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Interactive Installation
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And then... BOOM: Final Project Proposal

Short Description: *And then... BOOM* is an interactive installation that appears to allow users to digitally experience the Chinese New Year's tradition of shooting off fireworks, but then ultimately delivers a PSA concerning the harmful effects of the tradition on the environment. With the position of digital fireworks controlled by a physical firework launcher that can be pulled along a track, and a launch pad where the user can "light" the fuse of the launcher initiating fireworks to appear, the installation is designed to initially replicate the fun and excitement of launching fireworks in real life, so that user can come to their own realization as the environment progressively becomes more hazy and when prompted with the PSA message "What is worth protecting" in English or "传统还是环境? (Traditions or Environment)" in Chinese.

Extended Description: *And then... BOOM* is made possible by communicating graphics created in Processing with digital and physical fabrication elements connected to an Arduino. For the tech of the project, digital fireworks were coded using particle systems in Processing with additional effects coming from contributed libraries. The sound of fireworks were created with the Minim Library and smoke effects were added by repurposing the Pixel Flow Library's liquid simulation. To connect this to the physical elements, I used Serial Arduino/Processing communication and an IR ranger sensor to communicate the position of the physical firework launcher and the subsequent Y-position of the

fireworks on the screen. To indicate when the firework was launched by the user, I created 2 circuits. One was a closed circuit with LEDs to represent a fire source. The other was an open circuit designed to look like a firework fuse that the user could close by touching the fuse to the LEDs, which would effectively send a signal to Processing to launch the fireworks.

When it comes to the digital and physical fabrication of the project, there are 3 main components (1) the firework launcher, (2) the track, and (3) the launch pad. The firework launcher's base was designed in Adobe Illustrator, cut on MDF using a laser cutter, and then stained red, as one of the main colors of Chinese New Year. For the "launcher" component, we decided to mount a thick stalk of bamboo at a 45-degree angle to the base to replicate a sort of "cannon" aesthetic that could easily read as a source from which fireworks could be fired. Bamboo was chosen not only for its cylindrical shape, but also for its historical significance in the Han Dynasty, as one of the first iterations of today's modern firework. Finally, we attached 4 wheels to the base of the launcher and two ropes, so that it could be moved by the user. We constructed the track by using 2 red-stained parallel slats of wood that are braced together at the end by two smaller slats of wood. We added an additional slat of wood 3/4ths of the way down the track to keep the launcher within sensor range and to prevent it from colliding with our "launch pad". The launch pad was constructed by recycling found cardboard boxes and decorating them as Chinese firework boxes. Using these boxes, we created a "launch pad" to hide the open and closed circuits.

Ideation and Motivation: When ideation began for this project, we decided that we wanted to do something topical that could potentially change people's perception of a certain issue. While we considered a wide range of topics,, we decided in the end that we wanted to take inspiration from the place of our

installation. Since we didn't know the exact location of our installation at the time, we decided that it should be something relevant to China. The topic of pollution was ultimately decided upon because we wanted to challenge ourselves to reimagine a topic that was discussed so often, with a new element that many might not have considered. Since festivity fireworks of China's New Year's holiday cause a great deal of pollution, we ultimately decided that this would be our angle. Since many people do not realize the effects that fireworks have on the environment, but just view fireworks as a source of fun, we also decided that we wanted our final project to have an element of surprise where the user might to come to this realization on their own.

Requirements of the Installation: If *And then… BOOM* should be reinstalled in a different space, there are certain tech and spatial requirements that would be necessary. On the technical side, *And then… BOOM* requires a computer to run the Processing sketch and facilitate Arduino/Processing Serial communication. To maintain the framerate of the graphics, it is preferable if the computer has a RAM of 8GB or higher. The installation also requires wiring, an Arduino, an IR sensor, speakers for sound, and a projector to project the graphics. As for spatial requirements, the installation is stronger in the dark and currently occupies about 250 cm of horizontal space and about 2 meters of vertical space. While the vertical space restrictions could be reduced with a projector with a shorter throw distance, it is not recommended that *And then… BOOM* occupies less than 250 cm of horizontal space to promote user interaction.

Considerations for Future Iterations: If we were to do this project again, there are some considerations that we might make to improve the project and scale up the project. In terms of improving the project, we might want to make the "flame"

element more convincing and increase the amount of ambient sound to heighten realism. We might also choose an image with less visual complexity, so that the fireworks can stand out more. To scale the project up, we might consider making the track longer or adding more launchers and more tracks, so that more than one person can interact with the exhibit at a time.