

CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

Name(s) **Project Number Jarrison Ball; Matthew Harris** 34096 **Project Title** The Effect of Frost on an Aircraft Wing **Abstract Objectives/Goals** Our objective is to learn if sandpaper (simulating frost) on the upper surface of will produce significantly less lift than a clean wing without sandpaper. Methods/Materials We constructed three control wings and three dirty wings with sand aper attached to the upper surface. Each group had three wings so different angles of attack could be tested including 0, 5, and 10 degree angle of attack. After one round of tests we added 4oz of weight to each wing and retested all wings. Finally for the last round we added 10 oz of additional weight. This should simulate flights of empty, partially full, and full aircraft. A wind tunnel made by Aerold was used. **Results** All light wings with no additional weight produced lift that exceeded the top of the scale with the exception of the dirty wing at zero angle of attack which produced .8. Wings with 4 oz of additional weight added showed a reduction in but for all wings. Zero degree - clean .6 lbs dirty .4 lbs 5 degree clean 1.1 lbs dirty .4 lbs 10 degree - clean .85 dirty .8 Wings with 10oz additional weight added: Zero degree - clean .3 lbs dirty .05 lbs 5 degree clean .5 lbs dirty 1 lbs 10 degree - clean .4 lbs dirt Conclusions/Discussion The data confirmed our hypothesis as tests showed reduction in lift between the clean and dirty wings. The heavy wings appeared to have the most critical results because there was almost no lift created for the zero and five degree angle of attack dirty wings. Summary Statement We wanted to prove at even a slightly rough surface can reduce lift created by a wing. Help Received Mentor and father helped assemble the wind tunnel.