QuaLights

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Overall Problem

Indoor Air Quality

90% of our lives spent indoors

2-5x More pollution indoors than outdoors

Common Indoor Air Pollutants

Airborne particles from diesel exhaust, dust, smoke and other sources

Indoor formaldehyde from building materials, furniture, cooking, and smoking

Household odors & gases from activities such as painting, cooking, and smoking

Ozone from outdoor air (ground level ozone is harmful to breathe)

O_3

Carbon Dioxide from people exhaling and cooking

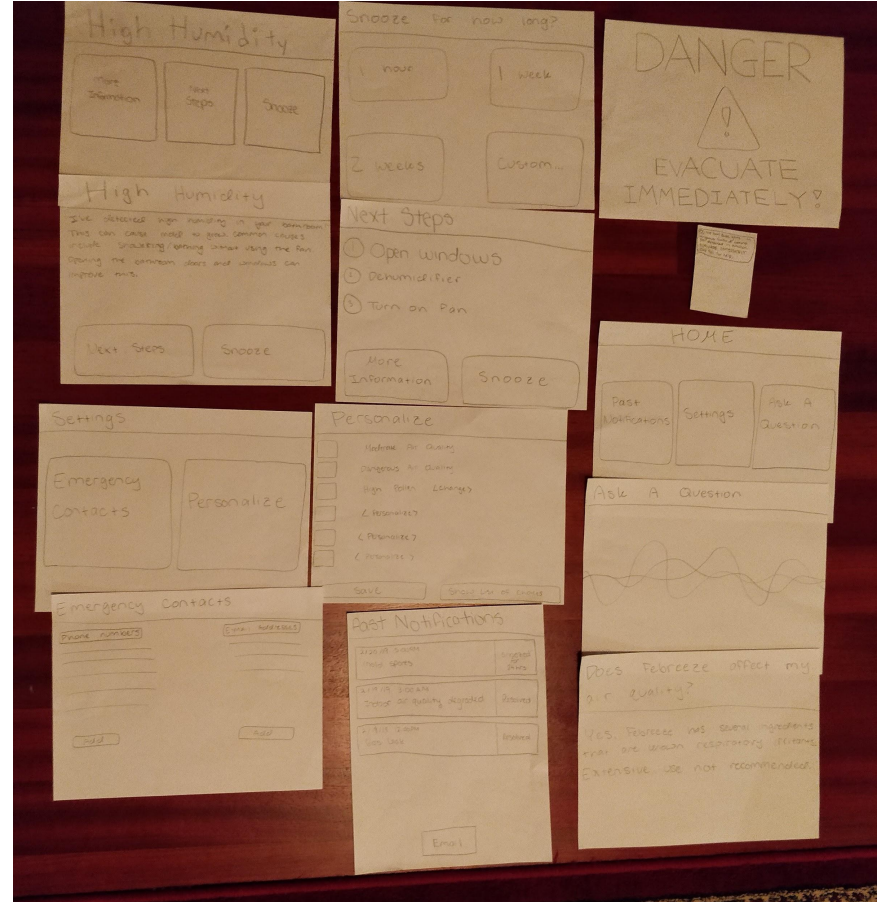Poor indoor air quality can cause or worsen many health problems.

- Irritation of eyes, nose, throat
- Headaches
- Dizziness
- Fatigue
- Respiratory disease
- Heart disease
- Cancer

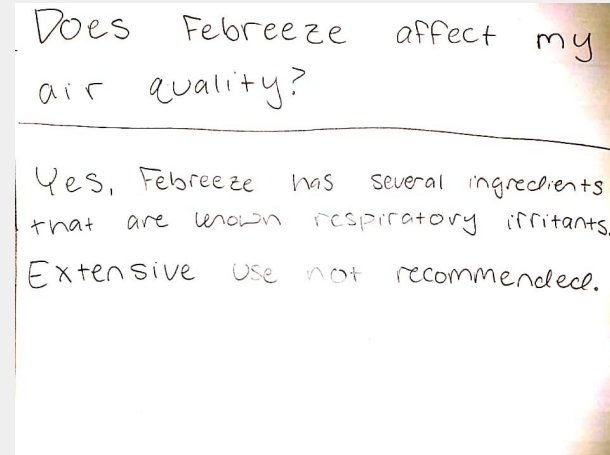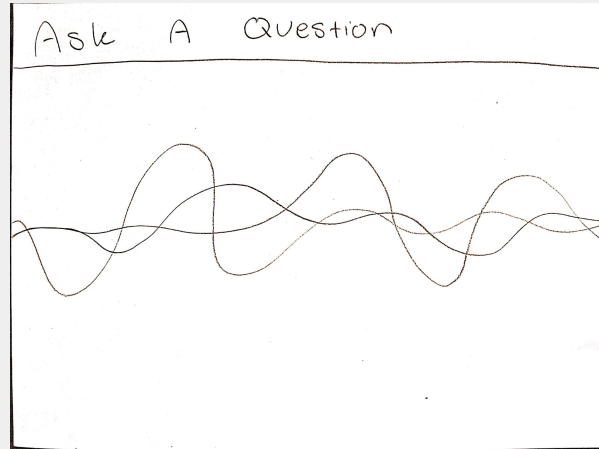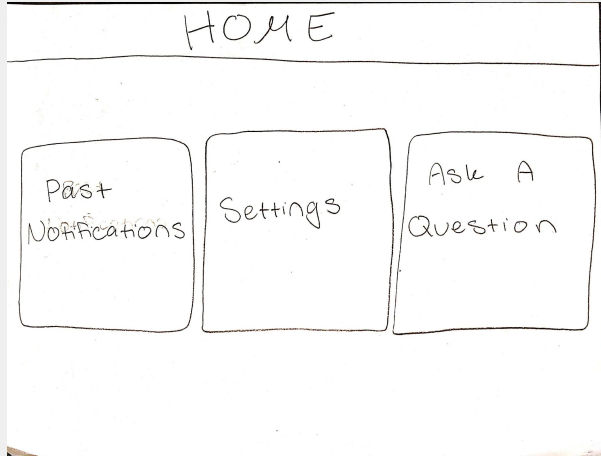However, most people are unaware or poorly informed about their indoor air quality.

Initial Paper Prototype
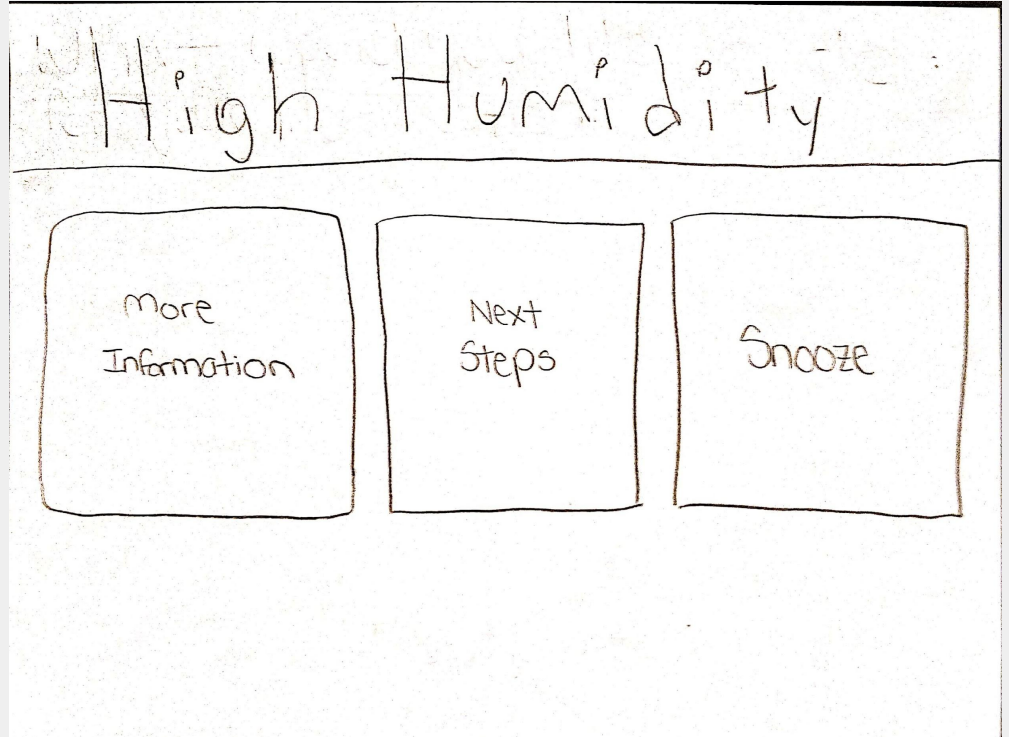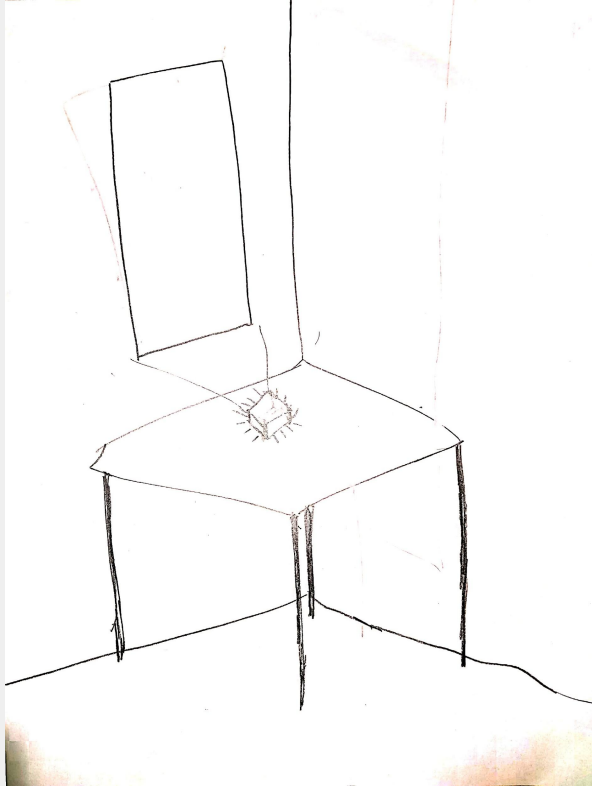
Main features:
- Hardware box
  - LED lights around perimeter to indicate notifications
- Projection interface
- Voice control
- Air quality hazard notifications
  - Projections
  - Text notifications

Initial Prototype - Educate about Air Quality

HOME

Past Notifications

Settings

Ask A Question

Ask A Question

Does Febreeze affect my air quality?

Yes, Febreeze has several ingredients that are known respiratory irritants. Extensive use not recommended.

Initial Prototype - Monitor Home Air Quality

Initial Prototype - Monitor Home Air Quality

High Humidity

I've detected high humidity in your bathroom! This can cause mold to grow. Common causes include showering/bathing without using the fan. Opening the bathroom doors and windows can improve this.

Next Steps   Snooze

Next Steps:

1. Open windows
2. Dehumidifier
3. Turn on Fan

More Information   Snooze

Testing Process and Results

2 Heuristic Evaluations	3 Usability Tests	Key Takeaways

2 Heuristic Evaluations
- 2 groups of classmates
- Projection form factor
  - Hard to use for data input
  - Voice navigation requires recall
  - Caused confusion

3 Usability Tests
- 3 college students
- Light box and mobile app
  - Straightforward and provides more flexibility
- Participants frequently forgot about voice control feature
- Difficulty in understanding function of personalization

Key Takeaways
- Projection became mobile app
- Brought personalization to the forefront
- Using visuals to communicate issues with air quality
- Communicating how to use device is essential

Final Paper Prototype

Main Features:
- Hardwear box
  - LED lights around perimeter to indicate notifications
  - Can be hung on wall or placed on table
- Personalized
- Placed in multiple rooms
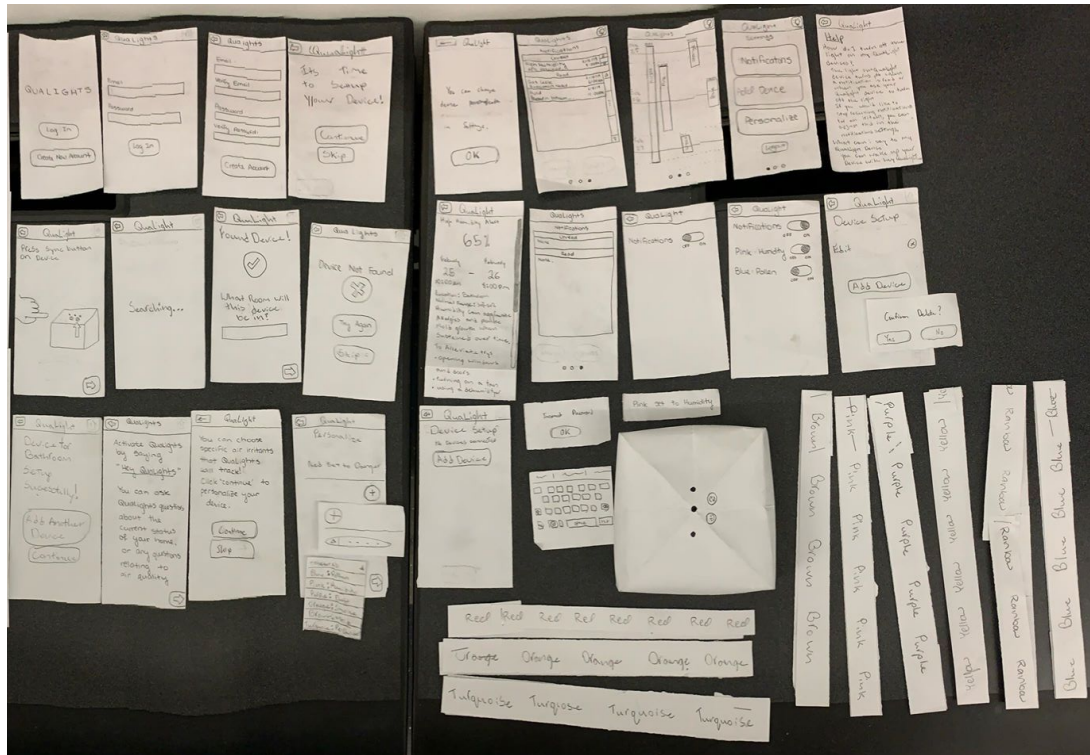
Final Prototype - Educate about Air Quality
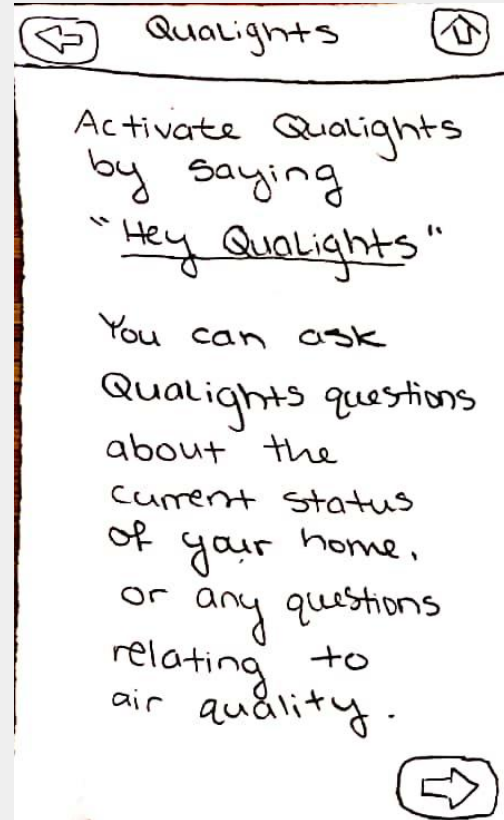
Final Prototype - Educate about Air Quality

Asking a Question About Air Quality

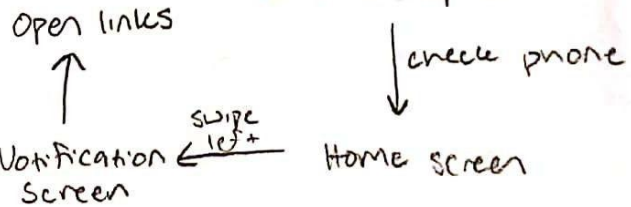"Hey Qualight, how does Febreze affect my air quality?"

QuaLight: "Febreze contains neurotoxins and carcinogens in small concentrations. Extensive use not recommended."

"Thanks Qualight"

"Tell me more!" → QuaLight: "Okay. I've sent you a notification to resources with more information on this topic."
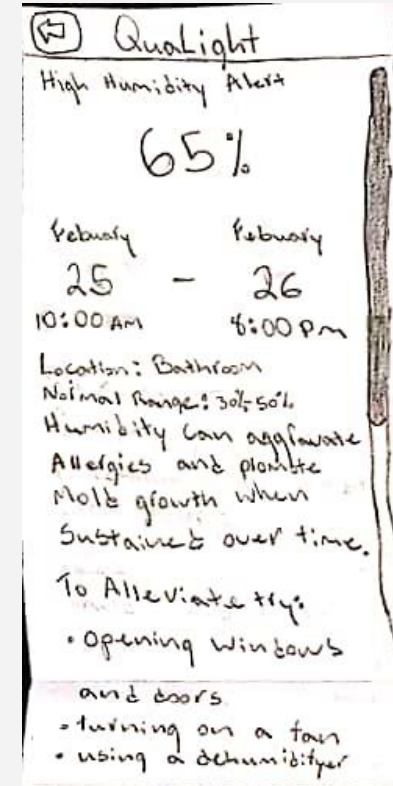
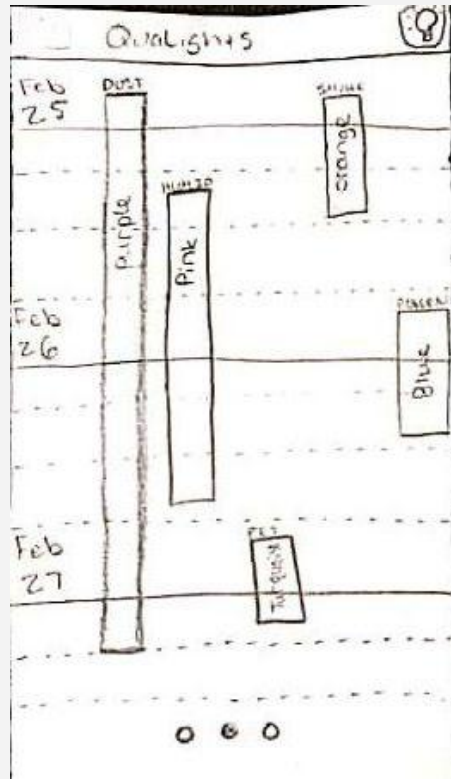Open links

Notification Screen ← swipe left — Home screen

check phone

Final Prototype - Monitor Home Air Quality
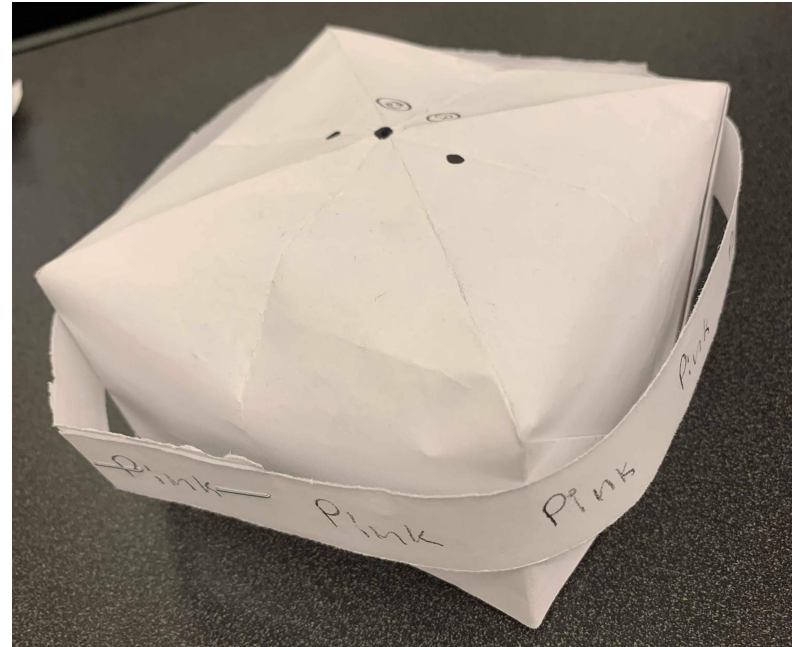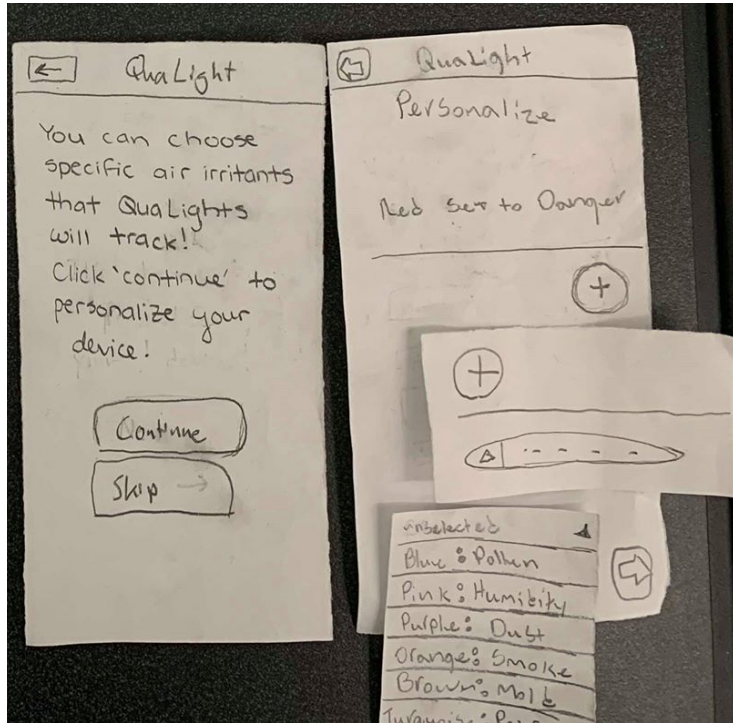
Final Prototype - Monitor Home Air Quality
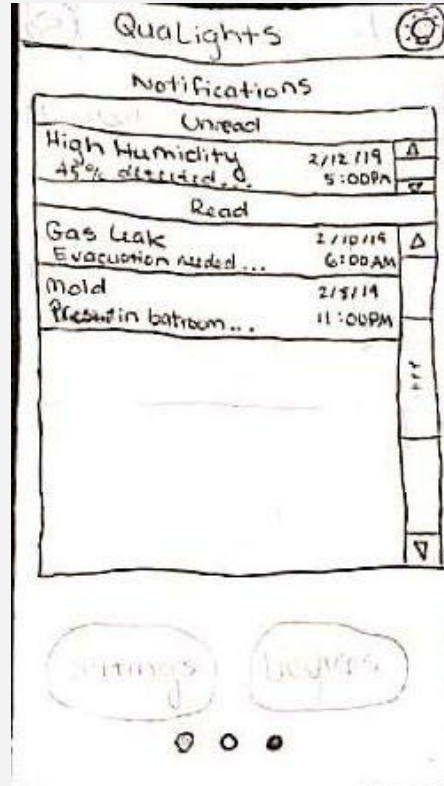
Digital Mockup - Educate About Air Quality

- Questions are prompted at the beginning of device setup
  - Allow people to think more about potential air quality concerns and to personalize their notifications
- Monthly air quality reports
  - Allows a person to view and learn more about their air quality notifications

An image of a person's monthly air quality report
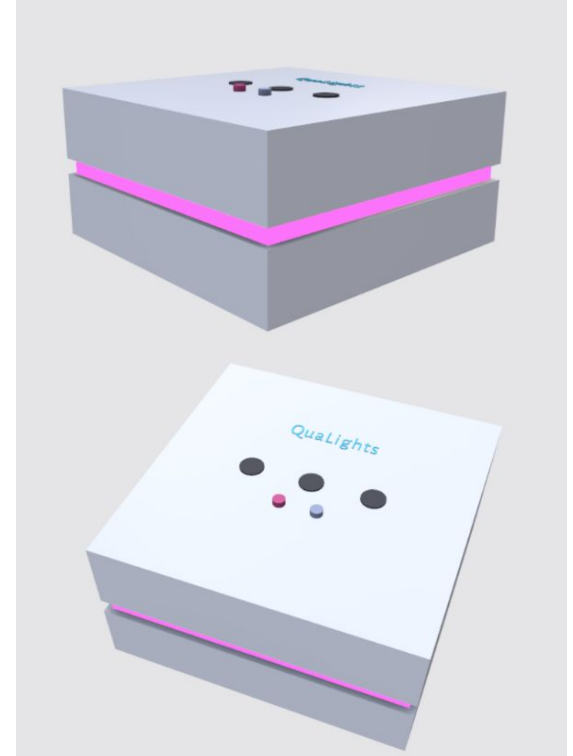
Digital Mockup - Educate About Air Quality

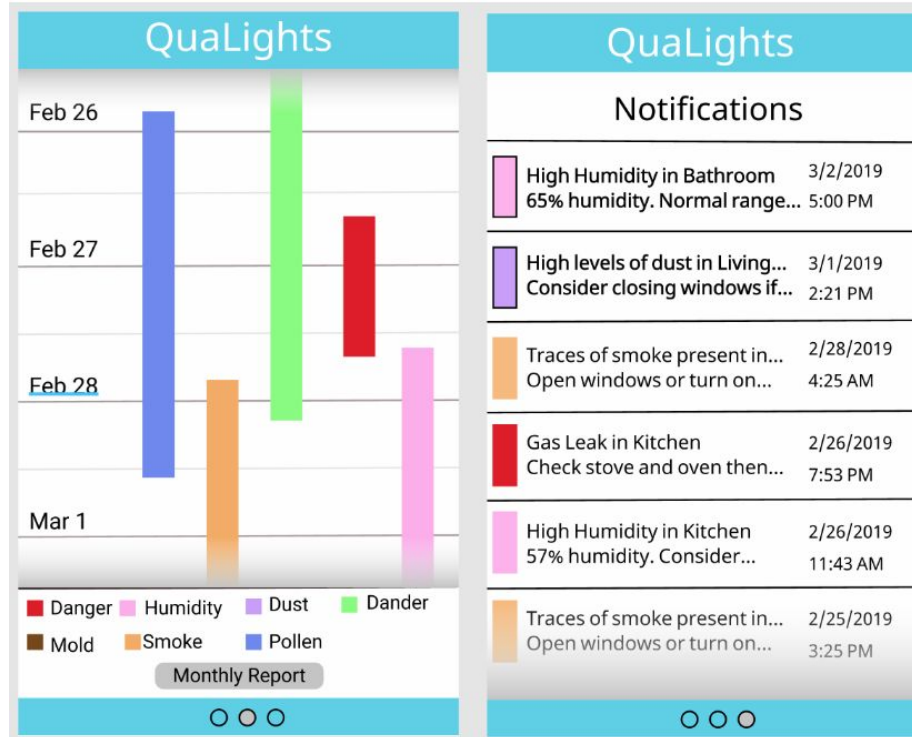# Digital Mockup - Educate About Air Quality

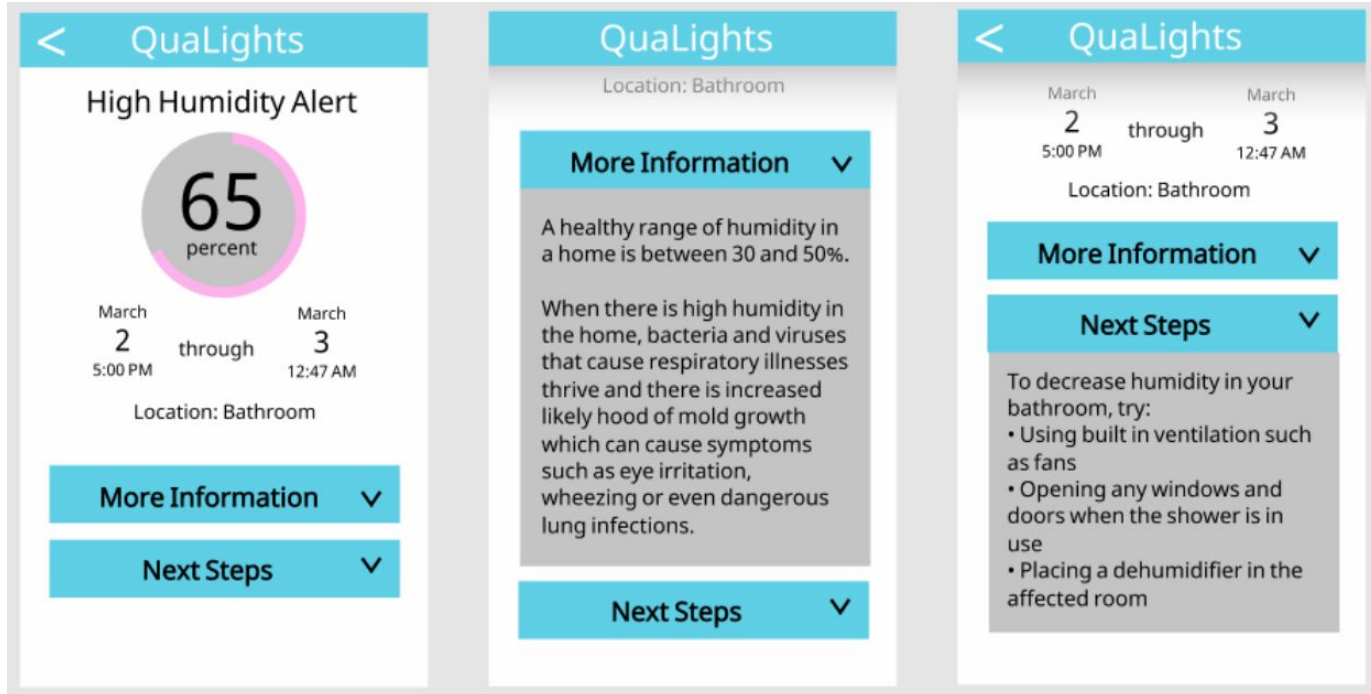# Digital Mockup - Monitor Home Air Quality

- Hardware device lights up when a change in a home's air quality is detected
- Home screen
- Log of notifications

Digital Mockup - Monitor Home Air Quality

Digital Mockup - Monitor Home Air Quality

Summary

- We learned to utilize existing resources, by using a smartphone or tablet to interface with our device instead of a ceiling projection
- We refocused on developing a design that accomplishes our tasks more effectively versus on a design that had a more unique form factor but was less usable
- We discovered the value in reevaluating our design choices multiple times

Thank you!

Contributions

Bailee Barrick: 25% - Worked on final prototype, digital mockup, initial prototype, added all scanned photos

Daniel Shen: 25% - worked on overall problem and initial paper prototype

Pei Lee Yap: 25% - worked on testing process and results

Joy Clark: 25% - created presentation template, worked on summary and digital mockup sections