



CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

Name(s) <p style="text-align: center;">Evan L.R. Karow</p>	Project Number <h2 style="font-size: 2em; margin: 0;">J0112</h2>																
Project Title <p style="text-align: center;">Can Kites Go Low?</p>																	
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%; border: none; vertical-align: top;">Objectives/Goals</td> <td style="border: none;">Abstract</td> </tr> <tr> <td style="border: none; vertical-align: top;"> <p>Which type of kite will fly well in low winds? My hypothesis is that the Propelled Pillow kite or the Aerodynamic Airfoil kite will be able to fly at the lowest wind speed.</p> </td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;">Methods/Materials</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;"> <p>Materials: Various to build the mini kites & wind tunnel; voltage rheostat; box fan. 8 different design mini kites were made & a wind tunnel constructed. A voltmeter measured voltage to the fan & was used as an indirect measurement of wind speed. A launch pad was constructed inside the wind tunnel & the kites were placed in exactly the same position for each test. A voltmeter reading was taken when the kite lifted off the launch pad. Each kite was tested 9 times. My independent variable was the design of the kite. My dependent variable was the average voltage reading of when the kite achieved lift. My controls: the construction materials, design of the wind tunnel, fan position, kite placement, & taking an average of 9 trials per kite. The measurement of voltage when the kites lifted determined which design was better at low wind speeds.</p> </td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;">Results</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;"> <p>The results supported one part of my hypothesis, but did not support the other. The Propelled Pillow did not perform well in low wind conditions: it had the second worst performance. The Aerodynamic Air Foil design delivered far superior performance in low wind conditions. It consistently tested at the lowest voltmeter reading, indicating the lowest wind speed required for flight.</p> </td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;">Conclusions/Discussion</td> <td style="border: none;"></td> </tr> <tr> <td style="border: none; vertical-align: top;"> <p>This experiment was successful in that it was able to create reliable results based on carefully controlled testing conditions. Having an indirect method (voltmeter) of collecting results had its advantages & disadvantages. The advantage was the ability to compare each kite under the same conditions, so results could be reproduced. The disadvantage was test results produced in the wind tunnel may not be an accurate indication of how kites will perform in real life. 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Help Received <p>Mother & tutor helped with editing; father assisted in wind tunnel construction, under Evan's direction; mother recorded results while Evan controlled voltmeter.</p>																	