



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

|   |                                       |
|---|---------------------------------------|
| <b>Name(s)</b><br><b>Sunil C. Bodapati</b>  | <b>Project Number</b><br><b>J0103</b> |
| <b>Project Title</b><br><b>Effect of Varying Air Outlets on the Stability of a Hovercraft</b>   |                                       |
| <b>Objectives/Goals</b><br>To determine whether the number of outlets of air on the bottom of a hovercraft will affect the stability of the hovercraft. Stability will be determined by measuring the number of degrees the hovercraft veers from a horizontal grid line and the distance it travels from an origin.  |                                       |
| <b>Abstract</b><br><b>Methods/Materials</b><br>Materials: 3 sheets of foam board 3ft by 2ft, plastic nuts, washers and bolts 2 1/2 inches and 4 M4 size, duct tape, plastic Trash bag, a lift fan 4 inches in diameter, 7.2-volt battery, protractor, hand tools and tape measure.<br><br>Construction Methods: Take the foam board and cut two sheets so the bottom sheet is two inches smaller than the top one all round. Drill 4 holes 2 inches from the corner of the smallest sheet, which is then placed in the bigger sheet. Cut a hole in the center of both sheets a little bigger than the diameter of the fan. Drill four holes to fix the fan to the outside of the top sheet (biggest sheet) using M4 bolts. Take a black plastic trash bag and cut into 8-inch wide strips. Tape the strips together, wrapping these around the hovercraft perimeter and taping them to the top and bottom foam boards.<br><br>Testing Methods: Using hand tools, foam board panels were cut so that each had a different number of holes. The panels were then secured onto the bottom of the hovercraft. The hovercraft is then placed on a horizontal grid line and turned on for 5 seconds. Conduct the same test with the same panel three times. The distance from where the hovercraft starts (the origin on the grid line) to where it ends is measured using a tape measure and recorded. Measure the angle in degrees it veers by drawing a line parallel to the hovercraft and making sure that the line parallel from where the hovercraft ended intersected each other. Use a protractor to measure the angles. |                                       |
| <b>Results</b><br>The hovercraft moved less when there were more holes on the panels at the bottom of the hovercraft. It also veered less with a panel with more holes.   |                                       |
| <b>Conclusions/Discussion</b><br>My hypothesis was supported in saying that with more holes, the hovercraft moved and also veered less, because the distribution of air was more even and would not cause an imbalance as easily as it would be caused by an uneven distribution of air.  |                                       |
| <b>Summary Statement</b><br>My project investigates whether varying the amount of air outlets on the bottom of a hovercraft affects its stability.  |                                       |
| <b>Help Received</b><br>Ms. Belinda Lowe-Schmahl mentored me throughout the project. My dad helped me conduct the experiment and my mom helped me create the display board.   |                                       |