



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Billy Paris</b>	<b>Project Number</b> <b>J0116</b>
<b>Project Title</b> <b>The Falling Rate of Small Spheres</b>	
<b>Objectives/Goals</b> An experiment was designed to test the falling rates of small plastic spheres ranging in diameter from 1-6 mm.	
<b>Abstract</b> <b>Methods/Materials</b> Six spheres were fashioned from hardenable modeling compound within the above diameter range. A testing apparatus was designed and built which included a four meter endless belt moving horizontally at a constant speed. A tripping device attached to the belt caused the graphite coated sphere to be released two meters above a zero point on the belt. The distance the belt moved between the zero point and the graphite mark left by the falling sphere was used to calculate the falling speed of that sphere. Each sphere was tested four times and the calculated speeds were averaged.	
<b>Results</b> The largest sphere (5.14 mm in diameter) fell at an average rate of 4,302 mm/sec., while the smallest sphere (1.6 mm in diameter) fell at an average rate of 2,369 mm/sec. When the average speeds of six spheres were plotted the result approximates a straight line.	
<b>Conclusions/Discussion</b> Larger spheres fall faster than smaller spheres of the same density. It is possible that the difference in falling speed between the larger and smaller spheres is greater than was measured if the larger spheres did not have enough height to reach their terminal velocity.  The hypothesis was based upon the increasing ratio of the volume to area of a sphere with increasing sphere diameter, and the data supports this. This relationship between size and speed of falling objects would account for insects falling from great heights uninjured and increasing amounts of damage from larger hailstones.	
<b>Summary Statement</b> This experiment was designed to determine the relationship of falling speed to size for small (1-6 mm in diameter) spheres.	
<b>Help Received</b> Suggestions from Dr. Richard Stepp , Ph.D. and mr. Bill Alexander both of Humbolt State University Physics Dept. helped with apparatus design. Mr. John Palmer, M.A., my science teacher helped with design and construction of apparatus. Mr. Kenny Norman on Green Point Staff, helped with math.	