



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> Erin N. Beebe	<b>Project Number</b> <b>J1303</b>
<b>Project Title</b> <b>A Stretch in Time: The Effect of Aging on Flexibility</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project was to find out how flexibility is affected by age. I also wanted to know how frequency of stretching impacts flexibility in different age groups. <b>Methods/Materials</b> I measured five age groups (6-8, 11-14, 18-25, 40-50, and 65+ year-olds) with thirty people in each group. First I had every subject fill out a survey about how often they stretch and exercise. Next I measured their degree of flexibility on four different muscles groups (legs, arms, back, hips) and gave them a score for each one. Then I found the average flexibility score for each muscle group and each age group. I also compared the flexibility of people in the three older age groups who stretched 2 or less times a week with people who stretched 3 or more times a week. I did not do this for the two younger age groups because there was not enough variety in how often they stretched. <b>Results</b> On average, the 6-8, 11-14, and 18-25 year-olds did not have significant differences in overall flexibility. The 40-50 year-olds were definitely less flexible than the younger groups, but not by a ton. However, the decrease in flexibility of the 65+group was very significant. According to the surveys, all of the age groups stretched a median of 1-2 times a week except for the 11-14 year-olds who stretched a median of 5 or more times a week. While the 40-50 and 65+ year-olds stretched the same number of times as the 6-8 and 18-25 year-olds, they were much less flexible. When I looked at the effect of stretching frequency on flexibility in the different age groups, stretching really increased flexibility in the 18-25 year-old group, had a smaller effect in the 40-50 year-old group, and did not seem to improve flexibility in the 65+ group. <b>Conclusions/Discussion</b> Overall, the results of my project did support my hypothesis that flexibility decreases with age. However, I had expected that flexibility would decrease significantly with each older age group. Instead, there was no significant decrease in flexibility until the 40-50 year-old and 65+ age groups. I also found that flexibility was increased more by stretching in the younger adults than in the older subjects. A follow-up study could explore different ways such as massages, exercise, diet or more intensive stretching to help older people become more flexible.	
<b>Summary Statement</b> My project is about how flexibility is affected by age.	
<b>Help Received</b> My parents drove me around to measure subjects and showed me how to make graphs in Excel.	