



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Amit S. Talreja</b>	<b>Project Number</b> <b>J0225</b>
<b>Project Title</b> <b>Yo-Yo Physics</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Determine what effect (if any) the weight and string length of a yo-yo have on its "sleep time," which is the time it stays at the bottom of the string when the yo-yo is thrown <b>Methods/Materials</b> One yo-yo, yo-yo strings, two dimes and two pennies. The weight of the coins was determined using a scale accurate to one-thousandth of a gram. The strings were measured and cut to 96.5 centimeters. 1 string was left as it was, and the other three were cut to lengths decreasing in increments of 5.5 centimeters. Duct tape was used to affix the coins (weights) to each side of the yo-yo. In this experiment, three(3) different yo-yo weights and four(4) different string lengths were used to give twelve(12) different test combinations. Each variation was thrown fifty times to ensure accuracy and minimize the impact of outliers. <b>Results</b> It was found that a string length of 96.5 centimeters and pennies taped to the side of the yo-yo produced the best result (the longest sleep time). The measurements indicated that on average when the string got shorter, the time the yo-yo stayed at the bottom of the string decreased. However, when weight was added the time it stayed at the bottom of the string increased <b>Conclusions/Discussion</b> The string length has a direct correlation with the #sleep time# because the yo-yo gets its energy by unwinding from the string. Therefore, if there is less string to unwind from, there is less energy for it to spin at the bottom of the string. When weight is added, the yo-yo has more mass as a whole, and therefore has more momentum when going down the string, giving it more energy to spin at the bottom of the string.	
<b>Summary Statement</b> What is the effect of a yo-yo's weight and string length on it's spinning motion (as measured by "sleep" time)?	
<b>Help Received</b> Brother weighed the coins in his high school lab.	