

H2Know



An IoT-enabled plant care system that combines hardware sensors with a social plant care app to help users successfully nurture their plants and connect with other plant enthusiasts.

What if your plants could actually tell you exactly what they need, when they need it?



This is Sarah. Last month, she wilted because I forgot about her in the corner of my room.

Unfortunately, this is the case for a lot of plants; last year, Americans spent over \$48 billion on indoor plants. Yet, 67% of plant parents admit to killing at least three plants in the past year.



How could we change this?

Project Brief

Targeted for beginners, H2Know revolutionizes indoor plant care by combining IoT technology with social **connectivity and building emotional connections with plants**. The system pairs moisture sensors with a feature-rich mobile application, creating an ecosystem where technology meets community. This solution addresses the common challenges of plant care while building a supportive community of plant enthusiasts.

Software Used



Figma



Arduino



Adobe Illustrator



Problem Statement

New plant owners, busy parents, and time-constrained individuals often struggle with houseplant care due to irregular watering and limited knowledge. While they value having plants, understanding proper care techniques remains challenging. Current solutions like smart pots and basic humidity testers are either expensive or offer minimal guidance for beginners.

How might we...

Motivate users to water plants in a non-evasive,
helpful way?

Educate users about their plants?

Create a straightforward and familiar interface?

Create a stronger bond between owners and plants?

Target Audience

1

People who
get too busy
to care for
plants

2

New plant
owners

3

Children

Research

1

Prototype

2

Implementation

3

Research

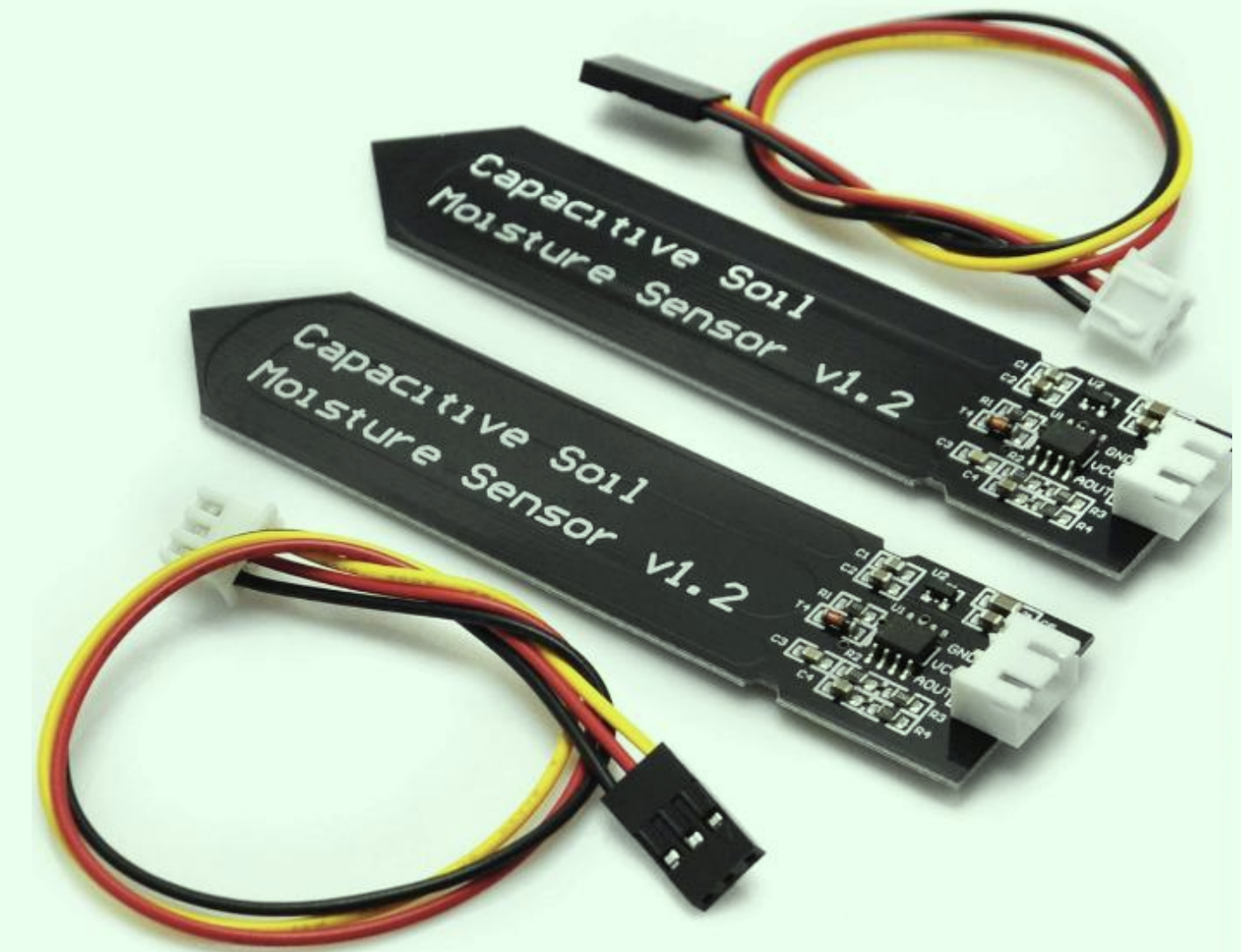


Competitive Analysis



Soil Moisture Meter

- Hard to interpret for beginners
- Doesn't remind people to water plant
- Inconsistent results
- Won't measure deeper soil



Gikfun Capacitive Soil Moisture Sensor

- May require frequent calibration
- Readings can be affected by temperature fluctuations
- Can't be submerged deep enough
- May require additional processing or lookup tables to extract data

USER INTERVIEWS

"I don't water my plants because I'm too stressed about school and I forget. Also, I feel like my plants grow the best when they are nearing death because they will mutate into a better version of themselves, 'Darwins Natural Selection.' But then I found out they were thriving because my mom was watering them. Over the past year I have killed two. **I'm happy when they die because then I can buy a new one.** Every time I'm depressed I get a new one."

Anya Li



Age: 16

Location of plants: All around her bedroom

Shows a
pattern of
dependent
behaviour

Shows a
disposable
mindset
towards
plants

Rationalizes
negligence
through
pseudo-
scientific
reasoning

Finds more joy
in the
acquisition of
new plants
than in
nurturing
existing ones

Mother serves
as a safety net
for
responsibilities

Uses plant
shopping as a
form of
emotional self-
medication

Macey Zhang



Age: 17

Location of plants: Bedroom windowsill

USER INTERVIEWS

"I used to have plants for the aesthetics of my room, but now **I can only buy fake plants** from Ikea because all of my plants die because I forget that they exist. **Now if I buy real plants, I can only buy succulents** because they are more hardy and don't need that much watering."

Primary
motivation is
aesthetic

Values
appearance
over the
experience
of nurturing
live plants

Learning
curve and
practical
adaptation to
their
limitations

Recognizes
their
tendency to
forget

Shifted from
general plant
purchases to
specific types

Have adjusted
expectations
rather than
continuing
cycles of
failure

USER INTERVIEWS

"I am a plant owner, but I am also a plant killer. **I always forget to water them because I get too busy. And when I do water, I overwater them and kill them.** I would really appreciate if there was some kind of system that clearly informs and reminds me to water my plants."

"My plants are all around my house, on my kitchen table, on the floor and on my desktop. When my mom comes back, she will come back to dead plants. She is about to go to Taiwan, so my plants are going to suffer. **My mother also revives my plants,** in total probably 15. It's a lot."

Pete Young



Age: 38

Location of plants: Around studio space and home

Plant placement makes it harder to keep track of them

Explicitly states desire for a solution-based system

Two-sided watering problem

Volume of plants may be unsuitable for current lifestyle

"Too busy" to maintain consistent care

Clear anxiety about managing alone

Common Pain Points

- Forgetfulness regarding to plant care
- Busy lifestyles interfering with plant care
- Inconsistent care
- Plants dying due to neglect
- Stress from responsibilities affect care practice
- Doesn't prioritize plant care

“I always forget to water them because I get too busy.”

“I don't water my plants because I'm too stressed about school and I forget.”

Plant Alternatives

- Switching to fake plants
- Choosing hardier plants
- Reliance on others for plant care
- Replacing dead plants with new ones

“Now if I buy real plants, I can only buy succulents.”

“My plants grow the best when they are nearing death...”

“My mother also revives my plants, in total probably 15.”

Emotional Aspects

- Neutral feelings about plant deaths
- Doesn't want to learn to care for their plants
- Feeling of resignation about killing plants
- Using plant shopping as emotional therapy
- Lack of empathy towards plants

“I'm happy when they die because then I can buy a new one.”

“When my mom comes back, she will come back to dead plants.”

Prototype



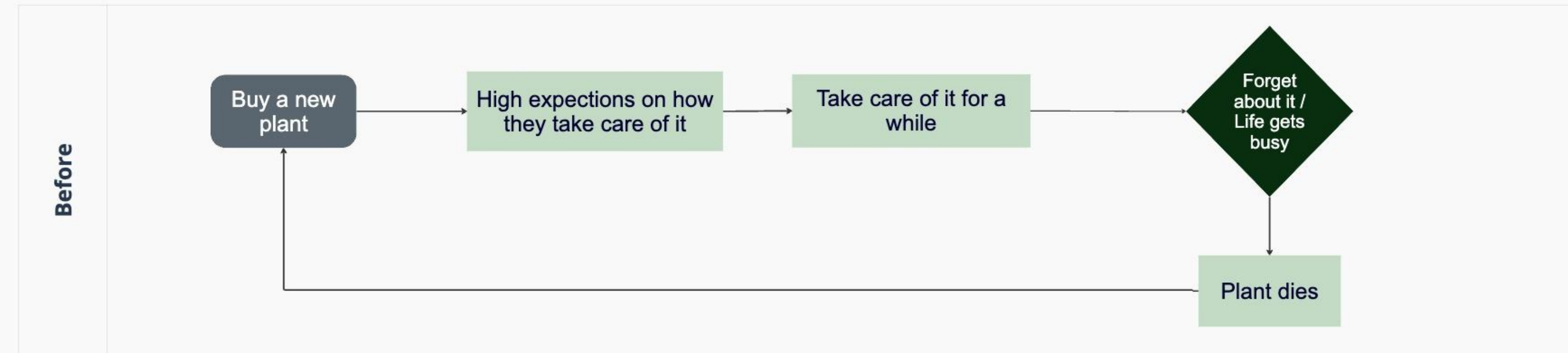
H2KNOW



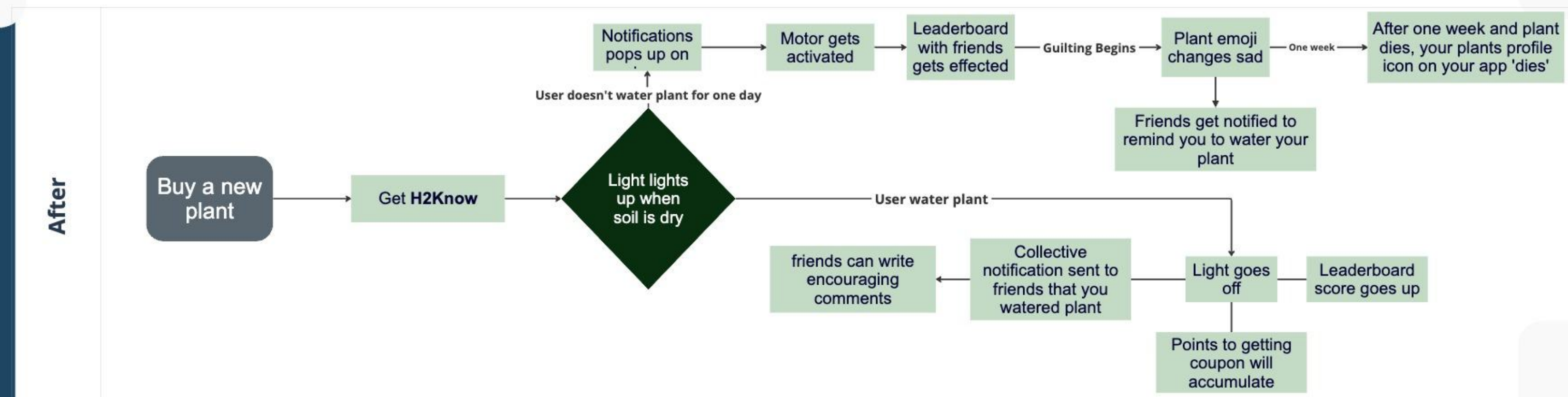
User flows

Motivating user through implementing gamification aspects, adding ownership and guilt.

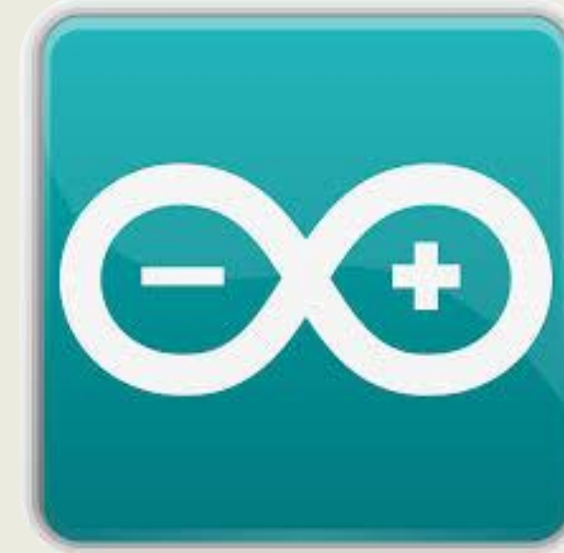
Current Flow



Ideal Scenario



Arduino Nano



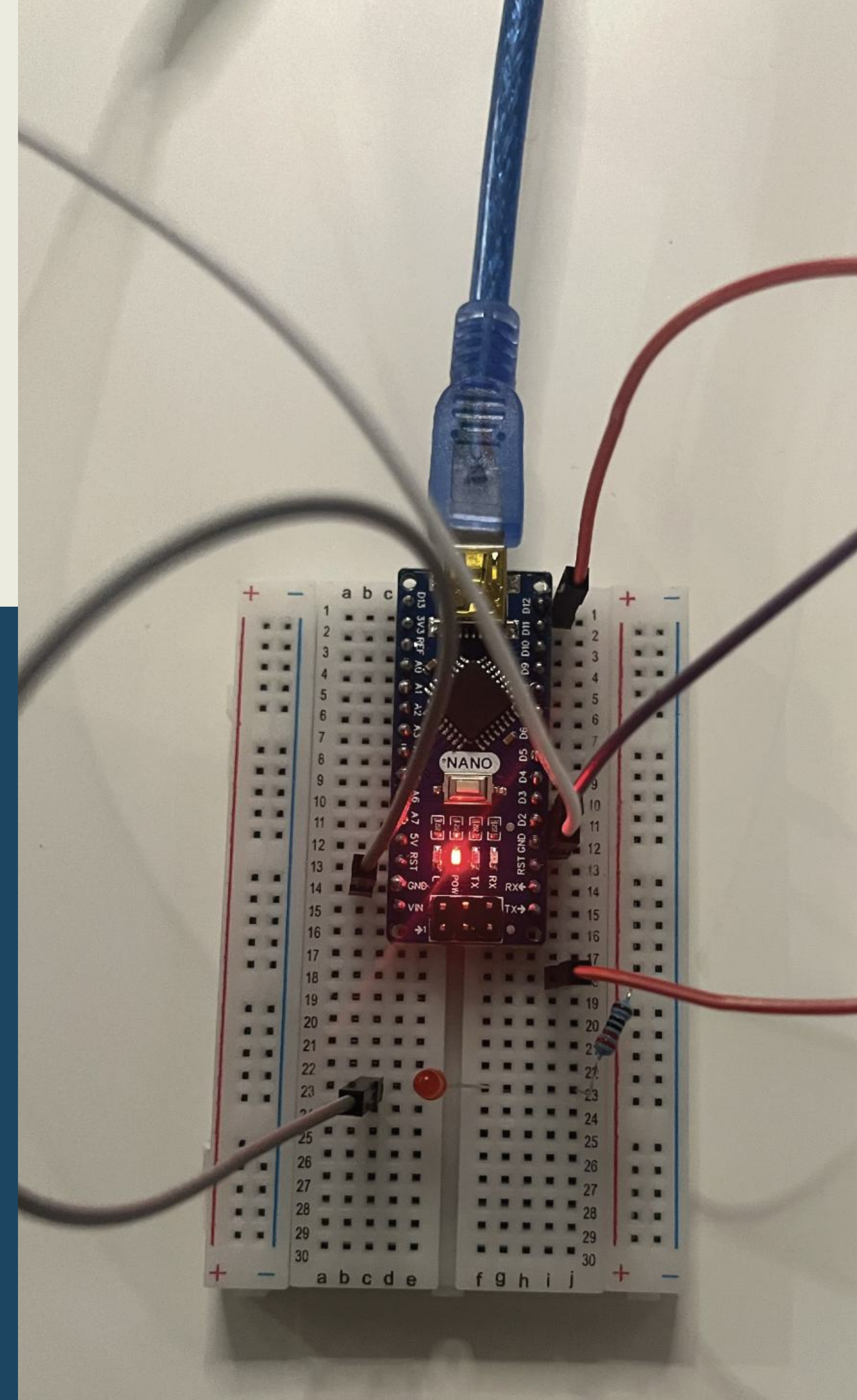
Pros:

- Less bulky
- Can be installed permanently without taking up much space
- Lower power consumption compared to Uno
- Perfect for battery operation if needed
- Cost-effective

Cons:

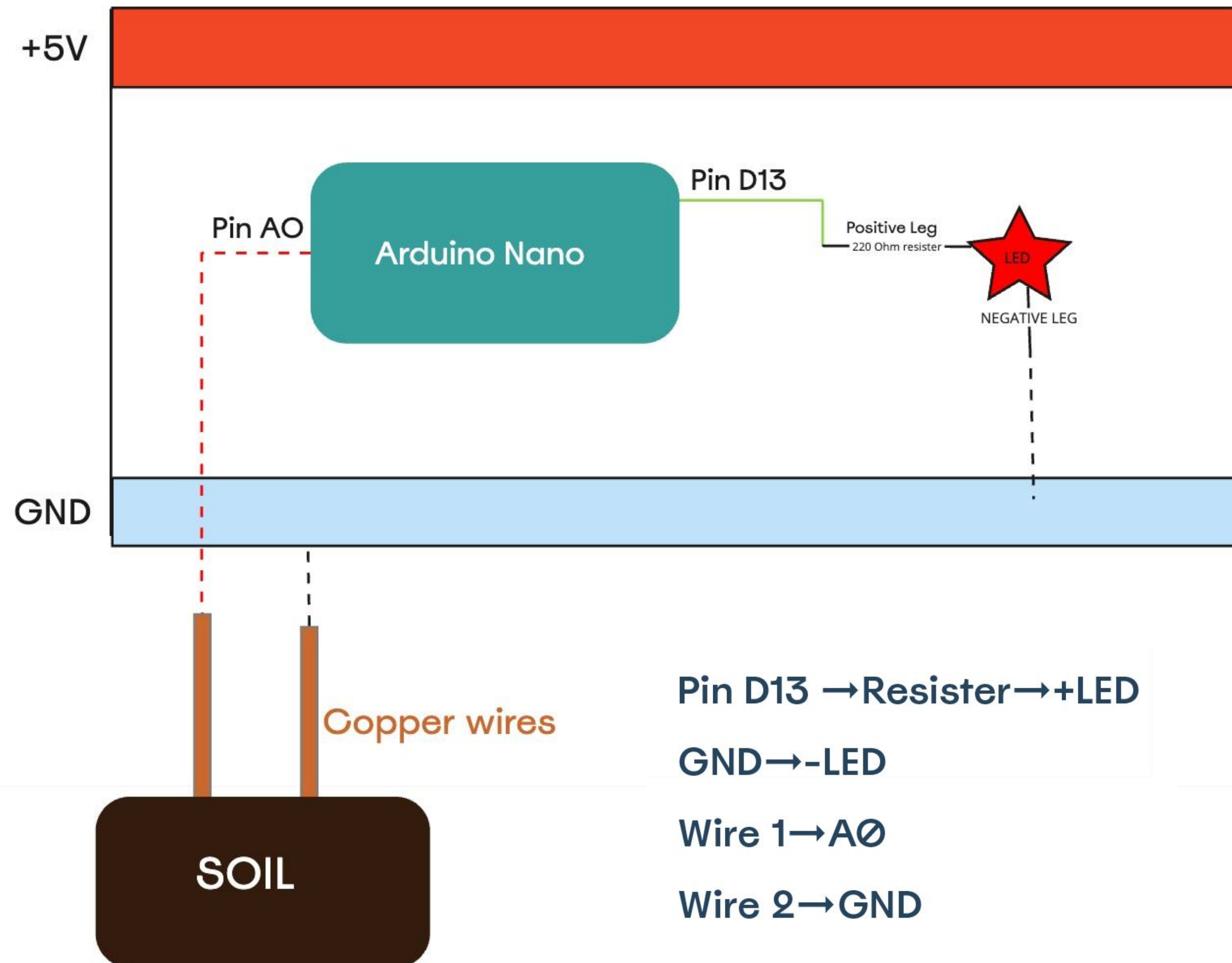
- Smaller pin headers, might be harder to solder
- No power jack (but USB is more convenient anyway)

Why is Arduino Nano a better option than other boards in this situation?

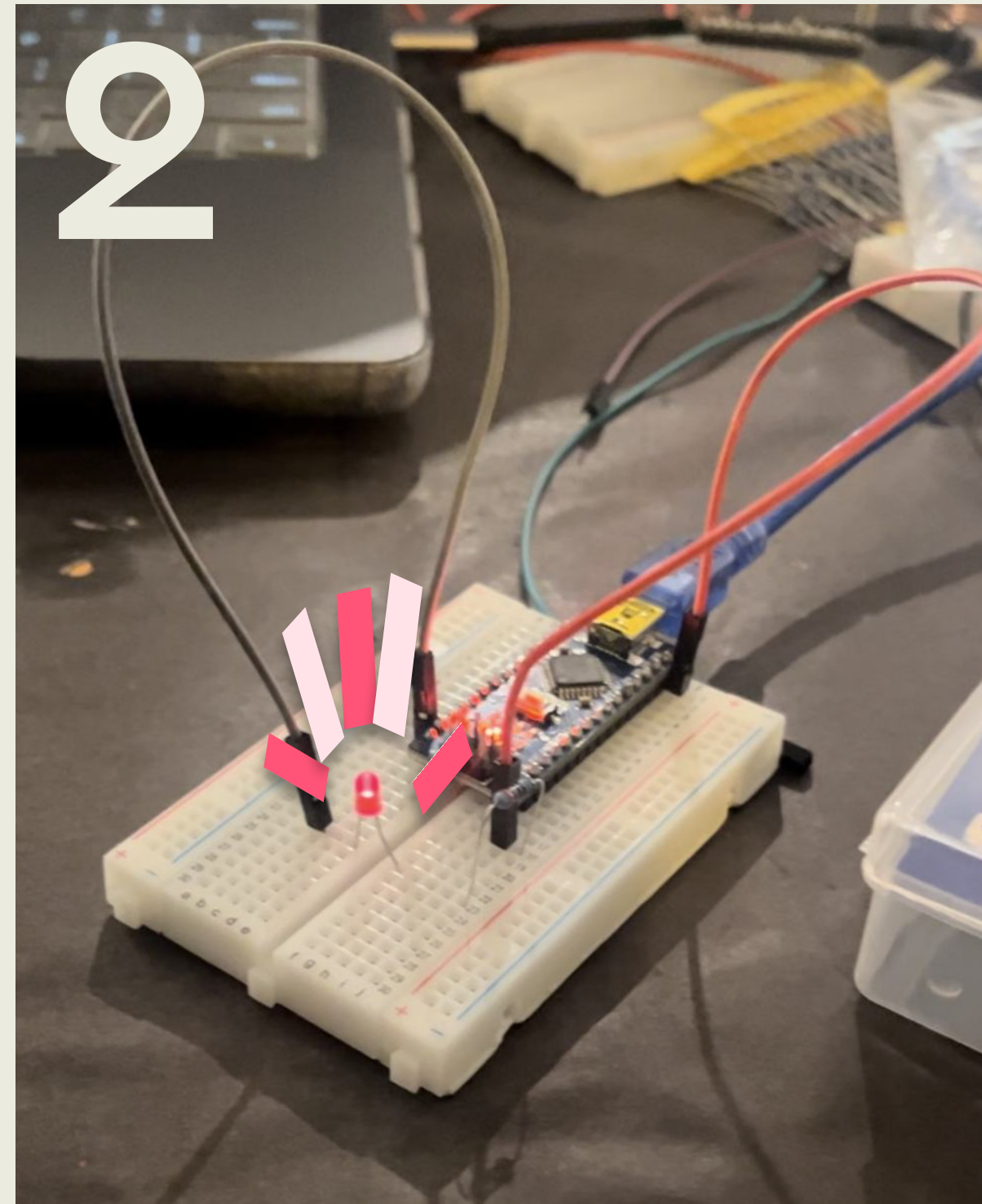
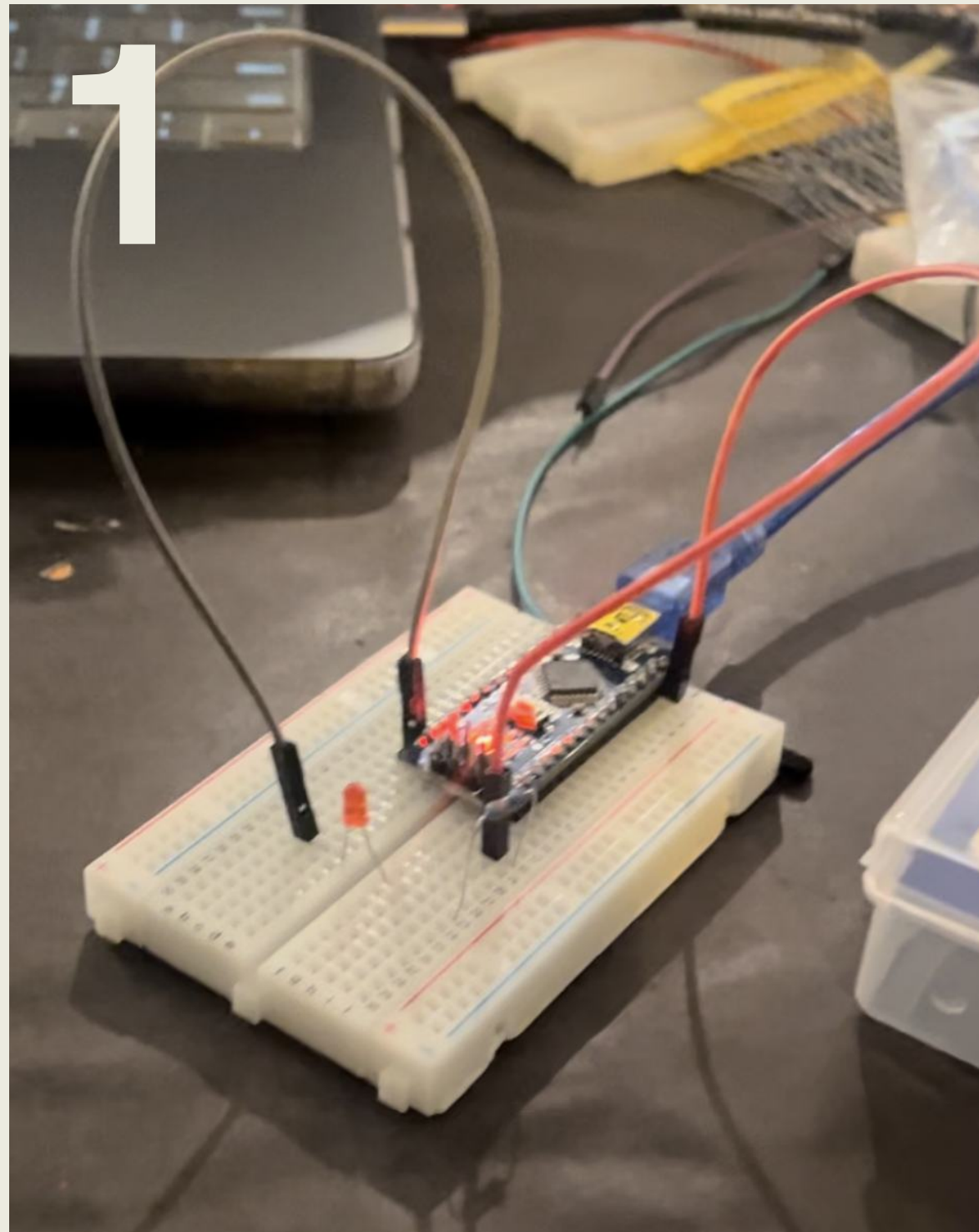


How it works

- The Nano sends a small current through A0 to Probe 1.
- This current flows through the soil to Probe 2 (connected to GND).
- The Nano measures the voltage drop at A0.
- Based on this reading, the Nano decides if the soil is dry.
- If dry, it sends power to D13, lighting up the LED.

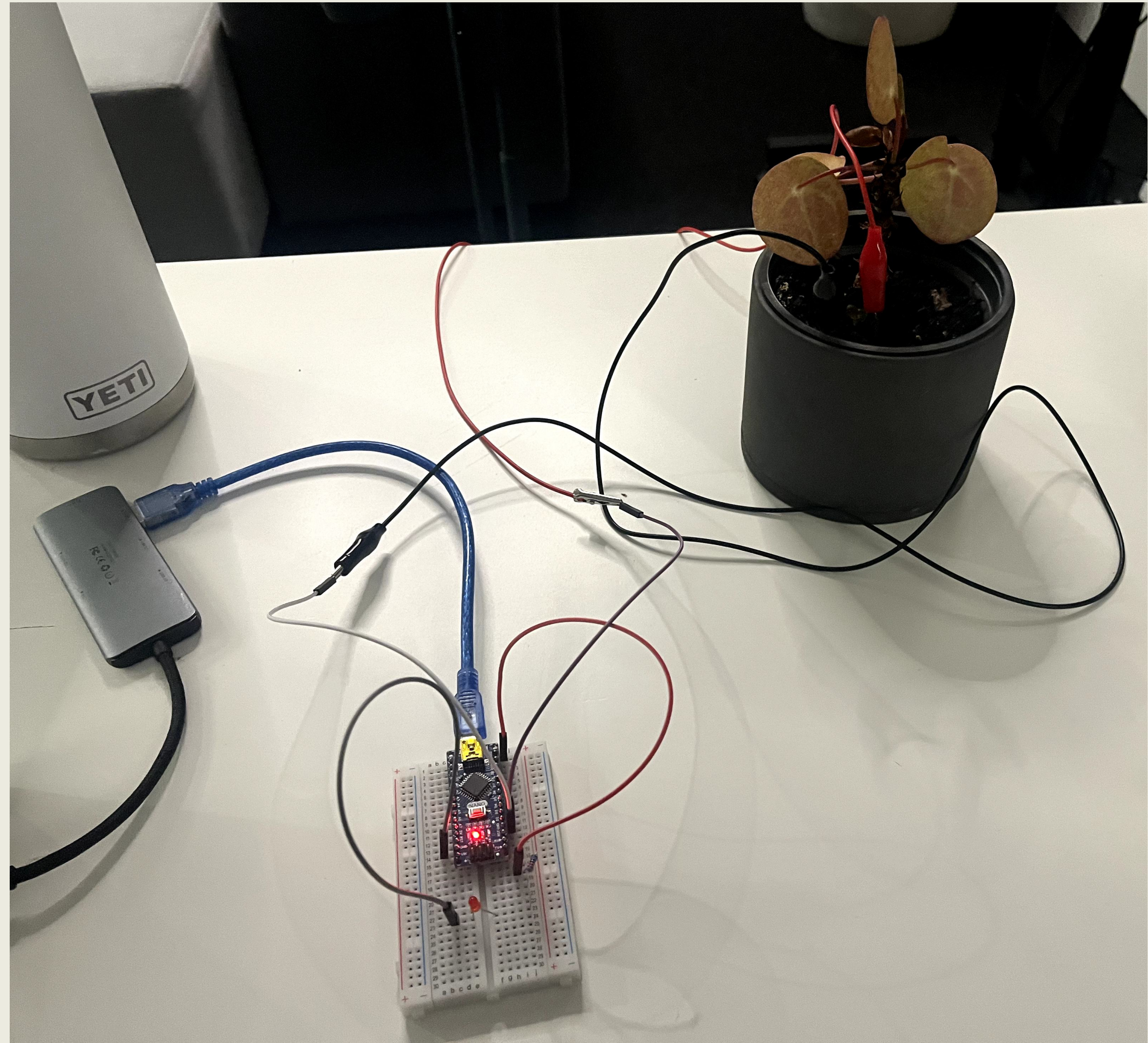


PROTOTYPE



Above: Arduino Nano prototype, testing the LED light sensitivity to humidity

Right: Arduino Nano connected to plant top to test for soil humidity



Implementation



How might we motivate users to take care of their plants?

Three areas of pain points from user interviews

Guilt

- Light turns on
- Plant icon turns from happy to sad
- Automatic photo or score shared with your friends
- Notification to phone

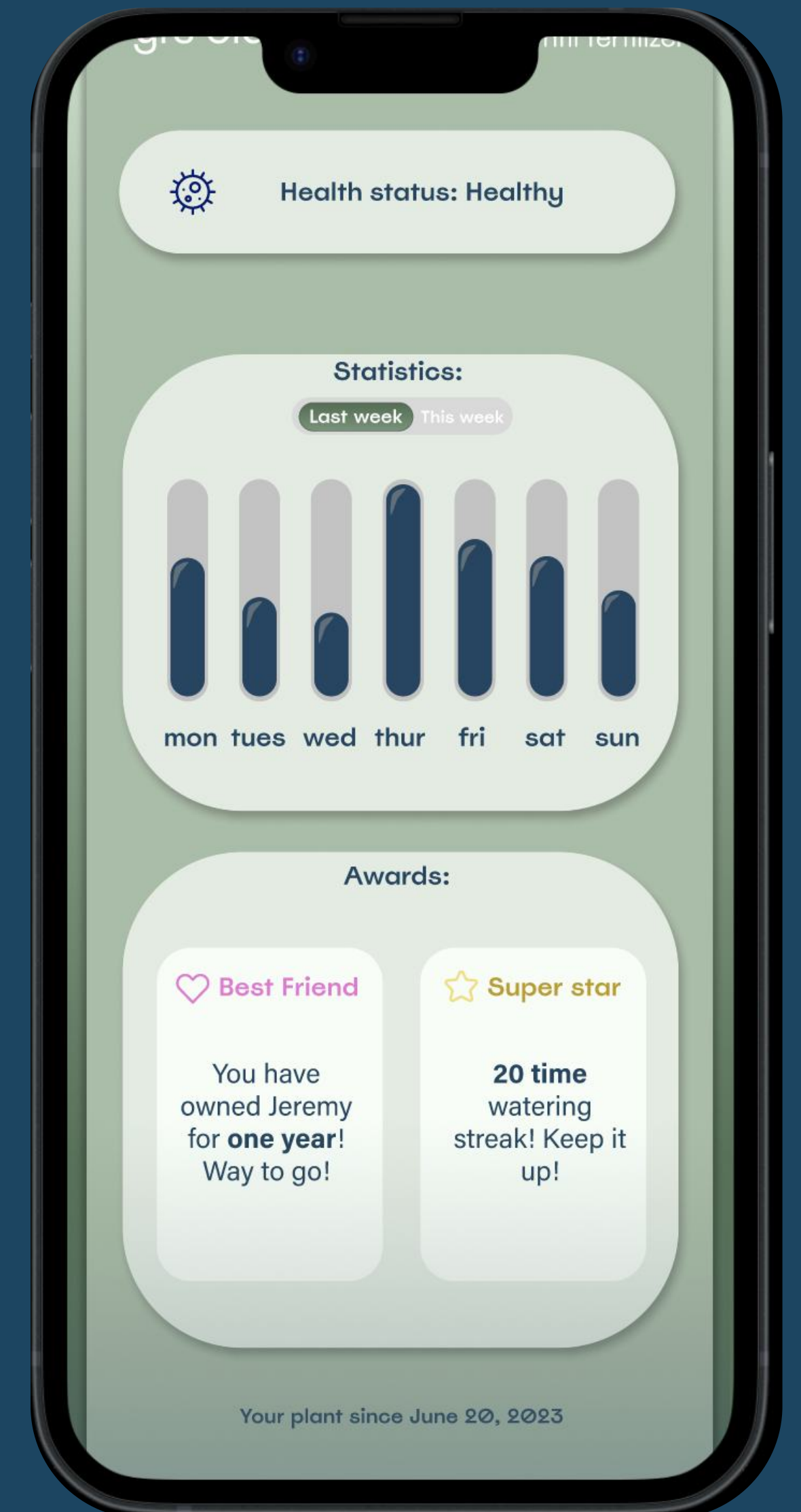
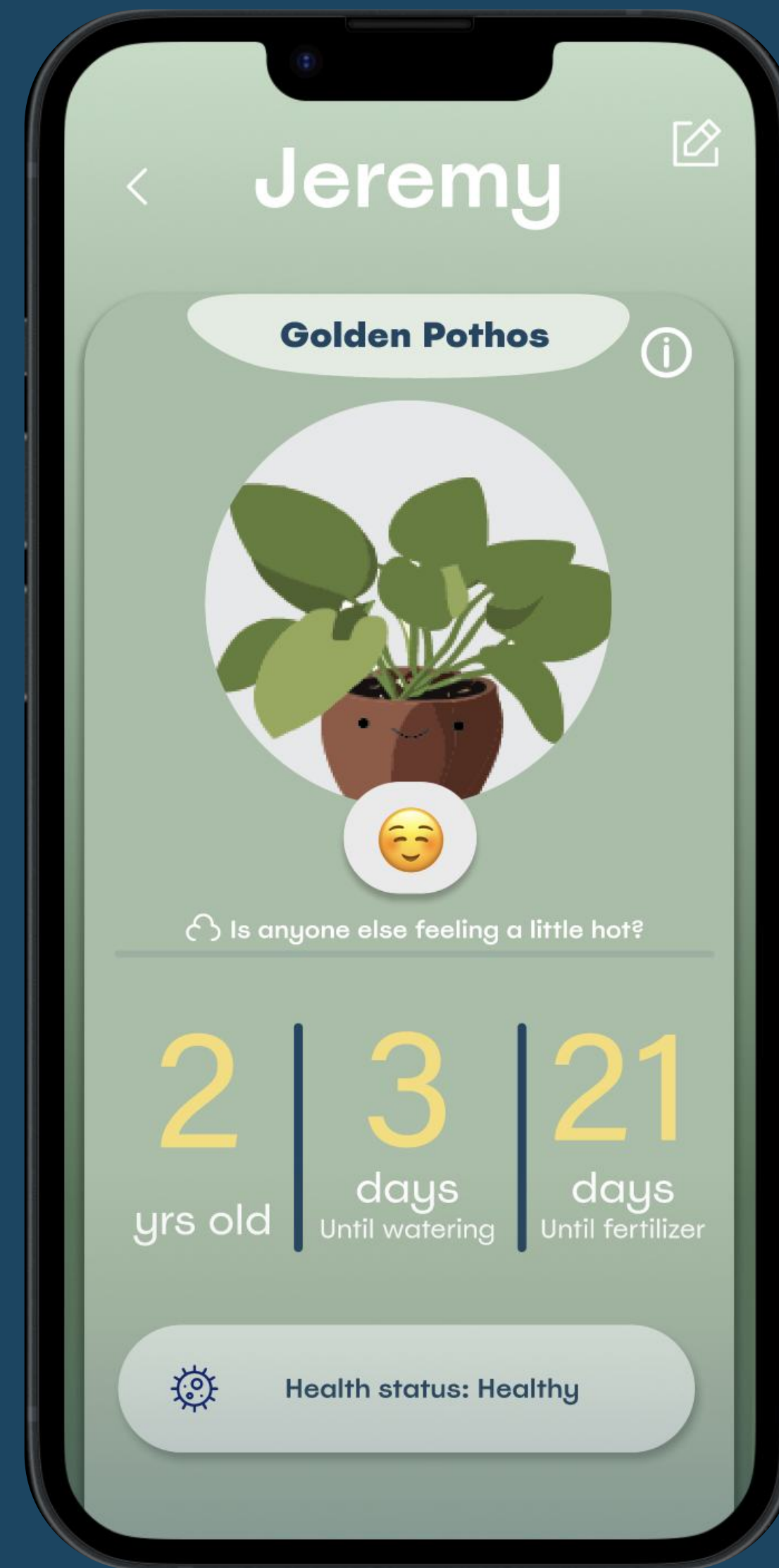
Ownership

- Know more about their plant and feel more responsible for it
- Give plants names and personalities to make them seem more important

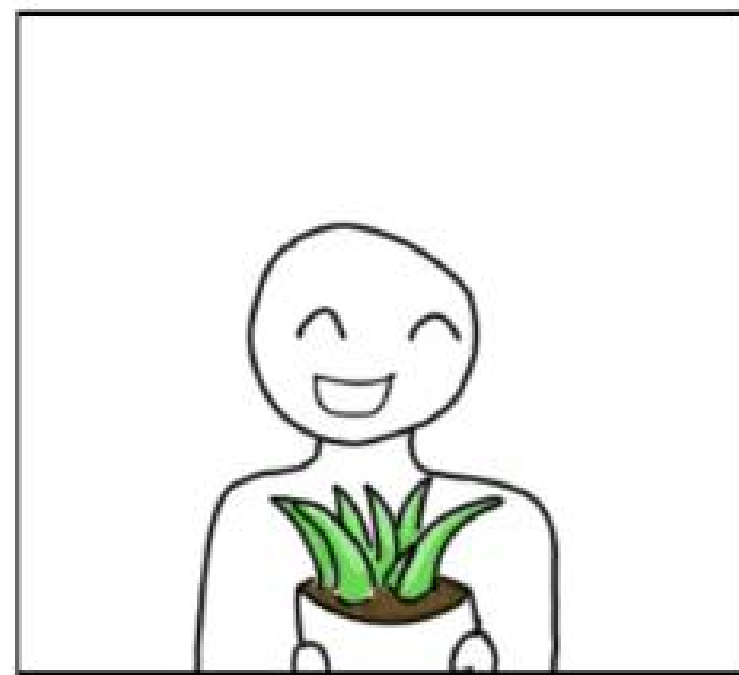
Reward

- # of days the plant has been within humidity levels
- Automatic photo or score shared with your friends (I'm winning)
- Give points and coupons when the plant has been watered
- Annoying things stop: getting light (stimuli) to stop

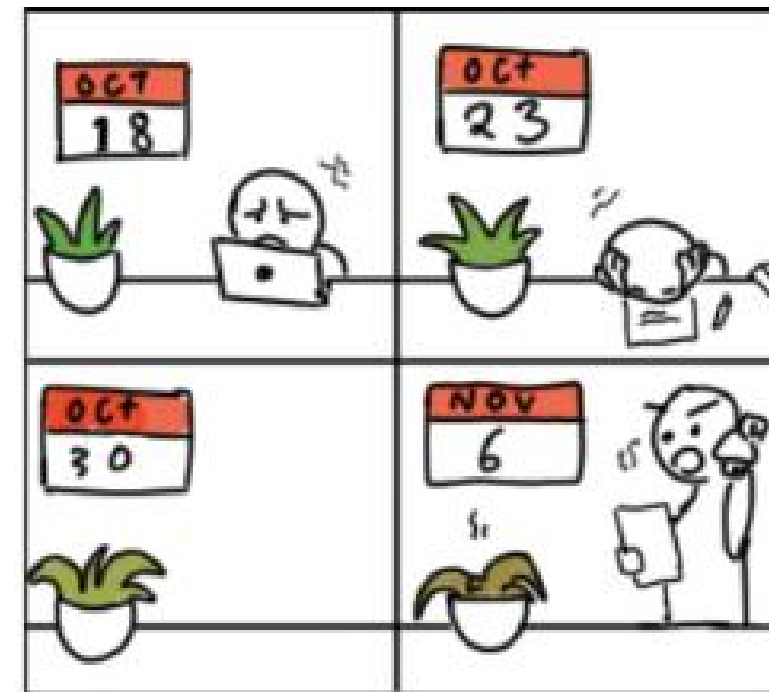
Users have the ability to see plants “thought bubbles” dependant on their health state, as well as name their plants and see soil humidity levels throughout the week.



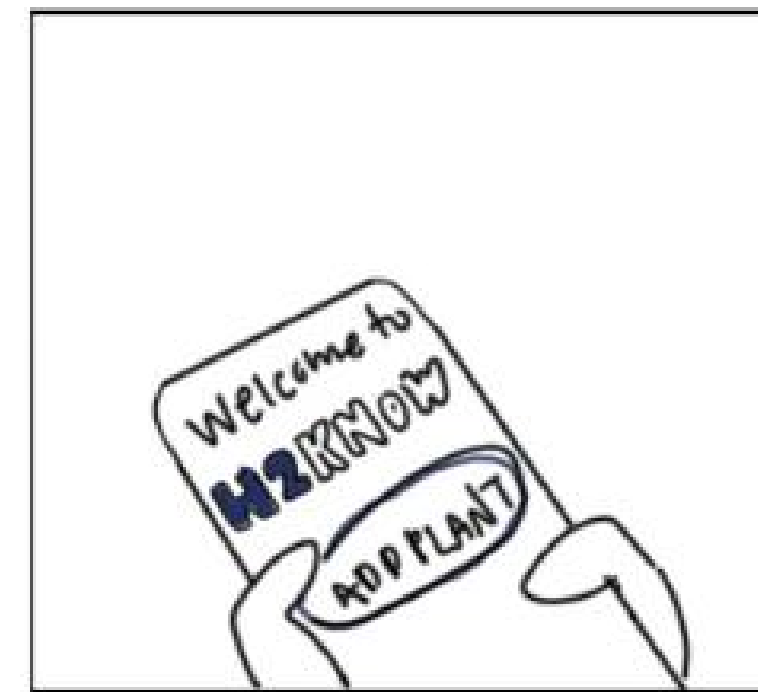
Storyboard



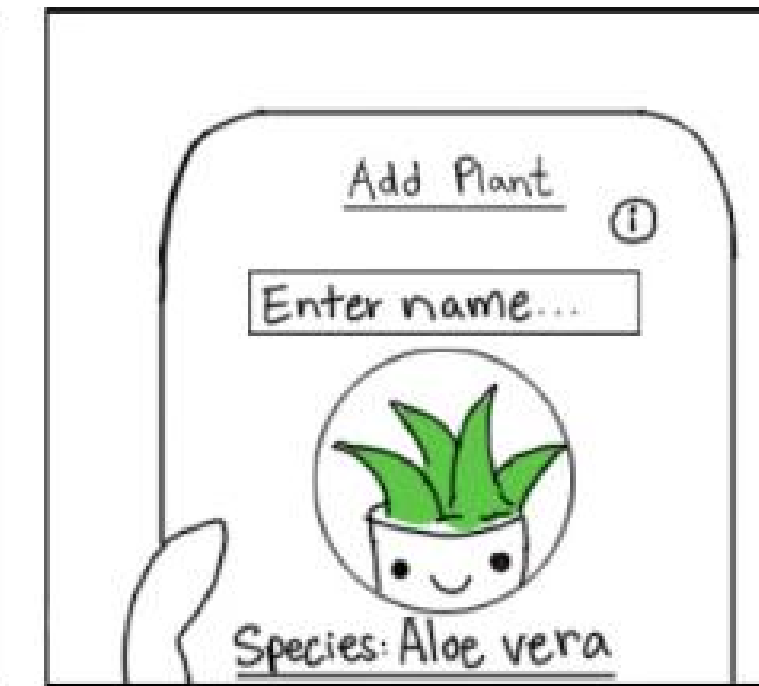
Pete is happy that he got a new plant



After a while, he get too busy to take care of it



Decided to download H2Know



Sets up his plant's profile



Learns more about his plant



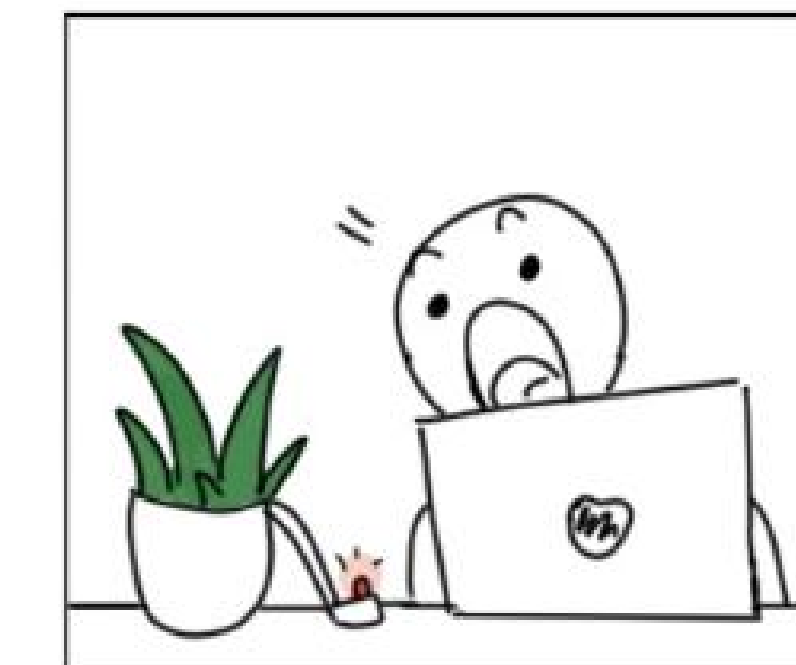
Contacts other owners with same plant for tips and tricks



Gets reminded on app to water his plant



Light device and friends also notify him

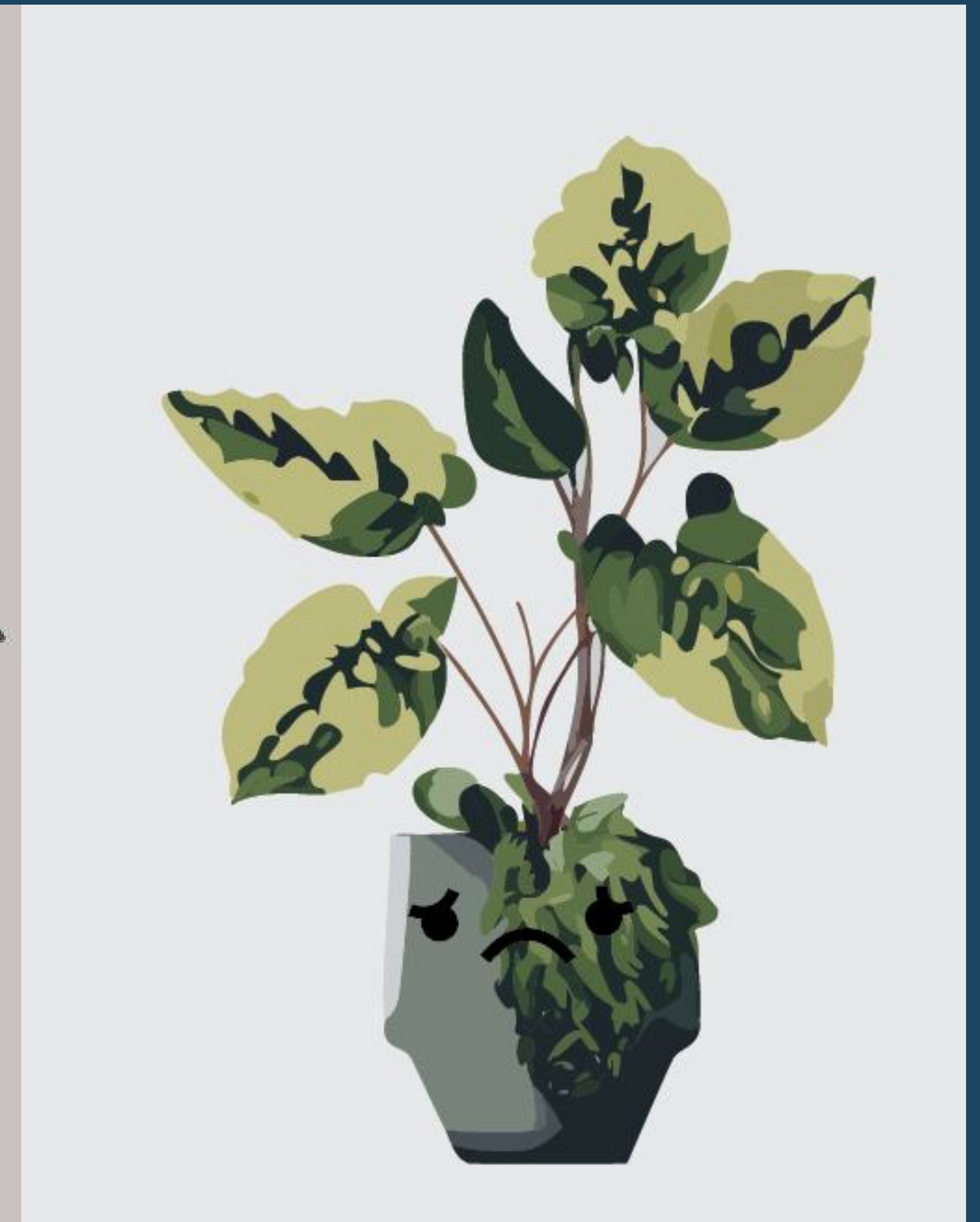


Develops a good habit to water plants on time

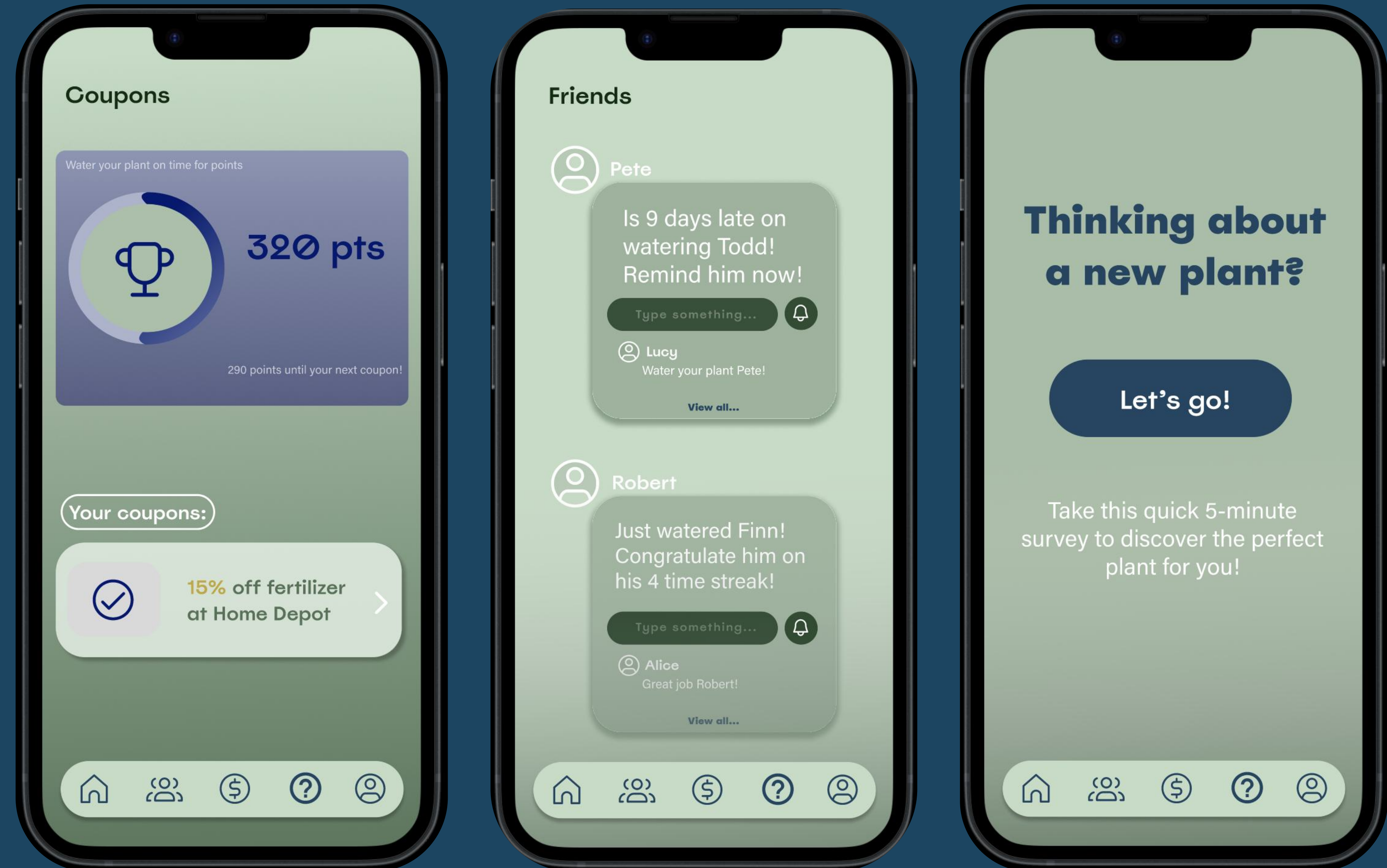
Plant's
facial
expression
emoji and
appearance
change
when not
watered



When Thirsty



App
functions
are created
through
user
interviews



Propagation Gifting:

- Option to trade and gift propagations and plant clippings with community.
- Encourages people to feel more connected with their plant, as they raise it from when it was young
- Increases community connection as you can get tips or help from people in your community
- Can get different plants for low cost

Plant locator map:

- Map that shows where plants are in each part of house
- also shows status of plant (need water, need fertilizer...)
- Serves as an overview to see all plants in house easily, especially if your plant is hidden and harder to spot

Title

Headers are Spoof Medium with a 2:13 ratio to title with a -8% spacing

Body text is Acumin Pro Regular, with -1% letter spacing and a 42 line height. The color palette brings together the soothing feel of earthy and coastal tones, mixed with a touch of warm sunlight. Altogether, these tones create a balanced, natural aesthetic—ideal for designs that aim for tranquility, warmth, and a subtle nod to nature's colors.

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#C3D9C5

#1C4561

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