



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

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<b>Project Title</b> <b>Chladni Patterns</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The main objective of the Chladni plates is to map out a series of nodes (places on the Chladni plate where there is no vibration) and modes (places on the Chladni plate in which there is vibration) on a thin sheet of metal sprinkled with salt and being fed waves of sound. The goal of this project is to help the viewer literally see sound and understand its dynamics. <b>Methods/Materials</b> I did two different experiments in which I will showcase and demonstrate at the fair that come from to very different time periods. The first was created by Ernst Chladni in 1784 with the original Chadni plate and the second is modernized. The first I used: a worker's bench, a screw clamp, 4 types of putty knives, a violin bow, and iodized salt. The way the experiment is done is that with the screw clamp I attached the one of the putty knives to the bench and poured salt on its edge, then I used the violin bow by bowing the edge of the knife where figures began to appear. The second I used more modern materials such as: a dismantled amplifier, a speaker, a length of cords, a thin sheet of metal, iodized salt, a microphone, and my voice. What I did was I took apart my amplifier and removed the speaker. I used long cords to keep the speaker connected so that I could manually control the sound. The I placed the thin sheet of metal atop the speaker and sprinkled a thin sheet of salt upon it. Then I turned on the amp and with a few more experiments figures had appeared. <b>Results</b> The result of this project happened to be that my hypothesis was correct which was that the higher the frequency then the more nodes there will become and the lower the frequency the more nodes there will become. Going through with the project was especially frustrating, but the results were rewarding, with the also the fact that most people doing this project cannot do it properly therefore this project usually has a small window for success rate. <b>Conclusions/Discussion</b> My conclusion for this project is to thank my family for referring me to do this project and also to my school and the Los Angeles County Science Fair for giving me an opportunity like this. This project was really inspired by love of music and also my knowledge of it proved very faithful to me in this project. You won't see the last of me after this project though, next year I coming back with an unforgettable project judges will be begging on their knees to see again.	
<b>Summary Statement</b> The chladni plates are tools used for acoustic engineering and help the viewer understand the dynamics and complexity of sound.	
<b>Help Received</b> My mother helped fund my project and my grandfather kept me from getting electricuted when I took apart the amplifier. (even though my hand did get shocked anyways)	