

Hana Kieger
Team Three Report

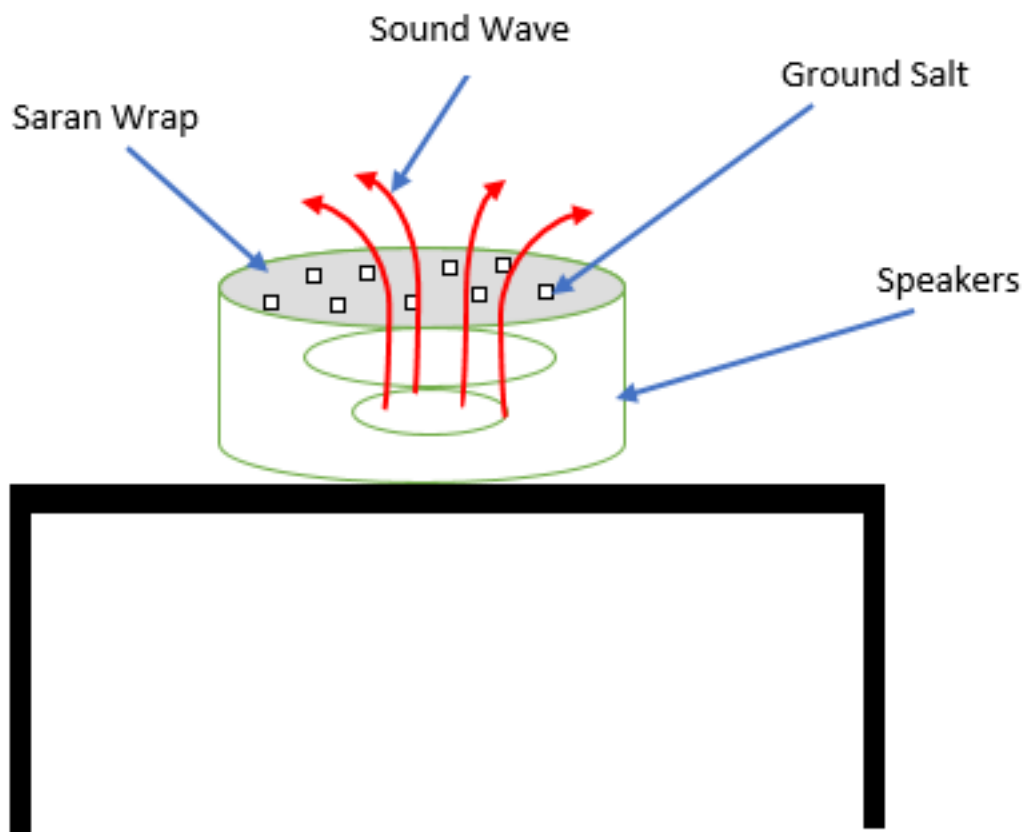
Photographic and Scientific Intent:

This video was taken for a Flow Visualization course at the University of Colorado Boulder. For this project, we attempted to visualize sound wave patterns. We saw a beautiful video (<https://www.youtube.com/watch?v=Q3oItpVa9fs>) that inspired us to attempt our own version.

Artistically, experimenting with cymatics creates beautiful patterns and allows for scientific exploration. This was a team collaboration between Eli Copp-Devol, Ibrahim Alhajji, and Chet Roe.

Setup (written by Ibrahim):

The setup for this experiment is simple. As you can see in the sketch below, a KEF q300 speaker cabinet was used as a sound wave source. The speaker was covered with Saran wrap and a small amount of grounded pink Himalayan rock salt was placed on the middle of the Saran wrap. To start the sound waves and to generate vibration, songs were played together with a sliding tone generator. Desired vibration frequency was achieved by adjusting the volume using the sliding tone generator.



Physics (Ibrahim):

Sound is a mechanical wave generated by the vibration of particles in the medium at which the vibration travels (air is the medium for this experiment). The sound generated by the speaker vibrate surrounding objects carrying the sound along. When the sound waves reach the salt particles, they start to vibrate the particles causing them to move and shake. Changing the volume or the frequency of the sound would change the salt particles movement.

Source: <https://study.com/academy/lesson/how-does-sound-travel-lesson-for-kids.html>

Visualization Technique (Eli):

As mentioned previously, ground salt was used to visualize the effect of different frequencies on fine particulate. The black face of the speaker playing the frequencies was used as a background which helped contrast against the white salt. An LED light panel was focused directly on the salt, adding clarity to the footage and one or two floor lamps were placed at a distance to create ambient light and eliminate any hard shadows generated by the light panel.

Photographic Technique:

The field of view of the video is roughly a foot wide, and the distance from the setup to the lens is roughly a foot. The video was taken on a Nikon d3200 digital camera. The original pixel ratio was 1920×1080 . For the post-production processing of this video, I wanted to make the videos change based on the strong beats of the music. Other than that, I didn't edit anything about the video such as color, saturation, etc.

Overall, I like how the video turned out – it shows different versions of the same phenomena, so you get to see how different sounds and frequencies affect the salt in different patterns.