



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Akemi M. Ito	Project Number J0113
Project Title Marble Viscosity Race	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine the viscosity of common liquids, honey, ocean water, and vegetable oil, by measuring the time it takes the marble to travel through the liquids.</p> <p>Methods/Materials Measure down about 2 cm from the top of each glass with a ruler, and mark it with tape. Fill each glass to the tape with a different liquid. Hold two marbles level with the tops of two glasses. Say, "Ready, Set, Go!" and start the stopwatch while the helper drops the marbles. Record your observations. Race the marbles a second and third time. Race another two liquids the same as above.</p> <p>To measure viscosity of the liquids fill the graduated cylinder up with one of the liquids to a level 5 cm below the top of the cylinder. Measure down at least 2 cm below the surface of the liquid and mark a starting line on the cylinder with the tape. The starting line needs to be lower than the surface of the liquid to allow time for your marble to reach its terminal velocity before you start taking measurements. Measure up from the bottom of the cylinder, approximately 5 cm, and mark an ending line on the cylinder with the marker. You don't want the ending line to be at the bottom of the cylinder because the marble will slow down as it approaches the bottom of the cylinder. Measure the distance between the starting point and ending point. This is the distance that you will use to calculate the speed of the marble as it travels through the liquid.</p> <p>Results For the marble race, the marble average speed was .32 seconds for ocean water, .46 seconds for vegetable oil, and 73 seconds for honey. For the viscosity experiment, ocean water viscosity was 129 kg/meters squared, vegetable oil was 167 kg/meters squared, and honey was 46,890 kg/meters squared.</p> <p>Conclusions/Discussion In the end my hypothesis was right! My hypothesis was if the honey, vegetable oil, and ocean water are compared for viscosity, then the marble will travel slower in honey compared to ocean water and vegetable oil. I discovered that my marble traveled slowly because the viscosity was high in honey.</p>	
Summary Statement The viscosity of common liquids.	
Help Received Mother helped with dropping the marbles, the range on my graphs, and some math conversions.	