



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Patrick M. Hearst</b>	<b>Project Number</b> <b>J0214</b>
<b>Project Title</b> <b>Catapulting Our Way into Science</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this experiment is to demonstrate the relationship between the distance traveled for similar shaped round projectiles of different weight, volume, and density. <b>Methods/Materials</b> A Scorpion II Catapult Kit was assembled and used to fire 20 identical wooden balls. Then, 9 different types of balls of varying weight, volume and density were fired 15 times each. Distances were measured with a metric rollout measuring wheel. Each of the ten types of projectiles was weighed. Then, the diameter of each of the ten types of projectiles was calculated using a micrometer caliper. This was used to establish the volume (diameter/2 x Pi squared). Next, density was established as weight/volume. The data collected was incorporated into Excel graphs to illustrate the correlation between distance traveled and the weight, volume and density of each of the 10 types of projectiles. <b>Results</b> The 20 identical wooden projectiles traveled nearly identical distances. Each of the other types of projectiles traveled a very consistently similar distance. Distances varied, however, between types of projectiles, with golf balls traveling the farthest and ping pong balls traveling the shortest distance. <b>Conclusions/Discussion</b> The highest degree of correlation between distances traveled was with density rather than weight or volume.	
<b>Summary Statement</b> This experiment used a catapult to demonstrate whether weight, volume, or density had the greatest affect on how far a projectile traveled.	
<b>Help Received</b> Grandfather helped assemble the catapult and provided digital micrometer. Father assisted with research at UCSD Library and marked landing points. Mother helped shop for display materials and photographed during the procedures.	