



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Dylan T. Woodbury	Project Number J0238
Project Title Breaking Point: Using Pasta to Find the Effect of Length and Cross-Sectional Area on the Strength of an Object	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine whether the cross-sectional area and the length of an object affects the strength and by how much. I believe that the pasta with the greatest cross-sectional area will be strongest, and will therefore support the most weight. I also believe that shorter pieces of pasta will be stronger than longer pieces because longer pieces bend more easily.</p> <p>Methods/Materials Three different types of pasta of the same brand were used: thin spaghetti, normal spaghetti, and linguini. For each type of pasta, five different lengths were used: two, four, six, eight, and ten inches. I set two blocks, with a notch in them to hold the pasta, on two tables. The tables were moved closer to or farther from each other, depending on what the span of the pasta had to be. A piece of yarn tied to a plastic cup was rested over the pasta. I had someone apply pressure to each end of the pasta to prevent the ends from bending and to keep the pasta from moving. I then dropped pennies one by one into the cup until the pasta broke. This was repeated ten times for each length of each type of pasta. All trials were done inside on the same day to control for atmospheric conditions such as humidity and temperature.</p> <p>Results The linguini (greatest cross-sectional area) held the most pennies while the thin spaghetti (smallest cross-sectional area) held the least pennies. For each type of pasta, the shortest length (2 inches) held the most pennies, while the longest length (10 inches) held the least. As the length increased, the number of pennies that each type of pasta could support decreased.</p> <p>Conclusions/Discussion My conclusion is that the strength of an object is definitely affected by its cross-sectional area and length. As cross-sectional area increases, the strength of the object increases. As the length increases, the strength of the object decreases.</p>	
Summary Statement My project is about finding whether the cross-sectional area and length of an object affects its strength.	
Help Received Father helped with graphs and regression equations; Father and Mother held down the pasta while I dropped pennies in the cup.	