



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

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<b>Project Title</b> <b>Pitch'ure Perfect</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> I wanted to find out what percentage of the population could sing on pitch, and if it would be dependent on the age, sex or musical background of the subjects.</p> <p><b>Methods/Materials</b> Materials: Seiko Chromatic Tuner, Tape recording of notes (C,B,G), Questionnaire. Procedure: The subject completed a questionnaire which included: age, sex, if they have taken music lessons, and if they think that they will sing on pitch. I played a recording of three notes (C,B,G); the subject practiced singing each note. I played the notes a second time; the subject sang each note while I determined with my chromatic tuner if the subject was on pitch or not. [The tuner displays the frequency (pitch) of the note being sung and shows the deviation direction (flat or sharp) if the note is sung off pitch] I logged if the subject was on pitch, flat or sharp on each note. I asked the subject if they thought that they had sung on pitch.</p> <p><b>Results</b> I tested 100 subjects. Only 19 subjects (19%) sang on pitch, defined as singing all three notes correctly. I tested 49 kids &lt;18 yo and 51 adults. 11 kids (22%) were on pitch and 8 adults (16%) were on pitch. 14/58 females (24%) were on pitch and 5/42 males (12%) were on pitch. 36% of males sang all three notes incorrectly as opposed to 17% of females. Of 77 subjects who had a musical background (voice or music lessons or having sung in a choir), only 18 (23%) were on pitch [little different from the total subject pool]. Although 95% of the subjects who sang on pitch had had a musical background, 52% of the subjects who sang all three notes incorrectly had also had a musical background. 13 of the subjects (68%) who sang on pitch had predicted that they would do so before testing. Almost all (96%) of the subjects who sang all three notes incorrectly had predicted that they would be off pitch and 92% realized after the test that they had sung off pitch. When a subject sang a note off pitch, 72% of the time they sang the note flat - 28% of the time sharp.</p> <p><b>Conclusions/Discussion</b> I proved that only 19% of the population could sing on pitch. Kids are more likely to be on pitch than adults and females are twice as likely to be on pitch as males. Music lessons did not help people with their pitch. When a person sings a note off pitch, they are more likely to be flat than sharp. Most people can predict whether they will sing on pitch or not.</p>	
<b>Summary Statement</b> I did an experiment that showed that only 19% of 100 subjects tested were able to sing on pitch; kids and females have better pitch than adults and males; having a musical background did not affect the the ability to sing on pitch.	
<b>Help Received</b> None	