



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Leandra A. Fraser	Project Number J1508
Project Title The Buoyancy Factor	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I created a term called the "buoyancy factor." This means the percentage of what part of an object is submerged under water. (Equation: $b-a=c$; $d-b=e$; $c/e=\%$) I tested twelve different objects once in tap water and once in salt water. I also made a taller cylinder so I could measure longer objects. Buoyancy factors ranged from as high as 100% to as low as 4%. Objects that sank to the bottom did not have a buoyancy factor simply because they are not buoyant.</p> <p>Methods/Materials Materials: The objects that you test and measure should all be about the same length such as: molding clay; two different sizes of wood doweling; copper piping; a crayon; etc. You will also need the longer graduated cylinder holding up to about 200 milliliters and a large amount of tap and salt water. The method I used/created is the buoyancy factor. Fill the cylinder to the 150 milliliter line with tap or salt water, drop an item in, take the measurement of where the water line is now, and subtract 150 from it. Push the remaining part of the object to the water line which should rise once again, and subtract 150 from that as well. Take those two numbers, make them a fraction, and turn that into a percentage.</p> <p>Results Each object had very different results in the tap and salt water. Nine out of the twelve items I used, floated. Buoyancy factor percentages ranged from as high as 100% like the wax crayon, which sank all the way to the 150 milliliter water line; and the lowest was the styrofoam with a buoyancy factor of 4% and did not sink very much at all.</p> <p>Conclusions/Discussion Out of all the items that did not sink, I found buoyancy factors for each. I compared the factors with tap water versus salt water. There were a few differences, but no dramatic changes. Objects made of the same material, but were different sizes (wood) had the same buoyancy factors in tap water, but were not alike in salt water. The three metals I tested, all sank even though two of them were hollow. These objects did not have buoyancy factors.</p>	
Summary Statement The "buoyancy factor" is a percentage that tells how much of an object is submerged in water.	
Help Received My parents bought most of my materials; and Home Depot and The UPS store for their assistance	