

IXD 330 - How to Improve Handicap Accessibility at CCE Farm

Marc Caceres, Luis Cepeda

Problem Statement

A large problem the Cornell Cooperative Extension Suffolk County Farm has to contend with is how to give handicapped people greater access to their farm and all of its activities. Currently, many physical barriers prevent handicapped people from learning and enjoying the variety of programs CCE has to offer.



Pain Points

Since our goal is to provide increased access to zones that are currently difficult to reach for people who don't have full mobility control over their bodies, it's important for us to go over some of the specific pain points such individuals might currently have at the farm so we can address them.



Pain Points

Hard to reach animal pens

Some animal pens are in hard to reach locations away from main paths.

Bumpy and uneven pathways

A lot of pathways are too bumpy to comfortably traverse while using personal mobility equipment.

Interior obstacles

Some buildings have interior obstacles that impede personal mobility equipment.

Distance fatigue

Large distances between important locations on the farm can cause fatigue.

Clogging mobility equipment

Some locations on the farm can become muddy and clog personal mobility equipment.

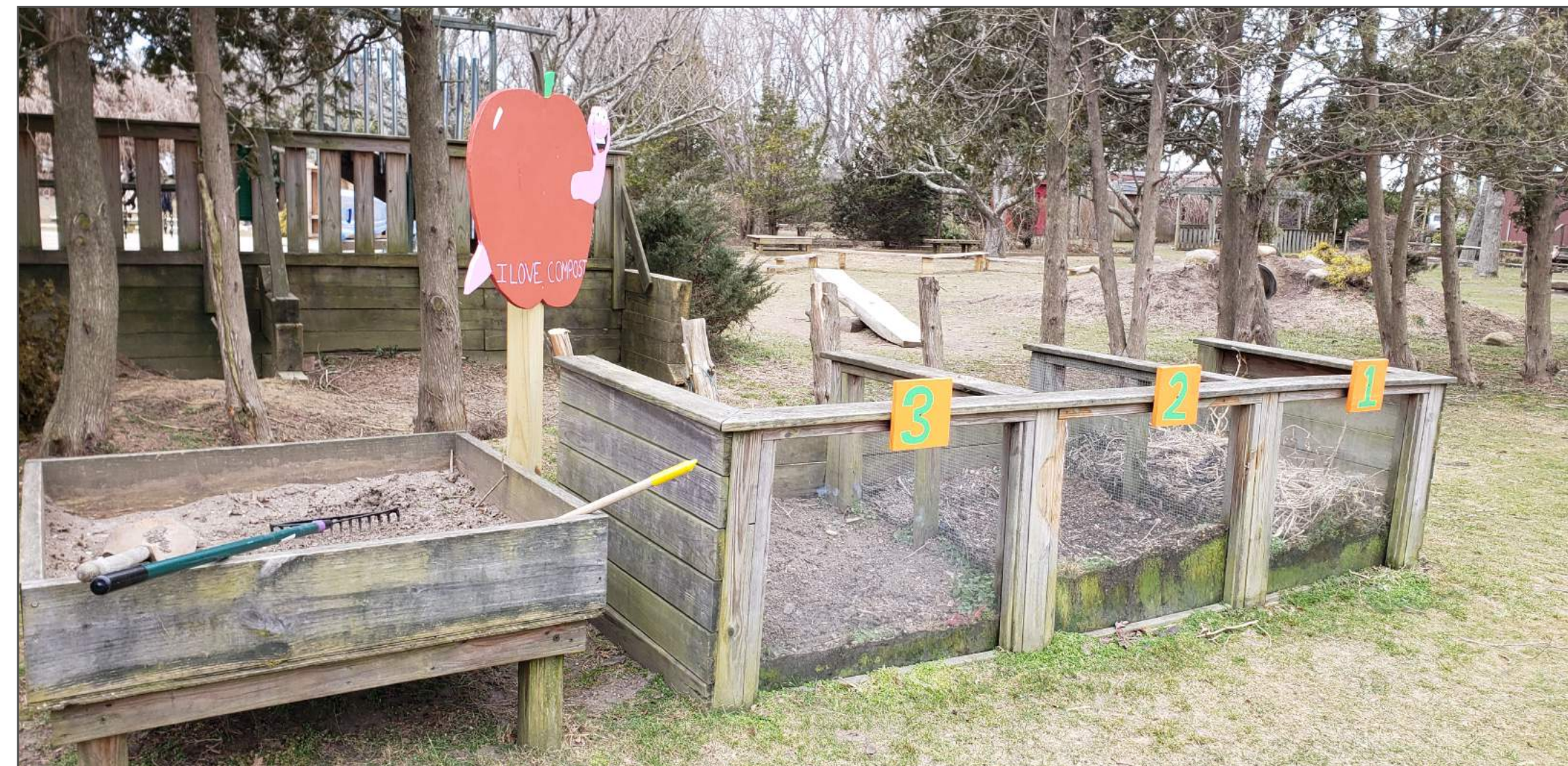


Value Opportunities

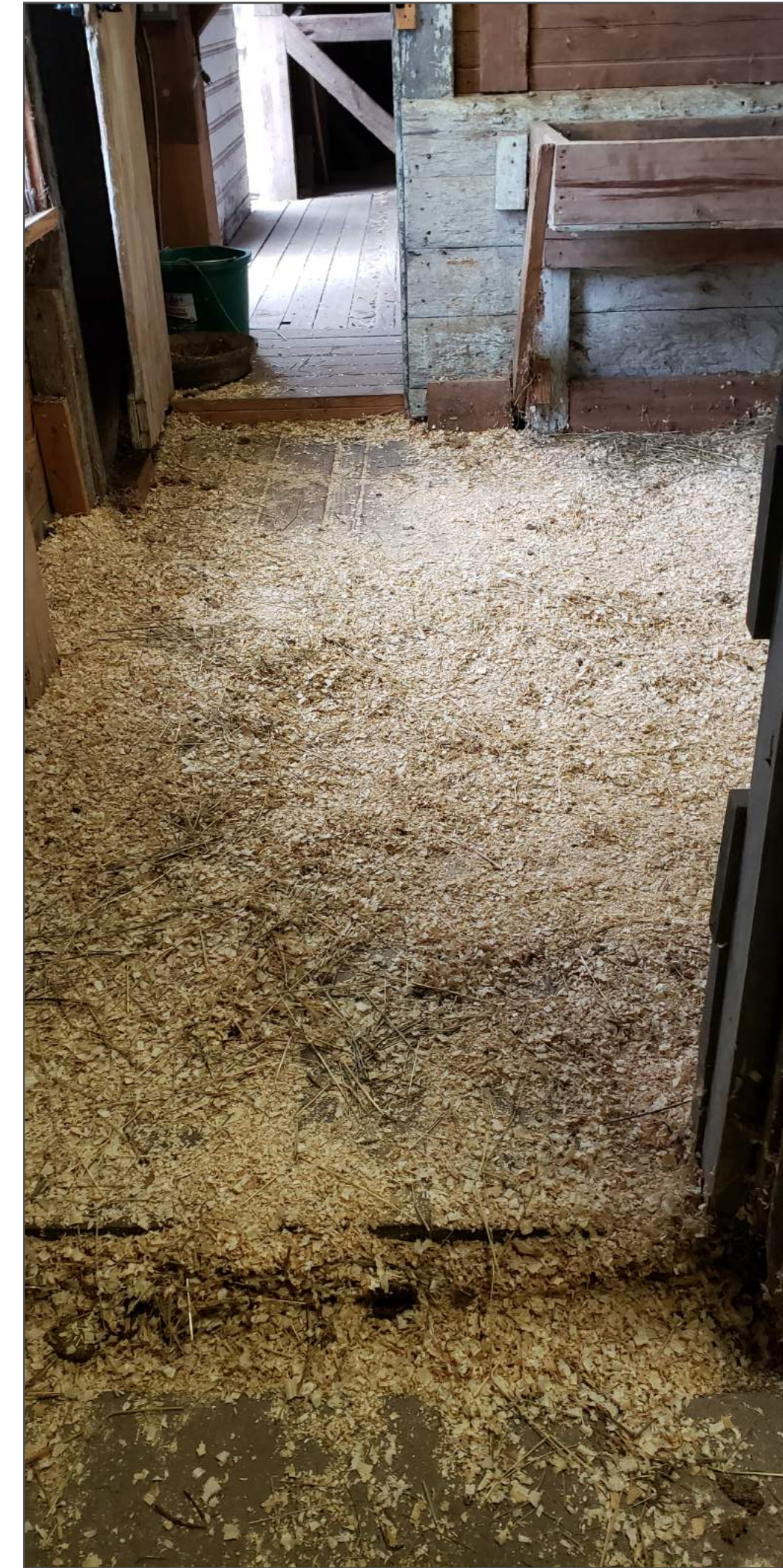
We have the unique opportunity to design especially effective experiences to help alleviate the stated problems since CCE is planning upgrades to its farm and visitor center. This allows us to implement new solutions that can be incorporated into the new construction. By visiting the farm we have been able to gain good insight into the needs of CCE and the individuals that visit their farm.



Additional Target Location Surveying



Additional Target Location Surveying



An ideal means of acquiring data on our target audience would have been to conduct interviews and distribute anonymous online surveys to individuals with mobility impairments that might have had an interest in visiting the CCE Suffolk Farm. Unfortunately, COVID restrictions have limited these opportunities and forced us to gather data via other means.



If given the chance to distribute a survey to our target audience the questions would have been as follows in this link:

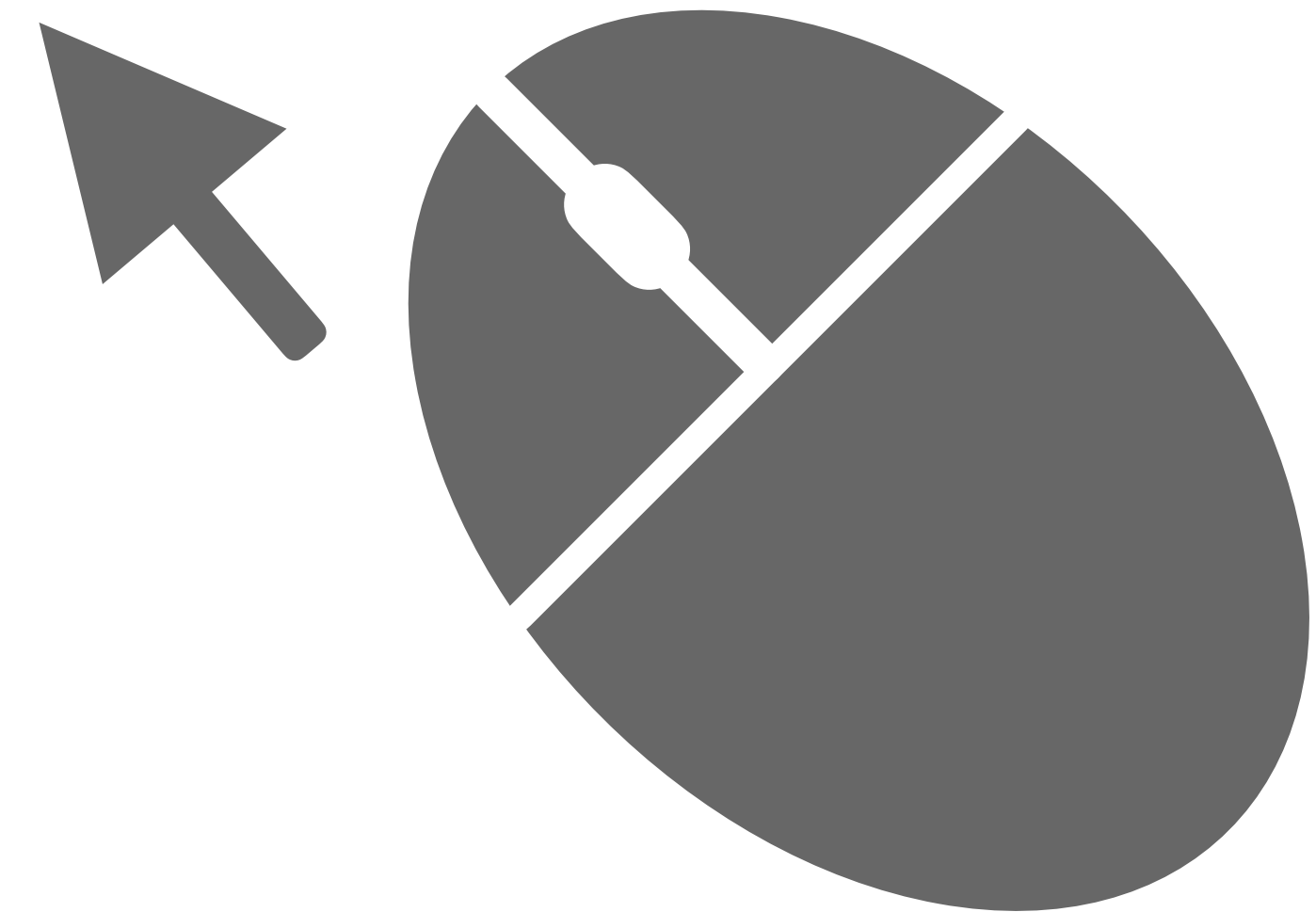
<https://forms.gle/BbFwqHmyYFZhM5gq7>



Since first person data collection was hampered by the aforementioned restrictions, internet based research was used to supplement missing information about our target audience.

Researching what issues regularly affect people with handicaps in other locations around the world helped give us a better idea of the problems we needed to solve.

Additionally, viewing the ADA site's requirements for mobility access helped give us insight on what needed to be designed.



Extant Accessibility Issues Elsewhere

The CCE Farm isn't the only place where people with mobility impairments may face issues getting around. Many places that we take for granted can be everyday challenges for people who are handicapped.

Some examples where lack of handicap access impedes normal life for people include:

Outdoor nature locations like parks and trails.

Grandfathered historical buildings.

Venues with dense visitor population.

Locations where handicap access features are misused by people who don't need them.

Places that lack adequate resting spots.

Tight corridors where mobility assistance equipment can't function easily.



The data acquired via these methods was used to discover the pain points of our target audience and build personas based around this. These personas give a general idea of who our audience is and how we should go about tackling their problems. This helps us focus our efforts into more valuable solutions for the accessibility problems at the farm.





Adventurous Allison

Age: 29 | Long Island, NY

Although Adventurous Allison has had to use a prosthetic leg all her life, she still tries to find new places to experience as long as she can safely navigate around. Having to walk a lot can make her tired so she likes places where she can sit and rest when she needs to.

Goals:

Allison wants to find new places to explore that won't tire her out.
She wants to have new experiences to entertain herself.
She values her independence and ability to move herself around.

Pain Points:

Long walking distances can cause leg fatigue.
Not being able to move herself around frustrates her.
Gets annoyed if something tampers with or snags her prosthetic.

Motivators

Entertainment
Adventure
Learning New Things
Defying Disability
Making Friends

Behaviors

Allison will find new places to visit from social media posts her friends make.
She will research a location's layout before visiting to see if there's places to rest.
She will sometimes refuse help moving around.

"I love finding new places to explore as long as I can get around in these spots"

Empathy Map

Says

- "I don't let my prosthetic get in the way of living a full life."
- "I want to help others like me feel free and independent."
- "In everyday life I hardly feel any different than my peers."
- "I try to look on the bright side of things when something's got me down."

Does

- Will challenge herself to go somewhere new and exciting even if it sometimes makes her tired.
- Tries to ignore her limitations and live a normal life.
- Advocates online for new tech that helps handicapped people live fuller and more active lives.



Adventurous Allison

Thinks

- "Sometimes I may need to rest, but I won't let my legs ruin my fun and where I can go."
- "I appreciate when someone knows I want to be independent."
- "I like when businesses give handicapped people good experiences and choices during that experience."

Feels

- Determined to get the most out of life.
- Frustrated when a physical limitation actually hinders her life.
- Annoyed if someone insists on helping her if she refused the help.
- Happy when she can get immersed in a place she's exploring.



Efficient Emily

Age: 25 | Long Island, NY

Efficient Emily has been paralyzed from the waist down her whole life, but she is still determined to make the most out of life despite her limitations. She is a Junior in College and prefers planning things in advanced.

Goals:

Emily wants to have a job closer to her home to save time and money.
She wants full independence despite her disability.
Wants to fulfill any steps needed for independence as quickly as possible.

Pain Points:

Long distances between home and other places are time consuming.
Lack of ramps in certain places makes movement more difficult.
Getting strange looks when maneuvering in public places.

Motivators

Achievements
Memories
Purpose in Life
Independence
Efficiency

Behaviors

Emily does her homework as soon as possible.
Surrounds herself with people who aim to better themselves.
She enjoys being outside and in nature.
She is hesitant to receive help moving in her wheelchair.
Can be a perfectionist in her work.

"Life is a journey and I'm making the most of it."

Empathy Map

Says

- “Life is beautiful and I’m going to live it to the full.”
- “I will achieve my goals.”
- “I want to be an example and give hope to other people like me.”

Thinks

- “I need to keep moving, no matter what obstacle.”
- “I need work smarter, not harder.”
- “What route should I take today?”
- “Gotta go hard.”



Efficient Emily

Does

- Plan her route before she leaves the house.
- Make sure she has enough resources in hand in case anything.
- Force herself to go places she needs to go, even if they’re not wheelchair friendly.
- Go to college.

Feels

- Determined to go where she needs to in life.
- Secretly afraid of some limitations her disability inevitably brings.
- Confident in how far she’s come and how far she can go.
- Afraid to make mistakes.

Potential Solutions

3D Mapping

Some handicapped people may be reluctant to visit the CCE farm unless they can be sure the farm can accommodate their needs. A 3D interactive map of the farm they can access from home may alleviate some worries they have regarding this issue.

Dedicated Pathing

A large issue with accessibility on the farm is the gravel pathways connecting the various activity locations. Funding for paved routes is limited, so perhaps dedicated tour paths that are stamped flat can be used in lieu of paved roads. These paths would not permit vehicle traffic to avoid damaging the flat surfaces.

Integration Into Planned Construction

The CCE Suffolk farm currently has plans for new construction in the near future. This gives us a unique opportunity to integrate our design thinking into their desired construction goals. The construction will involve a new visitor's center, and animal pens moved behind this visitor center which can help with easy animal access for handicapped people.

Potential Solutions

Designated Petting Spaces

High fences and other barriers usually found at animal pens might make it difficult for handicapped people to pet and feed these animals. Designated low height windows built into the fence structures can allow these people to comfortably reach the animals.

Centralized Experiences

A zone in which the vast majority of activities can take place. This will prevent people from having to move great distances between each activity. This can prevent fatigue and accessibility issues with terrain on gravel pathways.

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Potential Solutions

Rest Stops

Individuals who need to move around to different locations on the farm may become fatigued from having to travel large distances. Shaded and heated rest stops at key locations on the farm can help give people some respite when they need it.

Learning Modules

If an individual doesn't wish to move very far on the farm but still wants to learn about farming and animals, learning modules in the visitor center can be used. These modules would be panels and interactive activities in a single location that can educate and entertain people about farming practices.

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Potential Solutions

Tour Drones

In addition to 3D mapping, tour drones can be rented out by individuals from the comfort of their own homes. The drones would give an eagle eye view of the farm and provide users an educational experience about the various animals and crop plots they encounter on their tour.

Locator Bracelet

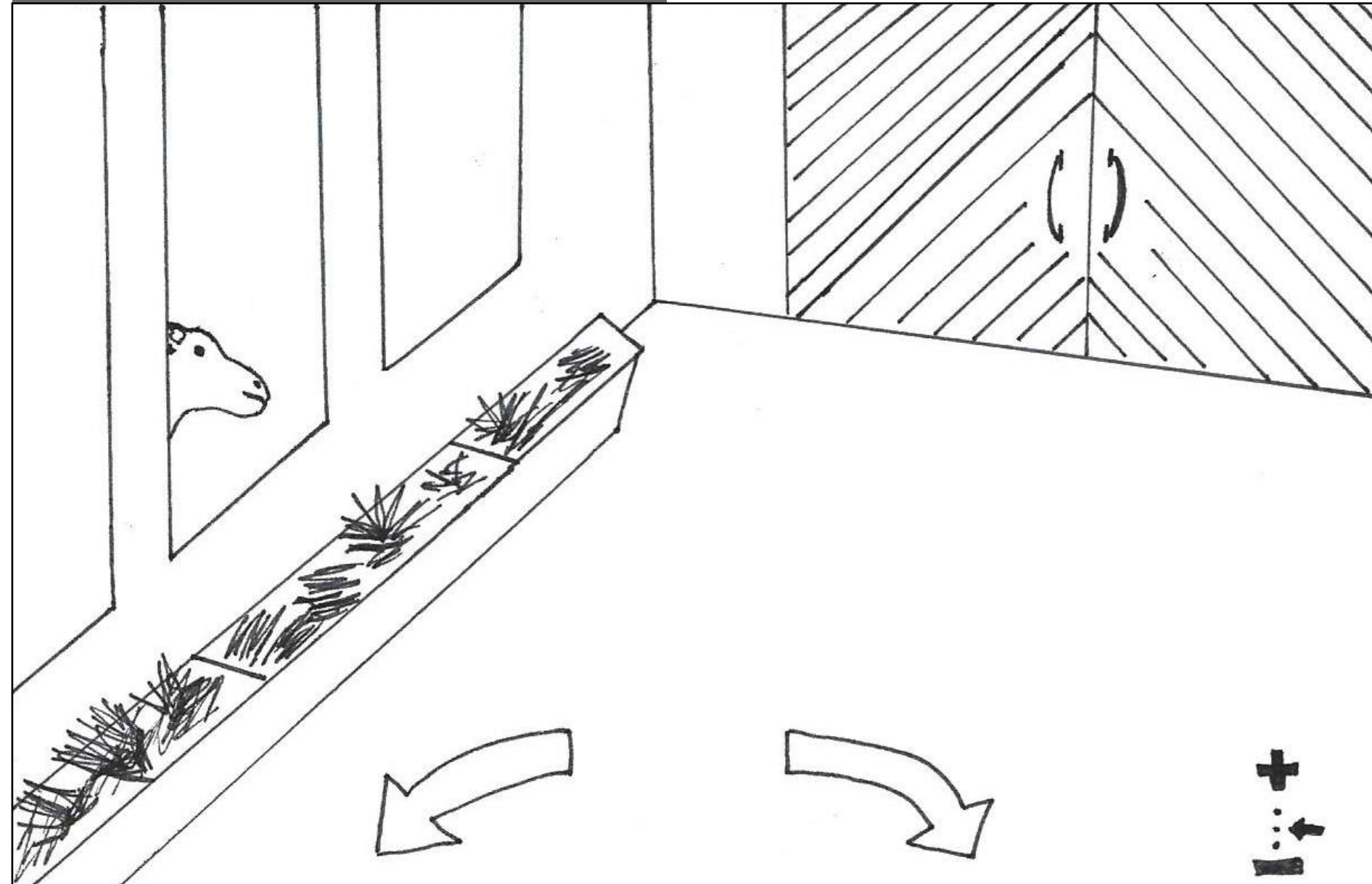
In case of unforeseen emergencies, it's a good idea for people with disabilities, or even anybody with an illness to have a form of getting immediate assistance from farm personnel. With special locator bracelets that allow people to call for help, this can give a feeling of ease and security.

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Ideation Sketches

3D Mapping



A 3-Dimensional interactive map of the farm's interior and exterior spaces so individuals can see that the location is safe and easily accessible for people with mobility impairments.

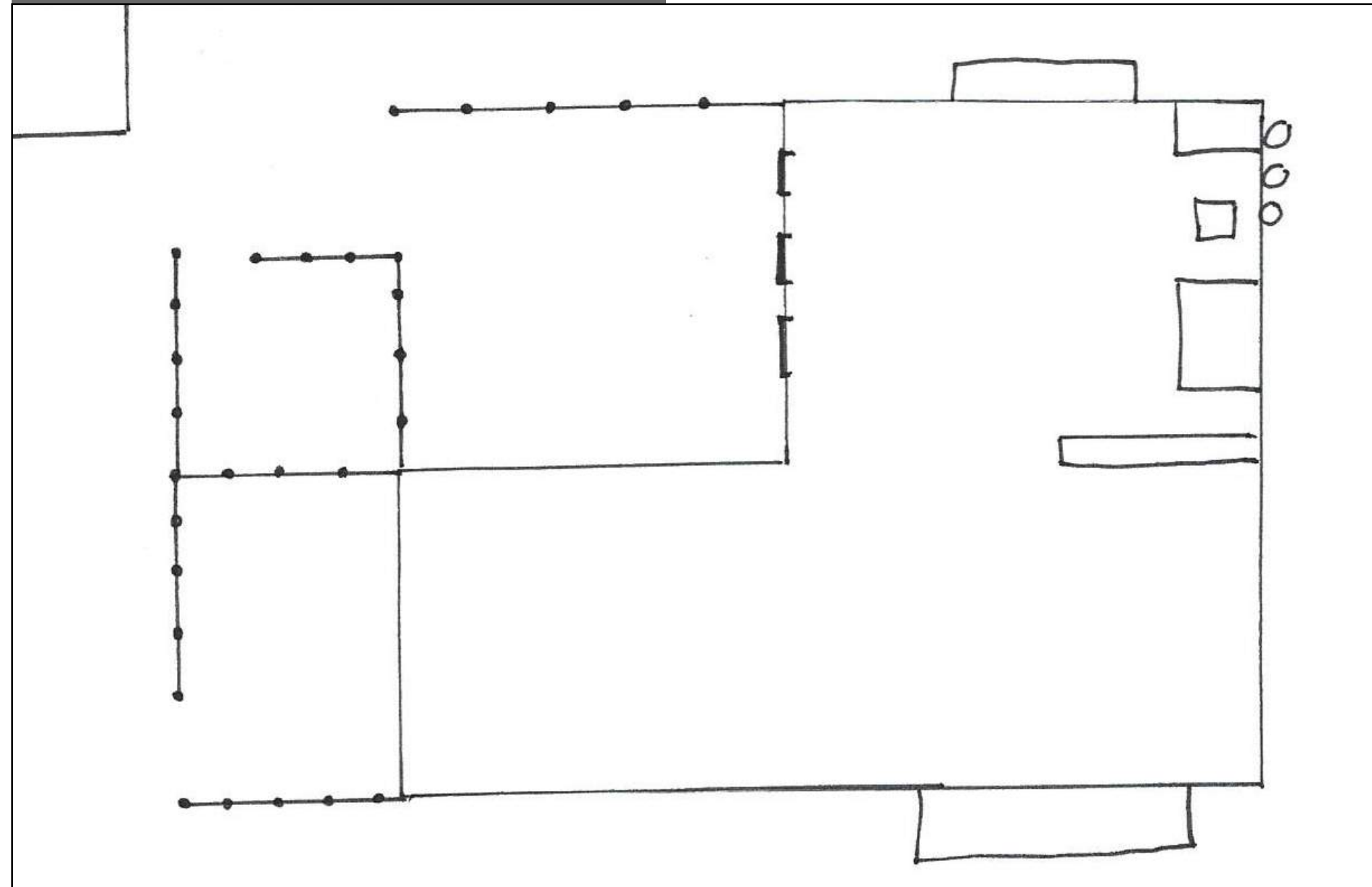
Dedicated Pathing



Dedicated paths that are stamped flat and void of gravel where only pedestrian traffic is permitted. This would keep the path flat enough to easily traverse and prevent the need to pave as many roads at the farm.

Ideation Sketches

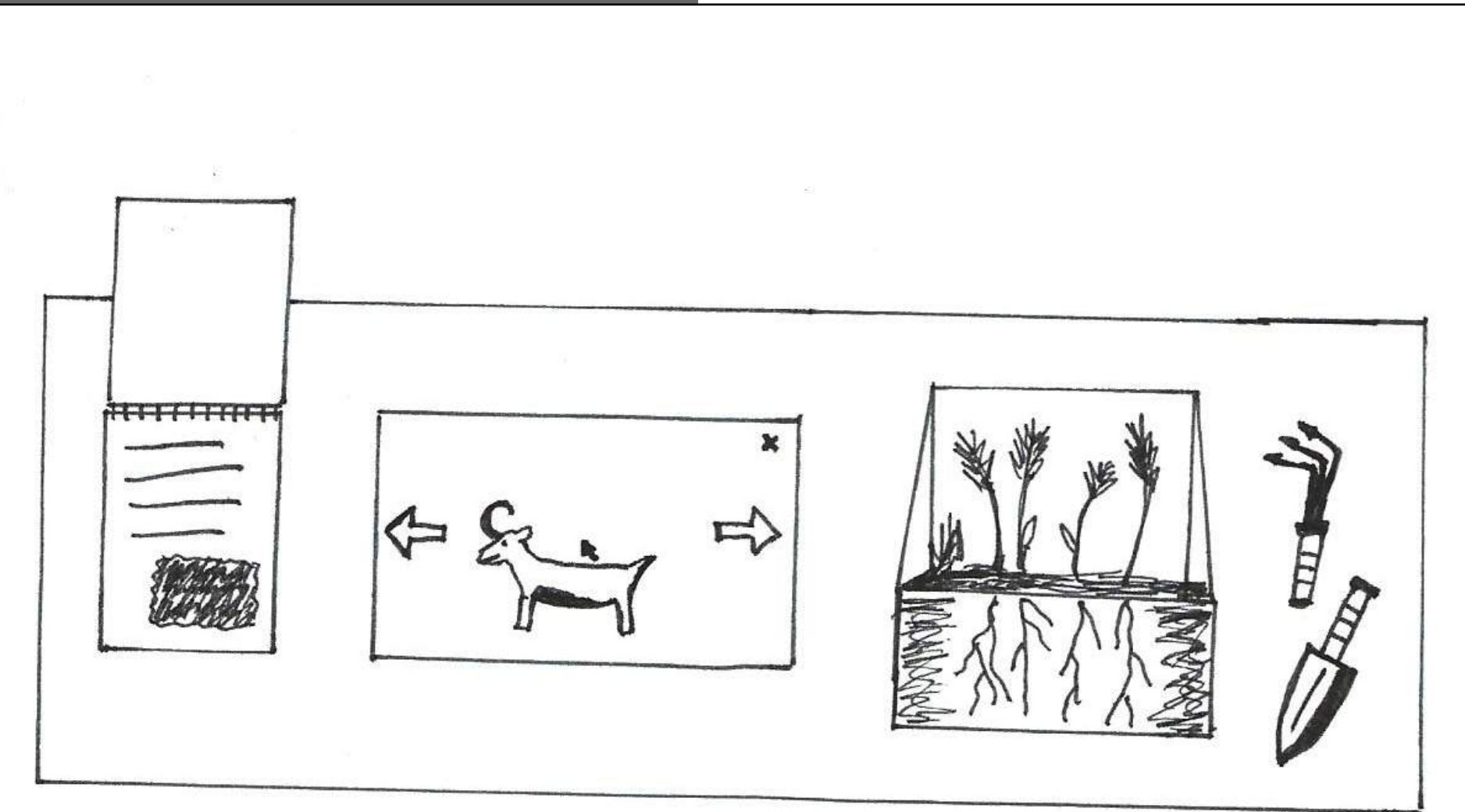
Centralized Experience



New visitor center with external animal pens along its left side.

Top right corner of the center depicts where learning modules and windows to the animal pens might exist.

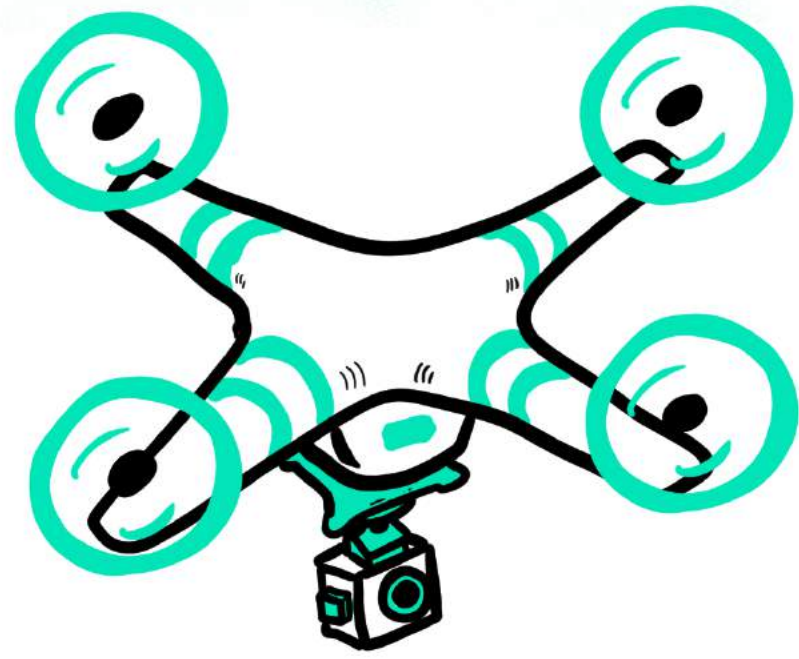
Learning Modules



Learning tables where people at the visitor center can get a mini experience of the farm. Depicted here are texture books, an interactive education game screen, live plants with longitudinal section of the soil, and gardening tools.

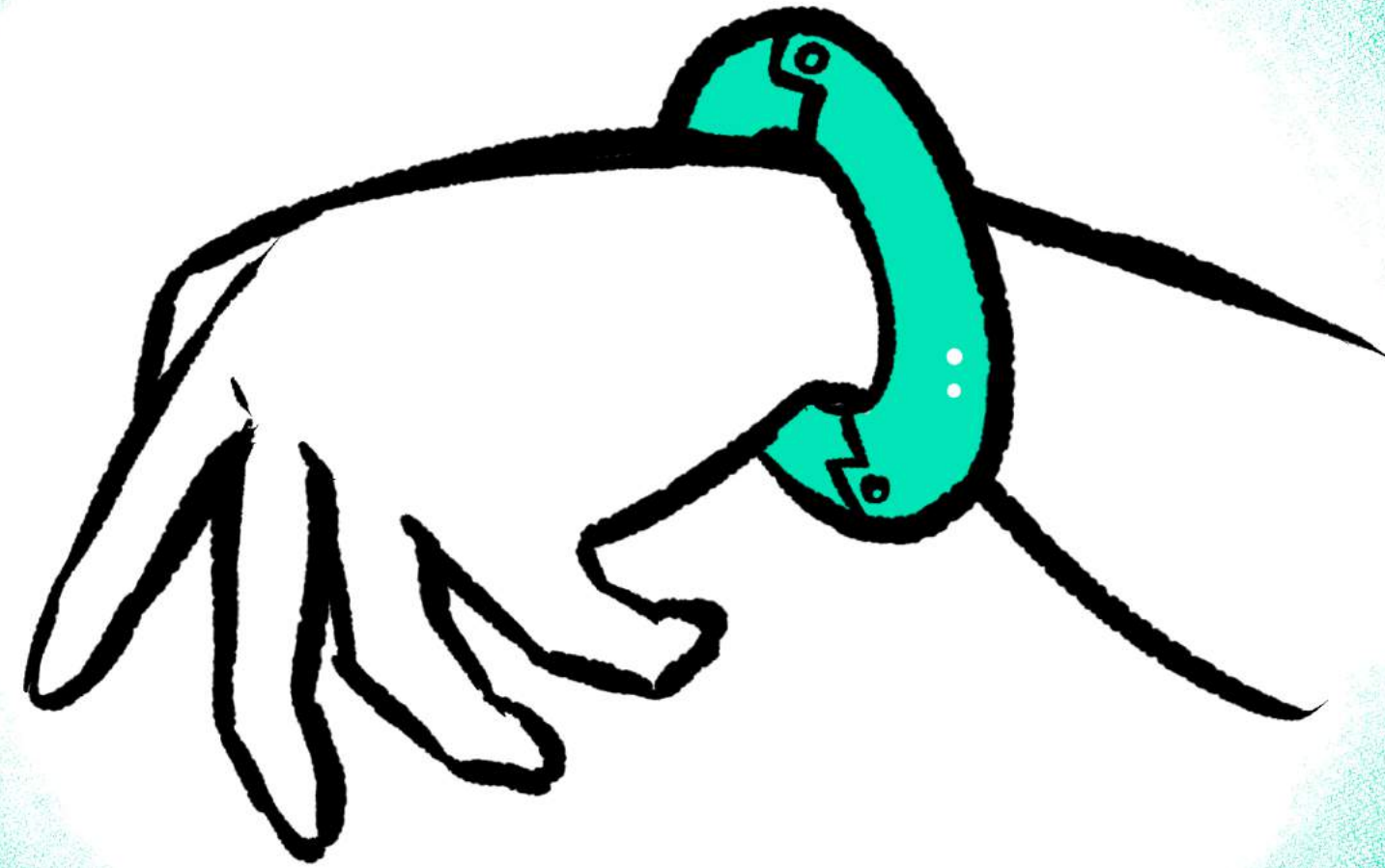
Ideation Sketches

Tour Drones



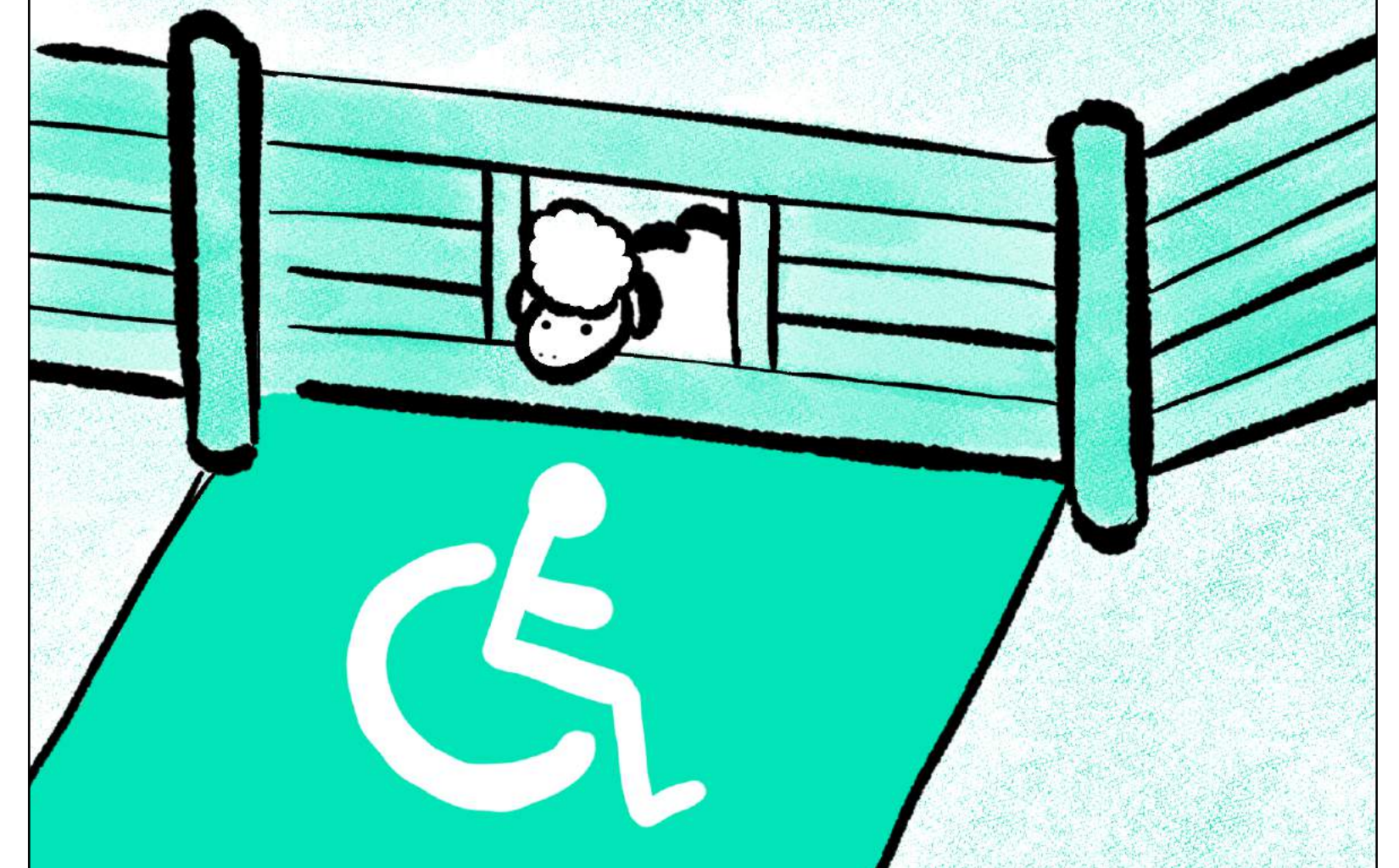
These drones would let people experience the farm live before deciding on showing up. The drones could be rented online and activated remotely.

Locator Bracelet



Locator bracelets would add an extra layer of safety for the visitors of the farm with mobility impairments. These would be totally optional and free of charge.

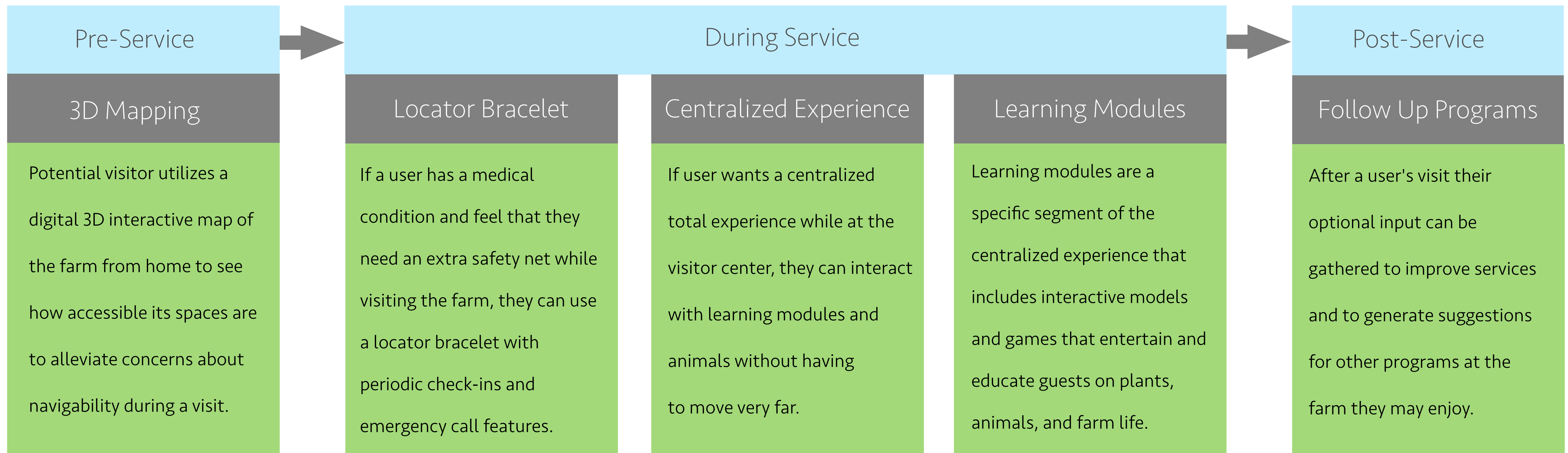
Petting Spaces



Designates petting spaces would give extra personal space to handicapped people and allow them more reachability. This concept can even be extended for small children.

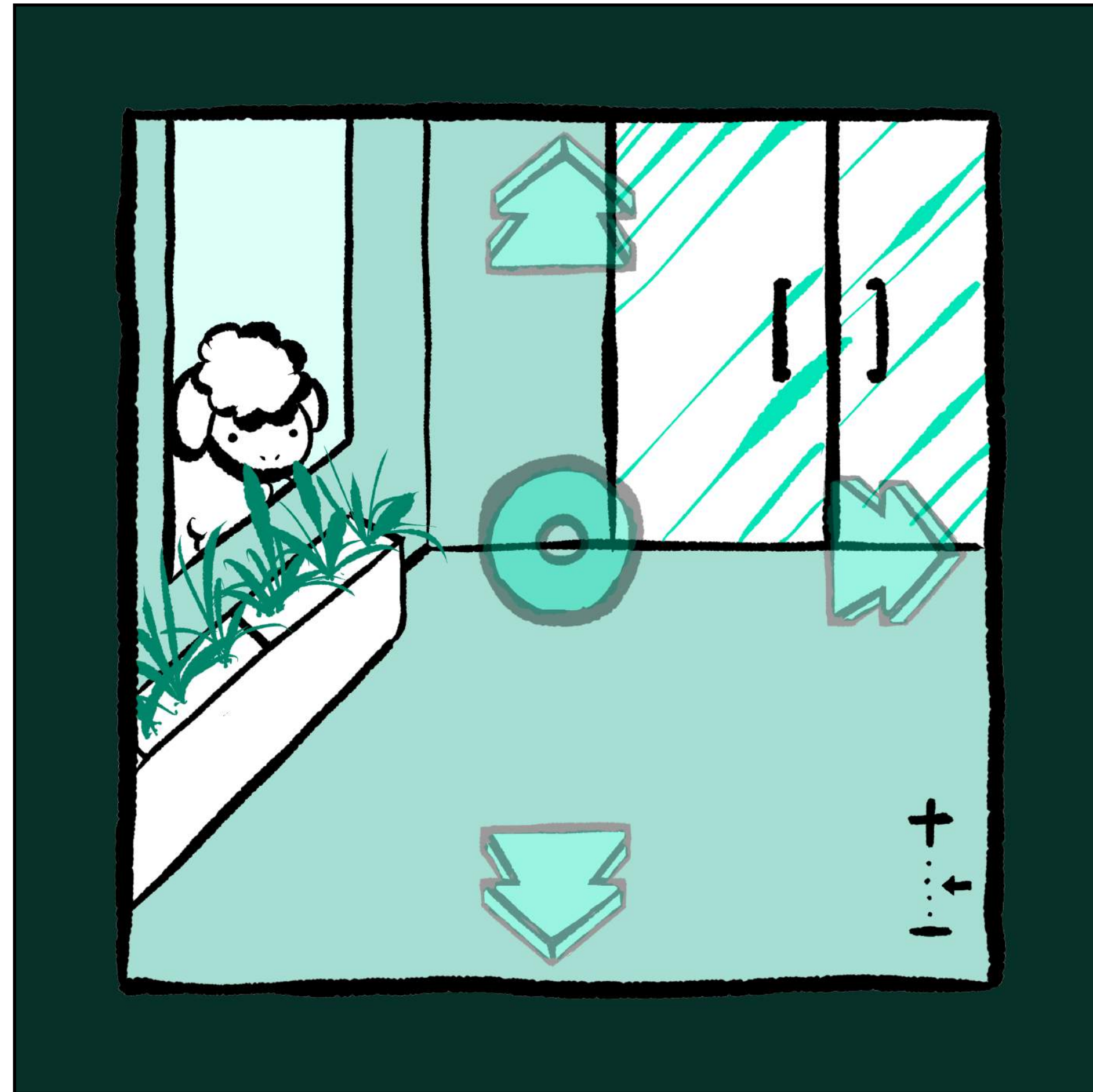
The User Experience - Start to Finish

We have determined five key aspects for a final product that will assist a handicapped user in having the best experience possible while at the CCE Suffolk farm. Each of these product solutions will have a more detailed description of services that can be rendered later on. The five main aspects are broken down into the three phases seen below.

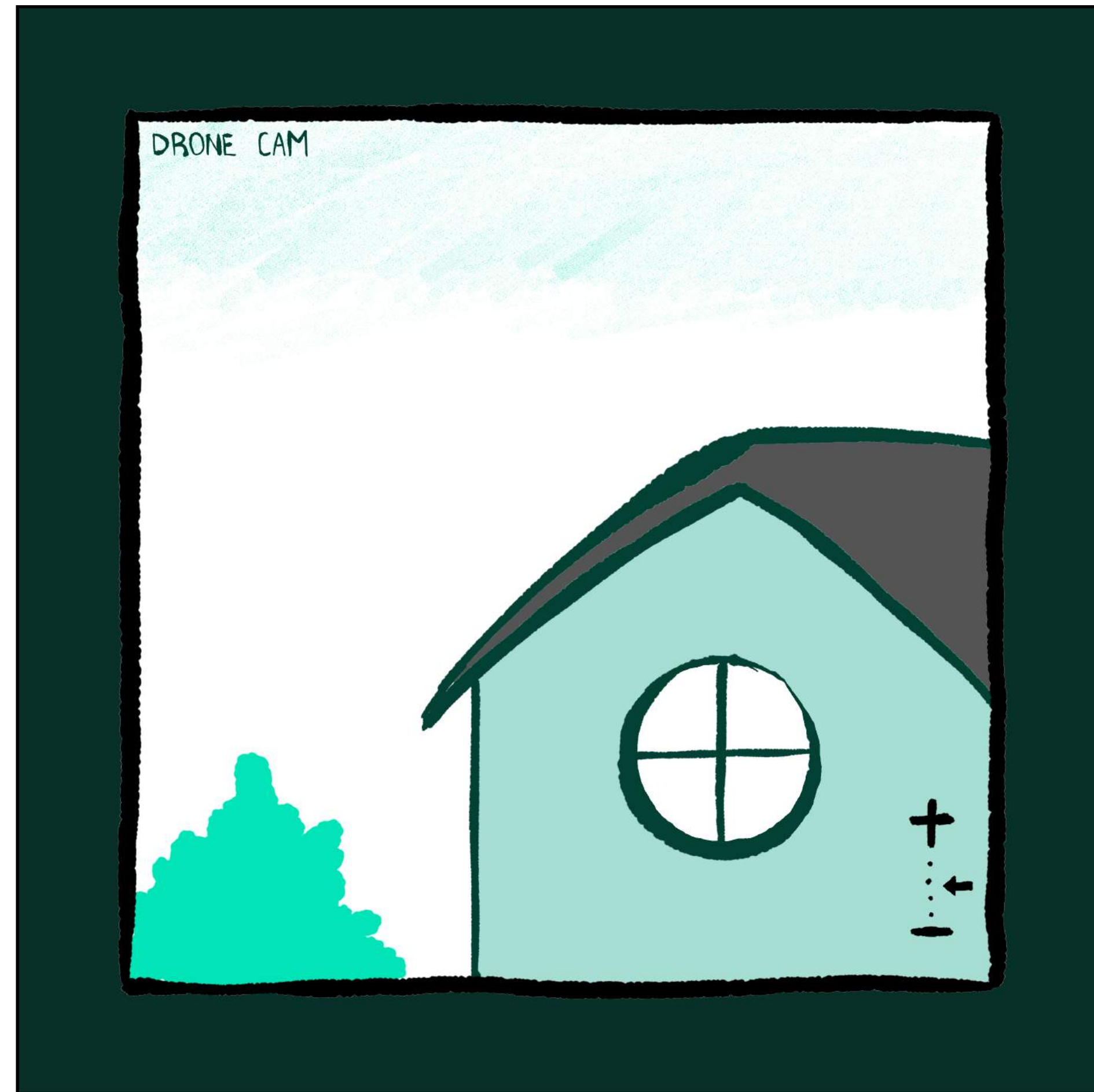




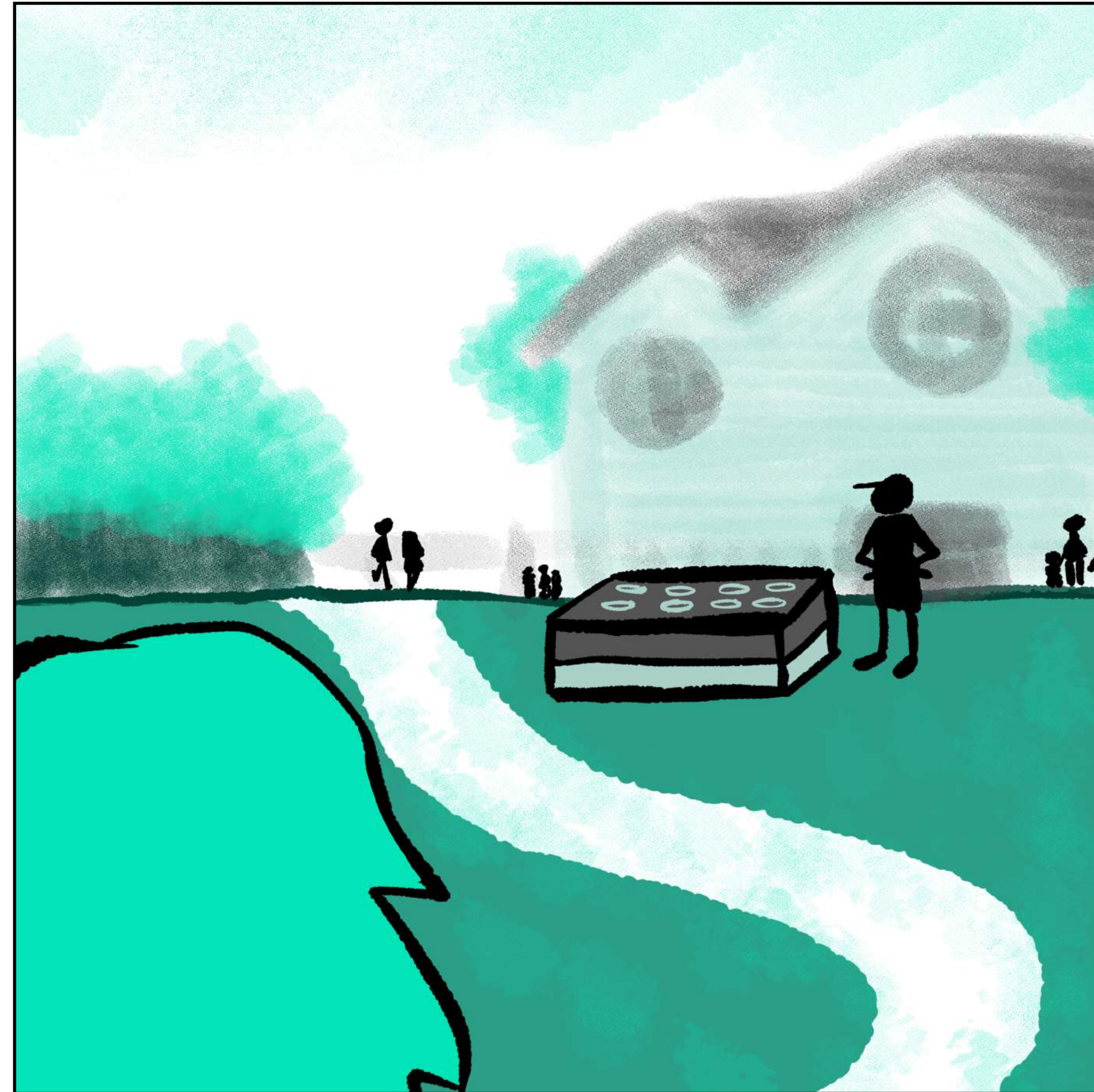
Storyboard: Efficient Emily



Storyboard: Efficient Emily



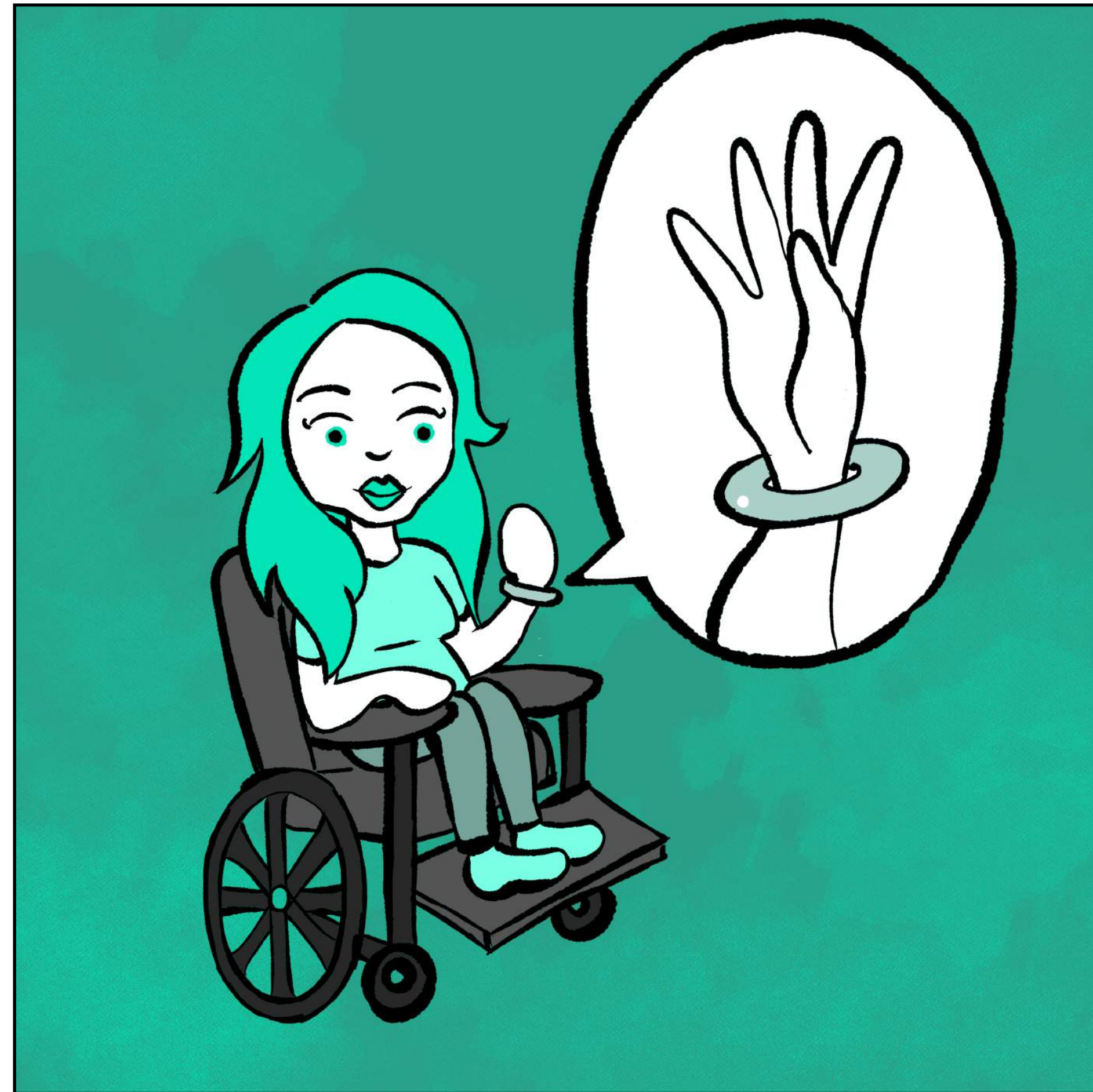
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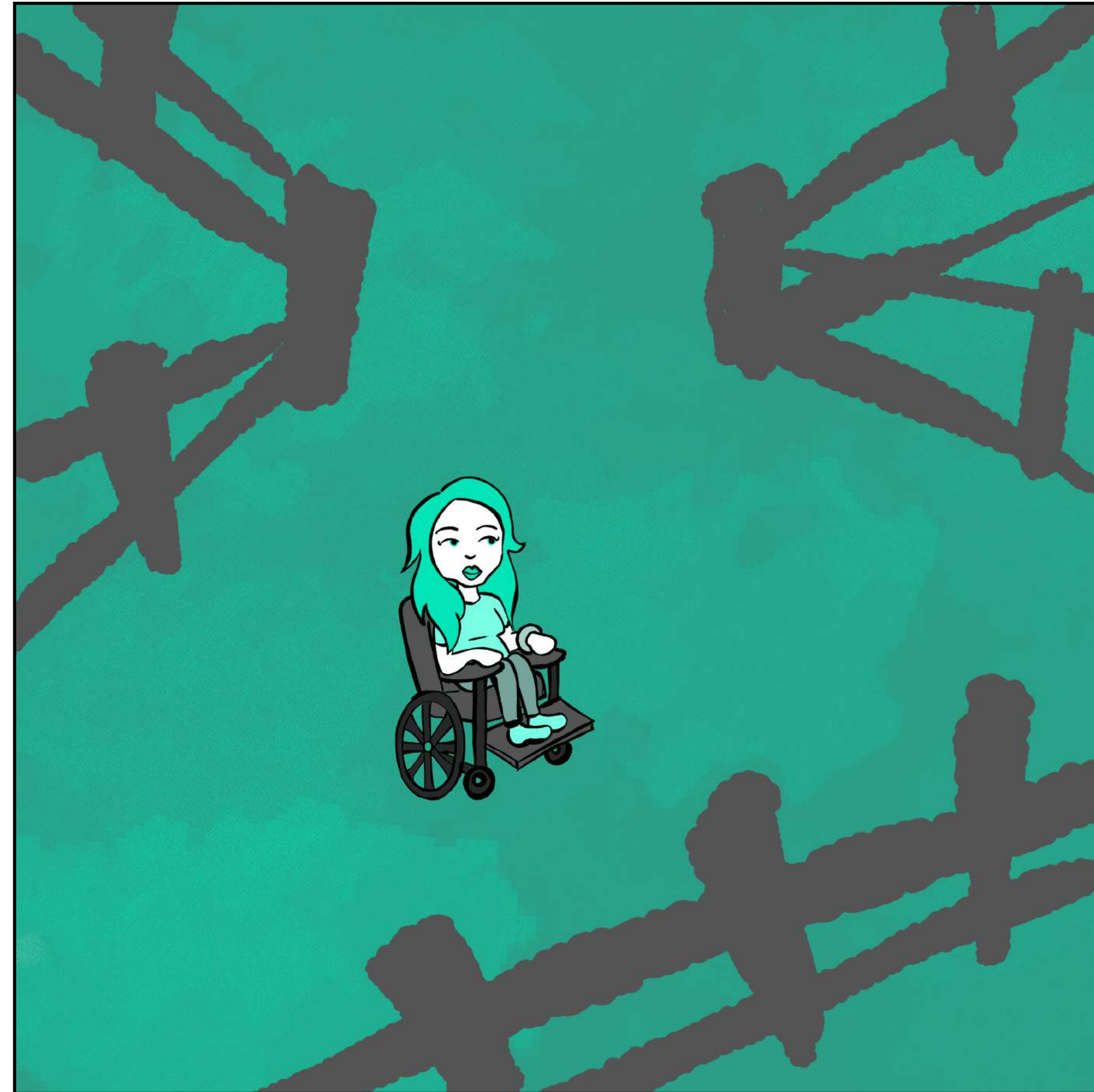
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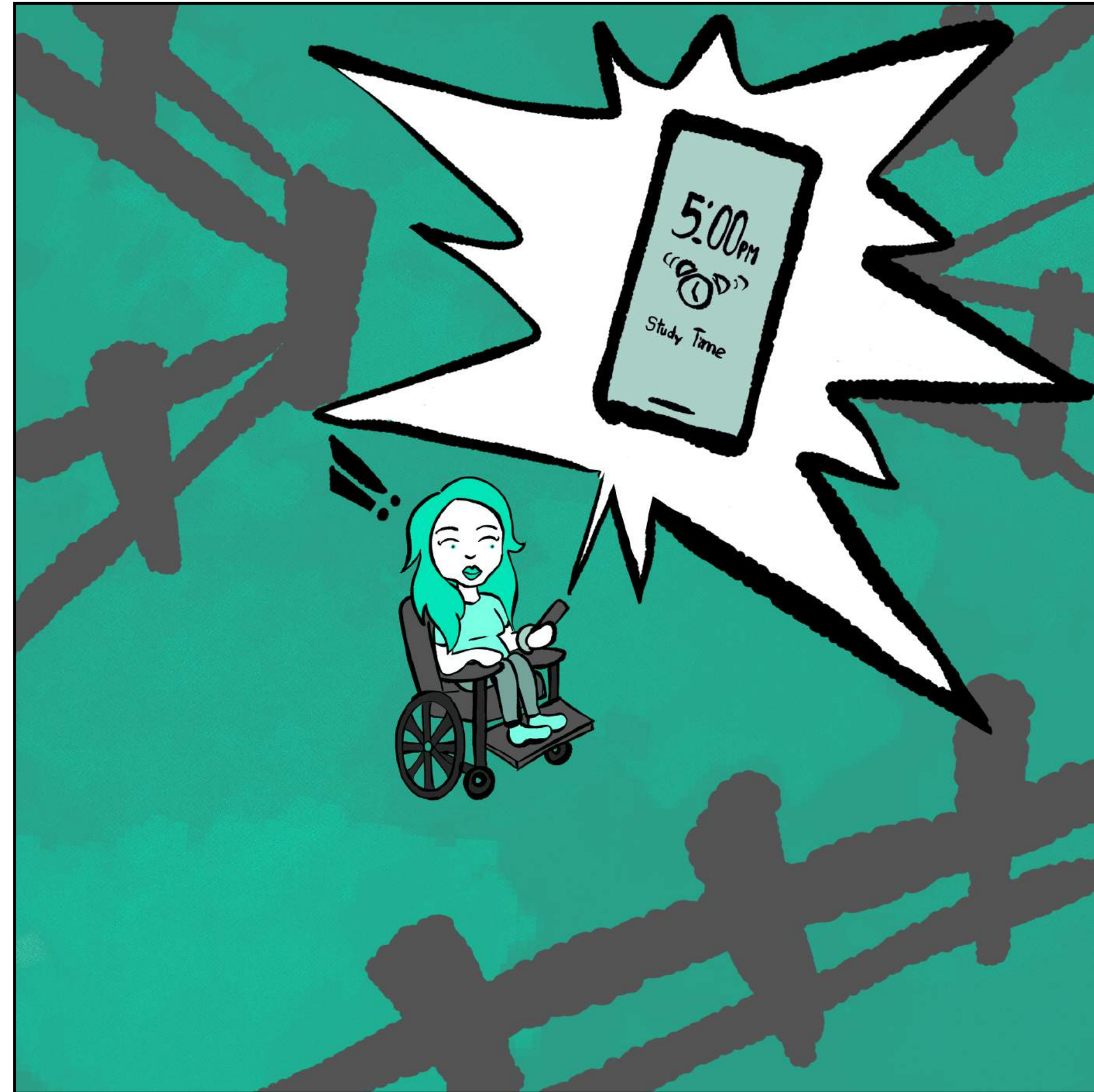
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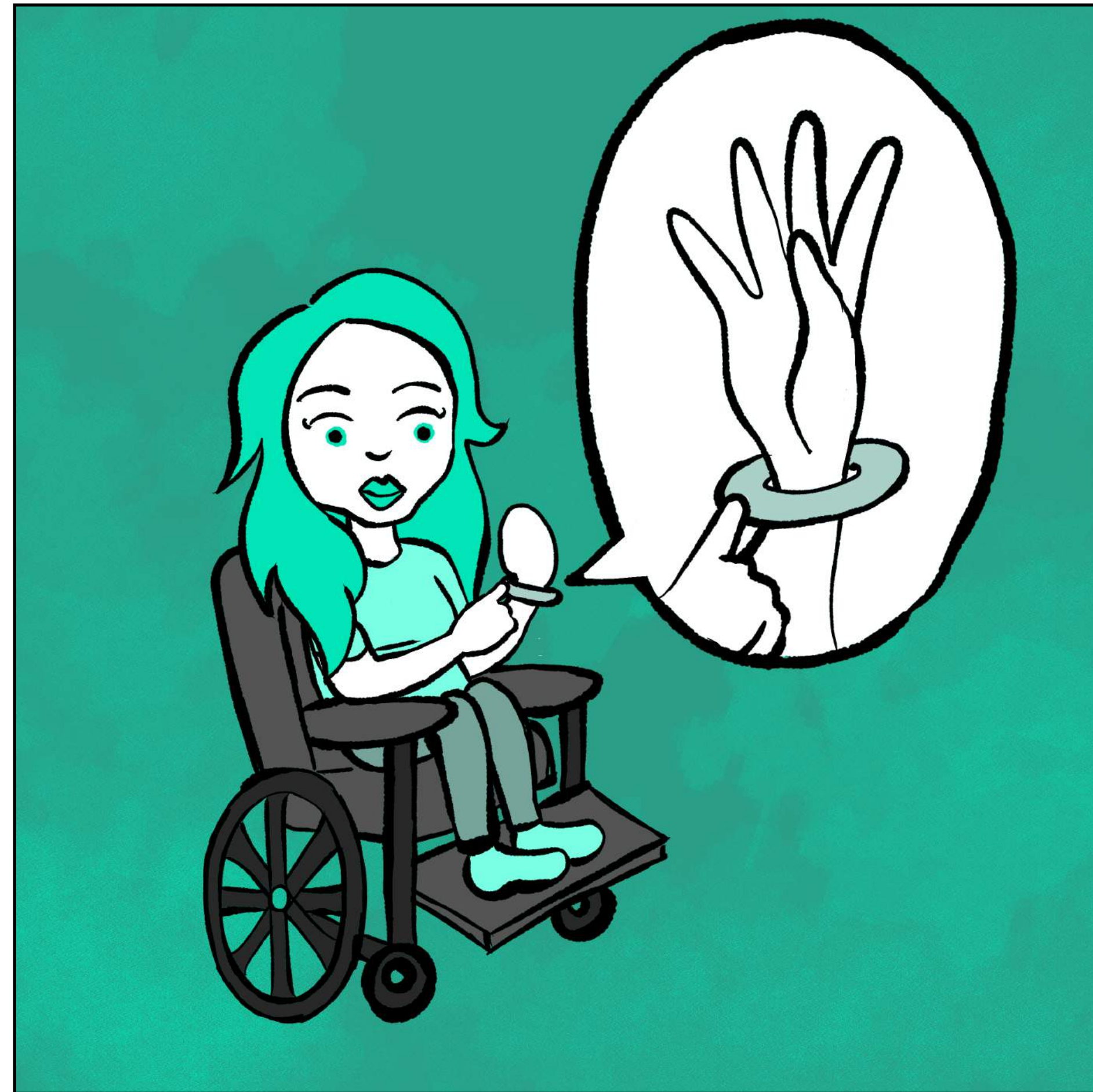
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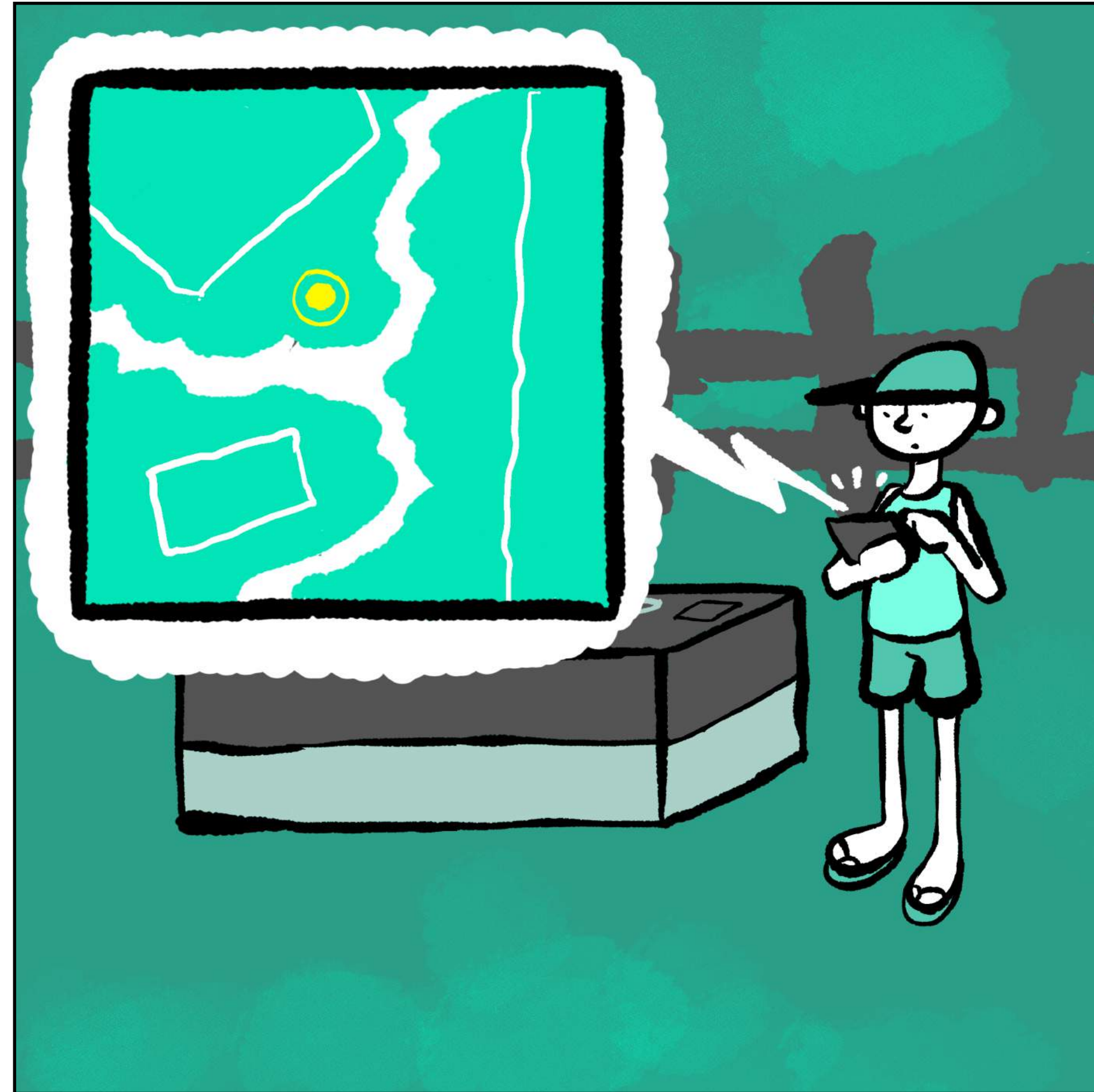
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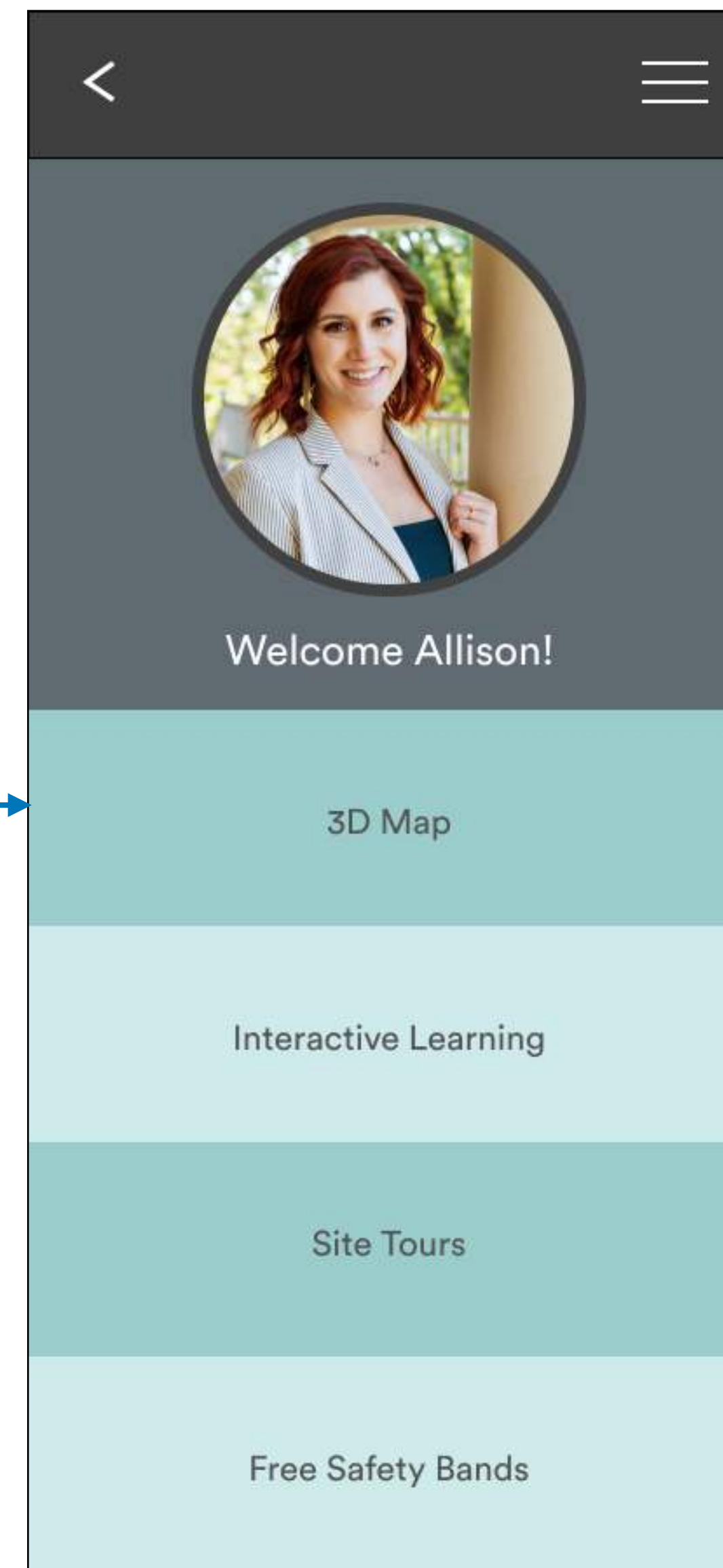


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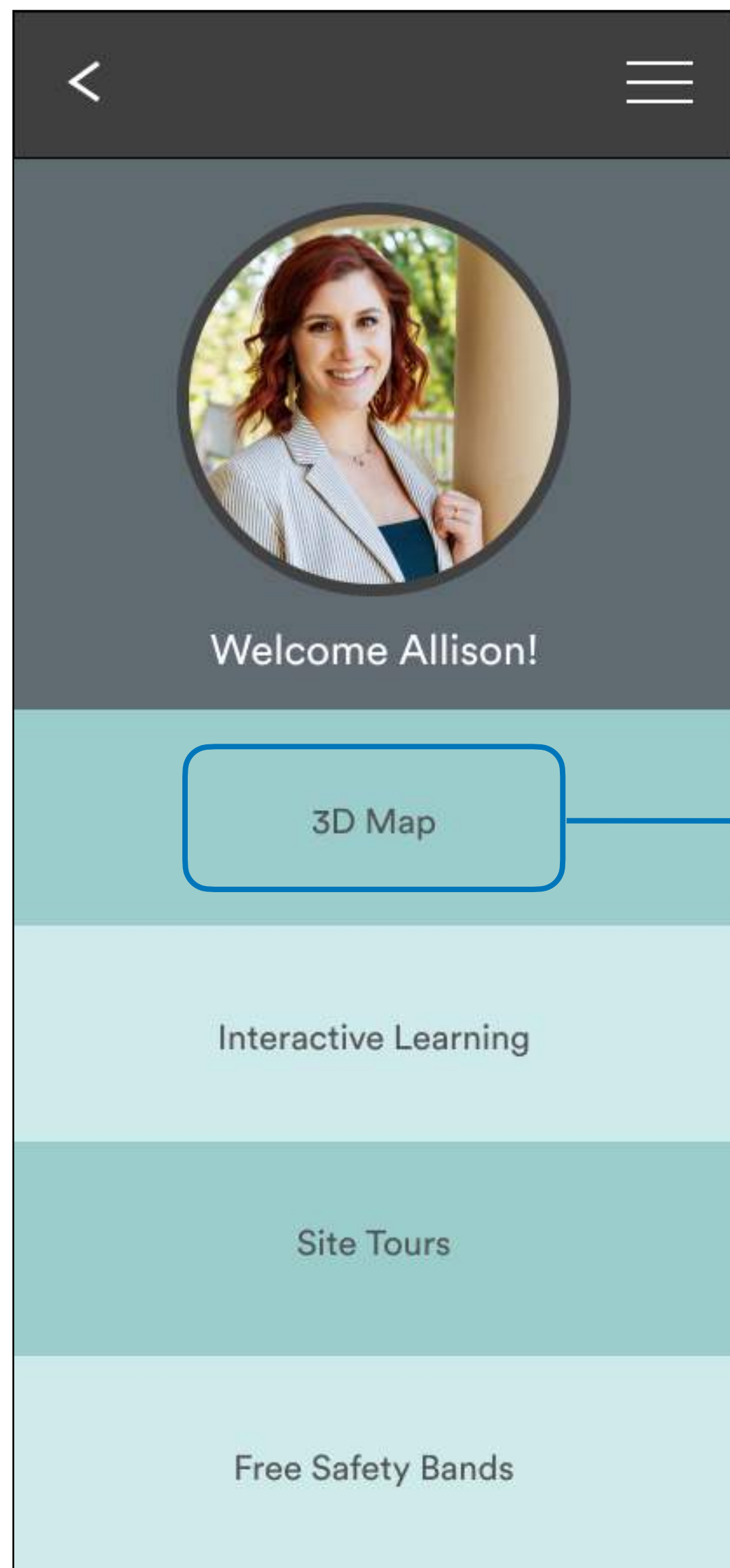


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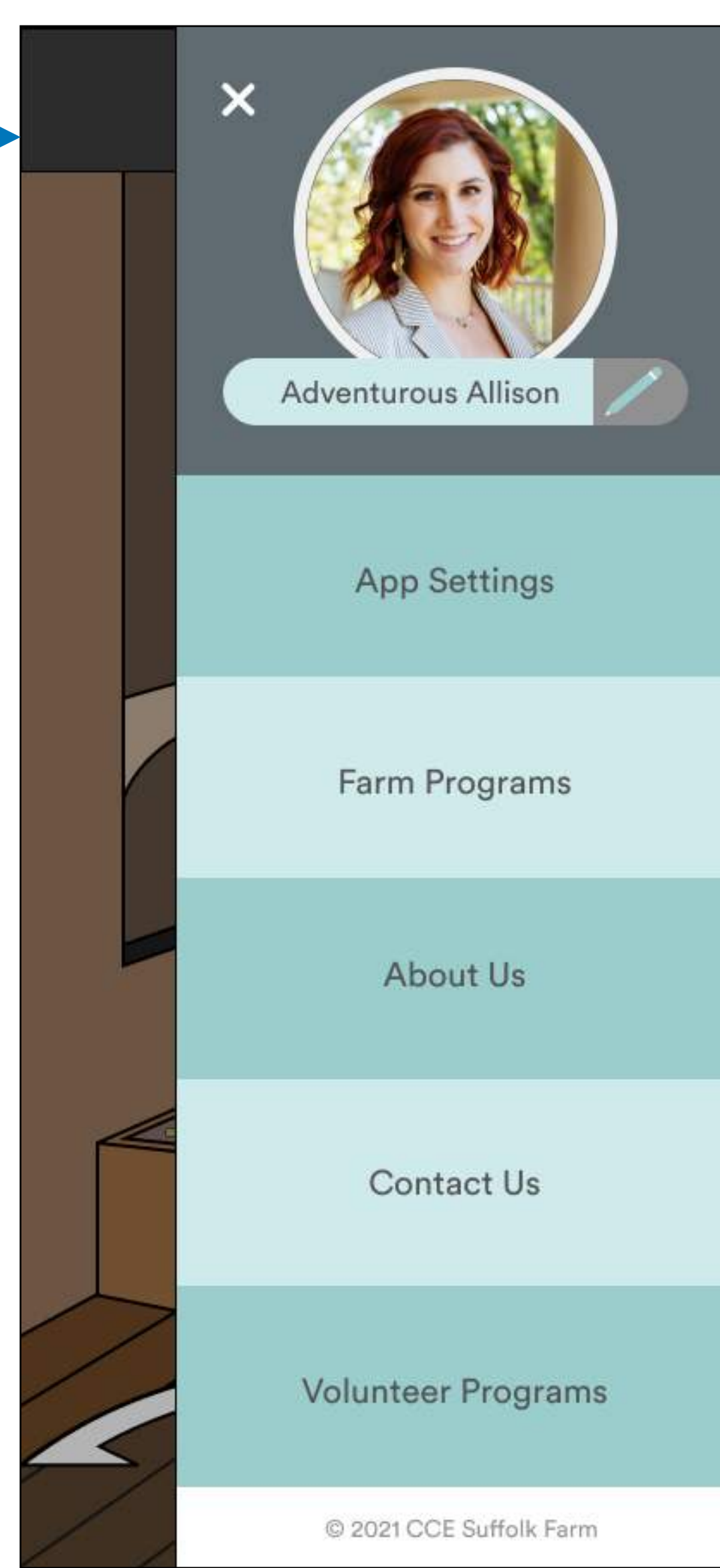
High Fidelity Prototypes



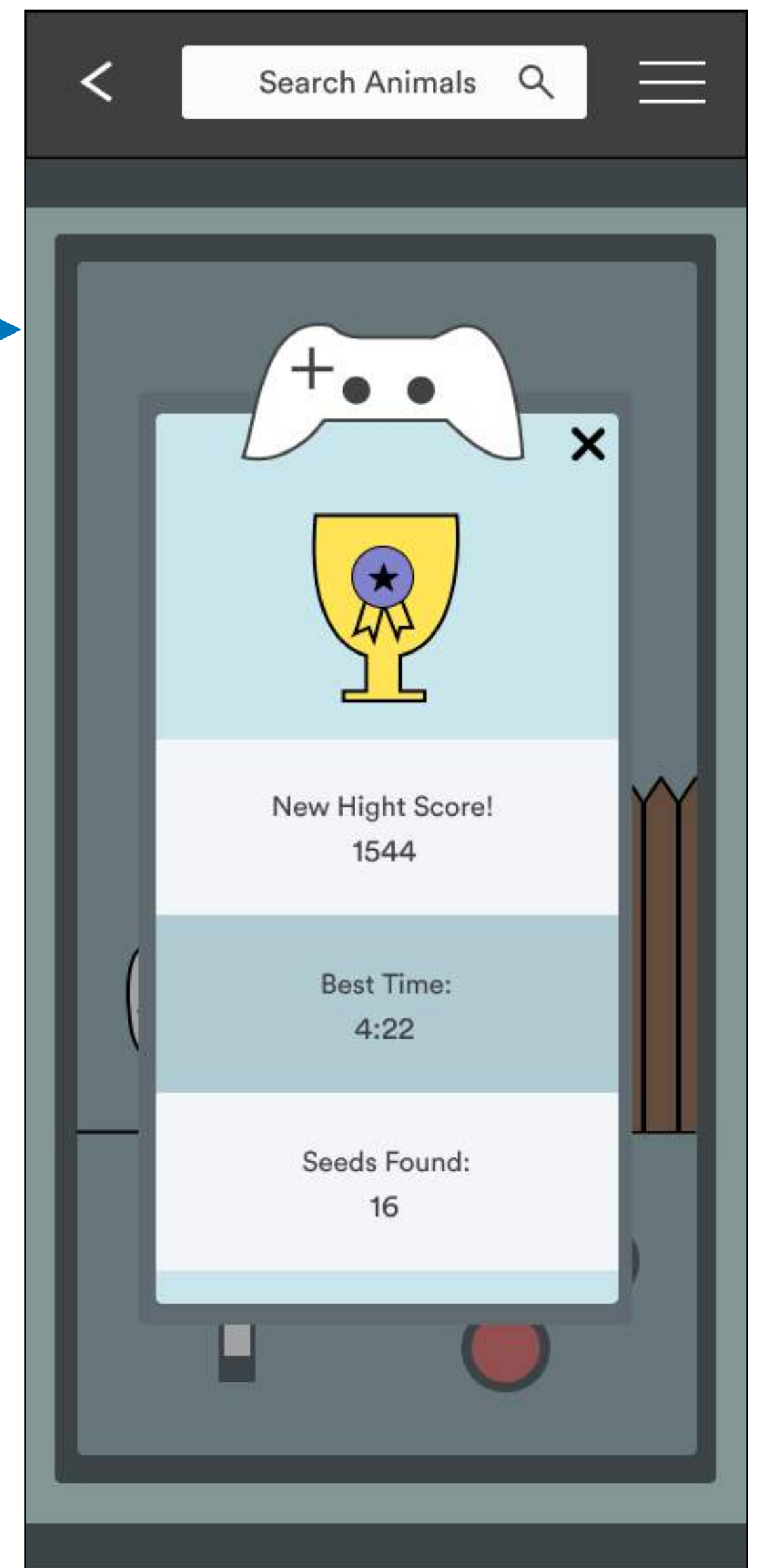
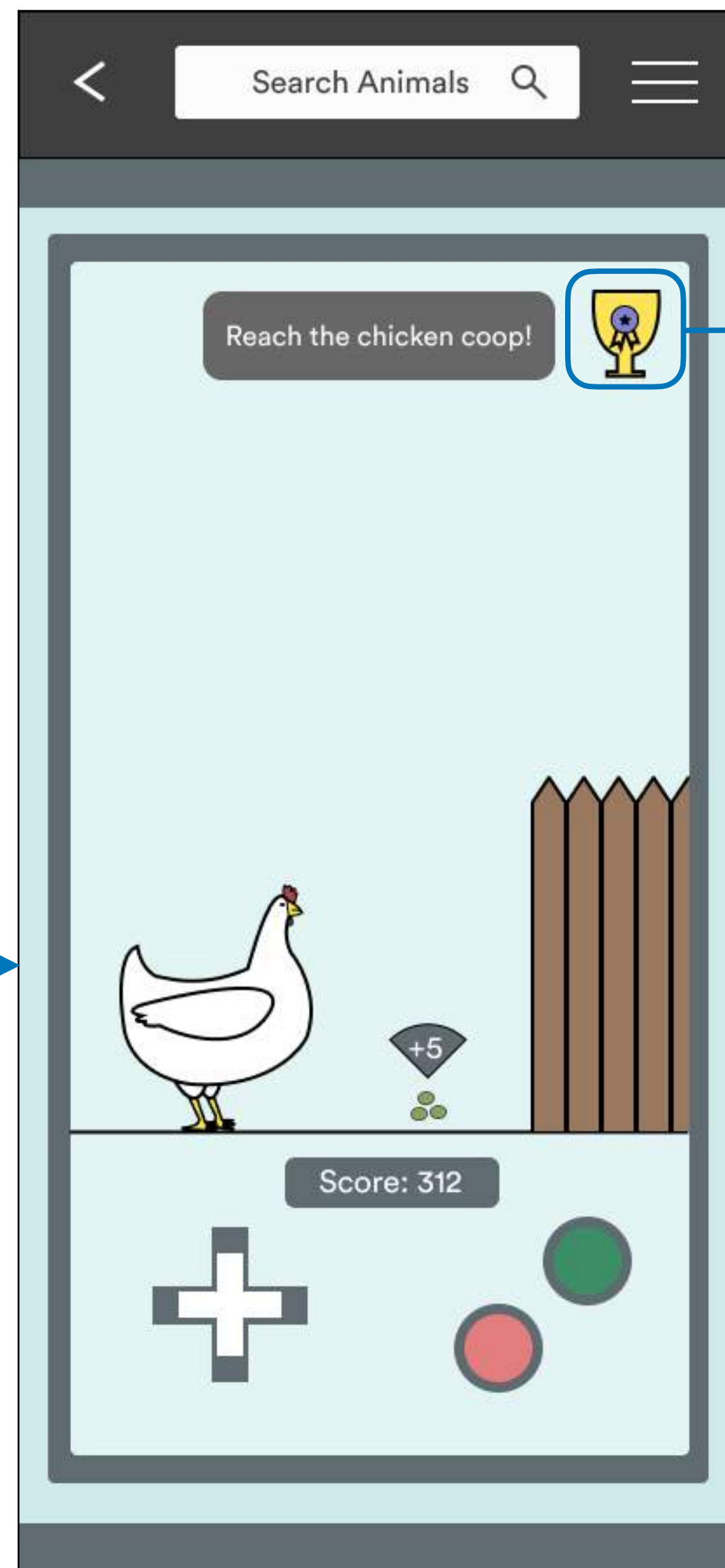
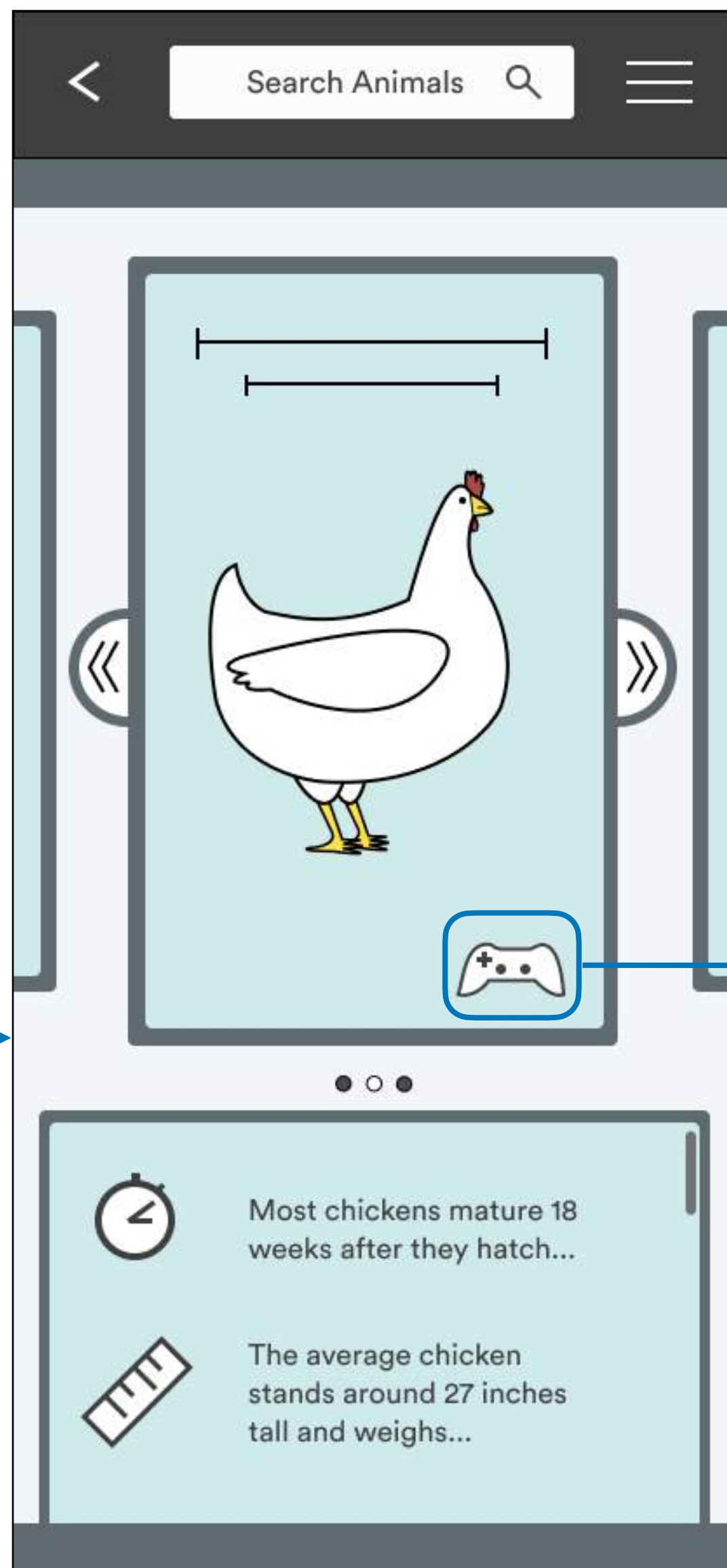
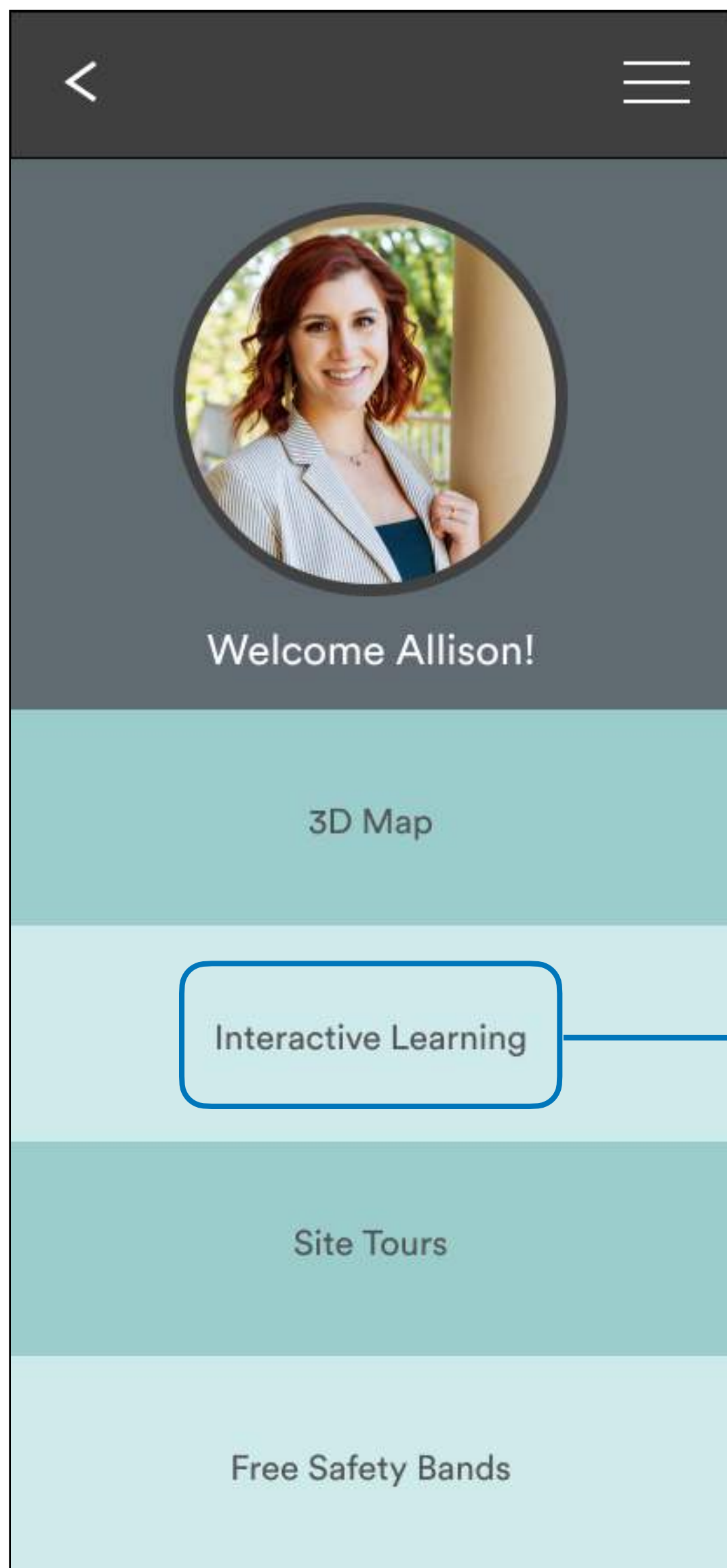
Splash & Home Pages



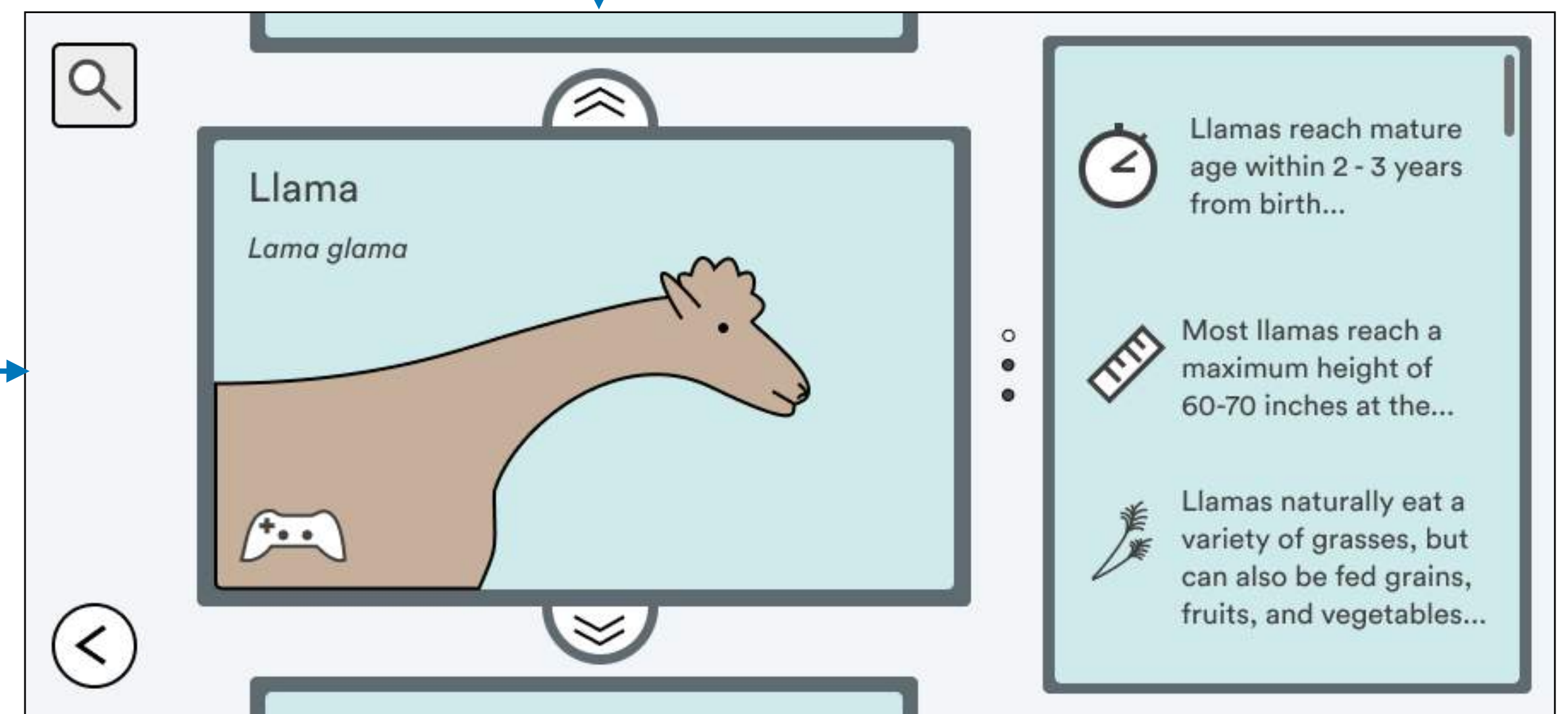
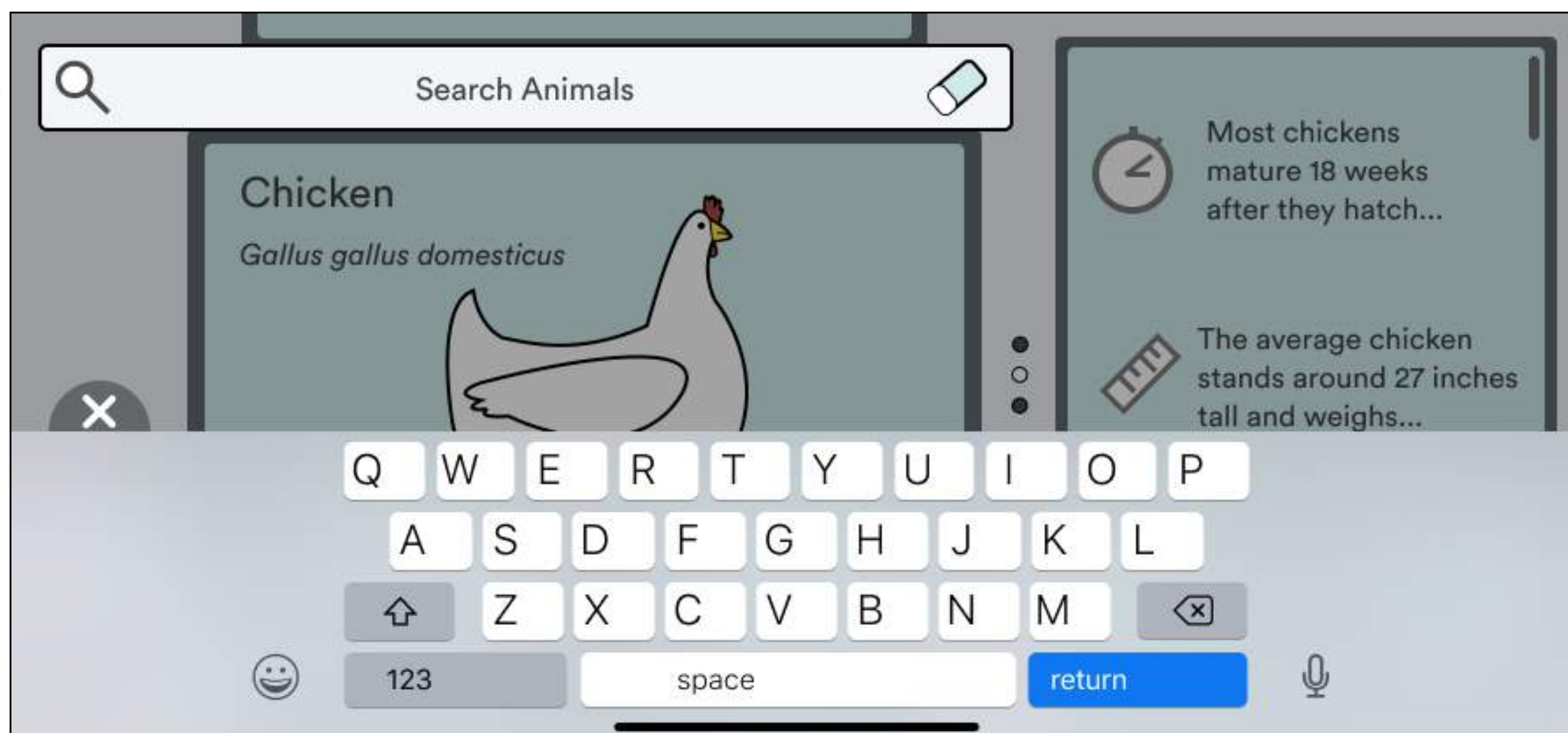
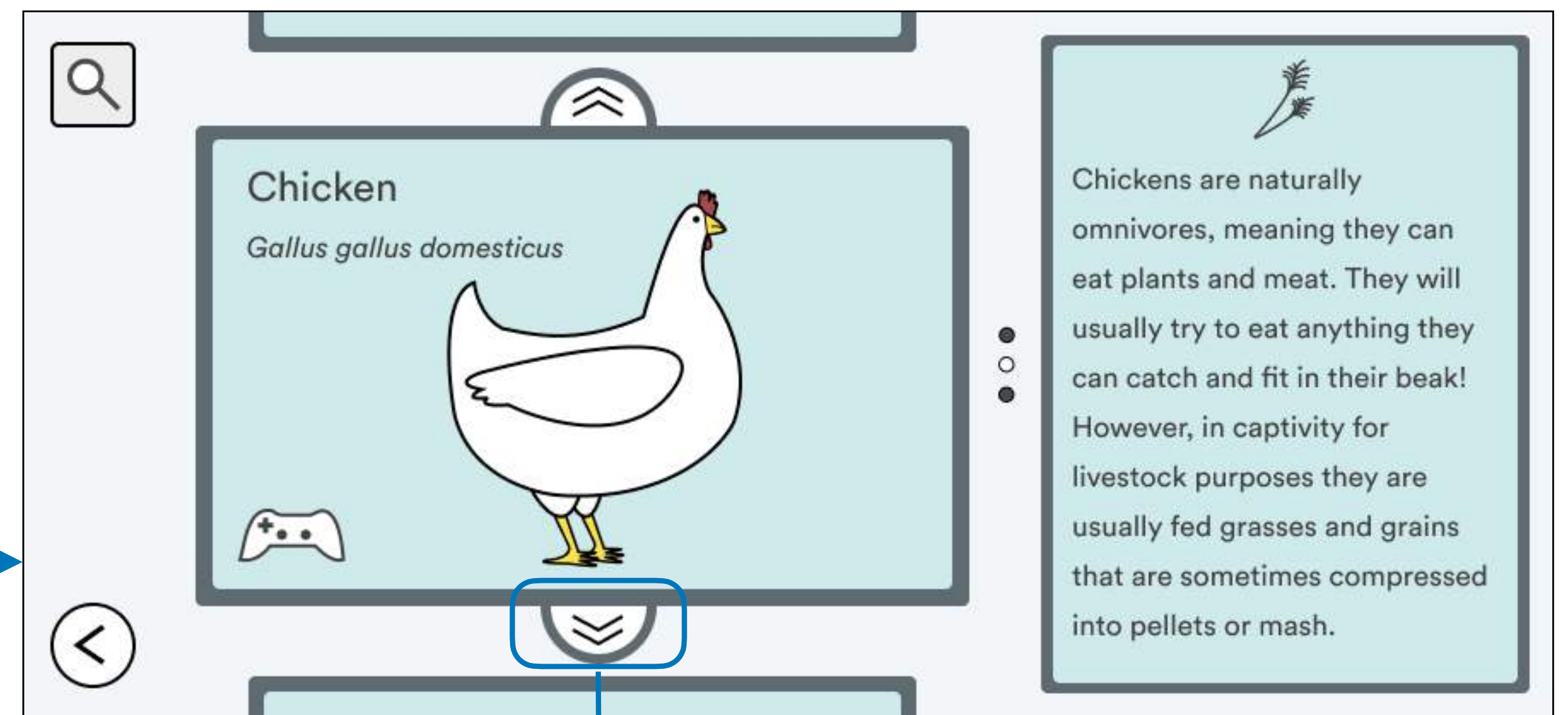
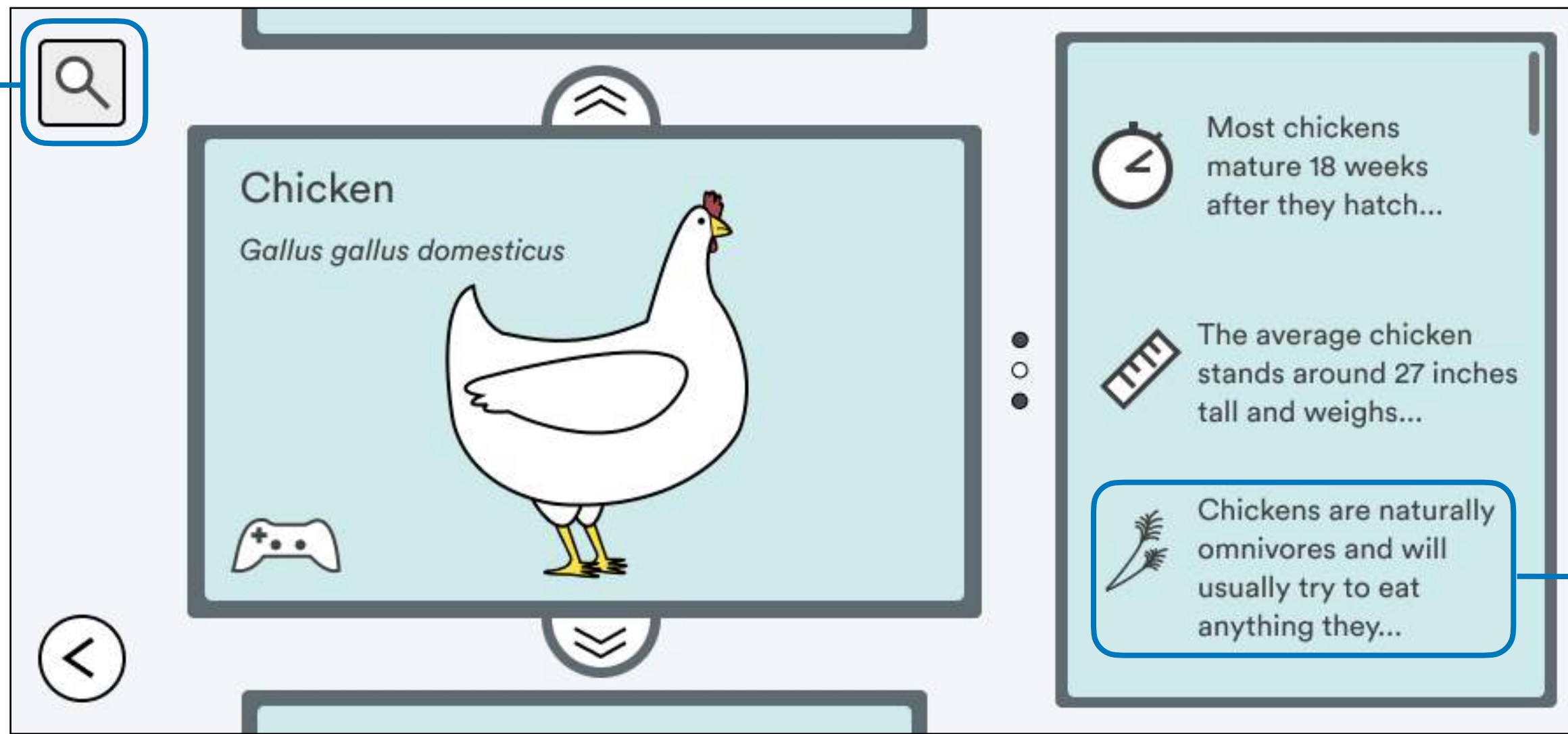
3 Dimensional Mapping

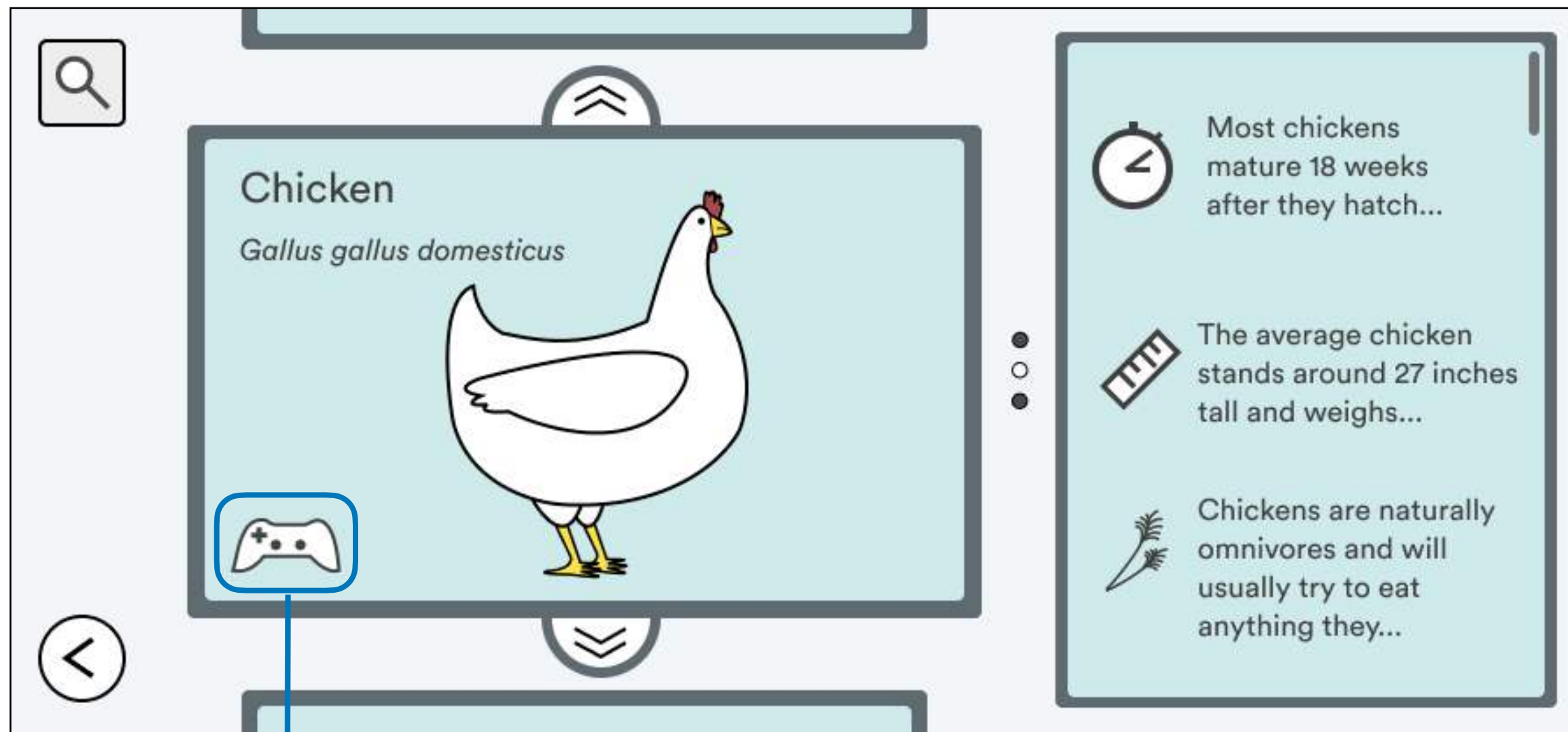


Menu & Settings



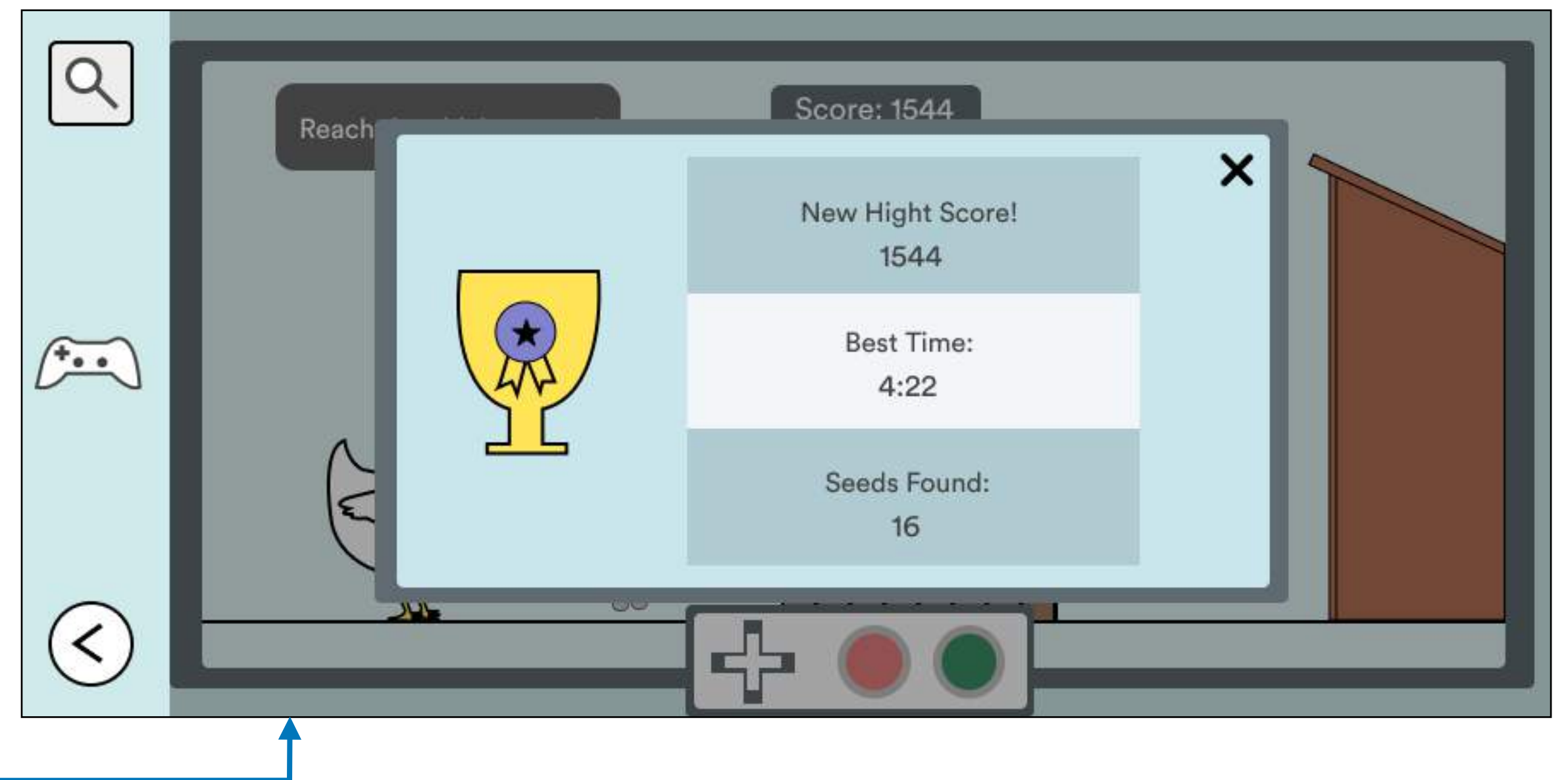
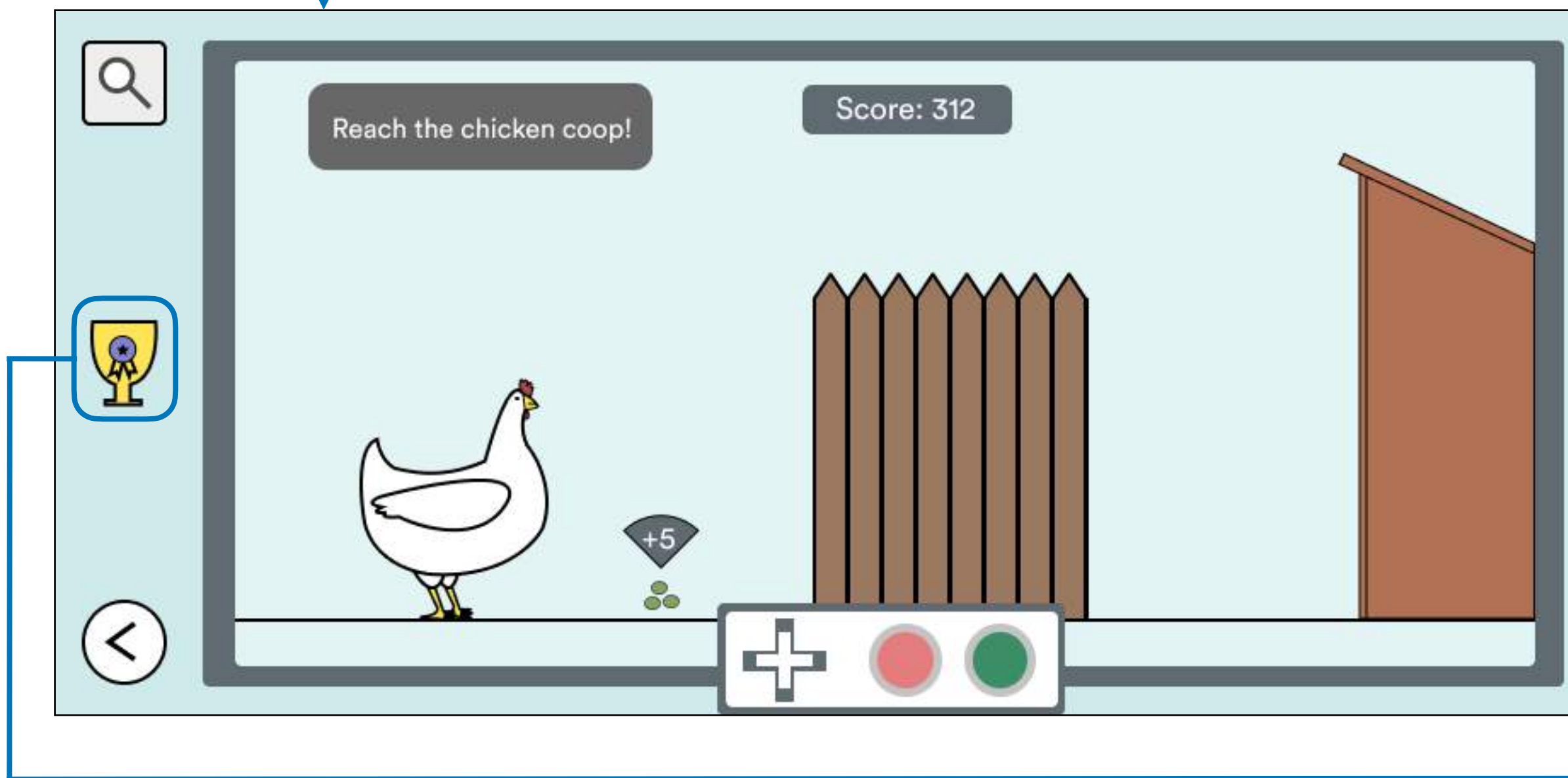
Learning Modules & Educational Games (Phone View)



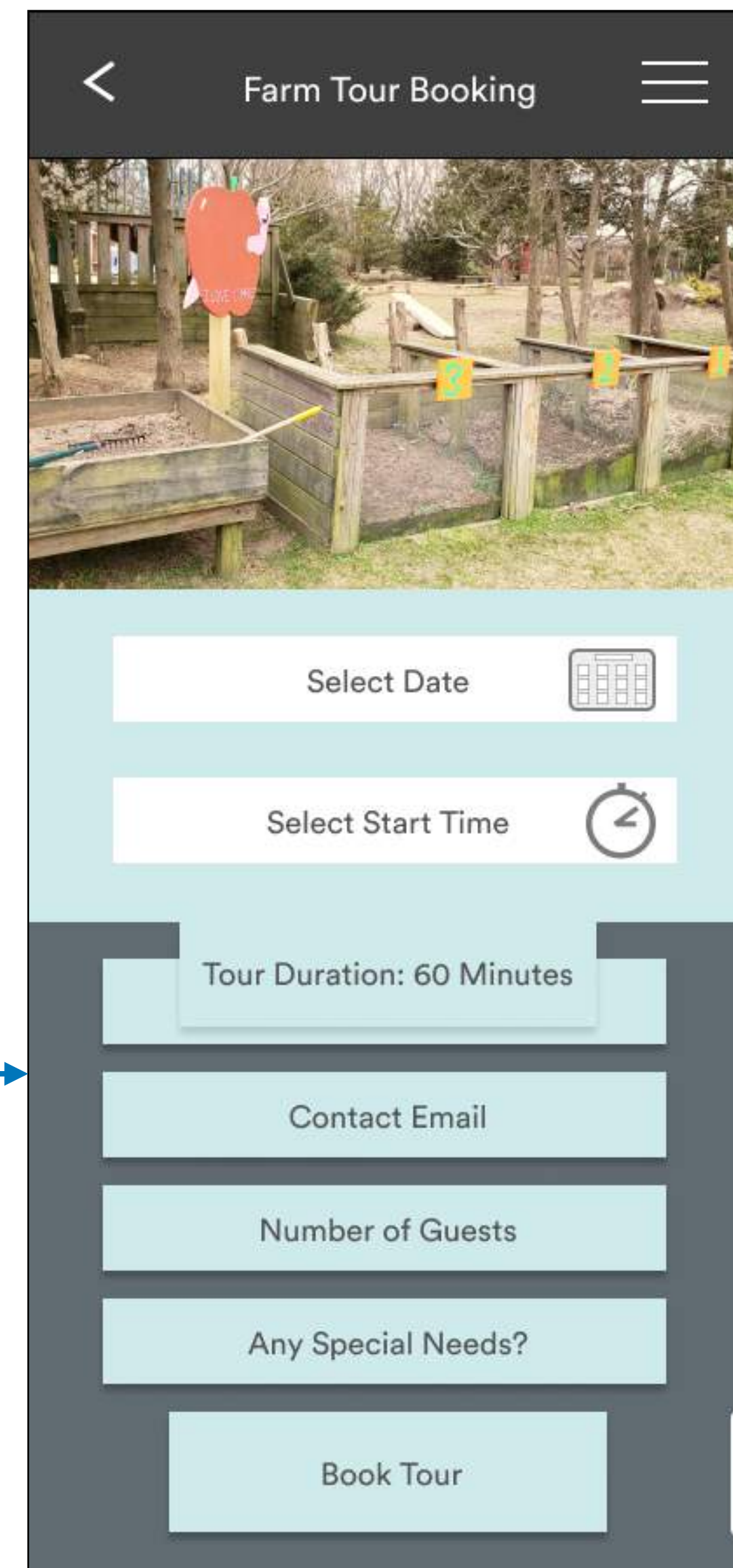
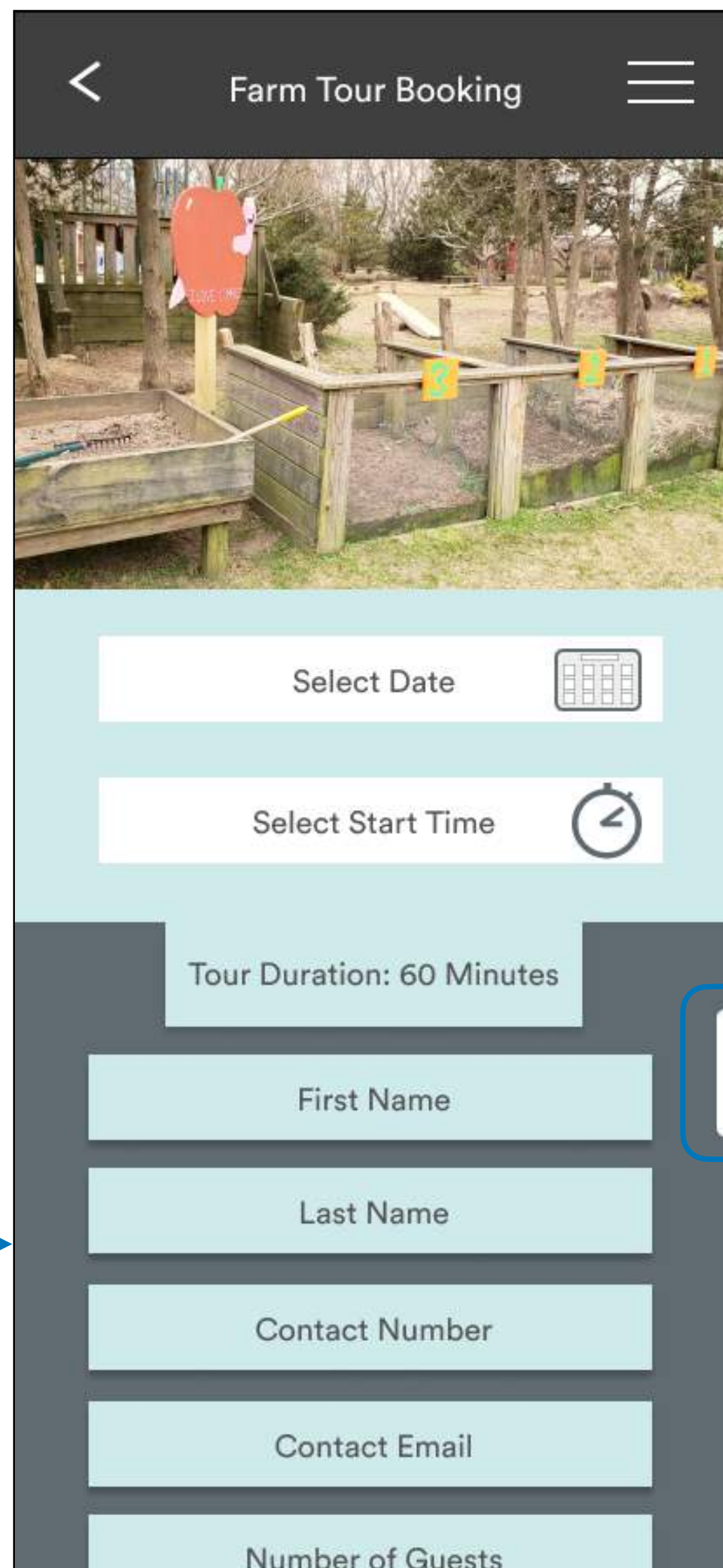
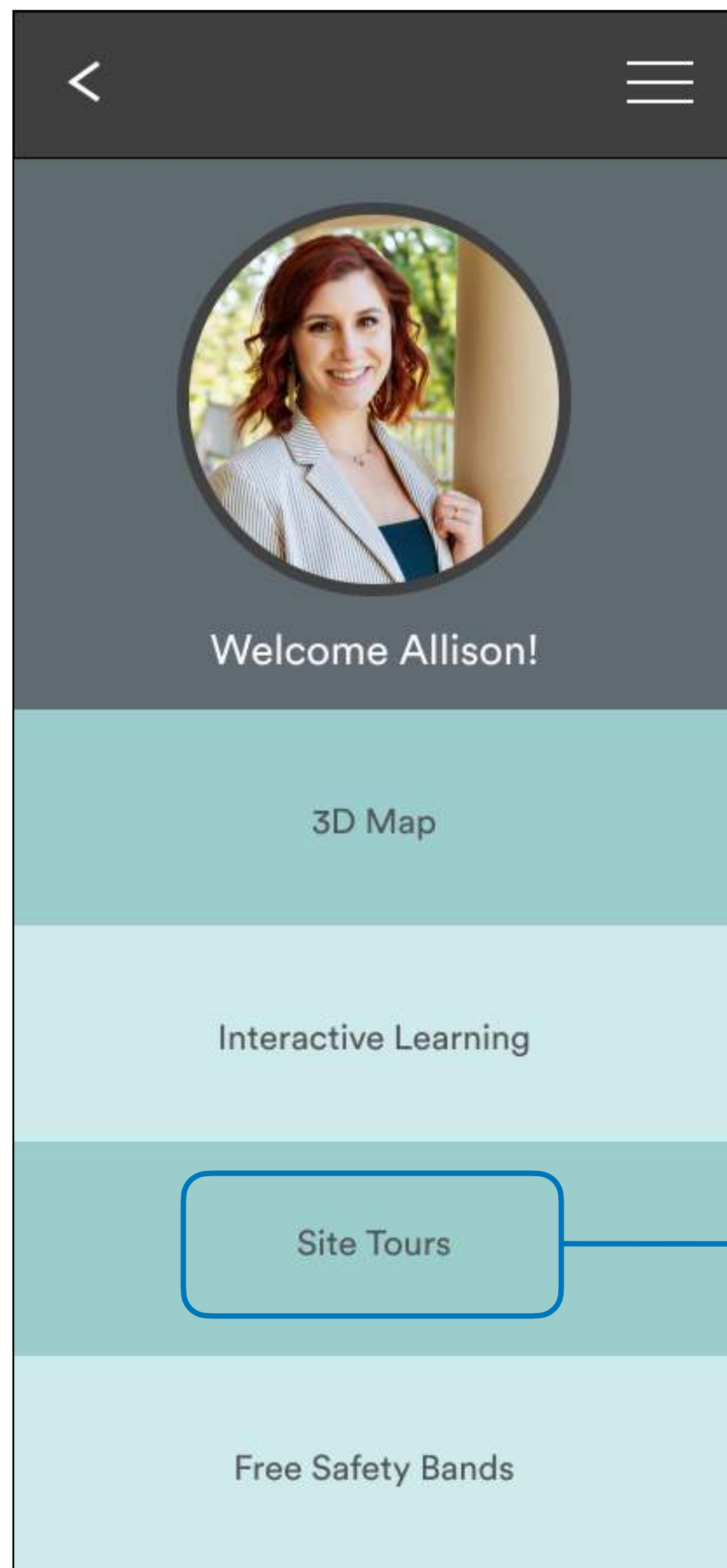


Special Note:

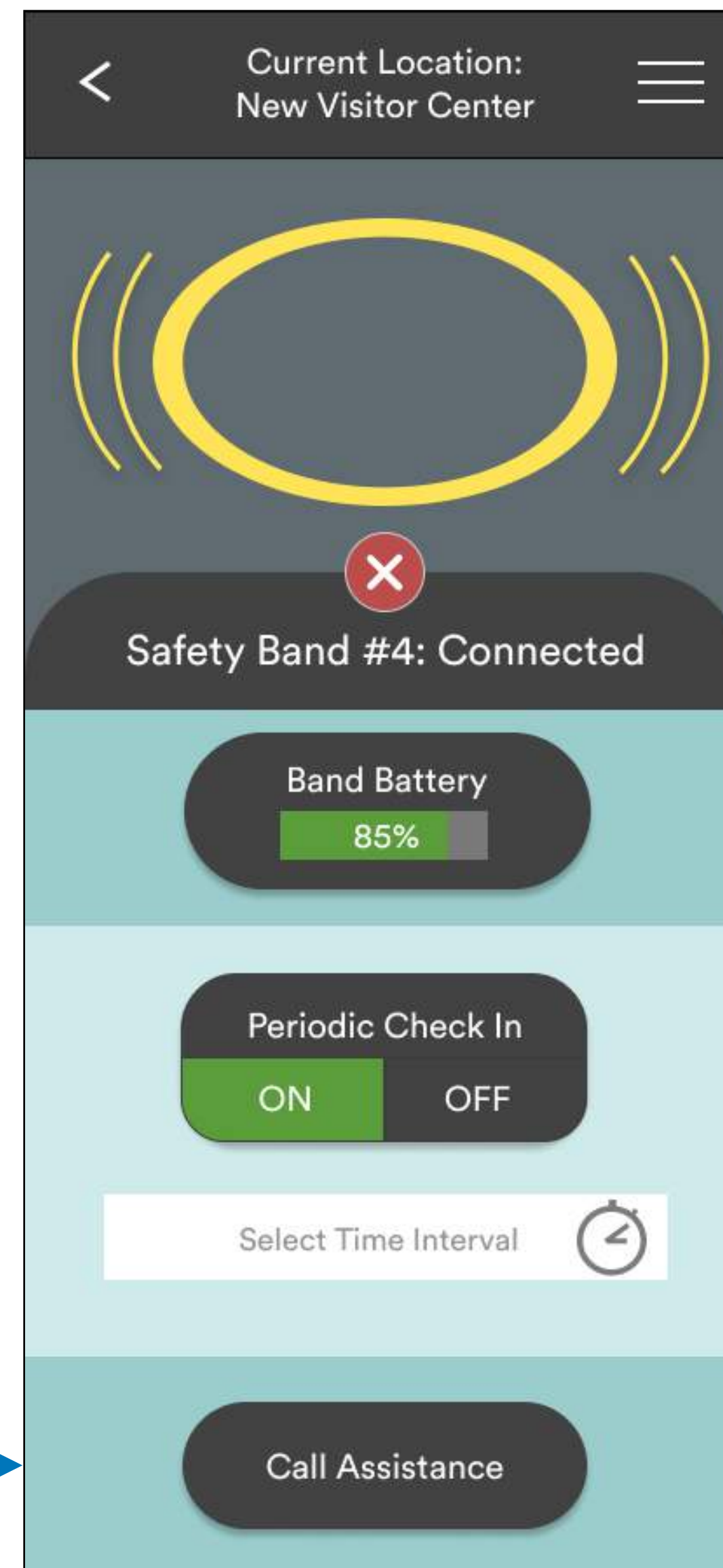
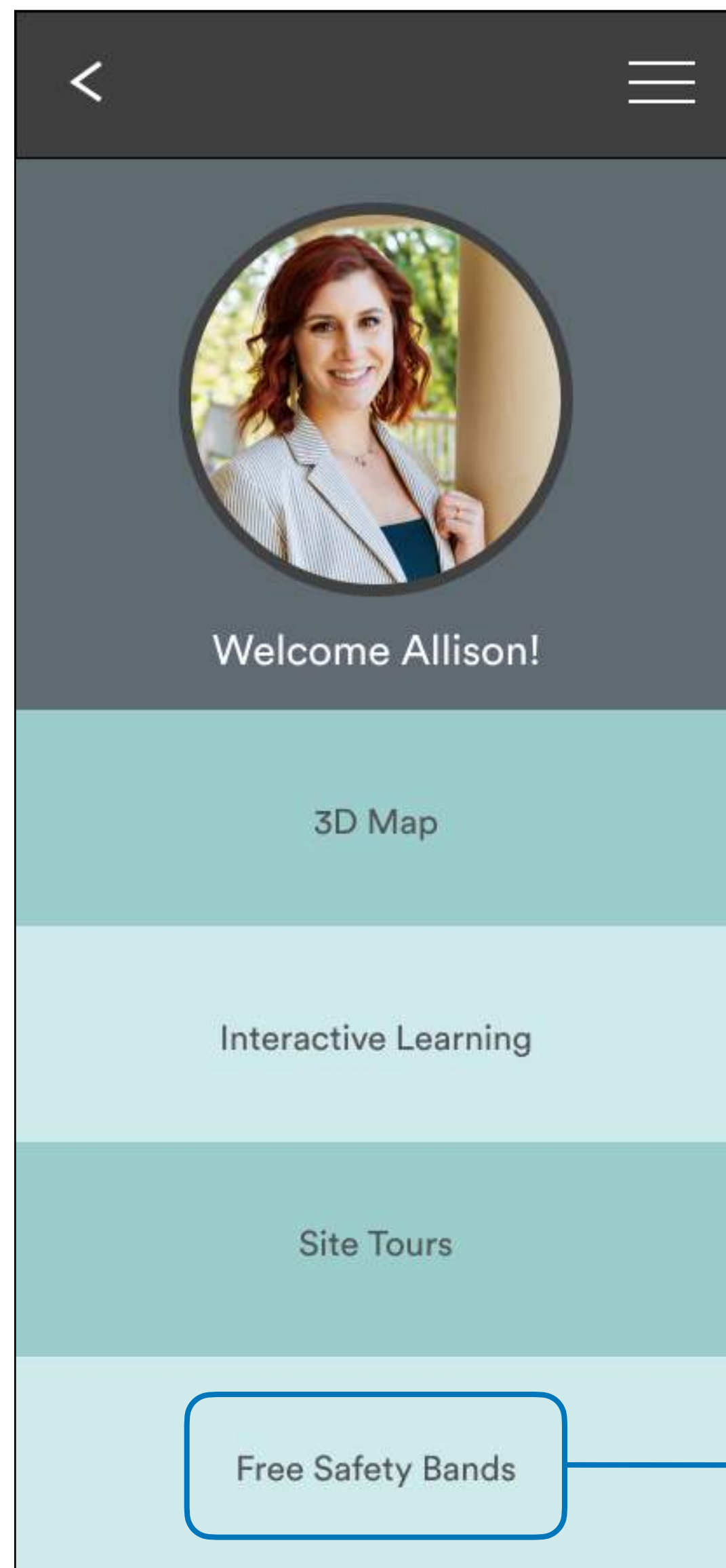
These embedded tablets would work from a learning module table within the new visitor center to supplement the tactile learning tools at the module. By using an already existing tablet design such as an iPad, electronic teaching tools can be embedded into cut out wooden surfaces. Additionally, the farm can save a lot of money by not having to create or order custom purpose electronic hardware to fulfill this task.



Learning Modules & Educational Games (Embedded Learning Table Tablet View)

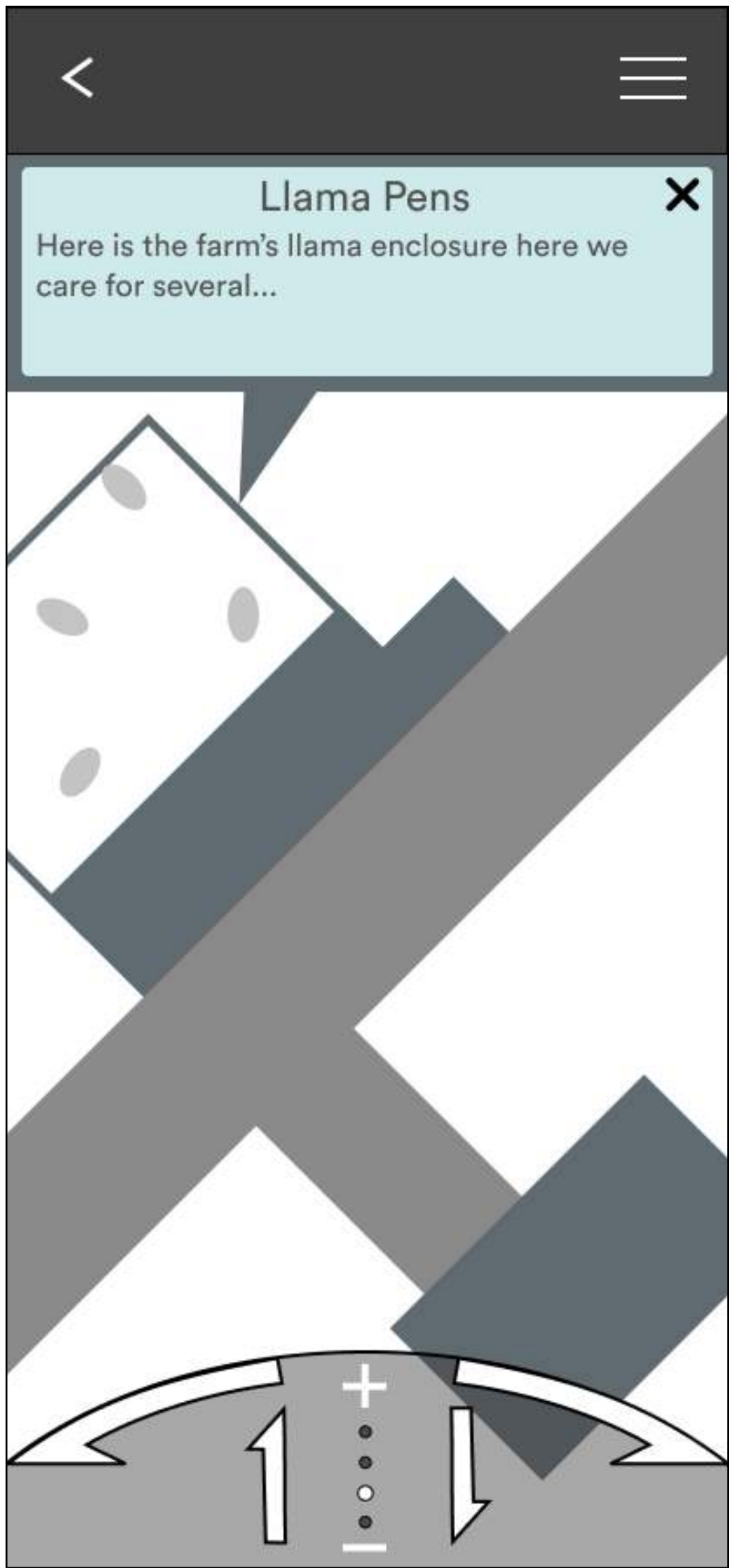
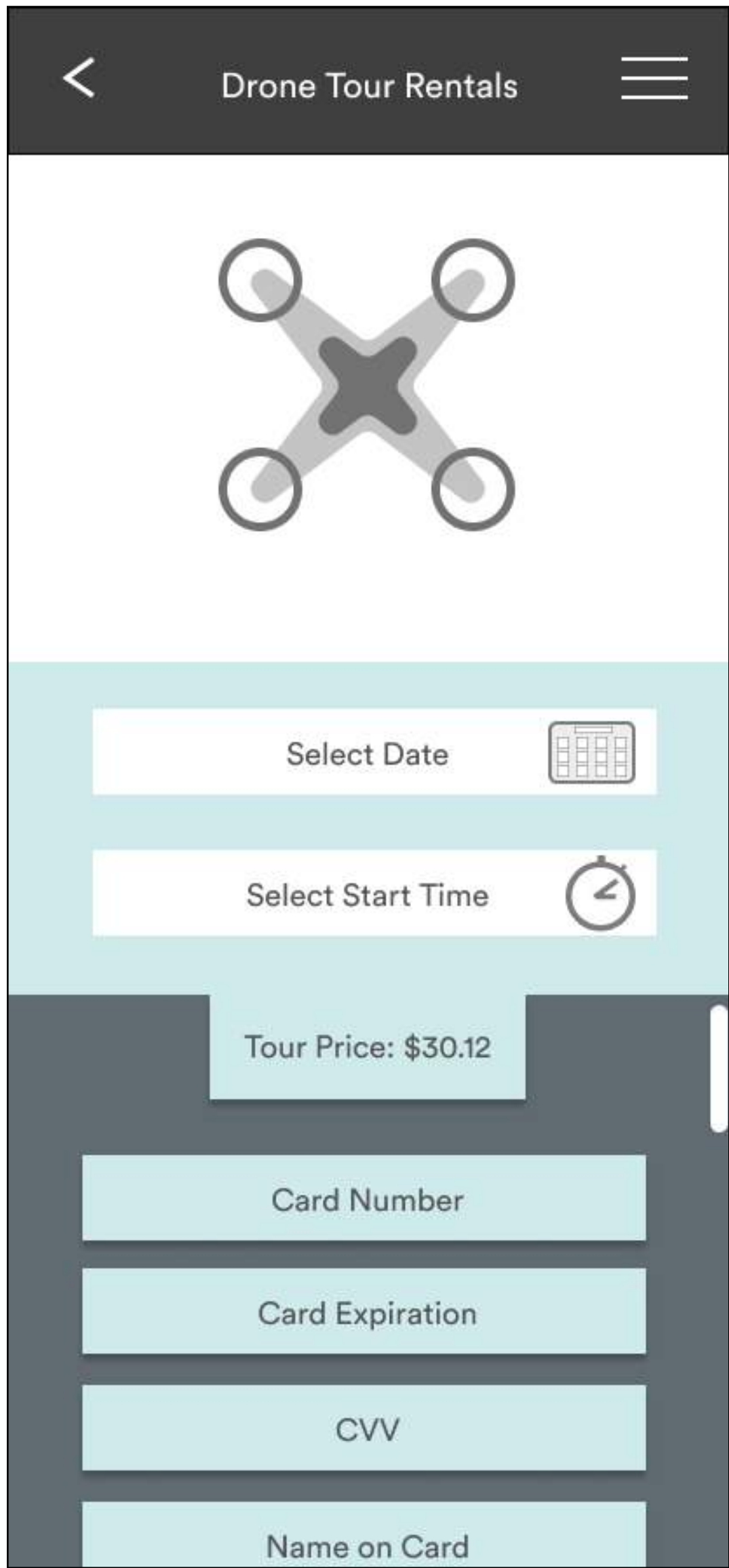


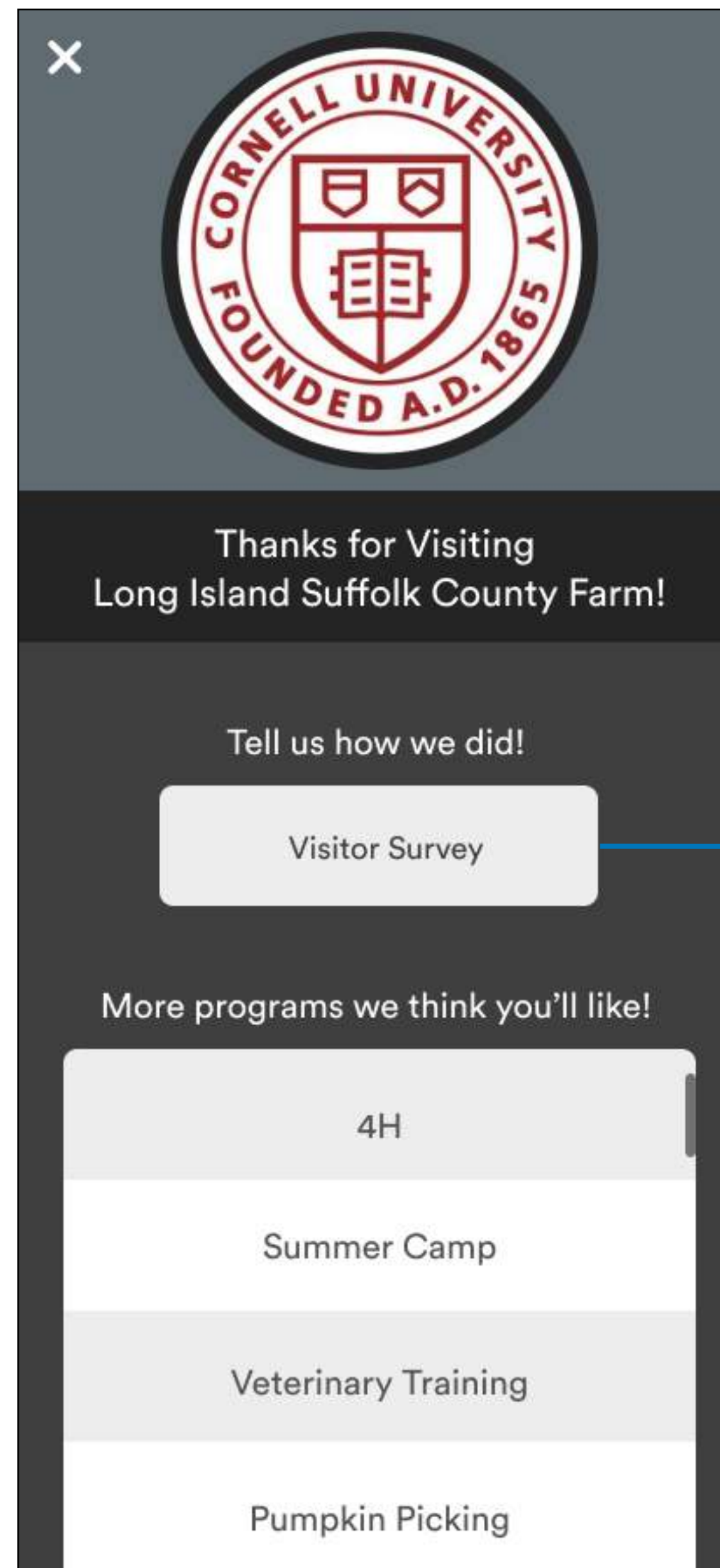
In-Person Tour Booking



Safety Bands

Special Note:
Although current laws inhibit certain commercial drone use scenarios, the concept remains here in case this feature becomes viable in the future.





<https://forms.gle/YTuVJUcgqrvZegDL6>

After Visit