



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Forrest K. Lighthart	Project Number J0322
Project Title Pythagorean vs. Equal-Tempered Tuning	
Abstract Objectives/Goals My objective was to see whether or not people today prefer the Pythagorean system of tuning to the currently used Equal-Tempered system. The Pythagorean system, or slight variations from it, were used from the days of Pythagoras through the late eighteen and early nineteen hundreds, when the Equal-Tempered system came into dominance and has remained there until today. Methods/Materials I took about sixty people and divided them into categories of with and without musical experience. I then played a major triad, minor triad, and major seventh chord to them in both tunings. They chose whichever chord they believed to be most harmonious, and had a third option they could choose if they could not hear the difference. It required use of computer generated chords, a CD, and a CD player to test, as well as results sheets where subjects could record their responses. Results The results were both contradictory and supportive of the initial hypothesis that subjects would prefer the Equal-Tempered chords on all but the minor triad. Instead, on all three chords, those without musical experience almost unanimously preferred the Equal-Tempered, whereas those with musical experience tended to prefer the Pythagorean chords. Conclusions/Discussion The conclusions I drew from the testing and results is that people without trained ears prefer the Equal-Tempered system because they can't hear the slight dissonances in it. People with musical experience and knowledge preferred the Pythagorean system because they heard the major dissonances as unusual new chords rather than unpleasant familiar ones. Judging by this, and also by increasing experimentation by composers for synthesizers to use new systems of tuning in their music, it may be time to reconsider the dominant system of tuning in today's music.	
Summary Statement Testing the difference in human preference between two systems of tuning musical instruments.	
Help Received Mother and Father helped understand material. Teacher directed me on how to write the research paper and format the notebook.	