

Design Brief

School: Cheney Middle School

State: Washington

Division: Middle School

Team Members: Gracie Day, Annika Palmer, Layla Shepard, & Daylynn Newbill

Project Title: Readers should have a glimpse at what the project is about and want to read more. (25-word maximum)

Seek Shelter Alert System: We are making a prototype that will alert individuals experiencing homelessness if the temperature drops or rises to a dangerous level.

Project Purpose: In one or two sentences explain what this project intends to do. (50-word maximum)

Our project is made to help individuals experiencing homelessness know when to seek shelter when the temperatures are dropping and rising to dangerous levels.

Abstract: Briefly describe the people who will benefit from the project and the challenges they face. Include any inequity that the project hopes to address. (100 Words Maximum)

Over 150 people experiencing homelessness have died on the streets due to extreme weather this year in the Spokane, WA area. Our prototype is going to help individuals experiencing homelessness find shelter when temperatures become too extreme the buzzer will alert the individuals to get up and get moving or get up and find a shelter.

User Research: Discuss key information about the users gathered through your research, interviews, and ongoing discussion with the user throughout the project. What did you learn about the user and the barriers they face? (200-word maximum)

In our interview with Sarah Yerden from Catholic Charities in Spokane, Washington, we learned that it is vital that people know when the temperature is becoming increasingly dangerous. Also, we learned that they serve approximately 1,000 people a year due to homelessness. Extreme heat can be just as problematic as cold. They served about 200 people in the summer due to extreme heat. Sarah helped us understand that there are many reasons why they are experiencing what they are. We learned it is important to realize the extreme hardships and trauma people face, and harsh weather is another one of those factors. Sarah Yerden recommended to us, to have the buzzer alert the individuals when the temperatures become unsafe and deadly, and those temperatures are 32°F, 25°F 100°F, and 110°F. She also recommended using a buzzer strong enough to wake them up but not too traumatic.

User Insight: Discuss your team's understanding of the experiences, emotions, and motivations of the users. This insight should inform the rest of the project and help the reader have a deeper understanding of the inequity of the user. What did you learn about how the barriers affect the user? (200-word maximum)

We understand that homelessness in the Spokane area is a very big hardship (and even bigger worldwide) and we would like to make sure that we can help individuals facing homelessness in some way. We understand that being homeless would be hard and especially hard not knowing if the temperatures are dangerous for us that night. Sarah Yerden gave us great information and insight into the homeless community. Not knowing when the temperatures are at dangerous levels would be a huge barrier for the homeless community. We understand that we will not be able to help every person experiencing homelessness but even if our group can only help one person it will be worth it.

User Needs: Develop a specific list of the user's needs produced from the user insight. What does the user want to help them with the barrier? (100-word maximum)

The homeless community is very hesitant so we talked to an expert and interviewed Sarah Yerden from Catholic Charities to help discover what we need for our client requirements. Individuals experiencing homelessness die due to extreme weather. We researched data on the homeless population and services, interviewed our client for specific statistics, and programmed our prototype to buzz when the temperature drops below 32 degrees Fahrenheit. We conducted trial runs to test the temperatures that our device would later detect. We added layers of code for different temperature ranges. We look forward to sharing our prototype success with Sarah.

Project Goals: List project goals and describe how they are linked to and will adequately meet the user's needs and address worries and/or barriers faced by the user. What do you want the project to do to help the user? (100-word maximum)

We would like our sensor to notify (buzzer) the user (individuals experiencing homelessness) when temperatures get too low/high (32, 20, 100, 110 degrees). Our goal is to alert them so that they can find shelter or get moving and prevent loss of life due to extreme temperatures.

Key Features of Design: List key features, illustrating that the design will adequately meet project goals. How will the project help the user? (200-word maximum)

Features of our design:

- Alerts at 32° and 25°, with different sounds and more frequent buzzing for colder temperatures (goal: alert people to get them up and moving when cold temperatures are most dangerous).
- We also have different pitches for the buzzer depending on the temperature (goal: people can recognize from the pitch sound if it is freezing or well below freezing).
- Alerts at 100° and 110°, with higher sounds and more frequent buzzing for warming temperatures (goal: alerts people to get to a shelter when heat temperatures are most dangerous).

Impact: Discuss how design addresses inequities for the user and/or removes barriers. Input from users should be included. Does the project help the user? How? (200-word maximum)

Our idea for our design is to impact the homeless community with issues that sprout from extreme temperatures all year round. Also, it's not easy to tell the temperature without some type of device, ours will be easy to use and carry around. Our design will help the homeless community in many ways, possibly saving lives with our device. Our prototype takes AA batteries with 1.5 voltage so that there is no need to charge the prototype. We would like to continue partnering with Catholic Charities of Spokane or possibly Jewels Helping Hands so that when the user needs new batteries they are able to get them! Although we aren't able to test our prototype directly with homeless individuals we designed our prototype based on our client's requests.

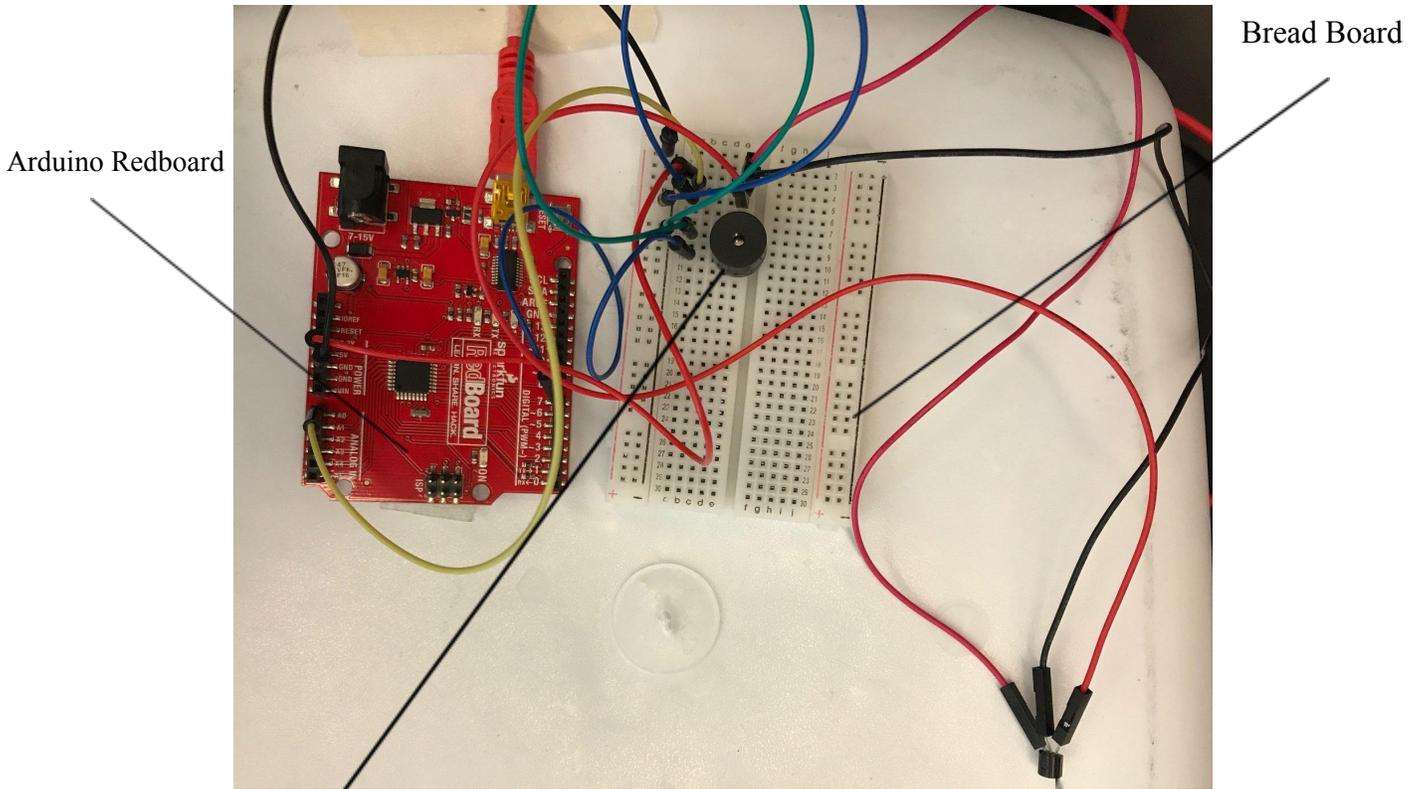
Status of Project: Describe the current status of the project, including feedback from users, and discuss potential next steps. What does the project do now? What would you like to work on in the future? (200-word maximum)

Our group just added in our second layer of code and we have found a way to convert the raw number that our temperature sensor gives us into a temperature. Our next steps could include finding a way to put our device into a custom-made case. Unfortunately, we are not able to have a homeless individual test our prototype, but Sarah Yerden from Catholic Charities gave us lots of insight into the homeless community and tips for our prototype. We also did testing in our very own school, we went into our walk-in freezer, and in rooms that are known to be hot. Our prototype is set to alert the user at the temperatures from Sarah Yerden at Catholic Charities

Reflection: Show that the team has an increased understanding of human-centered design. Examples of personal growth and insights gained about designing for others and helping them overcome challenges should also be included. What did you learn during this project? (200-word maximum)

While creating our design we had to learn to be open to trying new things such as coding and doing the wires. When MESA first started none of us had ever coded or wired for anything like this before. One big challenge was figuring out how to add the second layer of coding for the extreme heat. We finally found the problem and overcame it and also added new features to the buzzer by making it a different pitch. Another hard thing that we had to figure out was finding the raw number and finding the temperature. But, when we made the graph and looked at our data we finally got the temperature we needed. Although we did go through challenges we had the perspective of individuals experiencing homelessness and understand that our challenges are not nearly as hard as they have to face everyday. After talking to Sarah we have gained a lot of empathy for anyone that has or is going through homelessness.

Prototype Graphic: A single graphic with key features adequately labeled. It should be easy to understand and the reader should have a general understanding of how the prototype functions by looking at the graphic.



Piezo Speaker

Buzzer will alert at

- 32° F, quiet alert every 1-minute
- 20° F louder alert every 30 seconds
- 100° F quiet buzz every 1 minute
- 110° F louder buzz every 30 seconds

Temperature Sensor

It gives us raw data in our serial monitor that we converted into temperatures.