



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Brendan D. Bane	Project Number 22861
Project Title Watch Out Man of Steel: Here Comes Spider-Goat and His Webs of Steel!	
Abstract Objectives/Goals My objective was to test the strength of spider web silk to see if a hand rolled strand of spider web silk could hold at least fifteen times its weight. My goal was to confirm what scientists believe about spider silk: it is one of the strongest materials in the world, but it is impossible to harvest effectively so we need to find a way to make artificial spider silk. Methods/Materials Spider web silk was collected from a Chilean Rose-Hair Tarantula's cage. It was separated into four pieces. Each piece was rolled and shaped by hand into a strand approximately two inches long and weighing less than one gram. Two strands were slightly shorter and thinner than the other two, but did not have a measurable weight difference. The strands were not identical because spider web silk is a natural material that is difficult to harvest and hard to handle. Each strand was threaded through a series of 6 metal nuts. They weighed: under 1 gram, 1, 3, 5, 10 and 15 grams. Each strand was hand held with one nut hanging from it, in order to test the strength of the strand. The test was repeated with each strand and nut. The results were recorded. Results Two of the strands held each weight of nut without breaking. Two strands broke. One broke holding the 1 gram nut and the other broke holding the 3 gram nut. These two strands were the shorter strands. Conclusions/Discussion My conclusion is that a strand of spider web silk can hold at least 15 times its weight, depending on its shape and length.	
Summary Statement My project tested the strength of spider silk because scientists think it is one of the strongest materials in the world and if artificially created, it could be used as building materials, medical supplies or artificial limbs.	
Help Received My mother helped me type and assemble the display and report. My father and mother helped buy supplies and transporting the project. My tutor helped me research. I interviewed entomology professors, Dr. T. Perring and Dr. T. Prentice, at Univ. Cal. Riverside.	