



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Elizabeth Kearns</b>	<b>Project Number</b>  <b>J2014</b>
<b>Project Title</b>  <b>Chalk Talk: Determining the Best Liquid Chalk Product</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> As a gymnast, I use chalk to absorb the perspiration on my hands and feet before performing skills. For my science experiment, I asked the question Which liquid chalk product is best for improving grip? Research on the effectiveness of liquid chalk over powdered chalk shows that liquid chalk is more effective. In my project, I wanted to determine the best liquid chalk product on the market.</p> <p><b>Methods</b> My science fair procedure had two parts. First, I tested which chalk product had the highest viscosity with a qualitative test. I scored the liquid chalk brands on a scale of more watery = 1 and more glue stick-like = 10. To prevent bias, I tested the liquid chinks in a random order with the names of the brands covered. The highest scoring liquid chalk had the highest viscosity. The second part of my experiment was quantitative. A total of seven (7) gymnasts participated in this study. I tested how long each gymnast could hang on the bar without using chalk on their hands (the control). Then I tested how long each gymnast could hang on the bar with each type of chalk. I tested the hang times using a stopwatch. In between tests I washed the bar and thoroughly washed the gymnasts hands. I used six different types of chalk products including Hand Armor, ZUMWAX Beastly Chalk Gorilla Addition, SPORTSMEDIQ Pro Grade Liquid Chalk, Liquid Chalk (Camp USA), Black Widow Liquid Chalk, and Liquid Grip. I tested seven female gymnasts of similar abilities, including myself.</p> <p><b>Results</b> All gymnasts' hang times were improved by using liquid chalk. The average control hang time without chalk was 35.67 seconds. Liquid chalk brand Camp USA improved the average hang time to 71.23 seconds. Camp USA's product was the only product made from silicon dioxide. All the other products used magnesium carbonate.</p> <p><b>Conclusions</b> Surprisingly, liquid chalk made by Camp USA does not include the three popular ingredients in most liquid chalk brands: magnesium carbonate, alcohol, nor resin. Camp USA is made up of water and silicon dioxide. Silicon dioxide is capable of withstanding very high temperatures, which is an important property for a chalk product due to the friction created during gymnastic routines. The results of my experiment are relevant to gymnasts, coaches and other athletes such as rock climbers, baseball players, and CrossFit competitors who use chalk to improve grip. The results may also cause scientists to look more closely at the applicability of silicon dioxide over magnesium carbonate.</p>	
<b>Summary Statement</b>  I determined that a liquid chalk product made from silicon dioxide improved grip more than products made from magnesium carbonate.	
<b>Help Received</b>  During this project, I received help from my science teacher regarding organization and classification. I also received help from my mom overseeing the gymnasts when I measured hang times at a playground. Last, my babysitter helped with timing the gymnasts' hang time.	