



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> Seth G. McFarland	<b>Project Number</b> <b>J0112</b>
<b>Project Title</b> <b>The Effect of Wind on Bridges</b>	
<b>Objectives/Goals</b> To determine the effect of wind on different bridge structures.	
<b>Abstract</b> <b>Methods/Materials</b> I built four bridges; one bridge with no sides, one bridge with solid sides, one bridge with 17% of material removed from its# sides and one bridge with 30% of side material removed. I also built a wind tunnel where I tested all my bridges three times. I tested the bridges under wind speeds of low, medium, and high. The bridges were allowed to turn on an axis and the angle they turned was measured in degrees. I also tested the bridges horizontal motion under the same wind speeds. I measured this movement in millimeters.	
<b>Results</b> The bridge with no sides rotated the least, but the bridge with 30% of its side material removed from its sides rotated just a little less. The bridge with 17% of its side material removed turned more than the bridge with 30% of the side material removed but less than the bridge with solid sides, which turned the most. I threw out the data for the horizontal motion tests because the results were invalid.	
<b>Conclusions/Discussion</b> I have concluded that the surface area of the side of a bridge makes a big difference in wind resistance. The more surface area there is for the wind to hit, the more force is put on the bridge. This has to be taken into consideration when engineers design a bridge.	
<b>Summary Statement</b> In my experiment I tested four different bridge designs in a wind tunnel to further understand the importance of the aerodynamics of bridge sides.	
<b>Help Received</b>	