

Sand and Sound



Description:

My project, the Sand and Sound exhibit, works by applying vibrations with a sine wave generator or a violin bow onto a metallic plate, which then creates patterns throughout the surface. I have multiple versions of the Chladni Plate experiment. One version is completely DIY: a metal plate is attached to a subwoofer that serves as the middleman through which the sound waves from the Sine Wave Generator travel. While tinkering with this project, I have discovered a technique on making patterns generated by sine waves. If one were to “rock” the knob controlling the frequencies back and forth, then you are able to better control the sine waves. Key frequencies to take note of and explore are: 46-49Hz and 100-107Hz. The other version of the experiment however, is less DIY. This is because we had purchased ready-made Chladni plates online instead of making our own. However, it gained its title “Semi-DIY” because we had to assemble it ourselves, and the materials that were used to do so weren’t included with the plates. Finally, our last exhibit is what I refer to as Eco-Luxe. This version isn’t DIY at all because one can find this kit online with all of the parts. This version of design can be found in many physics classes because it demonstrates how waves travel and the patterns it leaves behind.

Budget:	Art-installation Semi DIY	Resurrected DIY	Eco-Luxe
Parts:	\$182.81	\$126.96	\$228
Labor:	3 hours	10 hours	15 minutes
Total:	\$182.81 + 3 hours	\$126.96 + 10 hours	\$228 + 15 minutes

Why This Matters

This exhibit provides a visual example of how sound waves travel. Without this fundamental knowledge, the people who created your favorite JBL speakers or Beats headphones wouldn’t have been able to do so! The Chladni plate experiment also provides something that our common Physics or Algebra classes lack: an interesting project to work on! With many DIY kits and tutorials online, one can recreate this experiment with ease and hopefully gain a better understanding and appreciation for mathematics and science!

What Can I Do?

Learn more at:
“Physics Girl” YouTube video:
<https://www.youtube.com/watch?v=wYoxOJDrZzw>

Or: <https://sciencedemonstrations.fas.harvard.edu/presentations/chladni-plates>