



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Claire Christensen; Alexis DeFendis	Project Number J1207
Project Title Hanging by a Thread; Which Fabric Can Withstand the Most Tension?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals We were interested in the different types of fabrics, and how strong they were. Therefore, we decided to test the durability of natural and synthetic fabrics. Our goal was to determine the fabric which had the highest tensile strength by creating a machine that specializes in testing the strength of fabrics.</p> <p>Methods/Materials To test the tensile strength of fabrics, we designed and made a contraption which pulls apart the fabrics, and measures the amount of force that was applied to tear the fabric. Our materials consisted of: two anchors, two scales, harnesses that were used for holding each piece of fabric in place (harnesses were made out of steel and bolts), two winches and braided cable. For our experimentation, we also used various types of natural and synthetic fabrics. The natural fabrics we used included flannel (made with 100% cotton), velvet (100% cotton), denim (100% cotton), silk (100% silk), wool (100% wool) and linen (100% linen). The synthetic fabrics we used were flannel (100% polyester), velvet (100% polyester), denim (50% cotton, 47% polyester, 3% other fibers), silk (100% polyester), wool (70% polyester, 20% rayon, 10% other fibers) and linen.</p> <p>Results Our results were accurate with what we had predicted. The synthetic fabrics, all together, were able to withstand 507 pounds, while the natural fabrics withstood 467 pounds. Out of all the fabrics, the natural silk was able to withstand the most pressure, breaking at 177 pounds, while the natural wool withstood the least amount of pressure, tearing at 20 pounds. Of the natural fabrics, silk was the strongest, and wool was the weakest. Of the synthetic fabrics, denim was the strongest, breaking at, 164 pounds, and flannel was the least strong, splitting apart at 45 pounds.</p> <p>Conclusions/Discussion We both learned a lot from doing this science fair project, regarding the tensile strength of fabrics. We learned that out of the twelve fabrics we tested, natural silk is the strongest fabric, and natural wool is the weakest. Of the synthetic fabrics, denim was the strongest, and flannel was the least strong. Between the natural fabrics, silk had the highest tensile strength, while wool had the least amount of strength. We both worked unbelievably hard and each put forth a phenomenal amount of effort into this project. This project we worked on together was beyond our wildest dreams.</p>	
Summary Statement Our project regards testing the tensile strength of fabrics.	
Help Received Father helped design project, helped put together machine, helped get us started on experimentation and helped get supplies; Mothers helped proofread report and get supplies needed for project.	