



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Robert P. Hasen; Roland E. Steinebrunner</b>	<b>Project Number</b> <b>J0112</b>
<b>Project Title</b> <b>How Does Pressure Affect the Bottle Rocket's Flight?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this experiment is to find out what amount of pressure will create the farthest flight. Our hypothesis was that the more pressure there was in the bottle the further it would fly. We also thought that at a certain point, the bottle would not fly any further, no matter how much pressure was applied. We thought this because after a certain point, the bottle would lose control and spin out or not go any further.</p> <p><b>Methods/Materials</b> Launcher, bottle rocket, and bicycle pump.</p> <p>Fill the bottle 1/3 full of water. Tip the launcher so that the end is 1.5 m above the ground. Place the bottle on the launcher and lock the mechanism. Attach the bicycle pump and insert the desired amount of pressure. Unravel the release cord, stand back, and pull the trigger.</p> <p><b>Results</b> After the experiment, we found that the distance changes depending on the amount of pounds per square inch. After about 40 PSI the distance has no correlation. We found when you place the bottle on the launcher, you must tip the launcher to keep the water from going inside the PVC pipe. The wind speed also was a big factor of in its overall flight pattern and distance. Sometimes there would be a downburst of wind which would decrease the distance the bottle flew.</p> <p><b>Conclusions/Discussion</b> Our science project helped us learn more about pressure. We also learned that pressure has more power than we anticipated. We learned how to make a successful experiment and how to organize data. This project helped us be able to have more fun while being safe. We learned that if your pressure is too high, the bottle will spin out of control.</p> <p>Pascal's principle is used in the bottle. This states that pressure is transmitted undiminished in an enclosed static fluid. Newton's second law - the more massive an object is, the more force is required to move it - helped us formulate our hypothesis.</p> <p>In all, our experiment was a success and not at all a waste of time. We learned a lot and had a good time.</p>	
<b>Summary Statement</b> Our project is about the effects of pressure and fuel on the flight of a bottle rocket.	
<b>Help Received</b> Ms. Dang critiqued the board and suggested using s.i. units instead of standard measurement (such as inches). One father demonstrated the use of PVC glue and one mother transported the launcher to and from the site of the launch.	