



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Nicholas L. Okita	Project Number J0226
Project Title Effect of Friction on Objects in Motion	
Abstract Objectives/Goals This study was conducted to determine whether objects of different materials (but equally weighted) would travel the same relative distance as the material of the sliding surface is changed. The objective was to study the frictional equation: $\text{Frictional Force} = (\text{Coefficient of Friction}) * (\text{Normal Force})$. Methods/Materials The effect of friction was investigated using four surfaces (pressed wood, felt, aluminum foil, and sandpaper). Four objects were used: wood Jenga block, plastic Lego block, eraser, sponge. The weight of each object was made identical using coins attached to the top of the object. Each object was shot across each surface five times for a total of 80 measurements. The starting point and force of the shooting mechanism were constant for each measurement. Results Each surface resulted in a different average distance traveled for each object. However, the distance traveled by the objects moving across the surfaces did not stay in the same relative order as the surfaces changed. The objects went the farthest on the smooth pressed wood surface (lowest frictional effect). The relative difference in distance traveled by each object was also the greatest. The sandpaper surface was observed to have the greatest amount of frictional effect based on the shortest distance traveled. Surprisingly, all objects traveled the same distance on this surface. Conclusions/Discussion The results indicate that the frictional coefficient is affected by the combination of the object and the sliding surface. Since the relative distance (or order of distance traveled) by the objects did not stay the same, different combinations of objects and sliding surfaces may result in higher than expected frictional conditions. Further, as observed of the rough sandpaper surface, the force to put the objects in motion may need to be increased to a certain minimum level to overcome static frictional effects.	
Summary Statement This project studies the effect of friction on bodies in motion.	
Help Received Minimal help was needed. My parents proofread my report and reviewed my work when it was complete.	