



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Rami Ratl Mrad; Carey Yoon	Project Number S1514
Project Title Music Measure Theory: A Mathematical Analysis of Musical Dissonance and Consonance	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of our project is to find the accuracy and reliability of the Music Measure Theory.</p> <p>Methods/Materials Upright Piano, Computer w/ internet access, Sheet music (Johann Sebastian Bach's Prelude in C Major BWV 846), Calculator, Paper and pencil: Found all frequencies of all keys on piano using computer, used intervals from the sheet music to generate ratios and graphs, calculated accuracy.</p> <p>Results Consonant-Consonant: 100% Accuracy Consonant-Neutral: 100% Accuracy Consonance-Dissonance: 100% Accuracy Dissonance-Neutrality: 50% Accuracy</p> <p>Conclusions/Discussion The Music Measure Theory makes mathematical sense and is accurate, so now people know why sounds sound consonant or dissonant together. In the past, there was no solid proof of the theory. People can use this theory to expand their current knowledge of sound by building off of it.</p>	
Summary Statement We mathematically analyzed sound frequencies with the Music Measure Theory in order to prove or disprove its accuracy.	
Help Received None. We designed and performed the experiments ourselves.	