



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Aiden D. Blood	Project Number J0203
Project Title Can Smaller Eggs Support More Weight?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment was designed to determine the relative strengths of eggs of different sizes. We made an apparatus to load weights onto a wooden platform, which was supported by an egg. The weights were loaded onto each egg, in a stepwise fashion, in 0.5 kg increments. The weight at which they exploded was recorded as their maximum weight. Each group of eggs was tested sequentially in the same setting.</p> <p>Methods/Materials One dozen of each different sized eggs (jumbo, extra large, large, medium), Wood, Saw, Weights, Egg cartons, Scale, String, to measure the circumference, Ruler, Drill and drill bits, Screws, Screwdriver, 4 wooden dowels (1.8 cm in diameter), Wood glue. 1. Build wooden support platform for the eggs. 2. Weigh each egg in gm and measure both axes circumferences in cm. 3. Place one egg into the carton holder in the wooden box support. 4. Lower the top wooden frame onto the egg. 5. Test the eggs for the amount of weight they can each support. a. Start with small weights, increase each time with 0.5 kg b. Gradually add larger weights until the egg breaks.</p> <p>Results When the data was analyzed, we discovered that the middle-sized eggs were actually able to support the most weight. After measuring all of the eggs, we learned that the middle-sized eggs, were actually the eggs sold as "medium" eggs and the eggs sold as "extra-large" eggs. The "large" eggs were the smallest and the "jumbo" the largest. Both the largest and smallest eggs withstood the smallest amount of weight.</p> <p>Conclusions/Discussion The data demonstrates that the middle-sized eggs are, on average, the strongest. This is not intuitive, as one might guess that the larger, and heavier birds would lay the largest eggs and these eggs would need to support the weight of the larger birds and thereby be the strongest eggs. Alternatively, if eggs act like water balloons, then the smallest would be the strongest because they have thicker walls and are able to withstand the most weight. We discovered that the eggs we bought varied in size within each carton, some mediums were smaller than other mediums, and likewise with each of the other sizes. Future tests might include the same "sized" eggs from different stores to determine other factors that influence their strength, like organic, or brown, or grade A, or grade AA, or free-range.</p>	
Summary Statement I tested the relative strengths of different sized eggs as a function of their sizes as sold, their actual sizes and their weights.	
Help Received Dad helped type and build apparatus, Grandfather helped build apparatus.	