



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tom J. Hiel</b>	<b>Project Number</b> <b>J0215</b>
<b>Project Title</b> <b>Will Crash Barrels Decrease the Stopping Force When a Car Impacts?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> On the roads, yellow barrels are often placed in front of guard rails. These barrels contain a substance that helps with the absorption of stopping forces when a car impacts. Usually, this substance is sand. In this project, I will compare different substances and determine which is the most effective. <b>Methods/Materials</b> To test my problem, I built a ramp on which a model car rolls down and bumps into a force plate. In front of the force plate, a small container is placed filled with a substance. I test one solid substance, one liquid substance, one thick gel like substance, and an empty container. When I release the car at the top of the ramp, it hits the container before crashing into the force plate. The container absorbs an amount of force and the force plate records the remaining impact. The data is collected and graphed. Using the results, I will determine which substance is the most effective in absorbing the stopping force. <b>Results</b> After finishing and graphing all my experiments, I concluded that air was the most effective substance. The results of all experiments with 1 or 3 barrels show that the impact force was nearly cut in half compared to having no barrels at all. Also the placement of the barriers invariably decreased the maximum impact force. This was true for the impact velocity range imparted by releasing the car from different positions of the ramp. <b>Conclusions/Discussion</b> All the data is recorded and graphed. An explanation of the observed results has been developed to explain what the most effective barrel is. My conclusion is that air in an enclosed barrel is most effective.	
<b>Summary Statement</b> In my project, I tested if crash barrels decrease the stopping force when a car impacts.	
<b>Help Received</b> Discussed results with my dad	