



**CALIFORNIA STATE SCIENCE FAIR  
2016 PROJECT SUMMARY**

<b>Name(s)</b> <b>Michael Maregne; Dylan Shragg</b>	<b>Project Number</b> <b>J1020</b>
<b>Project Title</b> <b>Shade Balls: Sphere vs. Tetrahedron: Using Geometric Shapes to Reduce Evaporation in Open Air Reservoirs</b>	
<div><div><b>Objectives/Goals</b> The objective is to determine whether different geometric shapes will reduce evaporation better than shade balls (sphere) while at the same time reducing cost.</div><div><b>Methods/Materials</b> Materials to make the mold and plastic tetrahedrons: cardboard, Smooth-On Mold Star# 30, hot glue, wooden dowels, razor blade, metal ruler, bucket, plastic cups, stirring sticks, scale, tape, saw, Plexi-glass cut into the shape of a triangle, rubber gloves, Smooth-On Smooth-Cast# 60D, Smooth-On Sonite# Wax, Smooth-On UVO Black Color Pigment, paint brush, rubber bands, water.  Materials to conduct the experiment: two plastic containers 1 foot in height, 2 feet in length, and 1 foot in width, 40 liters of water in each container, two different types of shapes (10 of each type), sunlight, scale, measuring tape.  Method: Place the two different shapes into their own container filled with water and measure the rate of evaporation.</div><div><b>Results</b> The amount of water remaining in the container with the spherical shade balls was 37.0 liters and the amount of water remaining in the container with the tetrahedral shade balls 36.8 liters. After seven days, the tetrahedral shade balls saved 0.20 more liters than the spherical shade balls. These results indicate that the tetrahedral shade balls reduced evaporation more than the spherical shade balls.</div><div><b>Conclusions/Discussion</b> According to the data collected, the hypothesis that states if the spherical shade balls and tetrahedral shade balls are placed in different containers filled with water, then less water would evaporate in the container with the tetrahedral shade balls. This hypothesis appears to be supported. It is suggested by the shapes that they can be made to increase the amount of water California saves.</div></div>	
<b>Summary Statement</b> Had a different geometric shape been used in the LADWP's open air reservoir shade ball project, anywhere from \$3 to 10 million could have been saved (depending how the results are calculated)	
<b>Help Received</b> Mother and father assisted with handling the chemicals, where to find and calculate equations, the formatting of the report in Microsoft Word, proofreading the report, the SketchUp program which helped analyze different shapes in 3D.	