



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Justin R. Jee	Science Fair Use Only <h1 style="margin: 0;">J1115</h1>
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) The Mathematics of Sound Waves	Division <u>X</u> Junior (6-8) _ Senior (9-12)
Preferred Category (See page 5 for descriptions.) 11 - Mathematics & Software	
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>Objective: My goal was to take recorded sound waveforms and approximate them with a sum of simple sine functions.</p> <p>Materials/Methods: First, I recorded multiple pitches from various musical instruments and devices with a digital recording device called a minidisc. I downloaded the sounds onto my computer through the sound card. A program allowed me to see and print out the waveforms of my recorded tones. To approximate the waveforms, I used a guess-and-check strategy and plugged the estimated sine equations into Maple, an advanced math computer program that could graph the equations for me. I compared the graphs against the waveforms to check my approximation.</p> <p>Result: Visually, I was able to get close to matching 5 of the originally recorded waveforms with sine functions.</p> <p>Conclusion: Waveforms with a clear tone can be approximated with a sum of sine functions; however, the approximation is difficult using only guess-and-check.</p>	
Summary Statement (In one sentence, state what your project is about.) I'm trying to use mathematical equations to replicate sound waves.	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Dad suggested project, supplied background info., and resources. Mom helped put together board.	