



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

<b>Name(s)</b> <b>Isaac P. Raval</b>	<b>Project Number</b>  31060
<b>Project Title</b> <b>Does Sound Travel Loudest through Solids, Liquids, or Gases?</b>	
<b>Objectives/Goals</b> The objective of this project was to conduct a scientific experiment to answer the question "Does sound travel loudest through solids, liquids or gases?" <b>Abstract</b> <b>Methods/Materials</b> The experiment design used the following as variables: The medium through which the sound travelled (solid/liquid/gas) as the independent variable; Sound measured in decibels (db) after it passed through the medium as the dependent variable; Sound level at the source, the distance that sound traveled, sound receiving equipment, and sound measurement equipment kept constant as the controlled variables. Air, Water and Dirt were used as the mediums, and they were placed in a plastic bottle one at a time for the experiment. A plastic-wrapped microphone was suspended into the medium from the top of the bottle. The microphone was connected to a laptop PC with the sound measurement software Adobe Soundbooth CS4. A stack of post-it notes were dropped from a fixed height to generate the source sound uniformly. The sound was measured in db after it passed through the medium and reached the microphone. The experiment was done 3 times for each medium and the results were recorded into the logbook. <b>Results</b> After passing through the gas medium, the average sound loudness was -45db. It was -27db for the liquid medium, and -21db for the solid medium. <b>Conclusions/Discussion</b> The experiment showed that Solid was the best of the 3 mediums for the sound to travel the loudest. Liquid medium was in the second place. Air medium gave the worst result. The results can be explained as follows. Sound travels as a wave of mechanical vibrations through mediums. Molecules in solids are closer to each other compared to liquid, so the sound vibration (wave) can transfer from one molecule to the next more easily. The same way, as liquid molecules are closer to each other compared to gas, sound travels better through liquid than through gas.	
<b>Summary Statement</b> A scientific experiment to answer the question "Does sound travel loudest through solids, liquids or gases?"	
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