage of what they offer.

TurRARIUM has value game play aside. It can be used as a resource for the New York City parks system, which doesn't currently have an app, and a tool to find environmentally friendly options in the city. It's also incredibly flexible. The parks and animals can change month to month. For example, the following 4 weeks could include parks outside of Manhattan (in the other boroughs) and dinosaur species. Also, participating businesses choose their own promotions. They can get involved to a degree that they're comfortable with, in ways that are best for their individual businesses. The interface's augmented reality transforms users' immediate urban landscape, and brings nature back into their daily lives threefold. TurRARIUM increases the amount of time they actually spend with nature, improves their knowledge of its current demise (with regard to lack of biodiversity), and helps them replace environmentally irresponsible choices with more eco-conscious ones.

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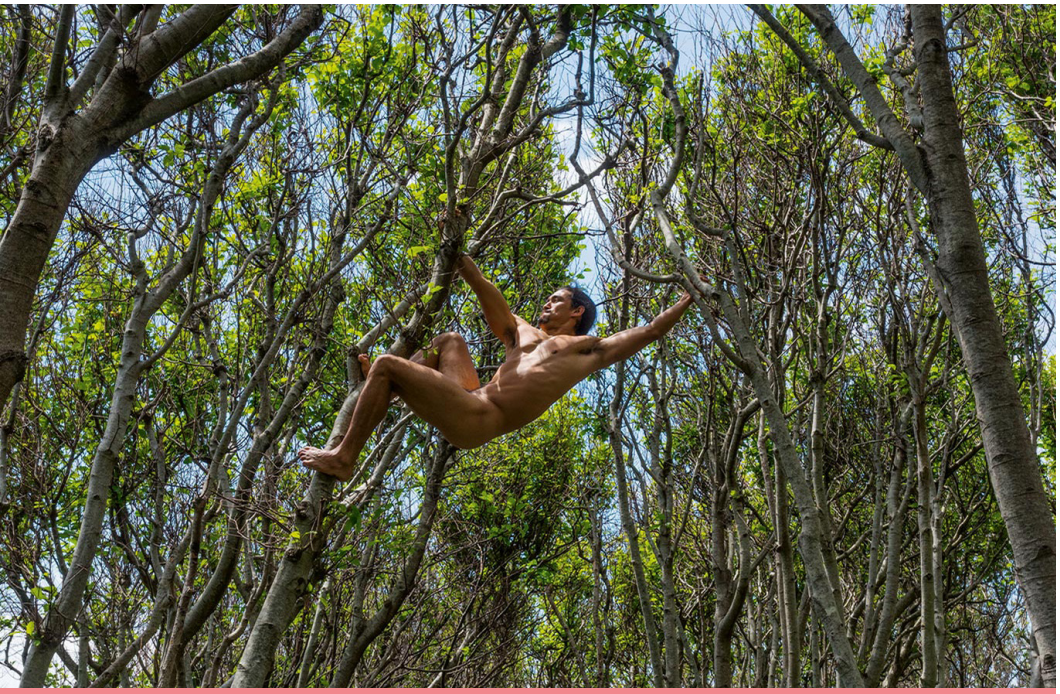


Photographer: Lucas Foglia, Publication: *National Geographic*

CHAPTER 1

Preface

A. About the Topic

TOPIC SELECTION

My thesis research topic, which can be loosely defined as "**Designing For Our Disconnect From Nature**," is the product of two (initially) separate passions I became interested in pursuing. I started this process by researching mental health and outdoor activity. After identifying the fact that the two have been very closely connected in my own life, I decided to investigate the extent to which this linkage exists in the context of the wider world. What I discovered steered me in the chosen direction. The scientific connection between being in nature and improved health and happiness is being studied and proven around the world to an extent that it hasn't been in the past. Yet, mankind has never been more disconnected from the natural world. The consequences of this shift are grave for the well-being of ourselves, society, and the planet at large, which is why designing for this problem is so important.

TOPIC RELEVANCE

Every human on earth has some sort of relationship to the natural world seeing as it's the origin of our species. One would think that the deteriorating state of our connection to nature would be impossible to ignore as a result, but up until fairly recently, the topic wasn't getting the attention it deserved. Now, the positive impacts of nature connectedness are being discussed through a wide variety of platforms, making this the perfect time to design a product, system, or service that improves it.

B. Methodologies

ACTIVITY

This book contains an extensive **critical literary review**, results from one **focus group**, and a brief **interview**. Understanding humanity's growing disconnect from nature required a critical literary view for a few reasons, the interconnected and philosophical nature of the topic being the primary one. It's difficult to learn about one subcategory existing within it without ascertaining valuable information about all the others. Focusing on research that's already been done before conducting studies of my own made the most sense, because a comprehensive understanding of the subjects shaping each chapter of this book was necessary before taking a more personal to any one of them. What makes the literary review critical is the variety of sources being cross-referenced within it. Disassembling and regrouping information from **books, articles, scientific studies, case studies, videos, and survey polls** provided me with the insights I'll need to execute the next, more hands on phase of my research. Plans for those future steps are included in the final chapter.

OBJECTIVE OF THE ACTIVITIES

Analyzing these secondary sources answered why, where, who, when, and how questions about (the context of) what I'll ultimately design. The focus group exercise I explored resulted in some initial answers to the what question, which is the spring semester's concentration. My next research steps are geared towards the same kind of discovery.

RECONNECTION MODELS

Reconnection Models are means of nature reconnection I'd like to mirror when it comes to my own design. They're strategies, systems, services, products, experiences (etc.) that bring people closer to nature in ways that correspond to the various chapters of this book. They're preexisting attempts to solve the problem I'm designing for worth setting aside for easy future reference.

C. Book Structure

- INTRODUCTIONS

Every sub-section within each chapter has a **personally written** introduction that provides an overview of the quoted material included.

- QUOTED MATERIAL

The **serif** body copy that lives in the centers of the spreads is taken directly from sources. This information is organized according to the chapter topics. Studies from all around the world are included because of nature's universal reach.

- INDIVIDUAL INSIGHTS

Personally written, detailed, design-related insights lives in the columns to the left and right of the center body copy. It's positioned near the material it references. These insights sometimes span the topics separated by chapters.

- FINDINGS

The most important **overreaching implication for design** from each sub-section is summarized in the "Findings" section of every chapter.

D. Ideology of Nature

WHAT IS NATURE?

Mark Barrow, a Virginia Tech environmental historian, says that "Americans have changed their attitudes toward nature many times over the centuries: It has been seen as evil, something to be tamed, a source of wealth, and as what Barrows calls a romantic playground" (Neilson, 2008).

Creating my own definition of the word nature with regard to the disconnect I'm researching was really important given the multitude of meanings that have developed over time. The concept of nature is far from concrete. In actuality, our idea of nature is a human intellectual construct. It's ever evolving as opposed to definitive, varying tremendously and shifting according to how we view other aspects of our world.

According to the "Ideology of Nature" section of Neil Smith's "Production of Nature" writing, nature can be viewed internally, externally, or universally. Internal nature constitutes what's inside of us, human nature. External nature refers to what's outside of us, the green, growing, natural world, and what's going on outside of us, events and society. Universal nature unites these two natures and all the natures we know by way of religion and the holy spirit.

The relationships between internal and external nature, and external, and universal nature (dualisms) dominate Western philosophical nature theory. Throughout recent history, Western society has had an increasingly difficult time grasping the fact that "the natural world is more than a decorative backdrop or a dispensable amenity" (Kellert, 2015). This digression stems from the Internal vs. External nature dualism specifically, and the widely-supported, rapid industrialization of today's society.

A desire and need to conquer external nature has always been part of our human nature, since the

beginning of time, when the Homo Sapiens first made use of natural materials to build shelters and developed the earliest forms of agricultural systems. Since then, this facet of our internal nature has only become more exploitative thanks to industrial capitalism. The immense pressure placed on people to grow economically in a way that depends all too much on the world's natural resources has made our instinct to control nature the dominant one... as has the support this growth has received from powerful institutions. Ultimately, the new multitude of highly lucrative opportunities to take from our environment at the cost of protecting it has left us detached from our undeniable and mutually beneficial connection to external nature, an even more important, long-standing, and biological side of human nature.

It's important for me to remember this line of thinking as I begin to design for the disconnect. As I continue researching this problem, I aim to continually question how potential solutions to it can direct people away from the need to dominate nature that lives within, which gets exacerbated by what's going on around (and outside of) them.

Photographer: Lucas Foglia, Publication: *National Geographic*

CHAPTER 2

Global Proof: Nature Improves Health & Happiness

A. Nature's Effect On The Brain

Studies from all around the world are proving that engaging with nature triggers certain responses in the brain, which lead to improved health and overall happiness. The specific way a person engages with nature determines what they'll get out of doing so. Watching a video about nature does less than actually being outside in it, but has benefits nevertheless.

According to Strayer, being in nature for three days wipes our mental windshields clean. This time frame is worth keeping in mind. 3 days could be used as a checkpoint or milestone. It should definitely be the minimum amount of time required for an intervention/ program-based solution. It could also define the preparation phase of an activity that requires the kind of qualitative thinking Strayer says being in nature for 3 days facilitates.

David Strayer, Cognitive Psychologist, University Of Utah
"Strayer specializes in attention so he's in a unique position to understand what modern life does to us. As an avid backpacker, he thinks he knows the antidote, nature. Our brains, he says, aren't tireless three-pound machines; they're easily fatigued. When we slow down, stop the busywork, and take in beautiful natural surroundings, not only do we feel restored, but our mental performance improves too. Strayer has demonstrated as much with a group of Outward Bound participants, who performed 50 percent better on creative problem-solving tasks after three days of wilderness backpacking. The three-day effect, he says, is a kind of cleaning of the mental windshield that occurs when we've been immersed in nature long enough. 'On the third day my senses recalibrate—I smell things and hear things I didn't before,' Strayer says. 'If you can have the experience of being in the moment for two or three days, it seems to produce a difference in qualitative thinking'" (Florence, 2016).

The Oregon and Sweden studies suggest that when it comes to sight and sound, experiencing the natural world has benefits, even when that experience is fabricated or takes place indoors. It produces a calmer, more focused state of mind.

Snake River Correctional Institution, Oregon
"Officers at Snake River Correctional Institution in Eastern Oregon Report calmer behavior in solitary confinement prisoners who exercise for 40 minutes several days a week in a "blue room" where nature videos are playing, compared with those who exercise in a gym without videos. Corrections officer Michael Lea experienced the difference. 'There's a lot of yelling really loud— it echoes horribly,' in the plain gym, he says. 'In the blue room they tend not to yell. They say, hold on, I got to watch my video'" (Florence, 2016).

Matilda Van Den Bosch, Physician, Sweden
"Matilda Van Den Bosch found that after a stressful math task, subjects' heart rate variability—which decreases with stress—returned to normal more quickly when they sat through 15 minutes of nature scenes and bird songs in a 3-D virtual reality room than when they sat in a plain room" (Florence, 2016).

The Japanese NK cell study provides information about another sense, touch. There's obviously value (from a health perspective) to experiencing nature for

Nippon Medical School Research, Tokyo
"A professor at Nippon Medical School in Tokyo, measured the activity of human natural killer (NK) cells in the immune system before and after exposure to the woods. Subjects showed significant increases in NK cell activity in the week after a forest visit, and positive effects lasted a month following each weekend in the woods. This is due to various essential oils, generally called phytoncide, found in wood, plants, and some fruit and vegetables, which trees emit to protect themselves from germs and insects. Forest air doesn't just feel fresher and better- inhaling phytoncide seems to actually improve immune system function" (Livni, 2016).

real... The subjects in the Oregon and Sweden studies won't get any phytoncide from the trees in the videos they're watching. The 5 senses obviously play a crucial role in our biological and designed connections to nature.

B. Emerging Theme: Urbanization

Most of the studies assessing the mental and physical health benefits of nature connectedness use city life as a point of comparison, even though they're not presented as being about the effects of rural vs. urban living. This consistency positions urban development as being a key part of the problem space.

The Kaplan study shows how a super specific kind of nature engagement can lead to a very pin pointed response, the example being: "Fascinating but not too demanding visual elements lead to soft focus that allows our brains to rest." These variations make determining the needs of the ideal user during the concepting phase of design development even more important.

Batman found that nature walkers (as opposed to city walkers) beat themselves up less. This speaks to happiness more than health, in addition to self-improvement, which could be the focus of improved connectedness.

The Exeter, Dutch, and Glasgow studies all show that living near green space improves mental distress. They conclude that people don't even need direct interaction with nature for this improvement to happen. This conjures up ideas about a nature reconnection point or installation, that could get packed up and be transported to areas where people who need it can see it.

Steven & Rachel Kaplan, University of Michigan Researchers
"Steven and Rachel Kaplan at the University of Michigan argue that it's the visual elements in natural environments—sunsets, streams, butterflies—that reduce stress and mental fatigue. Fascinating but not too demanding, such stimuli promote a gentle, soft focus that allows our brains to wander, rest, and recover from what the 'nervous irritation' of city life. 'Soft fascination ... permits a more reflective mode,' wrote the Kaplans—and the benefit seems to carry over when we head back indoors" (Florence, 2016).

Greg Batman, Stanford Researcher
"Stanford researcher Greg Batman and his colleagues scanned the brains of 38 volunteers before and after they walked for 90 minutes, either in a large park or on a busy street in downtown Palo Alto. The nature walkers, but not the city walkers, showed decreased activity in the subgenual prefrontal cortex—a part of the brain tied to depressive rumination—and the nature walkers beat themselves up less. Nature, he says, may influence 'How you allocate your attention and whether or not you focus on negative emotions'" (Florence, 2016).

University of Exeter Medical School Researcher, UK
"Researches from the University of Exeter Medical school recently analyzed mental health data from 10,000 city dwellers and used high-resolution mapping to track where the subjects had lived over 18 years. They found that people living near more green space reported less mental distress, even after adjusting for income, education, and employment (all of which are also correlated with health)" (Florence, 2016).

Team of Dutch Researchers
"A 2009 team of Dutch Researches found a lower incidence of 15 diseases—including depression, anxiety, heart disease, diabetes, asthma, and migraines—in people who lived within about a half mile of green space" (Florence, 2016).

Korean Researchers
"Korean researchers used functional MRI to watch brain activity in people viewing different images. When the volunteers were looking at urban scenes, their brains showed more blood flow in the amygdala, which processes fear and anxiety. In contrast, the natural scenes lit up the anterior cingulate and the insula—areas associated with empathy and altruism. Nature makes us nicer as well as calmer" (Florence, 2016).

Richard Mitchell, Epidemiologist, University of Glasgow, UK
"Richard Mitchell, an epidemiologist at the University of Glasgow Scotland, did a large study that found less death and disease in people who lived near parks or other green space—even if they didn't use them. 'Our own studies plus others show these restorative effects whether you've gone for walks or not,' Mitchell says. Moreover, the lowest income people seemed to gain the most: In the city, Mitchell found, being close to nature is a social leveler. Compared with people who have lousy window views, those who can see trees and grass have been shown to recover faster in hospitals, perform better in school, and even display less violent behavior in neighborhoods where it's common. Measurements of stress hormones, respiration, heart rate, and sweating suggest that short doses of nature—or even pictures of the natural world—can calm people down and sharpen their performance" (Florence, 2016).

International Research Team, Toronto
"A 2015 International team overlaid health questionnaire responses from more than 31,000 Toronto residents onto a map of the city, block by block. Those living on blocks with more trees showed a boost in heart and metabolic health equivalent to what one would experience from a $20,000 gain in income. Lower mortality and fewer stress hormones circulating in the blood have also been connected to living close to green space" (Florence, 2016).

Chiba University Researchers, Japan
"Japanese researchers at Chiba University sent 84 subjects to stroll in seven different forests, while the same number of volunteers walked around city centers. The forest walkers hit a relaxation jackpot: Overall they showed a 16 percent decrease in the stress hormone cortisol, a 2 percent drop in blood pressure, and a 4 percent drop in heart rate. Our bodies relax in pleasant, natural surroundings because they evolved there" (Florence, 2016).

Mitchell discovered that for people in cities, being close to nature is a social leveler. This finding implies that nature has the power to equalize people and bring them together, most likely because connectedness with nature is part of our human nature (as discussed). Nature engagement could mobilize people around environmental issues and other issues of societal importance as well.

"Those living on blocks with more trees showed a boost in heart and metabolic health equivalent to what they would experience from a $20,000 gain in income." Nature would have to provide people with something tangible, like money can, in order for them to be able to equate the two this way. It's a really powerful comparison worth utilizing (in a way that's less of a stretch).

C. Reconnection Model: Health

UCSF Benioff Children's Hospital, one of the hospitals recently ranked on U.S. News & World Report's 'Nation's Premier Hospitals' lists, has also made a recent commitment to making their patients' experiences more nature-centric, physically and intellectually. The doctors there understand its true potential. They prescribe nature in place of medication when appropriate.

The idea of writing nature prescriptions for people is great. This positivity is really important.

Doctor's at the UCSF Children's hospital connect their patients to nature intellectually through this prescription practice. The same patients are connected to it physically during their visits too, thanks to the way the hospital space has been transformed... "So that nature is everywhere."

This duality feels like a necessity. The best effects would come from a system, service, or product that brings about intellectual and physical engagement with nature (combination of the two).

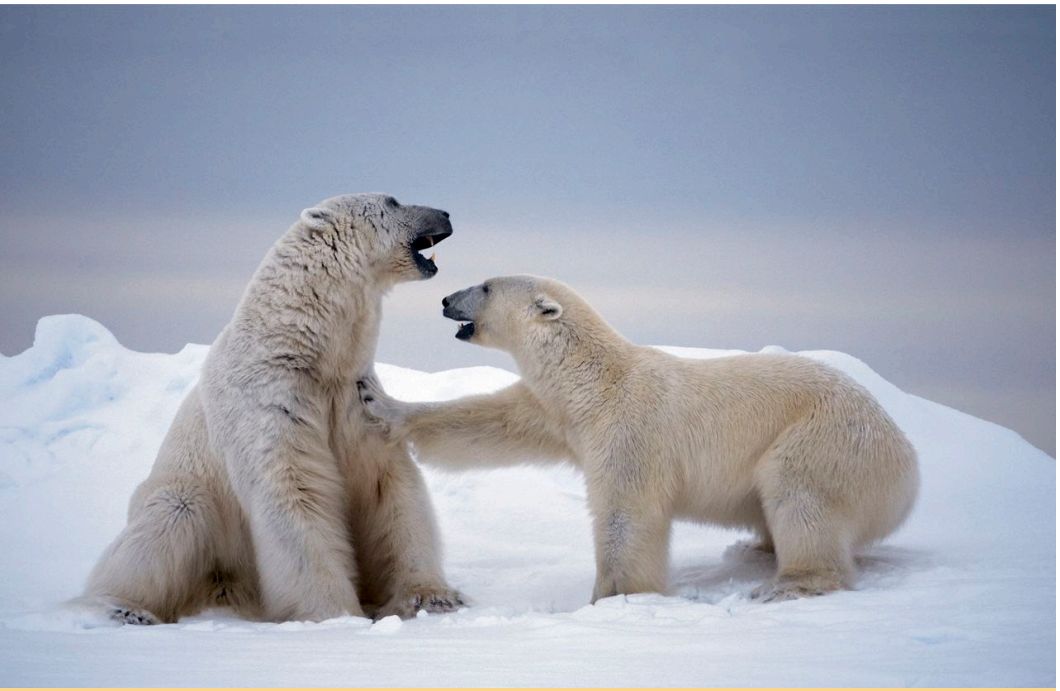
Nooshin Razani, Doctor, California Children's Hospital
Nooshin Razani at UCSF Benioff Children's Hospital in Oakland, California, is one of several doctors who have noticed the emerging data on nature and health. As part of a pilot project, she's training pediatricians in the outpatient clinic to write prescriptions for young patients and their families to visit nearby parks. It's not as simple as taking a pill. To guide the physicians and patients into a new mind-set, she says, 'We have transformed the clinical space so nature is everywhere. There are maps on the wall, so it's easy to talk about where to go, and pictures of local wilderness, which are healing to look at for both the doctor and patient'" (Florence, 2016).

Findings

A. Nature's Effect on the Brain- Because the impact of seeing nature differs from feeling it (for example), identifying what the targeted user group needs most from nature during the initial concept development phase of the design process is essential to the creation of a well-tailored solution.

B. Emerging Theme: Urbanization- Urbanization is the antithesis of increased nature connection. The rapid development of cities is unavoidable. The way urbanization changes nature accessibility must be addressed by the design solution as a result. For city dwellers, it removes nature from their immediate lives, for those outside the city, the impact is less tangible, but still existent from a global perspective

C. Reconnection Model: Health- The design should position reconnecting with nature as a solution to problems people are already facing, as opposed to something new they should be doing for reasons, a, b, and c.



Photographer: Paul Nicklen, Publication: *National Geographic*

CHAPTER 3

What's Keeping People From Nature

A. Urbanization

Many means of integrating nature into urban environments don't properly address the way rapid urbanization is forcing more and more people into the unique position of needing nature the most in places that offers it the least. Physical space, funding, and injustice hinder nature's potential as a wholistic life-improver in urban areas.

There's a big difference, perception-wise between what the Wildlife Trusts calls mundane or nearby nature and how most people think of nature, as the great outdoors. Seeing nature as something more grand (travel dependent) prevents city dwellers in particular from being able to recognize, appreciate, and engage with, the simpler, smaller nature that's actually already available to them, without addition. Ordinary nature needs to become extraordinary.

Peter Kahn ascertains that the way nature is currently being integrated into city environments isn't enough, because of how rapidly they're growing. Open windows, rooftop gardens, and urban agriculture is great, but, buildings that have these things are beyond outnumbered by ones that don't, and one's won't. These improvements also lack that intellectual engagement mentioned earlier. Kahn also discusses our senses and the fact that if they're not active in nature, its benefits won't be experienced. This point aligns his research the global studies. Nature reconnection should absolutely involve and revolve around all five senses.

Environmental racism is a major issue that's separate from the one being explored by this book, but very closely related nevertheless. It can be described as disproportional accounts of vulnerability to environmental disasters, toxins, etc., thanks to factors such as race, gender, and class. Ultimately, because of environmental racism, the people who need nature's benefits the most (those suffering from low socioeconomic status), are the same people who have the hardest time accessing it and therefore connecting with it. Everyone needs more nature, but marginalized groups need it the most. A communities like the south Bronx should be targeted first and foremost.

Any large-scale, public solution needs to meet Majora's "triple bottom line" in order to be successful. It needs to benefit the developers executing it, the community it's implemented in, and the government controlling that community. The overlap is key.

It's important to "Bring everyone to the table" as Majora says, but how can that happen when the needs of marginalized peoples differ so dramatically from the needs others? The players sitting at this metaphorical table where sustainability is being discussed needs to be defined. Are they different kinds of communities? Or different kinds of people existing within one kind of community?

Wildlife Trusts Case Study, '30 Days Wild,' UK
"As the proportion of people living in towns and cities increases, improving our engagement with nature will increasingly be based on interactions with nature within urban landscapes. There is a need to consider how more 'mundane' or 'nearby nature' can be valued and provide an everyday route for people to better understand their connection to nature in order to improve both environmental awareness and human well-being" (Richardson, 2016).

Peter Kahn, Director, Human Interaction With Nature and Technological Systems Lab, Washington University
"In a perspective piece published by the journal Science, the authors discussed the necessary role urban areas play in society and the numbing, even debilitating, aspects of cities that disconnect humans from the natural world.

As we build bigger cities, we're not aware how much and how fast we're undermining our connection to nature. There's a naturalness we can achieve in cities, but not at the scale we're building or at the scale we're headed with many cities.

There are steps cities can take to introduce nature into the urban core, including requiring buildings to have windows that open; incorporating more rooftop gardens and urban agriculture; and creating spaces to touch, see and smell native plants. But these remedies first require an appreciation for nature in urban centers.

It is more than just introducing nature into urban areas. People must be able to interact with these elements using more of their senses in order to experience physical and psychological benefits of nature, as well as to shift the collective baseline toward better understanding and appreciation of the natural world" (Times of India, 2016).

Majora Carter, American Urban Revitalization Strategist
"Unfortunately, race and class are extremely reliable indicators as to where one might find the good stuff, like parks and trees, and where one might find the bad stuff, like power plants and waste facilities. Land-use decisions created the hostile conditions that lead to problems like obesity, diabetes and asthma. Why would someone leave their home to go for a brisk walk in a toxic neighborhood? One out of four South Bronx children has asthma.

Physical improvements help inform public policy regarding traffic safety, the placement of the waste and other facilities, which, if done properly, don't compromise a community's quality of life. They provide opportunities to be more physically active, as well as local economic development.

As we nurture the natural environment, its abundance will give us back even more. We run a project called the Bronx [Environmental] Stewardship Training, which provides job training in the fields of ecological restoration, so that folks from our community have the skills to compete for these well-paying jobs.

I'm interested in what I like to call the 'triple bottom line' that sustainable development can produce. Developments that have the potential to create positive returns for all concerned: the developers, government and the community where these projects go up.

Help me make green the new black. Help me make sustainability sexy. Make it a part of your dinner and cocktail conversations. Help me fight for environmental and economic justice. Help me democratize sustainability by bringing everyone to the table, and insisting that comprehensive planning can be addressed everywhere" (Carter, 2006).

B. Technology

It's undeniable that technology takes valuable time and attention away from the natural world. The bigger problem with it however, is its normalcy. The mass acceptance of technological innovation and adoption has normalized digital experiences in a way that makes us value non-digital ones not as much, nature being the ultimate non-digital experience for obvious reasons.

The outdoor activity study concludes that "We seem to not need to experience the natural world in the ways that we previously did." The global health and happiness studies contrast this claim. It's not that we don't need to experience nature the way we used to, we THINK we don't need to experience nature the ways we used to (without technology). We actually do, because experiencing nature first-hand has benefits that digital nature experiences do not. Proper appreciation calls for a heightened awareness of this distinction.

The Wildlife Trusts illustrates how interacting with technology is inherently detached from nature connectedness (because of history). The organization argues that the problem with this detachment is that it prevents us from developing an ecological self, which necessary for pro-environmental behavior. We take care of the things we love. An important guideline can be created from this information. If technology becomes central to the method of reconnection, it needs to pair self exploration with nature exploration.

The hours children spend engaged with electronic media needs to decrease so time with nature can increase, or a chunk of it needs to become nature focused. There's an opportunity for videophilia and biophilia (a term that comes up later) to merge.

Study of American, Japanese, and Spanish Outdoor Activity
"A new era may be dawning, one in which the wild is best seen at zoos or plasma-screen TVs, the era of mediated nature. We seem to not need to experience the natural world in the ways that we did previously" (Levy, 2006).

Wildlife Trusts Case Study, '30 Days Wild' UK
"Technology increasingly shapes and defines us, to the point where people see themselves as separate from nature. Technological advances have led to agricultural and then industrial revolutions that have resulted in populations adopting contrasting lives in towns and cities where they can become detached from the natural environment. The development of an ecological-self is also related to pro-environmental behaviors and a greater respect for nature" (Richardson, 2016).

US, European, & Australian Studies from *Natural Childhood*
"The typical child in the United States now spends 90% of the time indoors. US children aged 2-5 engage in electronic media for an average of more than 30 hours per week; for 8-18-year-olds the figure is 52 hours" (Kellert, 2015)

American Survey of Over 600 Youths
"Researchers call this recent focus on sedentary activities involving electronic media 'videophilia'" (Nature Conservancy, 2011).

C. Reconnection Model: Technology

Yibu is a children's toy developed by Frog Design that helps kids typically stuck to screens move away from them without separating from technology entirely. Even though the product's primary aim is to get these kids to actively explore the world around them, its characteristics speak to the most basic facets of the problem being explored by this book.

Yibu, Children's Toy, Frog Design
"A new learning platform transforms screen time into a meaningful and physically active experience.

Yibu includes five crafted wooden toys embedded with sensing technology, which are connected to a character experiencing environmental challenges on the screen. Children who play the game learn about the world around them and feel empowered to positively influence it.

Physical Influences Digital
The sensing toys gather real-time environmental data and together with location-based data, influence the digital game. By moving around and placing toys in different situations, the child discovers how temperature, sound, light, direction and rotation influence the digital character.

Screen Time
Today kids are spending more time indoors and alone with digital devices than ever before, often at the expense of physical activity. Yibu turns the home into an adventure playground where kids can be active and have fun in a safe environment.

Going Further
Challenges become more complex as players progress through the game, requiring them to combine different sensors to achieve their goals. Yibu is designed as a modular platform that could offer a variety of different games that connect to the sensing toys" (Frog Design, 2016).

A potential design brief was created after roughly half of the research for this book was conducted. It reads, "Design an experience that creates a positive feedback loop between formal nature education and daily nature engagement/appreciation." The early stages of an ideation process followed, and the concept answering that brief ended up having elements very similar to Yibu, which validates it, from a sense-making point of view. The similarities show that the way the problem space is being understood here is in keeping with the way it's being understood elsewhere, at a major design firm.

The idea is as follows: A child would become responsible for an ecological avatar whose status would be determined by real life outdoor activities (with educational components) completed by that child. The avatar would automatically update by way of some sort of tracking device. The lessons/activities could be centered around fresh water, food, friends, and fun.

In both cases, real actions "Influence the digital character." This real vs. digital world pairing speaks to two others previously discussed.

The modular nature of Yibu is worth noting too. It keeps the game current for children as they age within an age group. Giving a new design modular characteristics could make it a good fit for an even wider range of ages. There could be versions for children, young adults, and adults.

D. Fear

People are hesitant to explore nature because they're afraid, but not of anything they actually need to be concerned about. The internet provides people with an unlimited number of risk related reasons not to engage with the outdoors. People generalize nature, and let horror stories from isolated incidents affect their perceived safety of nature across the board.

The articles from Trib Total Media and The Guardian have a lot of power when they're paired. One source covers people's unwillingness to engage with nature because of fear in the US and the other covers a similar phenomenon taking place in the UK. Both cite "Information overload" ("Blanket media coverage") as being the biggest contributor to this irrational fear. The fact that our connectedness to nature is being hindered by it across oceans flags it as a factor that needs to be addressed by the future design solution. There's an opportunity to use the digital age we're living in to nature's advantage.

These survey results add an extra layer of insight to the information provided my Majora Carter. The people who live in America's poorest areas need nature's benefits the most, but have the hardest time gaining access to it because of environmental racism. The crime often found in these marginalized communities makes it that much harder for the people living there (youth especially) to get outside and find ways to connect with nature.

Trib Total Media (Philadelphia News)
"According to the US Fish and Wildlife Service, the things visitors to parks, forests and wildlife refuges express concern about are often dangers that aren't there. At Great Swamp Refuge in New Jersey, for example, visitors have asked about the chances of encountering wolves and alligators, even though neither species exists in the state. Blame that on information overload.

In this age of instant information, a story about someone getting hurt while outside in California is available in real time to people the world over. We just know too much. That's impacting how people use state parks and how state parks are responding. At keystone, people use the park's paved walking path. Outdoor educators are taking people by the hand- sometimes almost too literally- to draw them out" (Frye, 2014).

British Survey of Over 2000 Kids
But the biggest obstacles to today's children being allowed out in this way (or even to the nearest park or patch of waste ground) stem more from anxiety than squeamishness. 'Stranger danger,' the fear of abduction by an unknown adult, is why most parents won't allow kids out unsupervised. Blanket media coverage of the few such incidents that do occur may have contributed to this the chance of a child being killed by a stranger in Britain is, literally, one in a million" (Henly, 2010.)

American Survey of Over 600 Youths
"Other Barriers: Concern about gangs and crime is far more acute for youth who live in big cities, youth of color, girls, and those who are less well-off; concern about not feeling welcome among other people in natural areas is seen as more of an obstacle by Asian American youth, by those in big cities, and by those in less well-off households" (Nature Conservancy, 2011).

Findings

A. Urbanization- A focus on the needs of people living in urban, low- income communities should be at the core of the design because a solution addressing them (those who need nature most) and their struggles would only further enhance better-off communities not facing them, communities that would also benefit from added opportunity to engage with nature (because everyone would).

B. Technology- Digital nature experiences can't replace the real thing. The technology included in the design should function as a tool that helps people ultimately actually get outside. It also needs help make the solution more individualized for users, not less.

C. Reconnection Model: Technology- Having the user's real actions influence a digital thing is a great way to ensure that the technological aspects of the design won't overpower a (hopefully) improved appreciation of the real natural world. The technological components can't be more appealing than what they inform users about nature. Technology should be used to make the design modular, generationally and geographically.

D. Fear- The irrational fears keeping people from getting acquainted with nature are caused by the same thing that has the greatest potential to mitigate them (the digital age). It needs to be just as easy for people to find correct information about risks that come with being in nature as it is for them to wind up misinformed and afraid.

Photographer: Jimmy Chin, Publication: *National Geographic*

CHAPTER 4

The Widespread Disconnect

A. All Ages

Patricia Zaradic, conservation ecologist, and Oliver Pergams, Conservation Biologist teamed up to research the global breadth of decreased participation in recreational outdoor activity and the depth of it in America more specifically. People are finding nature less entertaining in Japan, Spain, and the US, but to a greater degree in America.

Pergams and Zaradic call humanity's growing disconnect from nature a "Declining appreciation of nature." This alternative way of wording the problem is helpful. Pushing people to appreciate could be more affective than pushing people to reconnect. The researchers found that "Understanding that there is a problem" is the first step towards a solution. The design needs to foster that awareness before it can accomplish anything else.

The study showed that Americans are still interested and participating in hunting and backpacking. Why have these activities remained popular? It's unfortunate that hunting has, given the current loss of biodiversity being experienced by our planet. The competitive nature of the sport could be used to appreciate and protect animals as opposed to eliminate them.

A distinction between adult and child users needs to be made by the design if both groups are being targeted. All people (age aside) have a lot to gain from reconnecting with nature, but it's implied here that children have the most to gain.

Study of American, Japanese, and Spanish Outdoor Activity
"Pergams and Zaradic tracked the number of hunting and fishing licenses and the number of visits to national parks in the United States, Japan, and Spain. 'We've got data for hunting licenses, fishing licenses, three different data sources for camping and backpacking and hiking,' Pergams says.

[They've] been collecting outdoor head counts kept not only by national parks, but also by state and local parks, the U.S. Forest Service, the federal Bureau of Land Management and commercial polling firms.

In all three countries, contact with the outdoors has steadily decreased since 1987. There's been a 20 percent total decline since the 1980s. Since the late 1980s, the percentage of Americans taking part in such activities has declined at slightly more than 1 percent a year. Participation is down 18 percent from peak levels.

These data sets show that a few outdoor activities have remained popular. One in 10 Americans has gone hunting every year for the past several decades. And the overall number of backpackers, while relatively miniscule, has actually risen slightly.

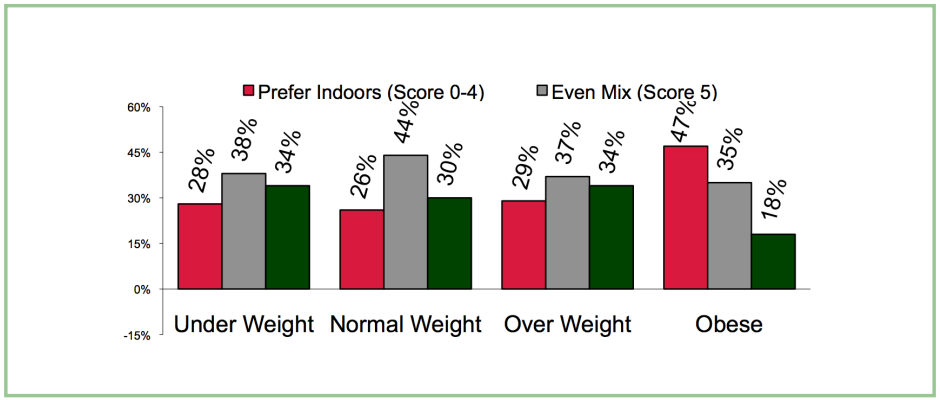
The study speculates that the declines could have a variety of long-term causes, ranging from rising gas prices to increases in the amount of time spent in front of screens. Understanding that there is a problem- the declining appreciation of nature- is a first step" (The Nature Conservancy. 2006).

British Survey of Over 2000 Children
"Just five minutes of 'green exercise' can produce rapid improvements in mental wellbeing and self-esteem, with the greatest benefits experienced by the young" (Henley, 2010).

B. Children

The stakes of our widening disconnect from nature are higher for children because they're still growing psychologically, physically, and behaviorally. Meaningful experiences with nature at a young age can enhance kids' development in a way that sticks. The same reconnection opportunity is likely produce more significant and sustained changes in children than adults.

Figure 1: Preference for indoors by body mass index (BMI) (Nature Conservancy, 2011, p.4)



American Survey of Over 600 Youths
"There is a growing disparity between the time kids spend indoors wired to technology and the time they spend outside enjoying nature. Fewer than two in five American youth participate in any of these activities on even a weekly basis:

- Going hiking outside
- Going fishing or hunting
- Visiting a local park, creek or beach in a city of town
- Visiting a national or state park outside a city
- Visiting a natural area outdoors

Obesity is perhaps the most visible symptom of the lack of such play **(See figure 1)"** (Nature Conservancy, 2011).

US, European, & Australian Studies from *Natural Childhood*
"The typical child in the United States now spends 90% of the time indoors. Most children devote just 30 minutes daily to unstructured outdoor play; a generation ago, it was more than 4 hours.

Design could either be used to improve these activities children are avoiding, so they participate in them more, or replace them entirely, aka provide a new, alternative outdoor option.

The Natural Childhood study and UK poll suggest the same thing about the way children should be engaging with nature. According to the two sources, children need to explore nature independently, without too

much structure. What children know about nature is less important than how they interact with it. Their needs differ from adults in this way. Children don't need to be fed information about nature, to feel connected to, and empowered around it. Adults need facts to break down the misinformed nature-related fears they're feeling as a result of information overload.

Biophilia describes the historically deep-rooted, innate need all humans have to connect with the natural world (other forms of life). The direct and indirect contact aspects of biophilic design mirrors the other oppositions previously highlighted in this book.

A new paradigm is needed: biophilic design. This approach to building and landscape design encourages direct and indirect contact with nature, and an experience of place evoking children's evolved affinities for the natural world" (Kellert, 2015).

British Survey of Over 2000 Kids
"64% of kids today play outside less than once a week
28% haven't been on a country walk in the last year
21% have never been to a farm
20% have never once climbed a tree

More children are now admitted to British hospitals for injuries incurred falling out of bed than falling out of trees.

A growing body of evidence is starting to show that it's not so much what children know about nature that's important, as what happens to them when they are in nature (and not just in it, but in it by themselves, without grown ups).

'There's a paradox,' says Stephen Moss, naturalist, broadcaster and author. More kids today are interested in the natural world than ever before; they watch it on the telly, they may well visit a nature reserve or a National Trust site with their families. But far fewer are experiencing it directly, on their own or with their friends, and that's what counts.

Richard Louv, author of the best-seller Last Child in the Woods, has defined the phenomenon as 'nature deficit disorder'" (Henley, 2010).

The Wildlife Trusts organization in Britain created and tested the success of a mass engagement campaign geared towards daily nature appreciation and addition. The initiative's success in yielding the results desired suggests that engaging users for an extended period of time, through a variety of touch points is a good idea.

Wildlife Trusts Case Study, '30 Days Wild,' UK
ABOUT THE STUDY
"Mass engagement through a clear campaign identity and a simple call to action to 'do something everyday' during June 2015 provided a framework to promote engagement with nature through a wide range of suggested activities. Sharing participation via social media allowed the creation of a wider social context to encourage, extend, and maintain participation. An emphasis was also placed on self-direction, in that people were encouraged to be creative and design their own activities.

Suggested activities were labeled 'Random Acts of Wilderness,' with 180 everyday activities being proposed during the campaign development phase.

Two categories were used, each with a three point scale.
1. Level of immersion: 'full', e.g. activities which required an intense level of dedication or time like climbing a mountain, 'intermediary', e.g. activities which required a medium level of involvement like identifying something new in nature, and 'momentary', e.g. sensory or fleeting activities like smelling a flower.
2. Technicality: 'high', e.g. requires specialist location or expert help, 'intermediary', e.g. activities which could require a field guide or online support, and 'none', e.g. activities which didn't require any knowledge or expertise.

The activities were also divided into four main types:
A) Noticing- more momentary and transient experiences and activities
B) Doing- activities that could directly or indirectly benefit nature
C) Sharing- sharing nature experiences and activities and how they made the participant feel
D) Activities that could help the participant to forge a stronger connection with nature. This was a broad category.

The activities and precise wording were refined with reference to five pathways to nature connection identified through online

The '30 Days Wild' case study proves that a mass engagement campaign can lead to improved nature connectedness, health, happiness and behavior. The campaign's success in delivering these benefits makes its structure a great model for the creation of a new solution to the problem it explores. The categories used to define outdoor activities (immersion, technicality, and type) can be applied to any design that involves them, campaign-based or not, as can many other components of the program.

Outdoor activity levels of immersion:
- Full, Intermediary, Momentary

Outdoor activity levels of technicality:
- High, Intermediary, None

Outdoor activity Types:
- A) Noticing, B) Doing, C) Sharing, D) Connecting

Biophilia-inspired pathways to nature connection: Emotion, meaning, compassion, and engagement with natural beauty

Promotional Frames:
How amazing nature is, encouraging shared experiences in nature, and supporting self direction and creativity in the context of the natural world

Physical Components:
Booklet, wall chart, badges and stickers

Digital Components:
Bloggers pack, twitter account, Facebook group, social media graphics, a campaign film, a series of emails, web pages

surveys structured around the 9 values of biophilia hypothesis. These pathways include: contact, emotion, meaning, compassion, and engagement with natural beauty.

This work informed the choice of frames used in the promotion of the campaign, notably highlighting how amazing nature is, encouraging shared experiences in nature, and supporting self direction and creativity in the context of the natural world.

The final list of 101 Random Acts of Wilderness activities were promoted on the 30 Days Wild website to guide and inspire people to find something wild to do each day of the month.

The activities were presented within a wider package of materials for participants, including the booklet, a wall chart to record activities, badges and stickers. A number of communication resources were developed, including a bloggers pack, a twitter account, a Facebook group, social media graphics, a campaign film, a series of emails, and web pages.

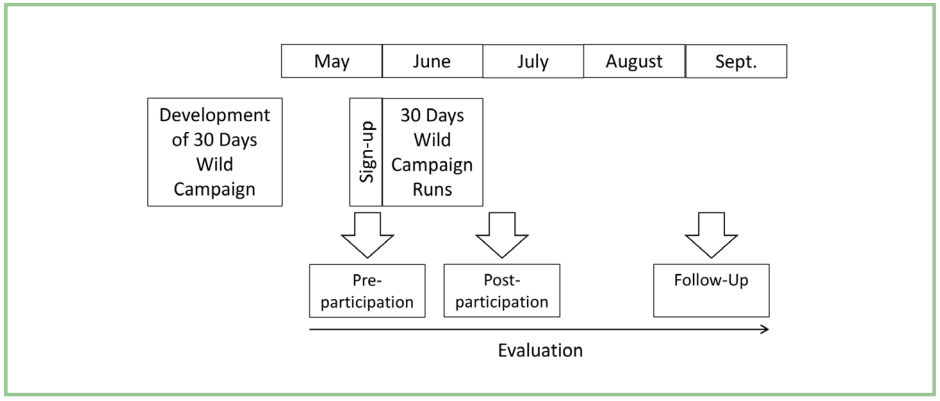
The 30 Days Wild campaign was not framed as a public health or health promotion campaign, although benefits to health and well-being were a likely outcome. The primary objective was to encourage people to make more time for nature in their lives and thus value nature more highly. There was a focus on 'everyday nature.'

RESULTS
"The evaluation focussed on the following outcomes: connection to nature; well-being; improved health; and an increase in conservation behaviors. Self- reported scores were taken at three time-points via survey: pre-participation, post-participation and follow-up at two months **(See Figure 2)**

- 12,400 people who formally signed up
- 2305 successfully completed the baseline pre-participation survey
- 344 both the pre-participation and the post-participation survey in July
- 269 both the pre-participation and the follow-up survey in September
- 126 participants successfully completed all three time points
Only those who had signed up for 30 Days Wild within the first week of June were included in the post-participation surveys.

The survey was framed as a 'Wildness Quiz' in order to engage participants within the communications style of the campaign and also to reduce demand characteristics.

Figure 2: Chronology of 30 Days Wild and its Evaluation (Richardson, 2016, p.6)



An analysis of pre to post-participation to follow up results revealed that time had a statistically significant impact on connection to nature, happiness, health and conservation behavior scores. The campaign success in engaging a large number of participants and delivering outcomes is notable given governmental and public health interest in policies and interventions to increase human well-being. There are also indications that the 30 Days Wild campaign can lead to nature being valued, bringing about improved connection to nature and pro-conservation behaviors within the context of everyday life. The evaluation provides evidence that conscious connections to nature can and should be part of a healthy lifestyle.

Our findings suggest that connection to nature may provide people with resilience to meet the challenges of everyday life, while also facilitating exercise, social contact and a sense of purpose.

The need to address global issues like declining biodiversity and the need for healthy lifestyles that reduce demands on our health services can both benefit from increasing people's connection to nature. Such grand challenges require large-scale upstream interventions. 30 Days Wild provides good evidence that progress can be made through partnerships with the environmental sector that use nature as a new paradigm for well-being" (Richardson, 2016).

CONCLUSIONS
"Simple interventions encouraging people to notice the 'good

David Strayer's research is in keeping with this finding that time has "A significant impact on connection to nature." He discusses the effects of 3 days totally immersed in nature whereas '30 Days Wild' focuses a smaller degree of nature engagement every day for thirty days. This pairing creates a range that can be used to design a time-sensitive solution. A program (for example) with a shorter duration would need to have more depth. It shouldn't run for more than 30 days regardless, given the success '30 Days Wild' achieved with regard to mass engagement.

Every day nature is the kind of nature that the design solution should focus on for a number of reasons. '30 Days Wild' found that it has the greatest potential to result in sustained health, happiness, and behavior improvements. It's also widespread, experienced by everyone, some way somehow, and easier to connect to on a personal level than more adventurous nature experiences. It lends itself to "Individual differences and preferences"

The conclusion about a need to suggest activity options implies that people won't reach for nature engagement on their own, it has to be handed to them (provided), all around easy to get involved in.

things' in nature each day have been shown to increase nature connection. Such tools have potential value as part of wider campaigns, but there is a need to provide a variety of approaches to cater for individual differences and preferences.

Research has shown that connection to nature can be increased in the short-term with sustained increases in nature connection being achieved through specific interventions.

As many people tend not to consciously engage with nature there is a need to draw attention to the natural world and suggest activities for people to engage with nature" (Richardson, 2016).

Findings

A. All Ages- The design solution's success relies on its ability to heighten users' understanding of the problem. People just don't know the true extent of nature's benefits (health, happiness, environmental improvement), and they think about it's potential and importance differently once they do.

B. Children- The aspects of the design geared towards children should focus less on knowing and more on doing. For them, the best nature connection gets formed when they engage with it freely. Their user experience needs to walk a very fine line between structured and unstructured.

C. Reconnection Model: Widespread Engagement- The outdoor activity types, (noticing, doing, sharing, connecting) levels of immersion (full, intermediary, momentary), and levels of technically (high, intermediary, none) utilized in "30 Days Wild" can be used to brainstorm nature activities that would ideal for any specific user archetype. For example, one that focus on noticing, requires full immersion, but no technicality would be good for a city-dweller who rarely experiences nature but wants to for the sake of improved mental health.

Photographer: Lucas Foglia, Publication: *National Geographic*

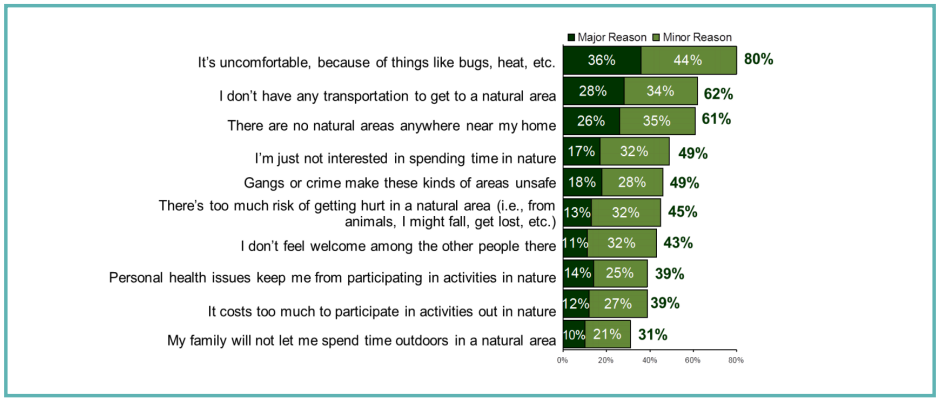
CHAPTER 5

How Children Feel About Nature

A. Their Attitudes

The Nature Conservancy's survey of over 600 kids between the ages of 13 and 18 shows that they feel positively and passionately about nature. The challenge isn't getting them to understand its value, the challenge is getting them interested and motivated enough to engage with it (and therefore benefit from and hopefully protect it.)

Figure 3: Reasons Youth Do Not Spend More Time in Nature (Nature Conservancy, 2011, p.3)



These statistics that illustrate how children feel about the current condition of the environment suggest that focusing on their demographic could have a greater potential for planetary impact. This information also widens the gap between the nature-related needs of children and adults. They need to work together though...

Environmental experiences that give way personal connections have more value for children. This

American Survey of Over 600 Youths

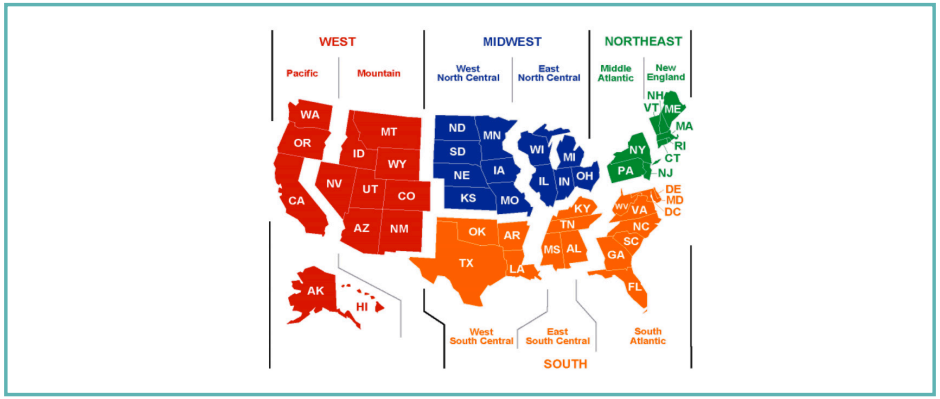
"KEY FINDING: American youth are unhappy with the condition of the environment, and lack faith in adults to address it.

- 51% rate 'the condition of the environment and nature' as an 'extremely' or 'very serious' problem.
- 73% agree that 'previous generations have damaged our environment and left it to our generation to fix it.'
- 33% third believe that government leaders are doing a 'good job addressing major problems facing our country.'

KEY FINDING: If American youth are given more opportunities to have a meaningful experience outdoors, they will be more likely to value nature, engage with it, and feel empowered to do something about it.

- 66% of youth say that they 'have had a personal experience in nature' that made them appreciate it more. That subset of

Figure 4 : Geographic Divisions (Nature Conservancy, 2011, p.5)



American youth is markedly different from those who have not had such experiences. They are:
- Almost twice as likely to say they prefer spending time outdoors
- Significantly more likely to express concern about water pollution, air pollution, global warming, and the condition of the environment
- Ten points more likely to agree that we can solve climate change by acting now
- 13 points more likely to say environmental protection should be prioritized over economic growth
- More than twice as likely to 'strongly agree' that protecting the environment is "cool
- More than twice as likely to consider themselves a 'strong environmentalist'
- Substantially more likely to express interest in studying the environment in college, working in a job related to nature, or joining an environmental club at their school

KEY FINDING: The key obstacles to overcome in getting youth to spend more time in nature are a lack of access, a lack of interest, and feelings of discomfort **(See Figure 3)**.

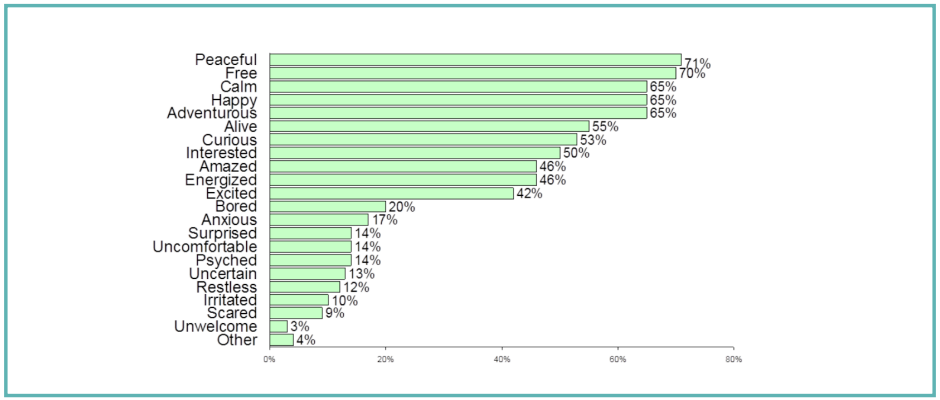
REGIONAL DATA **(See Figure 4)**: The gaps between use of technology and spending time outdoors 'almost every day' are pretty consistent across regions. There is relatively little regional variation in perceptions of gangs and crime as a 'major obstacle.'
- Youth in the West are most likely to regularly spend time in nature, and most likely to label themselves 'strong

extends to adults as well (a commonality) as indicated by the way the 30 Days Wild Case had success with a focus on one's "Eco-self." A design with personalized components could really transform the way any type of user feels about nature.

Key obstacles for children:
1. Lack of access, 2. Lack of interest, 3. Discomfort
The lack of interest obstacle contradicts other pieces of information provided by the survey. If children feel so positively about nature, why are they also uninterested in it? Richard Louv's research provides an answer. Children face a lot more pressure than they once did. They devote the little free time they do have to technology because it's so easily accessed, instantly engaging, and pushed by society.

Figure 5: Words and Phrases Used by Youth Who Spend Time in Nature (Nature Conservancy, 2011, p.6)

Figure 6: Phrases Chosen by Youth to Describe How They Feel Being in Nature (Nature Conservancy, 2011, p.8)



This regional data can be used to better inform a location-specific solution. Children in the Northeast struggle with the aforementioned obstacles more than children in the west. They need to be tackled head on in an area like the South Bronx.

Strategies:
1. Give them a chance to have fun
2. Turn their schools inside out
3. Turn peer pressure into a positive
4. Give them a place to escape their stresses and fears

The idea of turning peer pressure into a positive needs to be utilized. It speaks to the idea of a

environmentalists' (18%)
- Youth in the Northeast are most likely to express a preference for spending time indoors (35%), and youth in the West are most likely to express a preference for spending time outdoors (39%)
- Youth in the West were far less likely to see discomfort as an obstacle to being outside (with just 25% rating it a 'major obstacle' compared to 36% of the full sample).

"KEY FINDING: This research provides good news – there are a variety of strategies that can work to get youth more involved in nature.

1. Give them a chance to have fun (See Figure 5)- Among the outdoor activities in which youth express most interest in participating are 'seeing something beautiful or amazing in nature' (78%), 'having free time in a natural area with your friends to make your own fun' (74%), and 'doing something outdoors in a natural area you have never done before, to challenge yourself.' (63%)
2. Turn their schools inside out- Fewer than one-quarter of youth say they go on school field trips outdoors on even a monthly basis. Yet teens we interviewed spoke fondly of school experiences that went beyond the classroom.
3. Turn peer pressure into a positive- Among youth who regularly spend time in nature, nearly four in five (79%) report having done so with their friends.
4. Give them a place to escape their stresses and fears- Youth

are more likely to associate being in nature with being peaceful, free, calm, and happy than with any other characteristic **(See figure 6)**" (Nature Conservancy, 2011).

competitive/ game-based solution, which was brought up by the research illustrating hunting's long-standing popularity. Imagine if children pushed each other to keep up (engage with) nature the way they push each other to keep up with their favorite TV shows.

B. Parental Impact

The role parents play in their kid's relationships with nature can make or break what they're able to gain from it. The line between not enough involvement and too much involvement is very thin. Parents need to support their kids' exploration of nature without controlling and therefore hindering it. They can't function as middle men.

The British Survey and Study of American, Japanese, and Spanish Outdoor Activity presents opposing opinions about how involved parents should be in their children's outdoor engagement. The survey suggests that this play can't be "Set up according to an adult agenda, but Melissa Soule from the Nature Conservancy says that parents "Have to take charge." Both arguments are valid. Parents need to set a good example and support their children's exploration of nature, but not control it.

British Survey of Over 2000 Kids
"21% of today's kids regularly play outside, compared with 71% of their parents.

'We aim for children to experience true free play,' says Kristen Lambert, who runs the scheme's Play Ranger service. 'Play that's not set up according to an adult agenda – in forests and open spaces, not designated play areas. There are no specific activities, no fixed equipment; there are tree branches and muddy slopes.'

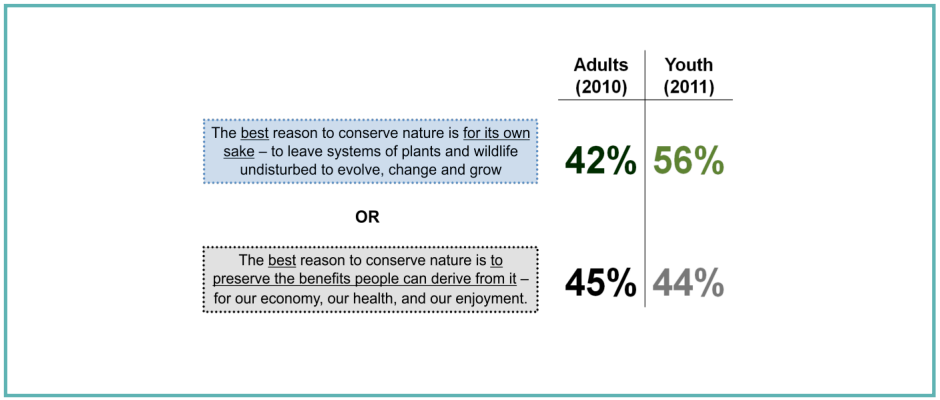
One project, in Somerset, could show the way ahead. Part of the scheme is a website, somersetoutdoorplay.org.uk, detailing more than 30 sites across the county, from hilltops to forests and headlands to beaches, where kids can play unsupervised.

Children will be smarter, better able to get along with others, healthier and happier when they have regular opportunities for free and unstructured play in the out-of-doors" (Henley, 2010).

Study of American, Japanese, and Spanish Outdoor Activity
"Parents have to take charge. Melissa Soule, Michigan communication director for the Nature Conservancy grew up in a family that favored TV and video games over close encounters in the forest. Now, she's teaching her 8-year-old daughter to appreciate the outdoors. 'It's changed me as a parent,' she said. Now I make sure my daughter has those experiences naturally, and it's a part of her mind-set.

Tips for parents:
- Even if it's too cold to hit the trails, study now for summer fun. Read bird books with your kids while you wait for temperatures to rise.
- Let little kids dawdle as they walk, checking out anthills, bugs, flowers, and more.
- Give kids time for creative play outdoors.
- Show your appreciation of nature to set an example for kids.
- Sign up for a program at a local nature center or park" (The Nature Conservancy. 2006).

Figure 7: Words and Phrases Used by Youth Who Spend Time in Nature (Nature Conservancy, 2011, p.7)



Trib Total Media (Philadelphia News)
Individual parks are offering more programs overall and more basic programs in particular. They contain no big, fancy educational messages. They're just designed to get families into the woods that wouldn't go on their own. The Pennsylvania Department of conservation and Natural Resources launched a 'Kids in Nature' program. Backed by a website, it's designed to teach parents and children how to explore the outdoors. Visitors get tips on what to do outside, where to do it, what to pack for a day afield, which clothes to wear and more" (Frye, 2014).

American Survey of Over 600 Youths
"There is great potential to mobilize American youth around issues related to the environment and nature **(See Figure 6)**. Roughly 76 percent of youth today strongly believe issues like climate change can be solved if action is taken now." (Nature Conservancy, 2014)

This shift in park programming helps define the kind of information families should receive about interacting with nature. Avoiding "big, fancy, educational messages" is important. The formal nature education included in the initial design brief doesn't have to be so formal.

There's an amazing opportunity for children to positively impact the environmental views of adults. Doing so can be difficult though, the little control they have over their own lives. A nature reconnection design solution for families should give the kids more control.

Findings

A. Their Attitudes- The design solution should make interacting with nature as appealing for kids as other (all-digital) activity options available to and often favored by them. Gamifying the reconnection experience in a way that promotes friendly competition is a good means of accomplishing this.

B. Parental Impact- A design geared towards families should address the two generations unequally (maybe 30/70). The 30% for adults should be more information centric than the 70% for kids. Ideally, the solution would help parents help their children reconnect with nature in their own ways. This somewhat less-direct approach could have a more far reaching impact, because the kids, those shaping the future of our planet would be the focus, but parents would undoubtedly be positively affected by their participation too. The design solution should help parents get more interested in nature so they can properly support the way the same solution engages their kids.

Photographer: Lucas Foglia, Publication: *National Geographic*

CHAPTER 6

Importance of Education

A. What Nature Teaches Children

Nature helps children develop skills to an extent that classroom learning can't, because of its realness. These skills are the same ones necessary for academic success, but gaining them from a tangible, living-breathing thing leads to a level understanding that hypothetical scenarios posed by a teacher or professor won't provide.

A 5th opposition pairing comes into play here. Nature engagement leads to both internal and external exploration. A design that has paths distinguishing between the two would help users understand the true potential of nature reconnection.

Basic learning responses:
Identification, differentiation, analysis and evaluation

Stimulation:
Kinetic, aural, visual, and tactile
These kinds of stimulation mirror the five sense. The reason why nature facilitates deeper development is because it engages them, whereas most classroom environments do not.

Stimuli Responses:
Curiosity, observation, wonder, exploration, problem solving, and creativity

British Survey of Over 2000 Kids
"Nature is a tool to get children to experience not just the wider world, but themselves" (Henley, 2010).

US, European, Australian Studies From *Natural Childhood*
"Immersion in the sensory and informational richness and dynamic qualities of woodlands, beaches and meadows evokes basic learning responses such as identification, differentiation, analysis and evaluation. Children distinguish big trees from little trees, house plants from garden plants, vines from ferns, ants from flies, ducks from songbirds, real creatures from imaginary ones. They develop quantitative skills by counting insects and flowers; gain materials knowledge from playing in grass and mud; intuit physics from how creek water responds to obstacles and opportunities. In recognizing hills, valleys, lakes, rivers and mountains, they learn geological form. In engaging with other life from redwood trees to hedgehogs, they encounter an endless source of curiosity, emotional attachment and a motivation for learning. In adapting to the ever-changing, often unpredictable natural world, they learn to cope and problem-solve.

A young child engaged in free play under a garden bush experiences a wealth of kinetic, aural, visual, and tactile stimulation. These experiences foster a wide array of adaptive responses that provoke curiosity, observation, wonder, exploration, problem solving and creativity.

A study of 90 schools for children aged 5 to 12 in Australia, for example, found that being outdoors improved the children's self-confidence, ability to work with others, caring, peer relationships, and interaction with adults.

The centrality of nature in children's learning begins with our origins as a species. For more than 99% of our evolutionary history, humans adapted in response to mainly natural forces. We became inclined to affiliate with nature, a tendency called biophilia" (Kellert, 2015).

American Survey of Over 600 Youths

B. Teaching Children About Nature

Properly educating children about valuing and protecting nature requires a total re-configuration of how most subjects are traditionally taught, which make schools less than ideal for the implementation of a new design solution. The mandatory participation integral to schooling would force kids to engage with nature, which is good, but hinder what they get out of doing so.

"Three quarters of the respondents to the Nature Conservancy Poll reported they had little if any access to nature through their schools" (Nature Conservancy, 2014)

David Orr, Environmental Studies Program Chair, Oberlin College
"The skills, aptitudes, and attitudes that were necessary to industrialize the Earth are not the same as those that are needed now to heal the Earth. Five measures are necessary to do this:

1: REDEFINE TRUTH
A growing number of scientists now believe, like Stephen Jay Gould, that 'We cannot win this battle to save [objectively measurable] species and environments without forging an [entirely subjective] emotional bond between ourselves and nature as well - for we will not fight to save what we do not love.'

2. CHALLENGE THE BASIC ASSUMPTIONS
We must challenge the hubris, buried in the hidden curriculum, which assumes that human domination of nature is good, that the growth economy is natural, that all knowledge, regardless of its consequences, is equally valuable, and that material progress is our right. We suffer a kind of cultural immune-deficiency syndrome that renders us unable to resist the seductions of technology, convenience and short-term gain.

3: INSTILL CITIZENSHIP
The ecological emergency can be resolved only if enough people come to hold a bigger idea of what it means to be a citizen. The ecological emergency is also about the failure to comprehend how utterly dependent we are on the wider community of life. Our political language gives little hint of this dependence. The word 'patriotism,' for example, is devoid of ecological content; it should in the future also come to mean the use made of land, forests, air, water and wildlife.

4: QUESTION TECHNOLOGICAL PROGRESS
Faith in technology is built into nearly every part of the

1. Redefine Truth
The design should anthropomorphize the natural world.

2. Challenge the Basic Assumptions"
A direct comparison between industrial growth/ development and natural growth/development needs to be made.

3. Instill Citizenship
The design should redefine what it means to be a citizen for the user. It should remind them of the ways they don't realize they rely on nature.

4. Question Technological Progress
"Is technology change taking us where we want to

go?" How can technology help take the direction of this topic where it needs to go?

5. Challenge the Notion of Educational Institutions" Connecting with nature is not a means to an end, even though the benefits of that connection should become clearer.

Creating a kind of new self-sustaining environment could be really cool.

Designing a means of connection that has room for creativity could help ensure that users have the freedom necessary to get the most out of experiencing nature.

curriculum as a kind of blind acceptance of the notion of progress. This technological fundamentalism deserves to be questioned: is technological change taking us where we want to go? What effect does technology have on our imagination and particularly on our social, ethical, and political imagination? And what net effect does it have on our ecological prospects?

5: CHALLENGE THE NOTION OF 'EDUCATIONAL INSTITUTIONS'
Colleges and universities offer a discipline-centric curriculum that corresponds modestly with reality. Place knowledge in an ecological context, to engage all of the senses of the student and not just the intellect. Things like rivers are real, whereas disciplines are abstract. Real things engage all the senses, not just the intellect. To know a river well, for example, one must feel it, taste it, smell it, swim in it, see it in its different moods, and converse with other people who know too.

Ecological education - the way of the future - will require the reintegration of experience into education, because experience is an indispensable ingredient of good thinking. One way to do this, for example, is to use the campus as a laboratory for the study of its own food, energy, materials, water and waste: flows. Research on the ecological impacts of a specific institution reduces the abstractness of complex issues to manageable dimensions.

THE WAY FORWARD
New curriculum must be organized around what can be called the `ecological design arts' - developing the analytical abilities, environmental wisdom and practical wherewithal essential for making things fit into a world of microbes, plants, animals and entropy. Ecological problems are in many ways design problems: our cities, cars, houses and technologies often do not fit the biosphere" (Orr, 1999).

Wildlife Trusts Case Study, '30 Days Wild,' UK
"Education programs with creative arts activities have led to increases in connection to nature, whereas knowledge-based activities did not improve nature connection. This type of approach requires substantial time and resources with a formal engagement by those taking part. Alongside this there is a need to develop approaches that fit with people's everyday working lives, quite often in an urban environment" (Richardson, 2016).

A.J. Juliani, Education and Technology Innovation Specialist
"We created the LAUNCH Cycle, an adapted K-12 design thinking cycle that's perfect for students of any age, level, and subject area.

Do we give students a chance to figure it out on their own or in a small group? Do we challenge them to solve a challenge in a fixed amount of time? Do we let them struggle and fail to the point where they have to work the problem and find a solution?

Now every student was 'working their own problem' and stumbling, struggling, and fighting to find a solution of how to learn, make, create, and launch an idea out into the world.

L: Look, Listen, and Learn: The goal here is awareness. It might be a sense of wonder at a process or an awareness of a problem or a sense of empathy toward an audience. A: Ask Tons of Questions: Sparked by curiosity

U: Understanding the Process or Problem: They might conduct interviews or needs assessments, research articles, watch videos, or analyze data.

N: Navigate ideas: They navigate ideas. Here they not only brainstorm, but they also analyze ideas, combine ideas, and generate a concept for what they will create.

C: Create a Prototype: It might be a digital work or a tangible product, a work of art or something they engineer. It might even be an action or an event or a system.

H: Highlight and Fix: Highlight what's working and fix what's failing. Every mistake takes them closer to success.

Launch to an Audience: Students can't solve problems and create solutions only to share it with 20 other people. They've got to take the final step of launching it into the world to a real authentic audience" (Juliani, 2016).

A.J.'s Launch Cycle is a perfect way to provide some (loose) structure to children's ideally uninhibited exploration of the outdoors. It lends itself to an emphasis on creativity as well.

C. HNR 250 Focus Group

HNR 250 is a natural sciences course in Syracuse University's Honors college titled, Being Human On Earth. Because the class covers a wide range of environmental issues, the students taking it this semester were asked to fill out focus group questionnaires for this research book. The goal was to find out what a relatively randomized group of 18-20 year old students want from nature, and whether their improved understanding of it (from class) will change the way they live their lives moving forward.

QUESTIONS:

Name_____ Age_____ Gender:_____ Hometown:_____

1. How would you describe your area of residence (not at school)? URBAN, SUBURBAN, RURAL

2. Would you say that you have a love for nature? YES NO

3. In a sentence or so, please describe why or why not.

4. Would you like more opportunities to connect with nature in your life? YES NO

5. In a sentence or so, please describe why or why not.

6. If yes, how would you prefer to get more opportunities? (please pick two)
- In your living space
- Through school
- Around your area (city or town)
- Digitally (through devices)
- Via a product
- From a specialized program, organization, or business

In theory, this class has provided you with a wealth of knowledge about nature, how we're negatively impacting it, and ways we can improve and protect it.

7. Do you feel like you now have an improved understanding of these topics? YES NO

8. If yes, do you plan to practice more eco-conscious behavior moving forward because of what you now know? YES NO

9. If no, why not?

10. If yes, how would you like to get involved with the preservation and protection of the environment? (list any ideas)?

11. What things (factors) might prevent you from actually doing so?

Figure 8: Focus Group Participants Completing their Questionnaires

PARTICIPANT MAKEUP:

A. Nathan, 18, Male, Rutland, VT, Rural

B. Emma, 18, Female, Poughkeepsie, NY, Suburban

C. Domenick, 18, Male, NYC, NY, Urban

D. Luke, 19, Male, Chester, NJ, Suburban

E. RaeAnne, 18, Female, Staten Island, NY, Suburban

F. Andrew, 18, Male, Syracuse, NY, Suburban

G. Amanda, 19, Female, Milwaukee, WI, Suburban

H. Mira, 20, Female, Glen Ridge, NJ, Suburban

MAJOR TRENDS:

- All 8 participants said yes to questions 4 and 8 (Would you like more opportunities to connect with nature in your life? & do you plan to practice more eco-conscious behavior moving forward because of what you now know?)

- Only 2 participants said they don't have a love for nature (Luke and RaeAnne)

- The top two preferred opportunities for reconnection are around your area (6) and through school (4)

- Multiple participants expressed an interest in reconnecting with nature as part of a group

- Multiple participants said lack of time, will power, and knowledge might prevent them from doing so

IMPORTANT QUOTES

Question 3: "I Never really had 'nature experiences' as a kid."- Luke (Why he doesn't love nature)

Question 4: "Sometimes, I feel stuck in a loop of school, home, sleep. A break from this cycle would be great."- Emma (Why she wants more connectedness).

Question 4: "I feel like it's beneficial for myself."- Luke (Why he wants more connectedness)

Question 4: "I believe more experience with nature could improve my lifestyle overall."- RaeAnne (Why she Wants more Connectedness)

Question 9: " I would like to do individual things, simple everyday things that would be part of my daily routine."- RaeAnne (How she wants to be more eco-conscious)

Findings

A. What Nature Teaches Children- Nature has the potential to teach children and all people things that traditional education can't, because of the way it engages our five senses and its realness. The five senses are everything with regard to improved nature connectedness. The design solution needs to engage them.

B. Teaching Children About Nature- The very nature of nature contradicts the essence of traditional teaching. Educating kids about nature in meaningful way requires a departure from the way subjects are traditionally taught in most schools today (common core).

C. HNR 250 Focus Group- Young adults want more nature in their lives, regardless of the extent to which their upbringing has prevented them from experiencing it. They articulate wanting more opportunities to engage with nature, and prefer said opportunities around the areas where they live, but admit that things like lack of time, will, power get in the way.

Photographer: Lucas Foglia, Publication: *National Geographic*

CHAPTER 7

Conclusion

A. Value of the Project

PEOPLE TAKE CARE OF THE THINGS THEY LOVE!

This realization stemmed from a conversation with Ilya Azaroff, an Industrial & Architectural Designer at Plus Labs in Brooklyn, NY. He delivered a presentation about the problems creatively solved by his team, all of which have to do with the dire condition of our planet. The wealth of knowledge and shocking statistics Azaroff shared made the need to act now incredibly clear. He talked about how today's children, and designers of all ages, have the power to turn history around, and ensure that our environment, and all of mankind in turn, will have a promising future. So I asked Ilya whether he thinks our growing disinterest in and disconnect from the natural world could hinder this amazing potential. He answered yes and ascertained that being in tune with nature goes hand in hand with being ecologically conscious. The correlation between nature appreciation and eco-conscious behavior ended up becoming a major theme running throughout my research. It was hard to find information about my topic that didn't allude to this insight. It's the real value of the project. There's an opportunity to design a product, system, service, or experience that reconnects people with nature in a way that leads to their improved protection of it. This kind of real impact and shifting of society's perspective is the end goal, and there's never been a better time to go after it. Other countries' governments are dedicating time, money, and resources to these issues. America's is not. Its recently heightened unwillingness to accept and fight devastating phenomenon such as global warming and climate change makes my attempt to improve people's attachment to the environment and rally them around its problems disproportionately important right now.

B. Implications for Future Design

DUALITIES:

- Intellectual /physical stimulation

- Videophilia/ biophilia

- Real/digital world

- Direct/indirect engagement

- Internal/external exploration

CONTEXT QUESTIONS

Why? We need to reconnect with nature for our own sake- improved physical and mental health, and for nature's sake. We can't exist with our environment, and we're losing it. People won't protect something they have no experience with or appreciation for.

Who? People living in cities, those who have the most to gain from nature, yet the least amount of access to it.

When? Over the course of a number of weeks. Improved connectedness (a developed relationship) requires time.

Where? Inside user's home and/or the areas around where it's located.

How? Co-design (prototyping) activities involving potential users in an attempt to understand their wants, needs, and motivations.

What... THE DESIGN CAN BE ANYTHING AS LONG AS IT:

1. Ultimately gets users outside. Digital Nature can't replace the real thing.
2. Engages the user's 5 senses
3. Is personal and provides something personally beneficial for the user.
4. Focuses on doing something in/with nature, not knowing about it.
5. Feels quick, easy, and novice.

C. Recommendations for Further Research

A. READING:

- *Vitamin N: The Essential Guide to a Nature-Rich Life*, Richard Louv
- *Technological Nature*, Peter Kahn
- *Re-connecting with nature: Transformative Environmental Education Through The Arts*, - Rachel Alice York

B. OBSERVATIONAL ACTIVITY: Children at the Syracuse Zoo

ASSUMPTIONS TO CHALLENGE:

1. The children at the zoo will be demonstrating curious behavior (asking a lot of questions)

2. Some children at the zoo (towards the exit) will be expressing a desire to stay longer

3. There will be opportunities to engage with eco-efforts (most likely animal related)- Take note of where they are, and what they're like

4. Children will be enjoying themselves- Take note of when they're not and why

5. Parents won't be as engaged with the exhibits

C. IN-PERSON SURVEY: Shoppers at Destiny USA

Age? Gender? I live in _____ (town).

Circle the option that best applies:

1. My place of residence is in a _____ area. Urban, suburban, rural

2. My overall attitude towards nature and the outdoors is _____. Positive, negative, indifferent

3. Why do you feel that way? (Brief explanation)

4. I came to the mall today _____.
    To shop
    To browse
    To eat
    To hangout
    To participate in a particular activity (like see a movie)

5. How much time do you expect to have spent at the mall today?

6. How much time do you expect to have engaged with nature today? (inside, digitally or outside, physically)

7. Are you interested in spending more time with nature? YES NO

8. Why? (Brief explanation)

9. Do you know that experiencing and appreciating nature is scientifically improves health & happiness? YES NO

D. INTERVIEWS:

- ILYA AZAROFF, Industrial & Architectural Designer, Plus Labs

1. Do you think mankind is becoming more and more disconnected from the natural world? Why or why not? What have you understood about this from your own experience?

2. During symposium, I asked you whether a growing disconnect has the potential to hinder our progress with regard to healing the environment? I'd like to ask this question again and elaborate based on the response you gave that day.

3. My sub-question is… How can design strengthen the relationship between being in tune with nature and environmentally conscious behavior?

4. Who do you think matters the most when it comes to getting people invested in these issues? Children? Adults? Both? Equally?

5. There's an obvious lack of nature and nature education in formal academic education. Do you have anything to say about the ease of integrating it given our government's willingness to dedicate time, energy, and money to environmental issues?

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List of Figures

FRAME & DEFINE: Statements About 'What Already Is' With the Problem Space

A. Nature has the power to teach people things that traditional education can't, because of its realness… the way it engages our five senses.

B. The specific way a person interacts with a specific kind of nature (stimuli) determines the kinds of benefits (mental vs. physical vs. emotional) they'll experience as a result doing so.

C. Continued appreciation of nature could require a redefinition of what it, and interacting with it entails, because of the way rapid, unavoidable urbanization is decreasing and changing our opportunities to experience it.
- People's concept of nature and what engaging with nature constitutes doesn't match what's available to them.

D. People are more inclined to get involved with nature when it's presented as being personally and individually beneficial, as opposed to another cause they need to get behind for reasons a,b, and c.

E. People living in urban, low-income communities need nature's benefits the most (socioeconomically), but have least amount of access to it.

F. People think they don't need to experience nature the same way we used to (first hand), but this is not the case scientifically or progressively. Digital nature can't replace real nature.

G. The irrational fears keeping people from getting acquainted with nature are the products of the same thing that could mitigate them, that being technology, the digital age, and its endless open flow of information.

H. Generally, children and adults value nature differently. Children think the best reason to conserve it is for its own sake whereas adults believe the best reason is to conserve is to preserve the resources people can derive from it.

I. Children get the most out of nature experiences that are free and unstructured, but they can't have those kinds of experiences without parental approval.
- Parents function as role models with regard to their children's interest in nature, but can easily hinder their connectedness to it (over-involvement).

J. With children especially, the challenge isn't getting them to appreciate the value of nature, they do, it's getting them interested and motivated enough to engage with it.
- What children know about nature has less of an impact than what they do in it.

K. People better appreciate nature when they have personal experiences with it.

L. People have a deep, biological affinity for nature and articulate wanting more of it in their lives, but admit that lack of time, will power, and knowledge get in the way.

M. The extent to which people have had the chance to experience nature directly determines how they feel about it.

N. An improved understanding of nature and appreciation for it directly leads to improved behavior surrounding the protection of it.

O. Young adults want more opportunities to engage with nature, and they want said opportunities around the areas they live.

P. Many designed nature experiences that provide exposure and appreciation also put forth ways people can protect the environment, but remain too disconnected from ways to actually help do so.

= Insights

= Criteria

= Foundations

FRAME & DEFINE: Insights, Criteria, and Goals

Important Insights:

B. The specific way a person interacts with a certain kind of nature (stimuli) determines the type of benefits (mental vs. physical vs. emotional) they'll experience as a result doing so.

C. Continued appreciation of nature could require a redefinition of what it, and interacting with it entails because of the way rapid, unavoidable urbanization is decreasing and changing our opportunities to experience it.

G. The irrational fears keeping people from getting acquainted with nature are the products of the same thing that could mitigate them, that being the digital age, technology, and its endless open flow of information.

P. Many designed nature experiences that provide exposure and appreciation also put forth ways people can protect the environment, but remain too disconnected from ways to actually help do so.

Design Criteria:

1. It needs to get people outside, digital nature can't replace the real thing

2. It must engage the user's five senses

3. It should be personal and provide something personally beneficial

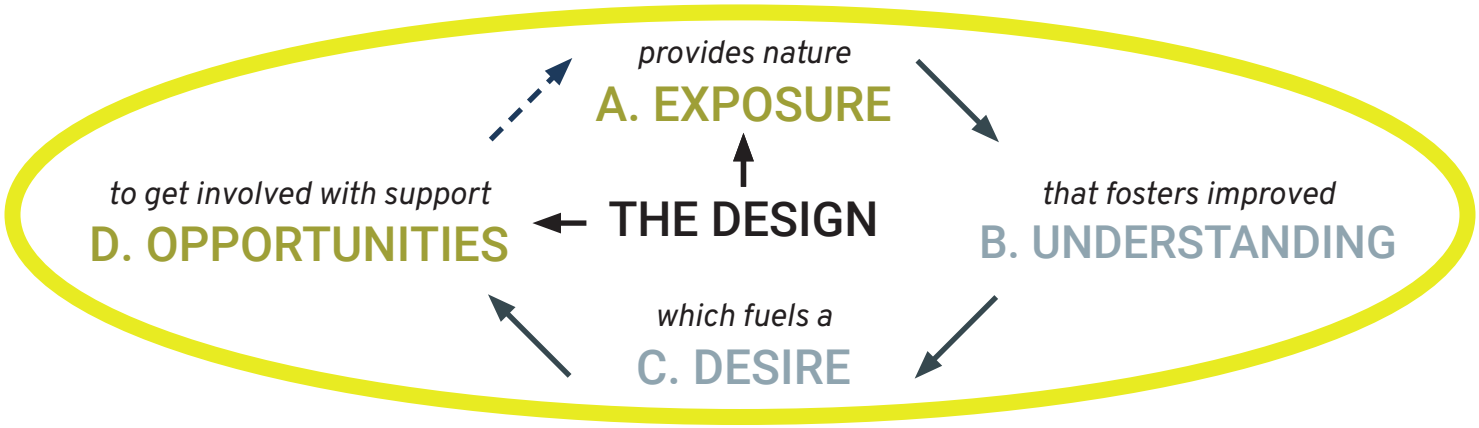
4. Its focus should be on doing with nature, not knowing about it

5. Its engagement needs to feel quick, easy, and novice

Goal:

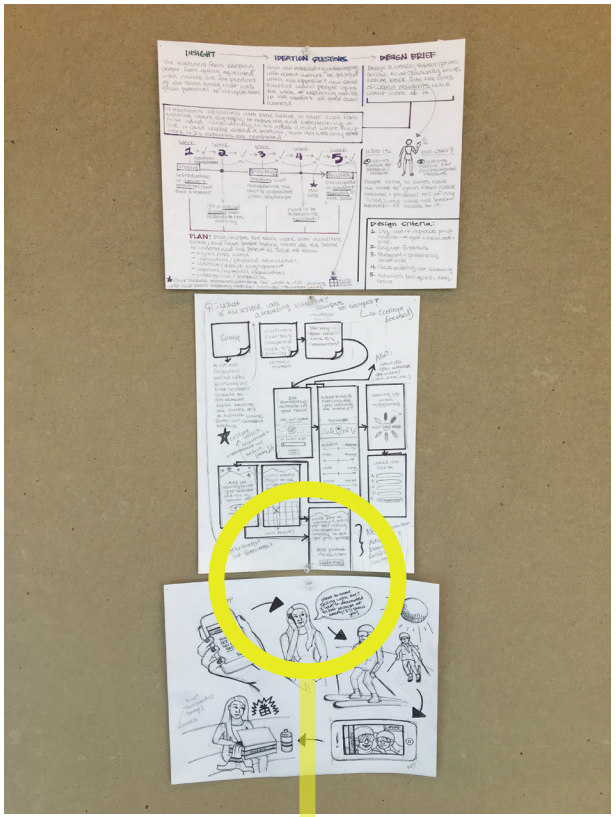
A & D= Tangible things provided by the design

B & C= Feelings developed by the user because of the design



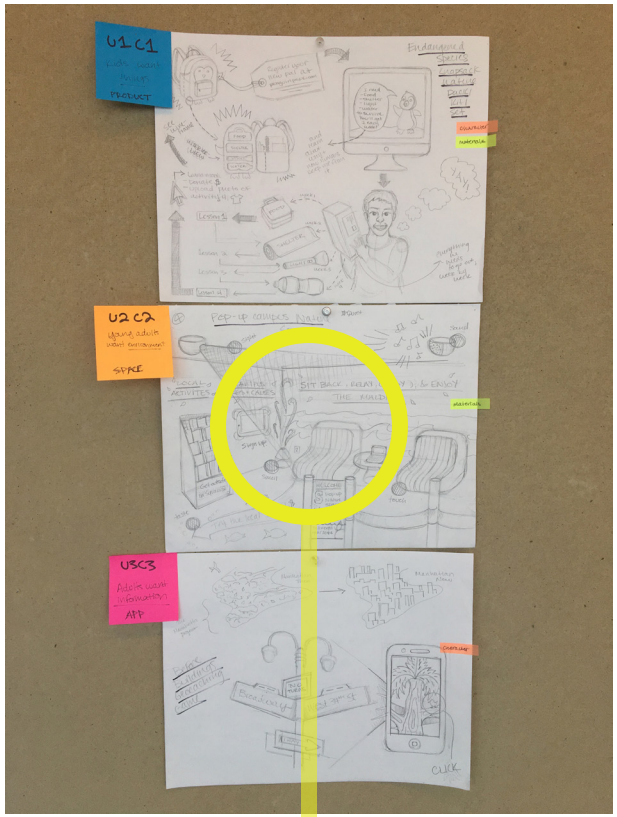
IDEATE: Early Concept Development

General Desired Outcome Planning



This thinking had value, but wasn't nearly specific enough. The common theme was time. It became obvious that I was wanting to design something that had a duration, aka lasted for a number of weeks, and changed week to week. My research had indicated that this structure would have value.

Concept 1, 2, and 3 Story Sketches



Each storyboard sketch represented a much more tangible idea- one product, one, space, and one interface, each for a different user group. However, the sketch for the space was too inaccurate. It didn't properly communicate how it would flow, which was imperative to its development.

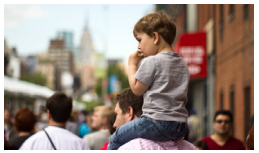
Concept 1, 2, and 3 Journey Maps

The journey maps for the second and third concepts made sense, but the one for the product concept was too forced. It had too much friction. I re-approached the idea from an object-centric perspective and a concept-centric perspective, ultimately deciding to proceed with the former.

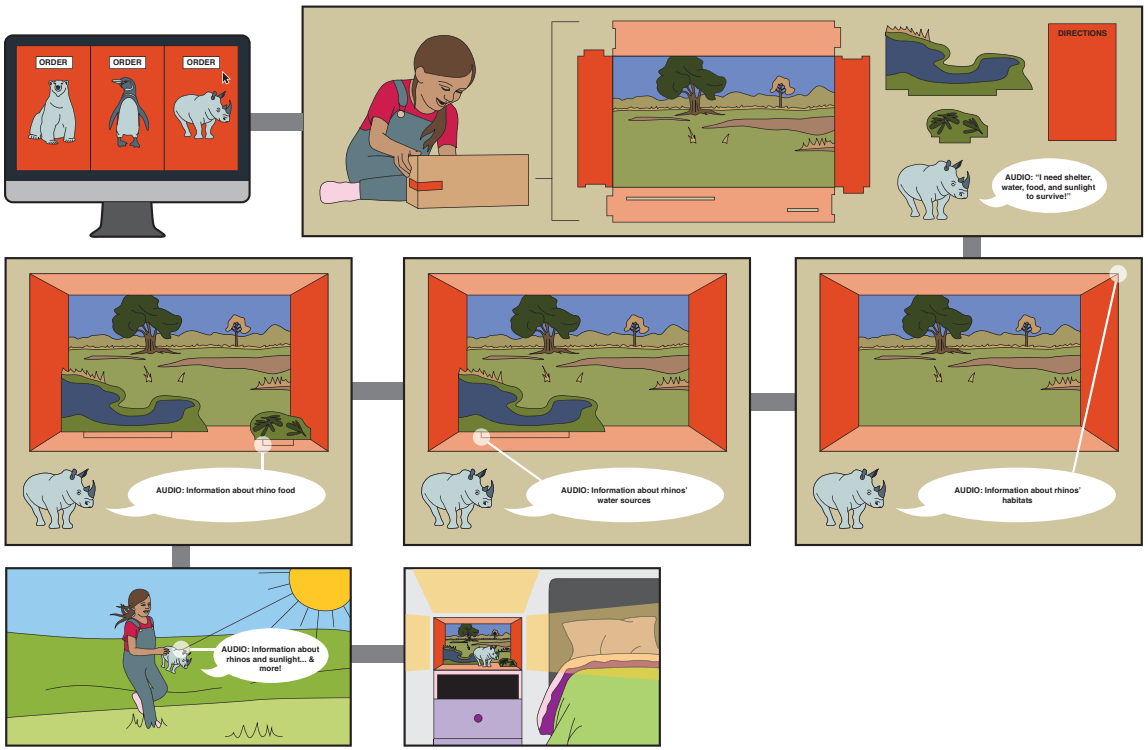
IDEATE: Initial Concept #1 | Endangered Species Survival Set

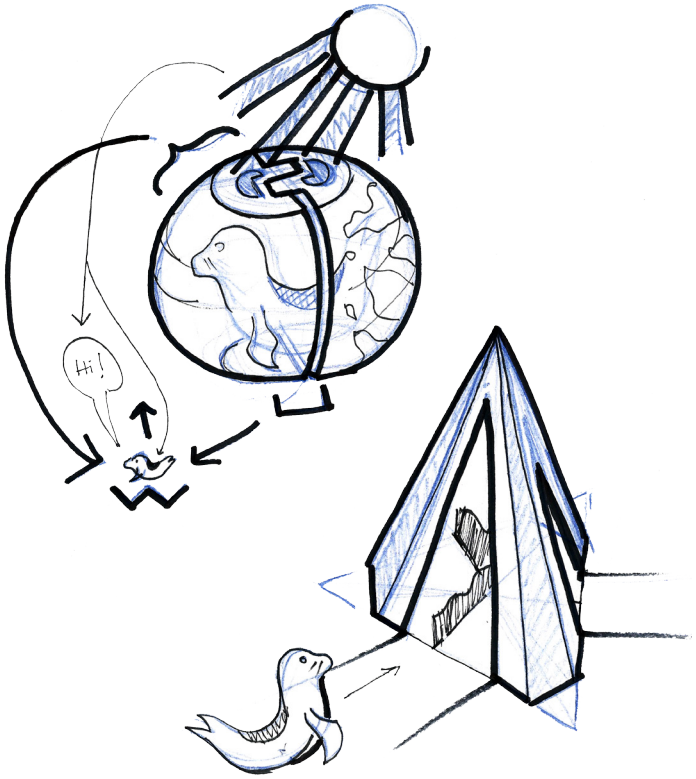
Description

Children appreciate the environment. They love animals in particular, but they're distanced from the fact that so many species are in grave danger, and there's an opportunity for kids to positively impact the environmental opinions of the adults around them... A creative kit that arrives in the mail (weekly) and contains a creature that reacts to being outside would be really anticipatory and exciting. It's also great that the product could double as a room accessory (night light).



USER PERSONA: Urban Child- wants things, "I like the park, but I can't go there alone, and I'd rather play video games anyway."



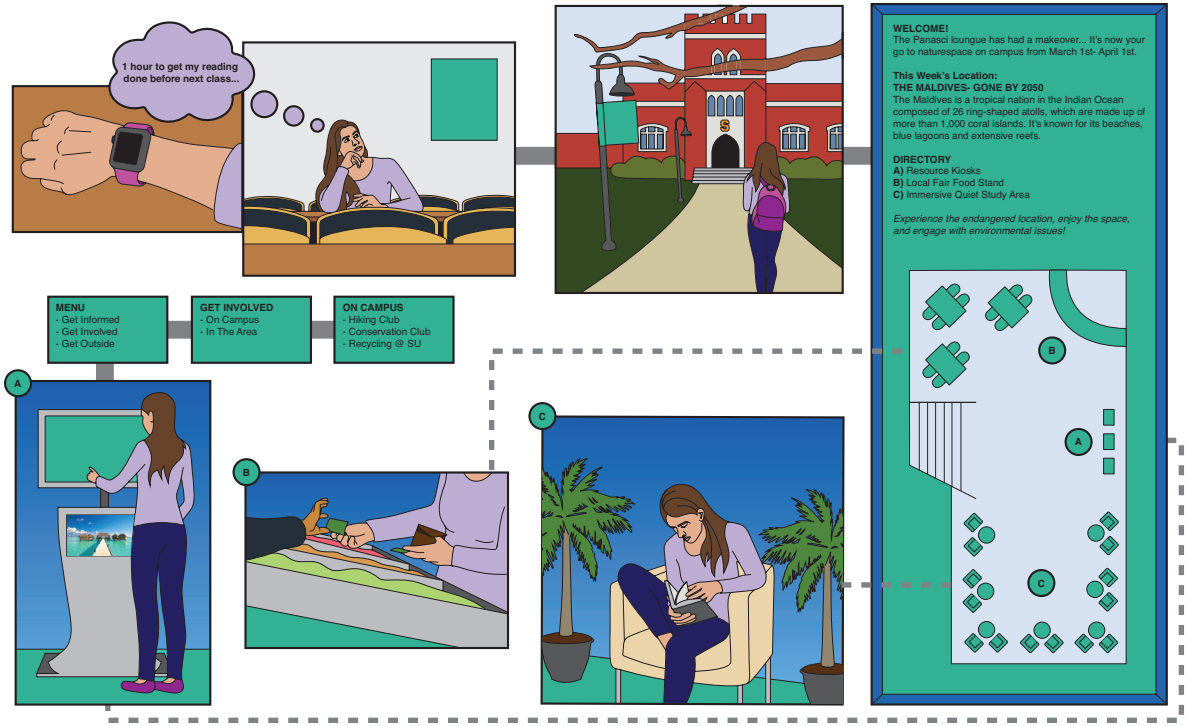


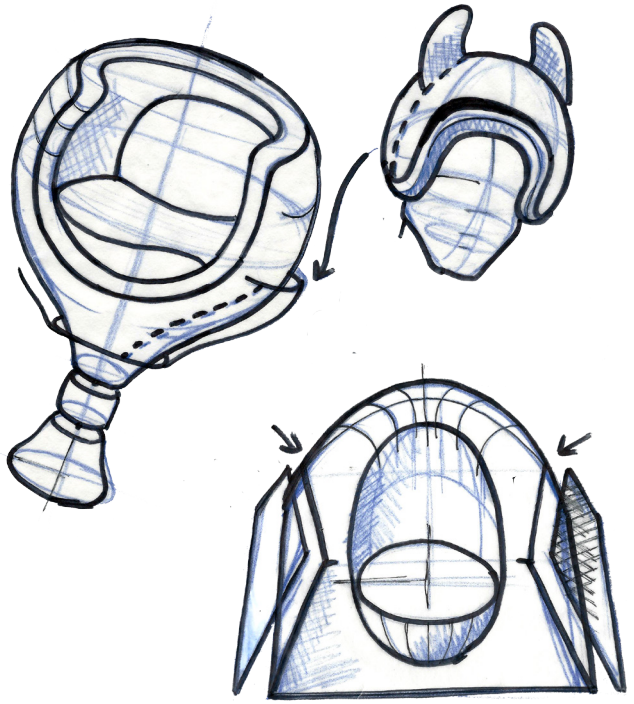
IDEATE: Initial Concept #2 | College Campus Pop-Up Nature Space

Description

College students have the most potential with regard to environmental understanding and action. It should be easier for them to interact with nature, learn about its depletion, and get involved with protecting it, on campus... Nature can be a great break from the continuous and often monotonous school-home-sleep cycle. Having access to a space that provides nature's benefits regardless of the surrounding environment and seasons would be ideal.

USER PERSONA: Urban Young Adult- wants environment, "I'd like to interact with nature in a simple, everyday way that could become part of my daily routine."



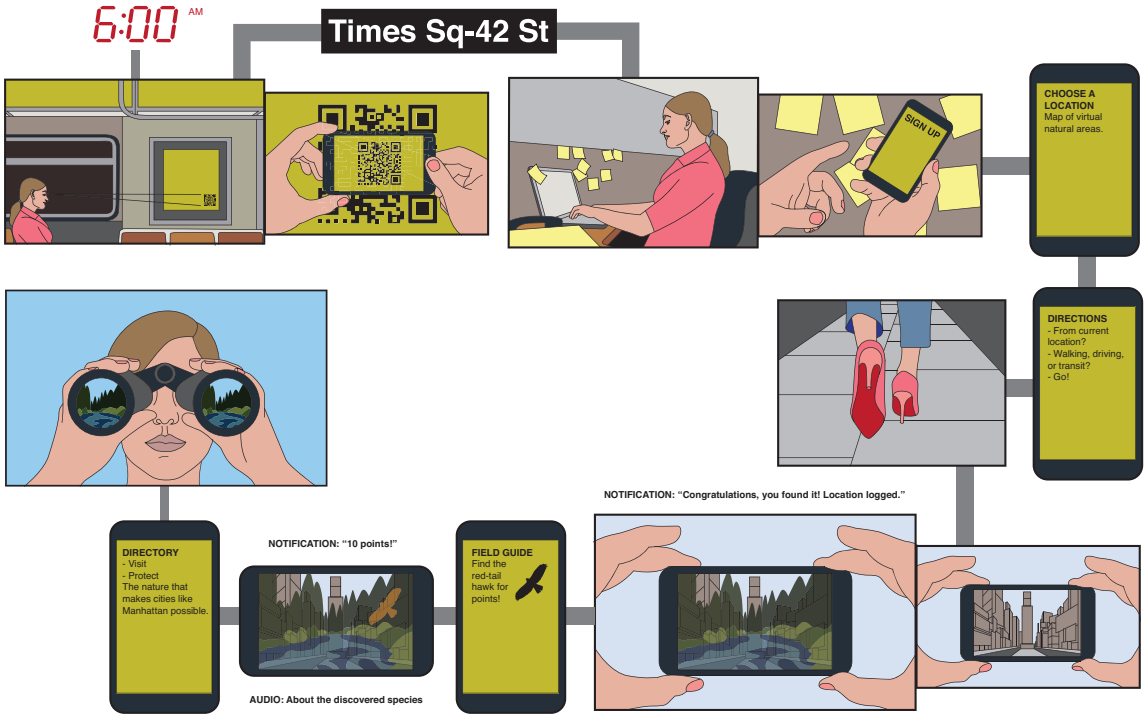


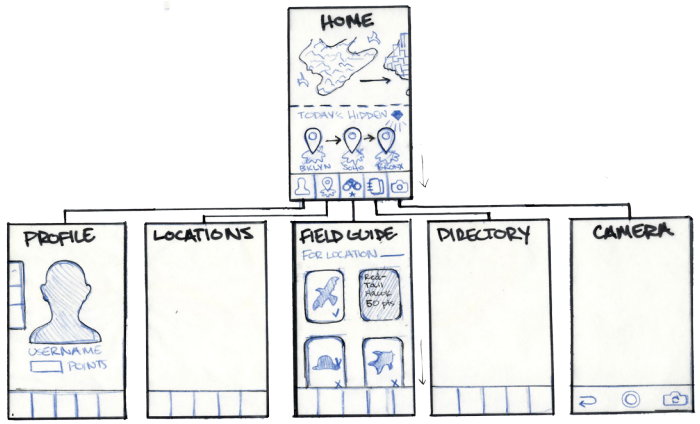
IDEATE: Initial Concept #3 | Manhattan Before Buildings AR Gaming App

Description

Adults appreciate nature for its resources, but don't totally grasp the relationship between it and mankind's progress- we need to protect it in order to continue developing. There won't be anything without it, humans included...The race to uncover a city's hidden natural history would be exciting, give various location a new dimension, and transform the city's urban landscape into something contradictory and therefore, thought provoking.

USER PERSONA: Urban Adult- wants information, "My career is the most important thing to me right now. Work keeps me in the city and nature just isn't a priority."





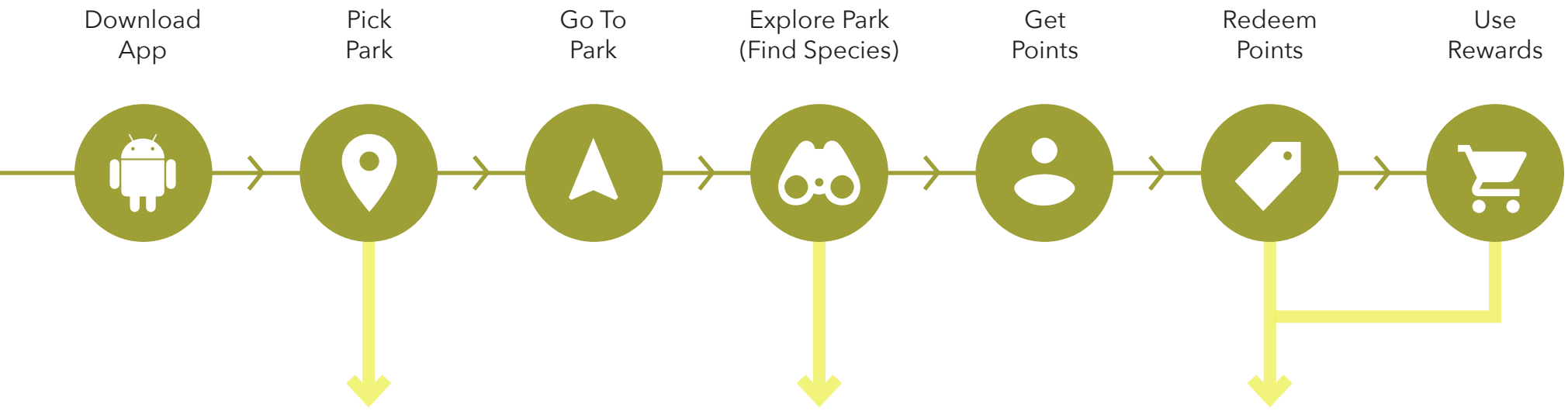
ManhattApp

IDEATE: Chosen Concept | #3

Why Concept #3?

SUBJECTIVE REASONING: There was a gap in my portfolio, a chance to design an interface to a complete degree that I hadn't previously
OBJECTIVE REASONING: Concept #3 had the widest audience, the best potential for reaching the most people

New Journey Map (Major Changes)



Location of digital experiences...

Before: Users were looking for virtual worlds in popular places around the city

Now: The augmented reality aspects can only be found in Manhattan's parks

Why: Why wouldn't the app draw users to the city's most nature-filled areas?!

What the digital experiences are...

Before: Users were looking for species that were actually in each place during 1601

Now: They look for a wide variety of at-risk animals (critically endangered-vulnerable)

Why: The 1601 species were not diverse or exciting enough, plus added awareness

Addition of real-world rewards...

Before: There weren't tangible rewards, just badges and achievements for the sake of play

Now: Users can redeem their points for discounts at eco-friendly establishments

Why: The incentive to participate, also brings users closer to improved behavior

DESIGN: First Full Wireframe

GETTING STARTED

HOME

CAMERA

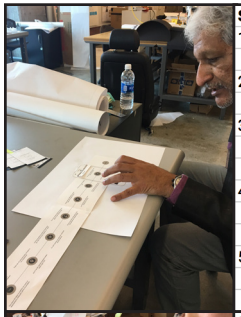
ACCOUNT

REWARDS

Why Android?

I had designed iOS mobile applications previously, and the opportunity to work with Google's "Materials Design" principles was really exciting, fitting too given the role of Google Maps in the app's concept and design

REFINE: Paper Prototyping



Section	Task	Friction (0-2)	Key Interaction	Notes
1: Welcome	Create account	1	Top bar vs screen	
	Consume instructions	2	Ready button	Instructions will need to be available elsewhere, no clicking in bar
2: Home	Pick a park	1	Screen after a park is chosen, (redundant)	Didn't notice the corner tab at all
	Get directions and go	0		Need to reference the species that will be there
3: Camera	Find species	0	Photo button	"The section needs to be renamed (semantics)"
	View saved species	1		
	Learn about species	1		
4: Profile	Check visited	1		
	Edit username	0		
	Add and chat friend	0	Clicking pictures instead of rows	
5: Rewards	Add a reward to accoun	0		
	Access reward	0		
	Order bonus item	2		User should be able to see them immediately

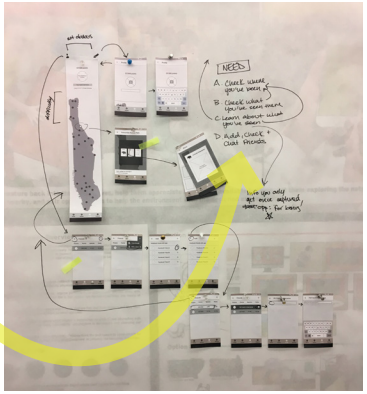
Section	Task	Friction (0-2)	Key Interaction	Notes
1: Welcome	Create account	1	Submitting username	Automatic acceptance would be good
	Consume instructions	2	Center circles	Next arrow isn't touched, too much too remember
2: Home	Pick a park	1	Screen after a park is chosen, (redundant)	Didn't notice corner tab at all
	Get directions and go	0	Orient button, could be something else	
3: Camera	Find species	0		Transition from map to camera isn't smooth enough
	View saved species	2	Album button	Thought they would be in the notification bar or capture button
	Learn about species	0		
4: Profile	Check visited	1	Scroll	Isn't scrolling, might need to redesign statistics
	Edit username	0		
	Add and chat friend	0		
5: Rewards	Add a reward to accoun	2	Arrow for directions pressed instead of add	
	Access reward	1	Wallet icon	"It's the icon on top right?"
	Order bonus item	1	Back instead of star	"Oh shoot! Didn't see star"

Section	Task	Friction (0-2)	Key Interaction	Notes
1: Welcome	Create account	1	Pushed check before type	Check mark was misleading
	Consume instructions	2	Ready	A progress bar would help, arrow ignored
2: Home	Pick a park	1		List and map view exist elsewhere, icon is typically for settings
	Get directions and go	0	Go arrow	Menu icon vague, pushed elsewhere to change transportation
3: Camera	Find species	0		
	View saved species	1	Album icon	Too abstract
	Learn about species	0		
4: Profile	Check visited	2		Searched wildly for button, arrow to indicate scroll
	Edit username	1	Clicked photo icon	
	Add and chat friend	1		Automatic back from adding the friend
5: Rewards	Add a reward to accoun	0	Either/or with the x and check	Straight from coupon page, not going back
	Access reward	1		
	Order bonus item	1		Label differently

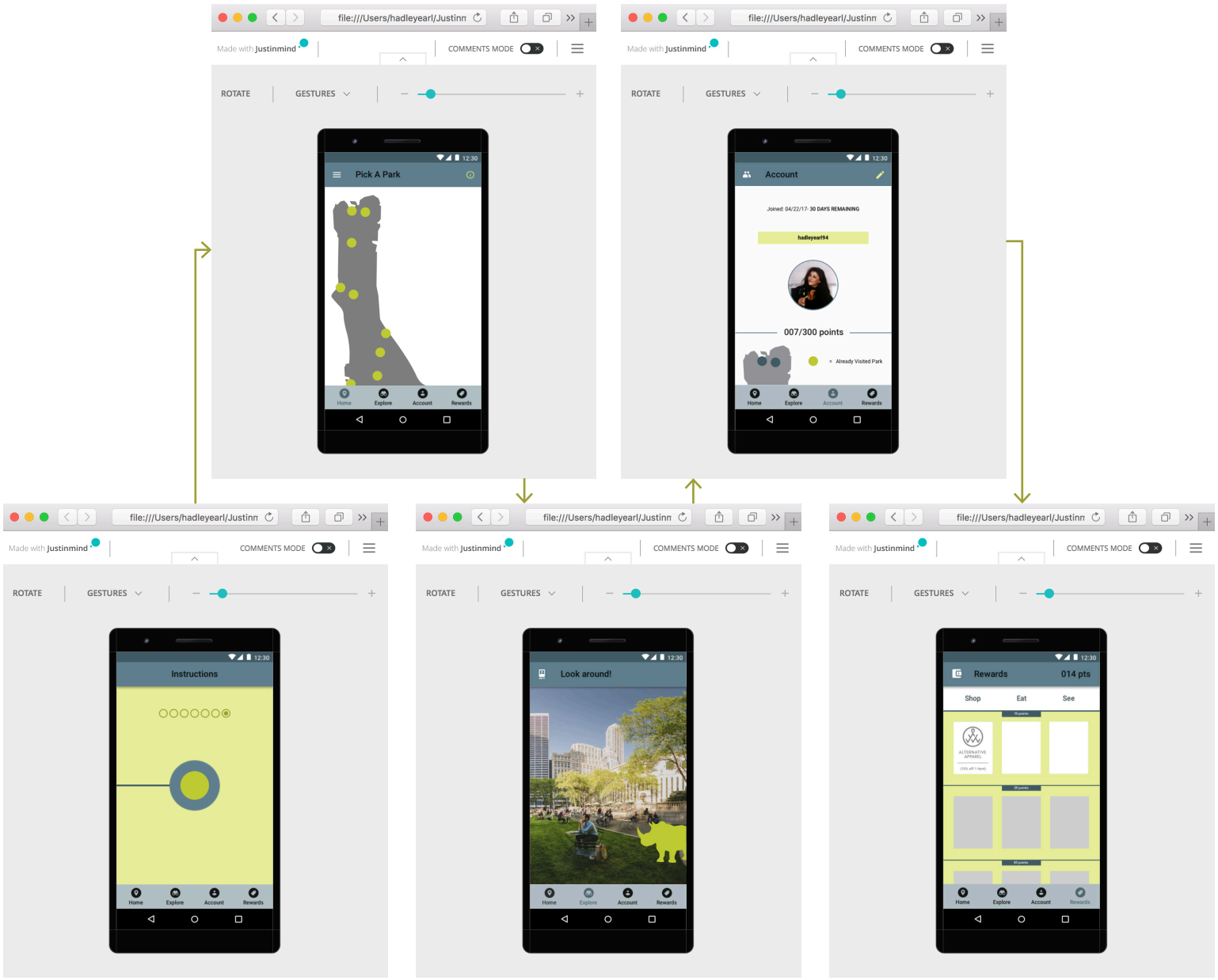
Section	Task	Friction (0-2)	Key Interaction	Notes
1: Welcome	Create account	0	Check mark	Top isn't changing, something should indicate completed action
	Consume instructions	1	Swiped instead of using arrow	Arrow feels more like a next button
2: Home	Pick a park	2	Redundant screen	
	Get directions and go	0	Corner tab missed	Animals missed, need direct connection between arrival and search
3: Camera	Find species	1		Clicked species directly
	View saved species	2		Clicked profile, not album, then notification, where does this live?
	Learn about species	0		
4: Profile	Check visited	0		Highlighted go to
	Edit username	0		Think about left vs. right side importance
	Add and chat friend	1	Wanted to search for friends	Left feels menu, whole strip for friend got pushed, need chat icon?
5: Rewards	Add a reward to accoun	1		Pushed photo instead of plus
	Access reward	0		
	Order bonus item	1		

Activity to Action

Problem areas became clear really quickly. The Camera and Profile sections were the two sections that required significant changes. I moved the species information piece from Camera (now Explore) to Profile actually. It's available immediately after users find each species as well.



REFINE: Interactive Prototyping



Key Feedback

- Wallet icon still isn't obvious enough

- The lime green color reads stronger than the white does, assign it to the most important features/clicks

- Consider Points vs. Your Parks vs. History language- wise for the Profile/Account page

- Notifications should come up from the bottom like the coupons in the wallet, or appear centered

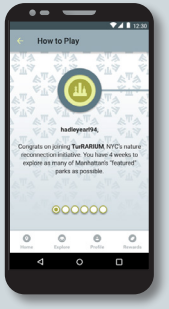
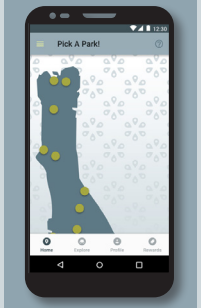
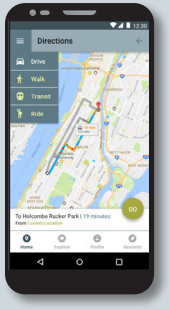
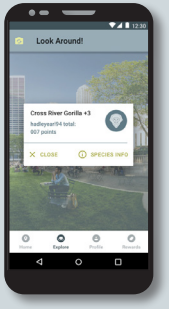
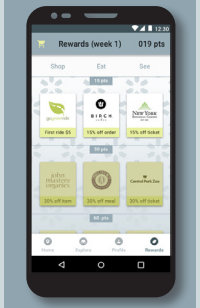
- The words that cannot be clicked need to be grayed out more to indicate inactivity

- The corner tabs still aren't registering, if the flip feature stays, it should be presented differently

- Information about the at-risk animal species could live on the homepage where the "About the App" screen currently sits

- Switch the Account section back to Profile and maybe make the social component more obvious conceptually

FINALIZE: Service Blueprint

Phase	ENTICE	INITIATE	LEARN	ENGAGE	ACT	PLAY	RECEIVE	REDEEM	EXTEND
User Actions	**A. See Subway Ad**	**B. Download App**	**C. Read Instructions**	**D. Pick Park**	**E. Go to Park**	**F. Explore Park (find species)**	**G. Get Points**	**H. Choose Rewards**	**I. Use Rewards**
LINE OF INTERACTION									
Front-Stage (designed components)	Advertisement for app/initiative	App icon in App Store	Scrolling description of what the user needs to do 	Map of Manhattan showing 30 "featured" parks 	Walking, driving, transit, or ride directions 	Virtual species come into camera view 	Notification: park and/or species points received 	Current week's reward options 	Signage indicating establishment's participation
LINE OF VISIBILITY									
Back-Stage					Chosen route gets calculated and updated	Camera, gps, and compass show virtual items in real world	Coupons user doesn't have enough points for are hidden	Chosen coupon gets added to cart	Employees are aware and ready to accept coupons
LINE OF INTERNAL INTERACTION									
Support	Advertising space provider	Android App Store		Parks Dept. data set	Google Maps	Augmented reality in use, WWF data set			Payment systems, Cube
LINE OF PRIMARY RESPONSIBILITY									
Stake-holders (professional)	MTA	Google, Facebook	Technological	NYC Department of Parks and Recreation	Google	Environmental: World Wildlife Fund		Independent: Shops, restaurants, attractions	Shops, restaurants, attractions
		Urban							

FINALIZE: Style Guide

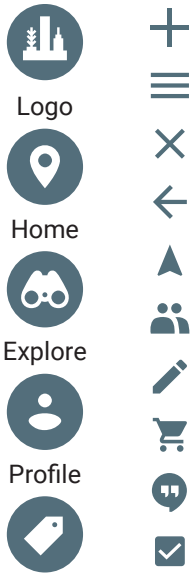
TYPE: Roboto

REGULAR
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
12345678910

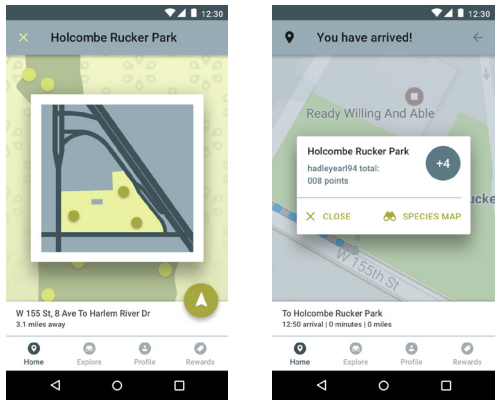
MEDIUM
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
12345678910

BOLD
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
12345678910

KEY SYMBOLS:



FEATURES:



Example of window vs. notification screens

Pattern Work

ILLUSTRATIONS:

Cross River Gorilla

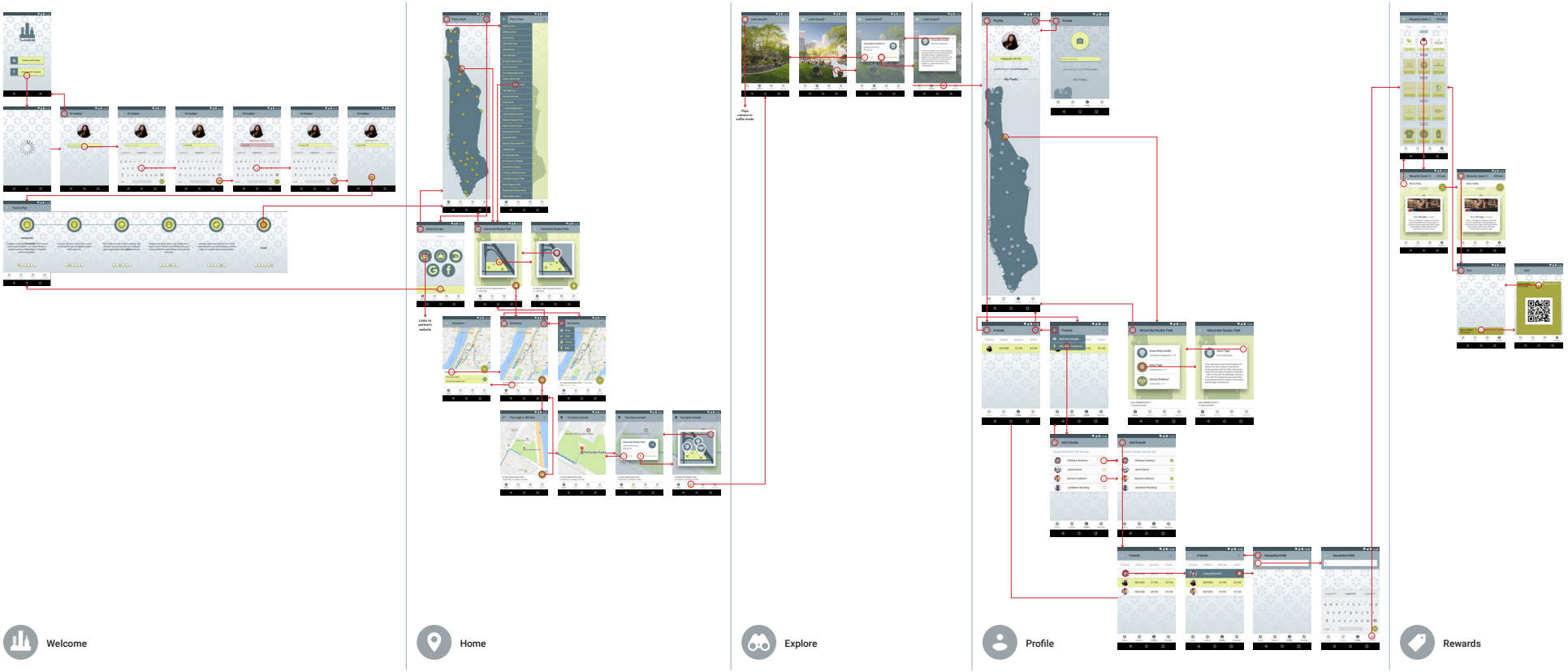
Amur Tiger

African Elephant

COLORS: PRIMARY- Materials Design Blue Grey palette | SECONDARY Colors- Materials Design Lime palette

900 #263236 800 #37474F 600 #546E7A 200 #BOBEC5 100 #CFD8DC 200 #E6EE9C 800 #9E9D24

FINALIZE: Full Wireframe



FINALIZE: In Context Image A | Main Navigation

TurRARIUM's five main sections are highlighted here; Welcome/ Getting Started, Home, Explore, Profile, and Rewards.

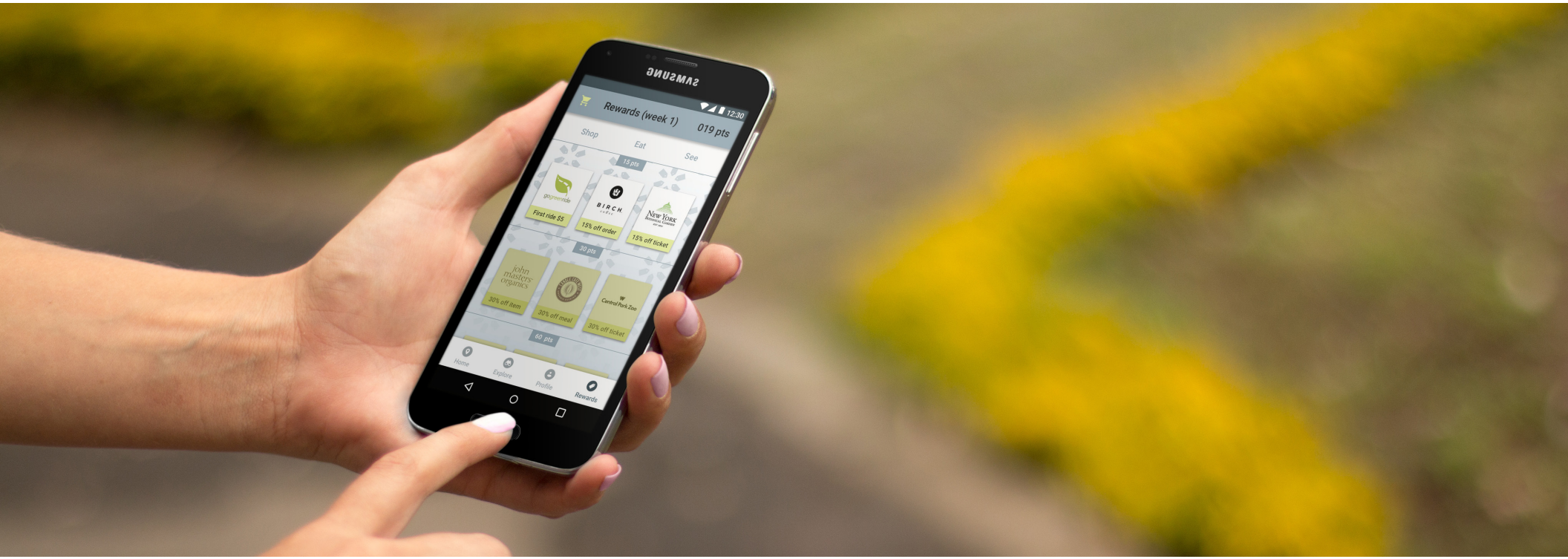
FINALIZE: In Context Image B | Holcombe Rucker Park Species Map

A user arrives at his chosen park and checks its species map to figure out what animals he should look for, and where he should look for them within that park.

FINALIZE: In Context Image C | Game Play

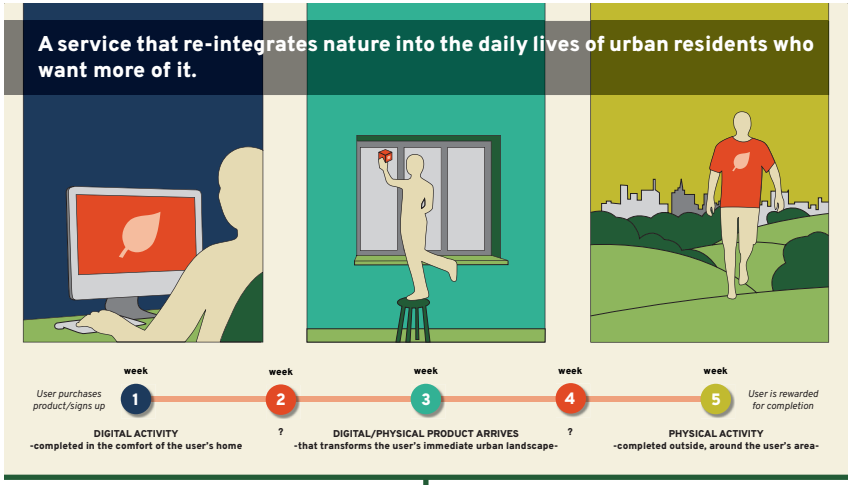
A user receives 3 points for finding a Cross River Gorilla in the park she's chosen to explore.
TurRARIUM is really flexible. The parks and digital experiences can change month to month. For example, the following 4 weeks could include parks outside of Manhattan (in the other boroughs) and feature dinosaurs instead of at-risk animal species. Also, participating businesses choose their own promotions, whatever deals they're comfortable with.

FINALIZE: In Context Image D | Week 1 Reward Options

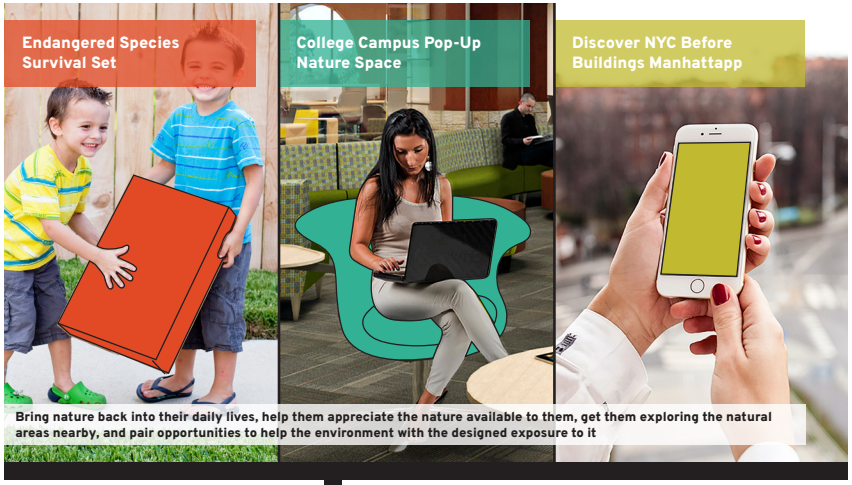


A user browses through the reward options available to her given the amount of points she's earned thus far.
The game breaks down to 4 weeks, 30 "featured" parks, 90 at-risk species, and dozens of rewards that rotate weekly. However, TurRARIUM has value game play aside. It can be used as a NYC Parks system resource (which doesn't have an app) and a tool to find environmentally ethical options in the city.

APPENDICES: Poster 1- First Draft (Due 01/31/17)



APPENDICES: Poster 2- Midterm (Due 03/07/17)



Research Space Overview:

The correlation between exposure to nature and improved health and happiness is being scientifically proven to an extent that it hasn't been previously. Yet, mankind is growing more disconnected from nature than ever before. People need to re-connect with nature for their own sake (mentally and physically) and more importantly, for the sake of the planet, because people take care of the things they love.

Insights:

The way a person interacts with nature (stimuli type) determines the kinds of benefits they'll receive from doing so (mental vs. physical).

- Many designed nature experiences expose participants to nature, and provide them with information about how they can protect the it, but remain too disconnected from any means of doing so.
- Children get the most out of nature experiences that are free and unstructured, but they can't have these kinds of experiences without parental approval.
- Continued appreciation of nature could require a redefinition of what it, and interacting with it entails because of the way rapid, unavoidable urbanization is decreasing and changing our opportunities to experience it.
- Children and adults value nature differently. Children think the best reason to conserve it is for its own sake, whereas adults feel like it should be conserved to preserve the resources it provides.

Design Criteria:

1. Design ultimately needs to get people outside. Digital nature can't replace the real thing
2. Design must engage the user's five senses
3. Design should be personal and provide something personally beneficial for the user
4. Design's focus should be on doing something in/with nature, not knowing about it
5. The engagement needs to feel quick, easy, and novice

Goal:

Regardless, the design needs to provide users with a nature experience that fosters an improved appreciation and understanding of it, which fuels their desire to help protect it, and the design should provide users with an entry point to involvement in that protection as well.

Project Statement 1:

Children have a natural affinity for the environment. They love animals in particular, but remain distanced from the fact that so many species are in grave danger. There's also an opportunity for kids to positively impact the environmental opinions of the adults in their lives... A creative kit that arrives in the mail (weekly) and contains a creature that reacts to being outside would be really anticipatory and exciting. It's also great that the product could double as a room accessory (nightlight).

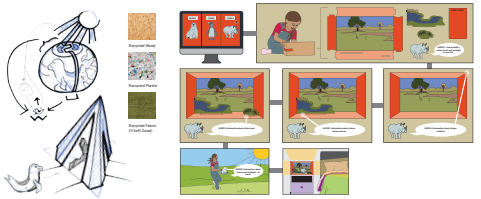
Project Statement 2:

College students have the most potential with regard to environmental understanding and action. It should be easier for them to interact with nature, learn about its depletion, and get involved with protecting it, on campus... Nature can be a great break from the continous and often monotoneous school-home-sleep cycle. Having access to a space that provides its benefits regardless of the surrounding environment and seasons would be ideal.

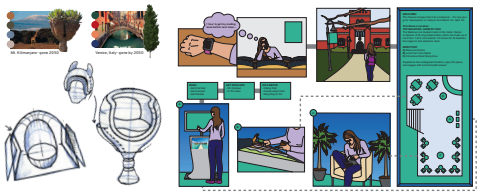
Project Statement 3:

Adults appreciate nature for its resources, but don't totally understand that because nature is what's made out development and progress possible, we need to protect it in order to continue progressing/developing. There won't be anything without it, humans included... a The race to uncover a city's hidden natual history would be exciting, give that location a new dimension, and transform its urban landscape into something contradictory and therefore, thought provoking.

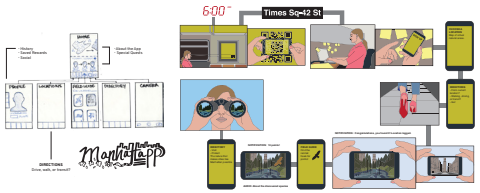
Option 1:



Option 2:



Option 3:



SVA SCHOOL OF DESIGN

HADLEY EARL ALLEN

APPENDICES: Poster 3- Final (Due 04/28/17)

RESEARCH SPACE

The correlation between exposure to nature and improved health and happiness is being scientifically proven to an extent that it hasn't been previously. Yet, mankind is growing more disconnected from nature than ever before. **We need to re-connect with nature for their own sake (mentally and physically) and maybe more importantly, for the sake of the planet**, bitcause people won't take care of something they don't experience or appreciate.

KEY INSIGHTS

A. The way a person interacts with nature (stimuli type) determines the kinds of benefits they'll receive from doing so (mental vs. physical)
B. Continued appreciation of nature could require a redefinition of what it, and interacting with it entails because of the way rapid, unavoidable urbanization is decreasing and changing our opportunities to experience it
C. Children and adults value nature differently. Children think the best reason to conserve it is for its own sake, whereas adults feel like it should be conserved to preserve the resources it provides
D. Many designed nature experiences expose participants to nature, and provide them with information about how they can protect the it, but remain too disconnected from any means of doing so

DESIGN CRITERIA

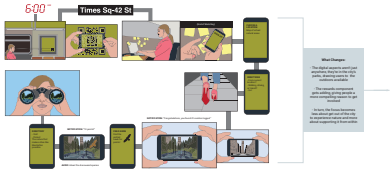
1. Design needs to get people outside, digital nature can't replace the real thing
2. Design must engage the user's five senses
3. Design should be personal and provide something personally beneficial
4. Design's focus should be on doing with nature, not knowing about it
5. Design's engagement needs to feel quick, easy, and novice

PROJECT STATEMENT

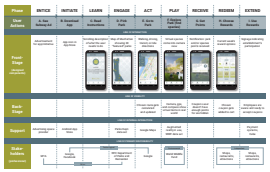
TurRARIUM functions as the center of a **month-long initiative that could be adopted by cities other than New York**. It motivates people (in Manhattan) to interact with the nature already available to them by gamifying the New York City parks system. Users have 30 "featured parks" to choose from, and receive points for visiting them and discovering three at-risk animal species digitally hidden within each one, using the interface's AR. They can redeem points for coupon rewards to eco-conscious shops, restaurants, and attractions in the city. Users support the environment by bringing their business to these establishments (instead of less conscious ones), and the interface does more than just connect them to these places, it provides them with opportunities and incentives to actually take advantage of what they offer.

VALUE PROPOSITION: Useful regardless, and flexible
- Game play aside, TurRARIUM can be used as a resource for the NYC Parks System, which doesn't have an app, and a tool to find environmentally ethical options in the city
- The parks and animals can change month to month, ex: the following 4 weeks could include parks outside of Manhattan (in the other boroughs) and dinosaurs
- Participating businesses choose their own promotions, whatever deals they're comfortable for them

INITIAL STORYBOARD

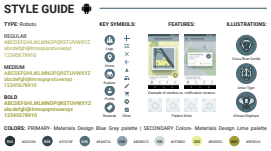


FINALSERVICE BLUEPRINT

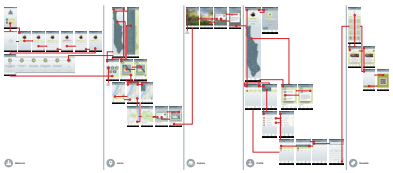


PROTOTYPING & TESTING PROCESS

STYLE GUIDE



FULL WIREFRAME



GAME PLAY

SCHOOLS OF DESIGN Hadley Allen