



# CALIFORNIA STATE SCIENCE FAIR 2004 PROJECT SUMMARY

<b>Name(s)</b> <b>Raven D. Gray</b>	<b>Project Number</b> <b>S0209</b>
<b>Project Title</b> <b>How Waterproof Is Fabric with or without Scotch-Gard?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Fabrics are made up natural and man-made fibers. Those fibers are woven, knitted, or felted together to make a cloth. Depending on how taut the fibers are put together determines how water resistant that fabric is. The purpose of this experiment was to clarify how water repellent the common fabrics used in everyday lifestyle really is, opposed to scotch-guarded fabrics.</p> <p><b>Methods/Materials</b> The experiment consisted of 12 different fabrics; Berber Polyester, Silk, Linen, Crepon Sheer Nylon, Stop Nylon, Cotton, Acetate, Waterproof Nylon, Polyester, Polyester #Fleece#, Wool, and Leather. The experimental group had scotch-gard added to each fabric, while the control group had nothing added. First, each fabric was weighed by grams, then each fabric was placed on a 45 degree slant. 6 inches above the slant, a funnel with a spray nozzle were suspended. 250 ml of water was then poured onto each fabric. After spraying the fabrics with the water, absorption was measured on a scale and rated according to a #standard spray test rating#. This was done to each scotch-guarded fabric as well.</p> <p><b>Results</b> First, each fabric being tested was weighed at its original weight. When the water was added to the control group, each fabric weighed only 2 or 3 grams more than the original weight, except for Berber Polyester and Polyester Fleece. Berber Polyester and Polyester Fleece weighted almost 5x their original weight. The experimental group weighed the same as the control group, un-wet. After being wet, the fabrics weighed 1 gram more than their original weight except for Berber Polyester and Polyester fleece. Their weights were almost 3x their original weight. For the standard spray rating for scotch-guard, leather and the waterproof Nylon were a 100. The closest fabrics to being waterproof was Acetate and Wool, with 90. Polyester Fleece, Cotton, and Rip Stop Nylon, were rated at an 80. Linen and Silk were a rating of 70. And Polyester, Berber Polyester, and Crepon Sheer Nylon, were rated at a 50.</p> <p><b>Conclusions/Discussion</b> Overall, the data did support the hypothesis. The scotch-gard did prevent water absorption onto the fabrics. The data shows that for almost every fabric tested with scotch-gard, the water did not penetrate the opposite side. Each fabric was woven together differently, so each fabric absorbs different amounts of water. The more water repellent a fabric is, the tighter the fibers are woven in that fabric.</p>	
<b>Summary Statement</b> This project is testing the water resistability, or how waterproof different fabrics are with or without Scotch-Gard.	
<b>Help Received</b> Dr. Diane Lewis of FIDM (Fashion Institute of Design and Merchandise) and Northridge University	