Design Proposal Template:

School: Anton Chico Middle School **State:** NM **Division: Middle School**

Team Members' Names: Amaya Gonzales, Amilee Cordova, Ava Lucero, Kiara Sanchez

Project Title: Readers should have a general sense for what the project is about and want to read more. (20 word maximum)
Fire Bandit is an early detection system sending instant alerts to fire personnel helping to prevent the spread of wildfires. (20 words)
Inequity Being Addressed: Describe the inequity that you will attempt to address with your proposed solution, and why you chose this inequity. Students are able to consider a global perspective related to their inequity. (75 word maximum)
The Hermit's Peak Calf Canyon Fire was the largest wildfire in New Mexico. Wildfires affect agriculture, farming, wildlife, and us. To prevent future wildfires, we need an early detection system. Our solution helps locate fires quickly and alert first responders immediately, reducing damage and protecting resources. Our project connects to UN Sustainable Development Goal #13: Climate Action by helping protect water, land, and communities from wildfire damage. (67 words)
Community Research and User Identification: Explain the process used to identify the inequity and select your user. Include any research done to identify issues in your community and understand which groups face challenges because of these issues. (150 word maximum)
We were all directly affected by the Hermit's Peak/Calf Canyon (HPCC) fire which burned 341,471 acres. Although our land or homes did not burn, there are people in communities who did. We researched wildfire response times and found that firefighters take an average of 6-15 minutes to arrive, but in remote areas, fires often burn for at least 20 minutes before first responders arrive. In 2023 alone, wildfires destroyed 4,318 structures, including 3,060 homes, in New Mexico. Although our community was not directly affected, some communities did lose their land and homes. To learn more, we interviewed Dr. Edward Martinez, an environmental science expert, who explained how early fire detection could make a big difference. He is also a resident of northern, NM and was directly impacted by the HPCC. His advice helped shape our solution. (140 words)

User Profile: Provide a detailed description of your selected user. Include information about challenges they face, how those challenges impact their lives, and specific project needs based on user feedback. (150 word maximum)

Our users would be the fire personnel who would set up these devices and depend on them for early detection. Fire personnel will be able to identify if a fire has started, and then respond promptly. Fire Bandits sensor will go off informing firefighters of its precise GPS location making it easier for them to send crews out to put out these wildfires.

Through our research we identified the following needs:

1. An alert system to instantly notify authorities.
2. Easy installation so they can be installed quickly and in multiple places.
3. Affordable so that this system is accessible by multiple fire departments
4. A system that can monitor large areas, particularly near campfire sites, forests, and high-risk wildfire zones.
5. A system that requires low maintenance and is self-sustainable and function for extended periods without frequent maintenance, potentially using solar power for sustainability (140 words)

Project Goals: List your project goals and explain how these goals will address the inequity. Project goals should define the desired outcomes, not specific features of the proposed solution. (150 word maximum)

Our project goals focus on preventing wildfires from spreading and reducing their impact on communities.

1. We aim to improve early fire detection, allowing firefighters and forest rangers to respond faster and contain fires before they grow out of control.
2. We strive to protect rural communities across Northern New Mexico, where wildfires like the Hermit's Peak Calf Canyon Fire destroyed homes, displaced families, and devastated local economies.
3. Support long-term sustainability and disaster prevention, helping communities recover and thrive.

By achieving these goals, we address the inequity of wildfire destruction in rural areas, where emergency response times are longer and resources are more limited. Faster fire detection means fewer families losing their homes and livelihoods, less environmental damage, and safer conditions for firefighters. (121 words)

Proposed Solution: Describe your proposed solution, including any innovative and unique features, and explain how this solution will address your users' needs and the inequity they face. (150 word maximum)

Our solution, Fire Bandit, is designed to address our user's needs by instantly alerting firefighters and forest rangers of the first sign of smoke. Right now, fire detection relies on people spotting flames or delayed satellite data, which means fires can grow out of control before help arrives. Fire Bandit gives real-time alerts, so crews can respond faster and keep fires from spreading. To ensure we put our detectors in the best locations, we're partnering with SciVision, a fire simulation company, to study fire patterns and figure out exactly where they're needed most. Wildfires have devastated our community, burning homes, killing livestock, and contaminating water. By catching fires sooner, Fire Bandit helps prevent destruction, protect natural resources, and to keep families safe. Faster response times mean less damage, fewer evacuations, and a better chance of stopping fires before they get out of control. (144 words)

Initial Design: A single graphic of your first design idea 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. Max size 8.5” x 11”

How the Fire Bandit Works

- Detects smoke using sensors
- Sends immediate alerts to emergency responders
- Reduces the time it takes to detect and respond to wildfires
- Monitors high-risk areas continuously
- Provides quick, important information during wildfire events